FINAL REPORT

WENATCHEE TFREC TEST PLOT REMEDIATION
WENATCHEE, WASHINGTON
DACA67-95-G-0001-38

Prepared for:
United States Army Corps of Engineers - Seattle District
4735 East Marginal Way South
Seattle, Washington 98124

August 1998

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ENGINEERING
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Memorandum

Date: August 10, 1998
To: Ralph Totorica
From: Fred Luck, GSA Project Manager

Subject: Instruction for inserting revisions to Appendix K
Wenatchee TFREC Test Plot Remediation
Wenatchee, Washington
Contract No. DACA67-95-G-0001-38

A revised copy of the Wenatchee TFREC Test Plot Remediation Final Report along with Appendices A through J is enclosed with this memo. Additionally, three revisions to the final appendix, Appendix K, are enclosed for insertion into the draft copy of this report appendix previously submitted. The insertions include replacing three Summary Chemical Data Quality Control Report Memorandums as follows:

1. Replace the memo for Sound Analytical reports #68599 and #68600
2. Replace the memo for Sound Analytical Report #69345
3. Remove both copies of the memo for Sound Analytical Report #68601 and replace with the revised copy.

If you have any questions concerning this document please feel free to contact me directly at (425) 519-0300 extension 205.

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MEMORANDUM

DATE: August 5, 1998

TO: Fred Luck, Project Manager

FROM: Michael Webb, Chemical Data Quality Manager MW

SUBJECT: Contract DACA67-95-G-0001-38
Wenatchee Tree Fruit Research Center Remediation
Summary Chemical Data Quality Control Report:
Final Confirmation Sampling November 4, 1997
Sound Analytical Reports #68599 and 68600

Analytical Methods:

- Method 8081 for Organochlorine Pesticides
- Method 8141 for Organophosphorus Pesticides, Modified for GC/MS

Data Use Intended:

- Final Confirmation Samples: To establish that the remediation lowered the concentrations of the target analytes to levels below the clean-up standard.

Summary of Qualified and Rejected Data:

- No soil data were rejected due to quality control problems.
- The result originally reported for DDT for sample FC10A1N04712 (the Performance Evaluation sample for organochlorine pesticides) showed unexplainable high recovery. Such a condition would indicate a possible high bias in DDT results. However, results from an initial undiluted run and from a re-analysis gave acceptable performance for DDT. Therefore no qualification of the DDT data set was warranted.

  The DDT result currently reported is from the initial undiluted run. Since this result is 10 % above the highest standard the value is reported with an "E" qualifier. There is no evidence of curvature in the calibration, so this extrapolation has been accepted.
- The value of the toxaphene in sample FC4B1N0477 was changed to 1100 mg/kg after discovery of a transcription error (the report contains a revised page, "20R").
- Some results were below the quantitation limit and were flagged with "J" qualifiers. "C" flags were used to indicate that second-column confirmation had confirmed the results (4,4'-DDD and 2,4'-DDT cannot be confirmed when both are present). "U" qualifiers were not used for undetected results, rather "ND" was placed in the quantitative value data field.

Summary of Method 8081 Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled November 4, 1997: FC9B2N0471, FC8A4N0472, FC7A2N0473, FC7A2N0474 (field duplicate), FC6C2N0475, FC5C4N0476, FC4B1N0477, FC4B3N0478, FC3A5N0479, FC2A2N04710, FC1A1N04711, FC10A1N04712 (PE Sample), SW1AWN04715, SW1BWN04716, SW5ANN04717, SW7ANN04718, SW8ANN04719, FCEBN04714 (equipment blank).
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Acceptable.** The acceptability limits were provided by the manufacturer of the standard and are documented in the final field report for the project.

Analyte	# FC10A1N04712 (% Recovery)
Date of Analysis	11/8/97
4,4'-DDD	120
4,4'-DDE	106
4,4'-DDT	88
Dieldrin	113
Endrin	89
Endrin aldehyde*	ND

* breakdown products

The result originally reported for DDT for sample FC10A1N04712 (the Performance Evaluation sample for organochlorine pesticides) showed unexplainable high recovery. Results from an initial undiluted run and from a re-analysis gave acceptable performance for DDT. The result currently reported above is from the initial undiluted run that is at a concentration 10 % above the highest calibration standard. There is no evidence of curvature in the calibration, so this extrapolation has been accepted.

The manufacturer of the PE sample claimed that the nonconformance for only one of the analytes in the mixture is not likely associated with the sample matrix. No further corrective action was taken for the unexplained high recovery.

- Analytical Sensitivity - **Acceptable.** Some samples were diluted prior to analysis due to high analyte concentration, thereby elevating the reporting limits to above the action levels. No site decisions were affected because these sample locations were subsequently excavated and resampled
- Accuracy -

  Calibration (Initial and Continuing)– **Acceptable.** However, a potential continuing calibration verification (CCV) nonconformance was indicated for the end of the run on 11/11 when some diluted extracts were analyzed. The CCV results marked as outside of 15% difference is actually not a deficiency as per the EPA method referenced. The method allows up to a 15% difference from the first calibration verification for the day. The data format used does not display this level of detail. There is actually less than a 6% difference for both of the analytes of concern for the CCV in question. To determine this the data user has to subtract the respective percent recoveries for the two calibration verification results for the day. Therefore the data are acceptable.

  DDT and Endrin Breakdown Standards - **Acceptable.** The laboratory reported a nonconformance for some analytical runs, but this QC parameter was within the project specifications.

Surrogates - **Acceptable.** Surrogates in some of the samples and in the performance evaluation samples were not reportable because dilutions resulting from high concentrations of target analytes (samples FC9B2N0471, FC4B3N0478, FC10A1N04712, and SW7ANN04718). One of two surrogates for FC6C2N0475 and FC3A5N0479 were below project targets but within the laboratory statistical window of acceptance as required by SW-846. No corrective action was warranted.
Matrix Spikes - **Acceptable.** High analyte concentrations caused nonconformances for 4,4'-DDE. No corrective action was necessary. The laboratory control sample results were acceptable.
Laboratory Control Samples (LCS) - **Acceptable for all analytes except aldrin.** No corrective action was taken because this analyte did not show up in any samples.
Laboratory Blanks - **Acceptable.**
Field Blanks - **Acceptable.**

- Laboratory Precision - **Acceptable.**
- Field Precision - **Acceptable.** The major analytes present showed acceptable precision. The endosulfans at low concentration showed variability. No further action was taken because the levels were far below the regulatory limit.

Summary of Method 8141 (Modified) Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled November 4, 1997: FC9B2N0471, FC8A4N0472, FC7A2N0473, FC7A2N0474 (field duplicate), FC6C2N0475, FC5C4N0476, FC4B1N0477, FC3A5N0479, FC2A2N04710, FC1A1N04711, FC10B1N04713 (PE Sample), FCEBN04714 (equipment blank).
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Acceptable.** No official acceptance limits have been provided for this analysis, but the percent recoveries were within those acceptable for method 8081.

Analyte	# FC10B1N04713 (% Recovery)
Date of Analysis	11/8/97
Dimethoate	52
Disulfoton	82
Parathion	64
Azinophos, methyl	88

- Analytical Sensitivity - **Acceptable.**
- Accuracy -

  Calibration, Tune, and Internal Standard Response- (These parameters were verified with the laboratory, however, data summaries for internal standard response were not included in the data package provided by the laboratory.) **Acceptable except for a calibration check 11/8 that was outside of limits for parathion and methyl parathion.** The analytes in all but one of the samples were undetected and no corrective action was deemed necessary. The one sample potentially affected was scheduled for dilution. It was reanalyzed for parathion on 11/9 with acceptable calibration.
  Surrogates - **Acceptable.**

Matrix Spikes - **Acceptable.**
Laboratory Control Samples (LCS) - **Acceptable.**
Laboratory Blanks - **Acceptable.**
Field Blanks - **Acceptable.**

- Laboratory Precision - **Acceptable.**
- Field Precision - **Not acceptable for one of two duplicates in this delivery group.** The focused removal duplicates were a factor of four different. Some of the most contaminated material was granular. It is possible that some of this particulate material that cannot be equally distributed between duplicates affected the duplicate results. No further action was taken.

Summary of Data Comparability, Representativeness, and Completeness

- **Field Sampling Issues** - No problems were encountered.
- **Data Completeness** - The data completeness was 100% for this phase of work.

Overall Conclusions

These data are acceptable for the intended use. The QC results meet the accuracy, precision, and completeness DQOs for the project except as noted.

MEMORANDUM

DATE: August 5, 1998

TO: Fred Luck, Project Manager

FROM: Michael Webb, Chemical Data Quality Manager MW

SUBJECT: Contract DACA67-95-G-0001-38
Wenatchee Tree Fruit Research Center Remediation
Summary Chemical Data Quality Control Report:
Final Confirmation Sampling December 10, 1997
Sound Analytical Report #69345

Purpose: This assessment summarizes data quality factors that affect usability and provides guidance in the use of these data for the intended purpose.

Analytical Methods:

- Method 8081 for Organochlorine Pesticides.

Data Use Intended:

- Final Confirmation Samples: To establish that the remediation lowered the soil concentrations for the contaminants of concern to below the clean-up standards.

Summary of Qualified and Rejected Data/Definitions of Qualifiers:

- No soil data were rejected due to quality control problems. However, the data for the organochlorine analytes detected have been assigned a "J" qualifier indicating to use with caution due to variability in the spiked sample replicates. Consider the results as being potentially biased either high or low but within 50% of the actual value present. The data demonstrates characteristics of an inhomogeneous sample.
- Some results were below the quantitation limit and were flagged by the laboratory with "J" qualifiers. "C" flags were used in the organochlorine results to indicate that second-column confirmation had confirmed the results. 4,4'-DDD and 2,4'-DDT cannot be confirmed when both are present, as is the case with these analytes. "U" qualifiers were not used for undetected results, rather "ND" was placed in the quantitative value data field.

Summary of Method 8081 Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled December 10, 1997: FC4-SW8AD101.
- Sample Handling, Holding Time and Chain of Custody – **Acceptable except for some missing documentation on the cooler receipt form.** The missing information was inadvertently overlooked, but there was no reason to believe a problem existed. There are no critical factors that apply to pesticides in soil in this portion of the checklist. Broken containers, etc. would have been noted at the bottom of the form as having been resolved with a phone contact.
- Performance Evaluation (PE) Results - **Not evaluated in this delivery group.**
- Analytical Sensitivity - **Acceptable.**

E:\BOA\S97038\Report\QC Data\sqr1210.doc

- Accuracy -

  Calibration (Initial and Continuing) - **Acceptable.**
  DDT and Endrin Breakdown Standards - **Acceptable.**
  Surrogates - **Acceptable except for matrix spike sample FC4-SW8AD101-ms.** The recovery for one of two surrogates for this sample is outside of the project targets but within the laboratory statistical limits as required by the SW-846 methodology. The unspiked project sample result also showed a surrogate recovery at the lower limit of the project target range. The relatively low surrogate recovery for these samples, in combination with the inhomogeneity discussed under the topic of matrix spikes, resulted in qualification of the results. This surrogate comes very early in the chromatogram and is not representative of all of the pesticide analytes. The variability in the matrix spike results discussed below is likely a more significant factor to the data quality than the surrogate results. A discussion by the laboratory regarding the variable results is provided as an attachment to this report.
  Matrix Spikes - **Not Acceptable.** The occurrence of high recovery for dieldrin has been assigned to a case of sample inhomogeneity. Some of the results for other compounds are affected by high concentrations of the spiked compounds in the original sample, but the variability between the replicates noted for dieldrin is also evident in the spiked sample concentrations. One of the matrix spike replicates shows low recovery for one surrogate compound, explaining some of the data variability. However, the primary indication is inhomogeneity rather than matrix interference. The laboratory control sample results indicate that the method is in control.
  Laboratory Control Samples (LCS) - **Acceptable.**
  Laboratory Blanks - **Acceptable.**
  Field Blanks - **Not evaluated in this delivery group.**

- Laboratory Precision - **Not Acceptable.** Although the matrix spike replicate results are affected by high concentrations of target analytes in the original sample, inhomogeneity is the primary indication for the spurious spike replicate concentrations. All of the spiked analytes above detection in the project sample except 4,4'-DDD have been qualified with a "J" flag indicating to use with caution.
- Field Precision - **Not evaluated in this delivery group.**

Summary of Method 8141 (Modified) Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled December 10, 1997: FC4-FR2BD103.
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Not evaluated in this delivery group.**
- Analytical Sensitivity - **Acceptable.**
- Accuracy -

  Calibration, Tune, and Internal Standard Response - **Acceptable.**
  Surrogates - **Acceptable.**
  Matrix Spikes - **Acceptable.**
  Laboratory Control Samples (LCS) - **Acceptable.**
  Laboratory Blanks - **Acceptable.**
  Field Blanks - **Not evaluated in this delivery group.**

- Laboratory Precision - **Acceptable.**

- Field Precision - **Not evaluated in this delivery group.**

Summary of Data Comparability, Representativeness, and Completeness

- **Field Sampling Issues** - No problems were encountered.
- **Data Completeness** - The data completeness was 100% for this phase of work.

Overall Conclusions

These data are acceptable for use for the intended purposes. The QC results meet the accuracy, precision, and completeness DQOs for the project except as discussed. Sample inhomogeneity is evident in the QC results for the organochlorine pesticides.

Attachment

MEMORANDUM

DATE: August 5, 1998

TO: Fred Luck, Project Manager

FROM: Michael Webb, Chemical Data Quality Manager MW

SUBJECT: Contract DACA67-95-G-0001-38
Wenatchee Tree Fruit Research Center Remediation
Summary Chemical Data Quality Control Report:
Rinse Water Sampling and Final Confirmation Equipment Blank November 4, 1997
Sound Analytical Report #68601

Analytical Methods:

- Method 8081 for Organochlorine Pesticides
- Method 8141 for Organophosphorus Pesticides, Modified for GC/MS
- Method 6020 for Metals
- Method 7470 for Mercury
- Method 160.2 for Total Suspended Solids

Data Use Intended:

- Rinse Water Samples: To establish whether the water had concentrations above the MTCA Method B groundwater clean-up standards.

Summary of Qualified and Rejected Data:

- No water data were rejected due to quality control problems.
- The result for dieldrin in sample RWSWN0474 was not confirmed on the secondary column within the 40% acceptance limit. This result has been qualified with a "J" qualifier to indicate use with caution. The result reported is the lesser of the two values and the result on the confirmation column has been assigned to an interference. This assignment is supported by the presence of an unidentified compound in the primary chromatogram at a level similar to that of the dieldrin peak in the confirmation chromatogram. The quantitation reports for the chromatograms are attached in Appendix 1. This unidentified compound is at a level of 10 to 50 times the concentration reported for dieldrin and possibly could be identified in the sample analyzed by GC/MS.
- One of two surrogates were below project target levels in each sample but were within the laboratory statistical limits (an SW-846 requirement). The low recoveries are not a significant problem for the use of these data. No decisions were affected.
- Some organics results were below the quantitation limit and were flagged with "J" qualifiers. "C" flags were used to indicate that second-column confirmation had confirmed the results (4,4'-DDD and 2,4'-DDT cannot be confirmed when both are present). "U" qualifiers were not used for undetected results, rather "ND" was placed in the quantitative value data field. The definition for the data flag "B" for inorganics is that the result is above detection but below the quantitation limit.

Summary of Method 8081 Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled November 4, 1997: FCEBN04714 (equipment blank for soil), RWGSAN0471, RWGSAN0472 (field duplicate), EBGSAN0473 (equipment blank for water), RWSWN0474.
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Not evaluated in this delivery group.**
- Analytical Sensitivity - **Acceptable.**
- Accuracy -

  Calibration (Initial and Continuing)- **Acceptable.** The initial calibration results for the 2,4'-isomers have been inserted following page 47 of the report.
  DDT and Endrin Breakdown Standards - **Acceptable.** The laboratory reported a nonconformance for some analytical runs, but this QC parameter was within the project specifications.
  Surrogates - **Not Acceptable.** One of two surrogates were below project targets but within the laboratory statistical window of acceptance as required by SW-846. No corrective action was warranted.
  Matrix Spikes - **Acceptable.** High analyte concentrations caused nonconformances for 4,4'-DDE. No corrective action was necessary. The laboratory control sample results were acceptable.
  Laboratory Control Samples (LCS) - **Acceptable for all analytes except aldrin.** No corrective action was taken because this analyte did not show up in any samples.
  Laboratory Blanks - **Acceptable.**
  Field Blanks - **Acceptable.**

- Laboratory Precision - **Acceptable.**
- Field Precision - **Acceptable.** The major analytes present showed acceptable precision. The endosulfans at low concentration showed variability. No further action was taken because the levels were far below the regulatory limit.

Summary of Method 8141 (Modified) Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled November 4, 1997: FCEBN04714 (equipment blank for soil), RWGSAN0471, RWGSAN0472 (field duplicate), EBGSAN0473 (equipment blank for water), RWSWN0474.
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Not evaluated in this delivery group.**
- Analytical Sensitivity - **Acceptable.**
- Accuracy -

  Calibration, Tune, and Internal Standard Response- **Acceptable.** These parameters were verified with the laboratory, however, data summaries for internal standard response were not included in the data package provided by the laboratory.
  Surrogates - **Acceptable.**
  Matrix Spikes - **Acceptable.**
  Laboratory Control Samples (LCS) - **Acceptable.**

Laboratory Blanks - **Acceptable.**
Field Blanks - **Acceptable.**

- Laboratory Precision - **Acceptable.**
- Field Precision - **Acceptable.**

Summary of Methods 6020 and 7470 Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled November 4, 1997: RWGSAN0471, RWGSAN0472 (field duplicate), EBGSAN0473 (equipment blank for water), RWSWN0474.
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Not evaluated in this delivery group.**
- Analytical Sensitivity - **Acceptable.**
- Accuracy -

  Calibration, and Calibration Verification - **Acceptable.**
  Surrogates - **Acceptable.**
  Matrix Spikes - **Acceptable.**
  Laboratory Control Samples (LCS) - **Acceptable.**
  Laboratory Blanks - **Acceptable.**
  Field Blanks - **Acceptable.**

- Laboratory Precision - **Acceptable.**
- Field Precision - **Acceptable.**

Summary of Method 160.2 Laboratory and Field Sampling Quality Control:

- Samples Covered - Sampled November 4, 1997: RWGSAN0471, RWGSAN0472 (field duplicate), RWSWN0474.
- Sample Handling, Holding Time and Chain of Custody - **Acceptable.**
- Performance Evaluation (PE) Results - **Not evaluated in this delivery group.**
- Analytical Sensitivity - **Acceptable.**
- Accuracy -

  Calibration, Tune, and Internal Standard Response - **Not applicable to a gravimetric test.**
  Surrogates - **Acceptable.**
  Matrix Spikes - **Acceptable.**
  Laboratory Control Samples (LCS) - **Acceptable.**
  Laboratory Blanks - **Acceptable.**
  Field Blanks - **Acceptable.**

- Laboratory Precision - **Acceptable.**
- Field Precision - **Acceptable.**

Summary of Data Comparability, Representativeness, and Completeness

- **Field Sampling Issues** - No problems were encountered. The samples of rinse water taken from the tank (sample numbers containing "RWGSA") were sampled with a decontaminated HDPE cup with extension handle. The sample of rinse water taken as a composite from barrels at the drainfield site (sample number containing "RWSW") were sampled by submerging the jars and obtaining an approximately equal amount from each barrel.
- **Data Completeness** - The data completeness was 100% for this phase of work.

Overall Conclusions

These data are acceptable for the intended use. The QC results meet the accuracy, precision, and completeness DQOs for the project except as noted.

Appendix 1

GC Quantitation Reports for Dieldrin on DB-1701 and DB-17 Columns

Sound Analytical Report #68601

GARRY STRUTHERS ASSOCIATES, INC.

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August 7, 1998

Mr. Ralph Totorica
USACE - Seattle District
P.O. Box 3755
Seattle, WA 98124-3755

RE: Actions on Final Report Review Comments

Dear Ralph,

GSA has reviewed the Draft Final Report review comments and has prepared the following responses for your review:

Reviewer	Comment #	Response
Gervais	1	Definition was replaced.
Gervais	2	The correct statement is in Section 1.2.1. The statement in Sec. 1.1 was deleted to reduce redundancy.
Gervais	3	Suggested change was made.
Gervais	4	Suggested change was made.
Gervais	5	Suggested change was made.
Gervais	6	Suggested change was made.
Gervais	7A	Suggested change was made.
Gervais	7B	Cave-in is discussed in the Field Sampling Plan in Section 4.2.2.1. However, with the apparent compression of the soil, this procedure was not activated. Therefore this section was revised to state that the cores did not exceed 36 inches, so adjustments for cave-in was not necessary. See also section 12.
Gervais	8	Suggested change was made.
Gervais	9A	The use of the midpoint of the calibration as the action level was mentioned.
Gervais	9B	Sentence was revised.
Gervais	10A	Suggested change was made to section 6.0.
Gervais	10B	"Lift" was not found in this paragraph. Elsewhere in the document it was changed to "one-foot horizon" when speaking of the site characterization data and left as lift when speaking of a layer of soil removed. When used in this context, it did not seem necessary to define "lift."

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Actions on Final Report Review Comments
August 7, 1998

Gervais	11	Suggested change was made.
Gervais	12A	Suggested change was made. The rationale and Ecology decision were also mentioned.
Gervais	12B	Suggested clarification made.
Gervais	13	Suggested change was made.
Gervais	14	Shipping documentation was added to Appendix I.
Lynch	1	Suggested change was made in last paragraph.
Lynch	2	The text of this section was revised to highlight the rationale for determining the COCs . "GSA" was replaced with a statement highlighting the team decision regarding additional COCs.
Lynch	3A	The rationale for the initial analysis plan was added following the tables of locations.
Lynch	3B	The sidewall sampling addendum has been added to Appendix E and referenced in a new section (Section 7.2) added to describe the confirmation sampling.
Lynch	4A	Suggested typographical change was made. Reference to "double-blind" QC was removed. This distinction is not made in the RAMP, and therefore will not be mentioned in the report.
Lynch	4B	WSU split samples were not collected in this phase of work. Mention of these samples has been added to a new section under Gross Removal Confirmation Sampling (Section 7.2). The splitting procedure was also described.
Lynch	5	Details of sampling for these extra characterization samples was added to section 7.2. The sidewall addendum was added and is referenced in the Gross Removal Confirmation Sampling discussion, Section 7.2.
Lynch	6	Suggested change from "chlordane" test to "cyclodiene as dieldrin/endrin" was made.
Lynch	7A	False positive/negative discussion was added.
Lynch	7B	Toxaphene ID discussion was added.
Lynch	8	Suggested change was made.
Lynch	9	Reference to double-blind PE was removed as the distinction is not made in the RAMP. The terminology is correct however.
Lynch	10	Suggested change was made. See # 6.
Lynch	11	Suggested change was made.
Lynch	12	Suggested additions regarding use of IAA results was added (false positive/negative performance relative to decisions made).

Lynch	13	Suggested change was made.
Lynch	14	Suggested addition was made.
Lynch	15	The term "corrective action" was inserted to demonstrate that reanalysis eliminated any concerns with these results.
Lynch	16A	Table of sample locations and correllation of QC samples to primary samples has been added as Appendix A.
Lynch	16B	New section for itemizing deviations from the RAMP was added as section 12.
Lynch	16C	Field notes have been added as Appendix J.
Lynch	17	Suggested changes were made.
Lynch	18	Suggested change was made.
Lynch	19A	Excavation details were added.
Lynch	19B	Requested information is already provided and organized in logical manner.
Lynch	19C	The sidewall sample results have been referenced. The sidewall sampling addendum was added to Appendix E.
Lynch	20	More detail concerning confirmation sampling procedures and rational was added to Section 7.2. The idealized table suggested was rejected from inclusion based upon QC review. GSA has added a cautionary note to use the report as a whole document. The requested information is already contained in tables 13, 14, 17 and 18.
Lynch	21	The summary details are already in Table 19 of the report. The field notes have been added as Appendix J.
Lynch	22	Suggested change was made.
Lynch	23	Suggested change was made.
Lynch	24A	GSA IDW results have been tabulated in Appendix D (Table D-2). Equipment blank results for final confirmation phase has been tabulated in App. E.
Lynch	24B	Shannon and Wilson IDW results have been tabulated in Appendix D (Table D-2).
Lynch	24C	The POTW personnel verbally approved of the discharge (section 8.2.4).
Lynch	25	The additional sidewall data have been added.
Lynch	26	Suggested change was made.
Lynch	27	See comment #16 (Lynch).
Converse	1	General
Converse	2	Suggested change was made
Converse	3	Appendix I has been completed.
Converse	4	References were made consistent.
Converse	5	Limits were added to the table and explained in adjoining text. Manufacturer limits were available only for organochlorine pesticides.
Converse	6	A new section was added for TCLP analyses.

Converse	7	Suggested evaluation and change was made to the assignments of waste designation.
Converse	8	Excavation details were added.
Converse	9	Suggested change was made
Converse	10	Site restoration information has been added.
Converse	11	FR10B and FR10C are PE samples for OCP and OPP, respectively, and were only analyzed for the appropriate analytes. No action taken because the sample number log added to Appendix A provides the identification of the samples.
Converse	12	The existing table includes these results.
Converse	13	No change made because the attached quality assessment report indicates that the calibration was acceptable.
Converse	14A	The RAMP did not require confirmatory analysis.
Converse	14B	Page removed.
Converse	14C	The "N/A" indicates that the data field for retention time is not applicable to this colorimetric analytical method.
Converse	15	Annotation in the memo was added to indicate that manufacture limits were provided for organochlorine pesticides. The memo states that no acceptance limits were provided for the organophosphorus pesticide analysis. The acceptance limits used are documented in the Final Report, Section 4.5 (Table 9), which was revised to include the limits.
Converse	16A	Notation was added to memo as follows: "Acceptable except for a calibration check 11/8 that was outside of limits for parathion and methyl parathion. The analytes in all but one of the samples were undetected and no corrective action was deemed necessary. The one sample potentially affected was scheduled for dilution. It was reanalyzed for parathion on 11/9 with acceptable calibration."
Converse	16B	The sensitivity of the instrument for some analytes is far less than that for the corresponding internal standard used, giving rise to some low relative response factors. This is not a method deficiency.
Converse	16C	Notation was added to memo as follows: "However, a potential continuing calibration verification (CCV) nonconformance was indicated for the end of the run on 11/11 when some diluted extracts were analyzed. The CCV results marked as outside of 15% difference is actually not a deficiency as per the EPA method referenced. The method allows up to a 15% difference from the first calibration verification for the day. The data format used does not display this level of detail. There is actually less than a 6% difference for both of the analytes of concern for the CCV in question. The data user has to subtract the respective percent recoveries for the two calibration verification results for the day. Therefore the data are acceptable."

Actions on Final Report Review Comments
August 7, 1998

Converse	17	Notation was added to memo as follows: "The matrix spike sample results for DDE and DDT were above the calibrated range and flagged with an "E." The concentration in the sample was high relative to the spike level and these MS results were not expected to be definitive. Therefore the extracts were not diluted and reanalyzed. The accuracy is supported by the laboratory control sample results."
Converse	18A	No deficiency exists for the blank for inorganics data with "B" flag. The definition for the data flag "B" for inorganics is that the result is above detection but below the quantitation limit. It has nothing to do with the blank. The definition has been noted in the memo.
Converse	18B	Please remove the second copy of the QC report for analytical report #68601 as per the enclosed instruction sheet.
Converse	18C	The data table shows no qualifiers because the results are near the detection limit (flagged "B") and serial dilution provides no useful information. No change or further documentation is warranted.
Converse	19	The missing information on the cooler receipt form was inadvertently overlooked. There are no substantial factors that apply to pesticides in soil in this portion of the checklist. Broken containers, etc., would have been noted at the bottom of the form as having been resolved with a phone contact. There was no reason to believe a problem existed. Annotation has been added to the memo.

Attached are 10 copies of the revised Final Report including appendices A through J. Due to the size of Appendix K, only replacement pages have been generated along with an instruction sheet.

Should you have questions concerning this document please feel free to contact me directly at (425) 519-0300 extension 205. GSA appreciates this opportunity to be of service to you.

Sincerely,

Frederick N. Luck, P.E.
Project Manager

FINAL REPORT

WENATCHEE TFREC TEST PLOT REMEDIATION
WENATCHEE, WASHINGTON
DACA67-95-G-0001-38

Prepared for:
United States Army Corps of Engineers - Seattle District
4735 East Marginal Way South
Seattle, Washington 98124

August 10, 1998

Garry Struthers Associates, Inc.
Contract No. DACA-67-95-G-0001-38
Transmittal No.: 5A
Item No. 2
Spec. Section 01420
Paragraph No.: 2.3.1
Approved: Yes: X No:
Approved with correction noted on submittal data:
On attached comment sheet:
Signature:
Title: Project Manager Date: 8/10/98

GARRY STRUTHERS ASSOCIATES, INC.
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BELLEVUE, WASHINGTON 98005-4446
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No warranty is expressly stated or implied in this report with regard to the condition of the substrate and groundwater below the surface of this property with the exception of the sampling and analysis of substrate assessed by GSA. This report is not intended to, nor does it purport to encompass every record, report or document available on the site and the surrounding properties. This report reflects our observations of the condition of the property during the time of field activities, and does not cover any other conditions found on the property that were not visible during these field activities. This report is to be used in its entirety in order to understand the full perspective of activities conducted at this site.

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ABBREVIATIONS AND ACRONYMS

bgs	Below Ground Surface
BHC	Benzene Hexachloride
CCC	Calibration Check Compound
CCV	Continuing Calibration Verification
COC	Chain of Custody
DCQCR	Daily Quality Control Report
DDD	Dichlorodiphenyl Dichloroethane
DDE	Dichlorodiphenyl Dichloroethylene
DDT	Dichlorodiphenyl Trichloroethane
DQO	Data Quality Objective
E&E	Ecology and Environment, Inc.
ECD	Electron Capture
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
FR	Focused Removal
GC	Gas Chromatograph
GC/MS	Gas Chromatography/Mass Spectrometry
GC/NPD	Gas Chromatography/Nitrogen-Phosphorus Detector
GSA	Garry Struthers Associates, Inc.
HPLC	High Performance Liquid Chromatography
IAA	Immunoassay Analysis
ICP	Inductively Coupled Plasma Emission Spectrometry
LCS	Laboratory Control Sample
LLD	Lower Limit of Detection
Mod.	Modified
MTCA	Washington State Model Toxics Control Act
NA	Not analyzed (for this analyte)
NAR	No Analysis Requested
ND	None Detected
NPD	Nitrogen-Phosphorus Detector
OC	Organochlorine
OP	Organophosphorus
ORD	EPA's Office of Research and Development
PARCC	Precision, Accuracy, Representativeness, Completeness, and Comparability
PE	Performance Evaluation
PHS	U.S. Public Health Service
PRC	PRC Environmental Management, Inc.
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
RAMP	Remedial Action Management Plan
RCRA	Resource Conservation and Recovery Act

ABBREVIATIONS AND ACRONYMS (Continued)

RF	Response Factor
RPD	Relative Percent Difference
RRF	Relative Response Factor
SDG	Sample Delivery Group
SOP	Standard Operating Procedure
SPCC	System Performance Check Compound
SW	Side Wall
SW-846	Test Methods for Evaluating Solid Waste (EPA 1995)
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TFREC	(Wenatchee) Tree Fruit Research and Extension Center
USACE	United States Army Corps Of Engineers
WSU	Washington State University
WAC	Washington Administrative Code
WTFREC	Wenatchee Tree Fruit Research and Extension Center

1. INTRODUCTION

This Final Report documents the activities and observations of merit regarding the remediation at the test plot. Guidance documents used in the compilation of this report are referenced in Section 13.

1.1 BACKGROUND INFORMATION

The test plot area of the WTFREC, located in the western portion of Wenatchee, Washington, has historically been used as an agricultural research facility. The test plot was initially used by the U.S. Public Health Service (PHS), and later by the U.S. Environmental Protection Agency (EPA), as a test facility to determine the effectiveness of various land disposal methods for pesticides. Testing reportedly began in 1966 and continued until the early 1980s. The disposal experiments reportedly focused on organochlorine (OC) and organophosphorus (OP) pesticides, but could possibly have included the testing of other pesticides. In the mid-1980s the property was transferred from the EPA to Washington State University (WSU). Additional test and laboratory facilities are operated by WSU at WTFREC. Due to its concern about pesticide contamination, WSU performed limited sampling and analysis of soil in and near the test plot. WSU then contacted the EPA and asked for assistance in characterizing and/or remediating the test plot site.

The EPA and its contractors performed site investigations, which included sampling and analysis, in 1990, 1991, and 1994. The EPA's Office of Research and Development (ORD) then obtained the assistance of the USACE for the purpose of remediating the test plot site. The test plot is adjacent to a graduate student mobile home, an unpaved access road, and a nearby manufactured home development.

1.2 PREVIOUS INVESTIGATIONS

1.2.1 EPA Research

Prior to writing specifications for the test plot remediation, the USACE reviewed records and publications from the research facility and contacted several of the researchers for additional information regarding their experiments. The USACE identified three reported methods of pesticide disposal used in the experiments.

The first disposal method involved placing a 12-inch square metal frame on the ground, digging out the soil to a depth of two inches within the frame, mixing the pesticide with soil (and sometimes acetone and zinc metal) and placing the soil/pesticide mixture back into the excavation. The second disposal method was a variation on the first, and utilized a concrete block with two hollow chambers (standard concrete block) placed in a two-inch deep excavation. The soil/pesticide mixture was placed in the chambers of the concrete block. The third method involved placing pesticide (DDT and parathion) in a bag with other chemicals and burying this mixture at a depth of two to three feet below ground surface (bgs). Some of these deep burial experiments involved mixing the bags of pesticide with lime, lye or Purex®. The bags were

According to the USACE, the reviewed records and publications indicated that, in general, pesticides are not likely to migrate appreciably in soil. Thus, they assumed that the transport of pesticide compounds would not occur more than one foot below the initial disposal location, and thus the removal of contaminated soil would likely be limited to the top foot in the shallow burial locations, and to less than four feet in depth in the deep burial experiment locations.

A sketch of the test plot drawn by the researchers in the 1970s indicated locations of the pesticides disposed in the test plot. Some physical markers (spikes in deep burial rows) still existed at the outset of the test plot remediation project. The USACE assumed that the deep burial locations were indicated by the spikes remaining in these test plot rows. Sampling and analysis performed by WSU, EPA, and the USACE yielded results that contradicted the sketch. These results indicated that some pesticides that are not shown on the sketch as having been disposed in a particular location sometimes had higher soil concentrations at that location than those indicated as having been buried in that location.

1.2.2 WSU and EPA Site Investigations

Prior to the remedial activities, sampling and analysis of soil both in and near the test plot, as well as background samples, was performed by both WSU and the EPA. The locations of these sampling efforts can be found in Figures 1 and 2. The analytical data of previous sampling efforts are presented in Table 1. From these results, the USACE derived a boundary for the area to be targeted for remediation and a list of contaminants of concern.

FIGURE 1. Previous Sampling Locations

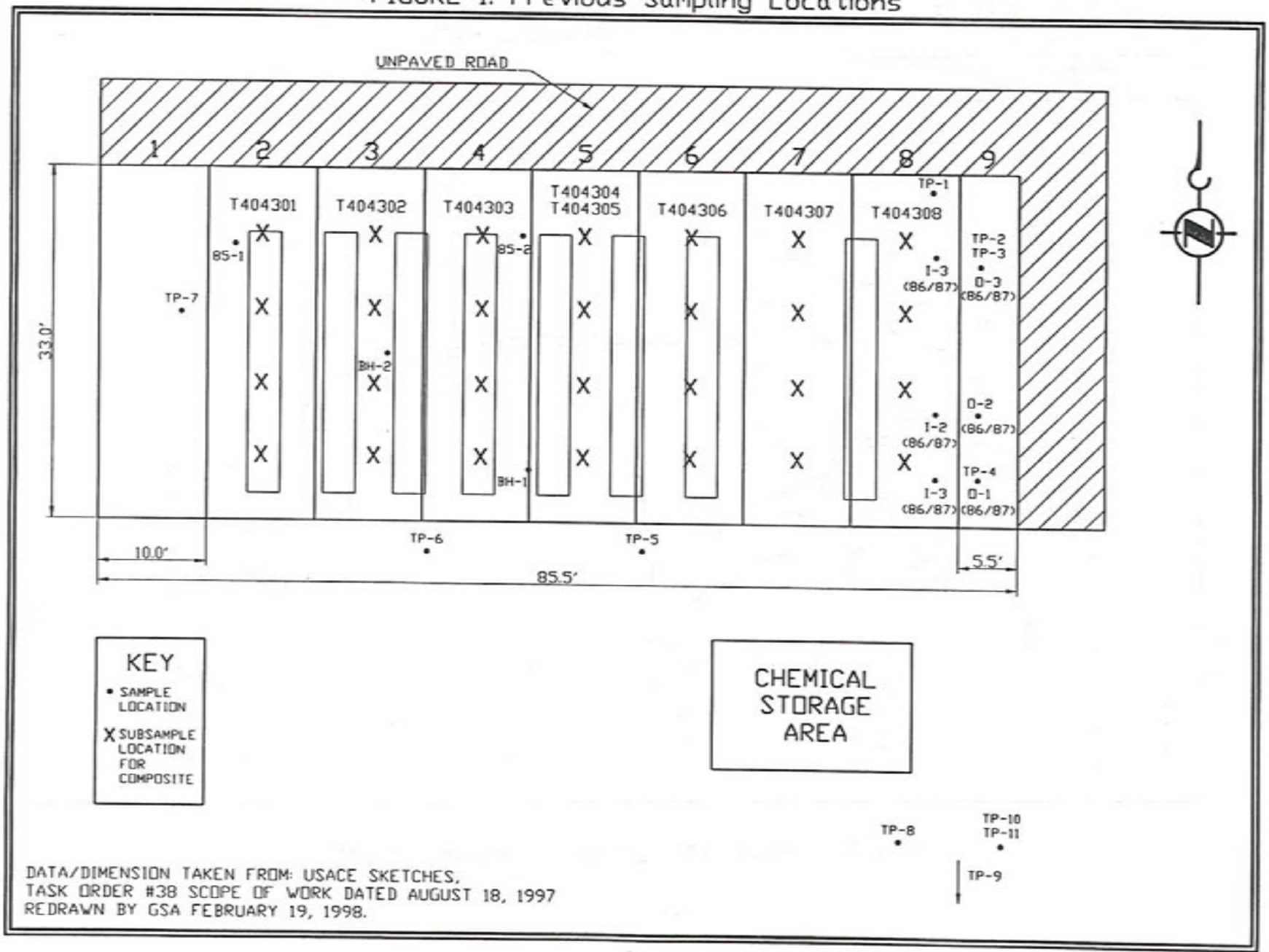
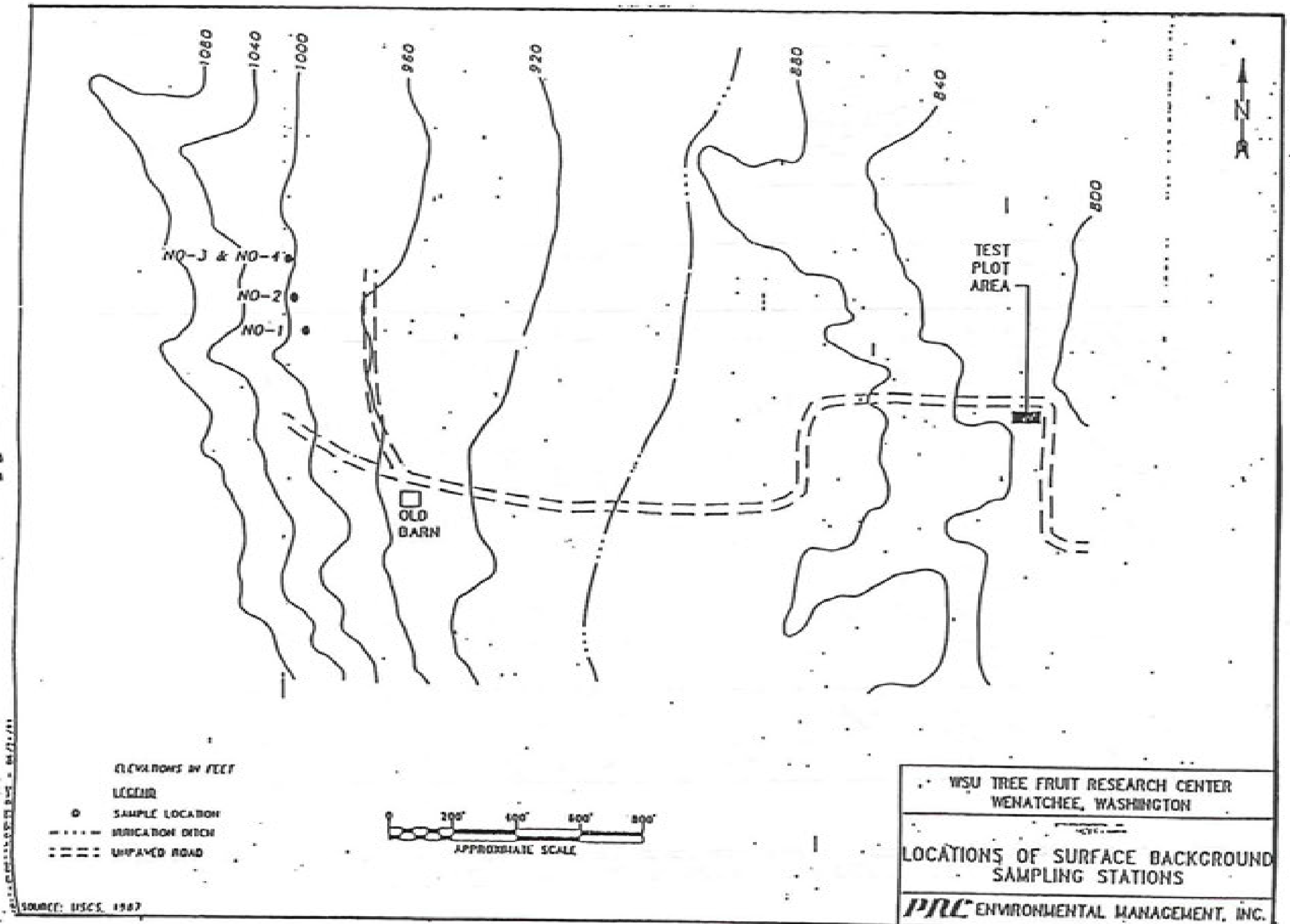


FIGURE 2. Locations of Surface Background Sampling Stations



1.2.3 Contaminants of Concern and Action Levels

EPA and Washington State Department of Ecology (Ecology) determined that the USACE list of contaminants of concern (COCs) found in Table 2 were acceptable for the site. Both the ortho-para and para-para isomers of 1,1-bis(Chlorophenyl)-2,2,2-Trichloroethane (DDT), 1,1-bis(Chlorophenyl)-2,2-Dichloroethene (DDE), and 1,1-bis(Chlorophenyl)-2,2-Dichloroehtane (DDD) are included. Additional pesticides were covered in the standard analyte list for the laboratory methods proposed for the project. Appendix H lists the chemical structures and acronyms for project pesticides of concern.

The USACE, WSU and EPA indicated that Washington State Model Toxics Control Act (MTCA) Method B was an appropriate method for setting the cleanup levels for the contaminants of concern for which MTCA Method B levels have been calculated. For COCs that do not have calculated MTCA Method B levels, the USACE, EPA, Ecology, and WSU agreed to use the MTCA Method B cleanup levels for their parent compounds (e.g. endrin ketone and endrin aldehyde had the action level of endrin, endosulfan sulfate had the action level of endosulfan I). The USACE, EPA, Ecology, and WSU also agreed that it was appropriate to add up the soil concentrations of the isomers of DDT and comparing this value with the DDT action level for the site. The same procedure was performed for the DDE isomers and the DDD isomers.

After the first round of characterization and waste samples were analyzed, GSA and the USACE included additional contaminants of concern for site. The relevant action levels for these compounds are presented in Table 3.

1.2.4 Boundary Determination

From the previous investigations the USACE concluded the horizontal extent of contamination, as defined by the MTCA Method 3 action levels, was not necessarily confined to the fenced test plot. The USACE decided initially to extend the boundary of the area of potential contamination as follows:

- another three feet beyond the northern edge of the test plot
- an additional 5.5 feet beyond the eastern edge of the test plot
- another 10 feet beyond the western edge of the test plot

They concluded that the southern edge of the test plot marked the southern extent of contamination related to test plot activities. Additionally, other locations within and near the test plot were identified by the USACE as having minimal to no data indicating the presence of contaminants. Non-orchard area background samples collected by EPA indicated that the background pesticide levels in the area did not exceed the MTCA Method B cleanup levels.

1.2.5 Analytical Strategy

Based on the site characteristics and the previous analytical data, it was determined by the USACE that a selective mix of field screening and fixed laboratory analyses would be used during the characterization of the remediation area in order to analyze for the contaminants of concern. A pilot study using immunoassay field analyses targeting organochlorine pesticides was performed by the USACE prior to establishing the specifications for the project analytical strategy.

1.3 REMEDIATION ACTIVITY SUMMARY

This report covers the activities from the WTFREC Test Plot remediation that were conducted by GSA. These activities included 1) mobilization; 2) focused removal of bags of pesticide; 3) characterization of remediation area; 4) gross removal of pesticide contaminated soil; 5) final confirmation sampling; 6) site restoration; and 7) disposal of contaminated materials.

Field and fixed laboratory data obtained during the course of the WTFREC Test Plot Remediation have confirmed that the remediation achieved an acceptable regulatory level for the subject test plot area as related to the identified contaminants of concern. This determination is based upon a statistical analysis of the sample data representative of the final conditions at the site at the maximum extent of excavation.

TABLE 1. Historical Site Sampling Results (Pre-Remediation Activities)

Sample Location	COC Label	Depth (inches bgs)	Collected By	Date	Contaminants	Concentration (mg/kg)	QA Flags (J, U, or D)	Notes
Parathion (deep) Grid #2	T404301	Surface	E&E	1994	DDE	2.30E+00		No OP pesticide analysis
					DDD	4.10E-02	J	
					DDT	1.80E+00		
Dieldrin & Endrin Grid #3	T404302	0-2	E&E	1994	Dieldrin	9.60E+00	J	All detection levels above MTCA B, No OP
					Endrin Ketone	2.20E+02		
DDT/Zn Grid #4	T404303		E&E	1994	Dieldrin	1.70E-01	J	No OP analysis
					Endrin Ketone	3.90E-01		
					DDE	2.00E+00		
					DDT	1.50E+00		
MPAR/Zn Grid #5 (duplicate 1)	T404304		E&E	1994	Dieldrin	3.90E-01	J	No OP analysis
					Endrin Ketone	2.10E-01		
					DDE	5.40E+00		
					DDT	3.60E+00		
MPAR/Zn Grid #5 (duplicate 2)	T404305		E&E	1994	Dieldrin	2.50E-01	J	No OP analysis
					Endrin Ketone	1.30E-01		
					DDE	4.00E+00		
					DDT	3.20E+00		
Methyl Parathion Grid #6	T404306		E&E	1994	Dimethoate	4.90E-01		OP and OC analysis
					Di-Sulfoton	5.70E+02		
					Endosulfan I	7.90E-02	J	
					Endosulfan II	8.10E-01	J	
					Endosulfan Sulfate	7.10E-01		
					Endrin	3.70E-01	J	
					Endrin Aldehyde	2.20E-01		
					DDE	2.10E+00		
Parathion Grid #7	T404307		E&E	1994	Di-Sulfoton	5.30E-01		OP and OC
					Endosulfan Sulfate	7.90E-02	J	
					DDE	3.10E+00		
					DDT	2.10E+00		

E&E - Ecology and Environment NAR - No Analysis Requested ND - None Detected.

U - Not Detected. The numerical value reported with this data flag is the Practical Quantitation Limit (PQL). J - The numerical value reported is detected but is below the PQL.

D - The result reported is from an analytical run with a diluted sample extract to improve data quality.

TABLE 1 (Continued). Historical Site Sampling Results (Pre-Remediation Activities)

Sample Location	COC Label	Depth (inches bgs)	Collected By	Date	Contaminants	Concentration (mg/kg)	QA Flags (J, U, or D)	Notes
Parathion Grid #8	T404308		E&E	1994	Di-Sulfoton	3.30E-01		OP and OC
					DDE	3.90E+00		Very close to MTCA B
					DDT	2.90E+00		
Core near Grids #4 & 5	BH1	0-2	E&E	1994	DDE	5.60E+00		Location uncertain
	T404309 (0-2")				DDT	4.70E+00		
	T404210 (12")	12			DDE	6.80E-01		
					DDT	5.10E-02	J	
	T404311 (24")	24			DDE	1.20E+00		
					DDT	4.40E+00		
Core in Grid #3	BH2		E&E	1994	Dieldrin	1.10E+00		Location uncertain
	T404312 (0-2")	0-2			Endrin	3.20E-01	J	
					Endrin Ketone	6.90E+00		
					Endrin Aldehyde	ND	U	
					DDE	1.10E+00		
					DDT	4.60E-01	J	
	T404313 (12")	12			Dieldrin	4.30E-01	J	
					Endrin	1.70E+00	J	
					Endrin Ketone	3.10E+00		
					Endrin Aldehyde	3.90E-01	J	
					DDE	9.60E-01		
					DDT	3.90E-01	J	
	T404314 (24")	24			Dieldrin	3.10E-03	J	
					Endrin	ND	U	
					Endrin Ketone	ND	U	
					Endrin Aldehyde	ND	U	
					DDE	ND	U	
					DDT	1.80E-02	J	
Grid #7	TP-1		PRC	1991	DDE	3.20E+00	D, J	OC, OP, and Carbamate
					DDT	3.40E+00	D, J	
					Endrin	6.50E-02	J	

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TABLE 1 (Continued). Historical Site Sampling Results (Pre-Remediation Activities)

Sample Location	COC Label	Depth (inches bgs)	Collected By	Date	Contaminants	Concentration (mg/kg)	QA Flags (J, U, or D)	Notes
Grid #9 close to O-3 samples	TP-2		PRC	1991	DDE	4.70E+00	J	OC, OP, and Carbamate
					DDT	1.10E+01	J	
Grid #9 Same as TP-2	TP-3		PRC	1991	DDE	5.10E+00	J	OC, OP, and Carbamate
					DDT	9.80E+00	J	
Grid #9 close to O-1	TP-4		PRC	1991	DDE	3.10E+00	J	OC, OP, and Carbamate
					DDT	3.40E+00	J	
South of Grid #6	TP-5		PRC	1991	DDE	5.60E-01	J	OC, OP, and Carbamate
					DDT	4.30E-01	J	
South of Grid #4	TP-6		PRC	1991	Dieldrin	1.20E-03	J	OC, OP, and Carbamate
					DDE	1.10E-02	J	
					DDT	1.10E-02	J	
Grid #1	TP-7		PRC	1991	DDE	1.30E+00	J	OC, OP, and Carbamate
					DDT	6.10E-01	J	
South of Grid #8 about 18 feet south	TP-8		PRC	1991	DDE	1.20E+00	J	OC, OP, and Carbamate
					DDT	1.10E+00	J	
South of Grid #9 about 50 feet south	TP-9		PRC	1991	DDE	4.10E-01	J	OC, OP, and Carbamate
					DDT	2.90E-01	J	
South of Grid #9 about 18 feet south	TP-10		PRC	1991	DDE	8.70E-01	J	Duplicate with TP-11
					DDT	7.10E-01	J	OC, OP, and Carbamate
Same as TP-10	TP-11		PRC	1991	DDE	1.00E+00	J	Duplicate with TP-10
					DDT	8.70E-01	J	OC, OP, and Carbamate
Non-Orchard 0.5 miles west of test	NO-1		PRC	1991	DDE	3.40E+00	J	OC, OP, and Carbamate
					Endosulfan Sulfate	1.70E-02	J	
					DDT	2.60E+00	J	
Non-Orchard 0.5 miles west of test	NO-2		PRC	1991	DDE	4.20E-02	J	OC, OP, and Carbamate
					DDT	3.10E-02	J	
Non-Orchard 0.5 miles west of test	NO-3		PRC	1991	various pesticides	below detection		Duplicate with NO-4
								OC, OP, and Carbamate
Non-Orchard 0.5 miles west of test	NO-4		PRC	1991	various pesticides	below detection		Duplicate with NO-3
								OC, OP, and Carbamate

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D - The result reported is from an analytical run with a diluted sample extract to improve data quality.

TABLE 1 (Continued). Historical Site Sampling Results (Pre-Remediation Activities)

Sample Location	COC Label	Depth (inches bgs)	Collected By	Date	Contaminants	Concentration (mg/kg)	QA Flags (J, U, or D)	Notes
Grid #8	#I-1	no depth info	WSU	1987	Ethyl Parathion	2.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	1.40E-02		
					DDE	1.40E+00		
					PP-DDT	2.60E+00		
					OP-DDT	8.00E-01		
Grid #9	#O-1	no depth info	WSU	1987	Ethyl Parathion	2.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	2.00E+00		
					PP-DDT	3.50E+00		
					OP-DDT	1.10E+00		
Grid #8	#I-2	no depth info	WSU	1987	Ethyl Parathion	1.40E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	1.30E+00		
					PP-DDT	2.00E+00		
					OP-DDT	6.00E-01		
Grid #9	#O-2	no depth info	WSU	1987	Ethyl Parathion	2.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	2.00E-02		
					DDE	1.70E+00		
					PP-DDT	1.90E+00		
					OP-DDT	6.00E-01		
Grid #8	#I-3	no depth info	WSU	1987	Ethyl Parathion	2.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	1.60E-02		
					DDE	2.30E+00		
					PP-DDT	4.80E+00		
					OP-DDT	9.00E-01		

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TABLE 1 (Continued). Historical Site Sampling Results (Pre-Remediation Activities)

Sample Location	COC Label	Depth (inches bgs)	Collected By	Date	Contaminants	Concentration (mg/kg)	QA Flags (J, U, or D)	Notes
Grid #9	#O-3	no depth info	WSU	1987	Ethyl Parathion	2.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	2.30E+00		
					PP-DDT	4.10E+00		
					OP-DDT	1.30E+00		
Grid #8	#I-1	no depth info	WSU	1986	Ethyl Parathion	1.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	7.00E-01		
					PP-DDT	1.00E+00		
					OP-DDT	3.00E-01		
Grid #9	#O-1	no depth info	WSU	1986	Ethyl Parathion	NAR		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	3.00E-01		
					PP-DDT	6.00E-01		
					OP-DDT	2.00E-01		
Grid #8	#I-2	no depth info	WSU	1986	Ethyl Parathion	NAR		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	9.00E-01		
					PP-DDT	1.20E+00		
					OP-DDT	4.00E-01		
Grid #9	#O-2	no depth info	WSU	1986	Ethyl Parathion	NAR		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	4.00E-01		
					PP-DDT	7.00E-01		
					OP-DDT	2.00E-01		

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TABLE 1 (Continued). Historical Site Sampling Results (Pre-Remediation Activities)

Sample Location	COC Label	Depth (inches bgs)	Collected By	Date	Contaminants	Concentration (mg/kg)	QA Flags (J, U, or D)	Notes
Grid #8	#I-3	no depth info	WSU	1986	Ethyl Parathion	1.00E-01		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	1.20E+00		
					PP-DDT	1.60E+00		
					OP-DDT	1.40E-01		
Grid #9	#O-3	no depth info	WSU	1986	Ethyl Parathion	5.30E-02		Composite samples
					Ethyl Paraoxon	NAR		
					Dieldrin	NAR		
					DDE	3.00E-01		
					PP-DDT	5.00E-01		
					OP-DDT	5.00E-01		
Grid #2	85-#1	0-6	WSU	1985	Ethyl Parathion	2.00E-01		Two sample composite
					Ethyl Paraoxon	trace		
					Dieldrin	NAR		
					DDE	4.01E+02		
					PP-DDT	1.60E+00		
					OP-DDT	5.00E-01		
Grid #4	85-#2	0-6	WSU	1985	Ethyl Parathion	0.00E+00		
					Ethyl Paraoxon	1.46E+03		No MTCA levels, but
					Dieldrin	NAR		very toxic
					DDE	8.16E+02		
					PP-DDT	3.08E+03		
					OP-DDT	1.26E+02		

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TABLE 2. Established Contaminants of Concern for the WTFREC Test Plot Remediation

Contaminant or Suspected Contaminant	MTCA Method B (mg/kg)	WA DW Designation (TCLP mg/L)	WA DW Designation estimate*** (mg/kg)	WAC Toxic Category	Universal Treatment Std. (mg/kg)
ORGANOCHLORINE PESTICIDES					
dieldrin	6.25E-02	none	none	B	1.30E-01
endrin	2.40E+01	2.00E-02	4.00E-01	A	1.30E-01
endrin aldehyde*	2.40E+01	none	none	none	1.30E-01
endrin ketone*	2.40E+01	none	none	B	none
endosulfan I	4.80E+02	none	none	C	6.60E-02
endosulfan II	4.80E+02	none	none	C	1.30E-01
endosulfan sulfate*	4.80E+02	none	none	B	1.30E-01
DDT	2.94E+00	none	none	C	8.70E-02
DDE	2.94E+00	none	none	D	8.70E-02
DDD	4.17E+00	none	none	C	8.70E-02
gamma-BHC (lindane)	7.69E-01	4.00E-01	8.00E+00	C	6.60E-02
methoxychlor	4.00E+01	1.00E+01	2.00E+02	X	8.70E-02
ORGANOPHOSPHORUS PESTICIDES					
Di-Syston (disulfoton)	3.20E+00	none	none	A	none
guthion (azinphosmethyl)*	3.20E+00	none	none	B	6.20E+00
parathion	4.80E+02	none	none	A	4.60E+00
methyl parathion	2.00E+01	none	none	B	4.60E+00
aminomethyl parathion*	2.00E+01	none	none	none	none
malathion	1.60E+03	none	none	C	none
ethion	4.00E+01	none	none	B	none
DDVP (dichlorvos)	3.44E+00	none	none	B	none
diazinon	7.20E+01	none	none	B	none
dimethoate	1.60E+01	none	none	C	none
paraoxon-ethyl*	4.80E+02	none	none	A	none
paroxon-methyl*	2.00E+01	none	none	A	none
CARBAMATE PESTICIDES					
carbaryl	8.00E+03	none	none	C	none
furadan (carbofuran)	4.00E+02	none	none	B	none
MISC. PESTICIDES					
paraquat	3.60E+02	none	none	C	none

* - Indicates the action level is based on the parent compound's action level
WA DW = Dangerous Waste (Washington State WAC 173-303)
*** - estimated as being 20 times the TCLP limit

TABLE 3. Additional Contaminants of Concern

Contaminant	MTCA Method B (mg/kg)	WA DW Designation (TCLP mg/L)	WA DW Designation estimate*** (mg/kg)	WAC Toxic Category
ORGANOCHLORINE PESTICIDES				
aldrin	5.88E-02	none	none	X**
alpha BHC	159E-01	none	none	X**
beta-BHC	5.56E-01	none	none	X**
delta-BHC	5.56E-01	none	none	X**
chlordane	7.69E-01	3.00E-02	6.00E-01	X**
heptachlor	2.22E-01	8.00E-03	1.60E-01	X**
heptachlor epoxide	1.10E-01	8.00E-03	1.60E-01	X**
toxaphene	9.09E-01	5.00E-01	1.00E+01	X**

WA DW = Dangerous Waste (Washington State WAC 173-303)
** - Assumed worst case scenario
*** - estimated as being 20 times the TCLP limit

2. INITIAL REMEDIATION ACTIVITIES

The initial remediation activities were conducted by GSA in preparation for gross soil removal. These initial activities included mobilization, focused removal, and site characterization activities. These activities are described in detail within the following sections.

2.1 MOBILIZATION ACTIVITY SUMMARY

Site mobilization activities included delivery and setup of construction support items, the removal of all aboveground objects and vegetation within the testplot area, the delineation of the test plot features, and the establishment of the decon area.

In general, this activity occurred prior to the occurrence of other phases of the project; however, some of the activities occurred concurrently with other phases.

2.1.1 Construction Support Mobilization

Construction support items included a mobile office trailer, a mobile laboratory trailer, a portable toilet, a solid waste dumpster, and several roll-off storage bins. All of these items, except for the roll-off-bins, were delivered to the site and setup during the week of September 15, 1997. Both electrical power and telephone connections were made to the mobile trailers. The roll-off storage bins began arriving at the site during the week of September 15, 1997 and continued to be delivered to the site into November 1997.

2.1.2 Removal of all Aboveground Objects and Vegetation from the Test Plot Area

Several objects that were in and immediately adjacent to the test plot at the commencement of the work were removed and disposed of according to the RAMP. These items included the barbed wire fence and fence posts, the chemical storage shed, and the trash cans. Additionally, all of the vegetation within the boundaries of the test plot was cleared to a level of approximately two-inches above the ground surface or less.

The material in the trash cans was sampled for waste characterization prior to disposal. The fencing materials and empty trash cans were disposed of as solid waste in the solid waste dumpster. Several jars of acetic anhydride were found in the chemical storage shed, and WSU collected these jars from GSA and disposed of them separate from this work. The remaining chemical storage shed materials were recycled. The removed vegetation was transported to the WSU burn pile; burning of materials was conducted by others separate from this work.

2.1.3 Delineation of the Test Plot

The location of the test plot area was established based upon the location of the barbed wire fencing. The barbed wire fencing secured a rectangular area with approximate dimensions of 69 feet-9 inches (from east to west) by 29 feet-9 inches (north to south). This area was approximately 23 feet south of the WTFREC facility's northern property line, as demarcated by another existing chain link fence. In order to achieve the specified site dimensions the boundaries of the test plot were extended from the area of the secured fenced area by

approximately 10 feet westward, 5.5 feet eastward, and 3 feet northward. This established the specified test plot dimensions of 85 feet by 33 feet.

Markers were placed in each of the test plot corners, and the test plot itself was subdivided into 27 grids. The grids were delineated by 9 columns (north - south) and three rows (east - west). The columns were identified as numbers 1 through 9, from the westernmost to easternmost column. The rows were identified as A (northernmost), B (center), or C (southernmost). Grids were subsequently referred to by a two character identifier representing the column number followed by the row letter, respectively (i.e. '8A' refers to the northernmost grid of column 8.). Columns 1 through 8 were each approximately ten feet (east-west) by 33 feet, while column 9 was approximately five feet (from east to west). Each of the three rows was approximately ten feet (north to south) by eighty-five feet. Each of the grids was delineated with markers in the corners and string along the edges.

Samples from columns 2, 3, 4, 5, 6, 7, and 8 were established in the RAMP as requiring characterization phase analysis for both organophosphorus and organochlorine pesticides. Columns 1 and 9 only required analysis for organochlorine pesticides during the characterization phase.

An x-y coordinate system was established for identifying key locations within the test plot. The origin for the system (coordinate 0,0) was set at the northwestern-most corner of the test plot. The x-axis was established as being the original northernmost boundary of the test plot, with values increasing in the easterly direction. The y-axis was established as being the original westernmost boundary of the test plot, with values increasing in the southerly direction. Coordinate locations presented in this report were measured to an accuracy of approximately +/- three inches.

Figures 3 and 4 show the test plot grid along with other test plot features from the initial remediation activities, including the focused removal areas.

2.1.4 Establishment of the Decon Area

The decon area was established near the test plot location. This area was comprised of a washdown pad consisting of an impervious reinforced-PVC liner. This liner was initially placed at a location, close to the work area, that was perceived to be outside of the area necessary to conduct the activities involved with excavation. Due to the need for excavation of soil quantities beyond the initial project scope, inadequate space existed within the initial work area, so the decon pad was subsequently moved on October 23, 1997, to a new location outside of the limits of the expanded excavation activities.

The decon pads were constructed within the limits of the facility's existing dirt roadway in such a way that water would collect in one corner of the decon area and remain contained. The impermeable liner was placed over a constructed depression in the roadway. A hose connected to the WSU irrigation system was used for washdown purposes, while collected water was pumped into a temporary 500-gallon capacity aboveground holding tank.

FIGURE 3. Remediation Grid and Focused Removal Areas

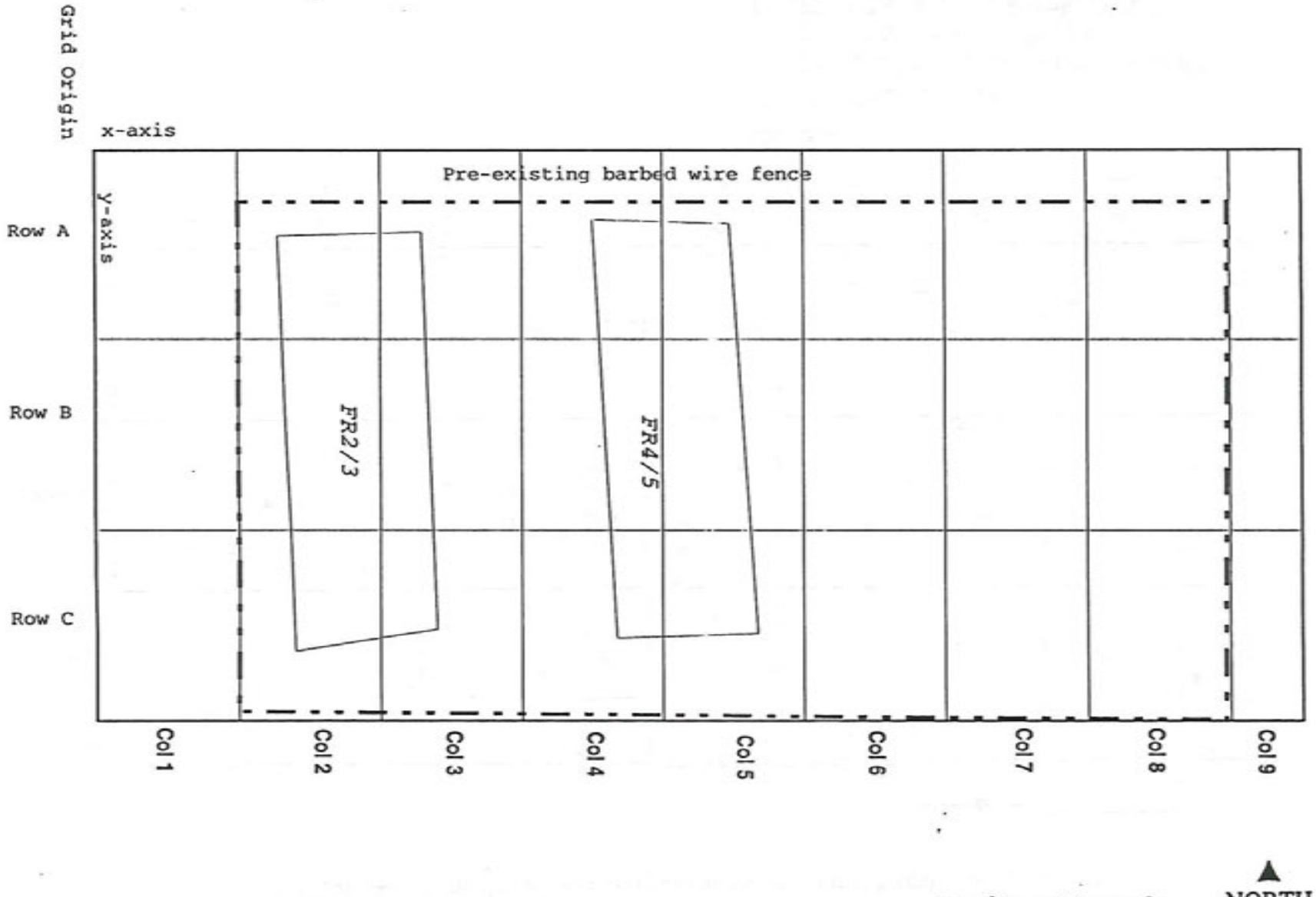
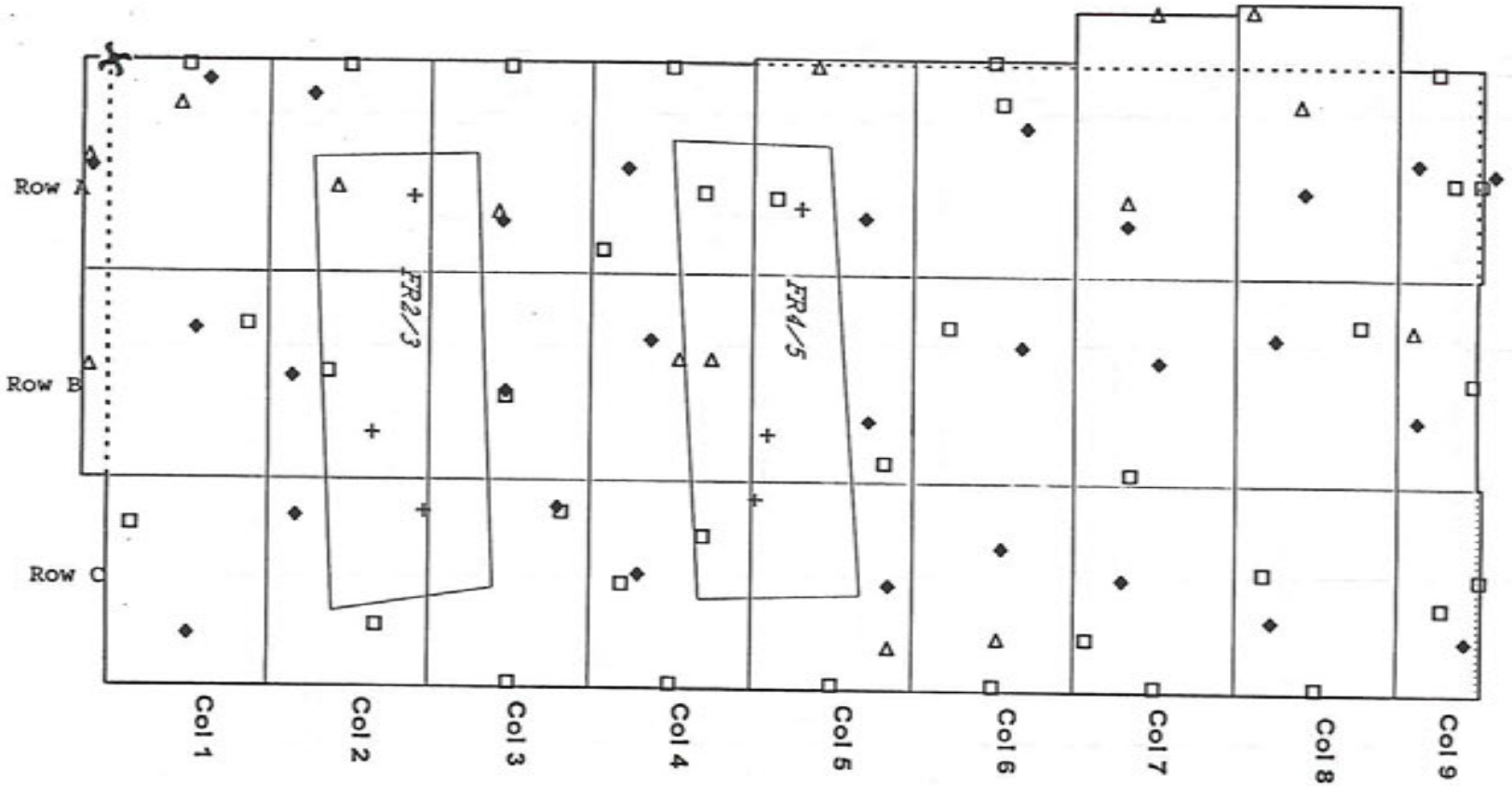


FIGURE 4. Remediation Sampling Locations and Final Excavation Boundary



LEGEND

- X-Y Coordinate Origin
- Focused Removal Confirmation Samples
- Site Characterization Sample
- Final Confirmation Sample (IAA Only)
- Final Confirmation Sample (Fixed Lab)
- Original Remediation Boundary
- Final Remediation Boundary

NORTH

2.2 FOCUSED REMOVAL ACTIVITY SUMMARY

The focused removal activities consisted of excavation of the deep burial columns and subsequent confirmational sampling at the bottom of these excavations. The details of these activities are presented in the following section. The analytical data resulting from this activity are presented in Section 5.

2.2.1 Focused Removal Excavation

Focused removal activities were directed at the two locations where bags of concentrated-pesticide product were buried at depth. These activities consisted of excavation of these areas based upon visual indicators, followed by confirmational sampling of the areas. These activities were conducted on September 22 and 23, 1997.

The two areas were each approximately 10 feet in width (east-west direction) by approximately 24 feet in length. One area was identified as Focused Removal Area 2/3 (FR2/3), while the other area was identified as Focused Removal Area 4/5 (FR 4/5). These areas were approximately centered over the boundaries between columns 2 and 3 (FR2/3) and columns 4 and 5 (FR4/5), respectively. Based upon the USACE review of the research records, the FR2/3 materials were expected to contain elevated levels of OP pesticides and the FR4/5 materials were expected to contain elevated levels of OC pesticides.

Within each of the two areas, bags of concentrated pesticide research materials began to be encountered at approximately 18-inches bgs. Excavation continued downwards until approximately six-inches below the last visually observed bag remnant was removed. Final excavation depths were approximately 27-inches bgs for FR2/3 and approximately 33-inches bgs for FR4/5. Materials were segregated according to expected contaminant and concentration during excavation and placed directly into designated roll-off bins. The filling of the roll-off bins is described in Section 7.1.

A total of 45.74 tons of material was excavated during the focused removal activity, 22.32 tons from FR2/3 and 23.42 tons from FR4/5. The coordinates for the corners of the excavated areas are presented in Table 4.

TABLE 4. Focused Removal Excavation Limits

	x coordinate (feet)	y coordinate (feet)
FR2/3		
NE corner	22.75	4.75
SE corner	24.00	27.75
NW corner	12.75	5.00
SW corner	14.00	29.00
FR4/5		
NE corner	44.75	4.25
SE corner	46.75	28.00
NW corner	35.00	4.00
SW corner	36.75	28.25

2.2.2 Focused Removal Sampling Design

At the conclusion of the focused removal excavation, confirmational sampling was conducted within the excavated areas. The confirmational sampling consisted of six samples. The collected samples were analyzed by the field laboratory for OC pesticides by the immunoassays tests and by the fixed laboratory for OP and OC pesticides.

The sampling grids for this effort were established by usage of the row divisions for the test plot and the excavated areas each constituting a separate column; this resulted in six sampling grids. A single sample was collected randomly from each grid, with the exception of grid 2/3B. The sample collected in grid 2/3B was biased toward a location with a piece of whitish particulate matter. This particle was selected due to the suspicion that it was a remnant of the focused removal excavation activities. The approximate focused removal confirmation sampling locations are indicated in Table 5.

TABLE 5. Focused Removal Confirmation Sampling Locations

Sampled grid	x-coordinate (feet)	y-coordinate (feet)	depth (inches)
2/3A	19.0	7.00	30
2/3B	16.50	19.50	28
2/3C	19.75	23.75	26
4/5A	43.00	7.50	38
4/5B	41.00	19.50	32
4/5C	40.25	23.00	31

2.2.3 Focused Removal Sampling Methodology

The focused removal confirmation samples were discrete surface samples, homogenized thoroughly, as described in the sampling procedures below, and split into three sub-samples. The samples were collected with a stainless steel spoon and placed in a stainless steel bowl. One of the split sub-samples was analyzed by IAA in the field laboratory and the second sub-sample was sent to the fixed laboratory for OP and OC analysis. The third sub-sample was reserved for possible quality control (QC) analysis.

The following sampling procedures were used to ensure representative samples and thorough homogenization:

- The first layer of soil (down to two inches below the sampled surface) was brushed aside with the spoon.
- Soil was collected into a decontaminated stainless steel bowl for initial debris removal (stones and sticks greater than 3/8 inch diameter), crushing, and mixing. Mixing, crushing, and shaking were applied, as needed, to obtain a visually homogeneous mixture of the soil.
- Final homogenization was done by coning and quartering the soil sample as follows:
  a) The soil was drawn up into a large cone and then split into four separate small cones.
  b) The soil from each small cone was stirred with the spoon to an even consistency.
  c) Two adjacent small cones were then joined together and mixed. The other two small cones were likewise mixed together.
  d) Finally the two separate mixtures were joined and mixed.

- Care was taken to keep the samples from being exposed to direct sunlight.
- Samples were split into sub-samples by segregation of approximately equal portions of the sample into three pre-cleaned sampling jars.

2.3 SITE CHARACTERIZATION ACTIVITY SUMMARY

Site characterization sampling began after completion of the field portion of the focused removal activities. The site characterization data are presented in Section 5 of this report. This activity consisted of the collection of numerous core samples from within the test plot area for the purpose of characterizing the test plot so that an excavation plan and preliminary waste disposal plan could be established. See Section 6 of this report for the details of those plans.

2.3.1 Site Characterization Sampling Design

The implemented sampling approach is defined by Ecology as "Focused Sampling." Focused Sampling means the selective sampling of areas where potential or suspected soil contamination can reliably be expected to be found if a release of a hazardous substance has occurred. The number of push sample locations (27 grid samples) was determined using statistical analysis of potential hot spots. Within each grid a biased location was selected in the field based upon visual observations of surface conditions. This was done in the field by the use of visual indicators at the ground surface (i.e. core locations were typically selected to be within or immediately adjacent to the cinder blocks that had been in-place as part of the previous test plot research activities). Some of the characterization sample locations were randomly selected due to the lack of identifying a high-biased sample location.

For grids that had been partially excavated during the focused removal activities, the push sampling location was selected from the un-excavated portion of the grid. This combined random and biased sampling approach provided a reliable means for determining the extent of contamination to be remediated.

The cores were collected using a polypropylene sleeve on a push sampler. Due to the sleeve length, two co-located cores were needed to sample to the specified 72-inch depth. An initial core was driven down to a depth of 36 inches. A second sleeve was then driven into the initial borehole down to a depth of 72 inches bgs. The cores were then subdivided into composite samples representative of individual one-foot increments. Each of the homogenized composite samples was subdivided into three containers; one for field laboratory analysis, one for potential fixed laboratory analysis, and one for temporary archive. The coordinates for all of the push sampling locations are indicated in Table 6.

TABLE 6. Test Plot Push Sampling Locations

Sampled grid	x-coord. (feet)	y-coord. (feet)		Sampled grid	x-coord. (feet)	y-coord. (feet)		Sampled grid	x-coord. (feet)	y-coord. (feet)
1A	6.25	1.00		4A	32.25	5.50		7A	63.25	8.25
1B	5.50	14.00		4B	33.75	14.50		7B	65.25	15.50
1C	5.00	30.25		4C	33.00	27.00		7C	63.00	27.13
2A	12.75	1.75		5A	47.00	8.00		8A	74.25	6.50
2B	11.50	16.50		5B	47.25	18.75		8B	72.50	14.25
2C	11.75	24.00		5C	48.50	27.50		8C	72.25	29.25
3A	24.50	8.25		6A	57.00	3.25		9A	81.25	5.00
3B	24.75	17.25		6B	56.75	14.75		9B	81.25	18.50
3C	28.00	23.50		6C	55.50	25.50		9C	84.25	30.25

2.3.2 Site Characterization Analysis Rationale

The field laboratory IAA analysis proceeded by a specific strategy based on the column of sample origin. The hypothesis was that only either DDT or cyclodienes (OC) would be found at depth (the organochlorine deep burial area). For all other areas the contaminant source was at the surface and the hypothesis was that their vertical migration would be limited to the first foot of depth. The OP pesticides could not be evaluated with the IAA analysis. Initially, those samples representing the first foot of the core (0 to 12-inch depth) were analyzed by IAA for columns 1, 7, 8 and 9. The first three one-foot increments were analyzed for columns 2 through 5. Deeper samples were subsequently analyzed only if the results from the deepest analyzed sample for the grid indicated the potential for elevated levels of contaminants at deeper levels (i.e. the IAA results were above the established field kit action level). At the completion of the IAA characterization sampling analysis, the concentrations of the deepest samples that did not exceed the field kit screening action level were compared on a column by column basis. The grid with the highest non-exceeding concentration within each column was selected for fixed laboratory analysis. The samples that were submitted to the laboratory were both the high non-exceeding concentration sample and the sample from the next shallower one-foot horizon corresponding to the same grid. The preliminary field kit action levels were established by the USACE during a field pilot study of WTFREC surficial soils (see Section 4.7.8.2).

Based upon the fixed laboratory analysis of the two samples selected per column in the first analytical phase of the characterization, a revised field kit action level was established. Based upon the new action level additional samples were submitted for fixed laboratory analysis from the previously non-selected grids. These additional samples generally were submitted from the same depth as that of the previously submitted non-exceeding high concentration sample. They served to confirm that excavation to the depth derived from the first analytical phase of

characterization would reach soil with concentrations below the MTCA standards in the other two grids in each column.

The analyses conducted upon the samples in the characterization phase was based upon the column of origin of the sample. Samples collected from columns 1 and 9 were only analyzed for OC pesticides. Samples collected from columns 2 though 8 were analyzed for OP and OC pesticides.

Two additional shallow characterization sample locations (location identifiers X1A and X9A) were subsequently added due to contaminant migration concerns. These locations were outside of the established limits of the test plot. These samples were collected to a depth of approximately 12-inches using a hand auger. The locations of these samples are indicated in Table 7. The loose surface dirt, foliage and stones were brushed aside prior to using the auger to extract two consecutive six-inch borings. The pair of borings totaling 12-inches were placed in a stainless steel bowl and homogenized as per the other characterization samples.

TABLE 7. Subsequent Characterization Sampling Locations

Location identifier	x-coord. (feet)	y-coord. (feet)
X1A	-1.0	5.5
X9A	86.0	5.5

2.3.3 Site Characterization Sampling Methodology

These samples were collected as 72-inch deep cores (six 12 inch deep horizons per core), homogenized and split into three sub-samples.

2.3.3.1 Field QC

Additional immediately adjacent cores were collected at several locations in order to collect enough soil for field duplicates. The two corresponding one-foot core segments for each horizon were homogenized together to provide enough soil to be split into identical field duplicates. These duplicates were sent to the laboratory as blind QC samples.

2.3.3.2 Sampling Methods

The following procedures were used to collect the 162 project core samples and additional field duplicates:

- The van-mounted push rig was positioned over the designated sampling location and activated by the push-rig team.
- The sleeves collected 30-36" of soil. The full-length sleeves were marked with a top and bottom and brought to a staging area adjacent to the test plot for handling by the GSA field laboratory staff.

- Compression was observed in some cores (less than 36 inches of soil in the sleeve after a 36 inch push), so each sleeve was divided and cut equally into three segments that ranged from 10 to 12 inches in actual length. The first segment was given the depth assignment of zero to one foot, the following segment was given the assignment of one to two feet, and the last segment was assigned two to three feet. Likewise, the lower depth sleeve was segmented and assigned a depth of three to four feet, four to five feet and five to six feet, respectively even though the actual dimensions were less due to the compression.
- Cave-in was not expected and none of the lower core sections contained more than 36 inches of soil. Therefore adjustments for cave-in were not necessary.
- The direct push cores were cut into sections as noted above. Each core segment was emptied into a pre-leaned half-gallon glass jar for homogenization with a minimum of 150 grams of soil per sample. The sample size was determined by laboratory requirements.
- The cores and jars were protected from direct exposure to sunlight.

The following steps were used to ensure representative samples and thorough homogenization:

- Soils were collected into the half-gallon glass jars (pre-cleaned as per EPA specifications) for initial debris removal, crushing, and mixing. Initial debris removal is where stones and sticks greater than 3/8-inch diameter were removed with a decontaminated stainless steel spoon. Mixing, crushing, and shaking were applied as needed to get a visually homogeneous mixture of the soil.
- Final homogenization was by coning and quartering within the jar as follows:
  a) The soils were drawn up into a cone followed by splitting into four separate cones.
  b) Each small cone was stirred with a stainless steel spoon to an even consistency.
  c) Two neighboring small cones were joined after mixing of the individual quarters and mixed and drawn together. The other two small cones were likewise mixed together.
  d) Finally the two separate mixtures were joined and mixed.
- Care was taken to keep the samples from being exposed to direct sunlight.
- Samples were split into three 4-oz. jars pre-cleaned to EPA specifications.
- A large batch of spoons was decontaminated prior to sampling and homogenization. Spoons used for waste sample handling were kept segregated from spoons used for characterization and confirmation sampling.
- One rinsate blank was generated during the characterization activities by pouring reagent water over some decontaminated spoons.

3. FIELD AND FIXED LABORATORY ANALYTICAL METHODOLOGY

The EPA has established fixed-laboratory procedures and field laboratory IAA techniques capable of meeting the project objectives in the methods manual SW-846.

Some of the methods used to complete this project were modified from that listed in the standard method for the purpose of achieving the project Data Quality Objectives (DQO's). The IAA tests were modified slightly to make a single soil extraction serve for both the cyclodiene and DDT field test kits. The immunoassay was calibrated to report cyclodiene as dieldrin and endrin. For OP pesticides, Gas Chromatography/Mass Spectroscopy (GC/MS) instrumentation was used for Method 8141, thereby eliminating the need for second column confirmation. The OC pesticides were analyzed by Gas Chromatography (GC) with Electron Capture Detector (ECD) (Method 8081) allowing for analysis of both the primary compounds of interest and multi-component pesticides (technical cyclodiene, reported as dieldrin and endrin, and toxaphene). All of the target list organochlorine pesticides were confirmed by the second column analysis specified in Method 8081, except for a few coeluting compounds caused by the extra target analytes added to the list. Refer to the data quality assessment in Section 4 for a more thorough discussion. The carbamates were analyzed by GC with an Nitrogen Phosphorus Detector (NPD) detector rather than the High Performance Liquid Chromatography (HPLC) method recommended. A list of the method modifications applied to the EPA reference methods along with justification for these modifications is presented in Table 8.

TABLE 8. Modifications to Standard Methods

SOP	Method/Sec. #	Modification/Justification
Cyclodiene IAA Test	EPA 4041	Extraction fluids were pure methanol rather than water/methanol mix. This made the test compatible with the DDT test, allowing for a single sample extraction for both tests.
DDT and Cyclodiene IAA tests.	EPA 4042 and 4041	The extractant volume was doubled to 20 mL to better bracket the action levels for these tests based on the pilot study cross-sensitivity results.
OP Pesticides	EPA Method 8141	GC/MS rather than GC/NPD was used. The surrogates and calibration requirements appropriate for this method were utilized from the source method (8141). The modification improved selectivity and maintained low enough quantitation limits to meet the project DQOs.
Organophosphorus Compounds by GC modified for Carbamates (CARBNPD.DOC)	EPA 8141, mod.	GC/NPD was used as directed in EPA Method 632, modified for a soil matrix according to the SW-846 methods. The moderate project detection limit requirements and restricted analyte list allowed the less sensitive but more selective GC/NPD technique to be used instead of HPLC (EPA Method 8321). The benefits were primarily in improved performance due to reduction of interference.
Carbamates	EPA 8141, mod.	Surrogate selected was bolstar. This pesticide was chosen as a surrogate since the compound is rarely used for agricultural applications in this geographical area.
Paraquat	RM-8-10.	This spectrophotometric method accommodates paraquat in a soil matrix according to procedures developed by Chevron Oil.

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4. SUMMARY OF DATA QUALITY

The summary data quality assessment in this section is based on the project DQOs presented in the WTFREC RAMP. Quality control results are summarized in the appendices and discussed below for the (PARCC) parameters: precision, accuracy, representativeness, completeness, and comparability.

Detailed data assessment reports are attached to the respective sample delivery group analytical reports in Appendix K.

4.1 SUMMARY OF CONCLUSIONS FOR THE FOCUSED REMOVAL CONFIRMATION AND SITE CHARACTERIZATION PHASES

No significant data bias or data quality problems were encountered that were not corrected. During the focused removal phase, the results of a field duplicate for a project sample (FR45B92372) analyzed for organochlorine pesticides was outside of the project targets. The problem was attributed to the inhomogeneous distribution of particles with high analyte concentration. During the subsequent characterization and confirmation phases, when particulate residual from the focused removal phase was less likely, the field duplicates were acceptable.

The correlation between the fixed lab results and the immunoassay test results was not quantitatively consistent across the site. However, it was possible in some cases to account for interference on a grid by grid basis. The excavation decisions based on IAA results below the action level (i.e. "negative" results) were confirmed by the fixed laboratory results. Therefore, the IAA tests produced no false negative results. Due to interference's, a few cases of false positives were encountered.

The suspected presence of toxaphene in a sample at the three to four-foot depth (sample C5C4924743) required extensive scrutiny. The identification of toxaphene was thoroughly researched because this pesticide was not found by the USACE to be documented as being used in test plot research activities. Also the additional excavation volume that would result from removing soil to the four-foot depth in one column elevated the impact of the outcome. Toxaphene is a mixture of chlorinated camphenes. Appendix H lists the chemical structures and acronyms for project pesticides of concern.

4.2 SUMMARY OF CONCLUSIONS FOR THE WASTE CHARACTERIZATION PHASE

Most of the analyses presented no significant bias or data quality problems. Some data variability for duplicates between some analytes was assigned to sample inhomogeneity. Such data variability was not significant to the waste characterization decisions involved. The carbamate analysis performed with a gas chromatography/NPD technique showed evidence of some positive interference, most likely due to organophosphorus compounds in the highly concentrated waste. The waste characterization decisions were not significantly affected by this problem.

The characterization of selected waste streams by TCLP for metals and organochlorine pesticide presented no sampling or analysis difficulties.

4.3 SUMMARY OF CONCLUSIONS FOR THE RINSEWATER CHARACTERIZATION PHASE

Except for some interference for dieldrin, no significant data quality problems were encountered. Careful inspection of the chromatograms indicated the presence of a non-target compound in the sample at a concentration high enough to interfere with the chromatographic confirmation for dieldrin. Therefore the lower of the two values between the quantitation and confirmation column was reported.

4.4 SUMMARY OF CONCLUSIONS FOR THE FINAL CONFIRMATION PHASE

No significant data quality problems were encountered. Data variability associated with the last sidewall confirmation sample resulted in data qualification, but no site decisions were affected. Even if twenty percent of the confirmation samples were not entirely accurate due to sample inhomogeneity, the statistical conclusions would still be the same regarding MTCA compliance. Variability is an inherent property of all environmental measurements. A slightly increased standard deviation for the confirmation data set would not have significantly changed the upper confidence limit on the mean concentration of the critical compounds.

The presence of toxaphene in a couple of the confirmation samples required extensive scrutiny, including GC/MS identification, because the records evaluated by the EPA and USACE had not indicated use of this pesticide at the site. Also the preponderance of non-detected values for this contaminant created a statistical dilemma. Under MTCA guidance for statistical evaluation, when more than 50 percent of the data are qualified as non-detected, the options for further action are limited primarily to reanalysis of the samples using a lower detection limit, or when the analyte of concern is only detected in a few samples then the sample with the highest concentration detected is selected as the upper confidence limit concentration. The laboratory detection limit (44 parts per billion (ppb)) was appropriate as compared to the cleanup standard (909 ppb) and the accuracy of the analysis was acceptable. Since the toxaphene concentration in question was above the clean-up standard, the soil was removed subsequent to the confirmation of the toxaphene detection.

4.5 PERFORMANCE EVALUATION SAMPLES FOR PESTICIDES IN SOIL

A total of four Performance Evaluation (PE) samples were submitted as blind QC samples to the fixed laboratory during the various sampling and analysis phases of the project. The PE sample results are listed below in Table 9 and a graphical representation is included in Appendix F (Figures F-19 and F-20). These manufactured mixtures contained several organochlorine and organophosphorus pesticides expected at the site (Environmental Resource Associates, Arvada, Colorado). The concentrations were at the MTCA Method B clean-up standard.

TABLE 9. Performance Evaluation Sample Results (Percent Recovery)

Analyte	# W1092377 10/1/97	# FR10C92379 10/1/97	# C1010372 10/8/97	# FC10A1N04712 11/8/97	Control Limits
4,4' - DDD	96	108	79	120	42.2 - 120%
4,4' - DDE	113	123*	96	106	50.5 – 119%
4,4' - DDT	112	146*	75	88	27.6 – 118%
Dieldrin	110	110	98	113	41.4 – 119%
Endrin	96	116	101	89	48.1 –121%
Endrin aldehyde	low conc.	ND	ND	ND	<14 mg/kg
2,4' - DDT	low conc.	Low conc.	ND	ND	< detection
Dimethoate	41	39*	52	52	40 – 120%**
Disulfoton	88	85	85	82	40 – 120%**
Parathion	77	79	73	64	40 – 120%**
Azinophos, methyl	88	81	84	88	40 – 120%**

* Outside of limits ** Provisional limits

Endrin aldehyde and 2,4'-DDT were not present in the sample according to the manufacturer. The presence of endrin aldehyde indicated some breakdown of endrin, which is allowed up to 15% in the calibration procedure. The presence of 2,4'-DDT indicated some potential carry-over or contamination in the laboratory. These results were deemed acceptable based on the trace levels and improved performance in the second round.

In two instances the levels of the PE sample results were high for DDT and DDE when compared to the acceptance window provided by the PE sample manufacturer. The source of the problem for the first nonconformance was not identified after thorough investigation. The manufacturer claimed that the samples were homogeneous. Since the recovery was within the statistical accuracy window for the laboratory and the subsequent PE sample showed acceptable results, these data have been accepted without qualification. In the second case a dilution error was suspected and the result for the PE sample from the undiluted run was reported, bringing the result back into the acceptance window. The concentration for the undiluted run was less than ten percent above the calibration range and was considered a better result than the suspect diluted result.

The organophosphorus control limits could not be provided by the manufacturer due to too few data. Provisional limits based on the organochlorine limits were used as noted in Table 9. Results for dimethoate were at the low end of the control limits in the first round. No corrective action was necessary because of improved performance in the second round and because of the provisional nature of the limits.

4.6 FIELD SAMPLING ISSUES

No problems occurred during sampling. Field blanks were acceptable for each phase of work. Field blanks consisted of equipment rinse blanks created by pouring reagent-grade water over the decontaminated spoons and/or bowls used during sampling and sample homogenization.

Because the push sampling technique was capable of delivering sample cores very quickly, all core samples were stored in two-liter glass jars and kept cool either with ice or in a refrigerator until the field laboratory could homogenize and split the samples.

During the waste sampling effort, a hand auger was used to collect samples from at least five stockpiled soil locations per sample. These sub-samples were then homogenized in a stainless steel bowl and split into sample jars for analysis.

4.7 IMMUNOASSAY FIELD LABORATORY DATA

The immunoassay tests were performed in batches of approximately 12 samples. Each batch consisted of a set of calibration samples, project samples, field duplicates, lab duplicates and control samples. Some of the calibration samples were conducted in duplicate. The calibration data were fit with an exponential curve by log-transforming the data and fitting a straight line with linear regression. The resulting calibration line was used to compute the project sample concentrations.

The field lab data quality assessment for each batch, as noted at the time the data were originally released for use, is written on the calculation spreadsheets (Appendix G). Highlights of the issues encountered are provided in the summary of the PARCC parameters below. An assessment of the correlation between the immunoassay tests and the fixed laboratory results is provided under the heading of data comparability.

4.7.1 Data Use Intended

These data were used to make on-site decisions for excavation planning and preliminary waste characterization. These data were also used to document the extent of contamination and support the representativeness of the post-excavation confirmation sampling array.

4.7.2 Summary of Qualified or Rejected Data

Some of the batches of immunoassay testing were rejected and rerun due to calibration deficiencies. Therefore all data reported are from acceptable data batches. No individual results have been rejected. Occasionally, the field duplicates showed variability above the project targets or a laboratory control sample exceeded the accuracy goals. These cases were evaluated on a case-by-case basis and did not result in data rejection. The data in these instances were still deemed usable for their intended purpose.

4.7.3 Sample Handling and Documentation

No problems were encountered. Samples were protected from sunlight during the sampling process and were refrigerated when not being handled by laboratory personnel. A daily log of the refrigerators was kept through the course of the project whenever the laboratory was in operation.

4.7.4 Precision

Field and laboratory duplicates are summarized in Appendix F (Table F-1). In most cases, the precision for the DDT and cyclodiene tests was well within the project targets. In many cases, the project sample concentrations were either below or above the range of the calibration, where

inaccuracies and variability are expected to be elevated. This is particularly evident in Appendix F (Figure F-22) where the high concentration duplicates are widely spread. Duplicates from the same sample jar (laboratory duplicates) were analyzed with many batches and were used to support conclusions about field duplicates or for batches that did not contain a field duplicate. Despite the sample homogenization process used, in a few cases the homogeneity of a sample was questionable.

4.7.5 Accuracy

The laboratory control sample (LCS) results are summarized in graphical form in Appendix F (Figures F-5, F-8, F-12 and F-16). These graphs indicate that most of these data fall within an accuracy window from 100 percent to 300 percent, with a mean near 200 percent. This mean is consistent with the known 100 percent calibration bias designed into the field screening method by the manufacturer. The LCS, created from the organochlorine PE sample, contained a mixture of three DDT-related compounds and two cyclodienes. Varied sensitivity for the compounds in the mixture made a true value difficult to assign. Once the LCS solution was diluted into the range of the calibration (Batch 6 onward) the mean LCS result for both immunoassay tests was closer to the expected 200 percent. For Batches 1-5 the concentration of the LCS was above the calibration range of the tests. The figures in Appendix F indicate a shift in the mean and standard deviation after Batch 5.

The project chemists investigated all LCS non-conformances prior to releasing data for use. The most common problem appeared to be the extra dilutions needed to create the LCS solutions. In some cases, the LCS non-conformances were a good indicator of calibration deficiencies. Such calibration deficiencies resulted in reanalysis of batches.

4.7.6 Representativeness

The sampling and homogenization procedures for these samples were designed to create representative samples. As with the fixed laboratory results, in a few cases the homogeneity of a sample has been questioned. However, the overall conclusion is that sample inhomogeneity has not significantly affected the site decisions.

4.7.7 Completeness

The data were 100 percent complete. Questionable samples were reanalyzed.

4.7.8 Comparability of Immunoassay Tests

The quantitative aspects of immunoassay tests used for field screening are unique to the particular manufacturer and situation of use. The strictures of their use as standard EPA methods emphasize a minimization of false negatives when compared to standard fixed laboratory results. False positives are unavoidable and related to site-specific factors. The tests are susceptible to comparability issues due to the site-specific mix of pesticides as a result of the cross-sensitivity of each IAA method to a variety of related compounds. The cross-sensitivity of the test is outlined in the following section. The correlation of the field data with fixed laboratory results is discussed following the cross-sensitivity summary.

4.7.8.1 Summary of Reactivity/Sensitivity of the Immunoassay Kits

The range of sensitivities of various pesticides in the reactivity group for the cyclodienes kit is shown in Table 10.

TABLE 10. Immunoassay Sensitivity for the Cyclodiene Reactivity Group

Constituent	LLD* (ppb)	Constituent	LLD (ppb)
Dieldrin	6	Endrin	6
Aldrin	20	Toxaphene	200
Heptachlor	6	Gamma – BHC	600
Chlordane	14	Alpha – BHC	2,000
Endosulfan I	6	Delta – BHC	2,000
Endosulfan II	6		

* LLD = lower limit of detection

The calibration range used for this project was as follows:

Calibration Range (ppb)	Low	Middle	High
Dieldrin/Endrin	18	86	512

The range of sensitivities (in parts per million (ppm)) of various pesticides in the reactivity group for the DDT kit is shown in Table 11.

TABLE 11. Immunoassay Sensitivity for the DDT Reactivity Group

Constituent	LLD* (ppm)	Constituent	LLD (ppm)
		Chlorobenzilate	0.03
p,p DDT	0.04	Dicofol	0.14
p,p-DDD	0.01	Tetradifon	1.2
p,p-DDE	0.18	Thiobencarb	5
o,p DDT	4	Tebuconazole	7
o,p-DDD	0.4	Neburon	17
o,p-DDE	3	Chloroxuron	24
DDA	0.002	Monolinuron	25
Chloropropylate	0.007	Diclofop	70

* LLD = lower limit of detection

The calibration range to be used for this project was as follows:

Calibration Range (ppm)	Low	Medium	High
DDT	0.8	4.0	40.0

4.7.8.2 Correlation of Immunoassay Tests with Fixed Laboratory Results

The USACE tested the kits against fixed laboratory results with surface soils from the site prior to the development of the RAMP. For the compound distributions found in these soils it was apparent that a DDT kit result of 5 ppm or a cyclodiene kit result of 0.1 ppm might indicate that a clean-up standard for an individual compound was exceeded. The sample preparation procedures were therefore customized for the remediation project. The procedure used during the remedial activities set the calibration midpoint concentration at 5 ppm and 0.086 ppm for DDT and cyclodienes, respectively. The IAA tests are most accurate at the midpoint concentration level.

The particular test kits used for this project were intentionally biased high by the manufacturer by 100 percent in order to reduce the occurrence of false negatives. Thus when quantitatively comparing the IAA results against the fixed-laboratory data and QC samples, the IAA results are expected to be twice as high (i.e. a 200 percent recovery on QC samples). The compounds at the site thought to contribute the most to the response for the DDT and cyclodiene immunoassay kits were DDT and dieldrin, respectively. However, because the project samples all contained a mixture of compounds, the immunoassay results were expected to correlate better with the sum of the compounds with known sensitivity for the test than with individual components.

As expected, a plot of the correlation between the field and fixed laboratory results during the focused removal and characterization phase of the remediation (Appendix F, Figure F-23) was not quantitatively consistent. There are a number of IAA results that were higher than predicted by the regression line (points below the line), particularly for the cyclodiene test. These are cases where other compounds present cause additional response. Most of the samples were either well above or well below the IAA action limit, so there were only a few locations where the proposed excavation profile was uncertain based on the IAA results alone. The proposed excavation profile based on IAA results alone was for the most part confirmed to be correct based on the fixed laboratory results.

The excavation decisions which were based on IAA results below the action level (i.e. "negative" results) were entirely confirmed by the fixed laboratory results. Therefore, the IAA tests produced no false negatives. Due to interference, a few cases of false positives were encountered. In particular, endosulfan compounds present in the analyzed soils were found to respond strongly in the cyclodiene test. These compounds have a relatively high clean-up standard. When endosulfans were present, even a high value (e.g. 2 ppm as dieldrin and endrin) did not necessarily indicate that a clean-up standard was exceeded. An example is characterization sample C5C6924745.

When the deeper soils were tested during the final confirmation phase, the action level for DDT was further refined to 10 ppm by GSA and the USACE management team. An example indicating this as an appropriate level for the deeper final soils being removed was sample number C5C4924743.

4.8 ORGANOCHLORINE FOCUSED REMOVAL, SITE CHARACTERIZATION AND FINAL CONFIRMATION SOIL ANALYSES

4.8.1 Data Use Intended

The focused removal and characterization data were used to confirm the on-site decisions for excavation planning. These data were also used to document the extent of contamination and support the representativeness of the post-excavation confirmation sampling array.

The final confirmation analytical data were used to demonstrate MTCA compliance after remedial excavation.

4.8.2 Summary of Qualified or Rejected Data

No data were rejected. Sample C3B59241 16 was qualified for possible low bias for endrin due to the outcome of the endrin breakdown check sample for the analytical batch. Site decisions were not affected.

4.8.3 Sample Handling and Documentation

No problems were encountered.

4.8.4 Precision

All field duplicates were acceptable. The graphical representation of the duplicate pairs indicates a reasonable correlation (Appendix F - Figure F-18). Problems with field duplicates were assigned to sample inhomogeneity in most cases. Matrix spike and matrix spike duplicate results are represented graphically in Appendix F (Figures F-4, F-7, F-10 and F-15). The data indicate acceptable laboratory performance.

4.8.5 Accuracy

The matrix spike results indicate that the analytical methodology performed well with these analytes. The Laboratory Control Samples indicate consistent laboratory performance. Surrogates showed uniform acceptable performance except for a few samples with high target analyte concentrations. The surrogate non-conformances were not considered to reflect any problems with target analyte quantitation.

Calibration verification results were acceptable for every analytical batch.

4.8.6 Representativeness

The sampling and homogenization procedures for these samples were designed to create representative samples. In a few cases the homogeneity of a sample has been questioned. However, the overall conclusion is that sample inhomogeneity has not significantly affected the site decisions.

4.8.7 Completeness

The system performance data were 100 percent complete.

4.8.8 Comparability

Comparability of these data were assessed with PE samples. No bias could be detected in the results based on the PE samples and matrix spikes. The Method 8081 analysis performed with these samples is expected to be comparable to that of similar laboratories analyzing similar samples. When the presence of toxaphene was reported by the laboratory, the ion chromatograms were reviewed thoroughly. In the case of the final confirmation side wall samples, GC/MS confirmation was performed; a confirmation report of this is presented in Appendix H.

4.9 ORGANOPHOSPHORUS FOCUSED REMOVAL, SITE CHARACTERIZATION AND FINAL CONFIRMATION SOIL ANALYSES

4.9.1 Data Use Intended

The focused removal and characterization data were used to confirm the on-site decisions for excavation planning. These data were also used to document the extent of contamination and support the representativeness of the post-excavation confirmation sampling array.

The final confirmation sample data were used to demonstrate MTCA compliance after remedial excavation.

4.9.2 Summary of Qualified or Rejected Data

No data were rejected.

4.9.3 Sample Handling and Documentation

No problems were encountered.

4.9.4 Precision

All field duplicates were acceptable. Matrix spike and matrix spike duplicate results (Appendix F - Figures F-4, F-7, F-10 and F-15) indicate acceptable laboratory performance.

4.9.5 Accuracy

The matrix spike results indicate that the analytical methodology performed well with these analytes. All non-conformances were investigated and found to be associated with high concentrations of the target analytes in the project sample. The laboratory control samples (Appendix F - Figures F-10, F-13, F-17 and F-21) indicate consistent laboratory performance.

4.9.6 Representativeness

The sampling and homogenization procedures for these samples were designed to create representative samples. In a few cases the homogeneity of a sample has been questioned. However, the overall conclusion is that sample inhomogeneity has not significantly affected the site decisions.

4.9.7 Completeness

The system performance data were 100 percent complete.

4.9.8 Comparability

The comparability of these data with PE sample results was assessed. No bias could be detected in the data based upon the PE sample results and matrix spike results. The modified Method 8140, performed by GC/MS for these samples, generated data that are expected to be comparable to that of similar laboratories analyzing similar samples by the standard GC/NPD method.

4.10 ORGANOCHLORINE AND ORGANOPHOSPHORUS WASTE CHARACTERIZATION SOIL ANALYSES

4.10.1 Data Use Intended

These data were used to establish waste designations under federal and Washington State hazardous waste regulations. These results are for the "total" pesticide and are distinct from the Toxicity Characteristic Leaching Procedure (TCLP) results discussed in the next section.

4.10.2 Summary of Qualified or Rejected Data

No data were rejected.

4.10.3 Sample Handling and Documentation

No problems were encountered.

4.10.4 Precision

All field duplicates were acceptable. Matrix spike and matrix spike duplicate results were generally inconclusive due to high concentrations of target analytes in the sample, but the consistency of supporting laboratory control samples (Appendix F - Figures F-10, F-13, F-17 and F-21) indicate acceptable laboratory performance.

4.10.5 Accuracy

The matrix spike results were generally inconclusive due to high concentrations of target analytes in the sample. All non-conformances were investigated and found to be associated with high concentrations of the target analytes in the project sample. The LCS data analyzed over the course of the project indicate consistent laboratory performance.

4.10.6 Representativeness

The sampling and homogenization procedures for these samples were designed to create representative samples. In a few cases disagreement between duplicates of a particular sample was blamed on inhomogeneity of the soil. However, the overall conclusion is that sample inhomogeneity has not significantly affected the site decisions.

4.10.7 Completeness

The system performance data were 100 percent complete.

4.10.8 Comparability

The comparability of these data with PE sample results was assessed during other phases of the project. No bias could be detected in the data based upon the PE sample results and matrix spike results. The analysis methods, for these samples, generated data that is expected to be comparable to that of similar laboratories analyzing similar samples.

4.10.9 Field Sampling Issues

No problems occurred during sampling.

4.11 TCLP ORGANOCHLORINE AND METALS WASTE CHARACTERIZATION SOIL ANALYSES

4.11.1 Data Use Intended

These data were used to establish waste designations under federal and Washington State hazardous waste regulations. The following selected waste streams were tested:

Sample Type/Location	Date Sampled	Analysis
Composites W02 and W09 (prefixes for sample numbers; see Table 19 for bin numbers and source)	10/14/97	TCLP Metals
Composites WA, WD, WE, and WF (prefixes for sample numbers; see Table 19 for bin numbers and source)	10/24/97	TCLP Metals and Pesticides

4.11.2 Summary of Qualified or Rejected Data

No data were rejected.

4.11.3 Sample Handling and Documentation

No problems were encountered.

4.11.4 Precision

All laboratory duplicates were acceptable.

4.11.5 Accuracy

The matrix spike for pesticides was acceptable. The matrix spike for metals was acceptable except for a slightly low result for silver. The analytical result for silver was undetected and no corrective action was deemed necessary because the detection limit was far below the regulatory limit.

4.11.6 Representativeness

The sampling, compositing and homogenization procedures for these samples were designed to create representative samples.

4.11.7 Completeness

The system performance data were 100 percent complete.

4.11.8 Comparability

The analysis methods, for these samples, generated data that is expected to be comparable to that of similar laboratories analyzing similar samples.

4.11.9 Field Sampling Issues

No problems occurred during sampling.

4.12 CARBAMATE WASTE CHARACTERIZATION AND FINAL CONFIRMATION SOIL ANALYSES

4.12.1 Data Use Intended

Waste analyses were required to demonstrate that Washington State toxic waste designation levels had not been exceeded. The final confirmation data were used to demonstrate MTCA compliance after remedial excavation.

4.12.2 Summary of Qualified or Rejected Data

No data were rejected.

4.12.3 Sample Handling and Documentation

No problems were encountered.

4.12.4 Precision

All field duplicates were acceptable. All non-conformances were investigated and found to be associated with high concentrations of the target analytes in the project sample.

4.12.5 Accuracy

The matrix spike results (Appendix F - Figures F-4, F-7, F-10 and F-15) indicate that the analytical methodology performed well with these analytes. All non-conformances were investigated and found to be associated with high concentrations of the target analytes in the project sample. The Laboratory Control Samples (Appendix F - Figures F-10, F-13, F-17 and F-21) indicate consistent laboratory performance.

4.12.6 Representativeness

The sampling and homogenization procedures for these samples were designed to create representative samples. The analyst questioned the homogeneity of a waste sample based on variable results with matrix spiked replicates. However, the overall conclusion is that sample inhomogeneity has not significantly affected the site decisions.

4.12.7 Completeness

The system performance data were 100 percent complete.

4.12.8 Comparability

No bias could be detected in the results based upon matrix spikes and surrogates. The modified Method 8141 performed by GC/NPD for these samples generated data that is expected to be comparable to that of similar laboratories analyzing similar samples by this method. The method was selected in order to reduce the possible occurrence of chromatographic interference.

4.13 PARAQUAT WASTE CHARACTERIZATION AND FINAL CONFIRMATION SOIL ANALYSES

4.13.1 Data Use Intended

Waste analyses were required to demonstrate that Washington State toxic waste designation levels had not been exceeded. The final confirmation data were used to demonstrate MTCA compliance after remedial excavation.

4.13.2 Summary of Qualified or Rejected Data

Two sample delivery groups were reanalyzed due to laboratory QC non-conformances. None of the reported data were qualified.

4.13.3 Sample Handling and Documentation

No problems were encountered.

4.13.4 Precision

All field duplicates were acceptable.

4.13.5 Accuracy

The matrix spike results (Appendix F - Figures F-4, F-7, F-10 and F-15) indicate that the analytical methodology performed well with these analytes. All non-conformances were investigated and resolved prior to reporting results. Two of the analytical batches were re-extracted and reanalyzed as a corrective action because of low recovery for laboratory control samples. The re-extracted batches showed acceptable recovery and only data from the latter batches were reported. The LCS data for the acceptable analytical batches during the project (Appendix F - Figures F-10, F-13, F-17 and F-21) indicate consistent laboratory performance. Because one SDG was reanalyzed with a later group, only two matrix spike results were reported for the three SDGs.

4.13.6 Representativeness

The sampling and homogenization procedures for these samples were designed to create representative samples. Field duplicates indicate that the homogenization was generally complete.

4.13.7 Completeness

The system performance data were 100 percent complete.

4.13.8 Comparability

No bias could be detected in the results based on matrix spikes. The methodology performed on these samples is expected to be comparable to that of similar laboratories analyzing similar samples.

4.14 RINSEWATER ANALYSIS FOR PESTICIDES AND METALS

4.14.1 Data Use Intended

These data were intended to establish the proper disposal procedure for the decontamination rinse water and to determine if the POTW would accept the wastewater. MTCA Method B standards for groundwater were used to determine whether the water could be discharged to the ground.

4.14.2 Summary of Qualified or Rejected Data

No data were rejected.

4.14.3 Sample Handling and Documentation

No problems were encountered.

4.14.4 Precision

All field duplicates were acceptable. LCS duplicate results indicate acceptable laboratory performance.

4.14.5 Accuracy

The matrix spike results for OP pesticides and metals indicated that the analytical methodology performed well with these analytes. The LCS results indicate consistent laboratory performance. One of two surrogates for OC pesticides was below project targets, but within the laboratory statistical limits required by SW-846 methods.

4.14.6 Representativeness

The sampling techniques were designed to create representative samples.

4.14.7 Completeness

The data were 100 percent complete.

4.14.8 Comparability

No bias could be detected in the results based on matrix spikes. The method performed for these samples generated data that is expected to be comparable to that of similar laboratories analyzing similar samples.

5. SUMMARY OF FOCUSED REMOVAL AND SITE CHARACTERIZATION ANALYTICAL RESULTS

During the focused removal and site characterization phases the following measured data were accumulated:

- Focused Removal Confirmation Sampling Analytical Data
- Site Characterization Analytical Data
- Initial Waste Characterization Analytical Data

Based upon IAA and fixed laboratory data an excavation and preliminary disposal plan were developed. Field documentation of the remedial activities is included as Appendix J. This excavation and preliminary disposal plan is presented in Section 6 of this report.

5.1 FOCUSED REMOVAL CONFIRMATION SAMPLING ANALYTICAL DATA

The focused removal confirmation sampling analytical data consists of field laboratory IAA data for the organochlorine pesticides and fixed laboratory results of samples analyzed for OP and OC pesticides. The analyzed samples were collected by procedures described in Section 2.2 of this report. The resulting data are presented in Appendix B. A master list identifying sample numbers for primary and field duplicate samples analyzed by both the field and fixed laboratory is provided in Appendix A.

5.2 SITE CHARACTERIZATION SAMPLING ANALYTICAL DATA

The Site Characterization Sampling Analytical Data consists of fixed laboratory results of samples analyzed for OP and OC pesticides in addition to the associated field laboratory immunoassay data. The analyzed samples were collected by procedures described in Section 2.3 of this report. The resulting data are presented in Appendices C and G. A master list identifying sample numbers for primary and field duplicate samples analyzed by both the field and fixed laboratory is provided in Appendix A.

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6. EXCAVATION PLAN AND PRELIMINARY DISPOSAL PLAN

The fixed laboratory characterization data and the respective IAA data presented in Section 5 were used to develop an excavation and preliminary disposal plan. This plan was used to guide the initial gross removal field activities. The data from Section 5 were compared to the respective action levels in order to guide the subsequent excavation and disposal activities with respect to the established relevant and applicable contaminant action levels.

The action levels for this project are presented in Tables 2 and 3 (see Section 1).

6.1 EXCAVATION PLAN

Table 12 shows the depths of excavation proposed based upon the MTCA Method B cleanup standards and the data presented in Section 5.

TABLE 12. Planned Excavation Depths

Grid	Planned excavation depth (feet bgs)	Grid	Planned excavation depth (feet bgs)	Grid	Planned excavation depth (feet bgs)
1A	1	4A	1	7A	2
1B	1	4B	1	7B	2
1C	1	4C	1	7C	2
2A	2	5A	4	8A	4
2B	1	5B	4	8B	4
2C	1	5C	4	8C	4
3A	5	6A	2	9A	2
3B	5	6B	2	9B	2
3C	5	6C	2	9C	2

The estimated quantity of soil to be excavated by this plan was approximately 270 yards.

6.2 PRELIMINARY DISPOSAL PLAN

The analytical data indicated the likely potential waste disposal designation for the materials to be excavated (See Section 8 for a thorough discussion of waste profiling details). These preliminary potential disposal designations were based upon a comparison of the fixed laboratory and IAA analytical data for the materials included in the excavation plan with the respective estimated dangerous waste designation and toxicity action levels. Based upon this comparison the materials excavated from grids 3A, 3B, and 3C would likely be dangerous wastes, while all of the remaining excavated material would likely not be a dangerous waste.

Based upon this comparison, while the excavated materials would be generally segregated according to columns, particular care would be taken to segregate those soils in column 3 both from the other columns and from itself based upon depth.

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7. GROSS REMOVAL REMEDIATION ACTIVITIES

The gross removal phase of remediation consisted of:

- Excavating soils in accordance with the excavation plan
- Confirmation sampling
- Subsequent additional excavation and confirmation sampling, as needed
- Final Waste Profiling

Field documentation of the remedial activities is included in Appendix J.

7.1 GROSS REMOVAL SOIL EXCAVATION

The gross removal soil excavation began on October 13, 1997. At the completion of the activities on this date most of the waste storage space available in the on-site roll-off bins was in use. Excavation activities were resumed on October 23 and 24, 1997. At the completion of the excavation activities on October 24, all of the materials identified in the initial excavation plan had been excavated; therefore, the initial round of confirmation samples was collected from the floor of the excavated pit. Initial confirmation samples were also collected from the side walls of the excavation by the USACE, with GSA and their contractor analyzing the side wall samples using both on-site IAA and off-site fixed laboratory analysis.

Based upon this sampling, additional excavation activities beyond the initial excavation plan were conducted on October 23, November 3, 4, and 17, 1997, and also December 10, 1997. On October 23, 1997, excavation activities beyond the scope of the initial plan removed six inches of soil from the floor of grid 6A. On November 3, 1997. Excavation activities removed approximately:

- 3 inches of soil from the western sidewall of grids 1A and 1B
- 3 inches of soil from the northern sidewall of grids 5A, 6A, 7A, and 8A
- 3 inches of soil from the eastern sidewall of grids 9A and 9C
- 3 inches of soil from the floor of the lower tier portions of grids 4A, 4B, and 4C
- 6 inches of soil from the sidewall which delineated the lower and upper tiers of grids 4A, 4B, and 4C

On November 4, 1997, excavation activities removed approximately:

- 6 inches of soil from the western sidewall of grids 1A and 1B

On November 17, 1997, excavation activities removed approximately:

- 6 inches of soil from the floor of grids 9A, 9B, and 9C.
- 12 inches of soil from the western sidewalls of grids 1A and 1B
- 12 inches of soil from the north sidewall of grids 7A and 8A

On December 10, 1997, excavation activities removed

- soil in grid 4B to an approximate depth of 4.5 feet
- approximately 6 inches of soil from the northern sidewall of grid 7A

- approximately 12 inches of soil from the northern sidewall of grid 8A

The final excavation depths for the test plot are presented in Table 13.

TABLE 13. Actual Excavation Depths

Grid	Actual excavation depth (feet bgs)	Grid	Actual excavation depth (feet bgs)	Grid	Actual excavation depth (feet bgs)
1A	1	4A*	1 / 3	7A	2
1B	1	4B	4.5	7B	2
1C	1	4C*	1 / 3	7C	2
2A*	2 / 2.6	5A	4	8A	4
2B*	1 / 2.6	5B	4	8B	4
2C*	1 / 2.6	5C	4	8C	4
3A	5	6A	2.5	9A	2.5
3B	5	6B	2	9B	2.5
3C	5	6C	2	9C	2.5

* These grids had two final excavation depths. The first number corresponds to the portion of the grid outside of the extent of the focused removal area, while the second number corresponds to the area within the extent of the focused removal.

By November 3, 1997, USACE and GSA had determined that elevated levels of contaminants of concern were present outside of the established limits of the test plot area. Excavation of sidewall areas began on November 3, 1997, and were subsequently conducted on November 4 and 17, 1997, as well as on December 10, 1997. Confirmational sampling was also conducted at the conclusion of each sidewall excavation event. For the sidewalls that were excavated, the sidewall excavation activities were conducted upon the entire sidewall surface corresponding to the immediately adjacent test plot grid. Sidewall locations were identified by a five character label; this label began as "SW," for sidewall, followed by the two character identifier for the immediately adjacent test plot grid followed by a letter indicating which direction the sidewall was located relative to the test plot (i.e. N, S, E, or W). The final limits of the areas excavated during the sidewall excavation activities are as indicated in Table 14.

TABLE 14. Extent of Sidewall Excavation

Sidewall Location	Excavated Distance (feet)	Sampled Location	Excavated Distance (feet)	Sampled Location	Excavated Distance (feet)
SW1AW	1.58	SW1AN	0.0	SW1CS	0.0
SW1BW	1.58	SW2AN	0.0	SW2CS	0.0
SW1CW	0.0	SW3AN	0.0	SW3CS	0.0
		SW4AN	0.0	SW4CS	0.0
SW9AE	0.25	SW5AN	0.25	SW5CS	0.0
SW9BE	0.0	SW6AN	0.25	SW6CS	0.0
SW9CE	0.25	SW7AN	2.83	SW7CS	0.0
		SW8AN	3.33	SW8CS	0.0
		SW9AN	0.0	SW9CS	0.0

In general, the gross removal excavation activities did not expand the excavation laterally with the exception of the sidewall excavation dimensions indicated in Table 14 and over-excavation of the portion of the FR4/5 sidewall that was within column 4 as described above.

During the gross removal excavation period, approximately 330 tons of contaminated soil were excavated, and placed into on-site storage bins. The storage bins were numbered and the excavated material was tracked to the numbered bins. The excavated soil was stored in bins in accordance with Table 15.

TABLE 15. Excavated Soil Disposition

Bin #	Contents	Date Accumulation Began
1	FR 2/3 (0" to Top of Bag)	09/22/97
2	Column 6	10/13/97
3	FR 2/3 Bags	09/23/97
4	FR 4/5 (0" to Top of Bag) & Column 8 (Feet 0 to 2)	9/22/97 and 10/13/97
5	Column 7 & Trash Can Contents	10/13/97
6	FR 4/5 Bags	09/23/97
7	Column 9 and Column 8 (Feet 0 to 2)	10/13/97
8	Column 9 and Column 8 (Feet 0 to 2)	10/13/97
9	Column 8 (Feet 2 to 4)	10/13/97
10	Column 8 (Feet 2 to 4)	10/13/97
11	Columns 6 & 7	10/13/97
12	Columns 6 & 7	10/13/97
13	Column 5 (First 2 feet)	10/13/97
14	Column 5 & Column 2	10/13/97 & 10/23/97
15	Columns 1 & 2 and overflow from Bin #4	10/23/97
16	Columns 1 & 2	10/23/97
17	Columns 4 & 5	10/23/97
18	Column 5	10/23/97
19	Columns 5, 6, 7, 1A, and manual excavation area overflow	10/23-24/97, 11/03-04/97
20	Column 3 (Feet 0 to 2)	10/24/97
21	Column 3 (Feet 0 to 2)	10/24/97
22	Column 3 (Feet 2 to 4)	10/24/97
23	Column 3 (Feet 2 to 4)	10/24/97
24	Column 3 (Foot 4 to 5)	10/24/97
25	Sidewalls 1A, 1B, 7A, and 8A, Grids 9A, 9B, 9C, and lower portion of 4B	11/17/97
26	Final Overex. of 7A & 8A Sidewalls, Old decon pad	11/17/97, 12/10/97
27	Final Over-excavation areas (Sidewalls 7A and 8A, grid 4B)	12/10/97
Drums	Manual Over-excavation areas (1A, 1B, 5A, 6A, 7A, 8A, 9A, and 9C sidewalls)	11/03-04/97

7.2 GROSS REMOVAL CONFIRMATION SAMPLING

Gross removal confirmational sampling was conducted at the completion of the excavation activities identified in the initial excavation plan and was subsequently reconducted at the completion of each additional lift of subsequently excavated soils in those areas still requiring excavation. Analytical data generated from this activity are presented in section 8.

7.2.1 Confirmation Sampling Design

At the conclusion of the gross removal excavation, confirmational sampling was conducted within the excavated areas. Initially, samples were collected from all 27 grids for field laboratory IAA analysis. Concentrations found above the IAA action levels resulted in further excavation

(see section 7.1). Each grid to be sampled was laid out into nine equal sub-grids and a random selection of the sub-grid to be sampled was made. Columns 2 and 4 each had multiple levels due to the presence of the focused removal trench. The lower tier of column 2 was not sampled in this effort because this area had not been over-excavated following the focused removal confirmation sampling effort. Both the upper and lower levels were sampled. The confirmational sampling for the fixed laboratory consisted of ten samples, one for each column plus a sample for multiple elevations in columns 4. After the IAA screening, the final confirmation samples were submitted for fixed laboratory for OP and OC pesticides, paraquat, and carbamate pesticides analysis. Toward the end of the process when only a few areas needed additional excavation and confirmation, the samples were sent directly to the fixed laboratory, without screening, for OC pesticide analysis only.

The IAA samples collected for the gross removal confirmation were discrete samples taken from a twelve-inch diameter area around the selected sampling location. The gross removal confirmation samples analyzed by the fixed laboratory were discrete surface samples, homogenized thoroughly as described in the sampling procedures below and split into three sub-samples.

7.2.2 Sidewall Sampling

Because of the evidence gathered indicating the possibility of elevated levels of analytes of interest extending horizontally beyond the previously established boundaries of the test plot, the USACE developed a sidewall sampling plan horizontally. See Appendix E for the sampling plan addendum.

Some of the sidewall samples were initially analyzed by IAA protocol prior to choosing to excavate further or sample for fixed laboratory analysis. Toward the end of the process when only a few areas needed additional excavation and confirmation, the samples were sent directly to the fixed laboratory.

7.2.2.1 Field QC

Approximately ten percent of the final confirmation samples were sent to the laboratory as blind QC samples. These samples were taken from the set of three homogenized split samples for each location.

7.2.3 WSU Split Samples During Confirmation and Sidewall Sampling

Approximately ten percent of the final confirmation samples were split for analysis at a separate laboratory under the direction of the WSU contractor at the site. These samples were provided to the WSU representative on site. These samples were split following the homogenization procedure. The locations for these split samples are provided in Table 16.

TABLE 16. WSU Split Sample Locations

Sampled Grid or Sidewall (SW)	Date	Project Sample Number	WSU Sample Number
5C	11/4/97	FC5C4N0476	FC5C4N0476
3A	11/4/97	FC3A5NO479	FC3A5NO479
SW1B West	11/4/97	SW1BWN04715	SW1BW
SW7A North	11/4/97	SW7AN04718	SW7AN04718
SW7A North	11/4/97	SW7AN04718	Field Duplicate
9B	11/17/97	FC2-9B2.5N1774	FC2-9B2.5N1774
SW7A North	11/17/97	FC3SW7ANN17711	FC3SW7ANN17711
SW8A North	12/10/97	FC4SW8AD101	FC4SW8AD101

7.2.4 Confirmation Sampling Methodology

The following procedures were used to collect the confirmation samples, field duplicate split samples, and WSU split samples:

- The first layer of soil (down to two inches below the sampled surface) from the twelve-inch diameter area to be sampled was brushed aside with a decontaminated stainless steel spoon.
- Several scoops of soil were then gathered together and homogenized in-situ with the spoon. With the aid of the spoon, the sample was then placed directly into the sampling jar for IAA analysis. The sampled location was marked with a wooden stake.
- If the analyzed sample showed IAA results below the action limit, the location was resampled for fixed laboratory confirmation analysis.
- When the fixed laboratory samples were collected, loose surface soil was again brushed aside and the following sampling procedures were used to ensure representative samples and thorough homogenization:
  - Soil was collected into a decontaminated stainless steel bowl for initial debris removal (stones and sticks greater than 3/8-inch diameter), crushing, and mixing. Mixing, crushing, and shaking were applied, as needed, to obtain a visually homogeneous mixture of the soil.
  - Final homogenization was done by coning and quartering the soil sample as follows:
    a) The soil was drawn up into a large cone and then split into four separate small cones.
    b) The soil from each small cone was stirred with the spoon to an even consistency.
    c) Two adjacent small cones were then joined together and mixed. The other two small cones were likewise mixed together.
    d) Finally the two separate mixtures were joined and mixed.
  - Care was taken to keep the samples from being exposed to direct sunlight.
  - Samples were split into sub-samples by segregation of approximately equal portions of the sample into three pre-cleaned sampling jars.

7.2.5 Confirmation Sampling Locations

The locations of the final round of confirmation samples (Final Confirmation) are shown in Table 17. These are the locations of the final confirmation immunoassay samples and the subsequent fixed laboratory samples from the same location.

TABLE 17. Final Confirmation Sampling Locations

Sampled Location	X-coord. (feet)	Y-coord. (feet)	Sampled Location	X-coord. (feet)	Y-coord. (feet)	Sampled Location	X-coord. (feet)	Y-coord. (feet)
1A	4.50	2.25	5C	48.50	30.75	SW7AN	65	-2.83
1B	8.75	13.75	6A	55.50	2.00	SW8AN	71	-3.33
1C	1.50	24.50	6B	52.25	13.75	SW9AE	85.25	6
2A	14.25	6.5	6C	55.25	30.25	SW9CE	85.25	27
2B	13.75	16.25	7A	63.25	7.00	SW9AN	82.5	0.0
2C	16.75	29.75	7B	63.50	21.50	SW9BE	85.0	16.5
3A	24.25	7.757	7C	60.75	30.25	SW8CS	75	33.0
3B	24.75	17.50	8A	74.00	2.00	SW7CS	65	33.0
3C	28.25	23.75	8B	77.75	13.50	SW6CS	55	33.0
4A Upper	30.75	9.75	8C	71.75	26.75	SW5CS	45	33.0
4A Lower	37.00	6.75	9A	83.50	6.00	SW4CS	35	33.0
4B Upper	35.50	15.50	9B	81.00	13.75	SW3CS	25	33.0
4B Lower	37.50	15.50	9C	82.75	28.50	SW1AN	5	0.0
4C Upper	32.00	27.50	SW1AW	-1.58	5	SW2AN	15	0.0
4C Lower	37.00	25.00	SW1BW	-1.58	16	SW3AN	25	0.0
5A	41.50	7.00	SW5AN	44	-0.25	SW4AN	35	0.0
5B	48.25	21.00	SW6AN	55	-0.25			

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8. SUMMARY OF FINAL CONFIRMATION ANALYTICAL RESULTS

During the gross removal phase of remedial activities the following measured data were accumulated:

- Final confirmation sampling analytical data

The final confirmation analytical data consisting of both IAA and fixed laboratory results from the sample locations at the maximum extent of the excavation were used as a preliminary confirmation that the remediation activities had cleaned up the WTFREC Test Plot to contaminant levels that are acceptable in accordance with MTCA procedures. The final determination of whether the remedial action had successfully cleaned up the site in accordance with MTCA was based upon statistical analysis of a cleanup data set. The data set was comprised, in part, of many of the fixed laboratory confirmation samples that were collected at the maximum extent of the excavation as well as other selected fixed laboratory data from earlier characterization phases of the work. See section 9 for details of the cleanup analysis determination.

8.1 GENERAL

The final confirmation analytical data consists of both mobile and fixed laboratory results. Together these results can be used to evaluate if the applicable MTCA soil cleanup levels have been met. Section 4 discusses the data quality for this phase of work.

The field laboratory data were used as a screening tool for purposes of selecting samples for fixed laboratory analysis. Based upon the results of the IAA analyses, selected sampling locations were used for fixed laboratory final confirmation analyses.

8.2 FINAL CONFIRMATION FIELD LABORATORY RESULTS

Surficial soil samples were collected from each of the test plot grids as well as from several of the test plot excavation sidewall locations at the respective maximum depths and extents of the excavation. These samples were submitted for cyclodiene kit and DDT kit IAA analyses. The results of these analyses for the samples collected at the maximum extent of the excavation are provided in Table 18.

8.3 FINAL CONFIRMATION FIXED LABORATORY RESULTS

Surficial soil samples were collected from each of the test plot columns as well as from selected sidewall locations and submitted to the fixed laboratory for analysis as per section 7.2. The rationale for determining which sample was submitted to the fixed laboratory was based upon review of the field laboratory data for each grid within the column. For columns 1, 2 and 6 the submitted sample exhibited the highest concentration on both the DDT analysis as well as the cyclodiene analysis. For columns 3, 5, 7, 8 and 9 the submitted sample had a DDT IAA concentration close to, but not quite the highest, for the column. However, for each of these columns the selected fixed lab sample exhibited a significantly higher cyclodiene IAA concentration than that of the other grids within the respective column. Column 4 did not have a final confirmation fixed laboratory sample that was collected from the deepest extent of the excavation in this column. This was due to the lower tier and the entire surface of grid 4B

having been excavated to a depth below that of the focused removal confirmation sampling locations. The associated focused removal sample concentrations were acceptable with respect to the MTCA Method B levels. The USACE selected the sidewall samples that would be submitted for fixed lab analysis.

This sample selection process resulted in a sample set that was submitted to the fixed laboratory which would likely be representative of the "worst case scenario" for each column. Thus, if the fixed laboratory samples had acceptable COC concentrations, then the remaining grids would also likely have acceptable COC levels due to the relative levels from the IAA analysis.

The complete data set of fixed laboratory final confirmation samples is presented in Appendix E (Table E-1). This table shows the chronological sequence of all of the final confirmation sampling results at each location.

TABLE 18. Final Confirmation IAA Data

Sample Location	Sample Date	Analysis Batch	DDT Kit (ppm)	Cyclodiene Kit (ppm)
Grid 1A	**10/23/97**	**DDT(12)/Chlor(12)**	**3.095**	**0.091**
Grid 1B	10/23/97	DDT(12)/Chlor(12)	1.315	0.079
Grid 1C	10/23/97	DDT(12)/Chlor(12)	0.274	0.018
Grid 2A	**10/24/97**	**DDT(14)/Chlor(14)**	**0.605**	**0.061**
Grid 2B	10/24/97	DDT(14)/Chlor(14)	0.137	0.013
Grid 2C	10/24/97	DDT(14)/Chlor(14)	0.117	0.013
Grid 3A	**10/24/97**	**DDT(14)/Chlor(14)**	**0.245**	**0.465**
Grid 3B	10/24/97	DDT(14)/Chlor(14)	0.273	0.101
Grid 3C	10/24/97	DDT(14)/Chlor(14)	0.232	0.117
Grid 4A	11/3/97	DDT(17)/Chlor(17-18)	0.8	0.117
Grid 4B*	11/3/97	DDT(17)/Chlor(17-18)	3.65	0.124
Grid 4C	11/3/97	DDT(17)/Chlor(17-18)	2.99	0.098
Grid 4A (Lower)	11/3/97	DDT(18)/Chlor(17-18)	1.381	0.098
Grid 4B (Lower)*	11/17/97	DDT(19)	0.266	NA
Grid 4C (Lower)	11/3/97	DDT(17)/Chlor(17-18)	2.99	0.030
Grid 5A	10/24/97	DDT(13)/Chlor(13)	0.363	0.089
Grid 5B	10/24/97	DDT(13)/Chlor(13)	8.53	0.007
Grid 5C	**10/24/97**	**DDT(13)/Chlor(13)**	**7.39**	**0.307**
Grid 6A	10/23/97	DDT(15)/Chlor(15)	0.184	0.008
Grid 6B	10/23/97	DDT(12)/Chlor(12)	2.17	0.224
Grid 6C	**10/23/97**	**DDT(12)/Chlor(12)**	**2.33**	**0.950**
Grid 7A	**10/23/97**	**DDT(12)/Chlor(12)**	**0.743**	**0.205**
Grid 7B	10/23/97	DDT(12)/Chlor(12)	0.420	0.053
Grid 7C	10/23/97	DDT(12)/Chlor(12)	0.857	0.187
Grid 8A	**10/13/97**	**DDT(11)/Chlor(11)**	**0.338**	**0.376**
Grid 8B	10/13/97	DDT(11)/Chlor(11)	1.212	0.057
Grid 8C	10/13/97	DDT(11)/Chlor(11)	0.0496	0.019
Grid 9A	11/17/97	DDT(19)	0.224	0.073
Grid 9B	**11/17/97**	**DDT(19)**	**0.177**	**0.356**
Grid 9C	11/17/97	DDT(19)	0.071	0.067

TABLE 18. Final Confirmation IAA Data (Continued)

Sample Location	Sample Date	Analysis Batch	DDT Kit (ppm)	Cyclodiene Kit (ppm)
Sidewall 1AW	11/17/97	DDT(19)	1.500	NA
Sidewall 1BW	11/17/97	DDT(19)	0.251	NA
Sidewall 1AN	10/24/97	DDT(15)/Chlor(15)	8.4	0.094
Sidewall 2AN	10/24/97	DDT(15)/Chlor(15)	0.2	0.004
Sidewall 3AN	10/24/97	DDT(15)/Chlor(15)	0.2	0.002
Sidewall 4AN	10/24/97	DDT(15)/Chlor(15)	0.4	0.004
Sidewall 5AN	**11/03/97**	**DDT(18)/Chlor(17-18)**	**9.02**	**0.019**
Sidewall 6AN	11/03/97	DDT(18)/Chlor(17-18)	0.231	0.012
Sidewall 7AN*	**11/17/97**	**DDT(20)**	**6.33**	**NA**
Sidewall 8AN*	**11/17/97**	**DDT(20)**	**7.11**	**NA**
Sidewall 9AN	10/24/97	DDT(14)/Chlor(14)	4.1	0.025
Sidewall 9AE	11/03/97	DDT(18)/Chlor(17-18)	5.77	0.092
Sidewall 9BE	10/23/97	DDT(13)/Chlor(13)	1.5	0.012
Sidewall 9CE	11/03/97	DDT(18)/Chlor(17-18)	2.36	0.045
Sidewall 3CS	10/24/97	DDT(15)/Chlor(15)	0.1	0.004
Sidewall 4CS	10/24/97	DDT(15)/Chlor(15)	0.1	0.002
Sidewall 5CS	10/24/97	DDT(13)/Chlor(13)	0.0	0.004
Sidewall 6CS	10/24/97	DDT(13)/Chlor(13)	0.1	0.005
Sidewall 7CS	10/24/97	DDT(14)/Chlor(14)	1.6	0.043
Sidewall 8CS	10/24/97	DDT(14)/Chlor(14)	3.9	0.091
Sidewall 9CE	11/03/97	DDT(18)/Chlor(17-18)	2.36	0.045

NA - Not analyzed

Bold - sample was subsequently used in the statistical cleanup determination

* - Area was subsequently over-excavated, the area may have been resampled, however, it was not reanalyzed by IAA

9. CLEANUP ANALYSIS DETERMINATION

Field laboratory data obtained during the course of the WTFREC Test Plot Remediation has confirmed that the subject test plot has achieved an accepted regulatory level of remediation. This determination is based upon a statistical analysis of the sample data representative of the final conditions at the site at the maximum extent of excavation.

This cleanup analysis determination is based upon statistical analysis of the cleanup data set of fixed laboratory analysis. This representative sample data is limited to the fixed laboratory data from the final confirmation samples and those characterization samples which were representative of the final extents of excavation (see Tables 13 and 14). Thus, if excavation at a particular location extended to the two-foot depth, a characterization sample, if analyzed, for the two to three foot depth would be applicable, however a characterization sample from this location for either the one to two foot depths or the three to four foot depths would not be applicable. Appendix E (Table E-2) provides a full listing of the samples used for the statistical analysis.

Data that shows an acceptable level of remediation in order to attain cleanup must pass three statistical tests. These tests are:

- The analyte concentration for no more than 10 percent of the samples can exceed the cleanup standard for that analyte;
- No sample concentration can exceed a level more than two times the cleanup standard for any particular analyte; and
- The upper confidence limit of the data for each analyte must be statistically shown to be less than the cleanup criteria for that analyte.

This analysis was conducted upon the data as shown in Appendix E.

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10. SITE RESTORATION

Site restoration consisted of the demobilization of all on-site project support facilities and the backfilling and revegetation of the test plot area

Backfill was placed in the vegetated areas of the test plot up to a depth of approximately six-inches below final grade and up to the final grade elevation for the backfilled roadway areas associated with the test plot. This backfill consisted of 463.37 tons of material.

Topsoil was placed in the areas to be vegetated in such a way that at least six-inches of topsoil exist in those areas. The amount of topsoil imported for this project amounted to approximately 70 cubic yards.

The areas with added topsoil were subsequently hydroseeded.

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11. FINAL WASTE CHARACTERIZATION SAMPLING AND PROFILING

Waste characterization sampling consisted of the sampling of the stockpiled soil within the roll-off bins and the accumulated decontamination rinse water.

11.1 WASTE SOIL CHARACTERIZATION

11.1.1 Characterization Sampling Design

Waste stream characterization sampling was conducted at the conclusion of the focused removal excavation and again as significant segments of the initial gross removal excavation plan were completed.

During the focused removal, samples were collected from each of the four segregated waste streams as well as from the three trash cans of soil. This sampling was conducted on September 23, 1997.

In addition to the waste characterization samples collected for the focused removal, several additional waste samples were collected at the conclusion of the excavation activities related to the initial excavation plan. Although, a preliminary indication of the likely waste designation was obtained directly from the site characterization data (see Section 6.2), the subsequent sample analyses were used for actual waste designation purposes. Neither IAA data nor fixed laboratory analyses conducted upon soils collected in-situ were used in the final determination of waste designation. These subsequent samples were collected on October 14 and 24, 1997. Each of the samples was collected as a composite sample from at least five different locations within either a single bin or a grouping of bins. The proportion of sample collected from within any bin was representative of the proportion of waste soil within the bin as compared to the collective grouping of bins.

The reasons behind the resampling include the fact that the excavation process to some extent homogenized and/or mixed adjacently situated soils. This combined with the compositing of the samples from several locations is perceived to provide a more accurate estimation of the average concentration of materials actually deposited within specific bins or groups of bins.

Waste designation is based upon the Washington State Dangerous Waste Regulations (WAC 173-303). As compared to these waste characterization samples, the role that MTCA plays in the designation process is limited to governing the decision to remove the material from the ground. With removal the material becomes a waste, after which time its disposition is governed by the dangerous waste regulations. (Note - although it is possible by these regulations to leave a material that would be designated 'dangerous' in the ground, due to a more stringent dangerous waste action level as compared to the relevant MTCA action level [endrin for example], there is no apparent indication, based upon the final confirmation data, that any such material remained in-place at the designated test plot at the conclusion of this project).

Some of the roll-off bins were not specifically sampled, particularly towards the end of the gross removal activities. Based upon the information known about the contents of these bins, the judgement was made that the relative contaminant concentrations within these bins were either at or lower than other bins, which were already known to be in the non-Resource Conservation and Recovery Act (RCRA) regulated waste category.

The sample numbers and associated waste storage containers are identified in Table 19.

TABLE 19. Soil Waste Characterization Sample Locations

Bin #	Contents	Sample Number	Profile Number
1	FR 2/3 (0" to Top of Bag)	W192373 and W192374	ZBX6347
2	Column 6	W02O1474	Z20070001
3	FR 2/3 Bags	W392371	ZCH073906
4	FR 4/5 (0" to Top of Bag) & Column 8 (Feet 0 to 2)	W492375	ZBX6347
5	Column 7 & Trash Can Contents	WA O2471	ZBX6347
6	FR 4/5 Bags	W692372	ZCH073906
7	Column 9 and Column 8 (Feet 0 to 2)	NA	ZBX6347
8	Column 9 and Column 8 (Feet 0 to 2)	NA	ZBX6347
9	Column 8 (Feet 2 to 4)	W09O1471 and W09O1472	ZBX6347
10	Column 8 (Feet 2 to 4)	NA	ZBX6347
11	Columns 6 & 7	WA O2471	ZBX6347
12	Columns 6 & 7	WA O2471	ZBX6347
13	Column 5 (First 2 feet)	WB O2472	ZBX6347
14	Column 5 & Column 2	WB O2472	ZBX6347
15	Columns 1 & 2 and overflow from Bin #4	WC O2473	ZBX6347
16	Columns 1 & 2	WC O2473	ZBX6347
17	Columns 4 & 5	WC O2473	ZBX6347
18	Column 5	WB O2472	ZBX6347
19	Columns 5, 6, 7, 1A, and manual excavation area overflow	WC O2473	ZBX6347
20	Column 3 (Feet 0 to 2)	WD O2474	ZCH073905
21	Column 3 (Feet 0 to 2)	WD O2474	ZCH073905
22	Column 3 (Feet 2 to 4)	WE O2475	ZBX6347
23	Column 3 (Feet 2 to 4)	WE O2475	ZBX6347
24	Column 3 (Foot 4 to 5)	WF O2476	ZBX6347
25	Sidewalls 1A, 1B, 7A, and 8A, Grids 9A, 9B, 9C, and lower portion of 4B	NA	ZBX6347
26	Final Overex. of 7A & 8A Sidewalls, Old decon pad	NA	ZBX6347
27	Final Over-excavation areas (Sidewalls 7A and 8A, grid 4B)	NA	ZBX6347
Drums	Manual Over-excavation areas (1A, 1B, 5A, 6A, 7A, 8A, 9A, and 9C sidewalls)	NA	ZBX6347
	Final Over-excavation areas	NA	ZBX6347

11.1.2 Waste Characterization Sampling Analytical Data

The waste characterization sampling analytical data consists of fixed laboratory results of samples analyzed for OP and OC pesticides, TCLP OC pesticides, and TCLP metals. The analyzed samples were collected by procedures described in Section 11.1.1 of this report. The resulting data are presented in Appendix D.

11.1.3 Profiling of Waste Soil

Based upon the waste characterization analytical data and 'generator knowledge' of the site, four different waste streams were generated for the purposes of profiling the waste soils for treatment and disposal. These waste streams were

1) Non-RCRA Solid for incineration (Profile #ZCH073906). This waste stream consisted of the soils that were excavated during the focused removal activities which contained the highly-concentrated pesticide research materials placed in bins 3 and 6. Based upon agreement with the USACE prior to initiation of the remediation activities, this waste stream was to be directed to incineration. This decision was part an agreement with the Department of Ecology. The agreement acknowledged that the site was not a RCRA unit and that the pesticide was not a listed waste. Analytical samples collected (W392371 and W692372) from this waste stream indicated that this means of profiling was acceptable, even though the material was not confirmed to be a characteristic waste.
2) Hazardous Waste, Solid, n.o.s. (endrin) for incineration (Profile #ZCH073905). This waste stream consisted of the soils that were excavated from the surface down to the two-foot depth of column 3, which were placed in bins 20 and 21. Analytical data (sample WDO2474) indicated that this waste stream contained endrin at TCLP concentrations of 0.086 mg/l, which is above the dangerous waste threshold limit of 0.02 mg/l. Based upon these analytical data, incineration was the appropriate means of treatment for this waste stream.
3) Non-RCRA Solid for disposal in a RCRA Subtitle C permitted landfill (Profile #Z20070001). This waste stream consisted of the soils that were excavated during the gross removal activities from the upper portion of column 6, which were placed in bin 2. Analytical data (sample WDO1474) indicated that this waste stream contained persistent compounds at a cumulative concentration of 0.044 percent, which is above the Washington State dangerous waste persistent compound designation level of 0.01 percent (WAC 173-303-100). The data indicated that none of the toxicity characteristic threshold limits were likely to be exceeded. Based upon this analytical data, disposal in a permitted landfill was the appropriate means of treatment for this waste stream.
4) Non-RCRA Solid for disposal in a RCRA Subtitle C permitted landfill (Profile #ZBX6347). This waste stream consisted of the soils that were excavated during the focused and gross removal activities other than identified as belonging to the three above waste streams. A total of nine samples were collected from excavated soils for this waste stream. These samples are identified in Table 19. The data from these samples indicated that none of the materials in this waste stream were likely to exceed any of the dangerous waste toxic characteristic threshold levels, cumulative toxic

waste, or cumulative persistent waste levels established in WAC 173-303. This waste was disposed of at a RCRA Subtitle C landfill to lower the liability risk.

11.1.4 Waste Soil Disposal

All of the waste soils generated during this remedial activity have been disposed of according to their respective profile. All of the waste soil materials were transported to their designated waste disposal facilities under the authority proper shipping documents. The shipping document number (manifest number) and disposition for each bin is itemized in Table 20. A copy of all of the shipping documents is contained in Appendix I.

TABLE 20. Waste Soil Shipping Details

Bin #	Profile #	Manifest #	Disposition	Disposal Weight (lbs)
1	ZBX6347	WE005	Non RCRA Solid - CWM Landfill	22000
2	Z20070001	WE009	Non RCRA Solid - ESI Landfill	27460
3	ZCH073906	WE008	Non RCRA Solid - Clean Harbors Incineration	22640
4	ZBX6347	WE002	Non RCRA Solid - CWM Landfill	25840
5	ZBX6347	WE010	Non RCRA Solid - CWM Landfill	33460
6	ZCH073906	WE007	Non RCRA Solid - Clean Harbors Incineration	37140
7	ZBX6347	WE004	Non RCRA Solid - CWM Landfill	30780
8	ZBX6347	WE006	Non RCRA Solid - CWM Landfill	30380
9	ZBX6347	WE001	Non RCRA Solid - CWM Landfill	31460
10	ZBX6347	WE003	Non RCRA Solid - CWM Landfill	28320
11	ZBX6347	WE011	Non RCRA Solid - CWM Landfill	26620
12	ZBX6347	WE012	Non RCRA Solid - CWM Landfill	26700
13	ZBX6347	WE013	Non RCRA Solid - CWM Landfill	34580
14	ZBX6347	WE014	Non RCRA Solid - CWM Landfill	27400
15	ZBX6347	WE015	Non RCRA Solid - CWM Landfill	22780
16	ZBX6347	WE016	Non RCRA Solid - CWM Landfill	23360
17	ZBX6347	WE017	Non RCRA Solid - CWM Landfill	26460
18	ZBX6347	WE018	Non RCRA Solid - CWM Landfill	30480
19	ZBX6347	WE019	Non RCRA Solid - CWM Landfill	32640
20	ZCH073905	WE020	Haz Waste Solid - Clean Harbors - Incineration	27440
21	ZCH073905	WE021	Haz Waste Solid - Clean Harbors - Incineration	24940
22	ZBX6347	WE022	Non RCRA Solid - CWM Landfill	26120
23	ZBX6347	WE023	Non RCRA Solid - CWM Landfill	36580
24	ZBX6347	WE024	Non RCRA Solid - CWM Landfill	24660
25	ZBX6347	WE026	Non RCRA Solid - CWM Landfill	34880
26	ZBX6347	WE027	Non RCRA Solid - CWM Landfill	29440
27	ZBX6347	WE028	Non RCRA Solid - CWM Landfill	16620
Drums	ZBX6347	WE025	Non RCRA Solid - CWM Landfill	9680

11.2 EQUIPMENT DECONTAMINATION RINSE WATER

11.2.1 Sampling Design and Methods

The objective was to obtain a representative sample of the rinse water from the 500-gallon capacity tank adjacent to the decon pad at the test plot as well as from three 55 gallon drums that contained IDW from the Shannon and Wilson investigation activities conducted at the nearby WTFREC Drain Field Site. The sediment at the bottom of the tank was intentionally excluded because it was to be disposed in the waste bins. Pre-cleaned sampling jars from the laboratory were submerged at the surface to obtain the samples.

11.2.2 Decontamination Rinse Water Analytical Data

The analytical results were used to decide whether the rinse water could be disposed on the ground, and if they were not acceptable, to provide documentation for wastewater discharge at a treatment plant. The results are summarized in Appendix F (page F-23, Tables F-2 and F-3). The rinse water results were not depicted graphically due to a lack of data points.

11.2.3 Decontamination Rinse Water Disposal Designation

Because dieldrin exceeded the MTCA Method B Groundwater Clean-up Standards (WAC 173-340-720), ground disposal was eliminated as a possibility. When the analytical results were presented to local waste treatment facilities, Douglas County Sewer District #1 accepted the material for disposal.

11.2.4 Waste Decontamination Rinse Water Disposal

The waste decontamination water generated during this remedial activity was disposed of by the Douglas County Sewer District #1. Analytical results were provided to the district personnel and a verbal approval for disposal was granted. They removed approximately 550 gallons of waste decontamination water on December 3, 1997. Following the removal of the water from the holding tank, the tank was triple-rinsed and demobilized from the site. A minimal amount of water, less than 20 gallons, was generated during triple rinsing and from subsequent on-site remedial activities. This water was disposed of in the waste soil bin used for that day. Waste disposal documentation is provided in Appendix I.

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12. DEVIATIONS FROM THE RAMP

The following are deviations from the RAMP which occurred during the course of the this remedial activity:

- Focused removal wastes were segregated into four waste streams. The focused removal wastes were segregated into four waste streams instead of the planned six waste streams. This segregation scheme occurred due to the actual depth of the top of the deep burial bags being shallower than expected. Segregation of the 0-18-inch bgs lifts occurred as planned, however, the deep burial bags began to be encountered at approximately the 18-inch depth. The remaining material down to approximately 6-inches below the bags were removed and containerized as one waste stream per each of the two deep burial columns.

- The soil cores from the characterization sampling were divided in the field. Each of the cores collected as part of the characterization sampling event were cut and divided into the respective samples while still within the exclusion zone associated with the test plot area and not within the field laboratory, as indicated in the plan. This deviation provided for more efficient handling of the materials, a lowered environmental risk associated with tracking the materials over the distance to the laboratory, and a lowered risk of cross-contamination to occur within the field laboratory.

- The soil cores from the characterization sampling were divided into thirds. Each of the cores collected as part of the characterization sampling event were cut and divided into thirds instead of exact 12-inch segments. This was conducted due to the minor amount of compaction that occurred to the soil collected within each core.

- Additional compounds were added to the listing of COCs. Several additional compounds were added to the listing of COCs for this site. Upon review of the initial fixed laboratory data, which covered an analyte list that was broader than the project COCs (Table 2), GSA identified several additional compounds that should also have been considered COCs. The USACE approved the recommendation that they should be considered additional analytes of concern. The listing of these compounds is and their appropriate regulatory action limits is included in Table 3. The original listing of COCs is included in Table 2.

- Sampling of additional decontamination water occurred. At the request of the USACE, GSA sampled wastewater generated from the Shannon & Wilson, Inc. WTFREC Septic Drain Field characterization activities. These samples were collected and analyzed in the same manner as GSA's own decontamination rinse water.

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13. REFERENCE DOCUMENTS

U.S. Army Corps of Engineers

EM 385-1-1 U.S. Army Corps of Engineers Safety and Health Requirement Manual, October 1992

EM 200-1-3 Requirements for the Preparation of Sampling and Analysis Plans

ER 1110-1 -263 Engineering and Design Chemical Quality Management -- Toxic and Hazardous Waste, April 1, 1996

U.S. Environmental Protection Agency

EPA 1994. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA540/R-94/012, EPA Office of Emergency Response and Remedial Response, Washington, D.C., February 1994.

EPA 1994. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA540/R-94/013, EPA Office of Emergency Response and Remedial Response, Washington, D.C., February 1994.

EPA 1995. Test Methods for Evaluating Solid Waste. SW-846. Third Edition. OSW. September, 1986, with Updates through 1995

EPA/600/4-79-020 -- Methods for Chemical Analysis of Water and Wastes, USEPA Environmental Monitoring and Support Laboratory, Revised March 1983

EPA/540/R-93/071 -- Data Quality Objectives Process for Superfund. 9335.9-01. Sept. 1993

EPA/230/R-92-014 -- Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Groundwater, July, 1992

40 CFR 261 -- Resource Conservation and Recovery Act (RCRA) Characteristic Waste Rules

40 CFR 262-263 -- Standards Applicable to Generators of RCRA Hazardous Waste

40 CFR 300-440 -- CERCLA Off-site Disposal Rule

U.S. Department of Transportation

49 CFR 171-173 -- U.S. Department of Transportation (DOT) Rules

49 CFR 177-DOT Dockets -- HM-181 (changes to rules) and HM-126F (employee training requirements)

State of Washington

WAC 173-340 -- The Model Toxics Control Act Cleanup Regulation

WAC 173-303 -- Dangerous Waste Regulations

WAC 173-200 -- Water Quality Standards for Ground Waters of the State of Washington

WADOE, 1994., Guidance on Preparing Independent Remedial Action Reports Under the Model Toxics Control Act Chapter 70.105D RCW, Washington State Department of Ecology, Publication No. 94-18, March 9, 1994.

Appendix A

Master Lists of Sample Identification Numbers

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TABLE A-1. Master List of Sample Identification Numbers for IAA

Fixed Lab Sample ID	Corresponding Fixed Lab Sample ID	Sample Collection Date	Sample Location	QC Class **	Sample Type
W1-3	W192373	9/23/97	See Table 17		Waste Characterization
W4-5	W492375	9/23/97	See Table 17		Waste Characterization
WCANS6	WCANS92376	9/23/97	See Table 17		Waste Characterization
1A1	C1A1294145	9/24/97	Column 1, Row A, Depth 0-1 ft.		Site Characterization
1A2	C1A2924146	9/24/97	Column 1, Row A, Depth 1-2 ft.		Site Characterization / Final Confirmation (Fixed)
1B1	None	9/24/97	Column 1, Row B, Depth 0-1 ft.		Site Characterization
1B2	C1B2924158	9/24/97	Column 1, Row B, Depth 1-2 ft.		Site Characterization / Final Confirmation (Fixed)
1C1	None	9/24/97	Column 1, Row C, Depth 0-1 ft.		Site Characterization
1C2	C1C2924172	9/24/97	Column 1, Row C, Depth 1-2 ft.		Site Characterization / Final Confirmation (Fixed)
23A5	FR23A92375	9/24/97	See Table 5		Focused Removal
23B6A	FR23B92376	9/24/97	See Table 5	LD1	Focused Removal
23B6B	FR23B92376	9/24/97	See Table 5	LD2	Focused Removal
23B7	FR23B92377	9/24/97	See Table 5		Focused Removal
23C8	FR23C92378	9/24/97	See Table 5		Focused Removal
2A1	C2A1924139	9/24/97	Column 2, Row A, Depth 0-1 ft.		Site Characterization
2A2	C2A2924140	9/24/97	Column 2, Row A, Depth 1-2 ft.		Site Characterization
2A3	None	9/24/97	Column 2, Row A, Depth 2-3 ft.		Site Characterization
2B1	None	9/24/97	Column 2, Row B, Depth 0-1 ft.		Site Characterization
2B2	C2B2924152	9/24/97	Column 2, Row B, Depth 1-2 ft.		Site Characterization / Final Confirmation (Fixed)
2B3	None	9/24/97	Column 2, Row B, Depth 2-3 ft.		Site Characterization
2C1	None	9/24/97	Column 2, Row C, Depth 0-1 ft.	FD1	Site Characterization
2C1	None	9/24/97	Column 2, Row C, Depth 0-1 ft.	FD2	Site Characterization
2C2	C2C2924165	9/24/97	Column 2, Row C, Depth 1-2 ft.	LD1/FD1	Site Characterization / Final Confirmation (Fixed)
2C2	C2C2924166	9/24/97	Column 2, Row C, Depth 1-2 ft.	FD2	Site Characterization
2C2A	NA	9/24/97	Column 2, Row C, Depth 1-2 ft.	LD2	Site Characterization
2C3	None	9/24/97	Column 2, Row C, Depth 2-3 ft.	FD1	Site Characterization
2C3	None	9/24/97	Column 2, Row C, Depth 2-3 ft.	FD2	Site Characterization
3A1	None	9/24/97	Column 3, Row A, Depth 0-1 ft.		Site Characterization
3A2	None	9/24/97	Column 3, Row A, Depth 1-2 ft.		Site Characterization
3A3	None	9/24/97	Column 3, Row A, Depth 2-3 ft.		Site Characterization
3A4	C3A4924136	9/24/97	Column 3, Row A, Depth 3-4 ft.		Site Characterization
3A5	None	9/24/97	Column 3, Row A, Depth 4-5 ft.		Site Characterization
3A6	None	9/24/97	Column 3, Row A, Depth5-6 ft.		Site Characterization
3B1	None	9/24/97	Column 3, Row B, Depth 0-1 ft.		Site Characterization
3B2	None	9/24/97	Column 3, Row B, Depth 1-2 ft.		Site Characterization
3B3	None	9/24/97	Column 3, Row B, Depth 2-3 ft.		Site Characterization
3B4	C3B4924115	9/24/97	Column 3, Row B, Depth 3-4 ft.	LD1	Site Characterization
3B4A	N/A	9/24/97	Column 3, Row B, Depth 3-4 ft.	LD2	Site Characterization
3B5	C3B5924116	9/24/97	Column 3, Row B, Depth 4-5 ft.	LD1	Site Characterization
3B5A	N/A	9/24/97	Column 3, Row B, Depth 4-5 ft.	LD2	Site Characterization
3B6	None	9/24/97	Column 3, Row B, Depth 5-6 ft.		Site Characterization
3C1	None	9/24/97	Column 3, Row C, Depth 1-2 ft.	LD1	Site Characterization
3C1A	None	9/24/97	Column 3, Row C, Depth 0-1 ft.	LD2	Site Characterization

TABLE A-1. Master List of Sample Identification Numbers for IAA

Fixed Lab Sample ID	Corresponding Fixed Lab Sample ID	Sample Collection Date	Sample Location	QC Class **	Sample Type
3C2	None	9/24/97	Column 3, Row C, Depth 1-2 ft.		Site Characterization
3C3	None	9/24/97	Column 3, Row C, Depth 2-3 ft.		Site Characterization
3C4	None	9/24/97	Column 3, Row C, Depth 3-4 ft.		Site Characterization
3C5	C3C5924110	9/24/97	Column 3, Row C, Depth 4-5 ft.		Site Characterization
3C6	C3C6924111	9/24/97	Column 3, Row C, Depth 5-6 ft.		Site Characterization / Final Confirmation (Fixed)
45A4	FR45A92374	9/24/97	See Table 5		Focused Removal
45B2	FR45B92372	9/24/97	Between Columns 4 and 5, Row B, Depth 1-2 ft.	FD1	Focused Removal
45B3	FR45B92373	9/24/97	See Table 5	FD2	Focused Removal
45C1	FR45C92371	9/24/97	See Table 5		Focused Removal
4A1	None	9/24/97	Column 4, Row A, Depth 0-1 ft.	FD1	Site Characterization
4A1	None	9/24/97	Column 4, Row A, Depth 0-1 ft.	FD2	Site Characterization
4A2	C4A2924127	9/24/97	Column 4, Row A, Depth 1-2 ft.	FD1	Site Characterization / Final Confirmation (Fixed)
4A2	C4A2924126	9/24/97	Column 4, Row A, Depth 1-2 ft.	FD2	Site Characterization
4A3	None	9/24/97	Column 4, Row A, Depth 2-3 ft.		Site Characterization
4A3	None	9/24/97	Column 4, Row A, Depth 2-3 ft.		Site Characterization
4B1	C4B1924118	9/24/97	Column 4, Row B, Depth 0-1 ft.		Site Characterization
4B2	C4B2924119	9/24/97	Column 4, Row B, Depth 1-2 ft.		Site Characterization
4B3	None	9/24/97	Column 4, Row B, Depth 2-3 ft.		Site Characterization
4C1	None	9/24/97	Column 4, Row C, Depth 0-1 ft.	FD1	Site Characterization
4C1	None	9/24/97	Column 4, Row C, Depth 0-1 ft.	FD2	Site Characterization
4C2	C4C2924101	9/24/97	Column 4, Row C, Depth 1-2 ft.		Site Characterization / Final Confirmation (Fixed)
4C3	None	9/24/97	Column 4, Row, C, Depth 2-3 ft.		Site Characterization
5A1	None	9/24/97	Column 5, Row A, Depth 0-1 ft.	FD1	Site Characterization
5A1	None	9/24/97	Column 5, Row A, Depth 0-1 ft.	FD2	Site Characterization
5A2	None	9/24/97	Column 5, Row A, Depth 1-2 ft.		Site Characterization
5A2	None	9/24/97	Column 5, Row A, Depth 1-2 ft.		Site Characterization
5A3	None	9/24/97	Column 5, Row A, Depth 2-3 ft.	FD1	Site Characterization
5A3	None	9/24/97	Column 6, Row A, Depth 2-3 ft.	FD2	Site Characterization
5A6	C5AG924799	9/24/97	Column 5, Row A, Depth 5-6 ft.		Site Characterization
5B1	None	9/24/97	Column 5, Row B, Depth 0-1 ft.		Site Characterization
5B2	None	9/24/97	Column 5, Row B, Depth 1-2 ft.		Site Characterization
5B3	None	9/24/97	Column 5, Row B, Depth 2-3		Site Characterization
5B6	C5B6924772	9/24/97	Column 5, Row 5, Depth 5-6 ft.		Site Characterization
5C1	None	9/24/97	Column 5, Row C, Depth 0-1 ft.	LD1	Site Characterization
5C1A	None	9/24/97	Column 5, Row C, Depth 0-1 ft.	LD2	Site Characterization
5C2	None	9/24/97	Column 5, Row C, Depth 4 ft.		Site Characterization
5C3	None	9/24/97	Column 5, Row C, Depth 2-3 ft.		Site Characterization
5C4	C5C4924743	9/24/97	Column 5, Row C, Depth 3-4 ft.		Site Characterization
5C5	C5C5924744	9/24/97	Column 5, Row C, Depth 4-5 ft.		Site Characterization / Final Confirmation (Fixed)
5C6	C5C6924745	9/24/97	Column 5, Row C, Depth 5-6 ft.		Site Characterization
6A1	None	9/24/97	Column 6, Row A, Depth 0-1 ft.		Site Characterization
6A2	None	9/24/97	Column 6, Row A, Depth 1-2 ft.		Site Characterization

TABLE A-1. Master List of Sample Identification Numbers for IAA

Fixed Lab Sample ID	Corresponding Fixed Lab Sample ID	Sample Collection Date	Sample Location	QC Class **	Sample Type
6A3	C6A3924787	9/24/97	Column 6, Row A, Depth 2-3 ft.		Site Characterization / Final Confirmation (Fixed)
6B1	None	9/24/97	Column 6, Row B, Depth 0-1 ft.	FD1	Site Characterization
6B1	None	9/24/97	Column 6, Row B, Depth 0-1 ft.	FD2	Site Characterization
6B2	C6B2924754	9/24/97	Column 6, Row B, Depth 1-2 ft.	FD1	Site Characterization
6B2B	C6B2924755	9/24/97	Column 6, Row B, Depth1- 2 ft.	FD2	Site Characterization
6B3	C6B3924756	9/24/97	Column 6, Row B, Depth 2-3 ft.	FD1	Site Characterization / Final Confirmation (Fixed)
6B3B	C6B3924756	9/24/97	Column 6, Row B, Depth 2-3 ft.	FD2	Site Characterization
6C1	None	9/24/97	Column 6, Row C, Depth 0-1 ft.		Site Characterization
6C2	None	9/24/97	Column 6, Row C, Depth 1-2 ft.		Site Characterization
6C3	C6C3924736	9/24/97	Column 6, Row C, Depth 2-3 ft.		Site Characterization / Final Confirmation (Fixed)
7A1	None	9/24/97	Column 7, Row A, Depth 0-1 ft.		Site Characterization
7A2	None	9/24/97	Column 7, Row A, Depth 1-2 ft.		Site Characterization
7A3	C7A3924781	9/24/97	Column 7, Row A, Depth 2-3 ft.		Site Characterization / Final Confirmation
7B1	None	9/24/97	Column 7, Row B, Depth 0-1 ft.		Site Characterization
7B2	None	9/24/97	Column 7, Row B, Depth 1-2 ft.	LD1	Site Characterization
7B2A	None	9/24/97	Column 7, Row B, Depth 1- 2 ft.	LD2	Site Characterization
7B3	C7B3924763	9/24/97	Column 7, Row B, Depth 2-3 ft.		Site Characterization / Final Confirmation
7C1	None	9/24/97	Column 7, Row C, Depth 0-1 ft.	FD1	Site Characterization
7C1	None	9/24/97	Column 7, Row C, Depth 0-1 ft.	FD2	Site Characterization
7C2	C7C2924727	9/24/97	Column 7, Row C, Depth 1-2 ft.	LD1	Site Characterization
7C2A	None	9/24/97	Column 7, Row C, Depth 1-2 ft.	LD2	Site Characterization
7C3	C7C3924729	9/24/97	Column 7, Row C, Depth 2-3 ft.	FD1	Site Characterization / Final Confirmation (Fixed)
7C3	C7C3924729	9/24/97	Column 7, Row C, Depth 2-3 ft.	FD2	Site Characterization
8A1	None	9/24/97	Column 8, Row A, Depth 0-1 ft.		Site Characterization
8A2	None	9/24/97	Column 8, Row A, Depth 1-2 ft.		Site Characterization
8A5	C8A5924777	9/24/97	Column 8, Row A Depth 4-5 ft.		Site Characterization / Final Confirmation
8B1	None	9/24/97	Column 8, Row B, Depth 0-1 ft.		Site Characterization
8B2	None	9/24/97	Column 8, Row B, Depth 1-2 ft.		Site Characterization
8B3	None	9/24/97	Column 8, Row B, Depth 2-3 ft.		Site Characterization
8B4	C8B4924749	9/24/97	Column 8, Row B, Depth 3-4 ft.		Site Characterization
8B5	C8B5924750	9/24/97	Column 8, Row B, Depth 4-5 ft.		Site Characterization / Final Confirmation (Fixed)
8B6	None	9/24/97	Column 8, Row B, Depth 5-6 ft.		Site Characterization
8C1	None	9/24/97	Column 8, Row C, Depth 0-1 ft.		Site Characterization
8C2	None	9/24/97	Column 8, Row C, Depth 1-2 ft.	LD1	Site Characterization
8C2A	None	9/24/97	Column 8, Row C, Depth 1-2 ft.	LD2	Site Characterization
8C5	C8C5924723	9/24/97	Column 8, Row C, Depth 4-5 ft.		Site Characterization / Final Confirmation
9A1	None	9/24/97	Column 9, Row A, Depth 0-1 ft.		Site Characterization
9A2	C9A292472	9/24/97	Column 9, Row A, Depth 1-2 ft.		Site Characterization

TABLE A-1. Master List of Sample Identification Numbers for IAA

Fixed Lab Sample ID	Corresponding Fixed Lab Sample ID	Sample Collection Date	Sample Location	QC Class **	Sample Type
9A3	C9A392473	9/24/97	Column 9, Row A, Depth 2-3 ft.		Site Characterization / Final Confirmation (Fixed)
9B1	None	9/24/97	Column 9, Row B Depth 0-1 ft.		Site Characterization
9B2	None	9/24/97	Column 9, Row B, Depth 1-2 ft.		Site Characterization
9B3	C9B392479	9/24/97	Column 9, Row B, Depth 2-3 ft.		Site Characterization / Final Confirmation (Fixed)
9C1	None	9/24/97	Column 9, Row C, Depth 0-1 ft.		Site Characterization
9C2	None	9/24/97	Column 9, Row C, Depth 1-2 ft.	LD1	Site Characterization
9C2A	N/A	9/24/97	Column 9, Row C, Depth 1-2 ft.	LD2	Site Characterization
9C3	C9C3924715	9/24/97	Column 9, Row C, Depth 2-3 ft.		Site Characterization / Final Confirmation
CX1A1	None	10/13/97	See Table 7		Site Characterization
CX9A1	None	10/13/97	See Table 7		Site Characterization
FC8A-A	None	10/13/97	Column 8, Row A	LD2	Final Confirmation
FC8B	None	10/13/97	Column 8, Row B		Final Confirmation (IAA)
FC8C	None	10/13/97	Column 8, Row C		Final Confirmation (IAA)
FC9A	None	10/13/97	Column 9, Row A		Final Confirmation
FC9C	None	10/13/97	Column 9, Row C		Final Confirmation
FC1B	None	10/23/97	Column 1, Row B		Final Confirmation (IAA)
FC1C	None	10/23/97	Column 1, Row C		Final Confirmation (IAA)
FC6A	None	10/23/97	Column 6, Row A		Final Confirmation (IAA)
FC6B	None	10/23/97	Column 6, Row B	LD1	Final Confirmation (IAA)
FC6B-A	None	10/23/97	Column 6, Row B	LD2	Final Confirmation (IAA)
FC7B	None	10/23/97	Column 7, Row B		Final Confirmation (IAA)
FC7C	None	10/23/97	Column 7, Row C		Final Confirmation (IAA)
FC9A	None	10/23/97	Column 9, Row A		Final Confirmation
SW1	None	10/23/97	Sidewall 9A North 1-2		Side Wall Confirmation
SW5	None	10/23/97	Sidewall 9A East 1-2		Side Wall Confirmation
SW6	None	10/23/97	Sidewall 9B East 0-1		Side Wall Confirmation
SW7	None	10/23/97	Sidewall 9C East 0-1		Side Wall Confirmation
2A	None	10/24/97	Column 2, Row A		Final Confirmation (IAA)
2B	None	10/24/97	Column 2, Row B		Final Confirmation (IAA)
2C	None	10/24/97	Column 2, Row C		Final Confirmation (IAA)
3A	None	10/24/97	Column 3, Row A	LD1	Final Confirmation (IAA)
3A-A	None	10/24/97	Column 3, Row A	LD2	Final Confirmation (LD)
3B	None	10/24/97	Column 3, Row B		Final Confirmation (IAA)
3C	None	10/24/97	Column 3, Row C		Final Confirmation (IAA)
4A	None	10/24/97	Column 4, Row A		Confirmation
4A1024	None	10/24/97	Grid 4A		Confirmation
4B	None	10/24/97	Column 4, Row B		Confirmation
4B1024	None	10/24/97	Grid 4A		Confirmation
4C	None	10/24/97	Column 4, Row C		Confirmation (IAA)
4C1024	None	10/24/97	Grid 4A	LD1	Confirmation
4C1029	None	10/24/97	Grid 4A	LD2	Confirmation
6A924	None	10/24/97	Grid 6A	LD1	
6A924-A	None	10/24/97	Grid 6A	LD2	
FC5A	None	10/24/97	Column 5, Row A		Final Confirmation (IAA)
FC5B	None	10/24/97	Column 5, Row B		Final Confirmation (IAA)

TABLE A-1. Master List of Sample Identification Numbers for IAA

Fixed Lab Sample ID	Corresponding Fixed Lab Sample ID	Sample Collection Date	Sample Location	QC Class **	Sample Type
SW10	None	10/24/97	Sidewall 7C South 1-2		Side Wall Confirmation
SW11	None	10/24/97	Sidewall 5C South 0-1	LD1/FD1	Side Wall Confirmation
SW11-A	None	10/24/97	Sidewall 5C South 0-1	LD2	Side Wall Confirmation
SW12	None	10/24/97	Sidewall 4C South 0-1 ft.		Side Wall Confirmation
SW13	None	10/24/97	Sidewall 3C South 0-1 ft.		Side Wall Confirmation
SW14	None	10/24/97	Sidewall 3A North 2-3 ft.	FD2	Side Wall Confirmation
SW15	None	10/24/97	Sidewall 1A North 0-1 ft.		Side Wall Confirmation
SW16	None	10/24/97	Sidewall 2A North 0-1 ft.		Side Wall Confirmation
SW17	None	10/24/97	Sidewall 3A North 2-3 ft.	FD1	Side Wall Confirmation
SW18	None	10/24/97	Sidewall 4A North 0-1 ft.		Side Wall Confirmation
SW19	None	10/24/97	Sidewall 5A North 0-1 ft.		Side Wall Confirmation
SW191024	None	10/24/97	Sidewall 5A North 0-1 ft.	Rerun of SW19	Side Wall Confirmation
SW2	None	10/24/97	Sidewall 8A North 0-1		Side Wall Confirmation
SW20	None	10/24/97	Sidewall 9A North 0-1		Side Wall Confirmation
SW21	None	10/24/97	Sidewall 1B West 0-1 ft.		Side Wall Confirmation
SW211024	None	10/24/97	Sidewall 1B West 0-1 ft.	Rerun of SW21	Side Wall Confirmation
SW22	None	10/24/97	Sidewall 6C South 1-2		Side Wall Confirmation
SW3	None	10/24/97	Sidewall 7A North 0-1		Side Wall Confirmation
SW4	None	10/24/97	Sidewall 6A North 1-2		Side Wall Confirmation
SW8	None	10/24/97	Sidewall 5C South 0-1	FD2	Side Wall Confirmation
SW9	None	10/24/97	Sidewall 8C South 0-1		Side Wall Confirmation
FC4A1	None	11/3/97	Column 4, Row A, Depth 0-1 ft.		Final Confirmation (IAA)
FC4A3	None	11/3/97	Column 4, Row A, Depth 2-3 ft.	FD1	Confirmation
FC4A3	None	11/3/97	Column 4, Row A, Depth 2-3 ft.	FD1 rerun	Final Confirmation (IAA)
FC4A3-2	None	11/3/97	Column 4, Row A, Depth 2-3 ft.	FD2	Confirmation
FC4A3-2	None	11/3/97	Column 4, Row A, Depth 2-3 ft.	FD2 rerun	Final Confirmation (Dup)
FC4C3	None	11/3/97	Column 4, Row C, Depth 2-3 ft.		Final Confirmation (IAA)
SW53	None	11/3/97	Blind duplicate of SW7AN from Corps.	FD2	Side Wall Confirmation
SW6AN	None	11/3/97	Column 6, Row A, North Side		Side Wall Final Confirmation (IAA)
SW9AE	None	11/3/97	Column 9, Row A, East Side		Side Wall Final Confirmation (IAA)
SW9CE	None	11/3/97	Column 9, Row C, East Side		Side Wall Final Confirmation (IAA)
FC1A (10/23)*	FC1A1N04711	11/4/97	Column 1, Row A		Final Confirmation (IAA and Fixed)
FC4B1 (11/3)*	FC4B1N0477	11/4/97	Column 4, Row B, Depth 0-1 ft.		Final Confirmation (IAA)
FC5C (10/24)*	FC5C4N0476	11/4/97	Column 5, Row C		Final Confirmation (IAA and Fixed)
FC6C2	FC6C2N0475	11/4/97	Column 6, Row C		Final Confirmation (IAA and Fixed)
FC7A2	FC7A2N0473	11/4/97	Column 7, Row A	FD1	Final Confirmation (IAA and Fixed)
FC8A (10/13)*	FC8A4N0472	11/4/97	Column 8, Row A	LD1	Final Confirmation (IAA and Fixed)
FC9B (10/13)*	FC9B2N0471	11/4/97	Column 9, Row B		Final Confirmation
SW1AW	SW1AWN04715	11/4/97	Column 1, Row A, West Side		Side Wall Confirmation

TABLE A-1. Master List of Sample Identification Numbers for IAA

Fixed Lab Sample ID	Corresponding Fixed Lab Sample ID	Sample Collection Date	Sample Location	QC Class **	Sample Type
SW1BW	SW1BWN04716	11/4/97	Column 1, Row B, West Side		Side Wall Confirmation
SW5AN	SW5AN04717	11/4/97	Column 5, Row A, North Side		Side Wall Final Confirmation (IAA and Fixed)
SW7AN (11/3)*	SW7AN04718	11/4/97	Column 7, Row A, North Side	FD1	Side Wall Confirmation
SW8AN (11/3)*	SW8AN04719	11/4/97	Column 8, Row A, North Side		Side Wall Confirmation
FC2-4B3	FC2-4B3N1771	11/17/97	Column 4, Row B		Final Confirmation (IAA)
FC2-9A2.5	None	11/17/97	Column 9, Row A, Depth 2.5 ft.		Final Confirmation (IAA)
FC2-9B2.5	FC2-9B2.5N1773	11/17/97	Column 9, Row B, Depth 2.5 ft.	FD1	Final Confirmation (IAA and Fixed)
FC2-9B2.5-2	FC2-9B2.5N1775	11/17/97	Column 9, Row B, Depth 2.5 ft.	FD2	Final Confirmation (Dup)
FC2-9C2.5	None	11/17/97	Column 9, Row C, Depth 2.5 ft.		Final Confirmation (IAA)
FC2-SW1AW	FC2SW-1AWN177	11/17/97	Column 1, Row A, West Side		Final Confirmation (IAA and Fixed)
FC2-SW1BW	None	11/17/97	Column 1, Row B, West Side		Final Confirmation (IAA)
FC2-SW7AN	None	11/17/97	Column 7, Row A, North Side		Confirmation
FC2-SW8AN	None	11/17/97	Column 8, Row A, North Side		Confirmation
FC3-SW7A	FC3SW-7ANN177	11/17/97	Column 7, Row A, North Side		Final Confirmation (IAA and Fixed)
FC3-SW8A	FC3SW-8ANN177	11/17/97	Column 8, Row A, North Side		Final Confirmation (IAA)
FC3-SW8A-DEEP	None	11/17/97	Column 8, Row A, North Side (12"-15" into sidewall)		Confirmation

* The values in parenthesis are the collection date for the field laboratory sample and were not part of the field laboratory ID These samples correlate to the fixed lab sample since no remedial activity occurred at the samples location between the collection dates of these two samples.

** QC Class Key

LD1 - Primary sample upon which a laboratory duplicate was analyzed
LD2 - Laboratory duplicate sample
FD1 - Primary sample associated with a field duplicate sample
FD2 - Field duplicate sample

TABLE A-2. Master List of Sample Identification Numbers for Fixed Lab Results

Fixed Lab Sample ID	Sample Collection Date	Sample Location	Sample Type	Analytical Data Location
FR10B923710	9/23/97	NA	Performance Evaluation	Appendix B
FR10C92379	9/23/97	NA	Performance Evaluation	Appendix B
FR23A92375	9/23/97	Border of Column 2 and 3, Row A	Focused Removal Confirmation	Appendix B
FR23B92377	9/23/97	Border of Column 2 and 3, Row B	Focused Removal Confirmation	Appendix B
FR23C92378	9/23/97	Border of Column 4 and 5, Row C	Focused Removal Confirmation	Appendix B
FR45A92374	9/23/97	Border of Column 4 and 5, Row A	Focused Removal Confirmation	Appendix B
FR45B92372	9/23/97	Border of Column 4 and 5, Row B	Focused Removal Confirmation	Appendix B
FR45B92373	9/23/97	Border of Column 4 and 5, Row B	Focused Removal Confirmation	Appendix B
FR45C92371	9/23/97	Border of Column 4 and 5, Row C	Focused Removal Confirmation	Appendix B
FREB923711	9/23/97	NA	Equipment Blank	Appendix B
W1092377	9/23/97	NA	Performance Evaluation	Appendix D
W1092378	9/23/97	NA	Performance Evaluation	Appendix D
W192373	9/23/97	See Table 17	Waste Characterization	Appendix D
W192374	9/23/97	See Table 17	Waste Characterization	Appendix D
W392371	9/23/97	See Table 17	Waste Characterization	Appendix D
W492375	9/23/97	See Table 17	Waste Characterization	Appendix D
W692372	9/23/97	See Table 17	Waste Characterization	Appendix D
WCANS92376	9/23/97	See Table 17	Waste Characterization	Appendix D
C1010371	9/24/97	NA	Performance Evaluation	Appendix E
C1010372	9/24/97	NA	Performance Evaluation	Appendix E
C1A1924145	9/24/97	Column 1, Row A, Depth 0-1 ft.	Site Characterization	Appendix E
C1A2924146	9/24/97	Column 1, Row A Depth 1-2 ft.	Site Characterization	Appendix E
C1B2924158	9/24/97	Column 1, Row B, Depth 1-2 ft.	Site Characterization	Appendix E
C1C2924172	9/24/97	Column 1, Row C, Depth 1-2 ft.	Site Characterization	Appendix E
C2A1924139	9/24/97	Column 2, Row A, Depth 0-1 ft.	Site Characterization	Appendix E
C2A2924140	9/24/97	Column 2, Row A, Depth 0-2 ft.	Site Characterization	Appendix E
C2B2924152	9/24/97	Column 2, Row B, Depth 1-2 ft.	Site Characterization	Appendix E
C2C2924165	9/24/97	Column 2, Row C, Depth 1-2 ft.	Site Characterization	Appendix E
C2C2924166	9/24/97	Column 2, Row C, Depth 1-2 ft.	Site Characterization	Appendix E
C3A4924136	9/24/97	Column 2, Row A, Depth 3-4 ft.	Site Characterization	Appendix E
C3B4924115	9/24/97	Column 3, Row B, Depth 3-4 ft.	Site Characterization	Appendix E
C3B5924116	9/24/97	Column 3, Row B, Depth 4-5 ft.	Site Characterization	Appendix E
C3C5924110	9/24/97	Column 3, Row C, Depth 4-5 ft.	Site Characterization	Appendix E
C3C6924111	9/24/97	Column 3, Row C, Depth 5-6 ft.	Site Characterization	Appendix E
C4A2924126	9/24/97	Column 4, Row A, Depth 1-2 ft.	Site Characterization	Appendix E
C4A2924127	9/24/97	Column 4, Row A, Depth 1-2 ft.	Site Characterization	Appendix E
C4B1924118	9/24/97	Column 4, Row B, Depth 0-1 ft.	Site Characterization	Appendix E
C4B2924119	9/24/97	Column 4, Row B, Depth 1-2 ft.	Site Characterization	Appendix E
C4C2924101	9/24/97	Column 4, Row C, Depth 1-2 ft.	Site Characterization	Appendix E
C5A6924799	9/24/97	Column 5, Row A, Depth5- 6 ft.	Site Characterization	Appendix E
C5B6924772	9/24/97	Column 5, Row B, Depth 5-6 ft.	Site Characterization	Appendix E
C5C4924743	9/24/97	Column 5, Row C, Depth 3-4 ft.	Site Characterization	Appendix E
C5C5924744	9/24/97	Column 5, Row C, Depth 4-5 ft.	Site Characterization	Appendix E
C5C6924745	9/24/97	Column 5, Row C, Depth 5-6 ft.	Site Characterization	Appendix E
C6A3924787	9/24/97	Column 6, Row A, Depth 2-3 ft.	Site Characterization	Appendix E
C6B2924754	9/24/97	Column 6, Row B, Depth 1-2 ft.	Site Characterization	Appendix E
C6B2924755	9/24/97	Column 6, Row B, Depth 1-2 ft.	Site Characterization	Appendix E

TABLE A-2. Master List of Sample Identification Numbers for Fixed Lab Results

Fixed Lab Sample ID	Sample Collection Date	Sample Location	Sample Type	Analytical Data Location
C6B3924756	9/24/97	Column 6, Row B, Depth 2-3 ft.	Site Characterization	Appendix E
C6B3924757	9/24/97	Column 6, Row B, Depth2-3 ft.	Site Characterization	Appendix E
C6C3924736	9/24/97	Column 6, Row C, Depth 2-3 ft.	Site Characterization	Appendix E
C7A3924781	9/24/97	Column 7, Row A, Depth 2-3 ft.	Site Characterization	Appendix E
C7B3924763	9/24/97	Column 7, Row B, Depth 2-3 ft.	Site Characterization	Appendix E
C7C2924727	9/24/97	Column 7, Row C, Depth 1-2 ft.	Site Characterization	Appendix E
C7C3924729	9/24/97	Column 7, Row C, Depth 2-3 ft.	Site Characterization	Appendix E
C8A5924777	9/24/97	Column 8, Row A, Depth 4-5 ft.	Site Characterization	Appendix E
C8B4924749	9/24/97	Column 8, Row B, Depth 3-4 ft.	Site Characterization	Appendix E
C8B5924750	9/24/97	Column 8, Row B, Depth 4-5 ft.	Site Characterization	Appendix E
C8C5924723	9/24/97	Column 8, Row C, Depth 4-5 ft.	Site Characterization	Appendix E
C9A292472	9/24/97	Column 9, Row A, Depth 1-2 ft.	Site Characterization	Appendix E
C9A392473	9/24/97	Column 9, Row A, Depth 2-3 ft.	Site Characterization	Appendix E
C9B392479	9/24/97	Column 9, Row B, Depth 2-3 ft.	Site Characterization	Appendix E
C9C3924715	9/24/97	Column 9, Row C, Depth 2-3 ft.	Site Characterization	Appendix E
W02O1474	10/14/97	See Table 17	Waste Characterization	Appendix D
W09O1471	10/14/97	See Table 17	Waste Characterization	Appendix D
W09O1472	10/14/97	See Table 17	Waste Characterization	Appendix D
WAO2471	10/23/97	See Table 17	Waste Characterization	Appendix D
WBO2472	10/24/97	See Table 17	Waste Characterization	Appendix D
WCO2473	10/24/97	See Table 17	Waste Characterization	Appendix D
WDO2474	10/24/97	See Table 17	Waste Characterization	Appendix D
WEO2475	10/24/97	See Table 17	Waste Characterization	Appendix D
WFO2476	10/24/97	See Table 17	Waste Characterization	Appendix D
FC10A1N04712	11/4/97	NA	Performance Evaluation	Appendix E
FC10B1N04713	11/4/97	NA	Performance Evaluation	Appendix E
FC1A1N04711	11/4/97	Column 1, Row A, Depth 1 ft.	Final Confirmation	Appendix E
FC2A2N04710	11/4/97	Column 2, Row A, Depth 2 ft.	Final Confirmation	Appendix E
FC3A5N0479	11/4/97	Column 3, Row A, Depth 5 ft.	Final Confirmation	Appendix E
FC4B1N0477	11/4/97	Column 4, Row B, Depth 1 ft.	Final Confirmation	Appendix E
FC4B3N0478	11/4/97	Column 4, Row B, Depth 3 ft.	Final Confirmation	Appendix E
FC5C4N0476	11/4/97	Column 5, Row C, Depth 2 ft.	Final Confirmation	Appendix E
FC6C2N0475	11/4/97	Column 6, Row C, Depth 2 ft.	Final Confirmation	Appendix E
FC7A2N0473	11/4/97	Column 7, row A, Depth 2 ft.	Final Confirmation	Appendix E
FC7A2N0474	11/4/97	Column 7, Row A, Depth 2 ft.	Final Confirmation	Appendix E
FC8A4N0472	11/4/97	Column 7, Row A, Depth 4 ft.	Final Confirmation	Appendix E
FC9B2N0471	11/4/97	Column 9, Row B, Depth 2 ft.	Final Confirmation	Appendix E
SW1AWN04715	11/4/97	Column 1, Row A, North Side	Side Wall	Appendix E
SW1BWN04716	11/4/97	Column 1, Row B, West Side	Side Wall	Appendix E
SW5ANN04717	11/4/97	Column 5, Row A, North Side	Side Wall	Appendix E
SW7ANN04718	11/4/97	Column 7, Row A, North Side	Side Wall	Appendix E
SW8ANN04719	11/4/97	Column 8, Row A, North Side	Side Wall	Appendix E
FC2-4B3N1771	11/17/97	Column 4, Row B, Depth 3 ft.	Final Confirmation	Appendix E
FC2-9B2.5N1773	11/17/97	Column 9, Row B, Depth 2 ft.	Final Confirmation	Appendix E
FC2-9B2.5N1775	11/17/97	Column 9, Row B, Depth 2 ft.	Final Confirmation	Appendix E
FC2SW-1AWN17710	11/17/97	Column 1, Row A, West Side	Side Wall	Appendix E
FC3SW-7ANN17711	11/17/97	Column 7, Row A, North Side	Side Wall	Appendix E

TABLE A-2. Master List of Sample Identification Numbers for Fixed Lab Results

Fixed Lab Sample ID	Sample Collection Date	Sample Location	Sample Type	Analytical Data Location
FC3SW-8ANN17712	11/17/97	Column 8, Row A, North Side	Side Wall	Appendix E
FC4-FR2BD103	12/10/97	Column 2, Row B	Final Confirmation	Appendix E
FC4-SW8AD101	12/10/97	Column 8, Row A	Side Wall	Appendix E

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Appendix B

Focused Removal Confirmation Sampling Analytical Results

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TABLE B-1. Focused Removal Confirmation Sampling Analytical Results

				Non-weighted Data Summaries (ppm)						Fixed Lab Data Totals (ppb)			
Fixed Lab Sample	Field Lab ID	Field Lab DDT	Field Lab Cyclodiene	DDD Family (ppm)	DDE Family (ppm)	DDT Family (ppm)	Endrin Family (ppm)	Endosulfan Family (ppm)	Fixed Lab OC Analysis dilution	Aldrin (ppb)	alpha BHC (ppb)	beta-BHC (ppb)	delta-BHC (ppb)
MTCA Cleanup Standard				4.17	2.94	2.94				58.8	159	556	556
Raw sensitivity/Sequencing #													
MDL									1	0.075	0.077	0.14	0.078
FR23B92377	23B7	216.85	0.07	0.047	0.029	0.151	0.001	0.000	1	ND	1.6	ND	ND
FR23A92375	23A5	37.35	0.03	0.019	0.789	0.560	0.004	0.000	1	ND	ND	ND	ND
FR23C92378	23C8	0.05	0.01	ND	0.018	0.016	0.001	0.000	1	ND	ND	ND	ND
FR10C92379	PE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FR45A92374	45A4	62.39	0.02	0.260	0.551	13.400	0.001	0.000	50	ND	ND	ND	ND
FR45B92372	45B2	290.72	0.03	0.430	2.450	24.400	0.001	0.000	50	ND	ND	ND	ND
FR45B92373	45B3	201.53	0.02	1.700	10.300	128.000	0.001	0.000	200	ND	ND	ND	ND
FR45C92371	45C1	0.15	0.0	0.004	0.049	0.154	0.001	0.000	1	ND	ND	ND	ND
FR10B923710	PE	NA	NA	4.500	3.600	4.355	0.470	0.000	20	ND	ND	ND	ND
FREB923711	EB	NA	NA	ND	ND	ND	ND	ND	1	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected
PE = Performance Evaluation
EB = Equipment Blank

TABLE B-1. Focused Removal Confirmation Sampling Analytical Results

Fixed Lab Sample	Lindane (ppb)	Chlordane (ppb)	4,4'DDD (ppb)	4,4'DDE (ppb)	4,4'DDT (ppb)	2,4'DDD (ppb)	2,4'DDE (ppb)	2,4'DDT (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)
MTCA Cleanup Standard	769	769							62.5	480000	480000	480000
Raw sensitivity/Sequencing MDL	0.17	2.5	0.17	3.6	13	1.5	1.5	1.5	0.071	0.32	0.17	0.24
FR23B92377	2.5	ND	6.1	28	130	41	ND	21	30	ND	ND	ND
FR23A92375	ND	ND	11	770	420	8.1	19	140	42	ND	ND	ND
FR23C92378	ND	ND	ND	17	8.2	ND	ND	ND	19	ND	ND	ND
FR10C92379	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FR45A92374	ND	ND	260	550	11000	ND	ND	2400	ND	ND	ND	ND
FR45B92372	ND	ND	430	1600	20000	ND	850	4400	ND	ND	ND	ND
FR45B92373	ND	ND	1700	6700	110000	ND	3600	18000	ND	ND	ND	ND
FR45C92371	ND	ND	3.7	36	110	ND	13	44	ND	ND	ND	ND
FR10B923710	ND	ND	4500	3600	4300	ND	ND	120	69	ND	ND	ND
FREB923711	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected
PE = Performance Evaluatio
EB = Equipment Blank

TABLE B-1. Focused Removal Confirmation Sampling Analytical Results

								Fixed Lab Data (ppb)			
Fixed Lab Sample	Endrin (ppb)	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)	Toxaphene (ppb)	Fixed Lab OP analysis dilution	Dichlorvos (ppb)	Dimethoate (ppb)	Diazinon (ppb)	Disulfoton (ppb)
MTCA Cleanup Standard	24000	24000	222	110	40000	909		3440	16000	72000	3200
Raw sensitivity/Sequencing											
MDL	0.12	0.89	0.1	0.17	2.2	44		8.5	5.2	7.4	4.4
FR23B92377	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR23A92375	3.6	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR23C92378	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR10C92379	NA	NA	NA	NA	NA	NA	20	ND	6600	ND	2800
FR45A92374	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR45B92372	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR45B92373	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR45C92371	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND
FR10B923710	470	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA
FREB923711	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected
PE = Performance Evaluatio
EB = Equipment Blank

TABLE B-1. Focused Removal Confirmation Sampling Analytical Results

Fixed Lab Sample	Parathion, methyl (ppb)	Malathion (ppb)	Parathion (ppb)	Azinphos, methyl (ppb)	Ethion (ppb)	Paraoxon, methyl (ppb)	Paraoxon, ethyl (ppb)
MTCA Cleanup Standard	20000	1600000	480000	3200	40000	20000	480000
Raw sensitivity/Sequencing							
MDL	7.5	6.3	11	6.2	4.4	4.4	4.4
FR23B92377	ND	ND	770000	ND	ND	ND	ND
FR23A92375	ND	ND	410	ND	ND	ND	ND
FR23C92378	ND	ND	170	ND	ND	ND	ND
FR10C92379	ND	ND	360000	2800	ND	ND	ND
FR45A92374	ND	ND	ND	ND	ND	ND	ND
FR45B92372	ND	ND	ND	ND	ND	ND	ND
FR45B92373	ND	ND	ND	ND	ND	ND	ND
FR45C92371	ND	ND	ND	ND	ND	ND	ND
FR10B923710	NA	NA	NA	NA	NA	NA	NA
FREB923711	ND	ND	ND	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected
PE = Performance Evaluatio
EB = Equipment Blank

Appendix C

Site Characterization Sampling Analytical Results

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TABLE C-1. Site Characterization Analytical Results

				Non-weighted Data Summaries (ppm)				
Fixed Lab Sample	Field Lab ID	Field Lab DDT	Field Lab Cyclodiene	DDD Family (ppm)	DDE Family (ppm)	DDT Family (ppm)	Endrin Family (ppm)	Endosulfan Family (ppm)
MTCA Cleanup Standard				4.17	2.94	2.94		
Raw sensitivity/Sequencing #								
MDL								
C1A1924145	1A1	19.8	0.80	0.058	4.366	2.490	0.015	0.000
C1A2924146	1A2	0.1	0.02	0.001	0.264	0.084	0.001	0.000
C1B2924158	1B2	0.1	0.01	0.001	0.071	0.012	0.001	0.000
C1C2924172	1C2	0.1	0.01	0.001	0.099	0.015	0.004	0.000
C2A1924139	2A1	19.8	0.39	0.070	5.065	3.380	0.048	0.000
C2A2924140	2A2	0.9	0.06	0.001	0.323	0.073	0.001	0.000
C2B2924152	2B2	0.4	0.01	0.001	0.303	0.081	0.001	0.000
C2C2924165	2C2	0.1	0.01	0.001	0.101	0.017	0.001	0.000
C2C2924166	2C2	0.1	0.00	0.001	0.095	0.015	0.001	0.000
C3A4924136	3A4	0.2	1.73	0.001	0.461	0.188	2.750	0.000
C3B4924115	3B4	0.6	1.67	0.001	0.151	0.428	4.500	0.000
C3B5924116	3B5	0.1	1.14	0.001	0.008	0.012	0.326	0.003
C3C5924110	3C5	0.1	1.22	0.024	0.009	0.015	1.650	0.120
C3C6924111	3C6	0.1	0.50	0.004	0.006	0.005	0.109	0.026
C4A2924126	4A2	0.4	0.05	0.004	0.195	0.185	0.001	0.000
C4B1924118	4B1	0.6	0.89	0.042	0.726	2.910	0.044	0.000
C4B2924119	4B2	0.2	0.05	0.001	0.031	0.033	0.001	0.000
C4C2924101	4C2	0.3	0.03	0.003	0.283	0.051	0.004	0.000
C4A2924127	4A2	0.5	0.04	0.005	0.205	0.191	0.001	0.000
C5A6924799	5A6	NA	NA	0.002	0.004	0.035	0.001	0.000
C5B6924772	5B6	NA	NA	0.001	0.006	0.013	0.001	0.000
C5C4924743	5C4	11.2	0.99	0.148	0.480	1.200	0.191	0.015
C5C5924744	5C5	0.3	0.10	0.008	0.027	0.065	0.008	0.010
C5C6924745	5C6	0.6	0.89	0.008	0.197	0.307	0.008	1.300
C6A3924787	6A3	0.3	0.01	0.004	0.032	0.154	0.001	0.000
C6B2924754	6B2	22.4	1.19	0.076	2.173	2.940	0.032	0.610
C6B3924756	6B3	0.9	0.05	0.007	1.711	0.202	0.001	0.007
C6C3924736	6C3	0.1	0.01	0.001	0.007	0.011	0.001	0.000
C6B2924755 (Field Dup)	6B2B	24.6	1.10	0.116	2.542	3.620	0.031	0.640
C6B3924757 (Field Dup)	6B3B	0.8	0.05	0.007	0.223	0.305	0.001	0.011
C7A3924781	7A3	NA	NA	0.001	0.059	0.072	0.001	0.000
C7B3924763	7B3	NA	NA	0.001	0.007	0.011	0.001	0.000
C7C2924727	7C2	1.0	0.46	1.201	1.201	0.820	0.001	0.500
C7C3924729	7C3	0.2	0.01	0.039	0.044	0.027	0.001	0.000
C8A5924777	8A5	NA	NA	0.001	0.004	0.014	0.001	0.000
C8B4924749	8B4	18.2	0.02	0.229	0.503	7.400	0.010	0.000
C8B5924750	8B5	0.1	0.00	0.001	0.003	0.013	0.001	0.000
C8C5924723	8C5	NA	NA	0.001	0.004	0.010	0.001	0.000
C9A292472	9A2	30.8	0.06	0.111	5.620	3.960	0.035	0.000
C9A392473	9A3	0.3	0.01	0.001	0.088	0.014	0.001	0.000
C9B392479	9B3	0.1	0.01	0.002	0.019	0.018	0.001	0.000
C9C3924715	9C3	NA	NA	0.028	0.556	1.620	0.001	0.000

TABLE C-1. Site Characterization Analytical Results

		Fixed Lab Data Totals (ppb)						
Fixed Lab Sample	Fixed Lab OC Analysis dilution	Aldrin (ppb)	alpha BHC (ppb)	beta-BHC (ppb)	delta-BHC (ppb)	Lindane (ppb)	Chlordane (ppb)	4,4'DDD (ppb)
MTCA Cleanup Standard		58.8	159	556	556	769	769	----------
Raw sensitivity/Sequencing								
MDL	1	0.075	0.077	0.14	0.078	0.17	2.5	0.17
C1A1924145	1	ND	ND	ND	ND	ND	ND	21
C1A2924146	1	ND	ND	ND	ND	ND	ND	ND
C1B2924158	1	ND	ND	ND	ND	ND	ND	ND
C1C2924172	1	ND	ND	ND	ND	ND	ND	ND
C2A1924139	1	ND	ND	ND	ND	ND	ND	24
C2A2924140	1	ND	ND	ND	ND	ND	ND	ND
C2B2924152	1	ND	ND	ND	ND	ND	ND	ND
C2C2924165	1	ND	ND	ND	ND	ND	ND	ND
C2C2924166	1	ND	ND	ND	ND	ND	ND	ND
C3A4924136	1	310	ND	ND	ND	ND	ND	ND
C3B4924115	1000	610	ND	ND	ND	ND	ND	ND
C3B5924116	1	15	ND	ND	ND	ND	ND	ND
C3C5924110	1	ND	ND	ND	ND	ND	ND	ND
C3C6924111	1	ND	ND	ND	ND	ND	ND	ND
C4A2924126	1	ND	ND	ND	ND	ND	ND	3.4
C4B1924118	1	ND	0.84	ND	ND	ND	ND	22
C4B2924119	1	ND	ND	ND	ND	ND	ND	ND
C4C2924101	1	ND	ND	ND	ND	ND	ND	2
C4A2924127	1	ND	ND	ND	ND	ND	ND	3.9
C5A6924799	1	ND	ND	ND	ND	ND	ND	1.6
C5B6924772	1	ND	ND	ND	ND	ND	ND	ND
C5C4924743	1	ND	ND	ND	ND	ND	ND	79
C5C5924744	1	ND	ND	ND	ND	ND	ND	3
C5C6924745	1	ND	ND	ND	ND	ND	ND	5.1
C6A3924787	1	ND	ND	ND	ND	ND	ND	3.3
C6B2924754	1	ND	ND	ND	ND	ND	ND	34
C6B3924756	1	ND	ND	ND	ND	ND	ND	ND
C6C3924736	1	ND	ND	ND	ND	ND	ND	ND
C6B2924755 (Field Dup)	1	ND	ND	ND	ND	ND	ND	36
C6B3924757 (Field Dup)	1	ND	ND	ND	ND	ND	ND	ND
C7A3924781	1	ND	ND	ND	ND	ND	ND	ND
C7B3924763	1	ND	ND	ND	ND	ND	ND	ND
C7C2924727	50	ND	ND	ND	ND	ND	ND	1200
C7C3924729	1	ND	ND	ND	ND	ND	ND	38
C8A5924777	1	ND	ND	ND	ND	ND	ND	ND
C8B4924749	1	ND	ND	ND	ND	ND	ND	170
C8B5924750	1	ND	ND	ND	ND	ND	ND	ND
C8C5924723	1	ND	ND	ND	ND	ND	ND	ND
C9A292472	1	ND	ND	ND	ND	ND	ND	28
C9A392473	1	ND	ND	ND	ND	ND	ND	ND
C9B392479	1	ND	ND	ND	ND	ND	ND	ND
C9C3924715	1	ND	2	ND	ND	ND	ND	17

TABLE C-1. Site Characterization Analytical Results

Fixed Lab Sample	4,4'DDE (ppb)	4,4'DDT (ppb)	2,4'DDD (ppb)	2,4'DDE (ppb)	2,4'DDT (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)
MTCA Cleanup Standard	----------	----------	----------	----------	----------	62.5	480000	480000
Raw sensitivity/Sequencing								
MDL	3.6	13	1.5	1.5	1.5	0.071	0.32	0.17
C1A1924145	4300	1900	37	66	590	43	ND	18
C1A2924146	260	60	ND	3.6	24	ND	ND	ND
C1B2924158	70	9.6	ND	ND	2.3	2.2	ND	ND
C1C2924172	98	9.7	ND	ND	4.9	3.8	ND	ND
C2A1924139	5000	2600	46	65	780	130	ND	ND
C2A2924140	320	56	ND	2.5	17	74	ND	ND
C2B2924152	300	61	ND	2.8	20	3.3	ND	ND
C2C2924165	100	11	ND	ND	6	2	ND	ND
C2C2924166	94	9.3	ND	ND	5.7	ND	ND	ND
C3A4924136	460	180	ND	ND	7.5	5000	ND	200
C3B4924115	150	420	ND	ND	7.5	5200	ND	340
C3B5924116	7.1	4.3	ND	ND	7.5	1100	3.2	15
C3C5924110	4.1	4.8	24	4.5	10	38	ND	5.7
C3C6924111	5.1	2	3.7	ND	3.2	9.1	ND	5.8
C4A2924126	190	150	ND	4.6	35	16	ND	ND
C4B1924118	710	2600	20	16	310	79	ND	ND
C4B2924119	30	24	ND	ND	9.3	2.9	ND	ND
C4C2924101	250	30	ND	33	21	22	ND	ND
C4A2924127	200	150	ND	5.4	41	18	ND	ND
C5A6924799	3.4	27	ND	ND	7.5	ND	ND	ND
C5B6924772	5	5.1	ND	ND	7.5	ND	ND	ND
C5C4924743	460	1000	69	20	200	34	15	99
C5C5924744	26	55	4.5	ND	10	ND	10	7.4
C5C6924745	170	250	2.9	27	57	62	1300	1400
C6A3924787	31	130	ND	ND	24	ND	ND	ND
C6B2924754	2100	2400	42	73	540	110	610	340
C6B3924756	1700	200	7.2	11	2.1	17	7.3	5
C6C3924736	ND	ND	ND	5.8	3.6	ND	ND	ND
C6B2924755 (Field Dup)	2500	2900	80	42	720	100	640	340
C6B3924757 (Field Dup)	210	250	6.8	13	55	ND	11	4.8
C7A3924781	57	54	ND	2.3	18	ND	ND	ND
C7B3924763	6.6	3.3	ND	ND	7.5	ND	ND	ND
C7C2924727	1200	630	ND	ND	190	240	500	450
C7C3924729	43	21	ND	ND	5.5	ND	ND	ND
C8A5924777	2.8	6.5	ND	ND	7.5	ND	ND	ND
C8B4924749	480	6100	59	23	1300	6.8	ND	12
C8B5924750	1.8	11	ND	ND	2.3	ND	ND	ND
C8C5924723	3.2	2.6	ND	ND	7.5	ND	ND	ND
C9A292472	5500	3000	83	120	960	27	ND	16
C9A392473	87	8.6	ND	ND	4.9	ND	ND	ND
C9B392479	17	15	2.2	2.1	2.7	ND	ND	ND
C9C3924715	540	1400	11	16	220	2.2	ND	3.8

TABLE C-1. Site Characterization Analytical Results

Fixed Lab Sample	Endosulfan Sulfate (ppb)	Endrin (ppb)	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)	Toxaphene (ppb)
MTCA Cleanup Standard	480000	24000	24000	222	110	40000	909
Raw sensitivity/Sequencing MDL	0.24	0.12	0.89	0.1	0.17	2.2	44
C1A1924145	ND	15	ND	ND	ND	36	ND
C1A2924146	ND	ND	ND	ND	ND	ND	ND
C1B2924158	ND	ND	ND	ND	ND	ND	ND
C1C2924172	ND	ND	4.1	ND	ND	ND	ND
C2A1924139	ND	30	18	ND	ND	38	ND
C2A2924140	ND	ND	ND	ND	ND	ND	ND
C2B2924152	ND	ND	ND	ND	ND	ND	ND
C2C2924165	ND	ND	ND	ND	ND	ND	ND
C2C2924166	ND	ND	ND	ND	ND	ND	ND
C3A4924136	ND	2100	650	ND	ND	ND	ND
C3B4924115	ND	3200	1300	ND	ND	ND	ND
C3B5924116	ND	290	36	5.4	ND	ND	ND
C3C5924110	120	1300	350	ND	ND	ND	ND
C3C6924111	26	100	9.3	ND	ND	ND	ND
C4A2924126	ND	ND	ND	ND	ND	ND	ND
C4B1924118	ND	26	18	ND	ND	ND	ND
C4B2924119	ND	ND	ND	ND	ND	ND	ND
C4C2924101	ND	3.5	ND	ND	ND	ND	ND
C4A2924127	ND	ND	ND	ND	ND	ND	ND
C5A6924799	ND	ND	ND	ND	ND	ND	ND
C5B6924772	ND	ND	ND	ND	ND	ND	ND
C5C4924743	ND	71	120	ND	ND	ND	4200
C5C5924744	ND	3.6	3.7	ND	ND	ND	ND
C5C6924745	ND	ND	7.7	ND	ND	ND	ND
C6A3924787	ND	ND	ND	ND	ND	ND	ND
C6B2924754	ND	11	21	ND	ND	ND	ND
C6B3924756	ND	ND	ND	ND	ND	ND	ND
C6C3924736	ND	ND	ND	ND	ND	ND	ND
C6B2924755 (Field Dup)	ND	11	20	ND	ND	ND	ND
C6B3924757 (Field Dup)	ND	ND	ND	ND	ND	ND	ND
C7A3924781	ND	ND	ND	ND	ND	ND	ND
C7B3924763	ND	ND	ND	ND	ND	ND	ND
C7C2924727	ND	ND	ND	ND	ND	ND	ND
C7C3924729	ND	ND	ND	ND	ND	ND	ND
C8A5924777	ND	ND	ND	ND	ND	ND	ND
C8B4924749	ND	7.3	2.6	2.5	ND	ND	ND
C8B5924750	ND	ND	ND	ND	ND	ND	ND
C8C5924723	ND	ND	ND	ND	ND	ND	ND
C9A292472	ND	21	14	0.05	0.085	44	ND
C9A392473	ND	ND	ND	ND	ND	ND	ND
C9B392479	ND	ND	ND	ND	ND	ND	ND
C9C3924715	ND	ND	ND	ND	ND	19	ND

TABLE C-1. Site Characterization Analytical Results

		Fixed Lab Data (ppb)					
Fixed Lab Sample	Fixed Lab OP analysis dilution	Dichlorvos (ppb)	Dimethoate (ppb)	Diazinon (ppb)	Disulfoton (ppb)	Parathion, methyl (ppb)	Malathion (ppb)
MTCA Cleanup Standard		3440	16000	72000	3200	20000	1600000
Raw sensitivity/Sequencing							
MDL		8.5	5.2	7.4	4.4	7.5	6.3
C1A1924145	NA	ND	ND	ND	ND	ND	ND
C1A2924146	NA	ND	ND	ND	ND	ND	ND
C1B2924158	NA	ND	ND	ND	ND	ND	ND
C1C2924172	NA	ND	ND	ND	ND	ND	ND
C2A1924139	10	ND	ND	ND	ND	ND	ND
C2A2924140	10	ND	ND	ND	ND	ND	ND
C2B2924152	10	ND	ND	ND	ND	ND	ND
C2C2924165	10	ND	ND	ND	ND	ND	ND
C2C2924166	10	ND	ND	ND	ND	ND	ND
C3A4924136	10	ND	ND	ND	ND	ND	ND
C3B4924115	10	ND	ND	ND	ND	ND	ND
C3B5924116	10	ND	ND	ND	ND	ND	ND
C3C5924110	10	ND	ND	ND	ND	ND	ND
C3C6924111	10	ND	ND	ND	ND	ND	ND
C4A2924126	10	ND	ND	ND	ND	ND	ND
C4B1924118	10	ND	ND	ND	ND	ND	ND
C4B2924119	10	ND	ND	ND	1600	ND	ND
C4C2924101	10	ND	ND	ND	ND	ND	ND
C4A2924127	10	ND	ND	ND	44	ND	ND
C5A6924799	10	ND	ND	ND	ND	ND	ND
C5B6924772	10	ND	ND	ND	ND	ND	ND
C5C4924743	10	ND	ND	ND	ND	110	ND
C5C5924744	10	ND	ND	ND	ND	ND	ND
C5C6924745	10	ND	ND	ND	ND	ND	ND
C6A3924787	10	ND	ND	ND	ND	ND	ND
C6B2924754	10	ND	ND	ND	1600	ND	ND
C6B3924756	10	ND	ND	ND	44	ND	ND
C6C3924736	10	ND	ND	ND	ND	ND	ND
C6B2924755 (Field Dup)	10	ND	ND	ND	1600	ND	ND
C6B3924757 (Field Dup)	10	ND	ND	ND	48	ND	ND
C7A3924781	10	ND	ND	ND	ND	ND	ND
C7B3924763	10	ND	ND	ND	ND	ND	ND
C7C2924727	10	ND	ND	ND	ND	ND	ND
C7C3924729	10	ND	ND	ND	ND	ND	ND
C8A5924777	10	ND	ND	ND	ND	ND	ND
C8B4924749	10	ND	ND	ND	ND	ND	ND
C8B5924750	10	ND	ND	ND	ND	ND	ND
C8C5924723	10	ND	ND	ND	ND	ND	ND
C9A292472	NA	ND	ND	ND	ND	ND	ND
C9A392473	NA	ND	ND	ND	ND	ND	ND
C9B392479	NA	ND	ND	ND	ND	ND	ND
C9C3924715	NA	ND	ND	ND	ND	ND	ND

TABLE C-1. Site Characterization Analytical Results

Fixed Lab Sample	Parathion (ppb)	Azinphos, methyl (ppb)	Ethion (ppb)	Paraoxon, methyl (ppb)	Paraoxon, ethyl (ppb)
MTCA Cleanup Standard	480000	3200	40000	20000	480000
Raw sensitivity/Sequencing					
MDL	11	6.2	4.4	4.4	4.4
C1A1924145	ND	ND	ND	ND	ND
C1A2924146	ND	ND	ND	ND	ND
C1B2924158	ND	ND	ND	ND	ND
C1C2924172	ND	ND	ND	ND	ND
C2A1924139	ND	ND	ND	ND	ND
C2A2924140	ND	ND	ND	ND	ND
C2B2924152	ND	ND	ND	ND	ND
C2C2924165	ND	ND	ND	ND	ND
C2C2924166	ND	ND	ND	ND	ND
C3A4924136	ND	ND	ND	ND	ND
C3B4924115	ND	ND	ND	ND	ND
C3B5924116	ND	ND	ND	ND	ND
C3C5924110	ND	ND	ND	ND	ND
C3C6924111	ND	ND	ND	ND	ND
C4A2924126	ND	ND	ND	ND	ND
C4B1924118	ND	ND	ND	ND	ND
C4B2924119	ND	ND	ND	ND	ND
C4C2924101	ND	ND	ND	ND	ND
C4A2924127	ND	ND	ND	ND	ND
C5A6924799	ND	ND	ND	ND	ND
C5B6924772	ND	ND	ND	ND	ND
C5C4924743	ND	ND	ND	ND	ND
C5C5924744	ND	ND	ND	ND	ND
C5C6924745	ND	ND	ND	ND	ND
C6A3924787	ND	ND	ND	ND	ND
C6B2924754	ND	ND	ND	ND	ND
C6B3924756	ND	ND	ND	ND	ND
C6C3924736	ND	ND	ND	ND	ND
C6B2924755 (Field Dup)	ND	ND	ND	ND	ND
C6B3924757 (Field Dup)	ND	ND	ND	ND	ND
C7A3924781	ND	ND	ND	ND	ND
C7B3924763	ND	ND	ND	ND	ND
C7C2924727	ND	ND	2000	ND	ND
C7C3924729	ND	ND	94	ND	ND
C8A5924777	ND	ND	ND	ND	ND
C8B4924749	ND	350	ND	ND	ND
C8B5924750	ND	ND	ND	ND	ND
C8C5924723	ND	ND	ND	ND	ND
C9A292472	ND	ND	ND	ND	ND
C9A392473	ND	ND	ND	ND	ND
C9B392479	ND	ND	ND	ND	ND
C9C3924715	ND	ND	ND	ND	ND

Appendix D

Waste Characterization Sampling Analytical Results

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TABLE D-1. Waste Characterization Sampling Analytical Results

				Non-weighted Data Summaries (ppm)					Fixed Lab Data Totals (ppb)		
Fixed Lab Sample	**Field Lab ID**	**Field Lab DDT**	**Field Lab Cyclodiene**	**DDD Family (ppm)**	**DDE Family (ppm)**	**DDT Family (ppm)**	**Endrin Family (ppm)**	**Endosulfan Family (ppm)**	**Fixed Lab OC Analysis dilution**	**Aldrin (ppb)**	**alpha BHC (ppb)**
MTCA Cleanup Standard				4.17	2.94	2.94				58.8	159
Raw sensitivity/Sequencing #											
MDL									1	0.075	0.077
W192373	W1-3	3.6	0.85	0.110	0.640	1.310	ND	ND	20	ND	ND
W192374 (Field Dup)	W1-3	NA	NA	ND	0.670	0.520	ND	ND	20	ND	ND
W492375	W4-5	7.7	0.22	0.360	7.030	23.100	ND	ND	100	ND	ND
WCANS92376	WCANS	0.0	0.01	ND	0.026	0.018	0.003	ND	1	ND	ND
W392371		NA	NA	ND	1.100	1.130	ND	ND	20	ND	ND
W692372		NA	NA	1.300	2.940	65.400	ND	ND	100	ND	ND
W1092377		NA	NA	NA	NA	NA	NA	ND	NA	NA	NA
W1092378		NA	NA	4.000	3.300	3.343	0.390	ND	20	ND	ND
W09O1471		NA	NA	0.032	0.244	0.324	ND	ND	1	ND	ND
W09O1472		NA	NA	0.025	0.223	0.188	ND	ND	1	ND	ND
W02O1474		NA	NA	ND	ND	ND	ND	410.000	1000	ND	ND
WAO2471		NA	NA	0.609	2.580	4.350	ND	4.100	10	ND	ND
WBO2472		NA	NA	0.072	1.178	3.020	ND	0.570	10	ND	ND
WCO2473		NA	NA	0.189	2.464	2.100	0.015	0.015	10	ND	ND
WDO2474		NA	NA	0.417	0.630	0.830	53.100	ND	50	380	ND
WEO2475		NA	NA	0.002	0.113	0.117	0.086	ND	1	3	ND
WFO2476		NA	NA	ND	0.082	0.049	0.012	ND	1	ND	ND

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

Fixed Lab Sample	beta-BHC (ppb)	delta-BHC (ppb)	Lindane (ppb)	Chlordane (ppb)	4,4'DDD (ppb)	4,4'DDE (ppb)	4,4'DDT (ppb)	2,4'DDD (ppb)	2,4'DDE (ppb)	2,4'DDT (ppb)	Dieldrin (ppb)
MTCA Cleanup Standard	556	556	769	769	----------	----------	----------	----------	----------	----------	62.5
Raw sensitivity/Sequencing											
MDL	0.14	0.078	0.17	2.5	0.17	3.6	13	1.5	1.5	1.5	0.071
W192373	ND	ND	ND	ND	110	640	1200	ND	ND	110	1200
W192374 (Field Dup)	ND	ND	ND	ND	ND	670	410	ND	ND	110	1500
W492375	ND	ND	ND	ND	360	6300	20000	ND	730	3100	ND
WCANS92376	ND	ND	ND	ND	ND	26	13	ND	ND	4.5	ND
W392371	ND	ND	ND	ND	ND	1100	910	ND	ND	220	82
W692372	ND	ND	ND	ND	1100	2600	56000	200	340	9400	ND
W1092377	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W1092378	ND	ND	ND	ND	4000	3300	3300	ND	ND	43	69
W09O1471	ND	ND	ND	ND	29	240	280	2.7	3.7	44	2
W09O1472	ND	ND	ND	ND	23	220	150	2.2	3.2	38	1.9
W02O1474	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WAO2471	35	ND	ND	ND	560	2400	3700	49	180	650	ND
WBO2472	ND	ND	ND	ND	48	1100	2600	24	78	420	ND
WCO2473	ND	ND	ND	ND	150	2400	1700	39	64	400	200
WDO2474	ND	ND	ND	ND	77	630	590	340	ND	240	44000
WEO2475	ND	ND	ND	ND	2.2	110	95	ND	2.7	22	770
WFO2476	ND	ND	ND	ND	ND	82	39	ND	ND	9.6	120

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

Fixed Lab Sample	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)	Endrin (ppb)	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)	Toxaphene (ppb)
MTCA Cleanup Standard	480000	480000	480000	24000	24000	222	110	40000	909
Raw sensitivity/Sequencing									
MDL	0.32	0.17	0.24	0.12	0.89	0.1	0.17	2.2	44
W192373	ND	ND	ND	ND	ND	ND	ND	ND	ND
W192374 (Field Dup)	ND	ND	ND	ND	ND	ND	ND	ND	ND
W492375	ND	ND	ND	ND	ND	ND	ND	ND	ND
WCANS92376	ND	ND	ND	3.4	ND	ND	ND	ND	ND
W392371	ND	ND	ND	ND	ND	ND	ND	ND	ND
W692372	ND	ND	ND	ND	ND	ND	ND	ND	ND
W1092377	NA	NA	NA	NA	NA	NA	NA	NA	NA
W1092378	ND	ND	ND	390	84	ND	ND	ND	ND
W09O1471	ND	ND	ND	ND	ND	ND	ND	ND	ND
W09O1472	ND	ND	ND	ND	ND	ND	ND	ND	ND
W02O1474	270000	140000	ND	ND	ND	ND	ND	ND	ND
WAO2471	2700	1400	ND	ND	ND	ND	ND	ND	ND
WBO2472	390	180	ND	ND	ND	ND	ND	ND	ND
WCO2473	ND	15	ND	15	ND	ND	ND	ND	ND
WDO2474	ND	ND	ND	49000	4100	ND	ND	ND	ND
WEO2475	ND	ND	ND	81	4.8	ND	ND	ND	ND
WFO2476	ND	ND	ND	12	ND	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

		Fixed Lab Data (ppb)								
Fixed Lab Sample	**Fixed Lab OP analysis dilution**	**Dichlorvos (ppb)**	**Dimethoate (ppb)**	**Diazinon (ppb)**	**Disulfoton (ppb)**	**Parathion, methyl (ppb)**	**Malathion (ppb)**	**Parathion (ppb)**	**Azinphos, methyl (ppb)**	**Ethion (ppb)**
MTCA Cleanup Standard		3440	16000	72000	3200	20000	1600000	480000	3200	40000
Raw sensitivity/Sequencing										
MDL		8.5	5.2	7.4	4.4	7.5	6.3	11	6.2	4.4
W192373	10	ND	ND	ND	ND	ND	ND	16000	ND	ND
W192374 (Field Dup)	10	ND	ND	ND	ND	ND	ND	14000	ND	ND
W492375	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
WCANS92376	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
W392371	10	ND	ND	ND	ND	ND	ND	8300	ND	ND
W692372	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
W1092377	20	ND	6300	ND	2700	ND	ND	370000	2600	ND
W1092378	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
W09O1471	10	ND	ND	ND	ND	ND	ND	ND	ND	72
W09O1472	10	ND	ND	ND	ND	ND	ND	ND	ND	62
W02O1474	10	ND	ND	ND	19000	ND	ND	360	ND	210000
WAO2471	10	ND	ND	ND	1700	ND	ND	16000	ND	1000
WBO2472	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
WCO2473	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
WDO2474	10	ND	ND	ND	ND	ND	ND	100	ND	ND
WEO2475	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
WFO2476	10	ND	ND	ND	ND	ND	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

Fixed Lab Sample	Paraoxon, methyl (ppb)	Paraoxon, ethyl (ppb)	Paraquat (ppb)	Carbaryl (ppm)	Carbofuran (ppm)		TCLP Arsenic (ppm)	TCLP Barium (ppm)	TCLP Cadmium (ppm)	TCLP Chromium (ppm)
MTCA Cleanup Standard	20000	480000	360000	8000	400		9999	9999	9999	9999
Raw sensitivity/Sequencing										
MDL	4.4	4.4	1100	0.5	0.5		0.4	0.005	0.08	0.01
W192373	ND	ND	NA	NA	NA		NA	NA	NA	NA
W192374 (Field Dup)	ND	ND	NA	NA	NA		NA	NA	NA	NA
W492375	ND	ND	NA	NA	NA		NA	NA	NA	NA
WCANS92376	ND	ND	NA	NA	NA		NA	NA	NA	NA
W392371	ND	ND	NA	NA	NA		NA	NA	NA	NA
W692372	ND	ND	NA	NA	NA		NA	NA	NA	NA
W1092377	ND	ND	NA	NA	NA		NA	NA	NA	NA
W1092378	NA	NA	NA	NA	NA		NA	NA	NA	NA
W09O1471	ND	ND	ND	ND	ND		0.66	0.82	0.04	0.038
W09O1472	ND	ND	ND	ND	ND		0.57	0.72	0.04	0.031
W02O1474	ND	ND	58000	ND	ND		0.59	0.84	0.04	0.043
WAO2471	ND	ND	32000	ND	26.9		0.749	0.843	0.0243	0.0373
WBO2472	ND	ND	NA	NA	NA		NA	NA	NA	NA
WCO2473	ND	ND	NA	NA	NA		NA	NA	NA	NA
WDO2474	ND	ND	ND	NA	NA		0.25	0.529	0.0243	0.0139
WEO2475	ND	ND	NA	NA	NA		0.134	0.398	0.0243	0.0128
WFO2476	ND	ND	NA	NA	NA		0.18	0.408	0.0243	0.0106

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

Fixed Lab Sample	TCLP Lead (ppm)	TCLP Selenium (ppm)	TCLP Silver (ppm)	TCLP Mercury (ppm)		TCLP gamma-BHC (ppb)	TCLP Endosulfan Sulfate (ppb)	TCLP Endrin (ppb)	TCLP Heptachlor (ppb)	TCLP Heptachlor Epoxide (ppb)
MTCA Cleanup Standard	9999	9999	9999	9999						
Raw sensitivity/Sequencing MDL	0.15	0.5	0.02	0.002						
W192373	NA	NA	NA	NA		NA	NA	NA	NA	NA
W192374 (Field Dup)	NA	NA	NA	NA		NA	NA	NA	NA	NA
W492375	NA	NA	NA	NA		NA	NA	NA	NA	NA
WCANS92376	NA	NA	NA	NA		NA	NA	NA	NA	NA
W392371	NA	NA	NA	NA		NA	NA	NA	NA	NA
W692372	NA	NA	NA	NA		NA	NA	NA	NA	NA
W1092377	NA	NA	NA	NA		NA	NA	NA	NA	NA
W1092378	NA	NA	NA	NA		NA	NA	NA	NA	NA
W09O1471	0.4	0.2	0.01	0.001		NA	NA	NA	NA	NA
W09O1472	0.33	0.29	0.032	0.001		NA	NA	NA	NA	NA
W02O1474	2.7	0.26	0.01	0.001		NA	NA	NA	NA	NA
WAO2471	1.39	0.172	0.0074	0.0017		ND	ND	ND	ND	ND
WBO2472	NA	NA	NA	NA		NA	NA	NA	NA	NA
WCO2473	NA	NA	NA	NA		NA	NA	NA	NA	NA
WDO2474	0.217	0.158	0.0074	0.0017		ND	ND	86	ND	ND
WEO2475	0.0679	0.158	0.0074	0.0017		ND	ND	6.3	ND	ND
WFO2476	0.0417	0.158	0.0074	0.0017		ND	ND	2.6	ND	ND

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

				Fixed Lab Data Totals (ppb)						
Fixed Lab Sample	**TCLP Methoxychlor (ppb)**	**TCLP Toxaphene (ppb)**		**Aldrin (ppb)**	**alpha BHC (ppb)**	**beta-BHC (ppb)**	**delta-BHC (ppb)**	**Lindane (ppb)**	**Chlordane (ppb)**	**4,4'DDD (ppb)**
MTCA Cleanup Standard										
Raw sensitivity/Sequencing										
MDL										
W192373	NA	NA								
W192374 (Field Dup)	NA	NA								
W492375	NA	NA								
WCANS92376	NA	NA								
W392371	NA	NA		0	0	0	0	0	0	0
W692372	NA	NA		0	0	0	0	0	0	0
W1092377	NA	NA								
W1092378	NA	NA								
W09O1471	NA	NA		0	0	0	0	0	0	0
W09O1472	NA	NA		0	0	0	0	0	0	0
W02O1474	NA	NA		0	0	0	0	0	0	0
WAO2471	ND	ND		0.075	0.077	0.14	0.078	0.17	2.5	0.17
WBO2472	NA	NA		0	0	0	0	0	0	0
WCO2473	NA	NA		0	0	0	0	0	0	0
WDO2474	ND	ND		0.075	0.077	0.14	0.078	0.17	2.5	0.17
WEO2475	ND	ND		0.075	0.077	0.14	0.078	0.17	2.5	0.17
WFO2476	ND	ND		0.075	0.077	0.14	0.078	0.17	2.5	0.17

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

Fixed Lab Sample	4,4'DDE (ppb)	4,4'DDT (ppb)	2,4'DDD (ppb)	2,4'DDE (ppb)	2,4'DDT (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)	Endrin (ppb)
MTCA Cleanup Standard										
Raw sensitivity/Sequencing										
MDL										
W192373										
W192374 (Field Dup)										
W492375										
WCANS92376										
W392371	0	0	0	0	0	0	0	0	0	0
W692372	0	0	0	0	0	0	0	0	0	0
W1092377										
W1092378										
W09O1471	0	0	0	0	0	0	0	0	0	0
W09O1472	0	0	0	0	0	0	0	0	0	0
W02O1474	0	0	0	0	0	0	0	0	0	0
WAO2471	0.36	1.3	1	1	1	0.071	8.3	3.2	0.24	0.12
WBO2472	0	0	0	0	0	0	0	0	0	0
WCO2473	0	0	0	0	0	0	0	0	0	0
WDO2474	0.36	1.3	1	1	1	30	0.32	0.17	0.24	51
WEO2475	0.36	1.3	1	1	1	5.9	0.32	0.17	0.24	3
WFO2476	0.36	1.3	1	1	1	6.4	0.32	0.17	0.24	0.12

NA = Not Analyzed
ND = Not Detected

TABLE D-1. Waste Characterization Sampling Analytical Results

Fixed Lab Sample	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)	Toxaphene (ppb)
MTCA Cleanup Standard					
Raw sensitivity/Sequencing					
MDL					
W192373					
W192374 (Field Dup)					
W492375					
WCANS92376					
W392371	0	0	0	0	0
W692372	0	0	0	0	0
W1092377					
W1092378					
W09O1471	0	0	0	0	0
W09O1472	0	0	0	0	0
W02O1474	0	0	0	0	0
WAO2471	0.89	0.1	0.17	2.2	54
WBO2472	0	0	0	0	0
WCO2473	0	0	0	0	0
WDO2474	13	0.1	0.17	2.2	54
WEO2475	0.89	0.1	0.17	2.2	54
WFO2476	0.89	0.1	0.17	2.2	54

NA = Not Analyzed
ND = Not Detected

Table D-2.
Investigation Derived Waste (IDW) Water Results

Sample Number	RWGSAN0471	RWGSAN0472	EBGSAN9473	RWSWN0464
Sample Source	Test Plot IDW	Test Plot IDW Field Dup	Equipment Blank	Shannon & Wilson
Sample Date	11/4/97	11/4/97	11/4/97	11/4/97
Analyte	Result (mg/L)	Result (mg/L)	Result (mg/L)	Result (mg/L)
Aldrin	ND	ND	ND	ND
alpha-BHC	0.032	0.038	ND	ND
beta-BHC	ND	0.037	ND	ND
delta-BHC	0.049	0.044	ND	ND
gamma-BHC	0.042	0.048	ND	ND
Chlordane	ND	ND	ND	ND
4,4'-DDD	0.17	0.017	ND	0.023
4,4'-DDE	1.2	1.1	ND	0.049
4,4'-DDT	1.2	0.91	ND	0.11
2,4'-DDD	0.095	0.082	ND	ND
2,4'-DDE	0.27	0.25	ND	0.02
2,4'-DDT	0.42	0.36	ND	0.062
Dieldrin	2.6	2.3	ND	0.029
Endosulfan I	1.4	1.3	ND	ND
Endosulfan II	0.43	0.4	ND	ND
Endosultan sulfate	ND	ND	ND	ND
Endrin	0.85	0.79	ND	ND
Endrin aldehyde	ND	0.039	ND	ND
Heptachlor	0.018	0.028	ND	ND
Heptachlor epoxide	ND	ND	ND	ND
Methoxychlor	ND	ND	ND	ND
Toxaphene	ND	ND	ND	ND
Dichlorvos	ND	ND	ND	ND
Dimethoate	ND	ND	ND	ND
Diazinon	ND	ND	ND	ND
Disulfoton	1.8	1.8	ND	ND
Parathion, methyl	ND	ND	ND	ND
Melathion	0.38	0.34	ND	ND
Parathion	0.87	0.79	ND	ND
Azinphos, methyl	ND	ND	ND	ND
Ethion	ND	ND	ND	ND
Paraoxon, methyl	ND	ND	ND	ND
Paraoxon, ethyl	ND	ND	ND	ND

ND = Not Detected

Appendix E

Confirmation Sequential Sampling Results and Final Confirmation Statistical Assessment

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TABLE E-1. Sequential Final Confirmation Sampling Data

				Non-weighted Data Summaries (ppm)					Fixed Lab Data Totals (ppb)				
Fixed Lab Sample	Field Lab ID	Field Lab DDT	Field Lab Cyclodiene	DDD Family (ppm)	DDE Family (ppm)	DDT Family (ppm)	Endrin Family (ppm)	Endosulfan Family (ppm)	Fixed Lab OC Analysis dilution	Aldrin (ppb)	alpha BHC (ppb)	beta-BHC (ppb)	delta-BHC (ppb)
MTCA Cleanup Standard				4.17	2.94	2.94				58.8	159	556	556
Raw sensitivity/Sequencing #													
MDL									1	0.075	0.077	0.14	0.078
FC9B2N0471		7.6	0.36	0.470	4.700	10.000	0.170	ND	20	ND	ND	ND	ND
FC8A4N0472		0.3	0.38	0.018	0.556	0.410	0.020	0.142	1	ND	ND	ND	ND
FC7A2N0473		0.7	0.20	0.005	0.112	0.088	ND	0.013	1	ND	ND	ND	ND
FC7A2N0474		NA	NA	0.006	0.101	0.083	ND	0.025	1	ND	ND	ND	ND
FC6C2N0475		2.3	0.95	0.033	0.101	0.566	ND	0.519	1	ND	ND	ND	ND
FC5C4N0476		7.4	0.31	0.030	0.509	1.270	0.008	0.017	1	ND	ND	ND	ND
FC4B1N0477		3.7	0.12	0.063	0.407	0.550	0.038	0.032	1	ND	ND	ND	ND
FC4B3N0478		3.0	0.10	0.220	2.670	17.230	ND	ND	50	ND	ND	ND	ND
FC3A5N0479		NA	NA	0.002	0.025	0.118	0.024	ND	1	ND	ND	ND	ND
FC2A2N04710		NA	NA	0.008	0.450	0.269	0.002	ND	1	ND	ND	ND	ND
FC1A1N04711		3.1	NA	0.018	1.118	0.600	0.005	ND	1	ND	ND	ND	ND
FC10A1N04712		NA	NA	5.000	3.100	2.600	0.360	ND	20	ND	ND	ND	ND
FC10B1N04713		NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA
FC2-4B3N1771		NA	NA	ND	0.008	0.014	ND	ND	1	ND	ND	ND	ND
FC2-9B2.5N1773		0.2	NA	ND	0.100	0.071	ND	ND	1	ND	ND	ND	ND
FC2-9B2.5N1775		0.1	NA	ND	0.084	0.061	ND	ND	1	ND	ND	ND	ND
FC2SW-1AWN17710		1.5	NA	ND	0.547	0.141	ND	ND	1	ND	ND	ND	ND
FC3SW-7ANN17711		6.3	NA	0.057	3.282	2.020	0.054	0.007	1	ND	ND	ND	ND
FC3SW-8ANN17712		7.1	NA	0.150	4.910	3.100	0.070	0.086	1	ND	ND	ND	ND
FC4-SW8AD101		NA	NA	0.084	2.367	1.590	ND	0.004	1	ND	ND	ND	ND
FC4-FR2BD103		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Analyzed
ND = Not Detected
J = Estimated Value

TABLE E-1. Sequential Final Confirmation Sampling Data

Fixed Lab Sample	Lindane (ppb)	Chlordane (ppb)	4,4'DDD (ppb)	4,4'DDE (ppb)	4,4'DDT (ppb)	2,4'DDD (ppb)	2,4'DDE (ppb)	2,4'DDT (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)	Endrin (ppb)
MTCA Cleanup Standard	769	769							62.5	480000	480000	480000	24000
Raw sensitivity/Sequencing													
MDL	0.17	2.5	0.17	3.6	13	1.5	1.5	1.5	0.071	0.32	0.17	0.24	0.12
FC9B2N0471	ND	ND	170	4700	8800	300	ND	1200	200	ND	ND	ND	170
FC8A4N0472	ND	ND	5.6	540	300	12	16	110	24	65	56	21	20
FC7A2N0473	ND	ND	2.7	110	67	2.4	2	21	ND	6.3	4.3	2.6	ND
FC7A2N0474	ND	ND	2.3	99	61	4	2.4	22	ND	7	8	10	ND
FC6C2N0475	4.3	ND	31	79	520	2.2	22	46	ND	350	160	9.3	ND
FC5C4N0476	ND	ND	21	480	1000	9.4	29	270	19	4.8	7.3	5.1	7.9
FC4B1N0477	ND	ND	22	380	430	41	27	120	33	5	7.4	20	13
FC4B3N0478	ND	ND	220	1900	17000	ND	770	230	ND	ND	ND	ND	ND
FC3A5N0479	ND	ND	2	25	92	ND	ND	26	15	ND	ND	ND	24
FC2A2N04710	ND	ND	4.2	440	190	3.3	9.8	79	22	ND	ND	ND	1.9
FC1A1N04711	ND	ND	7.6	1100	420	10	18	180	29	ND	ND	ND	5.1
FC10A1N04712	ND	ND	5000	3100	2600	ND	ND	ND	71	ND	ND	ND	360
FC10B1N04713	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC2-4B3N1771	ND	ND	ND	6.1	2.6	ND	1.8	11	ND	ND	ND	ND	ND
FC2-9B2.5N1773	ND	ND	ND	98	47	ND	2.2	24	ND	ND	ND	ND	ND
FC2-9B2.5N1775	ND	ND	ND	82	41	ND	2.4	20	ND	ND	ND	ND	ND
FC2SW-1AWN17710	ND	ND	ND	540	93	ND	7.1	48	ND	ND	ND	ND	ND
FC3SW-7ANN17711	ND	ND	17	3200	1300	40	82	720	24	ND	ND	7.4	44
FC3SW-8ANN17712	ND	ND	40	4800	2000	110	110	1100	35	ND	ND	86	ND
FC4-SW8AD101	ND	ND	37J	2300J	1100J	47J	67J	490J	23J	ND	4	ND	ND
FC4-FR2BD103	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Analyzed
ND = Not Detected
J = Estimated Value

TABLE E-1. Sequential Final Confirmation Sampling Data

							Fixed Lab Data (ppb)				
Fixed Lab Sample	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)	Toxaphene (ppb)	Fixed Lab OP analysis dilution	Dichlorvos (ppb)	Dimethoate (ppb)	Diazinon (ppb)	Disulfoton (ppb)	Parathion, methyl (ppb)
MTCA Cleanup Standard	24000	222	110	40000	909		3440	16000	72000	3200	20000
Raw sensitivity/Sequencing											
MDL	0.89	0.1	0.17	2.2	44		8.5	5.2	7.4	4.4	7.5
FC9B2N0471	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC8A4N0472	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC7A2N0473	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC7A2N0474	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC6C2N0475	ND	ND	ND	ND	ND	10	ND	ND	ND	150	ND
FC5C4N0476	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC4B1N0477	25	ND	ND	ND	1100	10	ND	ND	ND	ND	ND
FC4B3N0478	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
FC3A5N0479	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC2A2N04710	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC1A1N04711	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND
FC10A1N04712	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
FC10B1N04713	NA	NA	NA	NA	NA	200	ND	8300	ND	2600	ND
FC2-4B3N1771	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
FC2-9B2.5N1773	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
FC2-9B2.5N1775	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
FC2SW-1AWN17710	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA
FC3SW-7ANN17711	9.6	ND	ND	23	ND	NA	NA	NA	NA	NA	NA
FC3SW-8ANN17712	70	ND	4	62	1500	NA	NA	NA	NA	NA	NA
FC4-SW8AD101	ND	ND	ND	ND	330	NA	NA	NA	NA	NA	NA
FC4-FR2BD103	NA	NA	NA	NA	NA	10	ND	ND	ND	ND	ND

NA = Not Analyzed
ND = Not Detected
J = Estimated Value

TABLE E-1. Sequential Final Confirmation Sampling Data

Fixed Lab Sample	Malathion (ppb)	Parathion (ppb)	Azinphos, methyl (ppb)	Ethion (ppb)	Paraoxon, methyl (ppb)	Paraoxon, ethyl (ppb)	Paraquat (ppb)	Carbaryl (ppm)	Carbofuran (ppm)
MTCA Cleanup Standard	1600000	480000	3200	40000	20000	480000	360000	8000	400
Raw sensitivity/Sequencing									
MDL	6.3	11	6.2	4.4	4.4	4.4	1100	0.5	0.5
FC9B2N0471	ND	380	ND	ND	ND	ND	2200	ND	ND
FC8A4N0472	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC7A2N0473	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC7A2N0474	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC6C2N0475	ND	ND	ND	ND	ND	ND	9100	ND	ND
FC5C4N0476	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC4B1N0477	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC4B3N0478	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC3A5N0479	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC2A2N04710	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC1A1N04711	ND	ND	ND	ND	ND	ND	ND	ND	ND
FC10A1N04712	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC10B1N04713	ND	300000	2800	ND	ND	ND	NA	NA	NA
FC2-4B3N1771	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC2-9B2.5N1773	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC2-9B2.5N1775	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC2SW-1AWN17710	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC3SW-7ANN17711	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC3SW-8ANN17712	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC4-SW8AD101	NA	NA	NA	NA	NA	NA	NA	NA	NA
FC4-FR2BD103	ND	ND	ND	ND	ND	ND	NA	NA	NA

NA = Not Analyzed
ND = Not Detected
J = Estimated Value

TABLE E-2. Final Confirmation Results and Statistical Assessment

(units as per respective column)

	MTCA Cleanup Standard	4.17	2.94	2.94	58.80	159	556	556
Field Lab ID	Fixed Lab Sample	DDD Family (ppm)	DDE Family (ppm)	DDT Family (ppm)	Aldrin (ppb)	alpha BHC (ppb)	beta-BHC (ppb)	delta-BHC (ppb)
1A2	C1A2924146	0.001	0.264	0.084	0.038	0.039	0.070	0.039
1B2	C1B2924158	0.001	0.071	0.012	0.038	0.039	0.070	0.039
1C2	C1C2924172	0.001	0.099	0.015	0.038	0.039	0.070	0.039
2B2	C2B2924152	0.001	0.303	0.081	0.038	0.039	0.070	0.039
2C2	C2C2924165	0.001	0.101	0.017	0.038	0.039	0.070	0.039
3C6	C3C6924111	0.004	0.006	0.005	0.038	0.039	0.070	0.039
4A2	C4A2924126	0.004	0.195	0.185	0.038	0.039	0.070	0.039
4C2	C4C2924101	0.003	0.283	0.051	0.038	0.039	0.070	0.039
5C5	C5C5924744	0.008	0.027	0.065	0.038	0.039	0.070	0.039
6A3	C6A3924787	0.004	0.032	0.154	0.038	0.039	0.070	0.039
6B3	C6B3924756	0.007	1.711	0.202	0.038	0.039	0.070	0.039
6C3	C6C3924736	0.001	0.007	0.011	0.038	0.039	0.070	0.039
7A3	C7A3924781	0.001	0.059	0.072	0.038	0.039	0.070	0.039
7B3	C7B3924763	0.001	0.007	0.011	0.038	0.039	0.070	0.039
7C3	C7C3924729	0.039	0.044	0.027	0.038	0.039	0.070	0.039
8A5	C8A5924777	0.001	0.004	0.014	0.038	0.039	0.070	0.039
8B5	C8B5924750	0.001	0.003	0.013	0.038	0.039	0.070	0.039
8C5	C8C5924723	0.001	0.004	0.010	0.038	0.039	0.070	0.039
9A3	C9A392473	0.001	0.088	0.014	0.038	0.039	0.070	0.039
9B3	C9B392479	0.002	0.019	0.018	0.038	0.039	0.070	0.039
9C3	C9C3924715	0.028	0.556	1.620	0.038	2.000	0.070	0.039
None	FC1A1N04711	0.018	1.118	0.590	0.038	0.039	0.070	0.039
None	FC2A2N04710	0.008	0.450	0.269	0.038	0.039	0.070	0.039
None	FC3A5N0479	0.003	0.026	0.118	0.038	0.039	0.070	0.039
None	FC5C4N0476	0.030	0.509	1.270	0.038	0.039	0.070	0.039
None	FC6C2N0475	0.033	0.101	0.566	0.038	0.039	0.070	0.039
None	FC7A2N0473	0.005	0.112	0.088	0.038	0.039	0.070	0.039
None	FC8A4N0472	0.018	0.556	0.410	0.038	0.039	0.070	0.039
FC2-9B2.5N1773	FC2-9B2.5N1773	0.001	0.100	0.071	0.038	0.039	0.070	0.039
SW5A	SW5ANN04717	0.024	2.462	0.950	0.038	0.039	0.070	0.039
FC2-SW1AW	FC2SW-1AWN17710	0.001	0.547	0.141	0.038	0.039	0.070	0.039
FC3-SW7A	FC3SW-7ANN17711	0.057	3.282	2.02	0.038	0.039	0.070	0.039
None	FC4SW-8AD101	0.084	2.37	1.59	0.038	0.039	0.070	0.039
J = Estimated Value								

TABLE E-2. Final Confirmation Results and Statistical Assessment

		(units as per respective column)						
	MTCA Cleanup Standard	4.17	2.94	2.94	58.80	159	556	556

Field Lab ID	Fixed Lab Sample	DDD Family (ppm)	DDE Family (ppm)	DDT Family (ppm)	Aldrin (ppb)	alpha BHC (ppb)	beta-BHC (ppb)	delta-BHC (ppb)
	Mean	0.012	0.470	0.326	0.038	0.098	0.070	0.039
	S Dev	0.019	0.811	0.540	0.000	0.341	0.000	0.000
	N (# of Samples)	33	33	33	33	33	33	33
	UCL	0.07	2.79	1.14	0.0375	2.00	0.07	0.04
	UCL Limit	4.17	2.94	2.94	58.80	159	556	556
	UCL Check	Ok	Ok	Ok	Ok	Ok	Ok	Ok
	Max Check	0.08	3.28	2.02	0.04	2.00	0.07	0.04
	2* Level Check	Ok	Ok	Ok	Ok	Ok	Ok	Ok
	max's exceeding MTCA	0%	3%	0%	0%	0%	0%	0%
	# samples > MTCA B	-	1	-	-	-	-	-
	Max Percent Check	Ok	Ok	Ok	Ok	Ok	Ok	Ok

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	769	769	62.5	480000	480000	480000
Field Lab ID	Fixed Lab Sample	Lindane (ppb)	Chlordane (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)
1A2	C1A2924146	0.085	1.25	0.036	0.160	0.085	0.12
1B2	C1B2924158	0.085	1.25	2.20	0.160	0.085	0.12
1C2	C1C2924172	0.085	1.25	3.80	0.160	0.085	0.12
2B2	C2B2924152	0.085	1.25	3.30	0.160	0.085	0.12
2C2	C2C2924165	0.085	1.25	2.00	0.160	0.085	0.12
3C6	C3C6924111	0.085	1.25	9.10	0.160	5.80	26.0
4A2	C4A2924126	0.085	1.25	16.0	0.160	0.085	0.12
4C2	C4C2924101	0.085	1.25	22.00	0.160	0.085	0.12
5C5	C5C5924744	0.085	1.25	0.036	10.00	7.40	0.12
6A3	C6A3924787	0.085	1.25	0.036	0.160	0.085	0.12
6B3	C6B3924756	0.085	1.25	17.00	7.300	5.00	0.12
6C3	C6C3924736	0.085	1.25	0.036	0.160	0.085	0.12
7A3	C7A3924781	0.085	1.25	0.036	0.160	0.085	0.12
7B3	C7B3924763	0.085	1.25	0.036	0.160	0.085	0.12
7C3	C7C3924729	0.085	1.25	0.036	0.160	0.085	0.12
8A5	C8A5924777	0.085	1.25	0.036	0.160	0.085	0.12
8B5	C8B5924750	0.085	1.25	0.036	0.160	0.085	0.12
8C5	C8C5924723	0.085	1.25	0.036	0.160	0.085	0.12
9A3	C9A392473	0.085	1.25	0.036	0.160	0.085	0.12
9B3	C9B392479	0.085	1.25	0.036	0.160	0.085	0.12
9C3	C9C3924715	0.085	1.25	2.200	0.160	3.800	0.12
None	FC1A1N04711	0.085	1.25	29.0	0.160	0.085	0.12
None	FC2A2N04710	0.085	1.25	22.0	0.160	0.085	0.12
None	FC3A5N0479	0.085	1.25	15.0	0.160	0.085	0.12
None	FC5C4N0476	0.085	1.25	19.0	4.80	7.300	5.10
None	FC6C2N0475	4.300	1.25	0.036	350	160	9.30
None	FC7A2N0473	0.085	1.25	0.036	6.30	4.30	2.60
None	FC8A4N0472	0.085	1.25	24.0	65	56.0	21.00
FC2-9B2.5N1773	FC2-9B2.5N1773	0.085	1.25	0.036	0.160	0.085	0.12
SW5A	SW5ANN04717	0.085	1.25	0.036	0.160	0.085	0.12
FC2-SW1AW	FC2SW-1AWN17710	0.085	1.25	0.036	0.160	0.085	0.12
FC3-SW7A	FC3SW-7ANN17711	0.085	1.25	24.0	0.160	0.085	7.40
None	FC4SW-8AD101	0.085	1.25	23.0	0.160	4.0	86.00
J = Estimated Value							

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	769	769	62.5	480000	480000	480000
Field Lab ID	Fixed Lab Sample	Lindane (ppb)	Chlordane (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)
	Mean	0.213	1.250	7.097	13.567	7.747	4.864
	S Dev	0.734	0.000	9.812	61.458	29.032	15.719
	N (# of Samples)	33	33	33	33	33	33
	UCL	4.30	1.25	29.0	350	160	26
	UCL Limit	769	769	62.50	480000	480000	480000
	UCL Check	Ok	Ok	Ok	Ok	Ok	Ok
	Max Check	4.30	1.25	29	350	160	26.00
	2* Level Check	Ok	Ok	Ok	Ok	Ok	Ok
	max's exceeding MTCA	0%	0%	0%	0%	0%	0%
	# samples > MTCA B	-	-	-	-	-	-
	Max Percent Check	Ok	Ok	Ok	Ok	Ok	Ok

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	24000	24000	222	110	40000
Field Lab ID	Fixed Lab Sample	Endrin (ppb)	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)
1A2	C1A2924146	0.060	0.45	0.050	0.085	1.10
1B2	C1B2924158	0.060	0.45	0.050	0.085	1.10
1C2	C1C2924172	0.060	4.10	0.050	0.085	1.10
2B2	C2B2924152	0.060	0.45	0.050	0.085	1.10
2C2	C2C2924165	0.060	0.45	0.050	0.085	1.10
3C6	C3C6924111	100	9.30	0.050	0.085	1.10
4A2	C4A2924126	0.060	0.45	0.050	0.085	1.10
4C2	C4C2924101	3.50	0.45	0.050	0.085	1.10
5C5	C5C5924744	3.80	3.70	0.050	0.085	1.10
6A3	C6A3924787	0.060	0.45	0.050	0.085	1.10
6B3	C6B3924756	0.060	0.45	0.050	0.085	1.10
6C3	C6C3924736	0.060	0.45	0.050	0.085	1.10
7A3	C7A3924781	0.060	0.45	0.050	0.085	1.10
7B3	C7B3924763	0.060	0.45	0.050	0.085	1.10
7C3	C7C3924729	0.060	0.45	0.050	0.085	1.10
8A5	C8A5924777	0.060	0.45	0.050	0.085	1.10
8B5	C8B5924750	0.060	0.45	0.050	0.085	1.10
8C5	C8C5924723	0.060	0.45	0.050	0.085	1.10
9A3	C9A392473	0.060	0.45	0.050	0.085	1.10
9B3	C9B392479	0.060	0.45	0.050	0.085	1.10
9C3	C9C3924715	0.060	0.45	0.050	0.085	19.00
None	FC1A1N04711	5.10	0.45	0.050	0.085	1.10
None	FC2A2N04710	1.90	0.45	0.050	0.085	1.10
None	FC3A5N0479	24.0	0.45	0.050	0.085	1.10
None	FC5C4N0476	7.90	0.45	0.050	0.085	1.10
None	FC6C2N0475	0.060	0.45	0.050	0.085	1.10
None	FC7A2N0473	0.060	0.45	0.050	0.085	1.10
None	FC8A4N0472	20.0	0.45	0.050	0.085	1.10
FC2-9B2.5N1773	FC2-9B2.5N1773	0.060	0.45	0.050	0.085	1.10
SW5A	SW5ANN04717	6.60	0.45	0.050	0.085	1.10
FC2-SW1AW	FC2SW-1AWN17710	0.060	0.45	0.050	0.085	1.10
FC3-SW7A	FC3SW-7ANN17711	44.0	9.60	0.050	0.085	23.0
None	FC4SW-8AD101	0.060	70.0	0.050	4.0	62.0
J = Estimated Value						

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	24000	24000	222	110	40000
Field Lab ID	Fixed Lab Sample	Endrin (ppb)	Endrin Aldehyde (ppb)	Heptachlor (ppb)	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)
	Mean	6.612	3.308	0.050	0.204	4.152
	S Dev	19.066	12.188	0.000	0.682	11.459
	N (# of Samples)	33	33	33	33	33
	UCL	100	10	0.05	0.09	23.00
	UCL Limit	24000	24000	222	110	40000
	UCL Check	Ok	Ok	Ok	Ok	Ok
	Max Check	100.00	9.60	0.05	0.09	23.00
	2* Level Check	Ok	Ok	Ok	Ok	Ok
	max's exceeding MTCA	0%	0%	0%	0%	0%
	# samples > MTCA B	-	-	-	-	-
	Max Percent Check	Ok	Ok	Ok	Ok	Ok

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	909	3440	16000	72000	3200
Field Lab ID	Fixed Lab Sample	Toxaphene (ppb)	Dichlorvos (ppb)	Dimethoate (ppb)	Diazinon (ppb)	Disulfoton (ppb)
1A2	C1A2924146	22.0	NA	NA	NA	NA
1B2	C1B2924158	22.0	NA	NA	NA	NA
1C2	C1C2924172	22.0	NA	NA	NA	NA
2B2	C2B2924152	22.0	40.0	25	35	21
2C2	C2C2924165	22.0	40.0	25	35	21
3C6	C3C6924111	22.0	40.0	25	35	21
4A2	C4A2924126	22.0	40.0	25	35	21
4C2	C4C2924101	22.0	40.0	25	35	21
5C5	C5C5924744	22.0	40.0	25	35	21
6A3	C6A3924787	22.0	40.0	25	35	21
6B3	C6B3924756	22.0	40.0	25	35	44
6C3	C6C3924736	22.0	40.0	25	35	21
7A3	C7A3924781	22.0	40.0	25	35	21
7B3	C7B3924763	22.0	40.0	25	35	21
7C3	C7C3924729	22.0	40.0	25	35	21
8A5	C8A5924777	22.0	40.0	25	35	21
8B5	C8B5924750	22.0	40.0	25	35	21
8C5	C8C5924723	22.0	40.0	25	35	21
9A3	C9A392473	22.0	NA	NA	NA	NA
9B3	C9B392479	22.0	NA	NA	NA	NA
9C3	C9C3924715	22.0	NA	NA	NA	NA
None	FC1A1N04711	22.0	40.0	25	35	21
None	FC2A2N04710	22.0	40.0	25	35	21
None	FC3A5N0479	22.0	40.0	25	35	21
None	FC5C4N0476	22.0	40.0	25	35	21
None	FC6C2N0475	22.0	40.0	25	35	150
None	FC7A2N0473	22.0	40.0	25	35	21
None	FC8A4N0472	22.0	40.0	25	35	21
FC2-9B2.5N1773	FC2-9B2.5N1773	22.0	NA	NA	NA	NA
SW5A	SW5ANN04717	22.0	NA	NA	NA	NA
FC2-SW1AW	FC2SW-1AWN17710	22.0	NA	NA	NA	NA
FC3-SW7A	FC3SW-7ANN17711	22.0	NA	NA	NA	NA
None	FC4SW-8AD101	330	40.0	25	35	21
J = Estimated Value						

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	909	3440	16000	72000	3200
Field Lab ID	Fixed Lab Sample	Toxaphene (ppb)	Dichlorvos (ppb)	Dimethoate (ppb)	Diazinon (ppb)	Disulfoton (ppb)
	Mean	31.333	40.000	25.000	35.000	26.241
	S Dev	53.616	0.000	0.000	0.000	24.182
	N (# of Samples)	33	29	29	29	29
	UCL	22.00	40.00	25.00	35.00	150
	UCL Limit	909	3440	16000	72000	3200
	UCL Check	Ok	Ok	Ok	Ok	Ok
	Max Check	22.00	40.00	25.00	35.00	150.00
	2* Level Check	Ok	Ok	Ok	Ok	Ok
	max's exceeding MTCA	0%	0%	0%	0%	0%
	# samples > MTCA B	-	-	-	-	-
	Max Percent Check	Ok	Ok	Ok	Ok	Ok

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	20000	1600000	480000	3200	40000	20000
Field Lab ID	Fixed Lab Sample	Parathion, methyl (ppb)	Malathion (ppb)	Parathion (ppb)	Azinphos, methyl (ppb)	Ethion (ppb)	Paraoxon, methyl (ppb)
1A2	C1A2924146	NA	NA	NA	NA	NA	NA
1B2	C1B2924158	NA	NA	NA	NA	NA	NA
1C2	C1C2924172	NA	NA	NA	NA	NA	NA
2B2	C2B2924152	35	30	55	30	21	21
2C2	C2C2924165	35	30	55	30	21	21
3C6	C3C6924111	35	30	55	30	21	21
4A2	C4A2924126	35	30	55	30	21	21
4C2	C4C2924101	35	30	55	30	21	21
5C5	C5C5924744	35	30	55	30	21	21
6A3	C6A3924787	35	30	55	30	21	21
6B3	C6B3924756	35	30	55	30	21	21
6C3	C6C3924736	35	30	55	30	21	21
7A3	C7A3924781	35	30	55	30	21	21
7B3	C7B3924763	35	30	55	30	21	21
7C3	C7C3924729	35	30	55	30	94	21
8A5	C8A5924777	35	30	55	30	21	21
8B5	C8B5924750	35	30	55	30	21	21
8C5	C8C5924723	35	30	55	30	21	21
9A3	C9A392473	NA	NA	NA	NA	NA	NA
9B3	C9B392479	NA	NA	NA	NA	NA	NA
9C3	C9C3924715	NA	NA	NA	NA	NA	NA
None	FC1A1N04711	35	30	55	30	21	21
None	FC2A2N04710	35	30	55	30	21	21
None	FC3A5N0479	35	30	55	30	21	21
None	FC5C4N0476	35	30	55	30	21	21
None	FC6C2N0475	35	30	55	30	21	21
None	FC7A2N0473	35	30	55	30	21	21
None	FC8A4N0472	35	30	55	30	21	21
FC2-9B2.5N1773	FC2-9B2.5N1773	NA	NA	NA	NA	NA	NA
SW5A	SW5ANN04717	NA	NA	NA	NA	NA	NA
FC2-SW1AW	FC2SW-1AWN17710	NA	NA	NA	NA	NA	NA
FC3-SW7A	FC3SW-7ANN17711	NA	NA	NA	NA	NA	NA
None	FC4SW-8AD101	35	30	55	30	21	21
J = Estimated Value							

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	20000	1600000	480000	3200	40000	20000
Field Lab ID	Fixed Lab Sample	Parathion, methyl (ppb)	Malathion (ppb)	Parathion (ppb)	Azinphos, methyl (ppb)	Ethion (ppb)	Paraoxon, methyl (ppb)
	Mean	35.000	30.000	55.000	30.000	23.517	21.000
	S Dev	0.000	0.000	0.000	0.000	13.556	0.000
	N (# of Samples)	29	29	29	29	29	29
	UCL	35.00	30.00	55.00	30.00	94	21.00
	UCL Limit	20000	1600000	480000	3200	40000	20000
	UCL Check	Ok	Ok	Ok	Ok	Ok	Ok
	Max Check	35.00	30.00	55.00	30.00	94.00	21.00
	2* Level Check	Ok	Ok	Ok	Ok	Ok	Ok
	max's exceeding MTCA	0%	0%	0%	0%	0%	0%
	# samples > MTCA B	-	-	-	-	-	-
	Max Percent Check	Ok	Ok	Ok	Ok	Ok	Ok

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	480000	360000	8000	400
Field Lab ID	Fixed Lab Sample	Paraoxon, ethyl (ppb)	Paraquat (ppb)	Carbaryl (ppm)	Carbofuran (ppm)
1A2	C1A2924146	NA	NA	NA	NA
1B2	C1B2924158	NA	NA	NA	NA
1C2	C1C2924172	NA	NA	NA	NA
2B2	C2B2924152	21	NA	NA	NA
2C2	C2C2924165	21	NA	NA	NA
3C6	C3C6924111	21	NA	NA	NA
4A2	C4A2924126	21	NA	NA	NA
4C2	C4C2924101	21	NA	NA	NA
5C5	C5C5924744	21	NA	NA	NA
6A3	C6A3924787	21	NA	NA	NA
6B3	C6B3924756	21	NA	NA	NA
6C3	C6C3924736	21	NA	NA	NA
7A3	C7A3924781	21	NA	NA	NA
7B3	C7B3924763	21	NA	NA	NA
7C3	C7C3924729	21	NA	NA	NA
8A5	C8A5924777	21	NA	NA	NA
8B5	C8B5924750	21	NA	NA	NA
8C5	C8C5924723	21	NA	NA	NA
9A3	C9A392473	NA	NA	NA	NA
9B3	C9B392479	NA	NA	NA	NA
9C3	C9C3924715	NA	NA	NA	NA
None	FC1A1N04711	21	550	0.25	0.25
None	FC2A2N04710	21	550	0.25	0.25
None	FC3A5N0479	21	550	0.25	0.25
None	FC5C4N0476	21	550	0.25	0.25
None	FC6C2N0475	21	9100	0.25	0.25
None	FC7A2N0473	21	550	0.25	0.25
None	FC8A4N0472	21	550	0.25	0.25
FC2-9B2.5N1773	FC2-9B2.5N1773	NA	NA	NA	NA
SW5A	SW5ANN04717	NA	NA	NA	NA
FC2-SW1AW	FC2SW-1AWN17710	NA	NA	NA	NA
FC3-SW7A	FC3SW-7ANN17711	NA	NA	NA	NA
None	FC4SW-8AD101	21	NA	NA	NA
J = Estimated Value					

TABLE E-2. Final Confirmation Results and Statistical Assessment

	MTCA Cleanup Standard	480000	360000	8000	400
Field Lab ID	Fixed Lab Sample	Paraoxon, ethyl (ppb)	Paraquat (ppb)	Carbaryl (ppm)	Carbofuran (ppm)
	Mean	21.000	1262.500	0.250	0.250
	S Dev	0.000	NA	0.000	0.000
	N (# of Samples)	29	12	12	12
	UCL	21.00	NA	0.2500	0.2500
	UCL Limit	480000	360000	8000	400
	UCL Check	Ok	Ok	Ok	Ok
	Max Check	21.00	9100.00	0.25	0.25
	2* Level Check	Ok	Ok	Ok	Ok
	max's exceeding MTCA	0%	0%	0%	0%
	# samples > MTCA B	-	-	-	-
	Max Percent Check	Ok	Ok	Ok	Ok

TABLE E-3. DDD Family Background Data Analysis

DATA	ID
0.003785	C3C6924111
0.00415	C4A2924126
0.00275	C4C2924101
0.0075	C5C5924744
0.00405	C6A3924787
0.007285	C6B3924756
0.03875	C7C3924729
0.002285	C9B392479
0.028	C9C3924715
0.0176	FC1A1N04711
0.0075	FC2A2N04710
0.00275	FC3A5N0479
0.0304	FC5C4N0476
0.0332	FC6C2N0475
0.0051	FC7A2N0473
0.0176	FC8A4N0472
0.0237	SW5ANN04717
0.057	FC3SW-7ANN17711
0.084	FC4SW-8AD101

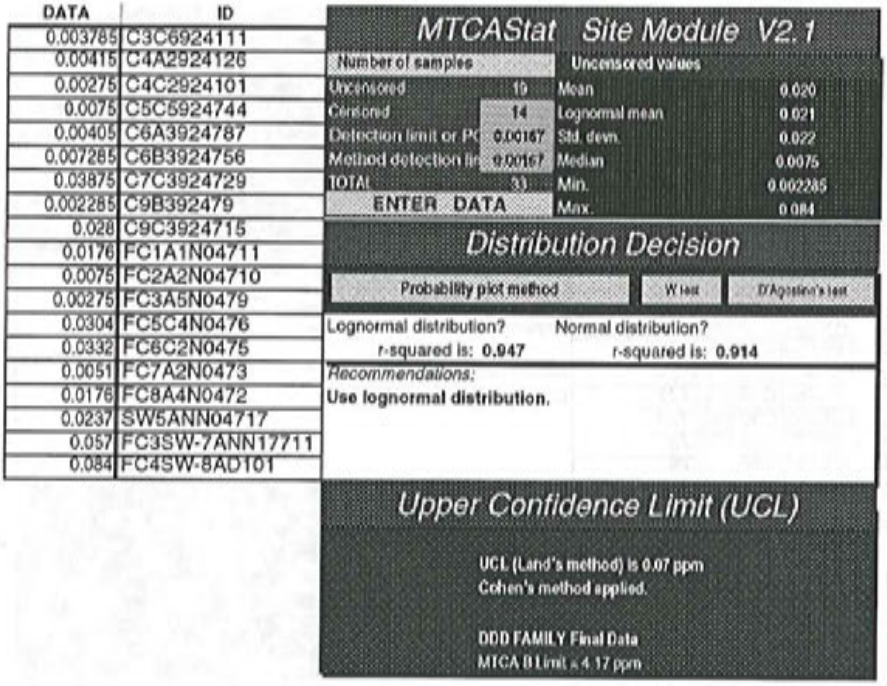

TABLE E-4. DDE Family Background Data Analysis

DATA	ID
0.2636	C1A2924146
0.07075	C1B2924158
0.09875	C1C2924172
0.3028	C2B2924152
0.10075	C2C2924165
0.00585	C3C6924111
0.1946	C4A2924126
0.283	C4C2924101
0.02675	C5C5924744
0.03175	C6A3924787
1.711	C6B3924756
0.00655	C6C3924736
0.0593	C7A3924781
0.00735	C7B3924763
0.04375	C7C3924729
0.00355	C8A5924777
0.00395	C8C5924723
0.08775	C9A392473
0.0191	C9B392479
0.556	C9C3924715
1.118	FC1A1N04711
0.4498	FC2A2N04710
0.02575	FC3A5N0479
0.509	FC5C4N0476
0.101	FC6C2N0475
0.112	FC7A2N0473
0.556	FC8A4N0472
0.1002	FC2-9B2.5N1773
2.462	SW5ANN04717
0.5471	FC2SW-1AWN17710
3.282	FC3SW-7ANN17711
2.37	FC4SW-8AD101

MTCAStat Site Module V2.1

Number of samples		Uncensored values	
Uncensored	32	Mean	0.486
Censored	1	Lognormal mean	0.259
Detection limit or PQ	0.005	Std. devn.	0.820
Method detection lir	0.005	Median	0.100875
TOTAL	33	Min.	0.00355
ENTER DATA		Max.	3.282

Distribution Decision

Probability plot method | W test | D'Agostino's test

Lognormal distribution? r-squared is: **0.972**

Normal distribution? r-squared is: **0.615**

Recommendations:

Use lognormal distribution.

Upper Confidence Limit (UCL)

UCL (Land's method) is 2.79 ppm

Simple substitution used with censored values.

DDE Family Final Data

MTCA B Limit = 2.94 ppm

TABLE E-5. DDT Family Background Data Analysis

DATA	ID
0.084	C1A2924146
0.0119	C1B2924158
0.0146	C1C2924172
0.081	C2B2924152
0.017	C2C2924165
0.0052	C3C6924111
0.185	C4A2924126
0.051	C4C2924101
0.065	C5C5924744
0.154	C6A3924787
0.2021	C6B3924756
0.0111	C6C3924736
0.072	C7A3924781
0.0108	C7B3924763
0.0265	C7C3924729
0.014	C8A5924777
0.0133	C8B5924750
0.0101	C8C5924723
0.0135	C9A392473
0.0177	C9B392479
1.62	C9C3924715
0.59	FC1A1N04711
0.269	FC2A2N04710
0.118	FC3A5N0479
1.27	FC5C4N0476
0.566	FC6C2N0475
0.088	FC7A2N0473
0.41	FC8A4N0472
0.071	FC2-9B2.5N1773
0.95	SW5ANN04717
0.141	FC2SW-1AWN17710
2.02	FC3SW-7ANN17711
1.59	FC4SW-8AD101

MTCAStat Site Module V2.1

Number of samples		Uncensored values	
Uncensored	33	Mean	0.326
Censored	0	Lognormal mean	0.395
Detection limit or PQ	0.015	Std. devn.	0.540
Method detection lir	0.015	Median	0.081
TOTAL	33	Min.	0.0052
ENTER DATA		Max.	2.02

Distribution Decision

Probability plot method | Wilcoxon | D'Agostino's test

Lognormal distribution? r-squared is: **0.949**

Normal distribution? r-squared is: **0.634**

Recommendations:

Use lognormal distribution.

Upper Confidence Limit (UCL)

UCL (Land's method) is 1.14 ppm

DDT Family Final Data

MTCA B Limit = 2.94 ppm

FIGURE E-1. DDD Family Normal Probablity Plot (Lognormal Case)

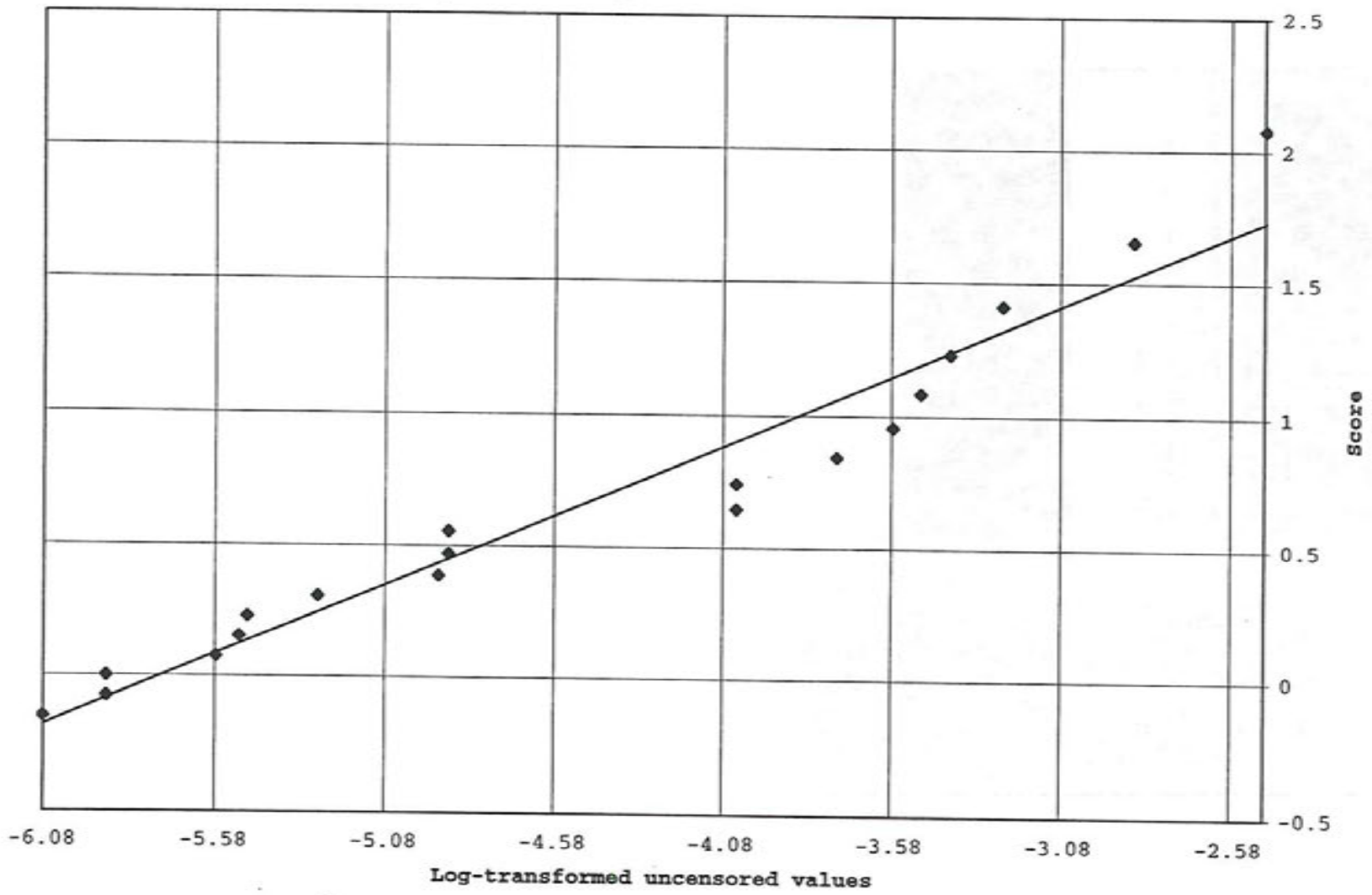

FIGURE E-2. DDE Family Normal Probability Plot (Lognormal Case)

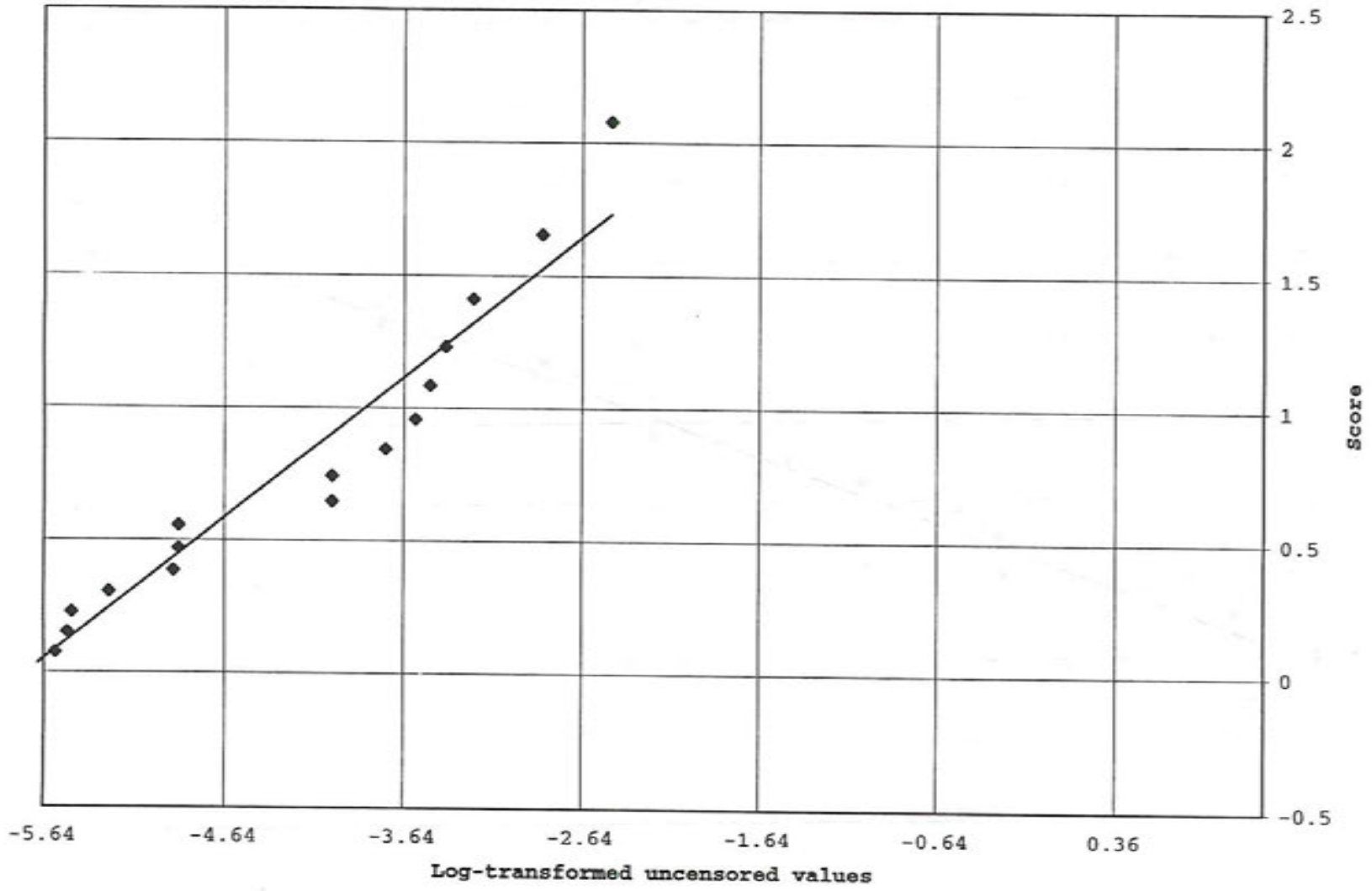

FIGURE E-3. DDT Family Normal Probability Plot (Lognormal Case)

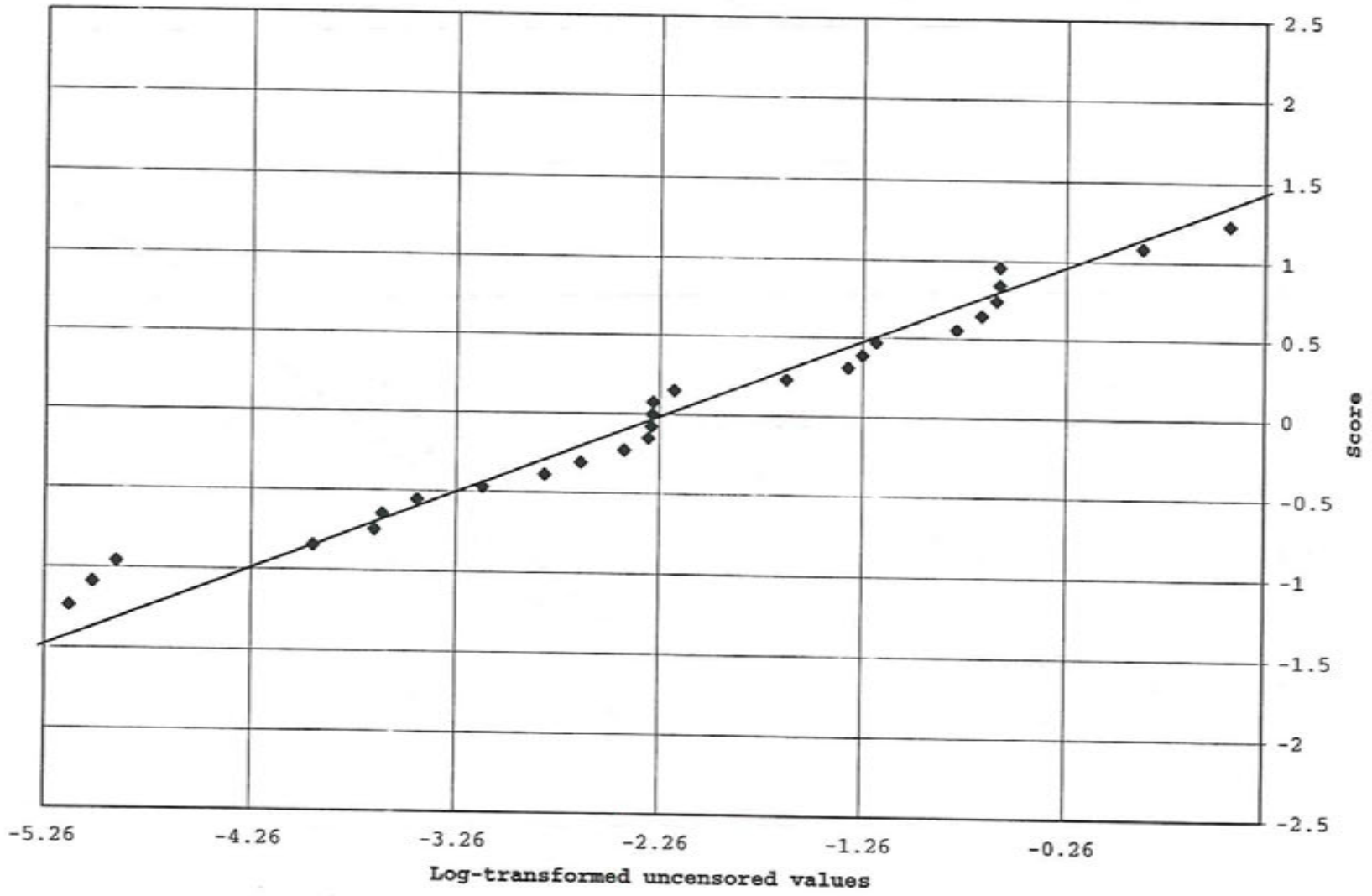

Table E-6.
Confirmation Sampling Equipment Blank Results

Sample Number: FCEBN04714 Sample Date: 11/4/97	
Analyte	Result (mg/L)
Aldrin	ND
alpha-BHC	ND
beta-BHC	ND
delta-BHC	ND
gamma-BHC	ND
Chlordane	ND
4,4'-DDD	ND
4,4'-DDE	ND
4,4'-DDT	ND
2,4'-DDD	ND
2,4'-DDE	ND
2,4'-DDT	ND
Dieldrin	ND
Endosulfan I	ND
Endosulfan II	ND
Endosultan sulfate	ND
Endrin	ND
Endrin aldehyde	ND
Heptachlor	ND
Heptachlor epoxide	ND
Methoxychlor	ND
Toxaphene	ND
Dichlorvos	ND
Dimethoate	ND
Diazinon	ND
Disulfoton	ND
Parathion, methyl	ND
Melathion	ND
Parathion, methyl	ND
Azinphos, methyl	ND
Ethion	ND
Paraoxon, methyl	ND
Paraoxon, ethyl	ND

ND = Not Detected

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(CENWS-EN-GT-ET)

FIELD SAMPLING PLAN ADDENDUM
WENATCHEE TFREC TEST PLOT
FINAL SIDEWALL CONFIRMATION SAMPLING

October 22, 1997

1.0 INTRODUCTION

The Corps of Engineers, through its contractor Garry Struthers Associates, Inc. (GSA), is performing a soil characterization and removal for EPA's Office of Research and Development (ORD) at the Wenatchee Tree Fruit Research and Extension Center (TFREC), owned and operated by WSU.

The Corps, ORD, and Washington State Department of Ecology (Ecology) decided in a conference call held October 21, 1997 to modify the original TFREC confirmation sampling strategy to include excavation side wall sampling and analysis. The TFREC team decided that this additional sampling was required to assure that the horizontal boundaries of the contamination area will be characterized with sufficient certainty to document a clean closure of the test plot area. Collection of samples from the side walls of the excavation is not included in the removal action scope of work (SOW) with GSA. However, on site analysis of soil samples using immunoassay analyses (IAA) and analysis of soil samples using a subcontract fixed laboratory is within the SOW. As a result, Corps personnel will perform the field sampling and will provide samples to GSA for on site IAA and fixed laboratory definitive organochlorine confirmation analysis by Method 8081.

Additional site information, including background data, removal action SOW, and the analytical data quality objectives can be found in the TFREC Test Plot Remediation Removal Action Management Plan (RAMP).

2.0 PURPOSE

Samples will be collected from the side walls of the excavation and analyzed by GSA personnel on site using DDT and cyclodiene IAA. Definitive organochlorine confirmation analysis will be performed by a fixed laboratory utilizing Method 8081. The objective of side wall sampling and analysis described in this addendum is two fold:

1. The IAA data will be initially used in the field to determine whether soil contaminated with organochlorine pesticides are present above MTCA Method B action levels in soil collected from the side walls of the test plot excavation. The IAA data will be used to make a decision in the field as to whether additional excavation should occur prior to collecting final confirmation samples. The Corps will determine if additional excavation is required. If required, soil will be excavated in a focused manner to remove hot spots, and the soil will be disposed off-site, as is indicated in the SOW.

2. The IAA data and the fixed laboratory definitive 8081 data will be used to document that the horizontal boundaries of the soil contaminated with organochlorine pesticides above MTCA Method B action levels was within the excavation horizontal boundaries.

The vertical extent of contamination will be determined using "bottom of hole" sampling and analysis by both IAA and off-site fixed laboratory definitive analyses. Confirmation that the horizontal and vertical boundaries of pesticide soil contamination above MTCA B levels have been defined will be completed prior to backfilling the excavation area. Results of the confirmation sampling and analysis will be presented in the site closure report.

3.0 SAMPLING EVENT

Soil samples will be collected from the side walls of the excavation. A total of 18 sample locations will be sampled, two blind field duplicate samples will be collected to assess IAA precision. Additional side wall samples for IAA may be collected to define the horizontal extent of organochlorine pesticide contamination above MTCA B levels. Two side wall soil samples will be collected for fixed laboratory organochlorine analysis by Method 8081. Samples will be transferred to GSA's on-site laboratory personnel for IAA, and/or shipment to Sound Analytical Services (SAS), GSA's subcontract laboratory.

3.1 SAMPLE ANALYSIS SUMMARY

Samples shall be analyzed using the following analytical methods:

- **DDT Immunoassay Analysis** (SDI's test kit; procedures included in RAMP);
- **Chlordane Immunoassay Analysis** (SDI's test kit; procedures included in RAMP); and
- **Organochlorine Pesticides Method 8081.**

Analytical data quality objectives can be found in the TFREC Test Plot Remediation Removal Action Management Plan (RAMP).

3.2 PROJECT ORGANIZATION AND RESPONSIBILITY

Ralph Totorica is the project manager, responsible with coordination with ORD and with the Corps project staff.

Greg Gervais is the Quality Assurance Representative, responsible for: completion of the sampling plan; acquisition and transportation of all field sampling equipment and supplies; successful collection of representative soil samples; and sample delivery to the on-site laboratory. He will be assisted by Victor Ramos.

Victor Ramos is the sampling event engineer, responsible with assisting Mr. Gervais with sample collection and handling.

Kira Lynch is the project environmental scientist, responsible for: completion of the sampling plan; leading technical project planning process; and coordinating with GSA chemistry staff, to ensure project data quality objectives are met.

Kim Converse is the Project Engineer, responsible for managing the contractor and coordinating with the Contract Officer's Representative at the Fort Lewis Area Office.

Bill Brooker is the COR, responsible for administering the contract.

3.3 CONTRACTORS

Corps personnel will collect and handle side wall soil samples. These samples will be delivered to GSA on-site laboratory personnel.

3.4 DESIGNATED WORK ZONES

The following work zone designations shall be used as an example for consideration by the sampling personnel. The contractor will modify these designations, if necessary, to address site and project-specific issues.

3.4.1 Exclusion Zone

This area is contained within a boundary delineated by a fence to the north and east of the Test Plot, test orchard trees to the east, and the north edge of the decontamination pad to the south.

3.4.2 Contaminant Reduction Zone(CRZ)

The CRZ will be located at the decontamination pad and adjacent to it. All sampling equipment will be decontaminated within this zone.

3.4.3 Support Zone

The support zone will be any area beyond the outermost border of the CRZ.

3.5 SAMPLING PROCEDURES

3.5.1 General Procedures

Soil sampling will be conducted within the test plot excavation, with samples collected specifically from the side walls of the excavation. The excavation is not considered a confined space for the purposes of both OSHA and Department of the Army regulations. Some heavy equipment will be working within the EZ, so samplers will need to coordinate sampling activities with the contractor so ensure worker safety.

All discrete soil samples shall be collected from the side wall using a clean, dedicated stainless steel spoon. The first two inches of "exposed" soil on the side wall will be scraped away and onto the ground. Once that is done, soil will be collected into a clean, dedicated stainless steel bowl for homogenization. Homogenization shall include the "quartering method." The homogenized soil will then be transferred from the stainless steel bowl (using stainless steel spoon) into laboratory-certified cleaned 4-oz. glass containers with Teflon-coated lids.

Sample labeling, chain of custody procedures, and documentation procedures will be performed as described in the TFREC Test Plot Remediation RAMP.

Blind field duplicate and definitive confirmation samples will be collected at the rate of at least one in ten project samples. Triplicate split samples will not be collected unless requested by Ecology or WSU.

3.5.2 Side Wall Sampling Location Strategy

Sample locations on side walls were selected based on highest Chlordane or DDT immunoassay results for the grid sample closet to the side wall. In addition, definitive sample results from the test plot characterization were used to identify the sample interval with the highest potential to be contaminated if lateral migration of contaminants had taken place. If the highest DDT result and Chlordane result were reported in different intervals then the contaminant type which was driving the removal decision in each column was used to determine the depth interval to sample. No samples will be collected from side walls where immunoassay and definitive data collected to date indicates that no contamination above MTCA B levels is present in the grid adjacent to the Side Wall.

The following are the locations from which side wall samples will be located. Additionally, from each of these "rectangular" sampling areas, an actual sampling location will be selected using x-y coordinates (the origin will always be at the lower left corner (0,0)) and a random number generator to determine the specific (x,y) coordinate of each sample for its "rectangle." Random numbers will be generated in the field prior to sampling using the algorithm built into the Hewlett-Packard 48G scientific calculator.

Grid 9A north side wall 1-2' bgs (depth selected based on highest DDT and CD result)
Grid 9A east side wall 1-2' bgs (depth selected based on highest DDT result)
Grid 9B east side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 9C east side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 9C south side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 8C north side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 8A south side wall 0-1' bgs (depth selected based on highest DDT result)
Grid 7C south side wall 1-2' bgs (depth selected based on highest CD result)
Grid 7A north side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 6C south side wall (no sample)
Grid 6A north side wall 1-2' bgs (depth selected based on highest DDT result)
Grid 5C south side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 5A north side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 4C south side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 4A north side wall 0-1' bgs(depth selected based on highest DDT and CD result)
Grid 3C south side wall 1-2' bgs (depth selected based on highest CD result)
Grid 3A north side wall 2-3' bgs(depth selected based on highest CD result)
Grid 2C south side wall (no sample)
Grid 2A north side wall 0-1' bgs(depth selected based on highest DDT and CD result)
Grid 1C south side wall (no sample)
Grid 1C west side wall (no sample)
Grid 1B west side wall 0-1' bgs (depth selected based on highest DDT and CD result)
Grid 1A west side wall (no sample)
Grid 1A north side wall 0-1' bgs (depth selected based on highest DDT and CD result)

Field duplicate samples shall be collected from Grid 3C south side wall and Grid 3C north side wall. These locations were selected for duplicate sample collection because these locations have

the greatest potential to have been influenced by significant lateral transport of pesticide contamination.

If results from the initial immunoassay sampling effort indicate that contamination may still be present in the side walls of the excavation above MTCA B levels, then additional removal will occur and sampling for immunoassay analysis will be repeated (i.e. at this point it will only be necessary to run the immunoassay that indicated contamination DDT or CD unless contamination was indicated by both analyses). Once Side Wall sampling and analysis by immunoassay indicates that all contamination above MTCA B levels has been removed the definitive confirmation samples can be collected.

Following completion of all immunoassay analyses, two sample locations will be selected for organochlorine definitive analysis by method 8081. The two sample locations with the highest immunoassay results should be selected for definitive confirmation analysis. If the request is made by WSU, split samples will be collected.

Samples shall be retained under chain of custody and walked under chain of custody to the on-site laboratory.

3.5.3 Decontamination Procedures

Decontamination of sampling spoons and bowls will be necessary as dedicated decontaminated spoons and bowls will not be used. The sample jars are certified clean and will not require on-site decontamination.

Cross contamination during sample collection will be minimized by the use of disposable gloves that will be replaced for every sample collected. Non-disposable equipment will be cleaned thoroughly with non-phosphate laboratory detergent (e.g., Liquinox) and distilled water, and triple rinsed with analyte-free water followed with reagent-grade methanol. Upon completion of sampling, all non-reusable sampling equipment, including gloves, will be disposed of properly. The decontamination rinsate will be collected and stored in a Baker tank.

3.6 INVESTIGATION DERIVED WASTE

The only IDW generated during the sampling event will be as follows:

- Tyvek boot covers;
- Nitrile gloves;
- Aluminum foil;
- Decontamination water with Liquinox detergent; and
- Reagent-grade Methanol.

Tyvek, gloves, and aluminum foil will be bagged and placed into GSA's solid waste bin on site. The decontamination liquids will be handled as described in the TFREC Test Plot Remediation RAMP.

3.7 SAMPLE HANDLING

3.7.1 Sample Containers

Sample containers are purchased pre-cleaned and treated according to EPA specifications for the methods. Containers are stored in clean areas to prevent exposure to fuels, solvents, and other contaminants.

3.7.1.1 Sample Volumes, Container Types, and Preservation Requirements

Sample volumes, container types, and preservation requirements for the analytical methods performed on Corps samples are listed in Table 3.7.1.1-1.

Table 3.7.1.1-1. Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Name	Analytical Methods	Container	Number of samples including QC	Minimum Sample Volume or Weight	Maximum Holding Time
OC Pesticides	DDT and Chlordane IAA Kits	G, T	21 (minimum)	4 ounces	14 days at 4°C (before extraction)
OC Pesticides	8081	G, T	2	4 ounces	14 days at 4°C (before extraction)

a. glass (G); amber glass (A); Teflon-lined Cap (T).

3.7.2 Sample Identification

Each sample label shall include the information listed below:

- Project name
- Sample identification number
- Type of analysis
- Date and time of collection
- Name of sampler(s)

Samples numbers will be identified in the field following the system being used by GSA that is described in the TFREC Test Plot Remediation RAMP.

3.8 SAMPLE CUSTODY

A chain-of-custody record must be completed and accompany every sample and every delivery of the samples to the on-site laboratory to document sample possession from the time of collection. Chain-of-custody records shall contain the following information:

- Project name and location
- Signatures of samplers
- Sample identification
- Date and time of collection
- Type of sample
- Number of containers
- Required analyses
- Any pertinent remarks
- Signature of sampler relinquishing the samples
- Relinquished date and time

3.9 SAMPLE SHIPMENT

Primary samples will be transported by foot or car directly to the on-site laboratory. GSA personnel will take custody of the samples by signing the chain of custody form and taking the samples and putting them either in a refrigerator or in a cooler, storing them at 4 °C. GSA will ship samples to SAS following procedures described in the TFREC Test Plot Remediation RAMP.

4.0 RECORD KEEPING

During the field sampling, a dedicated field logbook shall be used to record on-site activities and shall be in the possession of the field site manager. The cover of the logbook shall contain the following information:

- Project name and location
- Technical manager's and site manager's names and phone numbers
- Sequential book number
- Start date
- End date

Daily entries into the logbook may contain a variety of information. Each day all information pertinent to the field activities must be entered in the logbook. The types of information to be entered in the field logbook include but are not limited to the following:

- Date
- Start time
- End time
- Weather
- All personnel present
- Any visitors present (arrival/departure times)
- Synopsis of site activities
- Field observations
- References, such as maps or photographs of the sampling site

- Date and time of sample
- Type and number of samples
- Sample location and identification number
- Type and size of sample containers
- Sampling method
- Decontamination procedures
- Deviations from Work Plan
- Health and safety observations
- Field decisions

All data must be recorded directly and legibly into the field log book using indelible ink. All logbook pages must be sequentially numbered. If entries must be changed, the change should not obscure the original entry. At the end of each day, the Site Manager shall verify the accuracy of the entries, and sign and date the log book.

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Appendix F

Field and Fixed Laboratory Quality Control Data and Trendlines

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TABLE F-1 Field Duplicate Da ɔr OP and OC Pesticide Analysis

	Fixed Lab Sample	Aldrin (ppb)	alpha-BHC (ppb)	beta-BHC (ppb)	delta-BHC (ppb)	Lindane (ppb)	Chlordane (ppb)	4,4'DDD (ppb)	4,4'DDE (ppb)	4,4'DDT (ppb)	2,4'DDD (ppb)
flddup1	FR45B92372	0	0	0	0	0	0	430	1600	20000	0
flddup1	W192373	0	0	0	0	0	0	110	640	1200	0
flddup1	C2B2924152	0	0	0	0	0	0	0	300	61	0
flddup1	W09O1471	0	0	0	0	0	0	32	230	290	0
flddup1	FC7A2N0473	0	0	0	0	0	0	2.7	110	67	0
flddup1	FC2-9B2.5N1773	0	0	0	0	0	0	0	0	0	0
flddup1	C6B2924754	0	0	0	0	0	0	34	2100	2400	42
flddup1	C6B3924756	0	0	0	0	0	0	0	1700	200	7.2
flddup1	C4A2924126	0	0	0	0	0	0	3.4	190	150	0
Flddup2	FR45B92373	0	0	0	0	0	0	1700	6700	110000	0
Flddup2	W192374	0	0	0	0	0	0	0	670	410	0
Flddup2	C2C2924165	0	0	0	0	0	0	0	100	11	0
Flddup2	W09O1472	0	0	0	0	0	0	25	220	150	0
Flddup2	FC7A2N0474	0	0	0	0	0	0	2.3	99	61	0
Flddup2	FC2-9B2.5N1775	0	0	0	0	0	0	0	0	0	0
Flddup2	C6B2924755	0	0	0	0	0	0	36	2500	2900	80
Flddup2	C6B3924757	0	0	0	0	0	0	0	210	250	6.8
Flddup2	C4A2924127	0	0	0	0	0	0	3.9	200	150	0

TABLE F-1 Field Duplicate Dat ır OP and OC Pesticide Analysis

	Fixed Lab Sample	2,4'DDE (ppb)	2,4'DDT (ppb)	Dieldrin (ppb)	Endosulfan I (ppb)	Endosulfan II (ppb)	Endosulfan Sulfate (ppb)	Endrin (ppb)	Endrin Aldehyde (ppb)	Heptachlor (ppb)
flddup1	FR45B92372	850	4400	0	0	0	0	0	0	0
flddup1	W192373	0	110	1200	0	0	0	0	0	0
flddup1	C2B2924152	0	20	3.3	0	0	0	0	0	0
flddup1	W09O1471	0	58	1.8	0	0	0	0	0	0
flddup1	FC7A2N0473	0	21	0	0	0	0	0	0	0
flddup1	FC2-9B2.5N1773	0	0	0	0	0	0	0	0	0
flddup1	C6B2924754	73	540	110	610	340	0	11	21	0
flddup1	C6B3924756	11	2.1	17	7.3	5	0	0	0	0
flddup1	C4A2924126	4.6	35	16	0	0	0	0	0	0
Flddup2	FR45B92373	3600	18000	0	0	0	0	0	0	0
Flddup2	W192374	0	110	0	0	0	0	0	0	0
Flddup2	C2C2924165	0	6	2	0	0	0	0	0	0
Flddup2	W09O1472	0	47	1.7	0	0	0	0	0	0
Flddup2	FC7A2N0474	0	22	0	0	0	0	0	0	0
Flddup2	FC2-9B2.5N1775	0	0	0	0	0	0	0	0	0
Flddup2	C6B2924755	42	720	100	640	340	0	11	20	0
Flddup2	C6B3924757	13	55	100	11	4.8	0	0	0	0
Flddup2	C4A2924127	5.4	41	18	0	0	0.0	0.0	0.0	0

TABLE F-1 Field Duplicate Da.. r OP and OC Pesticide Analysis

	Fixed Lab Sample	Heptachlor Epoxide (ppb)	Methoxychlor (ppb)	Toxaphene (ppb)	Fixed Lab OP analysis dilution	Dichlorvos (ppb)	Dimethoate (ppb)	Diazinon (ppb)	Disulfoton (ppb)	Parathion, methyl (ppb)
fIddup1	FR45B92372	0	0	0		0	0	0	0	0
fIddup1	W192373	0	0	0		0	0	0	0	0
fIddup1	C2B2924152	0	0	0		0	0	0	0	0
fIddup1	W09O1471	0	0	0		0	0	0	0	0
fIddup1	FC7A2N0473	0	0	0		0	0	0	0	0
fIddup1	FC2-9B2.5N1773	0	0	0		0	0	0	0	0
fIddup1	C6B2924754	0	0	0		1	0	10	1600	0
fIddup1	C6B3924756	0	0	0		1	0	10	44	0
fIddup1	C4A2924126	0	0	0		0	0	0	0	0
FIddup2	FR45B92373	0	0	0		0	0	0	0	0
FIddup2	W192374	0	0	0		0	0	0	0	0
FIddup2	C2C2924165	0	0	0		0	0	0	0	0
FIddup2	W09O1472	0	0	0		0	0	0	0	0
FIddup2	FC7A2N0474	0	0	0		0	0	0	0	0
FIddup2	FC2-9B2.5N1775	0	0	0		0	0	0	0	0
FIddup2	C6B2924755	0	0	0		0	0	0	1600	0
FIddup2	C6B3924757	0	0	0		0	0	0	48	0
FIddup2	C4A2924127	0	0	0		0	0	0	0	0

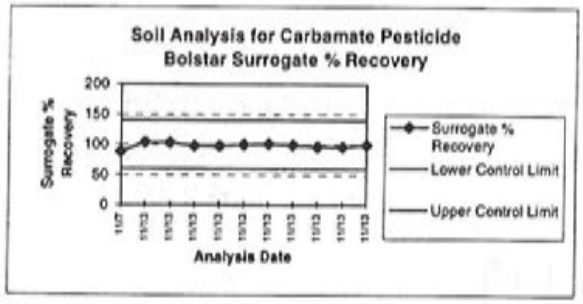
TABLE F-1 Field Duplicate Da or OP and OC Pesticide Analysis

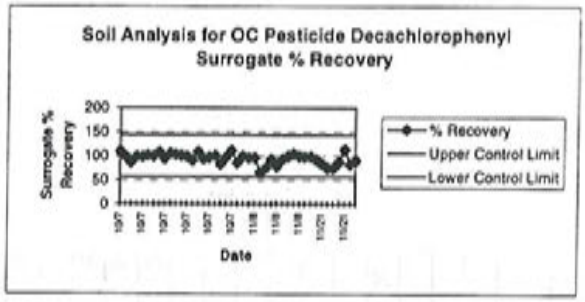
	Fixed Lab Sample	Malathion (ppb)	Parathion (ppb)	Azinphos, methyl (ppb)	Ethion (ppb)	Paraoxon, methyl (ppb)	Paraoxon, ethyl (ppb)	Paraquat (ppb)	Carbaryl (ppm)	Carbofuran (ppm)
flddup1	FR45B92372	0	5.5	3.1	0	0	0	0	0	0
flddup1	W192373	0	16000	3.1	0	0	0	0	0	0
flddup1	C2B2924152	0	5.5	3.1	0	0	0	0	0	0
flddup1	W09O1471	0	5.5	3.1	0	0	0	550	0.25	0.25
flddup1	FC7A2N0473	0	5.5	3.1	0	0	0	0	0	0
flddup1	FC2-9B2.5N1773	0	0	0	0	0	0	0	0	0
flddup1	C6B2924754	0	3.7	1600	0	0	0	0	0	0
flddup1	C6B3924756	0	3.7	44	0	0	0	0	0	0
flddup1	C4A2924126	0	3.75	3.15	0	0	0	0	0	0
Flddup2	FR45B92373	0	5.5	3.1	0	0	0	0	0	0
Flddup2	W192374	0	14000	3.1	0	0	0	0	0	0
Flddup2	C2C2924165	0	5.5	3.1	0	0	0	0	0	0
Flddup2	W09O1472	0	5.5	3.1	62	0	0	550	0.25	0.25
Flddup2	FC7A2N0474	0	5.5	3.1	0	0	0	0	0	0
Flddup2	FC2-9B2.5N1775	0	0	0	0	0	0	0	0	0
Flddup2	C6B2924755	0	0	0	0	0	0	0	0	0
Flddup2	C6B3924757	0	0	0	0	0	0	0	0	0
Flddup2	C4A2924127	0	0	0	0	0	0	0	0	0

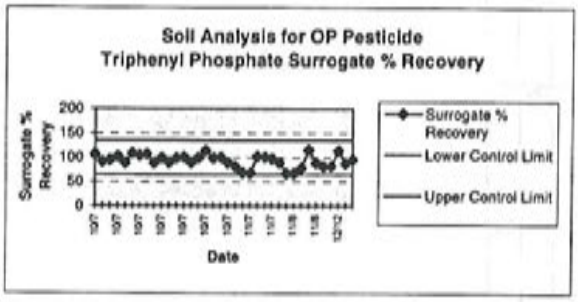
TABLE F-1 Field Duplicate Da ,r OP and OC Pesticide Analysis

	Fixed Lab Sample	TCLP Arsenic (ppm)	TCLP Barium (ppm)	TCLP Cadmium (ppm)	TCLP Chromium (ppm)	TCLP Lead (ppm)	TCLP Selenium (ppm)	TCLP Silver (ppm)	TCLP Mercury (ppm)
flddup1	FR45B92372	0	0	0	0	0	0	0	0
flddup1	W192373	0	0	0	0	0	0	0	0
flddup1	C2B2924152	0	0	0	0	0	0	0	0
flddup1	W09O1471	0.57	0.72	0.04	0.031	0.33	0.29	0.032	0.001
flddup1	FC7A2N0473	0	0	0	0	0	0	0	0
flddup1	FC2-9B2.5N1773	0	0	0	0	0	0	0	0
flddup1	C6B2924754	0	1	0	0	0	0	0	0
flddup1	C6B3924756	0	1	0	0	0	0	0	0
flddup1	C4A2924126	0	0	0	0	0	0	0	0
Flddup2	FR45B92373	0	0	0	0	0	0	0	0
Flddup2	W192374	0	0	0	0	0	0	0	0
Flddup2	C2C2924165	0	0	0	0	0	0	0	0
Flddup2	W09O1472	0.59	0.84	0.04	0.043	2.7	0.26	0.01	0.001
Flddup2	FC7A2N0474	0	0	0	0	0	0	0	0
Flddup2	FC2-9B2.5N1775	0	0	0	0	0	0	0	0
Flddup2	C6B2924755	0	0	0	0	0	0	0	0
Flddup2	C6B3924757	0	0	0	0	0	0	0	0
Flddup2	C4A2924127	0	0	0	0	0	0	0	0

FIGURE F-1. Soil Analysis Surrogate % Recovery







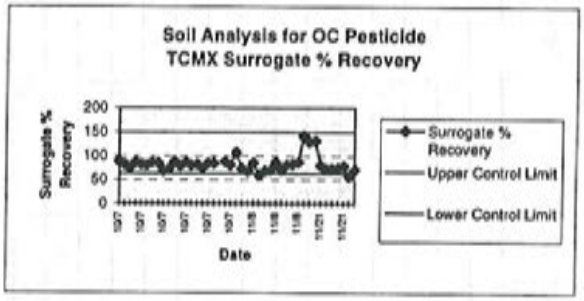


FIGURE F-2. Waste Analysis Surrogate % Recovery

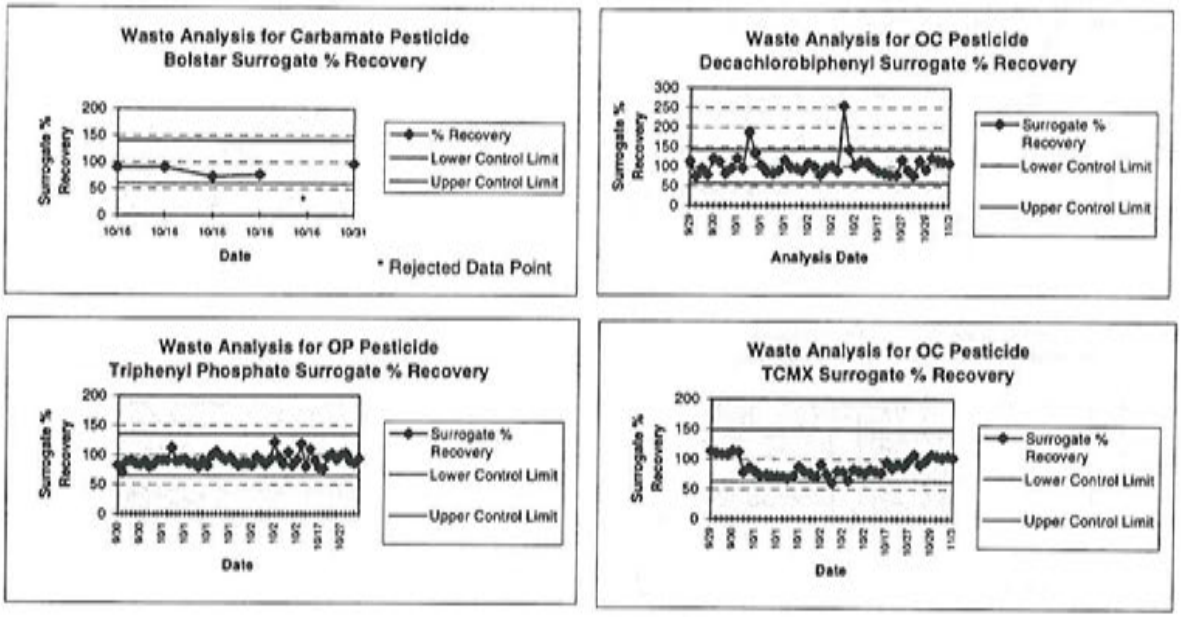
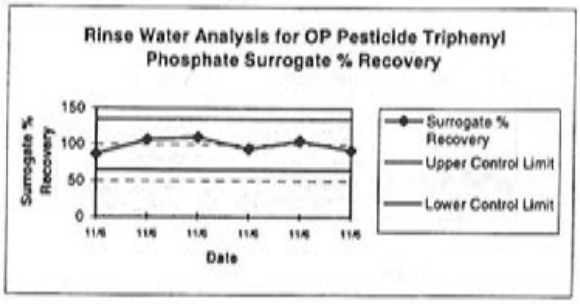
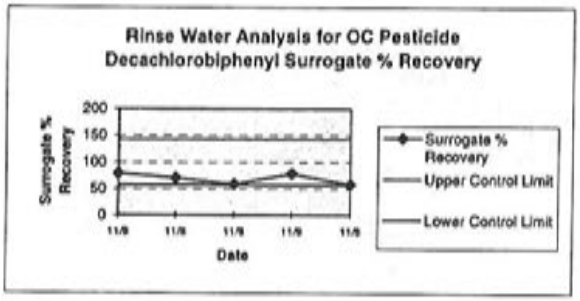


FIGURE F-3. Rinse Water Analysis Surrogate % Recovery





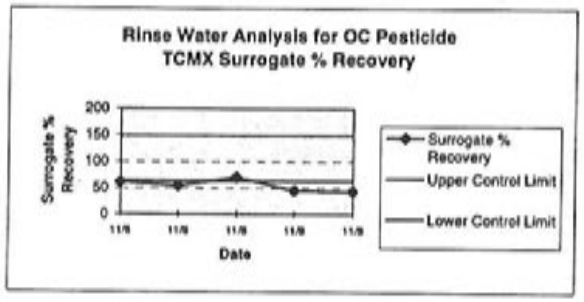
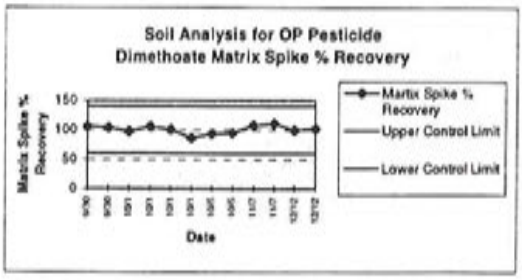
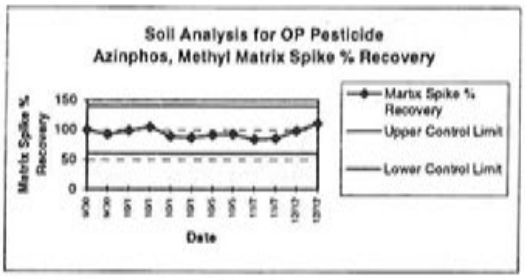
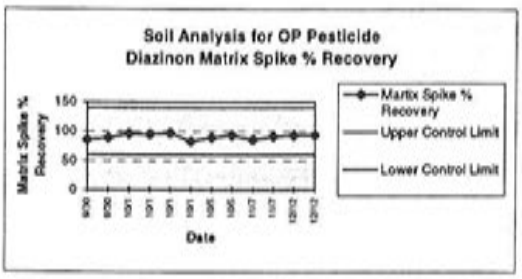
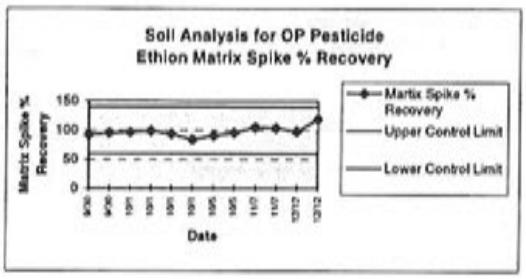


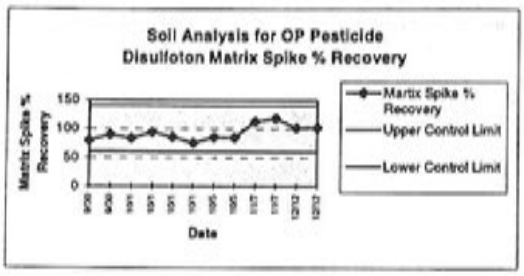
FIGURE F-4. Soil Analysis for OP and Carbamate Pesticides Matrix Spike % Recovery

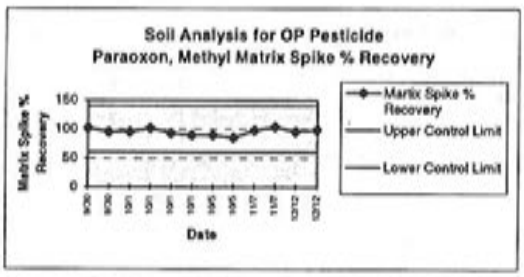


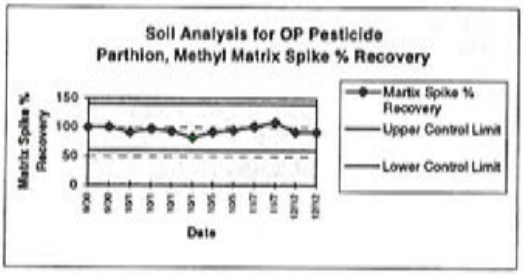


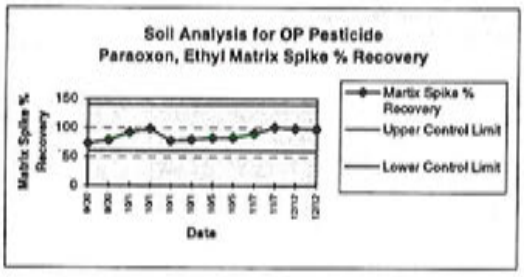


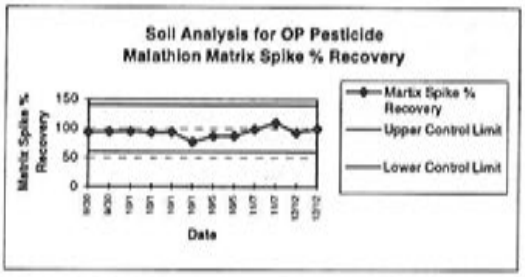


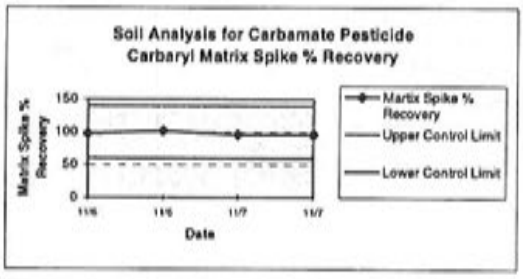


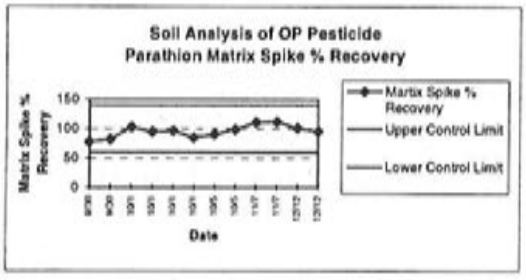












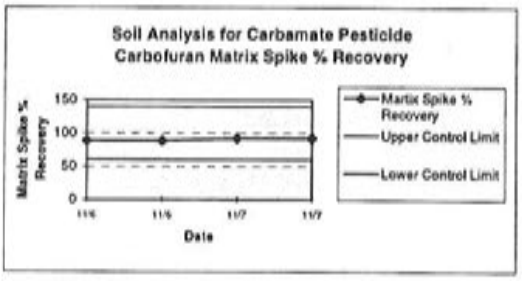
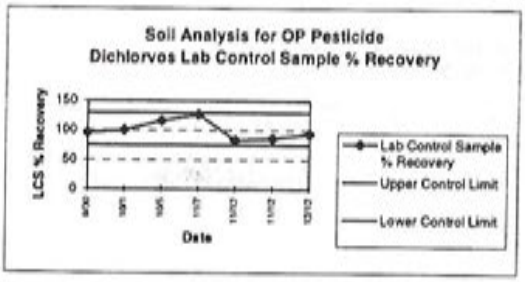
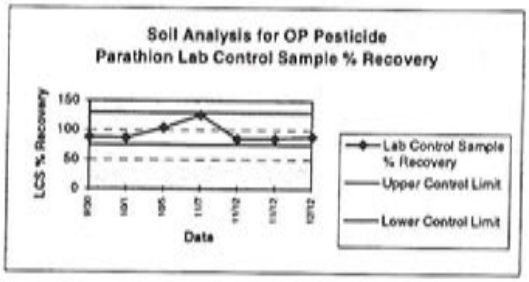
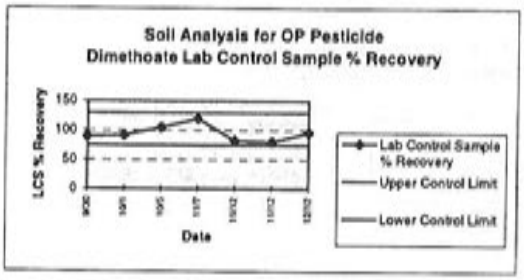
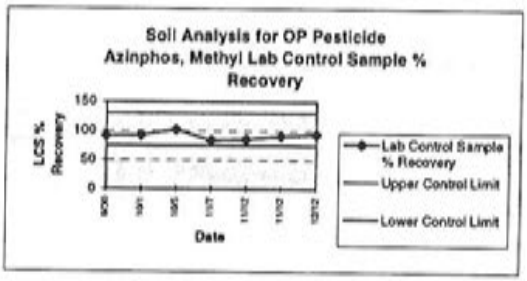


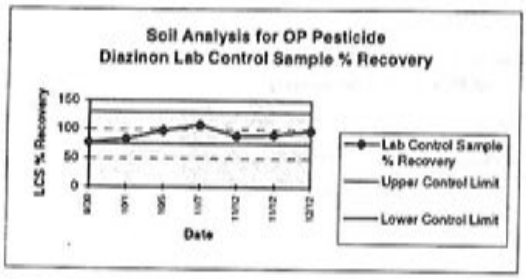
FIGURE F-5. Soil Analysis for OP Pesticides LCS % Recovery

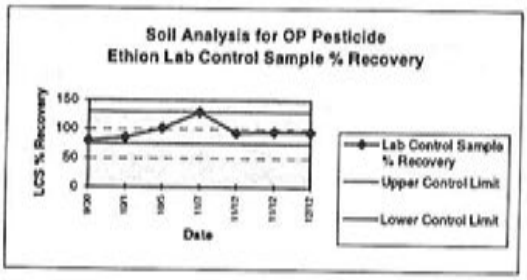


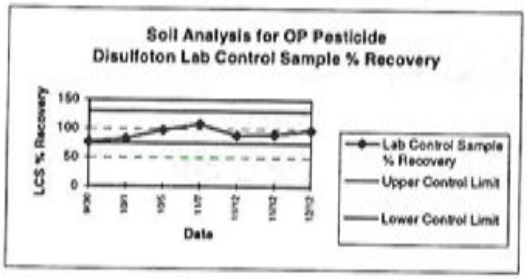


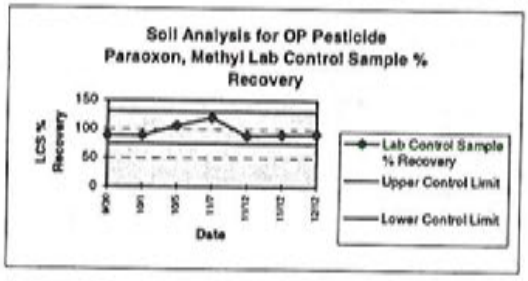


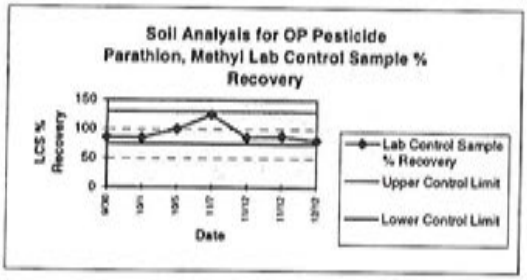


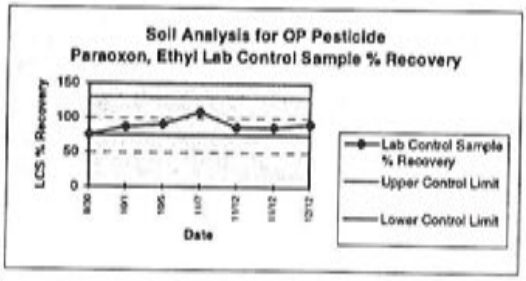












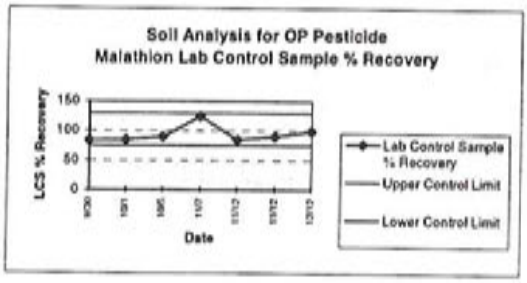
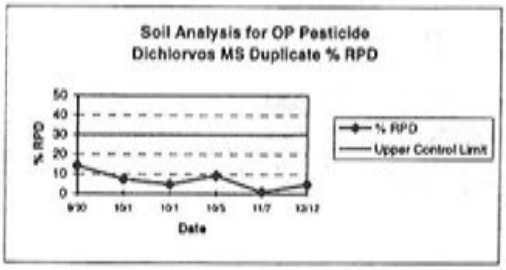
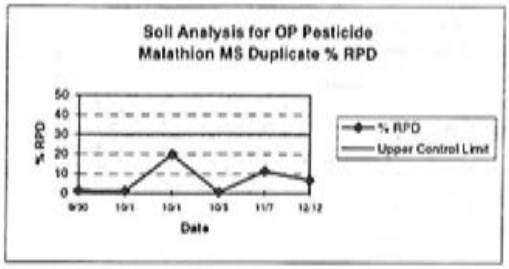
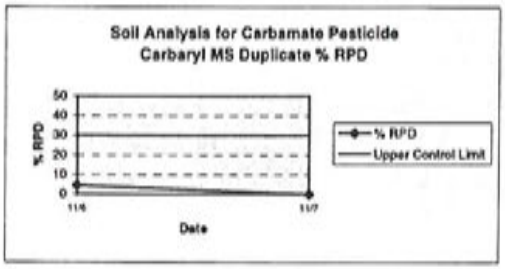
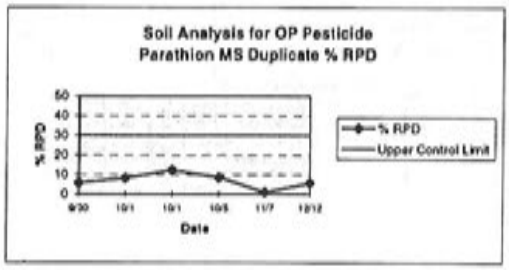


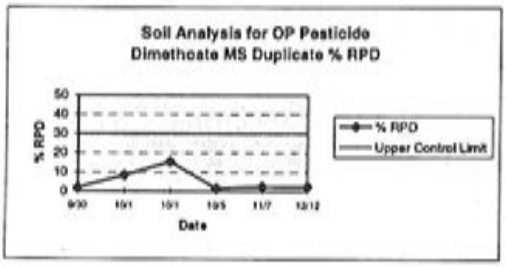
FIGURE F-6. Soil Analysis for OP and Carbamate Pesticides MS Duplicate % RPD

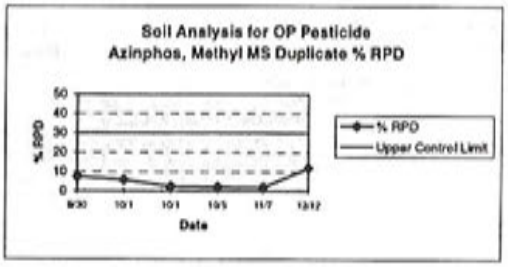


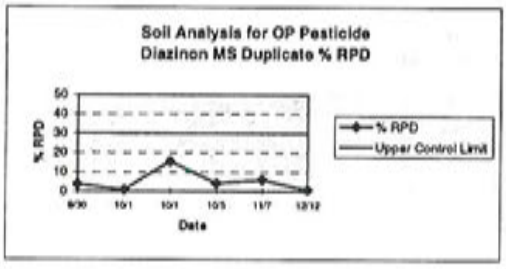


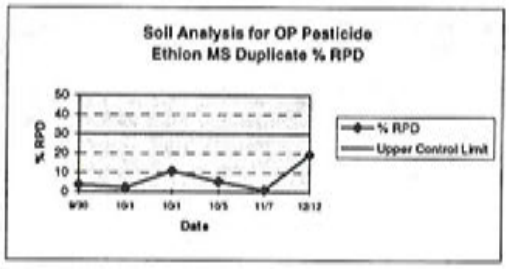


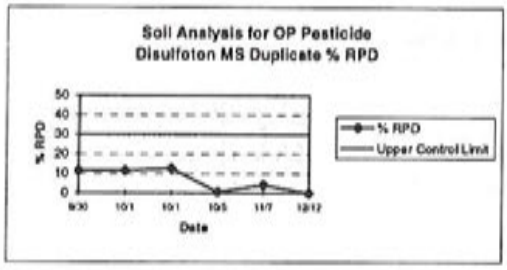


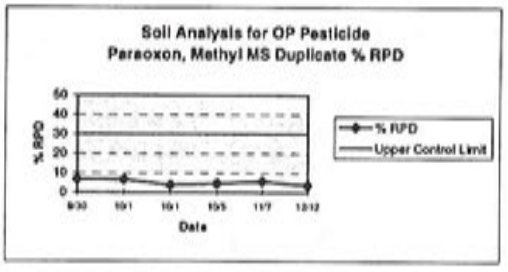


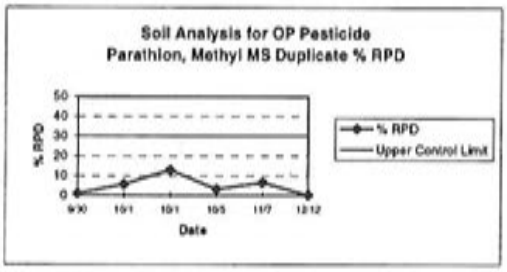












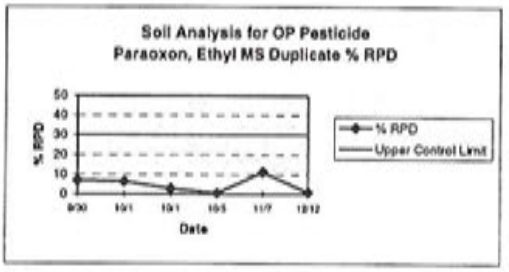
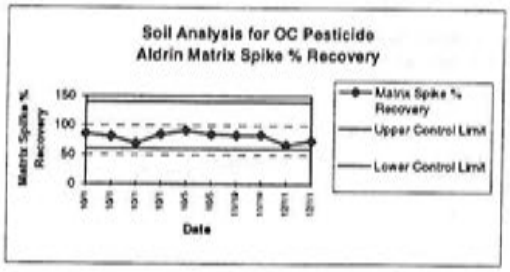
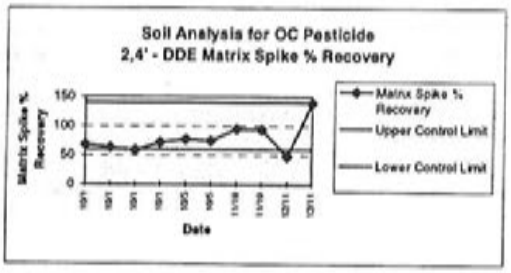
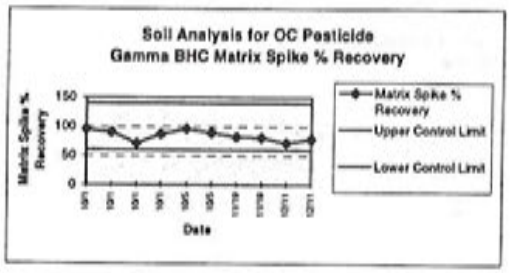
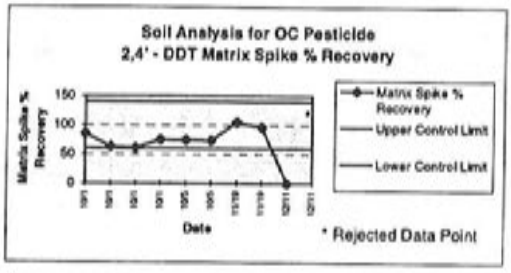


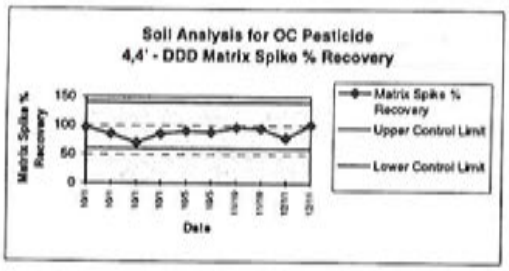
FIGURE F-7. Soil Analysis for OC Pesticide Matrix Spike % Recovery

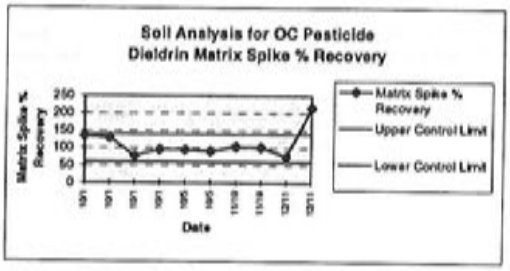


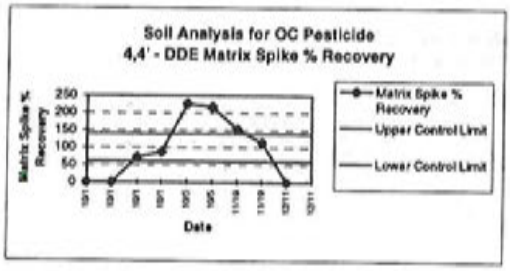


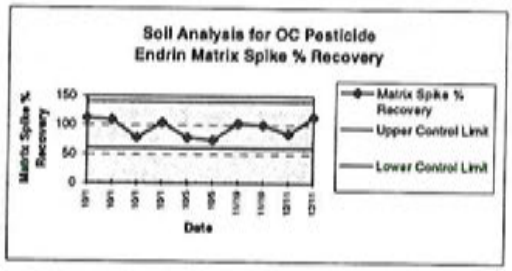


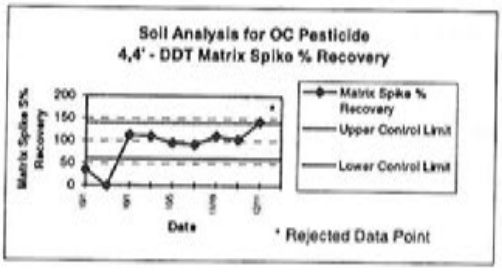


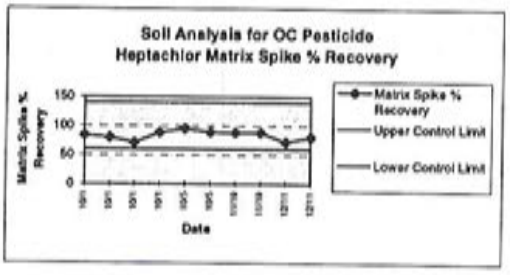












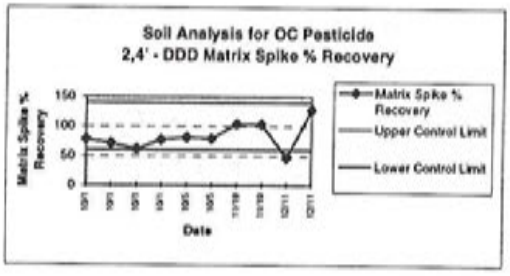
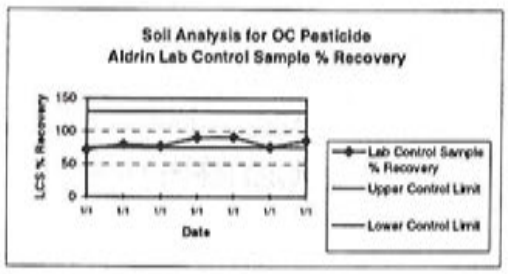
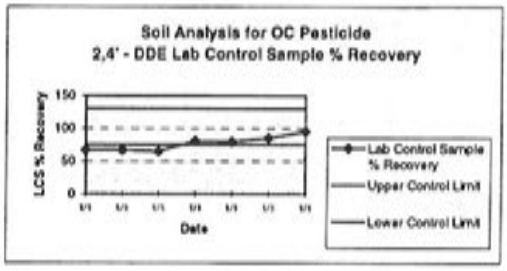
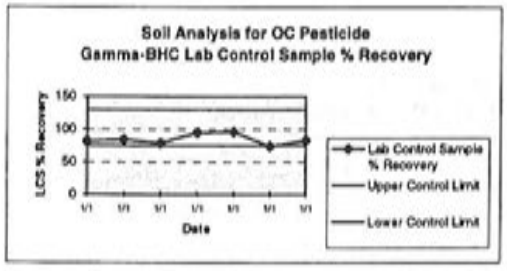
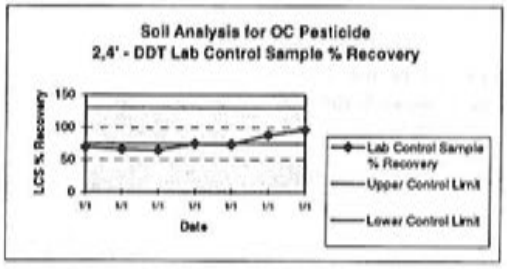


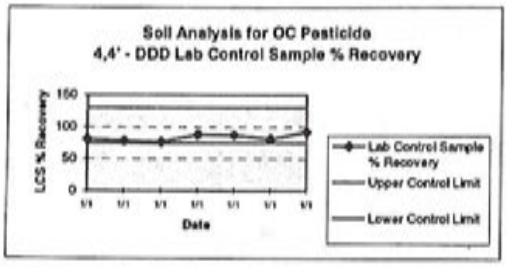
FIGURE F-8. Soil Analysis for OC Pesticide LCS % Recovery

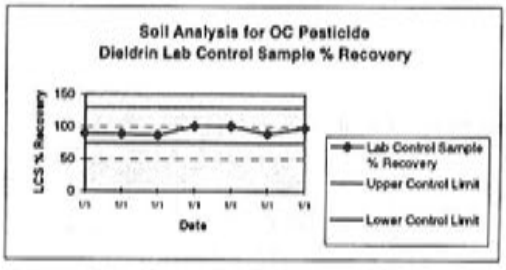


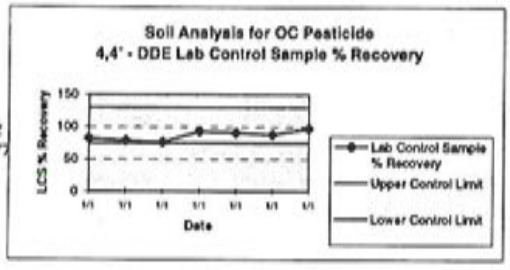


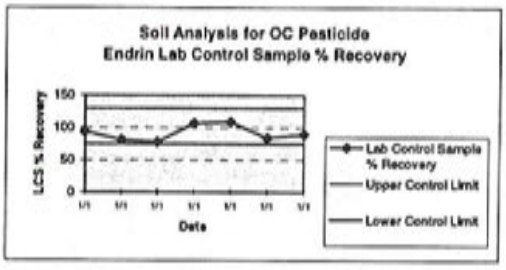


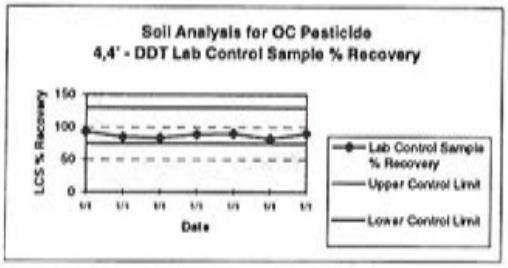


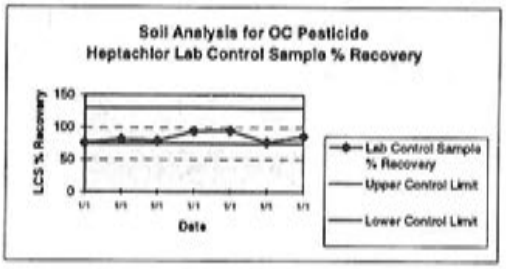












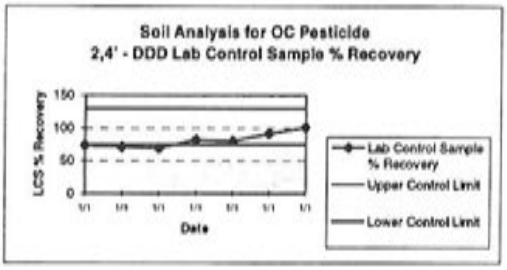
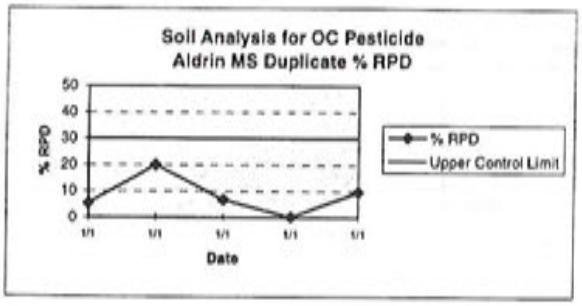
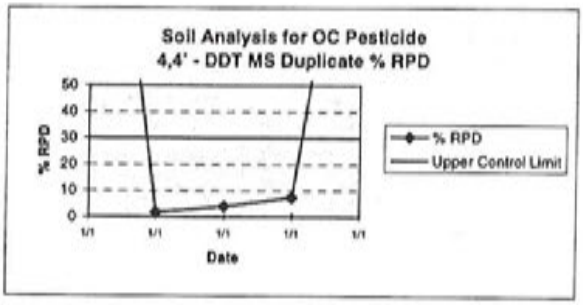
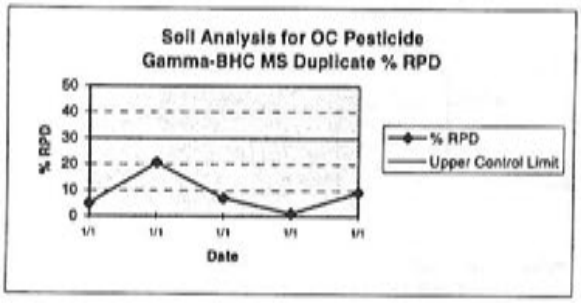
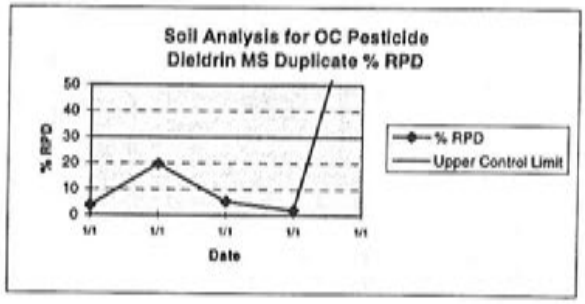


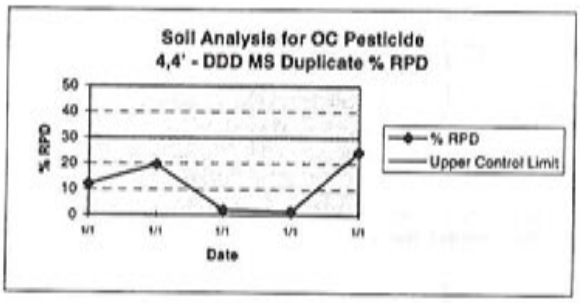
FIGURE F-9. Soil Analysis for OC Pesticide MS Duplicate % RPD

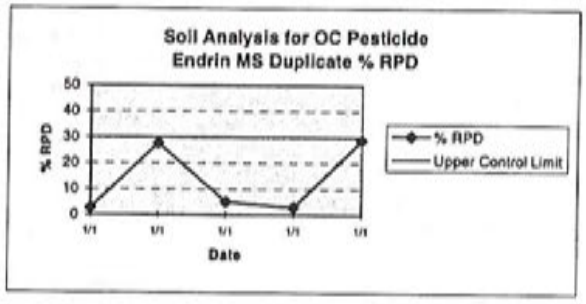


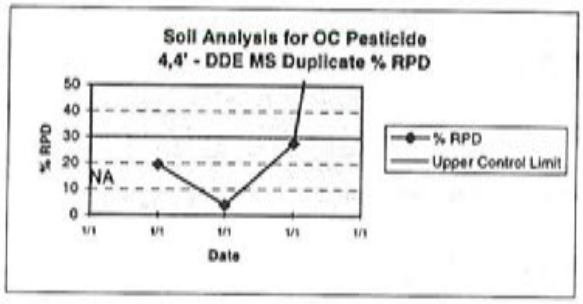












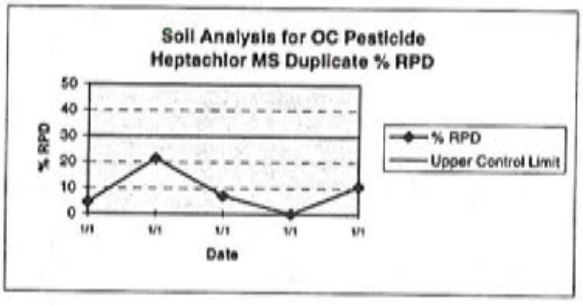
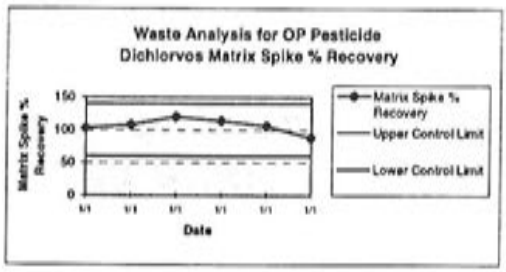
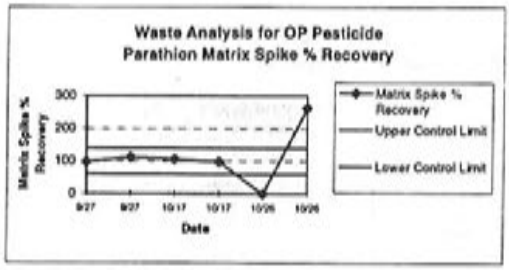
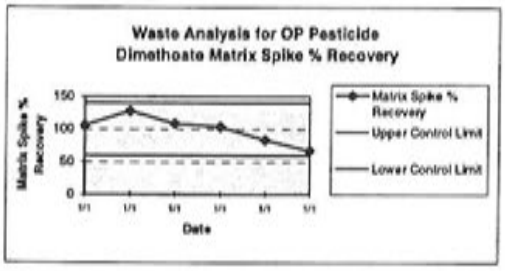
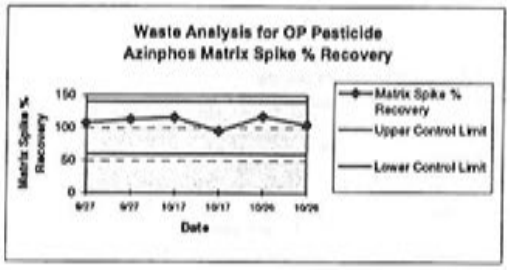


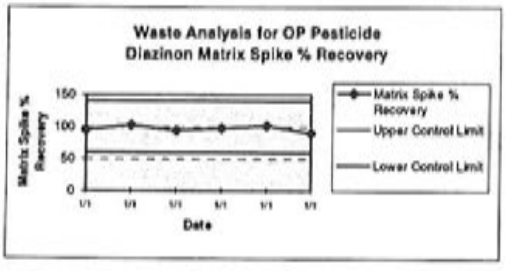
FIGURE F-10. Waste Analysis for OP Pesticide Matrix Spike % Recovery

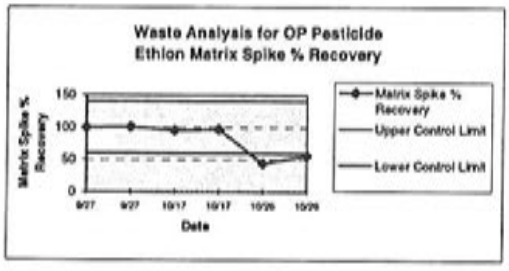


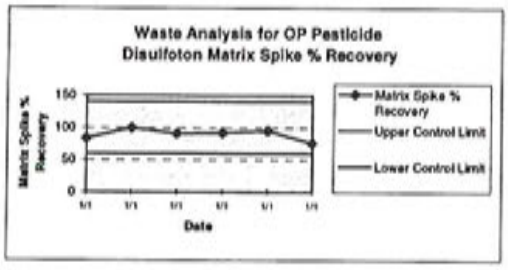


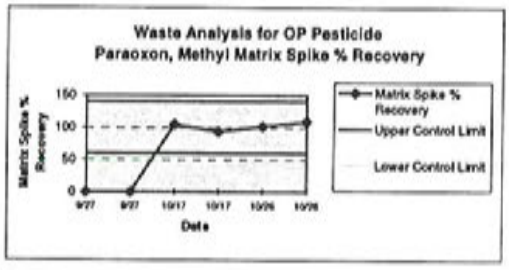


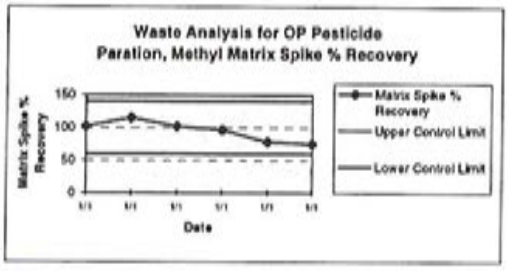


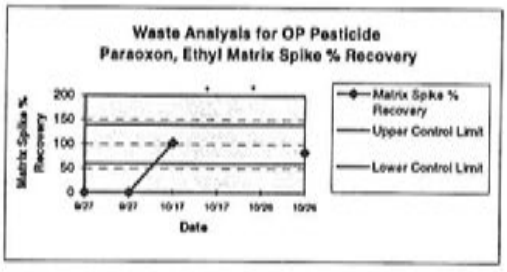


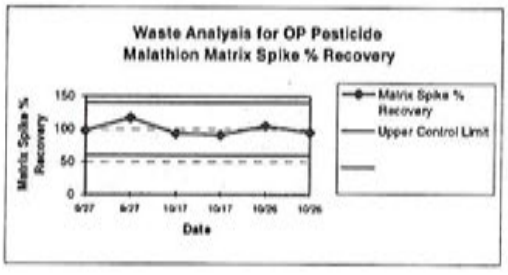












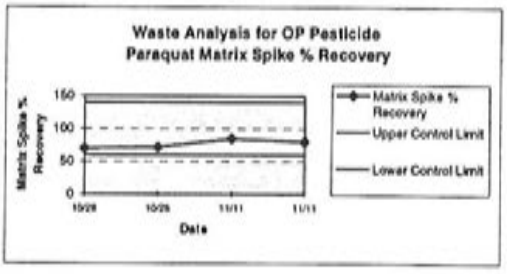
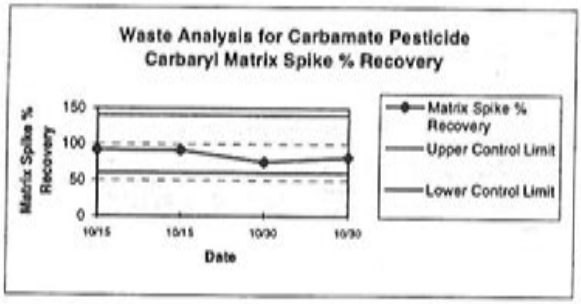


FIGURE F-11. Waste Analysis for Carbamate Pesticide Matrix Spike % Recovery



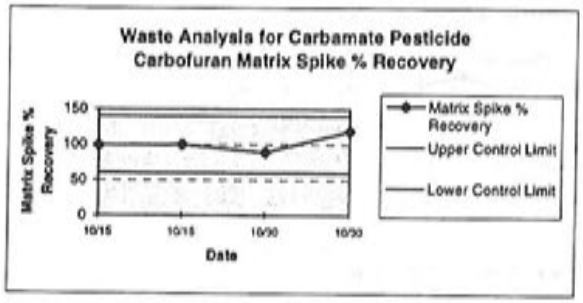
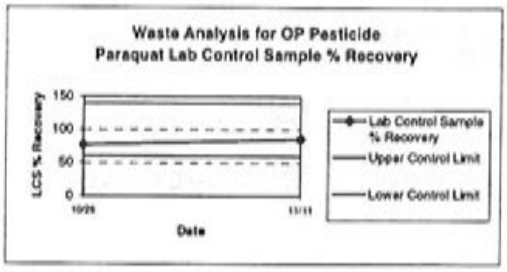
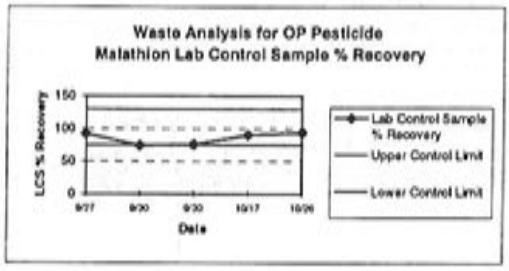
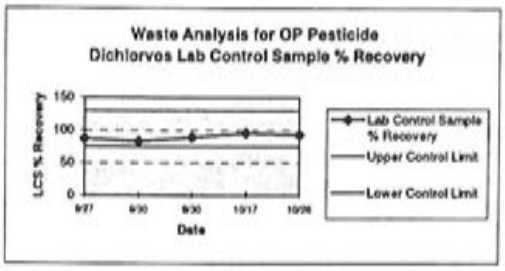
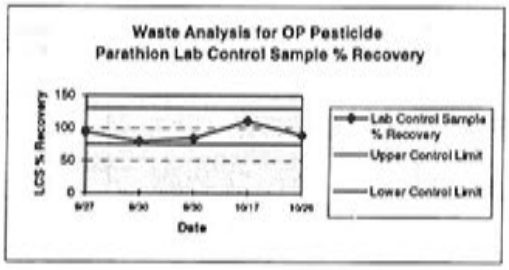


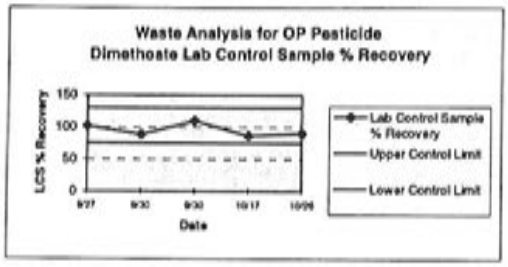
FIGURE F-12. Waste Analysis for OP Pesticide LCS % Recovery

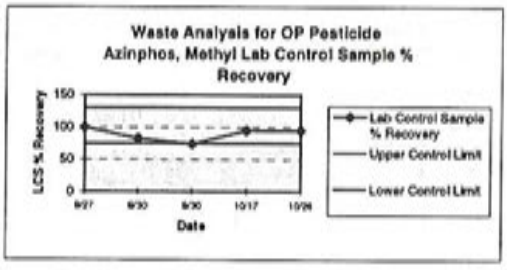


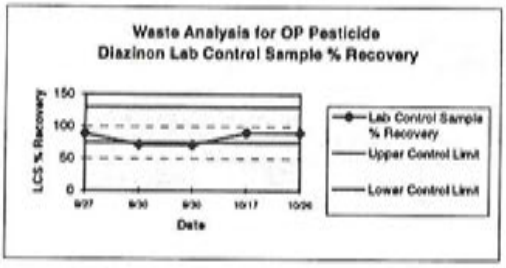


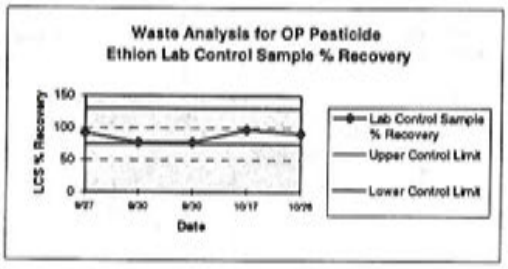


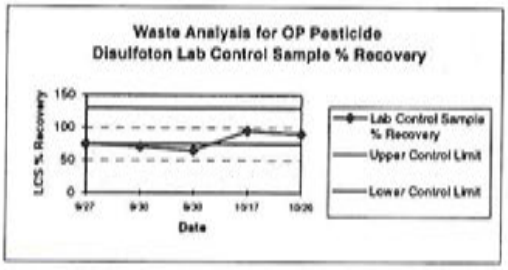


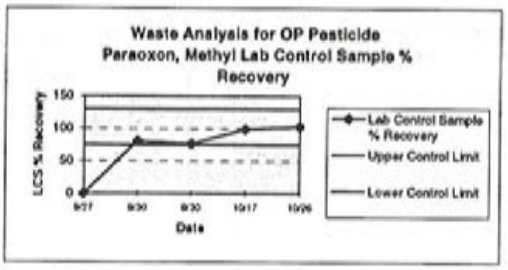


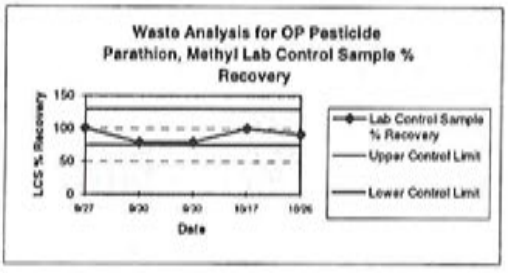












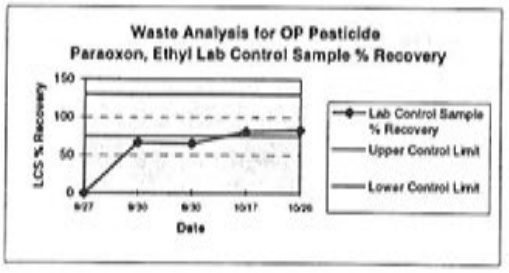
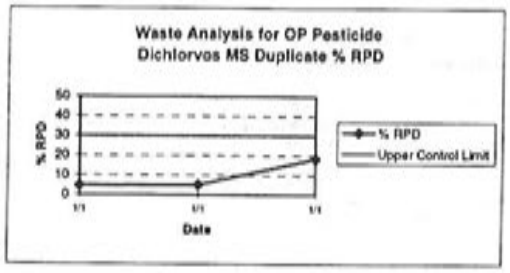
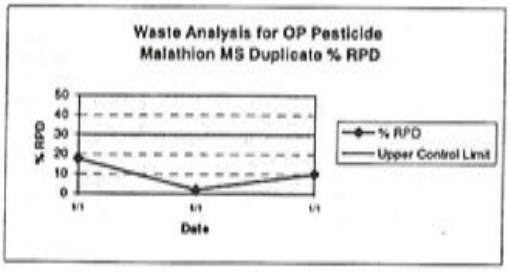
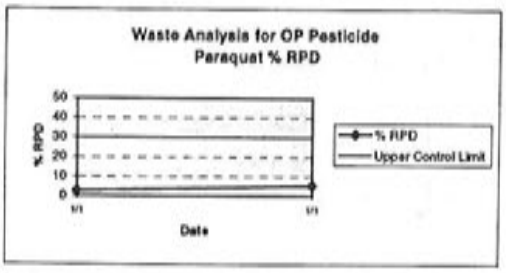
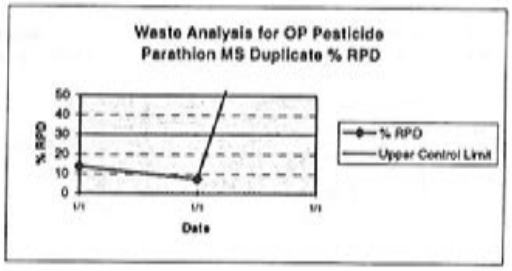


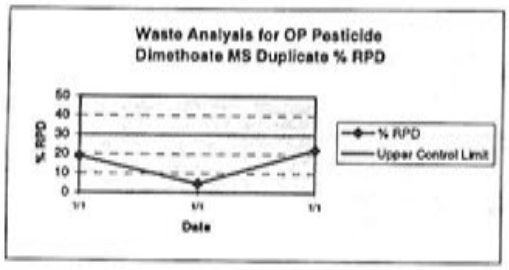
FIGURE F-13. Waste Analysis for OP Pesticide MS Duplicate % RPD

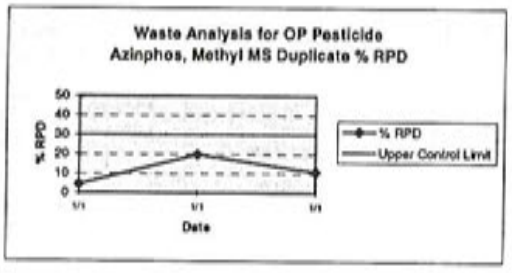


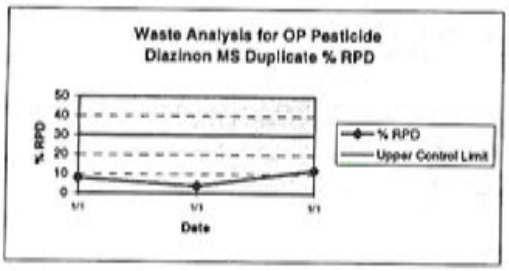


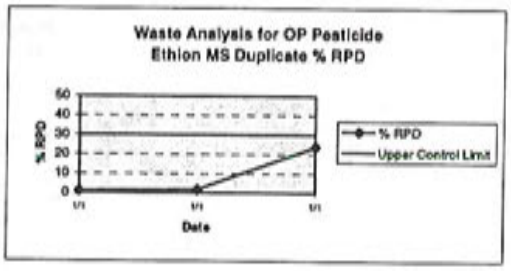


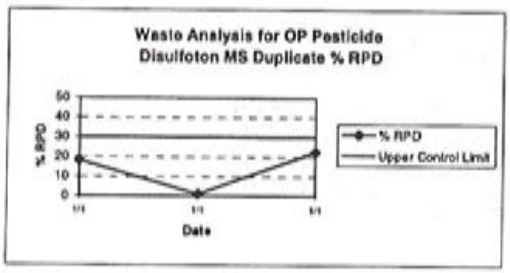


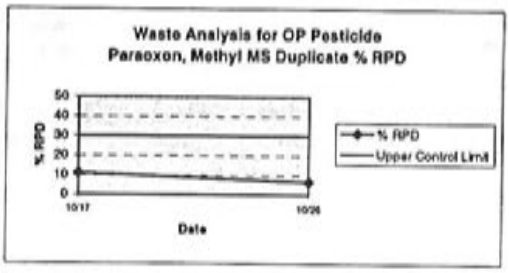


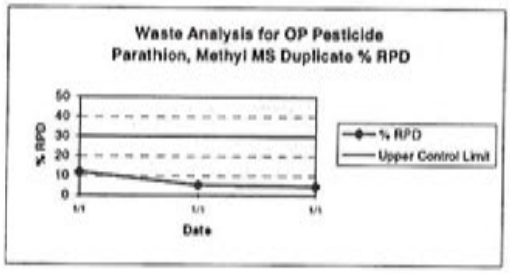












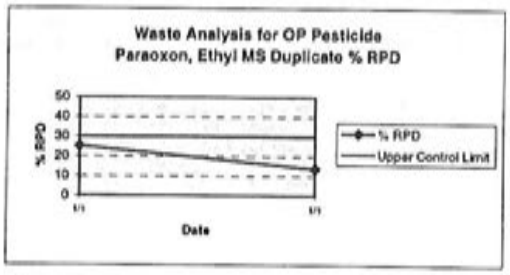
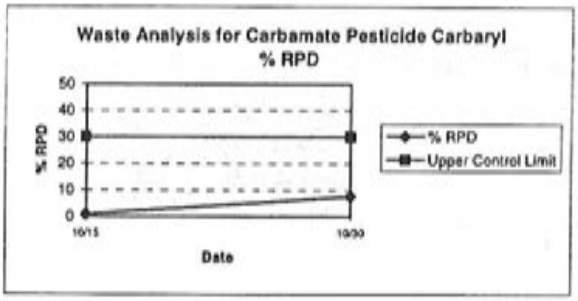


FIGURE F-14. Waste Analysis for Carbamate Pesticide MS Duplicate % RPD



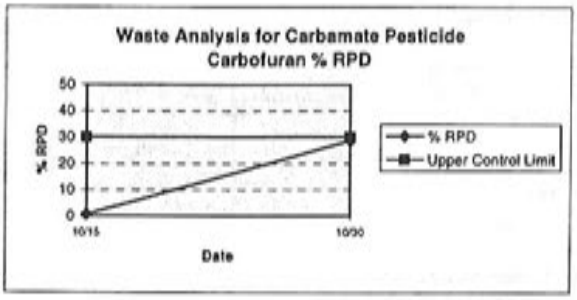
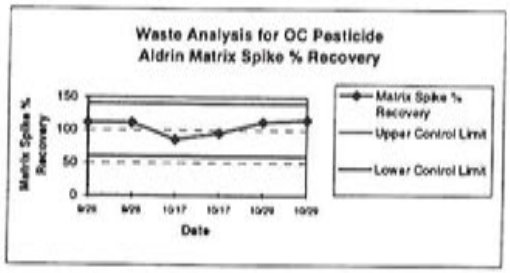
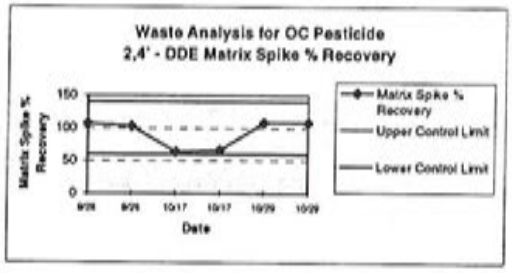
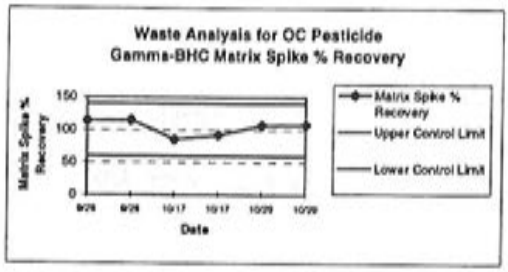
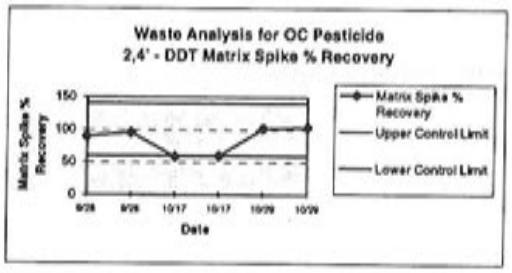


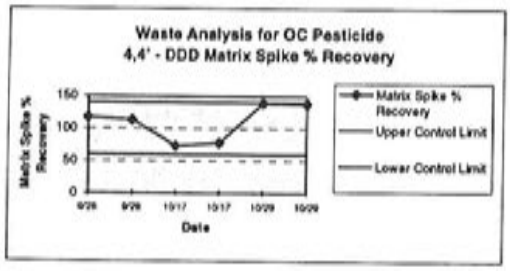
FIGURE F-15. Waste Analysis for OP Pesticide Matrix Spike % Recovery

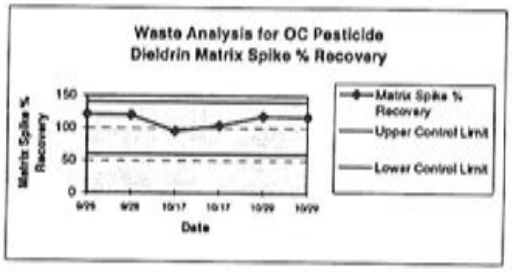


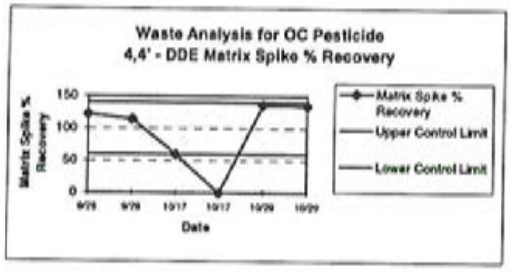


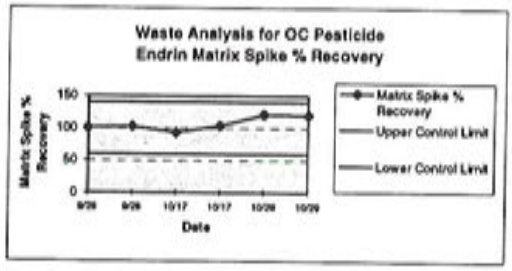


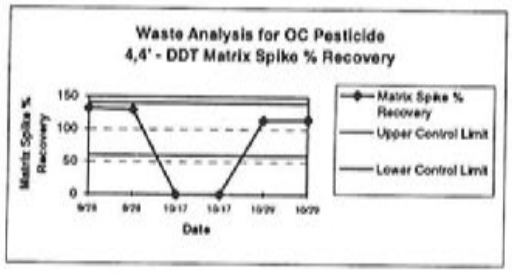


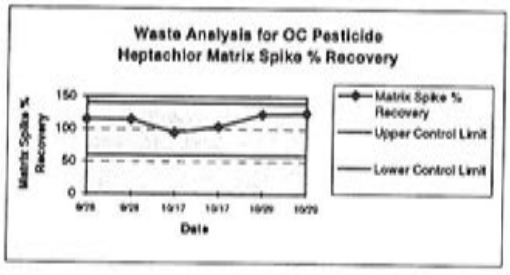












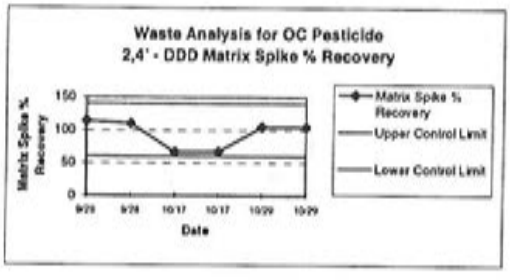
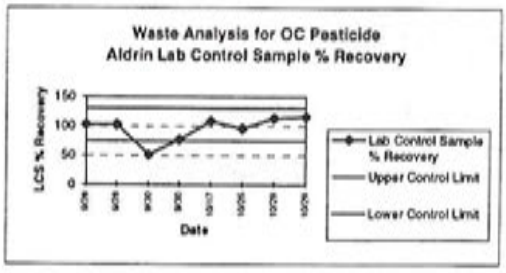
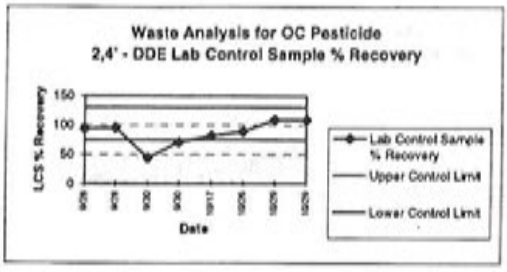
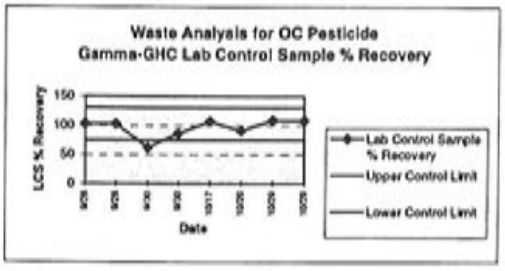
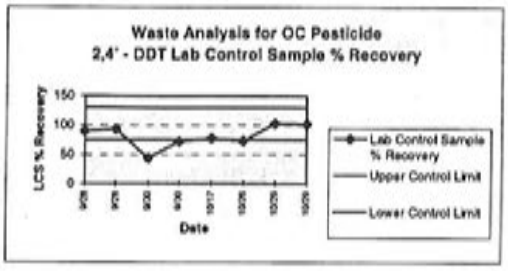


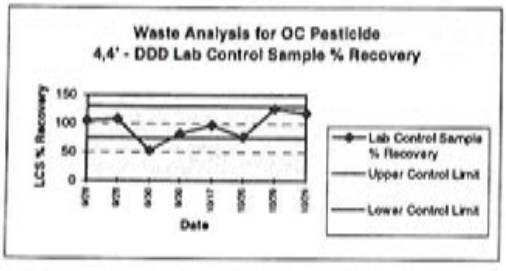
FIGURE F-16. Waste Analysis for OP Pesticide LCS % Recovery

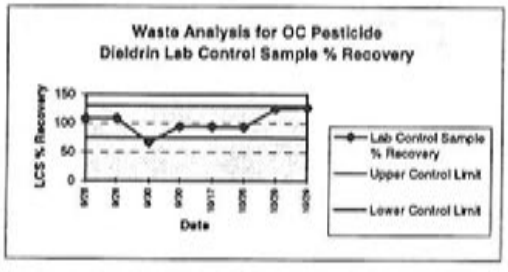


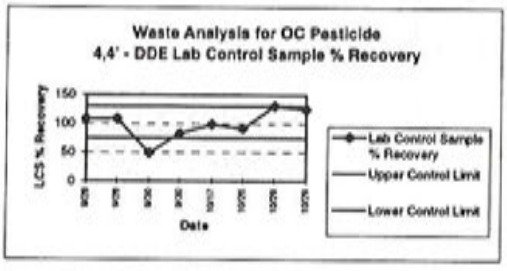


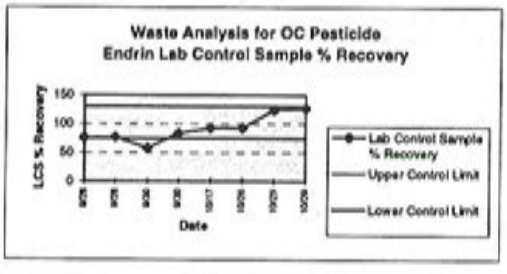


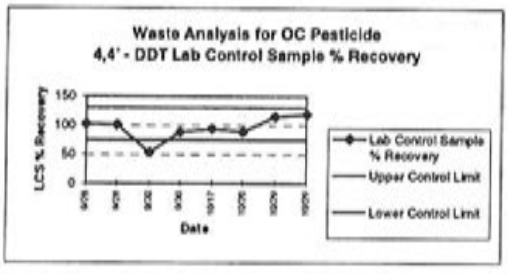


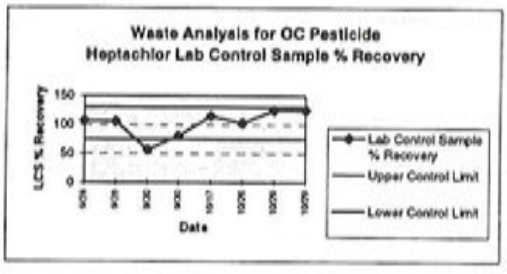












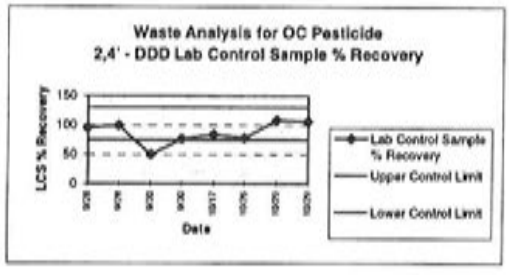
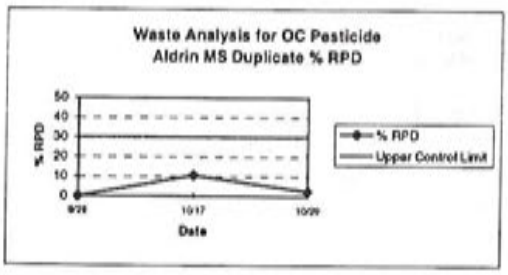
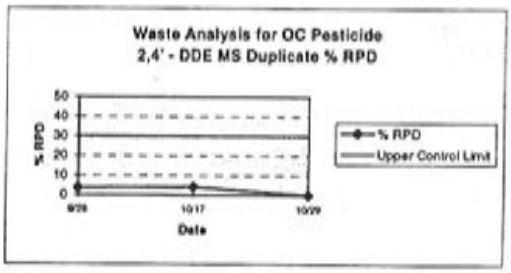
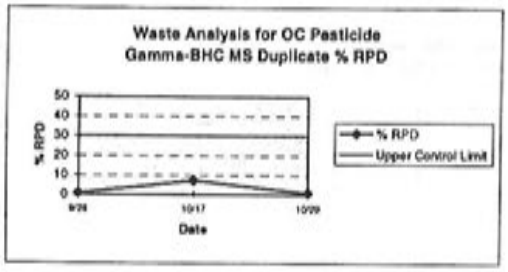
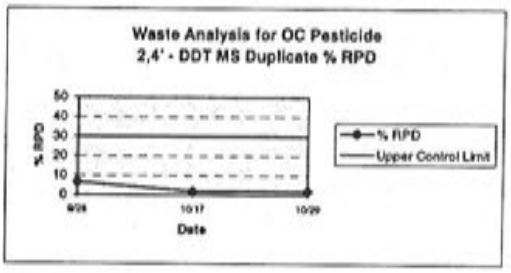


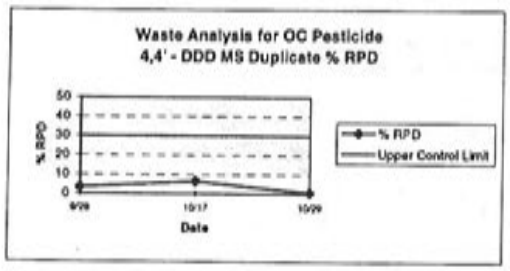
FIGURE F-17. Waste Analysis for OP Pesticide MS Duplicate % RPD

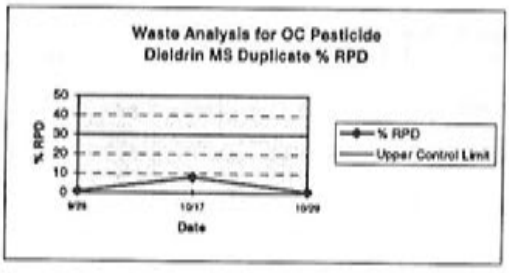


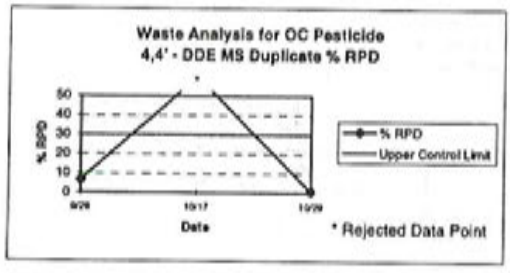


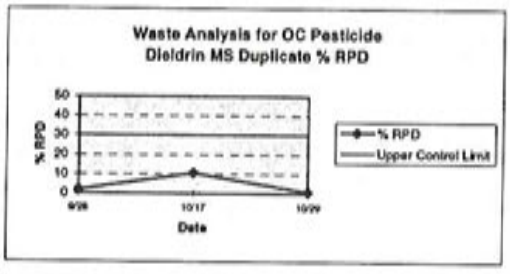


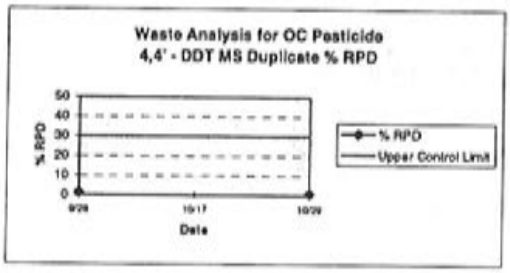


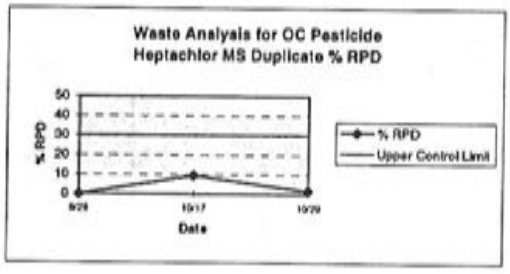












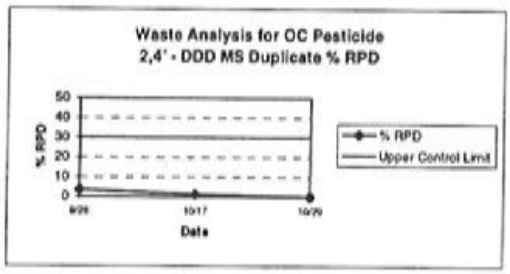


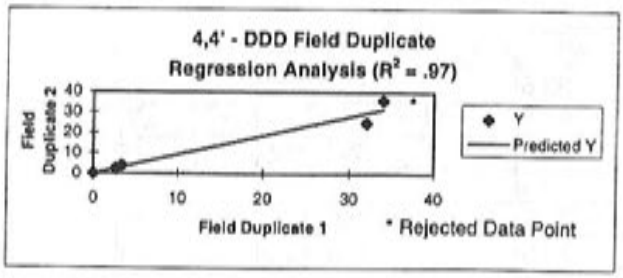
TABLE F-2. Rinse Water Analysis for OP Pesticides QC Data

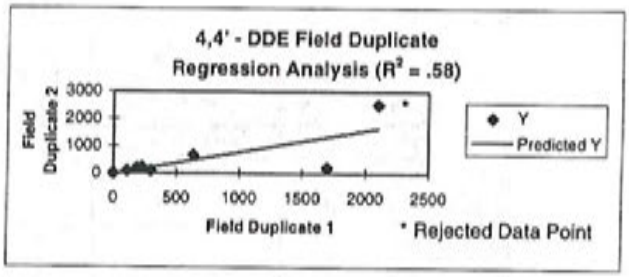
Compound	Sample #	Date	LCS%Rec	LCSDup%Rec	RPD	MS %Rec
Dichlorvos	EBGSAN0473	11/6/97	93.8	91.2	2.8	88
Dimethoate	"	"	68.6	77.8	12.6	76
Diazinon	"	"	74.6	78	4.5	69
Disulfoton	"	"	80	81	1.2	75
Parathion, methyl	"	"	82.2	93	12.3	85
Malathion	"	"	75.6	88.4	15.6	77
Parathion, methyl	"	"	75.4	88.6	16.1	85
Azinphos, methyl	"	"	86.4	85.4	1.2	106
Ethion	"	"	85.6	77.2	10.3	79
Paraoxon, methyl	"	"	76	78.8	3.6	75
Paraoxon, ethyl	"	"	65.2	71	8.5	74

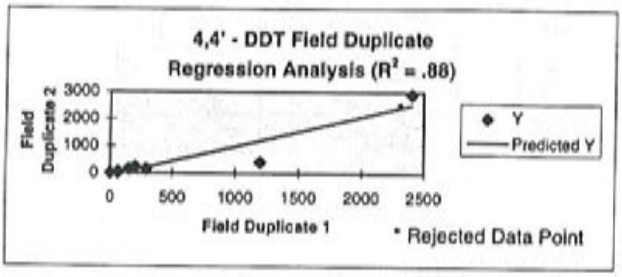
TABLE F-3. Rinse Water Analysis for OC Pesticide QC Data

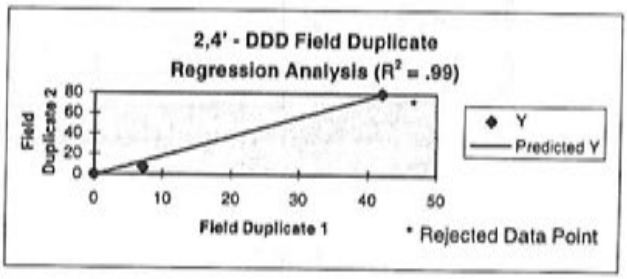
Compound	Sample #	Date	LCS%Rec	LCSDup%Rec	RPD
Aldrin	EBGSAN0473	11/6/97	75.2	77.1	2.5
gamma-BHC	"	"	77.9	76.6	1.7
4,4' - DDD	"	"	88.4	84.2	4.9
4,4' - DDE	"	"	98.2	88.5	10.4
4,4' - DDT	"	"	101	94.3	6.9
2,4' - DDD	"	"	92.1	84.4	8.7
2,4' - DDE	"	"	90.2	84	7.1
2,4' - DDT	"	"	92.4	84.7	8.7
Dieldrin	"	"	91.7	89.4	2.5
Endrin	"	"	90.5	88.3	2.5
Heptachlor	"	"	77.9	79.4	1.9

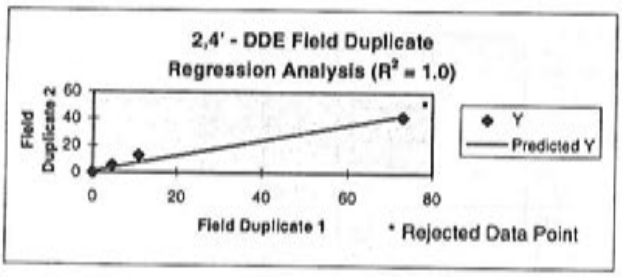
FIGURE F-18. Field Duplicate Regression Analysis for OP and OC Pesticide

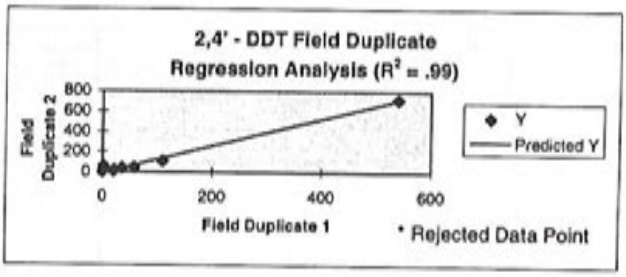


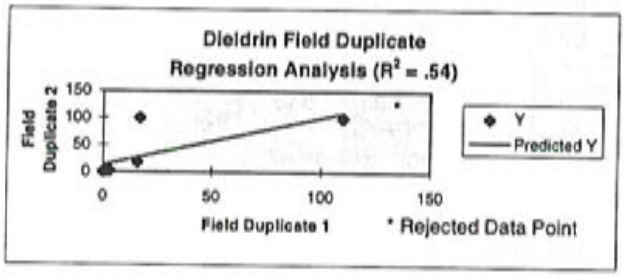


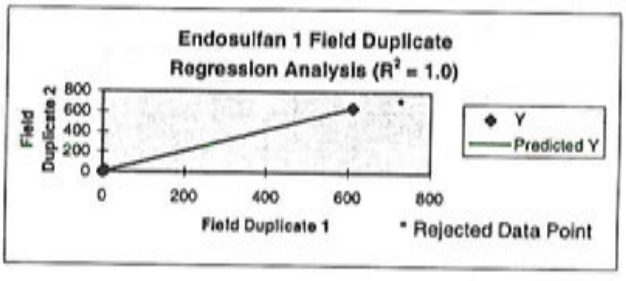












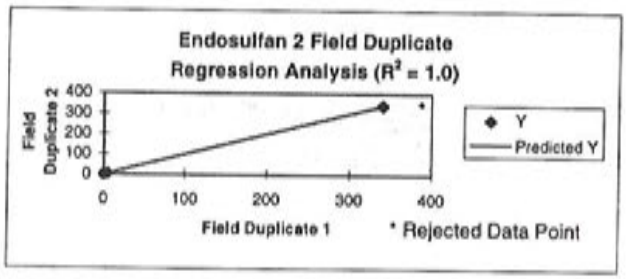
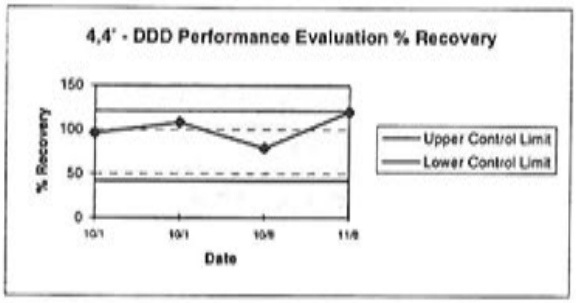
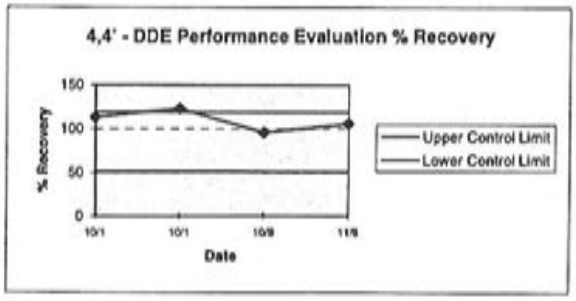
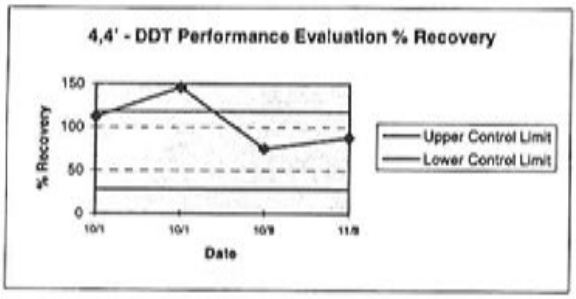
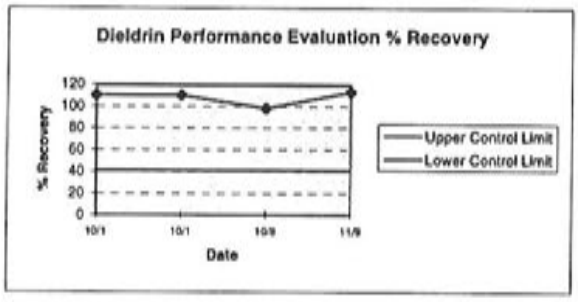


FIGURE F-19. Performance Evaluation for OP Pesticide









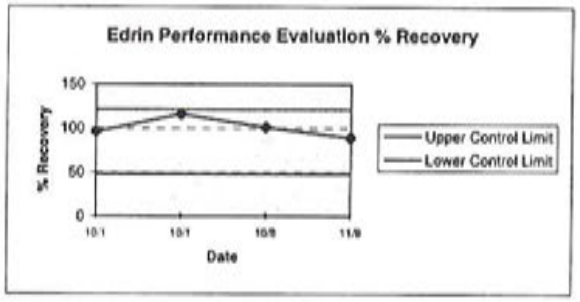
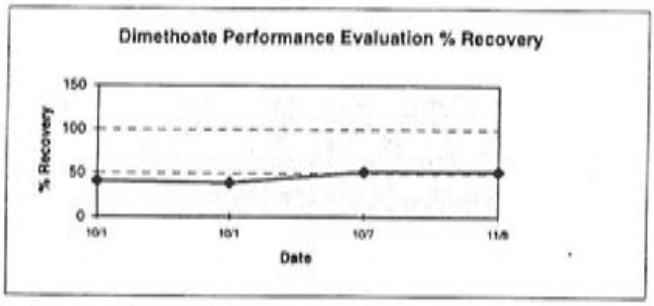
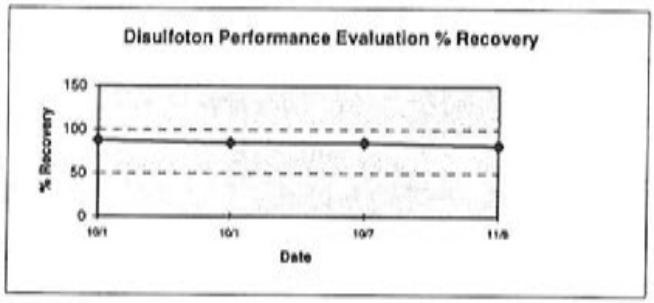
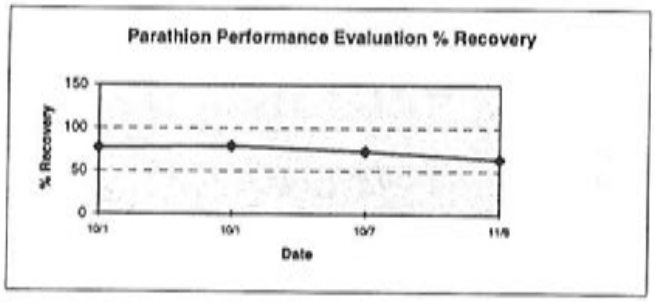


FIGURE F-20. Performance Evaluation for OC Pesticide







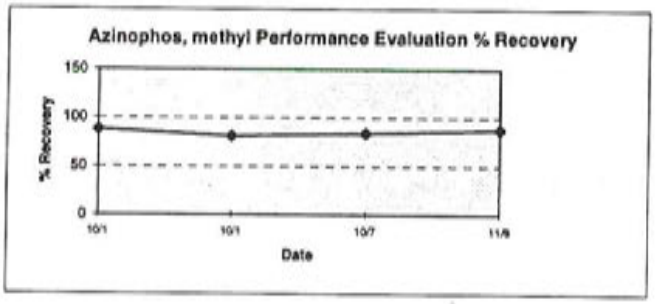
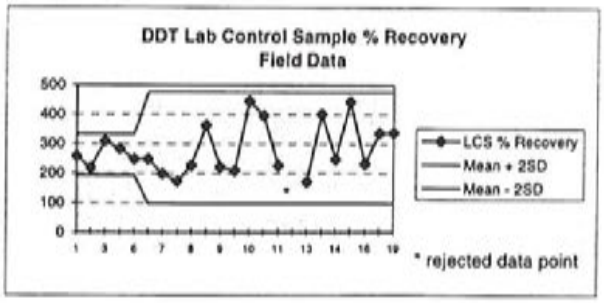


FIGURE F-21. Field Data LCS % Recovery for DDT and Chlordane



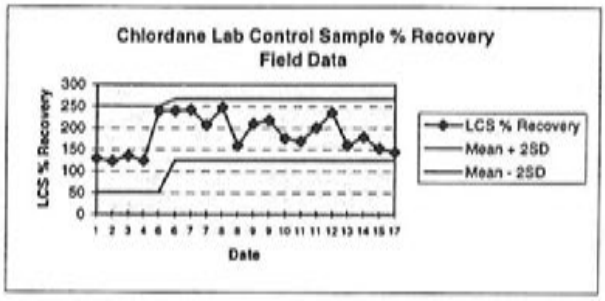
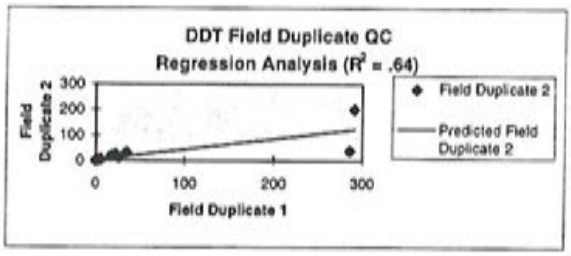


FIGURE F-22. Field Duplicate Regression Analysis for DDT and Chlordane



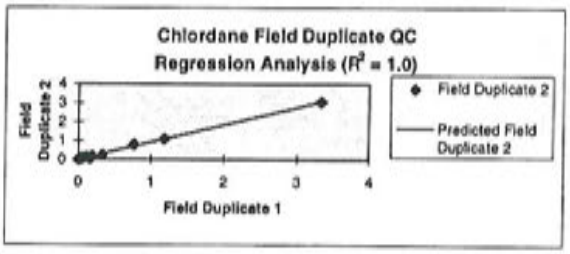
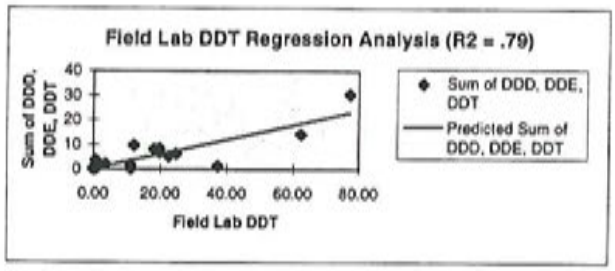
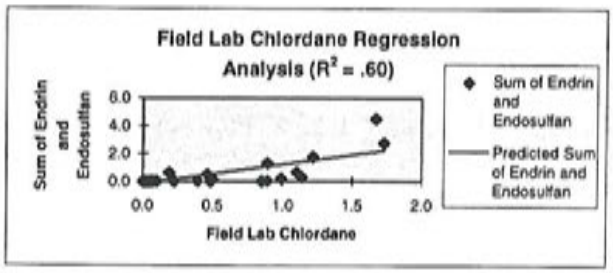


FIGURE F-23. Correlation of Immunoassay vs. Fixed Lab for DDT and Chlordane





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Appendix G

Field Laboratory Immunoassay Results, Calculations, and Analytical Batch Quality Assessments

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TABLE G-1. DDT Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
1	45B2	0.32	FD1	290.72
1	45B3	0.37	FD2	201.53
1	45C1	1.35		0.15
1	45A4	0.53		62.39
1	23A5	0.6		37.35
1	23B6A	1.41	LD1	0.10
1	23B6B	1.52	LD2	0.04
1	23B7	0.36		216.85
1	23C8	1.49		0.05
1	LCS1	0.65		25.89
1	W1-3	0.92		3.58
1	W4-5	0.5		77.73
1	WCANS6	1.62		0.02
2	9A1	1.16		12.15
2	9B1	1.18		11.18
2	9C1	0.98		25.85
2	8B1	0.75		67.79
2	8C1	0.82		50.55
2	7B1	1.04		20.10
2	7C1	1.4	FD1	4.44
2	7C1	1.41	FD2	4.26
2	6B1	0.91	FD1	34.66
2	6B1	0.93	FD2	31.88
2	6C1	1.61		1.84
2	5B1	1.03		20.96
2	5C1	1.02	LD1	21.86
2	5C1A	0.99	LD2	24.79
2	LCS1	1.02	LCS	21.86
3	5C2	0.97		3.22
3	5B2	0.88		6.09
3	5B3	1.67		0.02
3	5A3	1.34	FD1	0.24
3	3C1	1.1	LD1	1.28
3	5A3	1.26	FD2	0.41
3	7A1	0.71		20.26
3	3C1A	1.13	LD2	1.04
3	4B1	1.2		0.63
3	5A1	0.87	FD1	6.53
3	5A1	0.89	FD2	5.67
3	6A1	0.65		30.97
3	3B1	1.04		1.96
3	8A1	0.8		10.72
3	LCS1	0.65		30.97
4	5C3	1.8		0.12
4	3A1	1.65		0.30
4	2A1	0.96		19.75
4	1A1	0.96		19.75
4	1C1	1.43		1.14

TABLE G-1. DDT Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
4	4A1	0.52	FD1	285.45
4	7B2	1.56	LD1	0.52
4	4A1	0.85	FD2	38.51
4	8B2	0.69		101.71
4	2B1	1.04		12.15
4	1B1	0.92		25.18
4	7B2A	1.37	LD2	1.64
4	2C1	1.39	FD1	1.45
4	2C1	1.21	FD2	4.33
4	LCS1	0.9		28.43
5	2C2A	2.06	LD2	0.10
5	2C2	2.02	LD1	0.12
5	4C1	0.94	FD1	17.75
5	4C1	0.92	FD2	19.49
5	6B2	0.89	FD1	22.41
5	2B2	1.77		0.37
5	4B3	1.98		0.14
5	4C3	2.04		0.11
5	2C3	2.06	FD1	0.10
5	2C3	2.04	FD2	0.11
5	6B2B	0.87	FD2	24.60
5	6A2	0.71		51.89
5	2A2	1.57		0.94
5	LCS	0.82		31.06
6	9A2	0.78		30.81
6	9B2	1.13		5.66
6	7C2	1.48	LD1	1.04
6	5A2	1.8		0.22
6	4B2	1.81		0.21
6	7C2A	1.54	LD2	0.78
6	3A3	1.99		0.09
6	1B2	1.99		0.09
6	3B3	2.02		0.08
6	4A2	1.68	FD1	0.40
6	4A3	1.93		0.12
6	4A2	1.65	FD2	0.46
6	2B3	1.73		0.31
6	LCS1	1.11		6.24
6	LCS2	1.11		6.24
7	3A2	1.87		0.07
7	3C2	1.73		0.19
7	4C2	1.69		0.25
7	2A3	2.04		0.02
7	1A2	1.88		0.07
7	3C3	2.06		0.02
7	8A2	1.36		2.24
7	5A2	1.84		0.09
7	6C2	1.59		0.48

TABLE G-1. DDT Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
7	4A3	1.82		0.10
7	8C2	1.68	LD1	0.26
7	3B2	1.7		0.23
7	8C2A	1.61	LD2	0.42
7	LCS1	1.24		4.99
7	LCS2	1.26		4.37
8	6A3	1.61		0.28
8	1C2	1.74		0.13
8	6B3	1.4	FD1	0.94
8	7A2	1.32		1.50
8	6B3B	1.43	FD2	0.79
8	8B3	0.63		82.61
8	6C3	1.81		0.09
8	9C2	1.26	LD1	2.12
8	9C2A	1.21	LD2	2.84
8	LCS1*4	1.09		5.71
8	LCS2*4	1.01		9.08
9	8B4	0.86		18.21
9	3B4	1.48	LD1	0.64
9	3B4A	1.44	LD2	0.80
9	7C3	1.71	FD1	0.19
9	9A3	1.65		0.26
9	7C3	1.76	FD2	0.14
9	3A4	1.74		0.16
9	5C4	0.95		11.21
9	9B3	1.78		0.13
9	3C4	1.6		0.34
9	LCS1X	1.08		5.56
9	LCS2X	1.09		5.27
10	3A5	1.8		0.01
10	3A6	1.79		0.01
10	3C5	1.54		0.06
10	3C6	1.5		0.08
10	3B5	1.56	LD1	0.05
10	3B5A	1.56	LD2	0.05
10	3B6	1.58		0.04
10	5C5	1.34		0.28
10	5C6	1.24		0.60
10	8B5	1.53		0.06
10	8B6	1.52		0.07
10	LCS3*4	0.86		11.18
11	LCS4X2	0.78	LCS Dup 1	19.87
11	CX1A1	0.84		12.30
11	CX9A1	0.95		5.11
11	FC9A	0.72		32.09
11	FC9B	0.9		7.62
11	FC9C	0.93		5.99
11	FC8A	1.29	LD1	0.34

TABLE G-1. DDT Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
11	FC8A-A	1.34	LD2	0.23
11	FC8B	1.13		1.21
11	FC8C	1.53		0.05
11	LCS4X2-A	0.85	LCS Dup2	11.36
12	FC1A	1.04		3.10
12	FC1B	1.16		1.32
12	FC1C	1.38		0.27
12	FC6A	0.82		14.87
12	FC6B	1.09	LD1	2.17
12	FC6B-A	1.27	LD2	0.60
12	FC6C	1.08		2.33
12	FC7A	1.24		0.74
12	FC7B	1.32		0.42
12	FC7C	1.22		0.86
12	FC9A	1.03		3.32
12	LCS5X2	0.6		71.43
13	SW6	0.98		1.53
13	SW5	0.63		18.77
13	SW1	0.79		5.96
13	SW7	0.64		17.47
13	SW11	1.48	LD/FD2	0.04
13	SW11-A	1.44	LD	0.06
13	SW2	0.75		7.94
13	SW4	0.68		13.11
13	SW22	1.4		0.08
13	FC5A	1.18		0.36
13	FC5B	0.74		8.53
13	FC5C	0.76		7.39
13	SW8	1.45	FD2	0.05
13	LCS6X2	0.74		8.53
13	LCS5X2	0.62		20.16
14	4A	0.47		75.90
14	4B	0.5		64.72
14	4C	0.63		32.45
14	2A	1.38		0.60
14	2B	1.66		0.14
14	2C	1.69		0.12
14	SW3	1.01		4.31
14	SW10	1.2		1.57
14	SW9	1.03		3.88
14	SW20	1.02		4.09
14	3A	1.55	LD	0.25
14	3A-A	1.52	LD	0.29
14	3B	1.53		0.27
14	3C	1.56		0.23
14	LCS6X2	0.81		12.48
15	SW12	1.7		0.05
15	SW13	1.63		0.08

TABLE G-1. DDT Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
15	SW14	1.63		0.08
15	SW15	0.91		8.41
15	SW16	1.51		0.17
15	SW17	1.53		0.15
15	SW18	1.38		0.40
15	SW19	0.82		15.07
15	SW21	0.63		51.61
15	6A924	1.5	LD1	0.18
15	6A924-A	1.43	LD2	0.29
15	LCS6X2	0.76	LCS	22.23
16	LCS6X21029	0.71	LCS	11.66
16	4A1024	0.48		57.32
16	4B1024	0.51		46.57
16	4C1024	0.7	LD1	12.50
16	4C1029	0.57	LD2	30.74
16	SW191024	0.64		18.93
16	SW211024	0.62		21.74
17	FC4A1	0.98		1.76
17	FC4B1	0.87		3.65
17	FC4C3	0.9		2.99
17	FC4A3	1.1	FD1	0.79
17	FC4A3-2	0.89	FD2	3.20
18	LCS6X2	0.54	LCS	16.87
18	FC4A3	0.82	FD1 rerun	1.38
18	FC4A3-2	0.73	FD2 rerun	3.09
18	SW1AW	0.43		45.09
18	SW1BW	0.33		110.21
18	SW5AN	0.61		9.02
18	SW53	0.49	FD1	26.37
18	SW6AN	1.02		0.23
18	SW7AN	0.57		12.90
18	SW8AN	0.5		24.12
18	SW9AE	0.66		5.77
18	SW9CE	0.76		2.36
19	LCS7X2	0.72	LCS	15.96
19	FC24B3	1.43		0.27
19	FC2-9A2.5	1.46		0.22
19	FC2-9B2.5	1.5		0.18
19	FC2-9B2.5-2	1.58	FD1	0.11
19	FC2-9C2.5	1.66		0.07
19	FC2-SW7AN	0.74		14.22
19	FC2-SW8AN	0.65		23.89
19	FC2-SW1AW	1.13		1.50
19	FC2-SW1BW	1.44		0.25
20	4 ppm DDT	0.83		3.99
20	FC3-SW7A	0.75		6.33
20	FC3-SW8A	0.73		7.11
20	FC3-SW8A-DEEP	0.6		15.04

TABLE G-2. Cyclodiene Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
1	45B2	0.78	FD1	0.03
1	45B3	0.88	FD2	0.02
1	45C1	1.03		0.01
1	45A4	0.81		0.02
1	23A5	0.78		0.03
1	23B6A	0.69	LD1	0.05
1	23B6B	0.89	LD2	0.02
1	23B7	0.61		0.07
1	23C8	0.99		0.01
1	LCS1	0.22		0.61
1	W1-3	0.16		0.85
1	W4-5	0.41		0.22
1	WCANS6	0.9		0.01
2	9A1	1.09		0.15
2	9B1	1.88		0.01
2	9C1	1.6		0.03
2	8B1	1.41		0.06
2	8C1	1.33		0.07
2	7B1	1.18		0.11
2	7C1	0.82	FD1	0.34
2	7C1	0.95	FD2	0.23
2	6B1	0.06	FD1	3.34
2	6B1	0.09	FD2	3.05
2	6C1	1.35		0.07
2	5B1	0.99		0.20
2	5C1	0.12	LD1	2.79
2	5C1A	0.11	LD2	2.87
2	LCS1	0.64		0.58
3	5C2	0.31		0.81
3	5B2	1.37		0.02
3	5B3	1.02		0.07
3	5A3	1.23	FD1	0.04
3	3C1	0.02	LD1	2.16
3	5A3	0.97	FD2	0.09
3	7A1	0.62		0.28
3	3C1A	0.02	LD2	2.16
3	4B1	0.28		0.89
3	5A1	0.77	FD1	0.17
3	5A1	0.78	FD2	0.16
3	6A1	0.53		0.38
3	3B1	0.02		2.16
3	8A1	0.93		0.10
3	LCS1	0.38		0.64
4	5C3	0.87		0.10
4	3A1	0.01		1.88

TABLE G-2. Cyclodiene Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
4	2A1	0.47		0.39
4	1A1	0.93		0.08
4	1C1	0.68		0.19
4	4A1	0.27	FD1	0.77
4	7B2	1.34	LD1	0.02
4	4A1	0.26	FD2	0.80
4	8B2	1.11		0.04
4	2B1	0.87		0.10
4	1B1	0.78		0.13
4	7B2A	1.26	LD2	0.03
4	2C1	0.96	FD1	0.07
4	2C1	0.89	FD2	0.09
4	LCS1	0.35	0	0.59
5	2C2A	1.73	LD2	0.00
5	2C2	1.6	LD1	0.01
5	4C1	0.9	FD1	0.11
5	4C1	0.83	FD2	0.14
5	6B2	0.25	FD1	1.19
5	2B2	1.72	0	0.01
5	4B3	1.57	0	0.01
5	4C3	1.67	0	0.01
5	2C3	1.52	FD1	0.01
5	2C3	1.5	FD2	0.01
5	6B2B	0.27	FD2	1.10
5	6A2	0.97	0	0.08
5	2A2	1.05	0	0.06
5	LCS	0.34	0	0.85
6	9A2	0.93	0	0.06
6	9B2	1.37	0	0.01
6	7C2	0.42	LD1	0.46
6	5A2	1.34	0	0.01
6	4B2	0.94	0	0.05
6	7C2A	0.41	LD2	0.48
6	3A3	0.03	0	2.36
6	1B2	1.45	0	0.01
6	3B3	0.14	0	1.49
6	4A2	0.97	FD1	0.05
6	4A3	1.11	0	0.03
6	4A2	1.01	FD2	0.04
6	2B3	1.16		0.02
6	LCS1	0.54		0.28
6	LCS2	0.54		0.28
7	3A2	0.02		2.17
7	3C2	0.02		2.17
7	4C2	1.12		0.03
7	2A3	1.03		0.04

TABLE G-2. Cyclodiene Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
7	1A2	1.2		0.02
7	3C3	0.22		0.99
7	8A2	1.22		0.02
7	5A2	1.5		0.01
7	6C2	1.4		0.01
7	4A3	1.15		0.03
7	8C2	1.38	LD1	0.01
7	3B2	0.03		2.09
7	8C2	1.35	LD2	0.01
7	LCS1x	0.54		0.28
7	LCS2x	0.58		0.24
8	6A3	1.37		0.01
8	1C2	1.3		0.01
8	6B3	0.88	FD1	0.05
8	7A2	1.02		0.03
8	6B3B	0.91	FD2	0.05
8	8B3	1.17		0.02
8	6C3	1.3		0.01
8	9C2	1.11	LD1	0.02
8	9C2A	1.08	LD2	0.02
8	2/3B3	0.63	FD1	0.16
8	2/3B3	0.95	FD2	0.04
8	4/5B3	0.77		0.09
8	2/3A3	0.85		0.06
8	4/5A3	0.91		0.05
8	LCS1	0.5		0.29
8	LCS2	0.6		0.19
9	8B4	1.18		0.02
9	3B4	0.02	LD1	1.67
9	3B4A	0.01	LD2	1.73
9	7C3	1.33	FD1	0.01
9	9A3	1.42		0.01
9	7C3	1.24	FD2	0.01
9	3A4	0.01		1.73
9	5C4	0.15		0.99
9	9B3	1.39		0.01
9	3C4	0.03		1.60
9	LCS1X	0.5		0.25
9	LCS2X	0.49		0.26
10	3A5	0.11		0.78
10	3A6	0.22		0.39
10	3C5	0.04		1.22
10	3C6	0.18		0.50
10	3B5	0.05	LD1	1.14
10	3B5A	0.03	LD2	1.30
10	3B6	0.24		0.34

TABLE G-2. Cyclodiene Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
10	5C5	0.43		0.10
10	5C6	0.09		0.89
10	8B5	0.97		0.00
10	8B6	0.99		0.00
10	LCS3*4	0.32		0.21
11	LCS4X2	0.34	LCS LD1	0.40
11	CX1A1	0.85		0.02
11	CX9A1	0.67		0.06
11	FC9A	0.4		0.28
11	FC9B	0.36		0.36
11	FC9C	0.66		0.07
11	FC8A	0.35	LD1	0.38
11	FC8A-A	0.57	LD2	0.11
11	FC8B	0.69		0.06
11	FC8C	0.89		0.02
11	LCS4X2-A	0.31	LCS LD2	0.47
12	FC1A	0.61		0.09
12	FC1B	0.64		0.08
12	FC1C	0.97		0.02
12	FC6A	0.33		0.32
12	FC6B	0.41	LD1	0.22
12	FC6B-A	0.44	LD2	0.20
12	FC6C	0.09		0.95
12	FC7A	0.43		0.20
12	FC7B	0.73		0.05
12	FC7C	0.45		0.19
12	FC9A	0.66		0.07
12	LCS5X2	0.21		0.55
13	SW6	0.72		0.01
13	SW5	0.55		0.04
13	SW1	0.57		0.03
13	SW7	0.29		0.23
13	SW11	0.87	FD1	0.00
13	SW2	0.19		0.46
13	SW4	0.34		0.17
13	SW22	0.85		0.01
13	FC5A	0.43		0.09
13	FC5B	0.8		0.01
13	FC5C	0.25		0.31
13	SW8	0.88	FD2	0.00
13	LCS6X2	0.22		0.38
14	4A	0.48		0.13
14	4B	0.52		0.11
14	4C	0.11		0.80
14	2A	0.63		0.06
14	2B	0.94		0.01

TABLE G-2. Cyclodiene Field Lab Immunoassay Data

Batch #	Sample #	Absorbance	QC Class	Concentration
14	2C	0.94		0.01
14	SW3	0.26		0.38
14	SW10	0.7		0.04
14	SW9	0.55		0.09
14	SW20	0.81		0.03
14	3A	0.22	LD1	0.47
14	3A-A	0.25	LD2	0.40
14	3B	0.53		0.10
14	3C	0.5		0.12
14	LCS6X2	0.24		0.42
15	SW12	0.99		0.00
15	SW13	0.89		0.00
15	SW14	0.91	FD2	0.00
15	SW15	0.43		0.09
15	SW16	0.91		0.00
15	SW17	0.98	FD1	0.00
15	SW18	0.91		0.00
15	SW19	0.49		0.06
15	SW21	0.34		0.17
15	6A924	0.8	LD1	0.01
15	6A924-A	0.86	LD2	0.01
15	LCS6X2	0.23		0.36
17-18	LCS6X2	0.23		0.34
17-18	FC4A1	0.41		0.12
17-18	FC4B1	0.4		0.12
17-18	FC4C3	0.44		0.10
17-18	FC4A3	0.64	FD1	0.03
17-18	FC4A3-2	0.68	FD2	0.02
17-18	SW1AW	0.73		0.02
17-18	SW1BW	0.7		0.02
17-18	SW5AN	0.72		0.02
17-18	SW53	0.32	FD1	0.20
17-18	SW6AN	0.8		0.01
17-18	SW7AN	0.34		0.18
17-18	SW8AN	0.54		0.05
17-18	SW9AE	0.45		0.09
17-18	SW9CE	0.57		0.05

DDT Batch 1 Calibration and Sample Data 9/24/97

	conc (ppm)	abs	log(conc)	predconc
neg	0	1.55	#NUM!	0.0353845
neg	0	1.5	#NUM!	0.051044
cal 1	0.8	1.09	-0.09691	1.0299828
cal 1	0.8	1.2	-0.09691	0.45998
cal 2	4	0.82	0.60206	7.4497972
cal 2	4	0.92	0.60206	3.5799737
cal 3	40	0.64	1.60206	27.862544
cal 3	40	0.57	1.60206	46.537816

	x	y	log x

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.971434
R Square	0.943683
Adjusted R	0.929604
Standard E	0.065544
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.287949	0.287949	67.0267
Residual	4	0.017184	0.004296	
Total	5	0.305133		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.094031	0.037983	28.80331	8.65E-06
X Variable	-0.3142	0.038378	-8.18698	0.001212

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	45B2	0.32	FD1	290.7	
S2	45B3	0.37	FD2	201.5	36 %RPD
S3	45C1	1.35		0.2	
S4	45A4	0.53		62.4	
S5	23A5	0.6		37.4	
S6	23B6A	1.41	LD1	0.1	
S7	23B6B	1.52	LD2	0.0	77 %RPD
S8	23B7	0.36		216.9	
S9	23C8	1.49		0.1	
S10	LCS1	0.65		25.9	259 %Rec
S11	W1-3	0.92		3.6	
S12	W4-5	0.5		77.7	
S13	WCANS6	1.62		0.0	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.124481	-0.03448
2	1.124481	0.075519
3	0.904862	-0.08486
4	0.904862	0.015138
5	0.590658	0.049342
6	0.590658	-0.02066

Data Quality Assessment

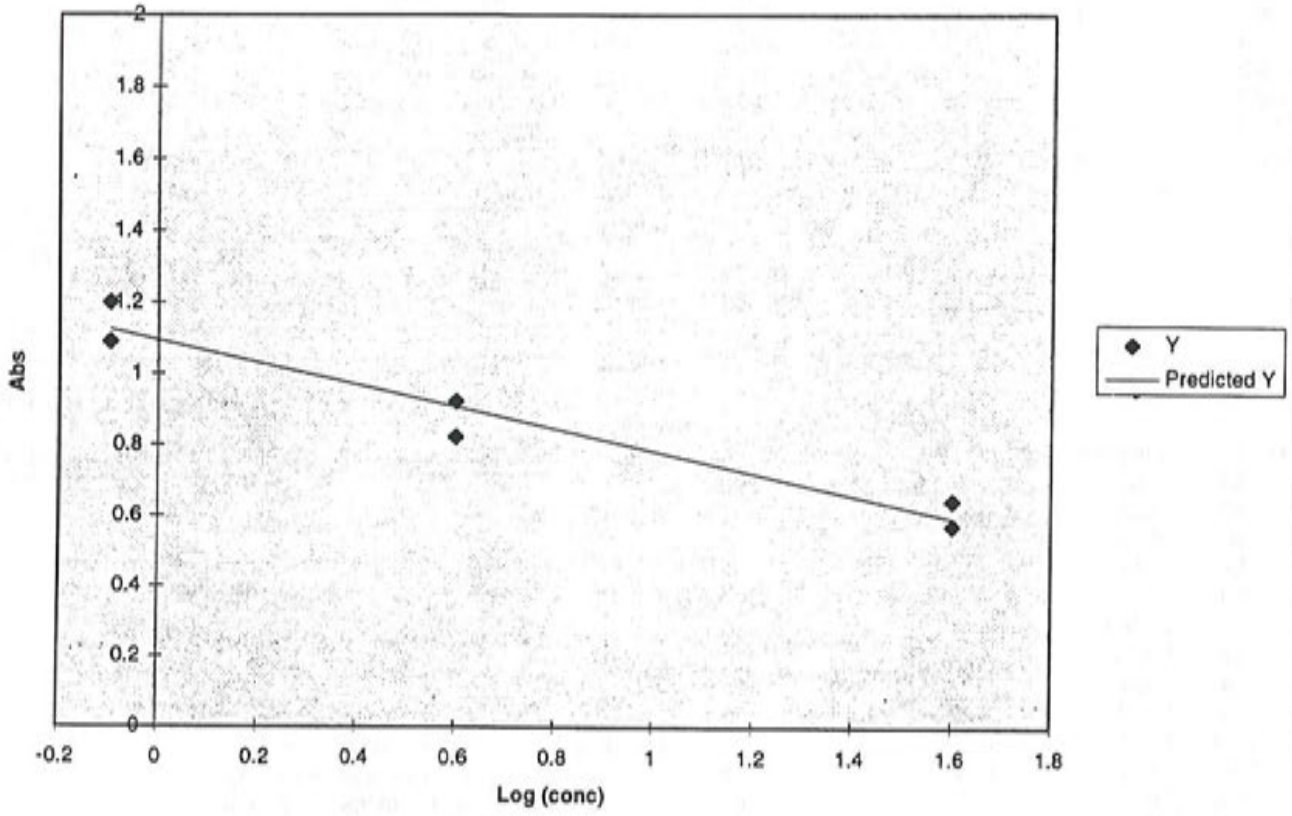
a) Calibration curve duplicates vary, but meet project DQO.

b) Field and lab duplicate are outside of calibration range and are therefore acceptable.

c) LCS 23% above expected value: acceptable (conc. is above calibration range)

d) The data are usable.

DDT Batch 1 Calibration 9-24-97



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DDT Batch 1 Calibration and Sample Data 9/24/97

	conc (ppm)	abs	log(conc)	predconc
neg	0	1.55	#NUM!	0.0353845
neg	0	1.5	#NUM!	0.051044
cal 1	0.8	1.09	-0.09691	1.0299828
cal 1	0.8	1.2	-0.09691	0.45998
cal 2	4	0.82	0.60206	7.4497972
cal 2	4	0.92	0.60206	3.5799737
cal 3	40	0.64	1.60206	27.862544
cal 3	40	0.57	1.60206	46.537816

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.971434
R Square	0.943683
Adjusted R	0.929604
Standard E	0.065544
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.287949	0.287949	67.0267
Residual	4	0.017184	0.004296	
Total	5	0.305133		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	1.094031	0.037983	28.80331	8.65E-06
X Variable	-0.3142	0.038378	-8.18698	0.001212

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	45B2	0.32	FD1	290.7	
S2	45B3	0.37	FD2	201.5	36 %RPD
S3	45C1	1.35		0.2	
S4	45A4	0.53		62.4	
S5	23A5	0.6		37.4	
S6	23B6A	1.41	LD1	0.1	
S7	23B6B	1.52	LD2	0.0	77 %RPD
S8	23B7	0.36		216.9	
S9	23C8	1.49		0.1	
S10	LCS1	0.65		25.9	259 %Rec
S11	W1-3	0.92		3.6	
S12	W4-5	0.5		77.7	
S13	WCANS6	1.62		0.0	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.124481	-0.03448
2	1.124481	0.075519
3	0.904862	-0.08486
4	0.904862	0.015138
5	0.590658	0.049342
6	0.590658	-0.02066

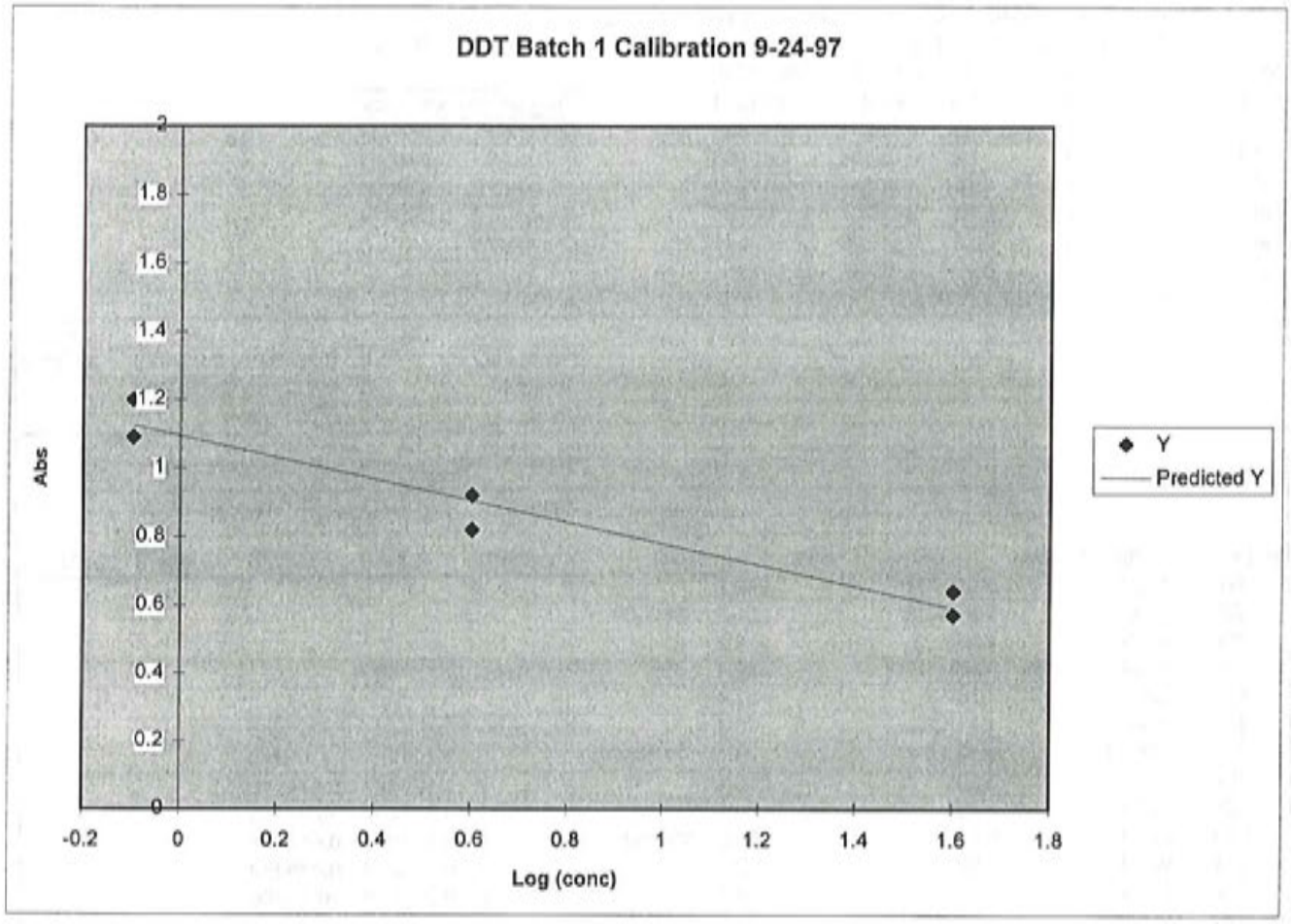
Data Quality Assessment

a) Calibration curve duplicates vary, but meet project DQO.

b) Field and lab duplicate are outside of calibration range and are therefore acceptable.

c) LCS 23% above expected value: acceptable (conc. is above calibration range)

d) The data are usable.


DDT Batch 1 Calibration 9-24-97
Abs
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
Log (conc)
Y
Predicted Y

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DDT Batch 2 Calibration and Sample Data 9/24/97

	conc	abs	log(conc)	predconc
neg	0	2.36	#NUM!	0.07944
neg	0	2.48	#NUM!	0.048036
cal 1	0.8	1.82	-0.09691	0.764094
cal 1	0.8	1.81	-0.09691	0.796806
cal 2	4	1.42	0.60206	4.086719
cal 2	4	1.41	0.60206	4.261677
cal 3	40	0.86	1.60206	42.74588
cal 3	40	0.9	1.60206	36.14693

	x	y	log x

y = -0.32 log x + 1.098

x = exp ((1.756 -y)/0.5493))

seq #	sample #	abs	QC	conc	SW Key/ %QC
	9A1	1.16		12.2	
	9B1	1.18		11.2	8 %RPD
	9C1	0.98		25.8	
	8B1	0.75		67.8	
	8C1	0.82		50.5	
	7B1	1.04		20.1	
	7C1	1.4	FD1	4.4	
	7C1	1.41	FD2	4.3	4 %RPD
	6B1	0.91	FD1	34.7	
	6B1	0.93	FD2	31.9	8 %RPD
	6C1	1.61		1.8	
	5B1	1.03		21.0	
	5C1	1.02	LD1	21.9	
	5C1A	0.99	LD2	24.8	13 %RPD
	LCS1	1.02	LCS	21.9	219 %Rec

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.999313
R Square	0.998627
Adjusted R	0.998283
Standard E	0.017394
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.87999	0.87999	2908.482
Residual	4	0.00121	0.000303	
Total	5	0.8812		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	1.755815	0.01008	174.1887	6.52E-09
X Variable	-0.54928	0.010185	-53.9303	7.08E-07

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.809046	0.010954
2	1.809046	0.000954
3	1.425116	-0.00512
4	1.425116	-0.01512
5	0.875838	-0.01584
6	0.875838	0.024162
2	0.905446	-0.03545
3	0.585417	0.014583
4	27.57342	12.42658

Data Quality Assessment

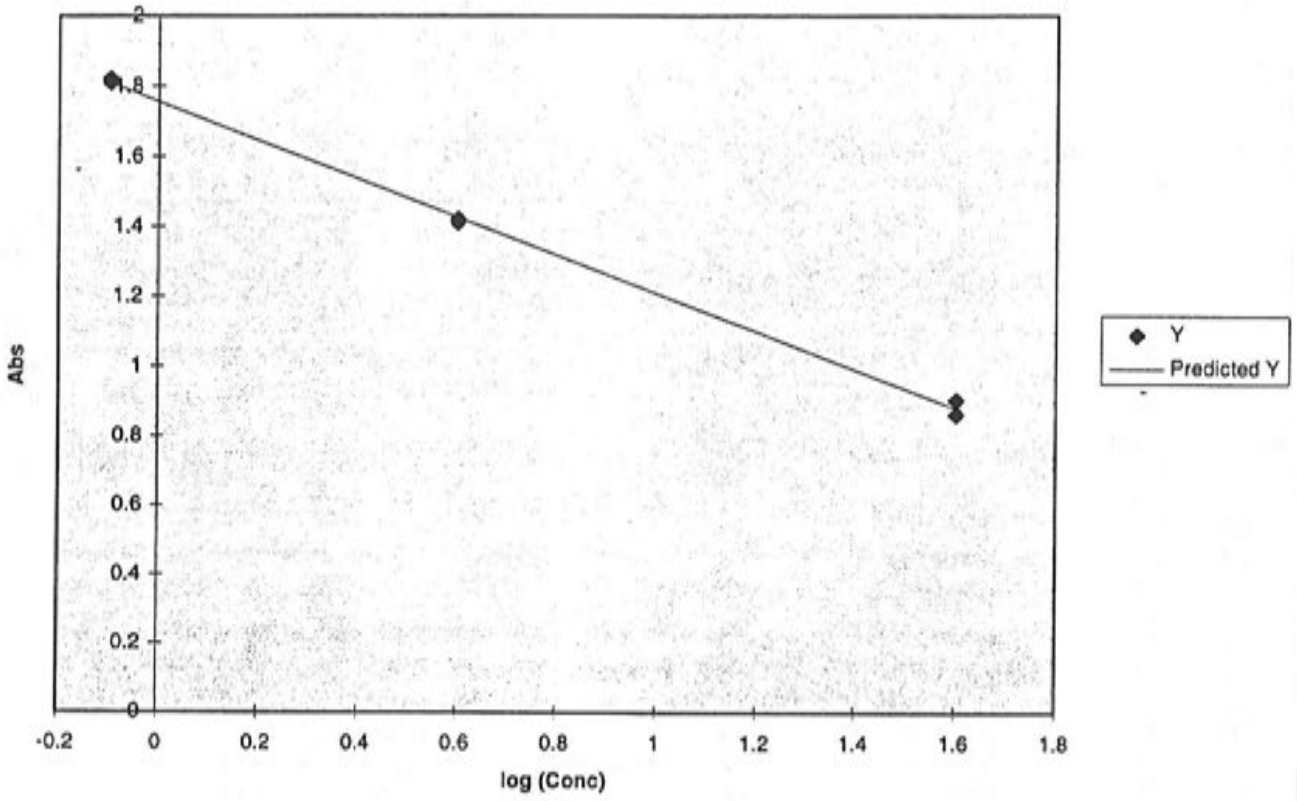
a) Calibration curve is excellent.

b) Field and lab duplicate are acceptable.

c) LCS 7% above expected value: acceptable.

d) The data are usable.

DDT Batch 2 Calibration 9-24-97



DDT Batch 3 Calibration and Sample Data 9/25/97

	conc	abs	log(conc)	predconc
neg	0	1.65	#NUM!	0.02623
neg	0	1.64	#NUM!	0.028153
cal 1	0.8	1.15	-0.09691	0.901277
cal 1	0.8	1.23	-0.09691	0.511788
cal 2	4	0.86	0.60206	7.010809
cal 2	4	0.94	0.60206	3.98107
cal 3	40	0.61	1.60206	41.09548
cal 3	40	0.65	1.60206	30.96777
	x	y	log x	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.981303
R Square	0.962955
Adjusted R	0.953694
Standard E	0.054518
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.309044	0.309044	103.9769
Residual	4	0.011889	0.002972	
Total	5	0.320933		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.135306	0.031593	35.93499	3.58E-06
X Variable	-0.32551	0.031922	-10.1969	0.000521

seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	5C2	0.97		3.2		
S2	5B2	0.88		6.1	62 %RPD	
S3	5B3	1.67		0.0		
S4	5A3	1.34	FD1	0.2		
S5	3C1	1.1	LD1	1.3		
S6	5A3	1.26	FD2	0.4	55 %RPD	
S7	7A1	0.71		20.3		
S8	3C1A	1.13	LD2	1.0	21 %RPD	
S9	4B1	1.2		0.6		
S10	5A1	0.87	FD1	6.5		
S11	5A1	0.89	FD2	5.7	14 %RPD	
S12	6A1	0.65		31.0		
S13	3B1	1.04		2.0		
S14	8A1	0.8		10.7		
S15	LCS1	0.65		31.0	310 %Rec	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.166851	-0.01685
2	1.166851	0.063149
3	0.939329	-0.07933
4	0.939329	0.000671
5	0.61382	-0.00382
6	0.61382	0.03618
3	0.585417	0.014583
4	27.57342	12.42658

Data Quality Assessment

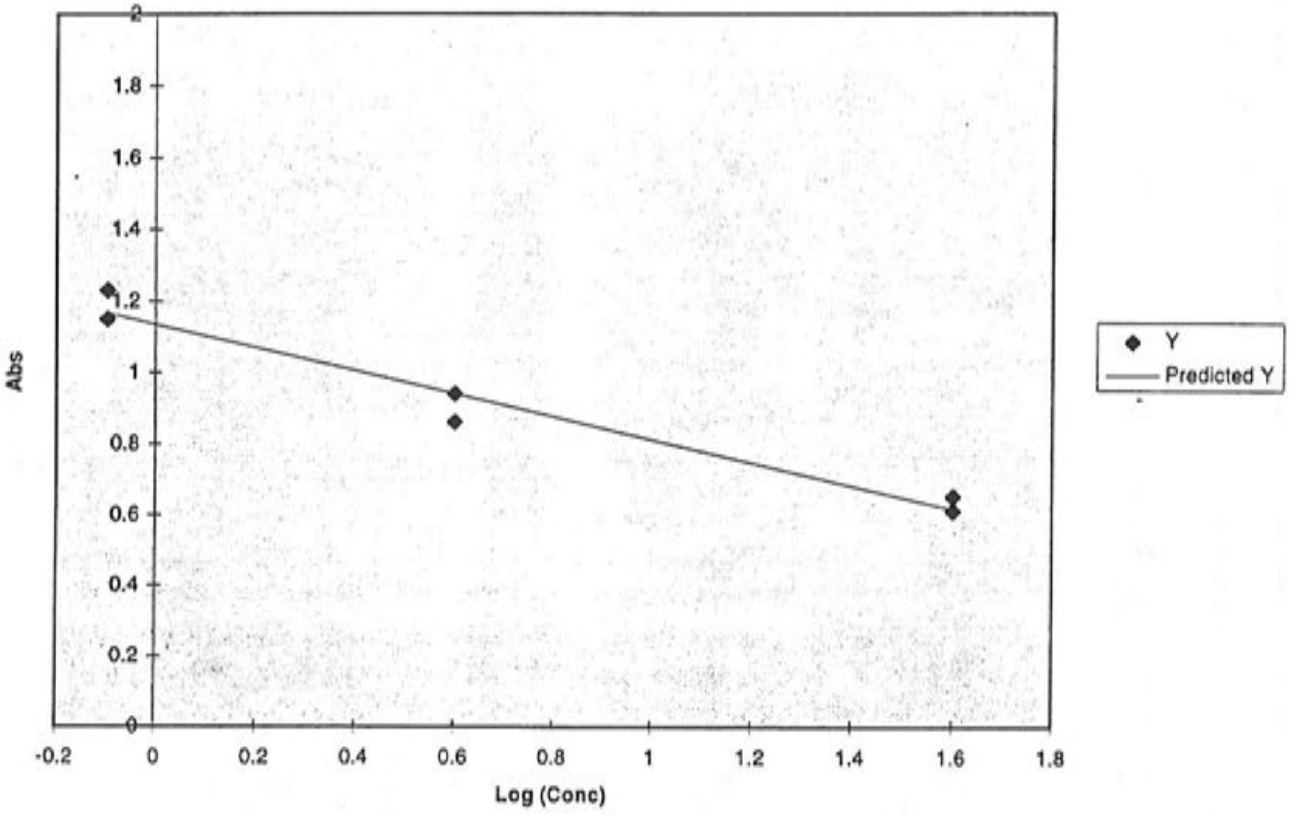
a) Calibration curve duplicates vary, but meet project DQO. Some curvature with possible high bias in midrange.

b) Field and lab duplicates are acceptable (one is outside of calibration range and is therefore acceptable).

c) LCS 55% above expected value: acceptable until better "true value" response is determined. (Conc. is above calibrti

d) The data are usable.

DDT Batch 3 Calibration 9-25-97



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DDT Batch 4 Calibration and Sample Data 9/25/97

	conc	abs	log(conc)	predconc
neg	0	2.22	#NUM!	0.009416
neg	0	1.96	#NUM!	0.045634
cal 1	0.8	1.57	-0.09691	0.486895
cal 1	0.8	1.41	-0.09691	1.285998
cal 2	4	1.29	0.60206	2.664366
cal 2	4	1.15	0.60206	6.232655
cal 3	40	0.94	1.60206	22.29933
cal 3	40	0.75	1.60206	70.66186

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.954796
R Square	0.911636
Adjusted R	0.889545
Standard E	0.100844
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.419672	0.419672	41.26723
Residual	4	0.040678	0.01017	
Total	5	0.46035		

	Coefficients	*tandard Erı*	*t Stat*	*P-value*
Intercept	1.451437	0.058439	24.83664	1.56E-05
X Variable	-0.37932	0.059048	-6.42396	0.003019

seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	5C3	1.8		0.1		
S2	3A1	1.65		0.3	85 %RPD	
S3	2A1	0.96		19.7		
S4	1A1	0.96		19.7		
S5	1C1	1.43		1.1		
S6	4A1	0.52	FD1	285.4		
S7	7B2	1.56	LD1	0.5		
S8	4A1	0.85	FD2	38.5	152 %RPD	
S9	8B2	0.69		101.7		
S10	2B1	1.04		12.2		
S11	1B1	0.92		25.2		
S12	7B2A	1.37	LD2	1.6	68 %RPD	
S13	2C1	1.39	FD1	1.5		
S14	2C1	1.21	FD2	4.3	100 %RPD	
S15	LCS1	0.9		28.4	284 %Rec	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.488197	0.081803
2	1.488197	-0.0782
3	1.223062	0.066938
4	1.223062	-0.07306
5	0.84374	0.09626
6	0.84374	-0.09374

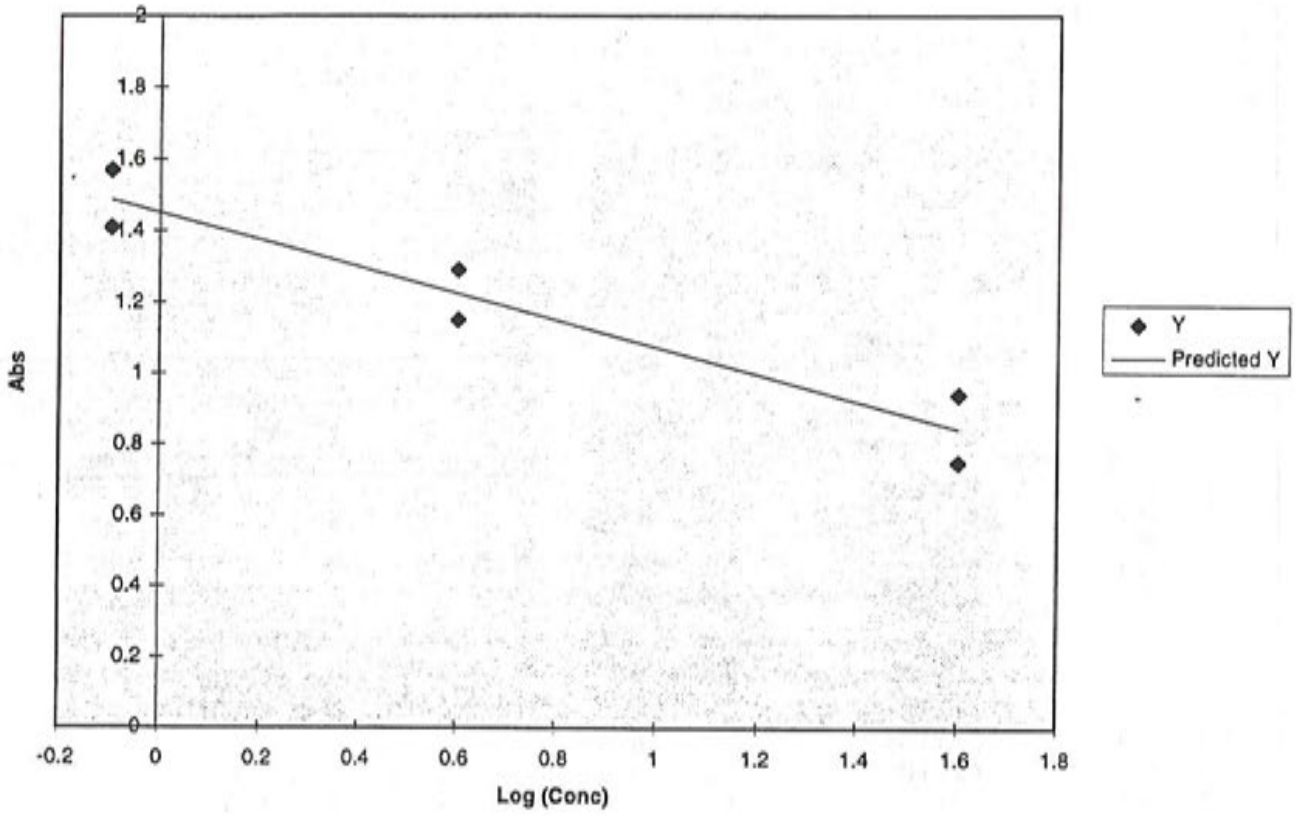
Data Quality Assessment

a) Calibration curve duplicates vary, but meet project DQO.

b) Field and lab duplicates show high variability (one is outside of calibration range and is therefore acceptable).

c) LCS 42% above expected value: acceptable until better "true value" response is determined (Conc. is above calibr

DDT Batch 4 Calibration 9-25-97



DDT Batch 5 Primary Calibration and Sample Data 9/25/97

	conc	abs	log(conc)	predconc
neg	0	2.2	#NUM!	0.049816
neg	0	2.18	#NUM!	0.054686
cal 1	0.8	1.7	-0.09691	0.512877
cal 1	0.8	1.55	-0.09691	1.032301
cal 2	4	1.25	0.60206	4.182076
cal 2	4	1.2	0.60206	5.280271
cal 3	40	0.78	1.60206	37.43486
cal 3	40	0.78	1.60206	37.43486

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.988856
R Square	0.977836
Adjusted R	0.972295
Standard E	0.063478
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.711082	0.711082	176.4736
Residual	4	0.016118	0.004029	
Total	5	0.7272		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.556817	0.036785	42.3218	1.86E-06
X Variable	-0.49376	0.037168	-13.2843	0.000186

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	2C2A	2.06	LD2	0.1	
S2	2C2	2.02	LD1	0.1	19 %RPD
S3	4C1	0.94	FD1	17.8	
S4	4C1	0.92	FD2	19.5	
S5	6B2	0.89	FD1	22.4	14 %RPD
S6	2B2	1.77		0.4	
S7	4B3	1.98		0.1	
S8	4C3	2.04		0.1	
S9	2C3	2.06	FD1	0.1	
S10	2C3	2.04	FD2	0.1	9 %RPD
S11	6B2B	0.87	FD2	24.6	9 %RPD
S12	6A2	0.71		51.9	
S13	2A2	1.57		0.9	
S14	LCS	0.82		31.1	311 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.604667	0.095333
2	1.604667	-0.05467
3	1.259545	-0.00955
4	1.259545	-0.05955
5	0.765788	0.014212
6	0.765788	0.014212

Data Quality Assessment

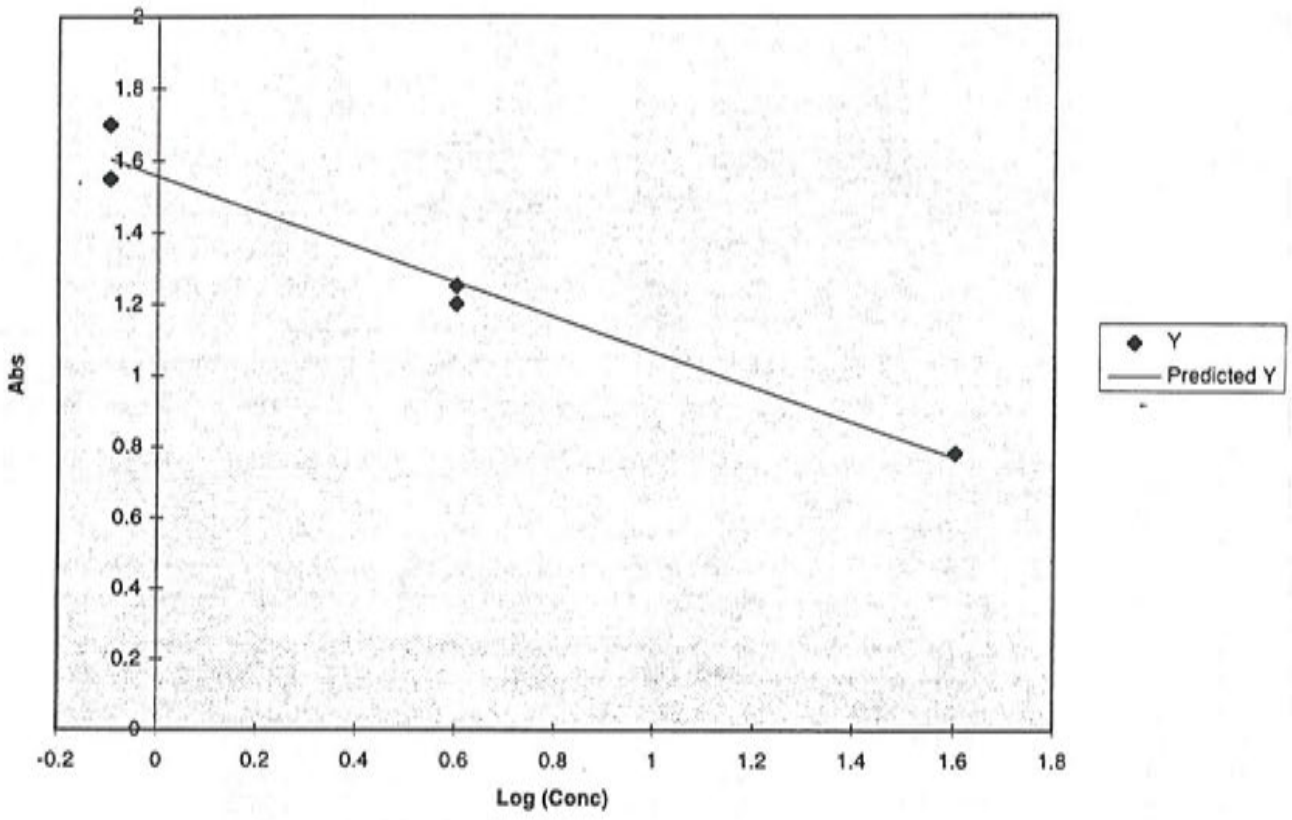
a) Calibration curve is excellent.

b) Field and lab duplicates are acceptable.

c) LCS 55% above expected value: acceptable until better "true value" response is determined. (Conc. is above calibrti

d) The data are usable.

DDT Batch 5 (Primary) Calibration 9-25-97



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DDT Batch 6 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg	0	2.16	#NUM!	0.038728
cal 1	0.8	1.56	-0.09691	0.706575
cal 2	4	1.24	0.60206	3.324765
cal 2	4	1.12	0.60206	5.942743
cal 3	40	0.77	1.60206	32.33299
cal 3	40	0.7	1.60206	45.37093

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	9A2	0.78		30.8		
S2	9B2	1.13		5.7		
S3	7C2	1.48	LD1	1.0		
S4	5A2	1.8		0.2		
S5	4B2	1.81		0.2		
S6	7C2A	1.54	LD2	0.8	29 %RPD	
S7	3A3	1.99		0.1		
S8	1B2	1.99		0.1		
S9	3B3	2.02		0.1		
S10	4A2	1.68	FD1	0.4		
S11	4A3	1.93		0.1		
S12	4A2	1.65	FD2	0.5	14 %RPD	
S13	2B3	1.73		0.3		
S14	LCS1X4	1.11		6.2	249 %Rec	
S15	LCS2X4	1.11		6.2	249 %Rec	

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.98847
R Square	0.977073
Adjusted R	0.969431
Standard E	0.061697
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.486661	0.486661	127.8513
Residual	3	0.011419	0.003806	
Total	4	0.49808		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.488235	0.045581	32.65048	6.31E-05
X Variable	-0.47576	0.042076	-11.3071	0.001484

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.534341	0.025659
2	1.201797	0.038203
3	1.201797	-0.0818
4	0.726033	0.043967
5	0.726033	-0.02603
6	0.590658	-0.02066

Data Quality Assessment

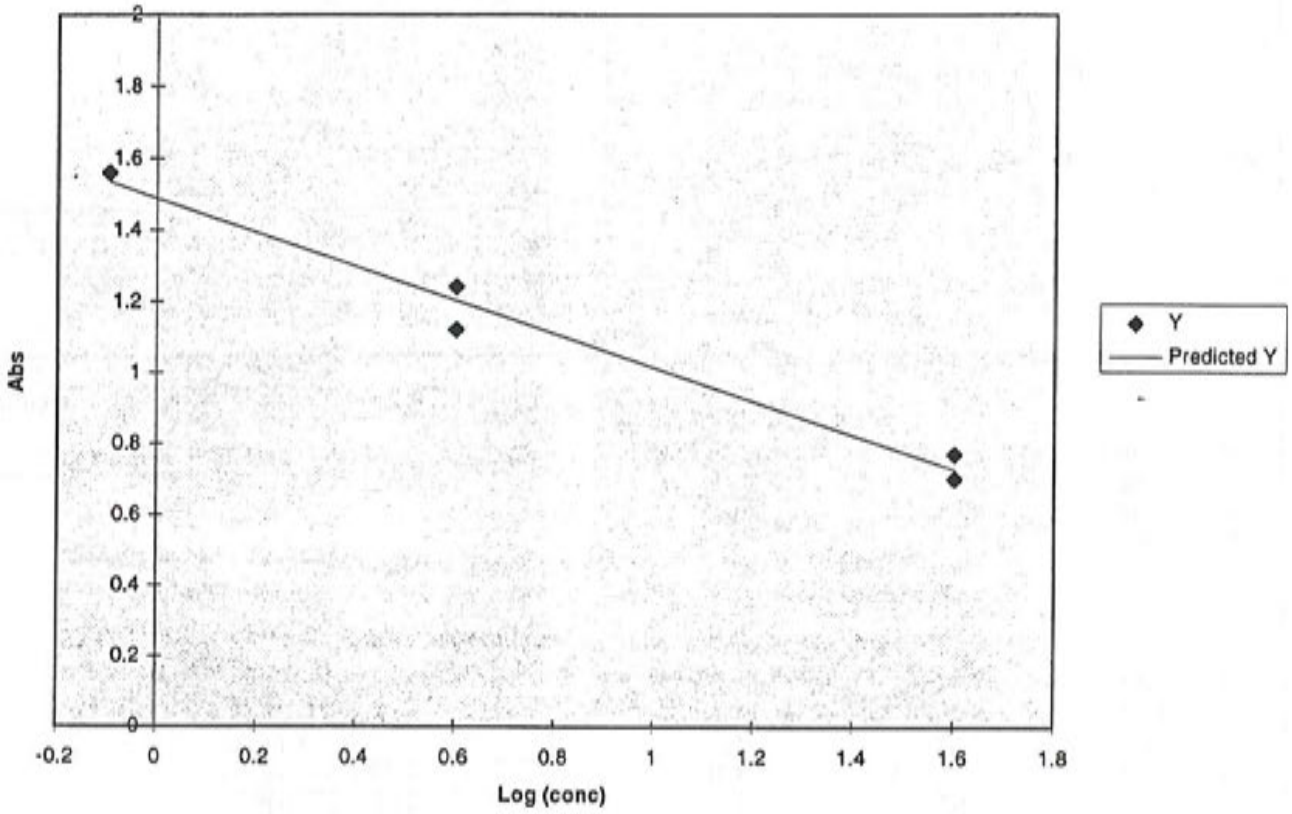
a) Calibration curve duplicates vary, but meet project DQO.

b) Field and lab duplicates are acceptable.

c) LCS is 25% above expected value: acceptable until better "true value" response is determined.

d) The data are usable.

DDT Batch 6 Calibration 9-26-97



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DDT Batch 7 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg	0	2.2	#NUM!	0.00817
cal 1	0.8	1.38	-0.09691	1.959542
cal 1	0.8	1.65	-0.09691	0.322493
cal 2	4	1.27	0.60206	4.08708
cal 3	40	0.93	1.60206	39.64716

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	3A2	1.87		0.1	
S2	3C2	1.73		0.2	
S3	4C2	1.69		0.2	
S4	2A3	2.04		0.0	
S5	1A2	1.88		0.1	
S6	3C3	2.06		0.0	
S7	8A2	1.36		2.2	
S8	5A2	1.84		0.1	
S9	6C2	1.59		0.5	
S10	4A3	1.82		0.1	
S11	8C2	1.68	LD1	0.3	
S12	3B2	1.7		0.2	
S13	8C2A	1.61	LD2	0.4	46 %RPD
S14	LCS1	1.24		5.0	200 %Rec
S15	LCS2	1.26		4.4	175 %Rec

Data Quality Assessment

a) Calibration curve is visually excellent, although R squared is low.
b) Lab duplicate is acceptable because it is below the conc. of the calibration.
c) LCS acceptable.
d) The data are usable.

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.929065
R Square	0.863162
Adjusted R	0.794743
Standard E	0.135026
Observatio	4

ANOVA

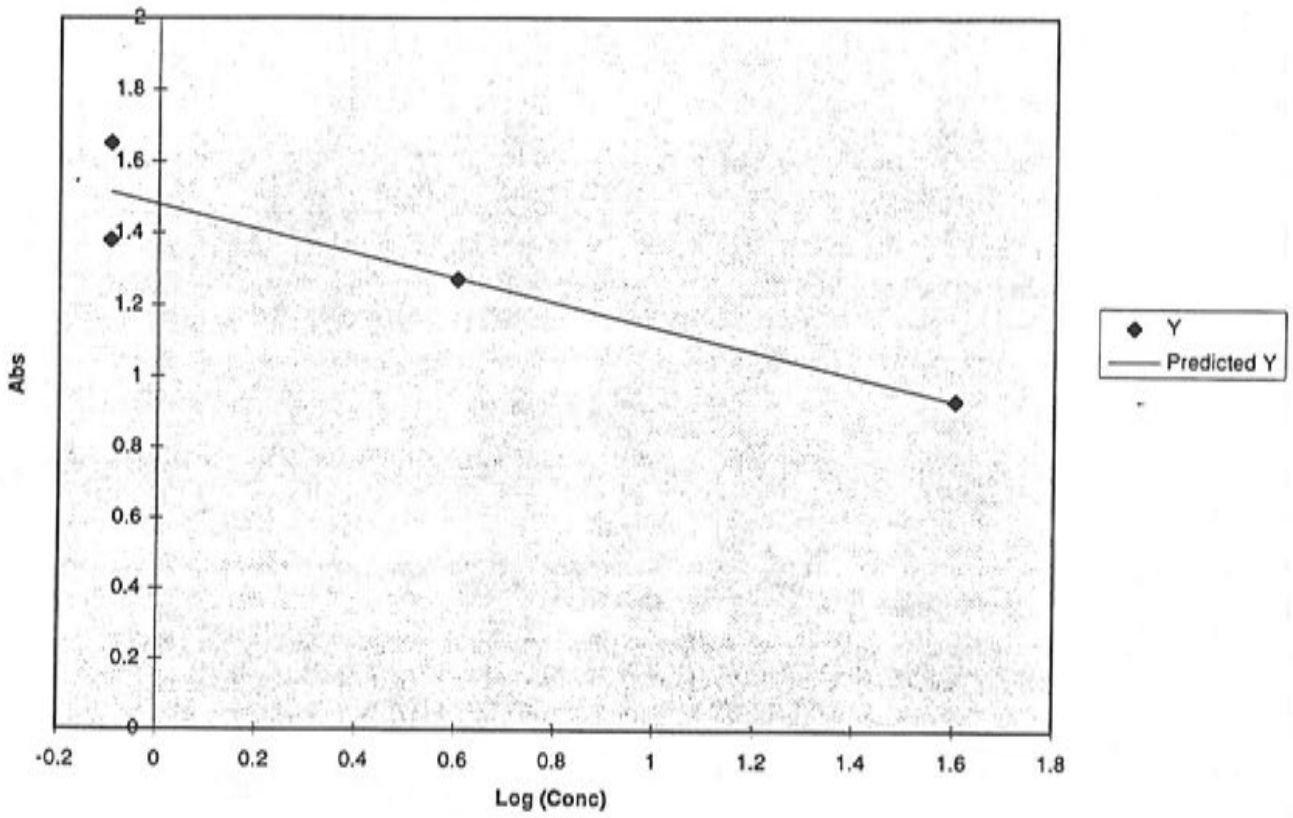
	df	*SS*	*MS*	*F*
Regressior	1	0.230011	0.230011	12.61581
Residual	2	0.036464	0.018232	
Total	3	0.266475		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	1.480661	0.083275	17.78034	0.003148
X Variable	-0.34455	0.097005	-3.55187	0.070935

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.514052	-0.13405
2	1.514052	0.135948
3	1.273223	-0.00322
4	0.928674	0.001326
5	0.726033	-0.02603
6	0.590658	-0.02066

DDT Batch 7 Calibration 9-26-97



DDT Batch 8 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg	0	1.94	#NUM!	0.04087
cal 1	0.8	1.4	-0.09691	0.94196
cal 2	4	1.11	0.60206	5.079439
cal 2	4	1.24	0.60206	2.386575
cal 3	40	0.75	1.60206	41.13736
cal 3	40	0.74	1.60206	43.59837

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	6A3	1.61		0.3		
S2	1C2	1.74		0.1		
S3	6B3	1.4	FD1	0.9		
S4	7A2	1.32		1.5		
S5	6B3B	1.43	FD2	0.8	17 %RPD	
S6	8B3	0.63		82.6		
S7	6C3	1.81		0.1		
S8	9C2	1.26	LD1	2.1		
S9	9C2A	1.21	LD2	2.8	29 %RPD	
S10	LCS1*4	1.09		5.7	228 %Rec	
S11	LCS2*4	1.01		9.1	363 %Rec	

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.984629
R Square	0.969495
Adjusted R	0.959327
Standard E	0.05951
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.337656	0.337656	95.3452
Residual	3	0.010624	0.003541	
Total	4	0.34828		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	1.389709	0.043965	31.60931	6.96E-05
X Variable	-0.39629	0.040585	-9.76449	0.002282

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.428114	-0.02811
2	1.151118	-0.04112
3	1.151118	0.088882
4	0.754825	-0.00483
5	0.754825	-0.01483
6	0.590658	-0.02066

Data Quality Assessment

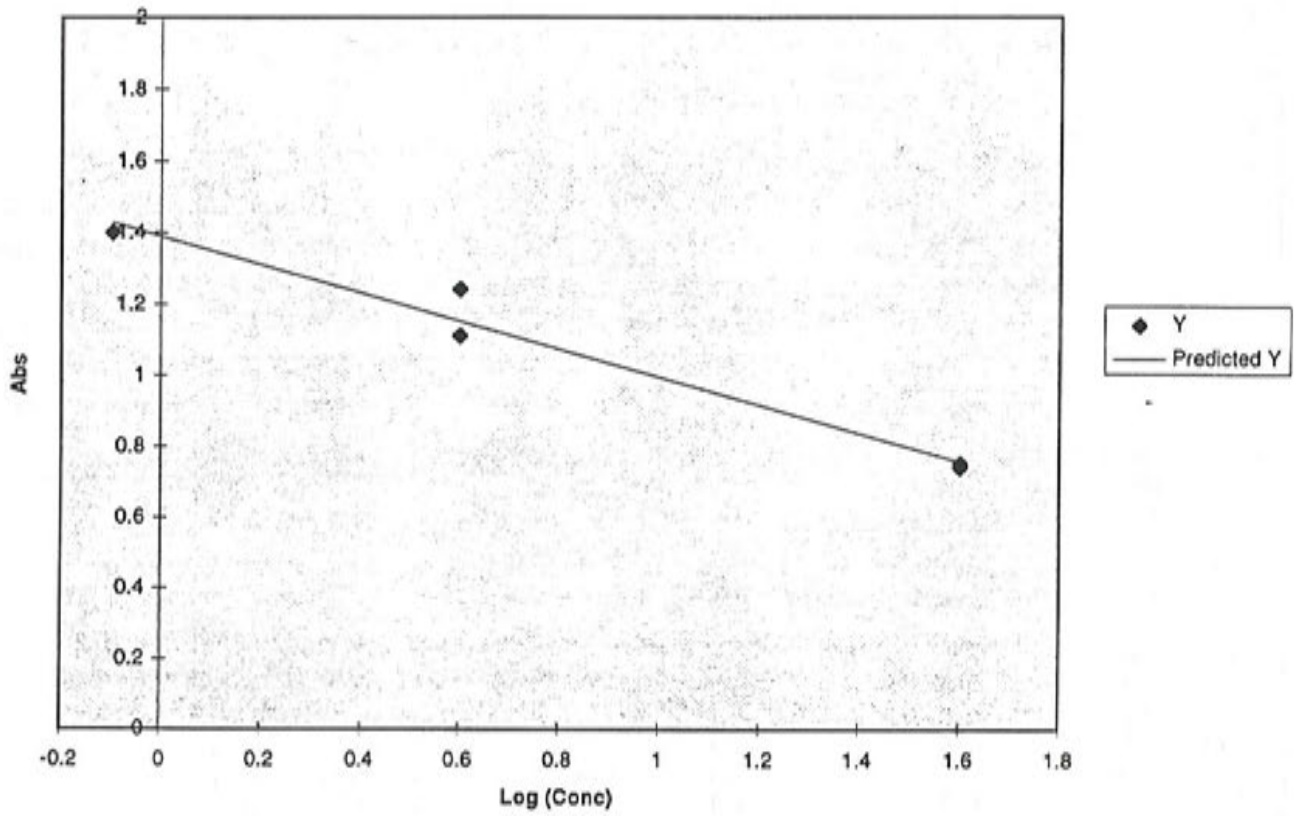
a) Calibration curve duplicates vary, but meet project DQO.

b) Lab and field duplicates are acceptable.

c) LCS is variable but acceptable (problem assigned to a dilution error).

d) The data are usable.

DDT Batch 8 Calibration 9-26-97



DDT Batch 9 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg	0	1.85	#NUM!	0.087739
neg	0	1.87	#NUM!	0.078774
cal 1	0.8	1.44	-0.09691	0.799395
cal 1	0.8	1.5	-0.09691	0.578544
cal 2	4	1.13	0.60206	4.249034
cal 2	4	1.05	0.60206	6.539181
cal 3	40	0.74	1.60206	34.75778
cal 3	40	0.73	1.60206	36.68226

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.988013
R Square	0.97617
Adjusted R	0.970212
Standard E	0.057006
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.532484	0.532484	163.8546
Residual	4	0.012999	0.00325	
Total	5	0.545483		

	Coefficients	*Standard Err*	*t Stat*	*P-value*
Intercept	1.398452	0.033035	42.33215	1.86E-06
X Variable	-0.42727	0.033379	-12.8006	0.000215

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	8B4	0.86		18.2	
S2	3B4	1.48	LD1	0.6	
S3	3B4A	1.44	LD2	0.8	21 %RPD
S4	7C3	1.71	FD1	0.2	
S5	9A3	1.65		0.3	
S6	7C3	1.76	FD2	0.1	27 %RPD
S7	3A4	1.74		0.2	
S8	5C4	0.95		11.2	
S9	9B3	1.78		0.1	
S10	3C4	1.6		0.3	
S11	LCS1X	1.08		5.6	223 %Rec
S12	LCS2X	1.09		5.3	211 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.43986	0.00014
2	1.43986	0.06014
3	1.141207	-0.01121
4	1.141207	-0.09121
5	0.713933	0.026067
6	0.713933	0.016067

Data Quality Assessment

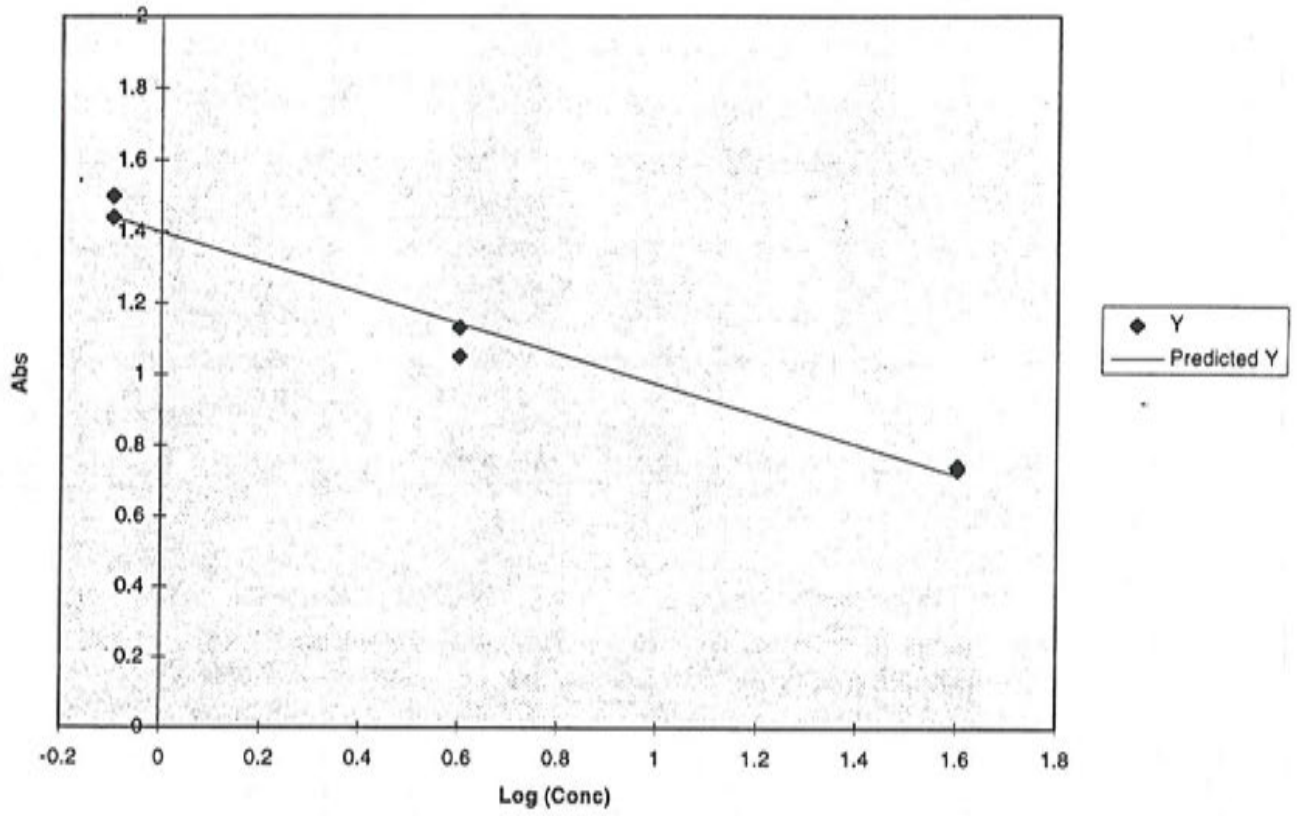
a) Calibration curve is acceptable.

b) Lab and field duplicates are acceptable.

c) LCS is acceptable.

d) The data are usable.

DDT Batch 9 Calibration 9-26-97



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DDT Batch 10 Calibration and Sample Data 9/29/97

	conc	abs	log(conc)	predconc
neg	0	1.66	#NUM!	0.023346
neg	0	1.74	#NUM!	0.012594
cal 1	0.8	1.18	-0.09691	0.947233
cal 1	0.8	1.21	-0.09691	0.751521
cal 2	4	0.94	0.60206	6.033678
cal 2	4	1.07	0.60206	2.213168
cal 3	40	0.7	1.60206	38.43327
cal 3	40	0.68	1.60206	44.84539

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	3A5	1.8		0.0	
S2	3A6	1.79		0.0	
S3	3C5	1.54		0.1	
S4	3C6	1.5		0.1	
S5	3B5	1.56	LD1	0.1	
S6	3B5A	1.56	LD2	0.1	0 %RPD
S7	3B6	1.58		0.0	
S8	5C5	1.34		0.3	
S9	5C6	1.24		0.6	
S10	8B5	1.53		0.1	
S11	8B6	1.52		0.1	
S12	LCS3*4	0.86		11.2	447 %Rec

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.982175
R Square	0.964667
Adjusted R	0.955834
Standard E	0.048776
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.259817	0.259817	109.2098
Residual	4	0.009516	0.002379	
Total	5	0.269333		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.172973	0.028265	41.49845	2.02E-06
X Variable	-0.29846	0.02856	-10.4504	0.000474

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.201897	-0.0219
2	1.201897	0.008103
3	0.993282	-0.05328
4	0.993282	0.076718
5	0.694821	0.005179
6	0.694821	-0.01482

Data Quality Assessment

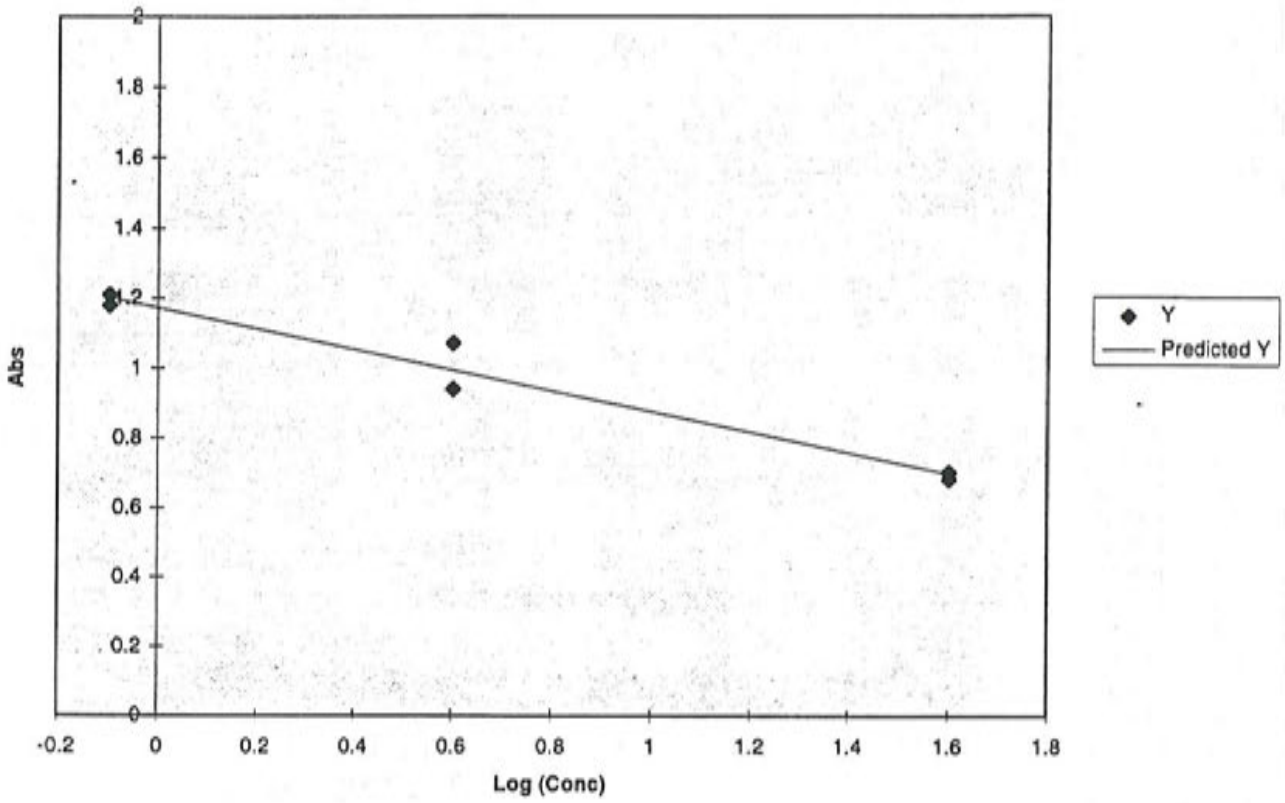
a) Calibration curve is acceptable.

b) Lab duplicate is acceptable.

c) LCS is questionable - new solution later confirmed to be dilution error.

d) The data are usable.

DDT Batch 10 Calibration 9/29/97



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DDT Batch 11 (rerun) Calibration and Sample Data 10/15/97

	conc (ppm)	abs	log(conc)	predconc
neg	0	1.67	#NUM!	0.0162034
neg	0	1.68	#NUM!	0.0149591
cal 1	0.8	1.18	-0.09691	0.8128856
cal 1	0.8	1.22	-0.09691	0.5904994
cal 2	4	0.94	0.60206	5.5320944
cal 2	4	0.96	0.60206	4.7150312
cal 3	40	0.7	1.60206	37.648676
cal 3	40	0.71	1.60206	34.757393

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.992075
R Square	0.984212
Adjusted R	0.980265
Standard E	0.031165
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.242198	0.242198	249.3591
Residual	4	0.003885	0.000971	
Total	5	0.246083		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.154074	0.01806	63.90097	3.59E-07
X Variable	-0.28816	0.018248	-15.7911	9.4E-05

seq #	sample #	abs	QC	conc	%R or RPD
S1	LCS4X2	0.78	LCS Dup 1	19.9	397%
S2	CX1A1	0.84		12.3	
S3	CX9A1	0.95		5.1	
S4	FC9A	0.72		32.1	
S5	FC9B	0.9		7.6	
S6	FC9C	0.93		6.0	
S7	FC8A	1.29	LD1	0.3	
S8	FC8A-A	1.34	LD2	0.2	39%
S9	FC8B	1.13		1.2	
S10	FC8C	1.53		0.0	
S11	LCS4X2-A	0.85	LCS Dup2	11.4	227%

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.182	-0.002
2	1.182	0.038
3	0.980582	-0.04058
4	0.980582	-0.02058
5	0.692418	0.007582
6	0.692418	0.017582

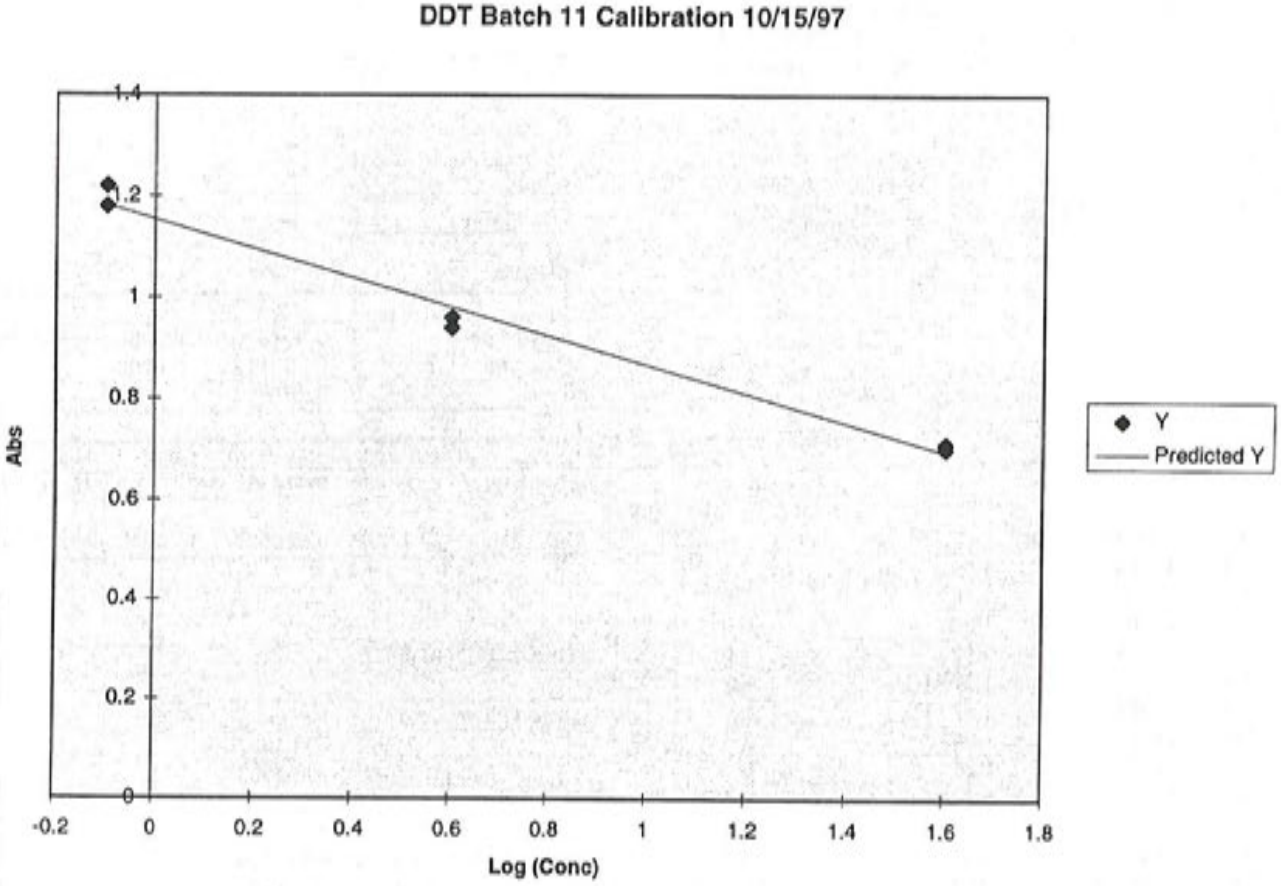
Data Quality Assessment

a) Calibration curve is acceptable.

b) Lab duplicate is acceptable.

c) LCS is questionable - new solution later confirmed to be dilution error.

d) The data are usable.


DDT Batch 11 Calibration 10/15/97
Abs
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
Log (Conc)
Y
Predicted Y

DDT Batch 12 Calibration and Sample Data 10/23/97

	conc	abs	log(conc)	predconc
neg	0	1.71	#NUM!	0.026001
neg	0	1.63	#NUM!	0.046008
cal 1	0.8	1.21	-0.09691	0.920511
cal 1	0.8	1.26	-0.09691	0.644355
cal 2	4	0.97	0.60206	5.09996
cal 2	4	1.02	0.60206	3.569958
cal 3	40	0.7	1.60206	34.99829
cal 3	40	0.67	1.60206	43.35

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.994778
R Square	0.989584
Adjusted R	0.98698
Standard E	0.028278
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.303885	0.303885	380.0238
Residual	4	0.003199	0.0008	
Total	5	0.307083		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	1.198389	0.016387	73.13	2.1E-07
X Variable	-0.32278	0.016558	-19.4942	4.08E-05

seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	FC1A	1.04		3.1		
S2	FC1B	1.16		1.3		
S3	FC1C	1.38		0.3		
S4	FC6A	0.82		14.9		
S5	FC6B	1.09	LD1	2.2		
S6	FC6B-A	1.27	LD2	0.6	113 %RPD	
S7	FC6C	1.08		2.3		
S8	FC7A	1.24		0.7		
S9	FC7B	1.32		0.4		
S10	FC7C	1.22		0.9		
S11	FC9A	1.03		3.3		
S12	LCS5X2	0.6		71.4	1429 %Rec	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.22967	-0.01967
2	1.22967	0.03033
3	1.004056	-0.03406
4	1.004056	0.015944
5	0.681274	0.018726
6	0.681274	-0.01127

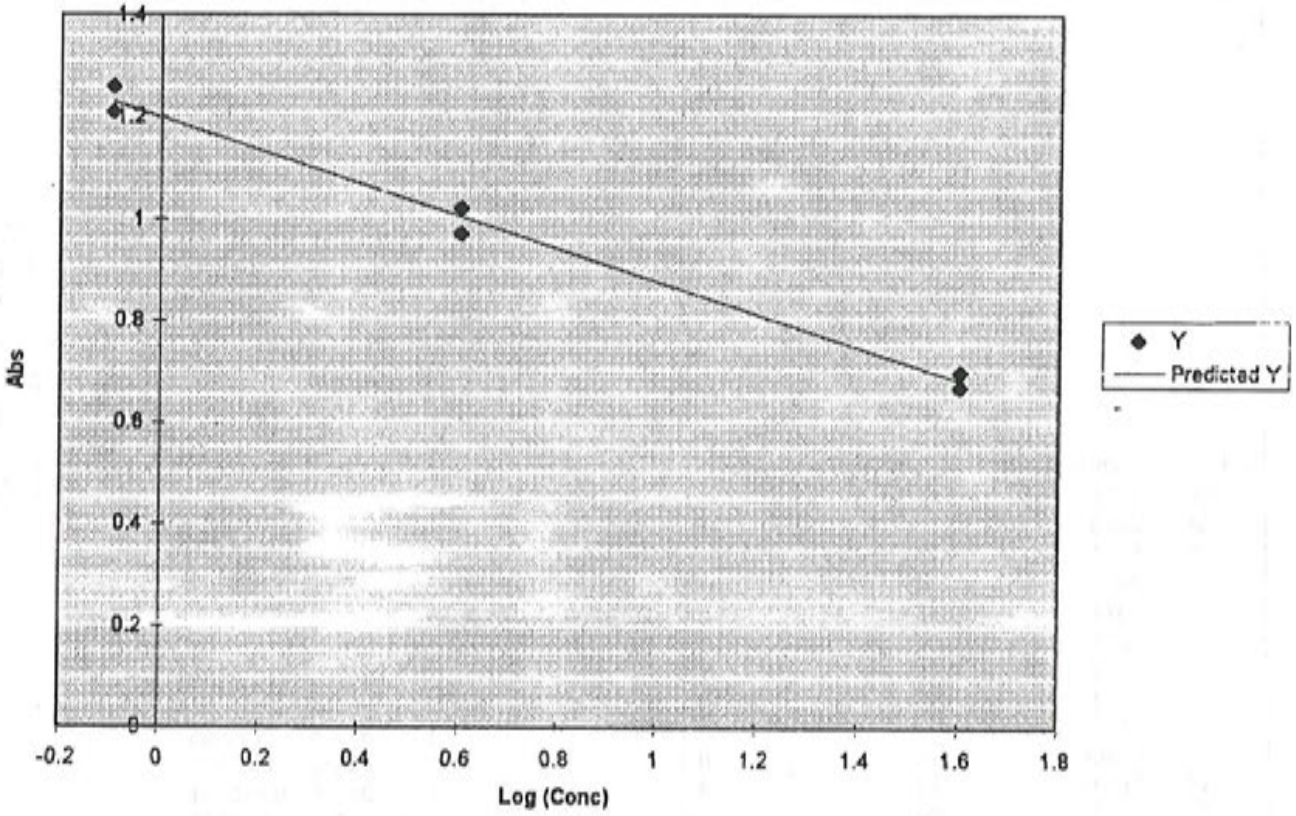
Notes: Acceptable calibration.

Duplicates were not acceptable, with no apparent reason.

Lab Control Sample (LCS) was not acceptable, with only possible cause is contamination of the solvent or equipment used for dilution. This was verified in Batch 13 when both this and a new solution were analyzed.

These data should be used with caution due to duplicates not agreeing, but in general are acceptable for the intended use.

DDT Calibration Batch 12 10/23/97



10/26/97

DDT Batch 13 Calibration and Sample Data 10/24/97

	conc	abs	log(conc)	predconc
neg	0		#NUM!	1720.563
neg	0	1.49	#NUM!	0.039338
cal 1	0.8	1.09	-0.09691	0.692911
cal 1	0.8	1.08	-0.09691	0.74443
cal 2	4	0.79	0.60206	5.957705
cal 2	4	0.85	0.60206	3.874348
cal 3	40	0.54	1.60206	35.78881
cal 3	40	0.53	1.60206	38.44979

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	SW6	0.98		1.5	9B(0-1)
S2	SW5	0.63		18.8	9AE(1-2)
S3	SW1	0.79		6.0	9AN(1-2)
S4	SW7	0.64		17.5	9C(0-1)
S5	SW11	1.48	LD/FD2	0.0	FD1 5C(0-1)
S6	SW11-A	1.44	LD	0.1	28 %RPD
S7	SW2	0.75		7.9	8A(0-1)
S8	SW4	0.68		13.1	6A(1-2)
S9	SW22	1.4		0.1	6C(1-2)
S10	FC5A	1.18		0.4	
S11	FC5B	0.74		8.5	
S12	FC5C	0.76		7.4	
S13	SW8	1.45	FD2	0.1	21 %RPD
S14	LCS6X2	0.74		8.5	171 %Rec
S15	LCS5X2	0.62		20.2	403 %Rec

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.993611
R Square	0.987263
Adjusted R	0.984079
Standard E	0.03114
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.300654	0.300654	310.045
Residual	4	0.003879	0.00097	
Total	5	0.304533		

	Coefficients	*tandard Erro*	*t Stat*	*P-value*
Intercept	1.038848	0.018046	57.56747	5.45E-07
X Variable	-0.32106	0.018234	-17.6081	6.11E-05

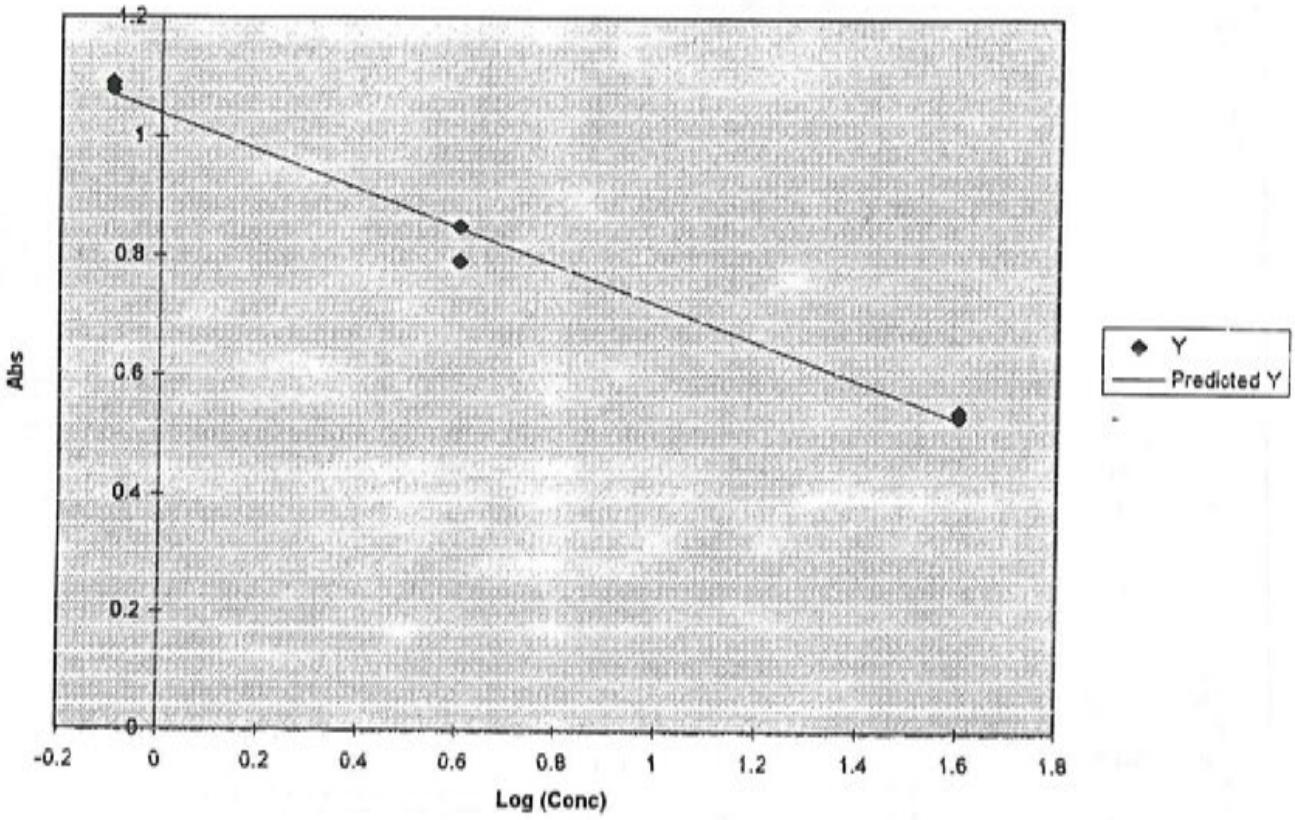
RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.069962	0.020038
2	1.069962	0.010038
3	0.84555	-0.05555
4	0.84555	0.00445
5	0.524489	0.015511
6	0.524489	0.005511

Notes: Acceptable calibration and QC (duplicates were below the concentration of the lowest calibrator).

Lab Control Sample (LCS6) was acceptable and LCS5 was high again, confirming the hypothesis noted in Batch 12.

DDT Batch 13 Calibration 10/24/97



MW 10/26

DDT Batch 14 Calibration and Sample Data 10/24/97

	conc	abs	log(conc)	predconc
neg	0		#NUM!	920.935
neg	0	1.86	#NUM!	0.047255
cal 1	0.8	1.4	-0.09691	0.543702
cal 1	0.8	1.31	-0.09691	0.876861
cal 2	4	0.93	0.60206	6.596872
cal 3	40	0.59	1.60206	40.13208
cal 3	40	0.63	1.60206	32.45177

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	4A	0.47		75.9	
S2	4B	0.5		64.7	
S3	4C	0.63		32.5	
S4	2A	1.38		0.6	
S5	2B	1.66		0.1	
S6	2C	1.69		0.1	
S7	SW3	1.01		4.3	7A(0-1)
S8	SW10	1.2		1.6	7C(1-2)
S9	SW9	1.03		3.9	8C(0-1)
S10	SW20	1.02		4.1	9AN(0-1)
S11	3A	1.55	LD	0.2	
S12	3A-A	1.52	LD	0.3	16 %RPD
S13	3B	1.53		0.3	
S14	3C	1.56		0.2	
S15	LCS6X2	0.81		12.5	250 %Rec

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.985652
R Square	0.97151
Adjusted R	0.962013
Standard E	0.073061
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.546066	0.546066	102.2986
Residual	3	0.016014	0.005338	
Total	4	0.56208		

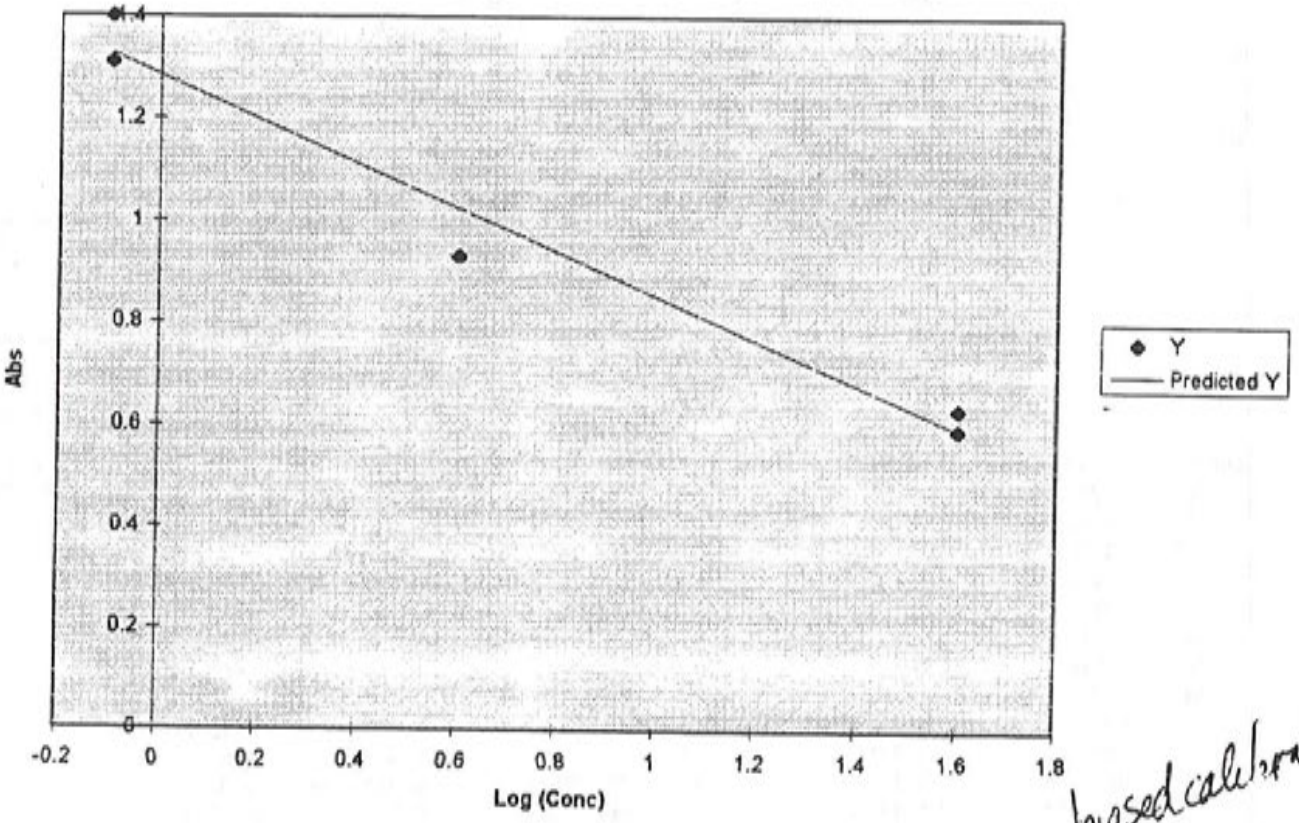
	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.285256	0.04502	28.54831	9.44E-05
X Variable	-0.43359	0.042869	-10.1143	0.002059

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.327275	0.072725
2	1.327275	-0.01727
3	1.024209	-0.09421
4	0.590621	-0.00062
5	0.590621	0.039379
6	0.524489	0.005511

Notes: Calibration does not fit the log model. This is being investigated by the kit manufacturer (SDI).
Mid-range of calibration is high biased, affecting LCS, SW3, SW20 and SW9. The values near 40 (4A, 4B, and 4C) are possibly high as well and are being investigated by the kit manufacturer.
Field duplicates were blind. The lab duplicates were required for QC for the 27 grid samples.

DDT Batch 14 Calibration 10/24/97



biased calibration
new 10/26/97

DDT Batch 15 Calibration and Sample Data 10/24/97

	conc	abs	log(conc)	predconc
neg	0		#NUM!	3054.664
neg	0	1.68	#NUM!	0.0574
cal 1	0.8	1.34	-0.09691	0.519245
cal 1	0.8	1.28	-0.09691	0.765879
cal 2	4	0.9	0.60206	8.977356
cal 3	40	0.68	1.60206	37.32816
cal 3	40	0.71	1.60206	30.73567

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.971511
R Square	0.943833
Adjusted R	0.925111
Standard E	0.085327
Observatio	5

	x	y	log x

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.367038	0.367038	50.41227
Residual	3	0.021842	0.007281	
Total	4	0.38888		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.238822	0.052579	23.56135	0.000168
X Variable	-0.35548	0.050066	-7.10016	0.005748

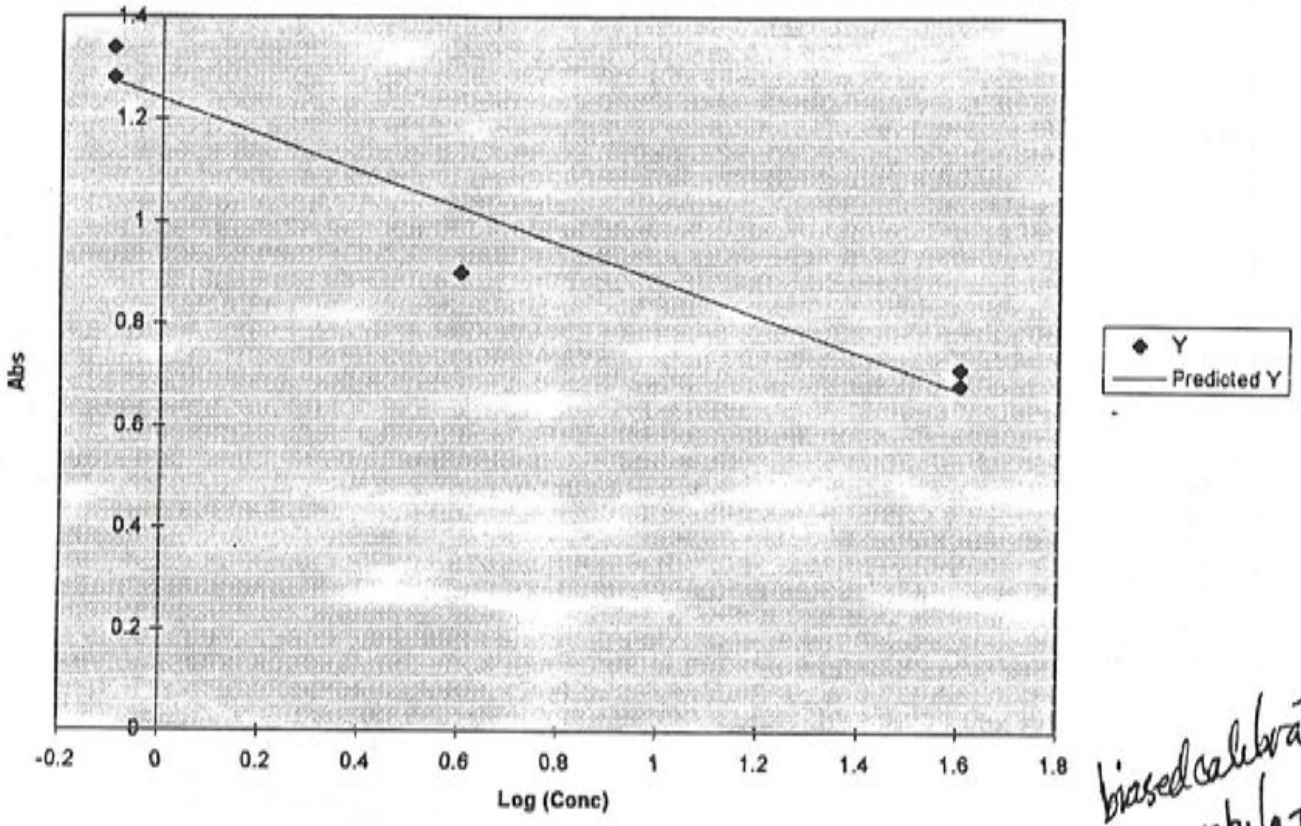
seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	SW12	1.7		0.1	4C(0-1)
S2	SW13	1.63		0.1	3C(0-1)
S3	SW14	1.63		0.1	FD2 (SW17)
S4	SW15	0.91		8.4	1A(0-1)
S5	SW16	1.51		0.2	2A(0-1)
S6	SW17	1.53		0.2	FD1 3A(2-3)
S7	SW18	1.38		0.4	4A(0-1)
S8	SW19	0.82		15.1	5A(0-1)
S9	SW21	0.63		51.6	1B(0-1)
S10	6A924	1.5	LD1	0.2	
S11	6A924-A	1.43	LD2	0.3	45 %RPD
S12	LCS6X2	0.76	LCS	22.2	445 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.273271	0.066729
2	1.273271	0.006729
3	1.024804	-0.1248
4	0.669327	0.010673
5	0.669327	0.040673
6	0.524489	0.005511

Notes: Calibration does not fit the log model. This is being investigated by the kit manufacturer (SDI).
Mid-range of calibration is high biased, affecting LCS, SW15 and SW19. SW21 is possibly high as well and is being investigated by the kit manufacturer.
Field duplicates and lab duplicates were acceptable because the concentrations are below the lowest calibrator.
Field duplicates were blind. The lab duplicates were required for QC for the 27 grid samples.
M.W. 10/27

DDT Batch 15 Calibration 10/24/97



biased calibration
mw 10/24/97

DDT Batch 16 Calibration and Sample Data 10/29/97

	conc	abs	log(conc)	predconc
neg	0		#NUM!	1590.654
neg	0	1.39	#NUM!	0.105218
cal 1	0.8	1.12	-0.09691	0.682232
cal2	4	0.83	0.60206	5.080554
cal 2	4	0.86	0.60206	4.127683
cal 3	40	0.54	1.60206	37.8347
cal 3	40	0.54	1.60206	37.8347

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	LCS6X21029	0.71	LCS	11.7	233 %Rec
S2	4A1024	0.48		57.3	
S3	4B1024	0.51		46.6	
S4	4C1024	0.7	LD1	12.5	
S5	4C1029	0.57	LD2	30.7	84 %RPD
S6	SW191024	0.64		18.9	5A(0-1)
S7	SW211024	0.62		21.7	1B(0-1)

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.996088
R Square	0.992191
Adjusted R	0.989588
Standard E	0.024978
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.237808	0.237808	381.1543
Residual	3	0.001872	0.000624	
Total	4	0.23968		

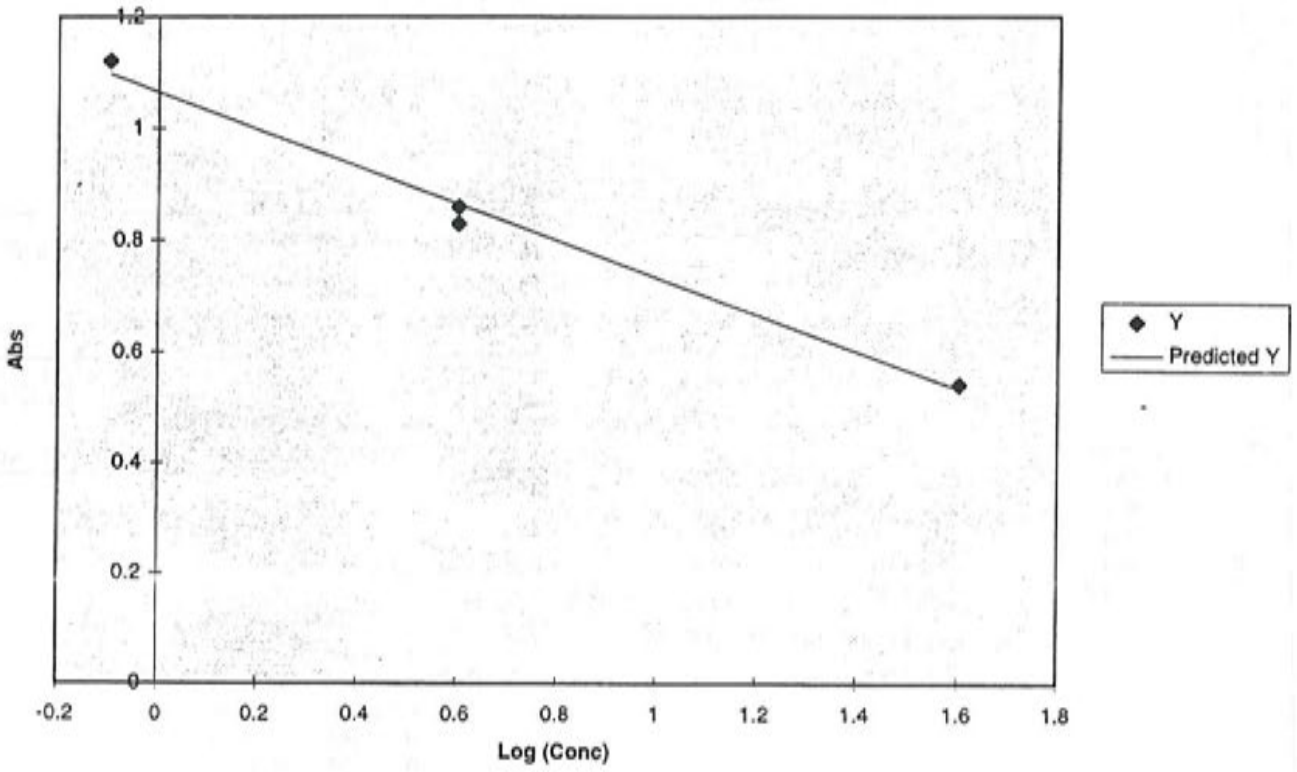
	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.06477	0.018454	57.6994	1.15E-05
X Variable	-0.33258	0.017035	-19.5232	0.000294

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.097	0.023
2	0.864538	-0.03454
3	0.864538	-0.00454
4	0.531962	0.008038
5	0.531962	0.008038
6	0.524489	0.005511

Notes: Calibration is excellent.
LCS is within 20% of "true value" at 200%
Lab duplicates are outside of control limits, however a bubble formed in the second tube when substrate was added. This is consistent with the observation of higher conc for the duplicate. The first value is acceptable.
The data are accepted. M.W. 10/29

DDT Batch 16 Calibration 10/29/97



DDT Batch 17 Calibration and Sample Data 11/3/97

	conc	abs	log(conc)	predconc
neg		0	#NUM!	1171.314
neg		0	1.46 #NUM!	0.072988
cal 1		0.8	1.13 -0.09691	0.651314
cal2		4	0.83 0.60206	4.763417
cal 2		4	0.83 0.60206	4.763417
cal 3		40	0.51 1.60206	39.77914
cal 3		40	0.53 1.60206	34.83749

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	FC4A1	0.98		1.76	
S2	FC4B1	0.87		3.65	
S3	FC4C3	0.9		2.99	
S4	FC4A3	1.1	FD1	0.8	
S5	FC4A3-2	0.89	FD2	3.2	120 %RPD

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.994673
R Square	0.989374
Adjusted R	0.985832
Standard E	0.030458
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.259137	0.259137	279.3346
Residual	3	0.002783	0.000928	
Total	4	0.26192		

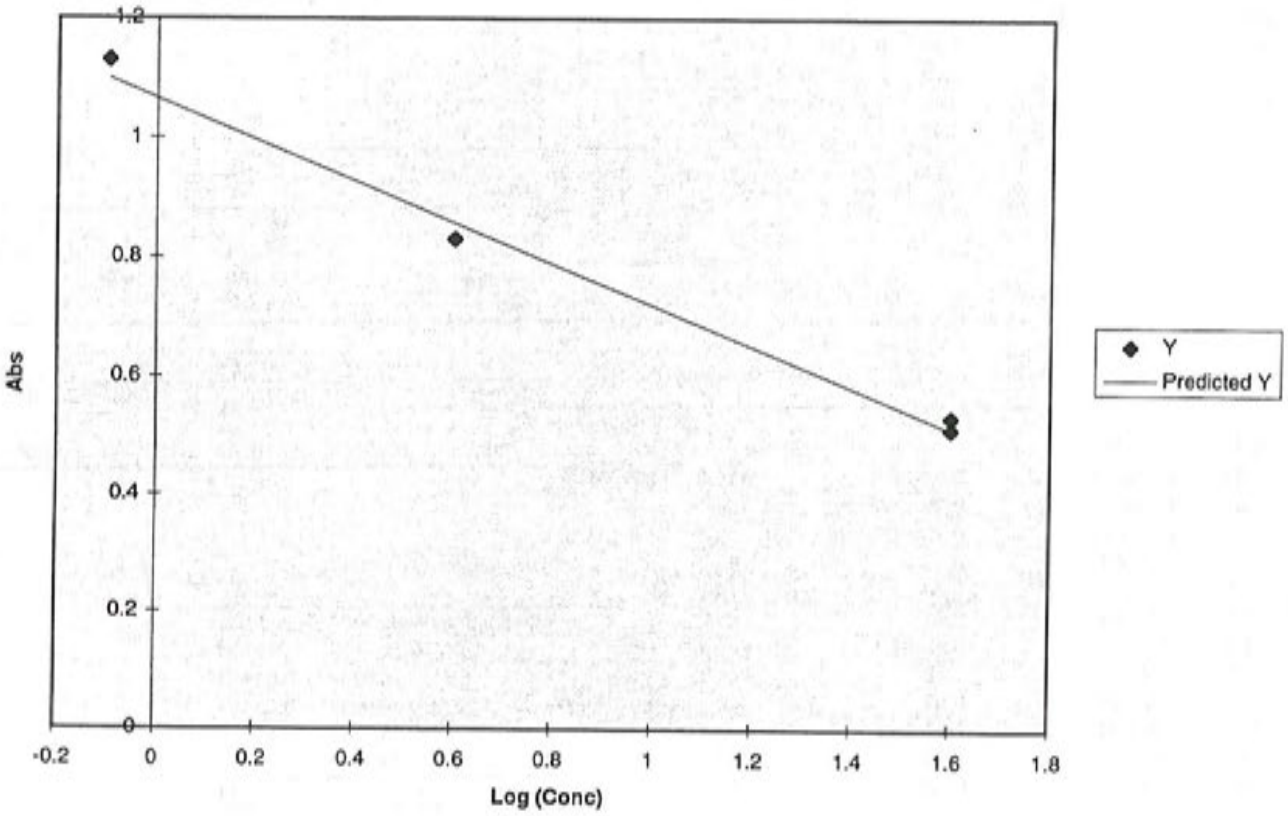
	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	1.065353	0.022502	47.34456	2.07E-05
X Variable	-0.34717	0.020772	-16.7133	0.000466

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.098998	0.031002
2	0.856336	-0.02634
3	0.856336	-0.02634
4	0.509165	0.000835
5	0.509165	0.020835
6	0.524489	0.005511

Notes: Calibration is excellent.
LCS was accidentally omitted.
Lab duplicates are outside of control limits, however inhomogeneity is suspected (pebbles were noted during the extraction). Solutions will be rerun.
The data are accepted based on the outcome of the reruns. The variability in the field duplicates is high, but the reported concentrations are far enough below the action level that there is little impact on the conclusions.

DDT Batch 17 Calibration 11/3/97



DDT Batch 18 Calibration and Sample Data 11/3/97

	conc	abs	log(conc)	predconc
neg		0	#NUM!	2104.217
neg		0	1.29 #NUM!	0.020704
cal 1		0.8	0.9 -0.09691	0.675782
cal2		4	0.69 0.60206	4.41475
cal 2		4	0.68 0.60206	4.827479
cal 3		40	0.43 1.60206	45.08967
cal 3		40	0.47 1.60206	31.53697

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.993725
R Square	0.987489
Adjusted R	0.983319
Standard E	0.02455
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.142712	0.142712	236.7958
Residual	3	0.001808	0.000603	
Total	4	0.14452		

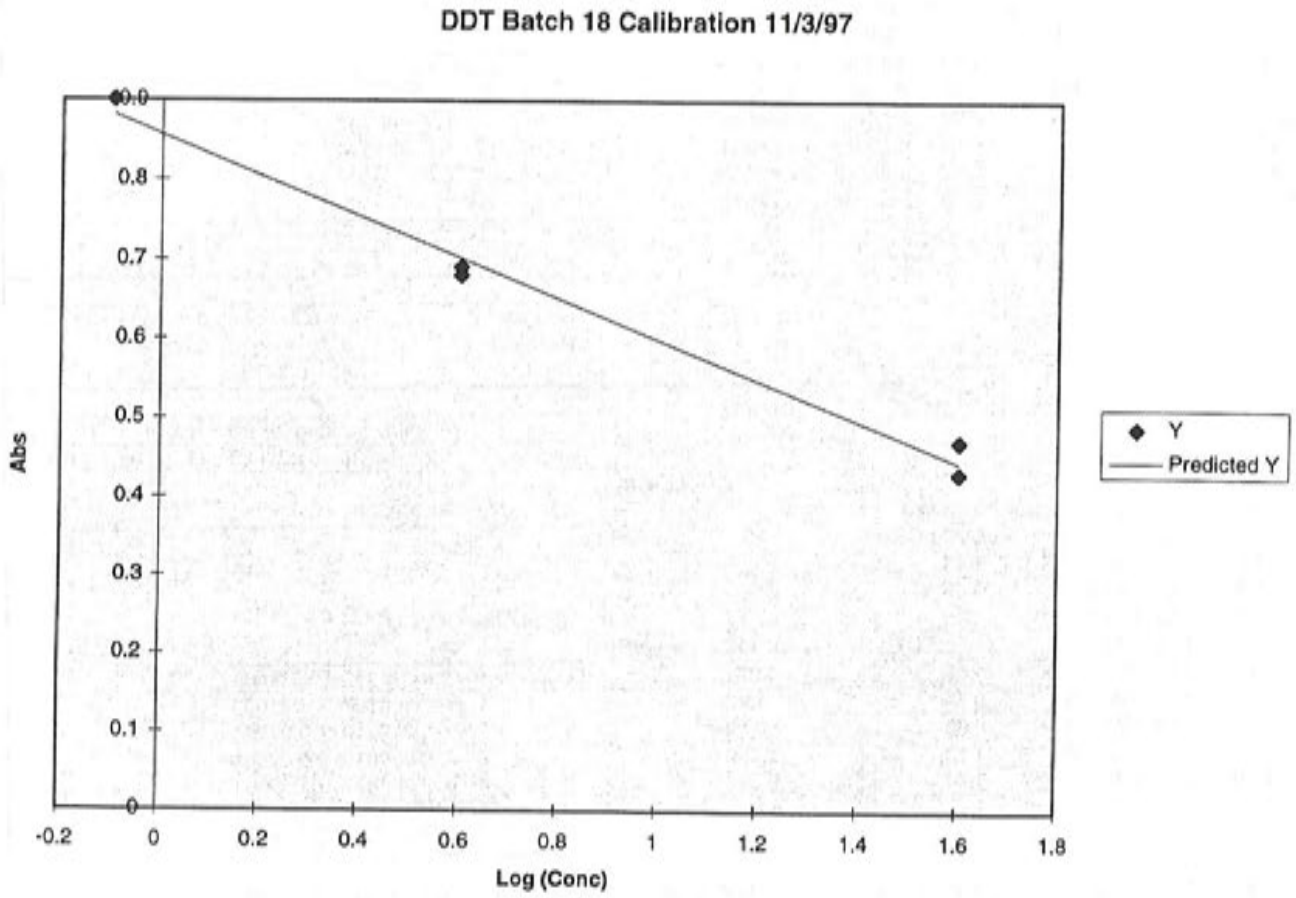
	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	0.856152	0.018137	47.20481	2.09E-05
X Variable	-0.25764	0.016743	-15.3882	0.000596

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	LCS6X2	0.54	LCS	16.9	337 %Rec
S2	FC4A3	0.82	FD1 rerun	1.381	
S3	FC4A3-2	0.73	FD2 rerun	3.1	76 %RPD
S4	SW1AW	0.43		45.1	
S5	SW1BW	0.33		110.2	
S6	SW5AN	0.61		9.02	
S7	SW53	0.49	FD1	26.4	
S8	SW6AN	1.02		0.231	
S9	SW7AN	0.57		12.9	69 %RPD
S10	SW8AN	0.5		24.1	
S11	SW9AE	0.66		5.77	
S12	SW9CE	0.76		2.36	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.881119	0.018881
2	0.701039	-0.01104
3	0.701039	-0.02104
4	0.443402	-0.0134
5	0.443402	0.026598
6	0.524489	0.005511

Notes: LCS is approximately 70% above the "true value" at 200%. This is not acceptable.
The duplicates for FC4A3 replicated the results of batch 17, confirming the inhomogeneous sample.
The second field duplicate was done as corrective action for Batch 17 and is also outside of the DQO targets.
The calibration is excellent. These data are tentatively accepted until the LCS issue is resolved.


DDT Batch 18 Calibration 11/3/97
Abs
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
Log (Conc)
Y
Predicted Y

DDT Batch 19 Calibration and Sample Data 11/15/97

	conc	abs	log(conc)	predconc
neg	0		#NUM!	1014.775
neg	0	1.89	#NUM!	0.01872
cal 1	0.8	1.28	-0.09691	0.631296
cal2	4	0.92	0.60206	5.034533
cal 2	4	0.93	0.60206	4.752381
cal 3	40	0.57	1.60206	37.89982
cal 3	40	0.58	1.60206	35.77578

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	LCS7X2	0.72	LCS	16.0	319 %Rec
S2	FC24B3	1.43		0.266	
S3	FC2-9A2.5	1.46		0.224	
S4	FC2-9B2.5	1.5		0.177	
S5	FC2-9B2.5-2	1.58	FD1	0.112	45 %RPD
S6	FC2-9C2.5	1.66		0.071	
S7	FC2-SW7AN	0.74		14.2	
S8	FC2-SW8AN	0.65		23.9	
S9	FC2-SW1AW	1.13		1.500	
S10	FC2-SW1BW	1.44		0.251	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99330965
R Square	0.98666407
Adjusted R	0.98221876
Standard E	0.03929307
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.342688	0.342688	221.9562
Residual	3	0.004632	0.001544	
Total	4	0.34732		

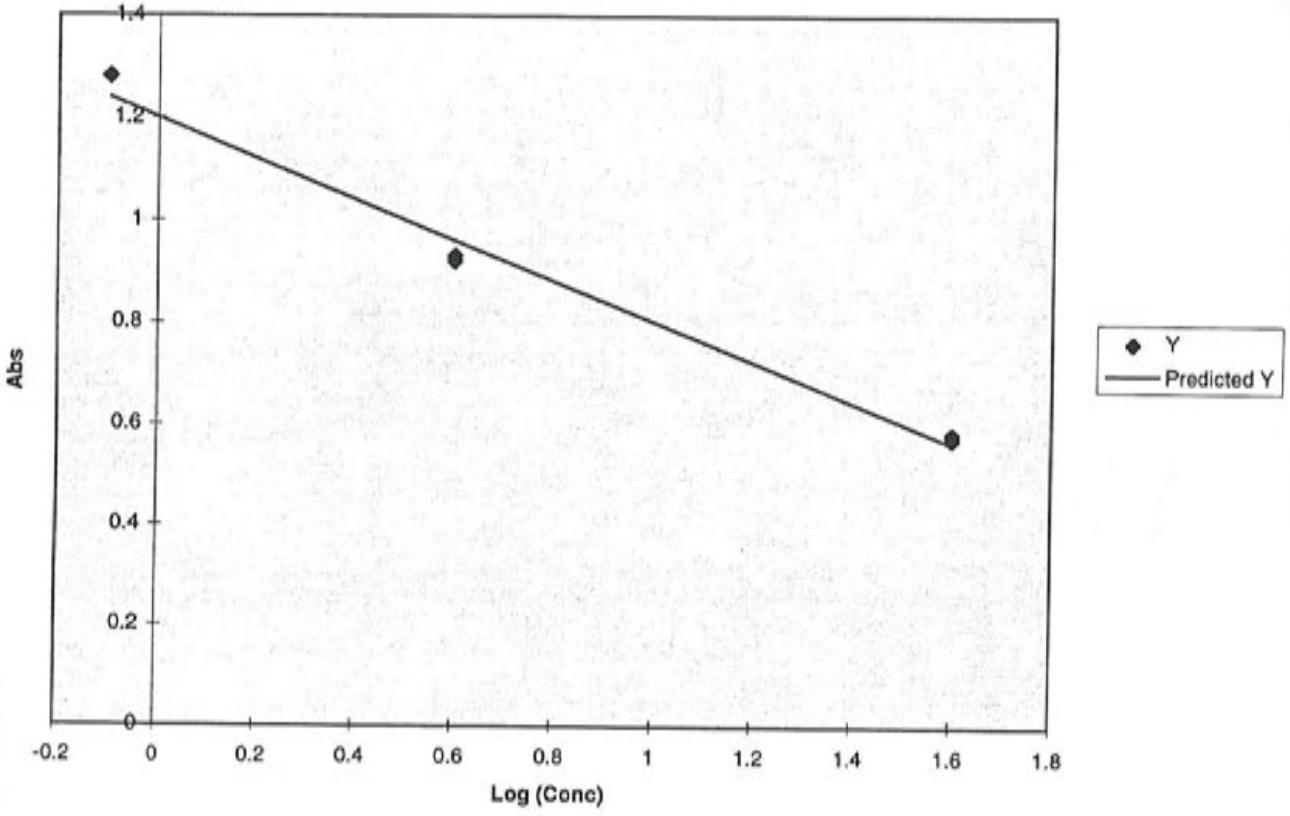
	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	1.20024626	0.029029	41.34596	3.11E-05
X Variable	-0.3992344	0.026798	-14.8982	0.000656

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.23893607	0.041064
2	0.95988319	-0.03988
3	0.95988319	-0.02988
4	0.56064877	0.009351
5	0.56064877	0.019351
6	0.52448866	0.005511

Notes: LCS is approximately 60% above the "true value" at 200%. This is not acceptable based on earlier performance, but is typical of recent performance.
Duplicate precision is acceptable since concentration is below the lowest standard.
The calibration is excellent. These data are accepted.

DDT Calibration Batch 19 ii/15/97



DDT Batch 20 Sample Data 11/15/97 (Using Batch 19 Calibration Adjusted for Intercept'

	conc	abs	log(conc)	predconc
neg		0	#NUM!	478.773
neg		0	#NUM!	0.008832
cal 1		0.8	-0.09691	0.297847
cal2		4	0.60206	2.375304
cal 2		4	0.60206	2.242184
cal 3		40	1.60206	17.88122
cal 3		40	1.60206	16.87909

	x	y	log x

Lower the whole curve to predict the 4 ppm standard:

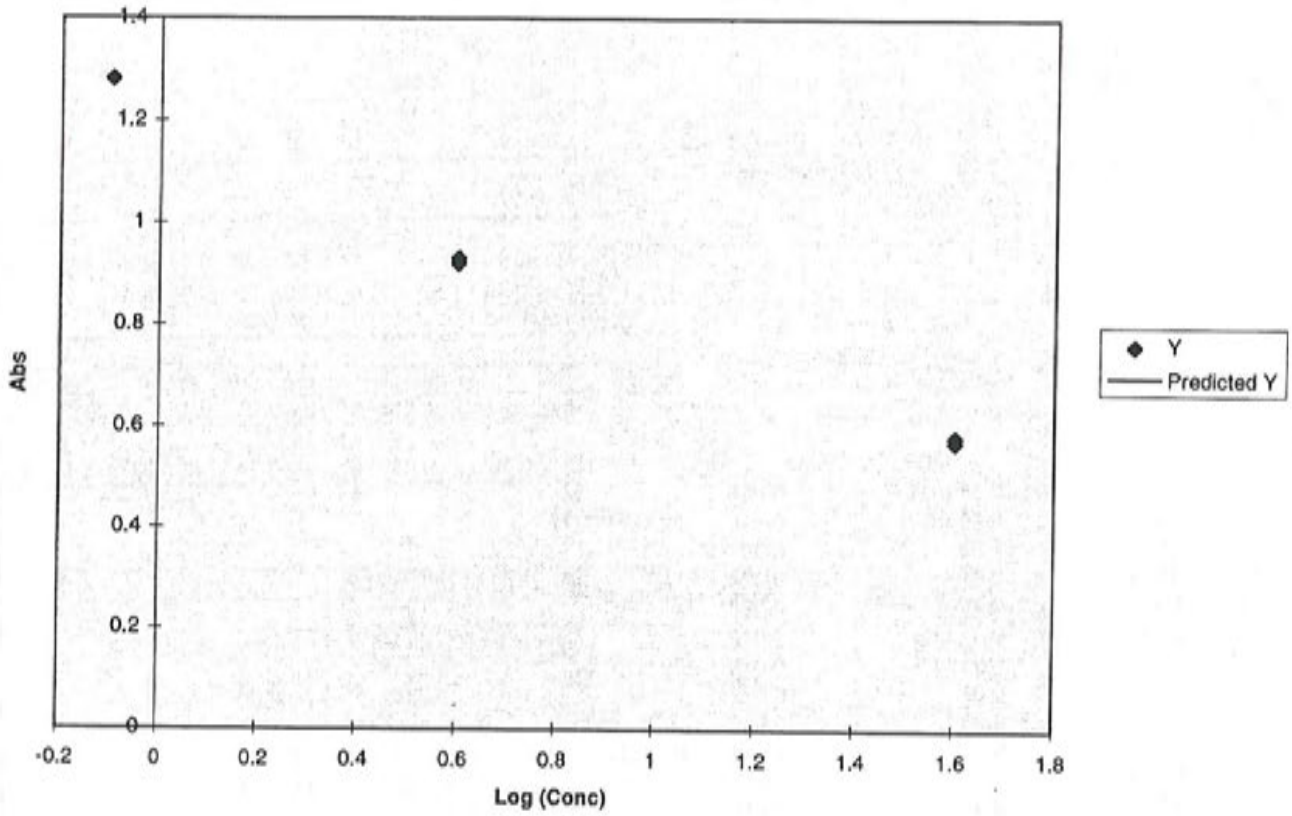
	Batch 20	*Batch 19*
Intercept	1.07	1.2
Slope	-0.39923	-0.39923

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	4 ppm DDT	0.83		4.0	100 %Rec
S2	FC3-SW7A	0.75		6.33	
S3	FC3-SW8A	0.73		7.11	
S4	FC3-SW8A-DEEP	0.6		15.0	

Notes: LCS is approximately 70% above the "true value" at 200%. This is not acceptable.

The calibration is excellent. These data are tentatively accepted until the LCS issue is resolved.

DDT Calibration Batch 20 (Adjusted #19) 11/15/97



Chlordane Batch 1 Calibration and Sample Data 9/24/97

	conc	abs	log(conc)	predconc
neg	0	1.19	#NUM!	0.002951
neg	0	1.25	#NUM!	0.002122
cal 1	0.018	0.84	-1.74473	0.020216
cal 1	0.018	0.9	-1.74473	0.014535
cal 2	0.086	0.56	-1.0655	0.094255
cal 2	0.086	0.56	-1.0655	0.094255
cal 3	0.512	0.24	-0.29073	0.54756
cal 3	0.512	0.28	-0.29073	0.439457

x	y	log x

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.995406
R Square	0.990834
Adjusted R	0.988542
Standard E	0.029304
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.371298	0.371298	432.3769
Residual	4	0.003435	0.000859	
Total	5	0.374733		

	Coefficients	*tandard Erro*	*t Stat*	*P-value*
Intercept	0.13046	0.02401	5.433532	0.005567
X Variable	-0.41878	0.02014	-20.7937	3.16E-05

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	45B2	0.78	FD1	0.028	
S2	45B3	0.88	FD2	0.016	54 %RPD
S3	45C1	1.03		0.007	
S4	45A4	0.81		0.024	
S5	23A5	0.78		0.028	
S6	23B6A	0.69	LD1	0.046	
S7	23B6B	0.89	LD2	0.015	100 %RPD
S8	23B7	0.61		0.072	
S9	23C8	0.99		0.009	
S10	LCS1	0.22		0.611	133 %Rec
S11	W1-3	0.16		0.850	
S12	W4-5	0.41		0.215	
S13	WCANS6	0.9		0.015	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.861117	-0.02112
2	0.861117	0.038883
3	0.576671	-0.01667
4	0.576671	-0.01667
5	0.252212	-0.01221
6	0.252212	0.027788

Data Quality Assessment

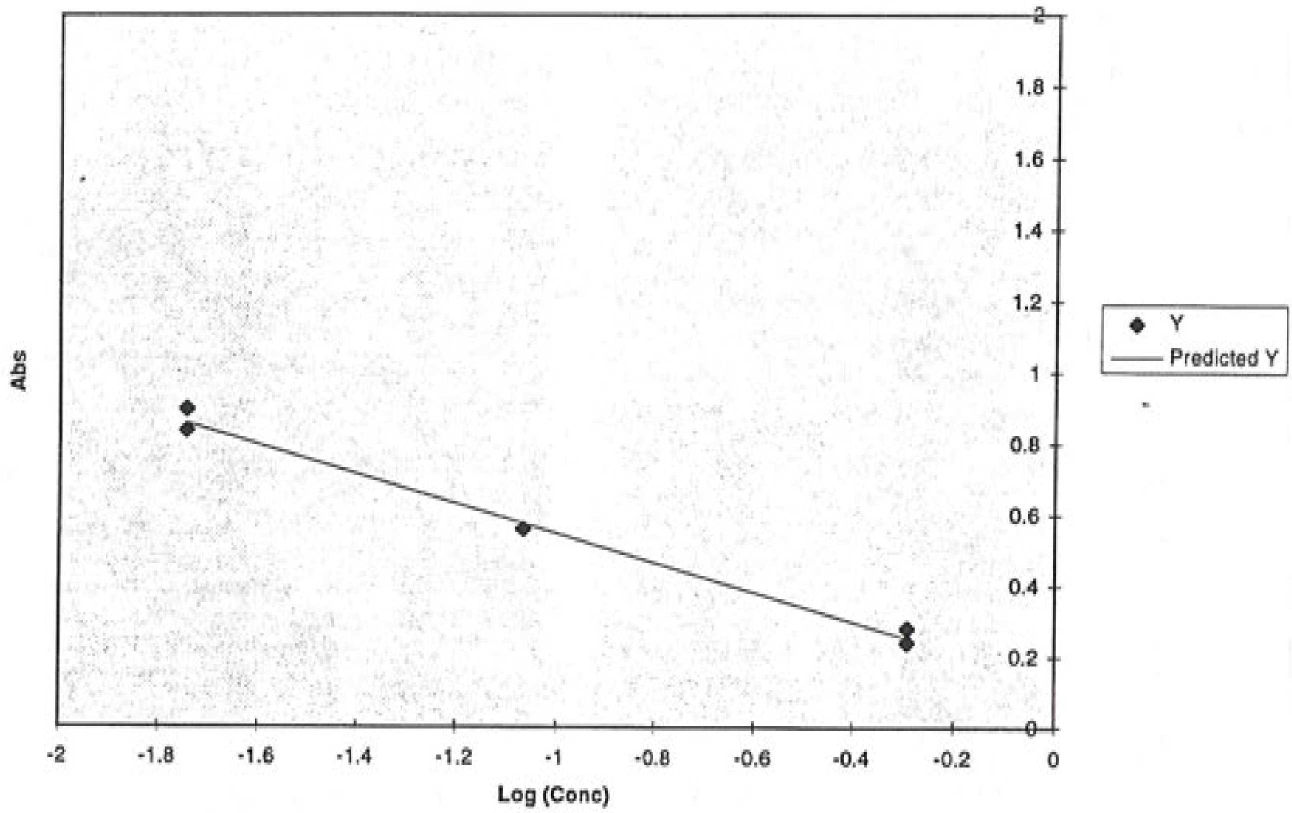
a) Calibration curve is excellent.

b) Field and lab duplicate are outside of calibration range and are therefore acceptable.

c) LCS 33% below expected value: acceptable (conc. is above calibration range)

d) The data are usable.

Chlordane Batch 1 Calibration 9-24-97



mw 9/30

Chlordane Batch 2 Calibration and Sample Data 9/24/97

	conc	abs	log(conc)	predconc
neg	0	2.18	#NUM!	0.005663887
neg	0	2.21	#NUM!	0.005174969
cal 1	0.018	1.78	-1.74473	0.018874341
cal 1	0.018	1.77	-1.74473	0.019450946
cal 2	0.086	1.29	-1.0655	0.082461153
cal 2	0.086	1.34	-1.0655	0.070942216
cal 3	0.512	0.62	-0.29073	0.619252479
cal 3	0.512	0.71	-0.29073	0.47233201

	x	y	log x

y = -0.4188 log x + 0.13

x = exp ((0.46 -y)/0.7652))

seq #	sample #	abs	QC	conc	SW Key/ %QC
	9A1	1.09		0.151	
	9B1	1.88		0.014	
	9C1	1.6		0.032	
	8B1	1.41		0.057	
	8C1	1.33		0.073	
	7B1	1.18		0.115	
	7C1	0.82	FD1	0.339	
	7C1	0.95	FD2	0.229	39 %RPD
	6B1	0.06	FD1	3.340	
	6B1	0.09	FD2	3.052	9 %RPD
	6C1	1.35		0.069	
	5B1	0.99		0.203	
	5C1	0.12	LD1	2.788	
	5C1A	0.11	LD2	2.873	3 %RPD
	LCS1	0.64		0.583	252 %Rec

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.996026
R Square	0.992068
Adjusted R	0.990085
Standard E	0.049777
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	1.239572	1.239572	500.2783
Residual	4	0.009911	0.002478	
Total	5	1.249483		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	0.460743	0.040785	11.29697	0.00035
X Variable	-0.76517	0.03421	-22.3669	2.37E-05

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.795762	-0.01576
2	1.795762	-0.02576
3	1.276036	0.013964
4	1.276036	0.063964
5	0.683202	-0.0632
6	0.683202	0.026798

Data Quality Assessment

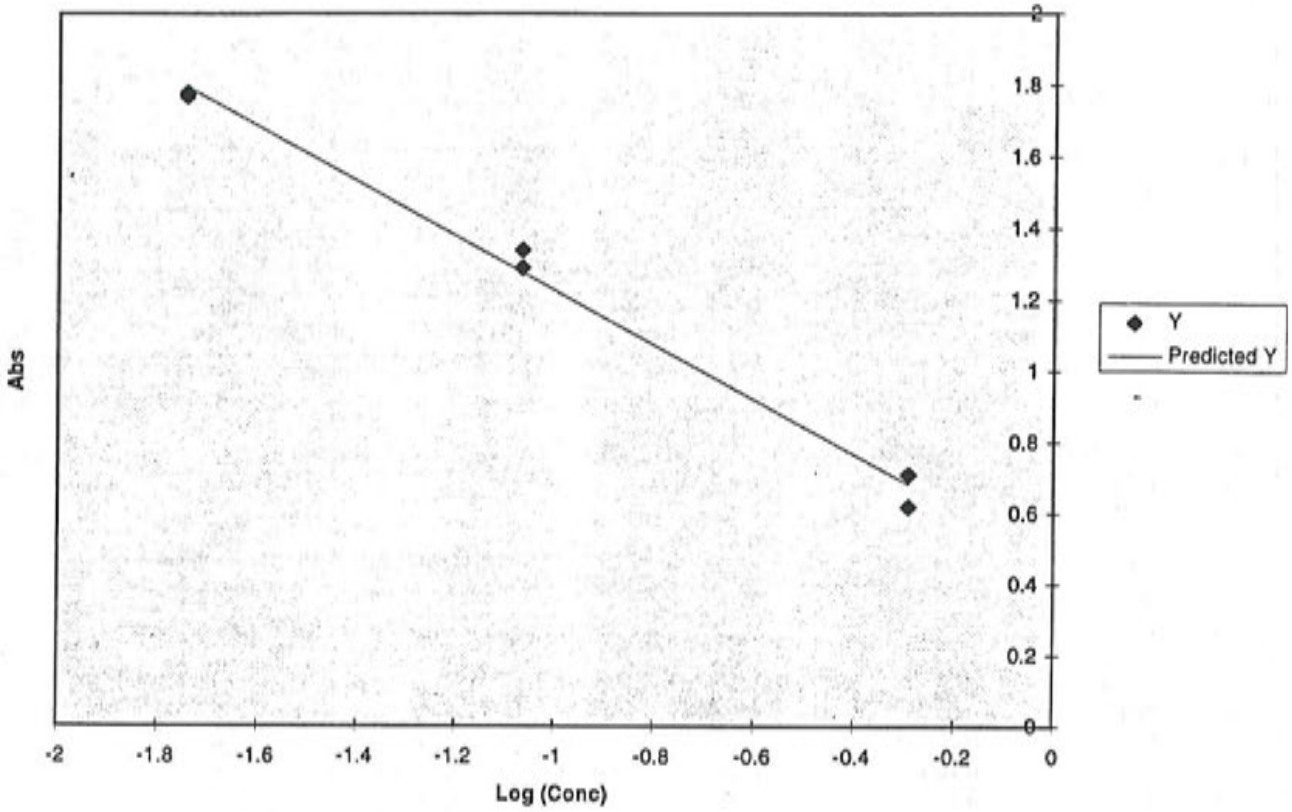
a) Calibration curve is excellent.

b) Field and lab duplicates are acceptable..

c) LCS 25% above expected value: acceptable (conc. is above calibration range)

d) The data are usable.

Chlordane Batch 2 Calibration 9-24-97



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Chlordane Batch 3 Calibration and Sample Data 9/25/97

	conc	abs	log(conc)	predconc
neg	0	1.82	#NUM!	0.004811
neg	0	1.87	#NUM!	0.00406
cal 1	0.018	1.43	-1.74473	0.018062
cal 1	0.018	1.4	-1.74473	0.019997
cal 2	0.086	0.98	-1.0655	0.083118
cal 2	0.086	1.02	-1.0655	0.072572
cal 3	0.512	0.45	-0.29073	0.501747
cal 3	0.512	0.41	-0.29073	0.574662

	x	y	log x

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.997568
R Square	0.995142
Adjusted R	0.993927
Standard E	0.034506
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.975521	0.975521	819.3313
Residual	4	0.004763	0.001191	
Total	5	0.980283		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	0.246689	0.028272	8.725587	0.00095
X Variable	-0.6788	0.023714	-28.624	8.87E-06

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	5C2	0.31		0.807	
S2	5B2	1.37		0.022	
S3	5B3	1.02		0.073	
S4	5A3	1.23	FD1	0.036	
S5	3C1	0.02	LD1	2.158	
S6	5A3	0.97	FD2	0.086	83 %RPD
S7	7A1	0.62		0.282	
S8	3C1A	0.02	LD2	2.158	0 %RPD
S9	4B1	0.28		0.893	
S10	5A1	0.77	FD1	0.169	
S11	5A1	0.78	FD2	0.164	3 %RPD
S12	6A1	0.53		0.382	
S13	3B1	0.02		2.158	
S14	8A1	0.93		0.098	
S15	LCS1	0.38		0.636	275 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.431011	-0.00101
2	1.431011	-0.03101
3	0.969952	0.010048
4	0.969952	0.050048
5	0.444037	0.005963
6	0.444037	-0.03404

Data Quality Assessment

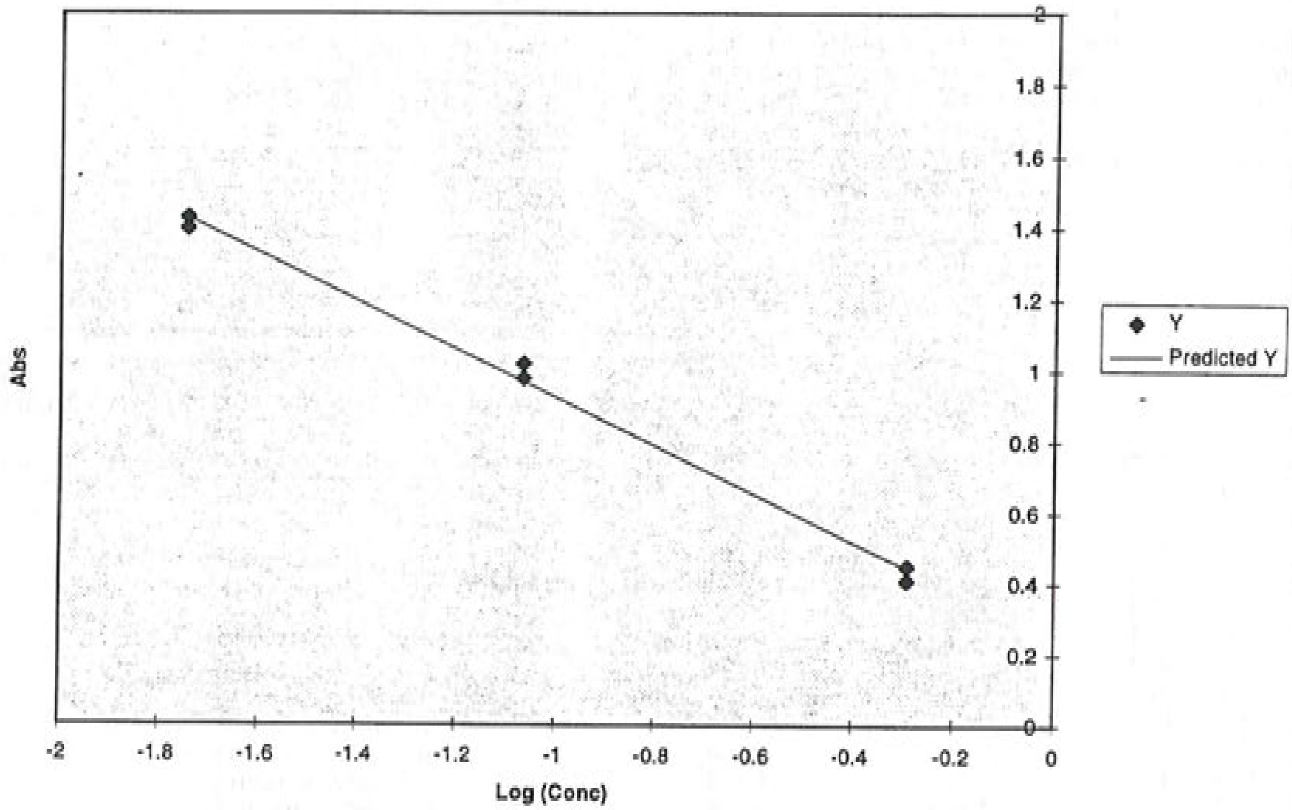
a) Calibration curve is excellent.

b) Field and lab duplicates are acceptable except for first one.

c) LCS 37% above expected value: acceptable (conc. is above calibration range)

d) The data are usable.

Chlordane Batch 3 Calibration 9-25-97



mw 9/30

Chlordane Batch 4 Calibration and Sample Data 9/25/97

	conc	abs	log(conc)	predconc
neg	0	1.75	#NUM!	0.004882
neg	0	1.67	#NUM!	0.006418
cal 1	0.018	1.4	-1.74473	0.016165
cal 1	0.018	1.36	-1.74473	0.018536
cal 2	0.086	0.94	-1.0655	0.077993
cal 2	0.086	0.84	-1.0655	0.109809
cal 3	0.512	0.43	-0.29073	0.446496
cal 3	0.512	0.37	-0.29073	0.548234
	x	y	log x	

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.995351
R Square	0.990723
Adjusted R	0.988403
Standard E	0.047382
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.95902	0.95902	427.162
Residual	4	0.00898	0.002245	
Total	5	0.968		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	0.194315	0.038823	5.005215	0.007463
X Variable	-0.67304	0.032564	-20.6679	3.24E-05

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	5C3	0.87		0.099	
S2	3A1	0.01		1.879	
S3	2A1	0.47		0.389	
S4	1A1	0.93		0.081	
S5	1C1	0.68		0.190	
S6	4A1	0.27	FD1	0.772	
S7	7B2	1.34	LD1	0.020	
S8	4A1	0.26	FD2	0.799	3 %RPD
S9	8B2	1.11		0.044	
S10	2B1	0.87		0.099	
S11	1B1	0.78		0.135	
S12	7B2A	1.26	LD2	0.026	27 %RPD
S13	2C1	0.96	FD1	0.073	
S14	2C1	0.89	FD2	0.093	24 %RPD
S15	LCS1	0.35		0.587	254 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.368578	0.031422
2	1.368578	-0.00858
3	0.911435	0.028565
4	0.911435	-0.07144
5	0.389987	0.040013
6	0.389987	-0.01999

Data Quality Assessment

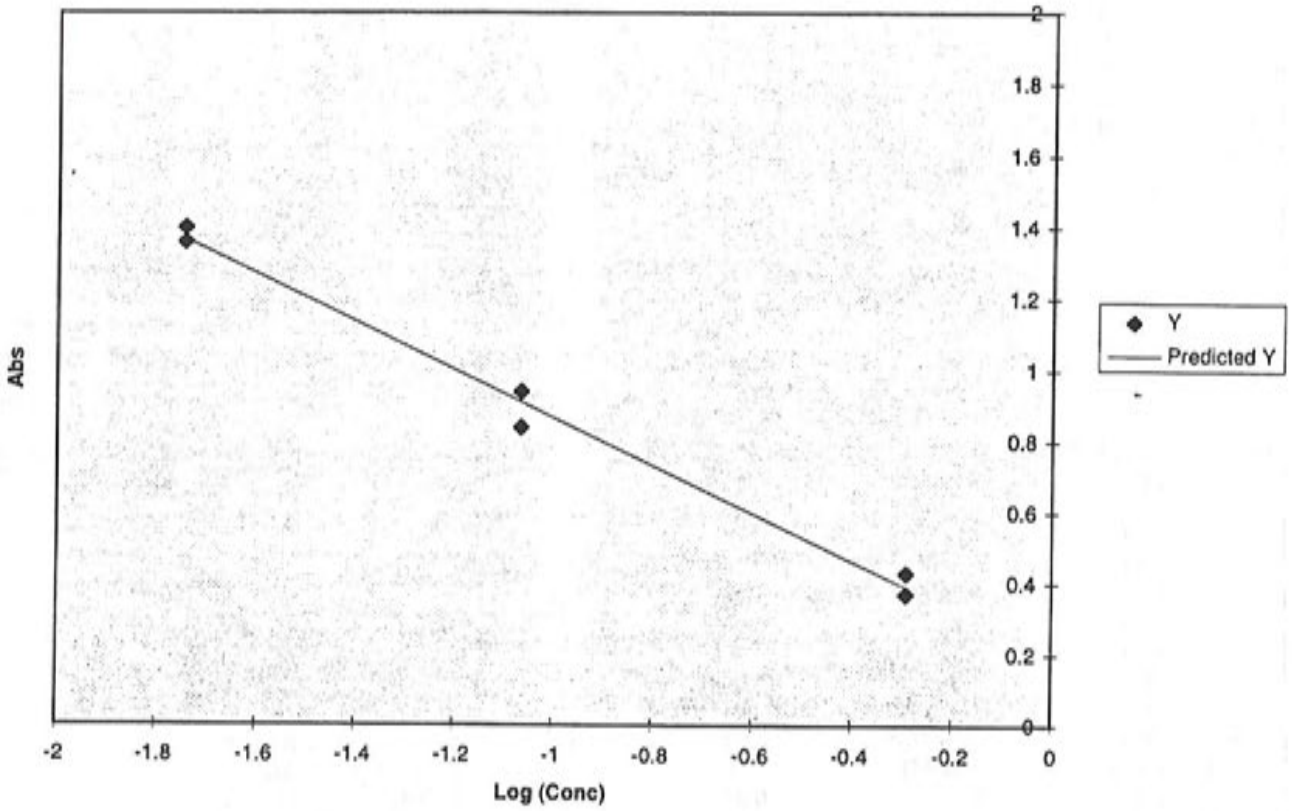
a) Calibration curve is excellent.

b) Field and lab duplicates are acceptable.

c) LCS 27% above expected value: acceptable (conc. is above calibration range)

d) The data are usable.

Chlordane Batch 4 Calibration 9-25-97



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Chlordane Batch 5 Calibration and Sample Data 9/25/97

	conc	abs	log(conc)	predconc
neg	0	1.84	#NUM!	0.003318
neg	0	1.8	#NUM!	0.003847
cal 1	0.018	1.4	-1.74473	0.016888
cal 1	0.018	1.36	-1.74473	0.01958
cal 2	0.086	0.94	-1.0655	0.092544
cal 2	0.086	0.99	-1.0655	0.076921
cal 3	0.512	0.49	-0.29073	0.488717
cal 3	0.512	0.46	-0.29073	0.546058

	x	y	log x

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.998432
R Square	0.996866
Adjusted R	0.996083
Standard E	0.025398
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.82082	0.82082	1272.45
Residual	4	0.00258	0.000645	
Total	5	0.8234		

	Coefficients	*Standard Erro*	*t Stat*	*P-value*
Intercept	0.29639	0.02081	14.24275	0.000141
X Variable	-0.62266	0.017455	-35.6714	3.69E-06

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	2C2A	1.73	LD2	0.005	
S2	2C2	1.6	LD1	0.008	47 %RPD
S3	4C1	0.9	FD1	0.107	
S4	4C1	0.83	FD2	0.139	26 %RPD
S5	6B2	0.25	FD1	1.187	
S6	2B2	1.72		0.005	
S7	4B3	1.57		0.009	
S8	4C3	1.67		0.006	
S9	2C3	1.52	FD1	0.011	
S10	2C3	1.5	FD2	0.012	7 %RPD
S11	6B2B	0.27	FD2	1.103	7 %RPD
S12	6A2	0.97		0.083	
S13	2A2	1.05		0.062	
S14	LCS	0.34		0.851	368 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.382755	0.017245
2	1.382755	-0.02275
3	0.959831	-0.01983
4	0.959831	0.030169
5	0.477415	0.012585
6	0.477415	-0.01741

Data Quality Assessment

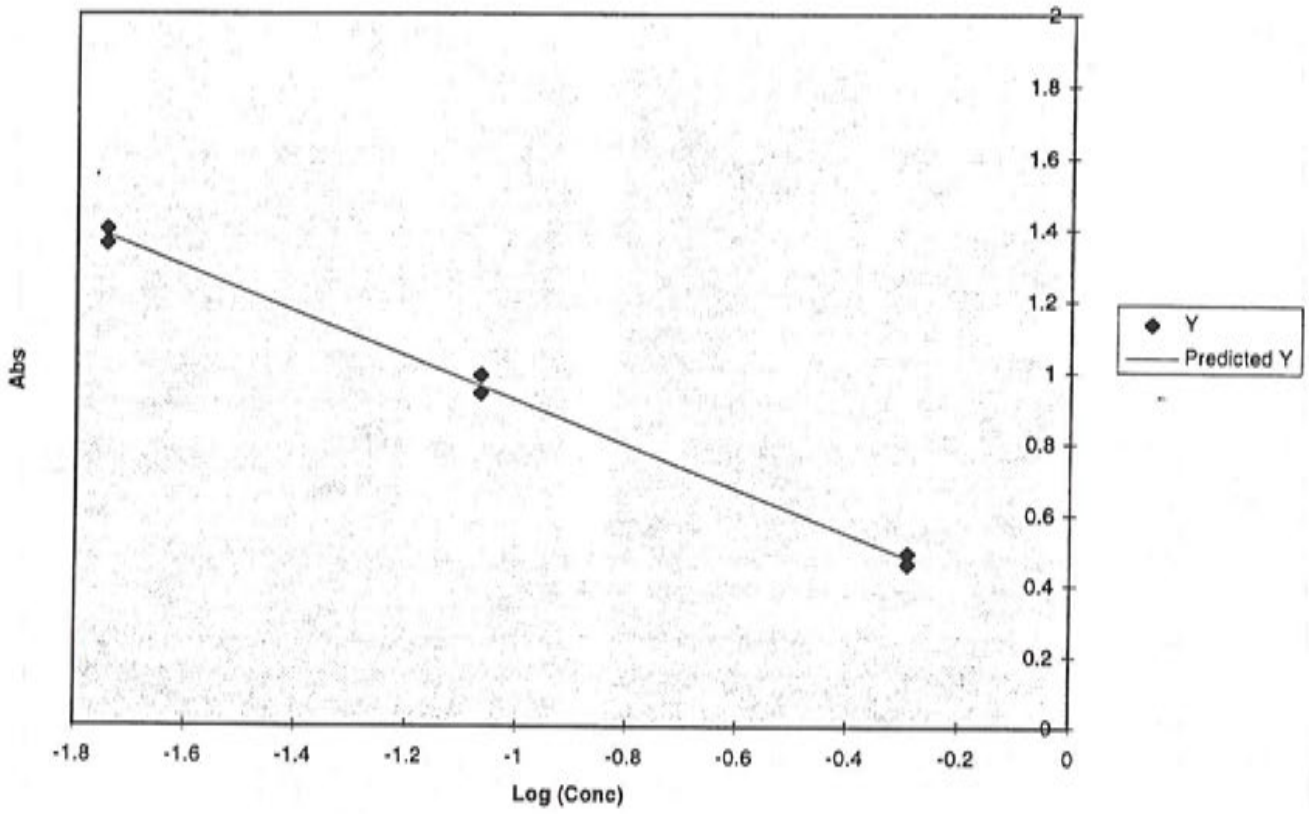
#VALUE! a) Calibration curve is excellent.

#VALUE! b) Field and lab duplicates are acceptable.

#VALUE! c) LCS 84% above expected value: acceptable (conc. is above calibration range)

#VALUE! d) The data are usable.

Chlordane Batch 5 Calibration 9-25-97



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Chlordane Batch 6 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg				
neg	0	1.56	#NUM!	0.003993
cal 1	0.018	1.23	-1.74473	0.015817
cal 2	0.086	0.83	-1.0655	0.083903
cal 2	0.086	0.76	-1.0655	0.112354
cal 3	0.512	0.43	-0.29073	0.445068
cal 3	0.512	0.39	-0.29073	0.525886

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	9A2	0.93		0.055	
S2	9B2	1.37		0.009	
S3	7C2	0.42	LD1	0.464	
S4	5A2	1.34		0.010	
S5	4B2	0.94		0.053	
S6	7C2A	0.41	LD2	0.484	4 %RPD
S7	3A3	0.03		2.361	
S8	1B2	1.45		0.006	
S9	3B3	0.14		1.492	
S10	4A2	0.97	FD1	0.047	
S11	4A3	1.11		0.026	
S12	4A2	1.01	FD2	0.040	17 %RPD
S13	2B3	1.16		0.021	
S14	LCS1X4	0.54		0.281	244 %Rec
S15	LCS2X4	0.54		0.281	244 %Rec

Data Quality Assessment

#VALUE!	a)	Calibration curve is excellent.
#VALUE!	b)	Field and lab duplicates are acceptable.
#VALUE!	c)	LCS 22% above expected value: acceptable.
#VALUE!	d)	The data are usable.

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.993256
R Square	0.986557
Adjusted R	0.982075
Standard E	0.04572
Observatio	5

ANOVA

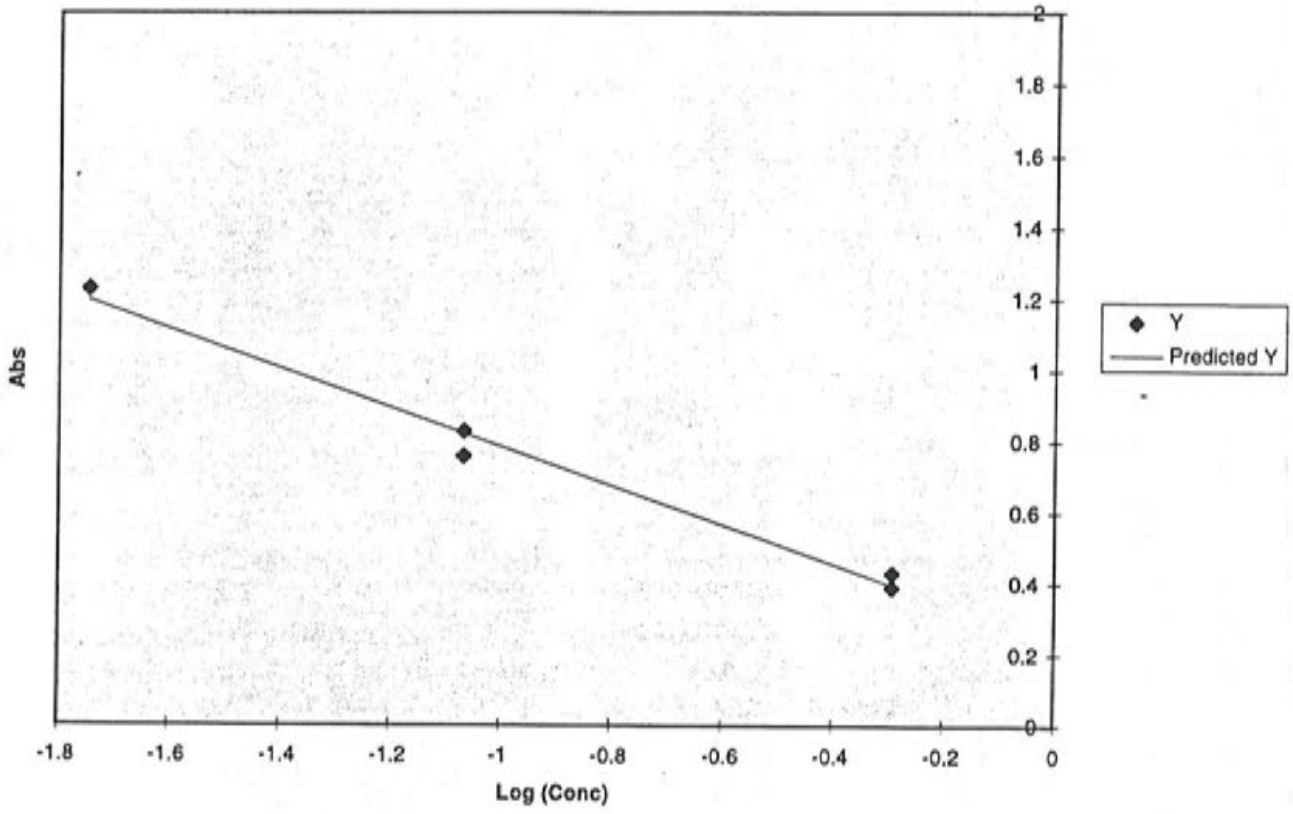
	df	*SS*	*MS*	*F*
Regressior	1	0.460209	0.460209	220.1573
Residual	3	0.006271	0.00209	
Total	4	0.46648		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	0.235935	0.03896	6.05584	0.009034
X Variable	-0.55199	0.037202	-14.8377	0.000664

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.199008	0.030992
2	0.824081	0.005919
3	0.824081	-0.06408
4	0.396415	0.033585
5	0.396415	-0.00641
6	0.477415	-0.01741

Chlordane Batch 6 Calibration 9-26-97



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Chlordane Batch 7 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg				
neg	0	1.81	#NUM!	0.001996
cal 1	0.018	1.27	-1.74473	0.016452
cal 2	0.086	0.83	-1.0655	0.091762
cal 2	0.086	0.82	-1.0655	0.095418
cal 3	0.512	0.4	-0.29073	0.492209
cal 3	0.512	0.4	-0.29073	0.492209
	x	y	log x	

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.998368
R Square	0.996739
Adjusted R	0.995652
Standard E	0.023924
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.524803	0.524803	916.9043
Residual	3	0.001717	0.000572	
Total	4	0.52652		

	Coefficients	*tandard Er*	*t Stat*	*P-value*
Intercept	0.218535	0.020386	10.71962	0.001736
X Variable	-0.58946	0.019467	-30.2804	7.91E-05

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	3A2	0.02		2.172	
S2	3C2	0.02		2.172	
S3	4C2	1.12		0.030	
S4	2A3	1.03		0.042	
S5	1A2	1.2		0.022	
S6	3C3	0.22		0.994	
S7	8A2	1.22		0.020	
S8	5A2	1.5		0.007	
S9	6C2	1.4		0.010	
S10	4A3	1.15		0.026	
S11	8C2	1.38	LD1	0.011	
S12	3B2	0.03		2.089	
S13	8C2	1.35	LD2	0.012	12 %RPD
S14	LCS1x	0.54		0.285	247 %Rec
S15	LCS2x	0.58		0.244	211 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.246978	0.023022
2	0.846603	-0.0166
3	0.846603	-0.0266
4	0.389908	0.010092
5	0.389908	0.010092
6	0.477415	-0.01741

Data Quality Assessment

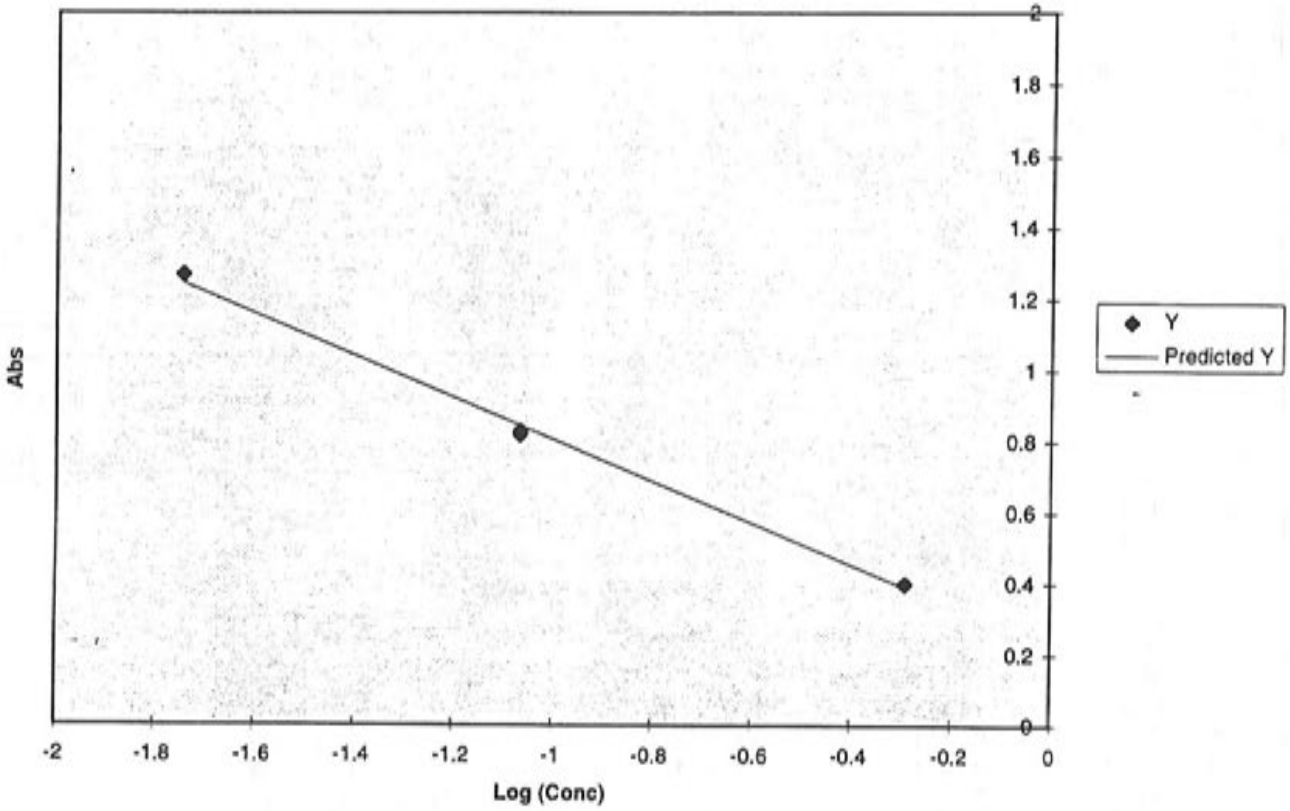
a) Calibration curve is excellent.

b) Field/lab duplicates are acceptable.

c) LCS 5% above expected value: acceptable.

d) The data are usable.

Chlordane Batch 7 Calibration 9-26-97



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Chlordane Batch 8 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg	0	1.45	#NUM!	0.004432
neg	0	1.35	#NUM!	0.006886
cal 1	0.018	1.15	-1.74473	0.016622
cal 2	0.086	0.74	-1.0655	0.101212
cal 2	0.086	0.78	-1.0655	0.084857
cal 3	0.512	0.38	-0.29073	0.494431
cal 3	0.512	0.38	-0.29073	0.494431

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.997792
R Square	0.995588
Adjusted R	0.994117
Standard E	0.024685
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.412492	0.412492	676.9597
Residual	3	0.001828	0.000609	
Total	4	0.41432		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	0.220143	0.021035	10.46577	0.001862
X Variable	-0.52259	0.020085	-26.0184	0.000125

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	6A3	1.37		0.006	
S2	1C2	1.3		0.009	
S3	6B3	0.88	FD1	0.055	
S4	7A2	1.02		0.029	
S5	6B3B	0.91	FD2	0.048	13 %RPD
S6	8B3	1.17		0.015	
S7	6C3	1.3		0.009	
S8	9C2	1.11	LD1	0.020	
S9	9C2A	1.08	LD2	0.023	13 %RPD
S10	2/3B3	0.63	FD1	0.164	
S11	2/3B3	0.95	FD2	0.040	122 %RPD
S12	4/5B3	0.77		0.089	
S13	2/3A3	0.85		0.062	
S14	4/5A3	0.91		0.048	
S15	LCS1	0.5		0.291	252 %Rec
S16	LCS2	0.6		0.188	162 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.131921	0.018079
2	0.776964	-0.03696
3	0.776964	0.003036
4	0.372075	0.007925
5	0.372075	0.007925
6	0.477415	-0.01741

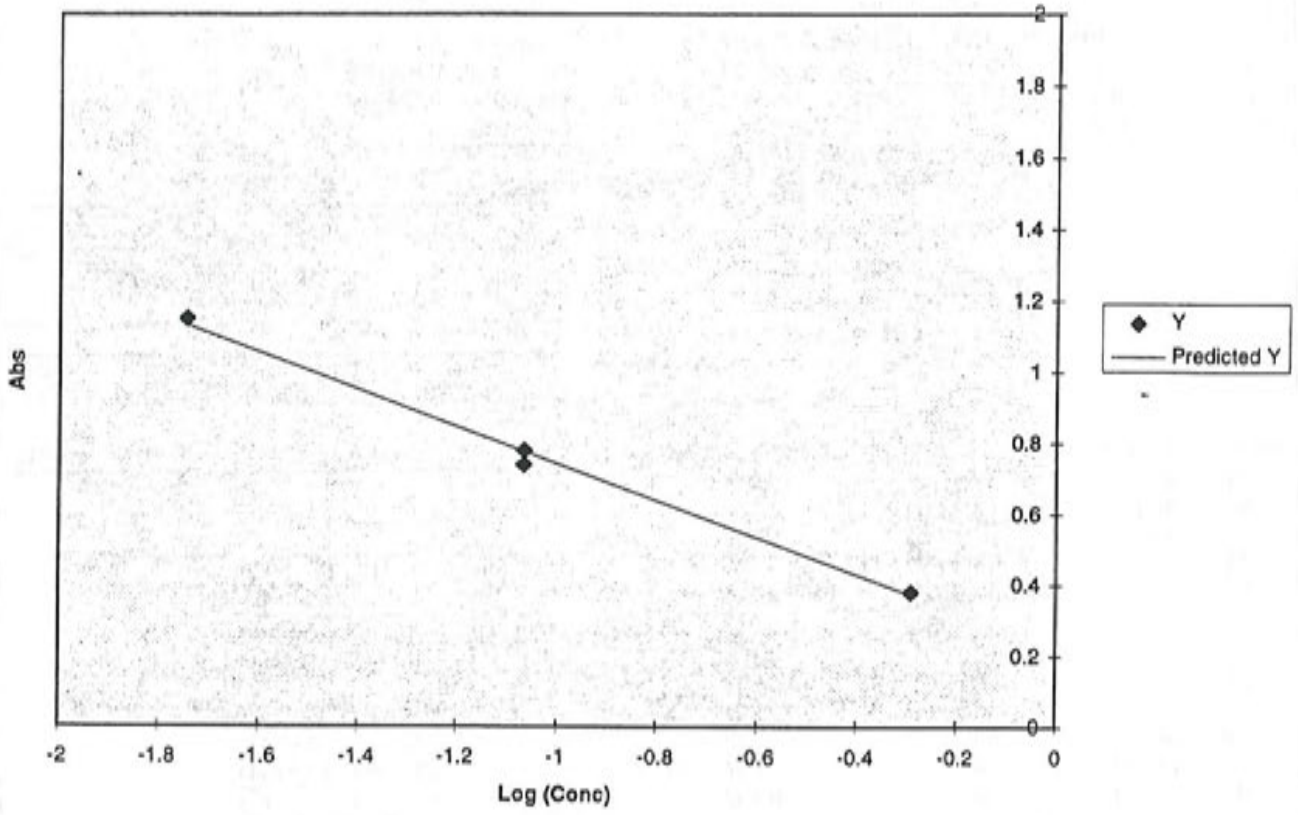
Data Quality Assessment

a) Calibration curve is excellent.

b) Field/lab duplicates are acceptable except for possible inhomogeneous field duplicate.

c) LCS variable but acceptable.

Chlordane Batch 8 Calibration 9-26-97



9/22

Chlordane Batch 9 Calibration and Sample Data 9/26/97

	conc	abs	log(conc)	predconc
neg	0	1.43	#NUM!	0.006077
neg	0	1.5	#NUM!	0.004598
cal 1	0.018	1.14	-1.74473	0.019282
cal 1	0.018	1.19	-1.74473	0.015801
cal 2	0.086	0.74	-1.0655	0.09481
cal 2	0.086	0.76	-1.0655	0.087553
cal 3	0.512	0.33	-0.29073	0.485125

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	8B4	1.18		0.016	
S2	3B4	0.02	LD1	1.667	
S3	3B4A	0.01	LD2	1.735	4 %RPD
S4	7C3	1.33	FD1	0.009	
S5	9A3	1.42		0.006	
S6	7C3	1.24	FD2	0.013	35 %RPD
S7	3A4	0.01		1.735	
S8	5C4	0.15		0.993	
S9	9B3	1.39		0.007	
S10	3C4	0.03		1.602	
S11	LCS1X	0.5		0.247	213 %Rec
S12	LCS2X	0.49		0.257	222 %Rec

Data Quality Assessment

a) Calibration curve is excellent.
b) Field/lab duplicates are acceptabl
c) LCS 5 - 10% above expected valu
d) The data are usable.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.997774
R Square	0.995554
Adjusted R	0.994072
Standard E	0.026912
Observatio	5

ANOVA

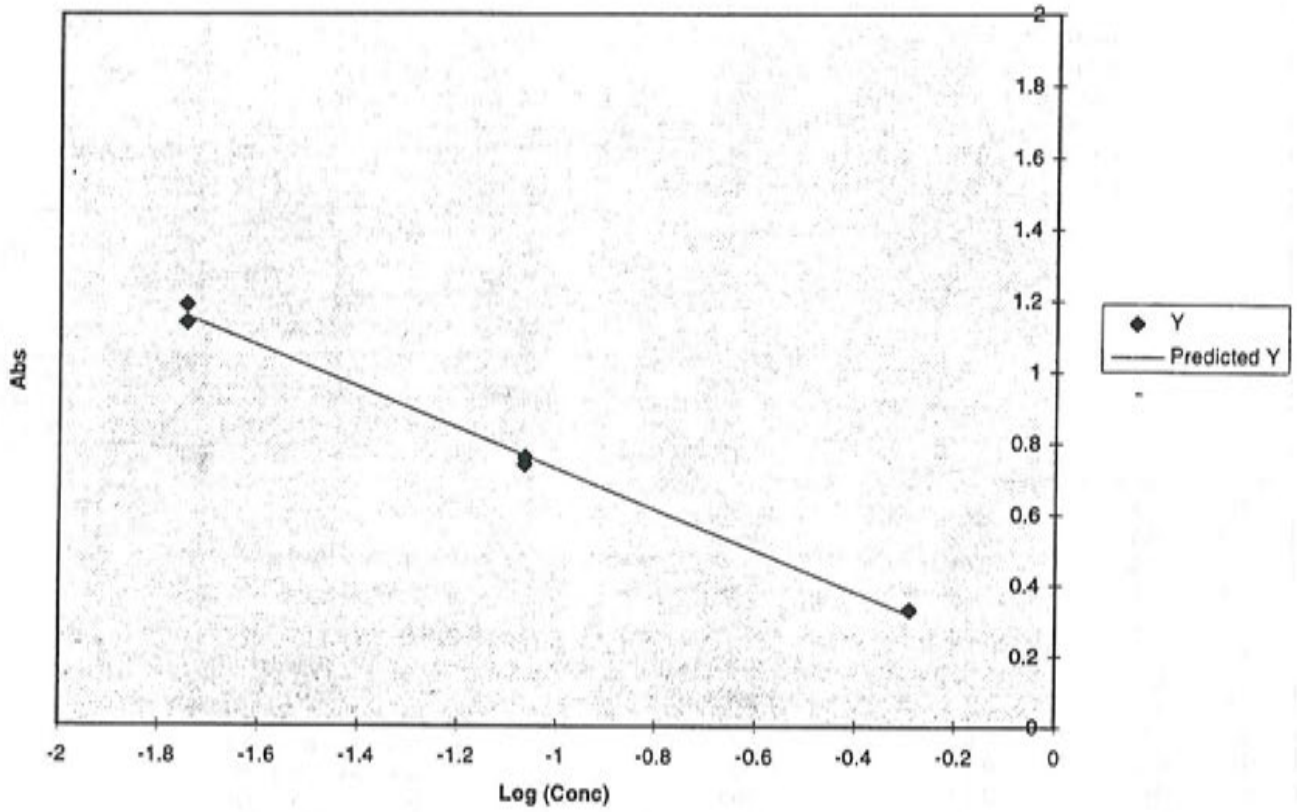
	df	*SS*	*MS*	*F*
Regressior	1	0.486507	0.486507	671.7228
Residual	3	0.002173	0.000724	
Total	4	0.48868		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	0.148335	0.028994	5.115999	0.014453
X Variable	-0.57828	0.022312	-25.9176	0.000126

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	1.157277	-0.01728
2	1.157277	0.032723
3	0.764494	-0.02449
4	0.764494	-0.00449
5	0.316459	0.013541
6	0.477415	-0.01741

Chlordane Batch 9 Calibration 9-26-97



9/22

Chlordane Batch 10 Calibration and Sample Data 9/29/97

	conc	abs	log(conc)	predconc
neg	0	0.97	#NUM!	0.003354
neg	0	0.94	#NUM!	0.004057
cal 1	0.018	0.74	-1.74473	0.014414
cal 1	0.018	0.7	-1.74473	0.018574
cal 2	0.086	0.4	-1.0655	0.1244
cal 2	0.086	0.46	-1.0655	0.085043
cal 3	0.512	0.18	-0.29073	0.501751
cal 3	0.512	0.2	-0.29073	0.442005

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.990829
R Square	0.981742
Adjusted R	0.977177
Standard E	0.036039
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.279338	0.279338	215.0773
Residual	4	0.005195	0.001299	
Total	5	0.284533		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	0.071206	0.029528	2.411486	0.073437
X Variable	-0.36324	0.024768	-14.6655	0.000126

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	3A5	0.11		0.782	
S2	3A6	0.22		0.389	
S3	3C5	0.04		1.219	
S4	3C6	0.18		0.502	
S5	3B5	0.05	LD1	1.144	
S6	3B5A	0.03	LD2	1.299	13 %RPD
S7	3B6	0.24		0.343	
S8	5C5	0.43		0.103	
S9	5C6	0.09		0.888	
S10	8B5	0.97		0.003	
S11	8B6	0.99		0.003	
S12	LCS3*4	0.32		0.207	179 %Rec

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.704955	0.035045
2	0.704955	-0.00495
3	0.458235	-0.05824
4	0.458235	0.001765
5	0.17681	0.00319
6	0.17681	0.02319
	0.477415	-0.01741

Data Quality Assessment

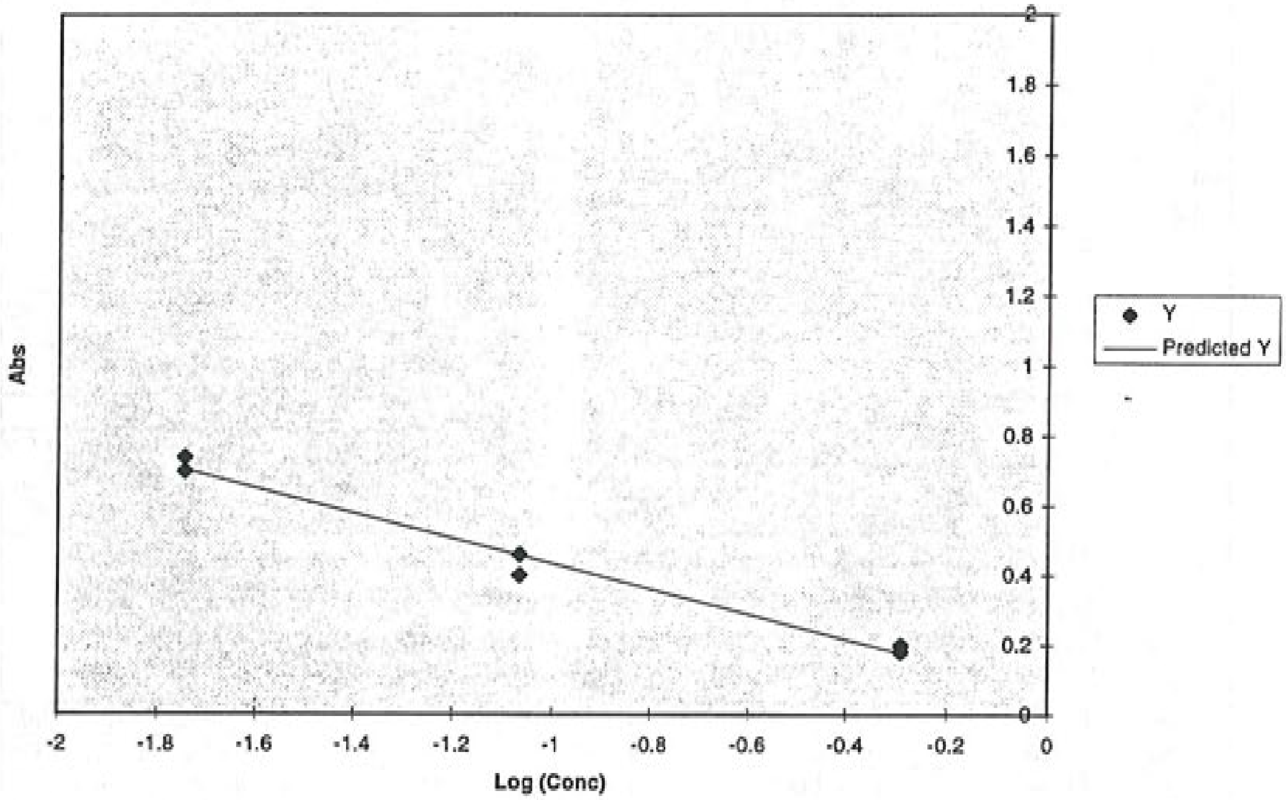
a) Calibration curve is excellent.

b) Field/lab duplicates are acceptable.

c) LCS: acceptable.

d) The data are usable.

Chlordane Batch 10 Calibration 9-29-97



MW 9/22

Chlordane Batch 11 Calibration and Sample Data 10/14/97

	conc	abs	log(conc)	predconc
neg	0	1.21	#NUM!	0.003
neg	0	1.24	#NUM!	0.003
cal 1	0.018	0.94	-1.74473	0.014
cal 1	0.018	0.84	-1.74473	0.025
cal 2	0.086	0.63	-1.0655	0.079
cal 2	0.086	0.62	-1.0655	0.084
cal 3	0.512	0.3	-0.29073	0.497
cal 3	0.512	0.28	-0.29073	0.556

	x	y	log x

seq #	sample #	abs	QC	conc	
S1	LCS4X2	0.34	LCS LD1	0.398	172 %Rec
S2	CX1A1	0.85		0.023	
S3	CX9A1	0.67		0.063	
S4	FC9A	0.4		0.285	
S5	FC9B	0.36		0.356	
S6	FC9C	0.66		0.067	
S7	FC8A	0.35	LD1	0.376	
S8	FC8A-A	0.57	LD2	0.110	109 %RPD
S9	FC8B	0.69		0.057	
S10	FC8C	0.89		0.019	
S11	LCS4X2-A	0.31	LCS LD2	0.470	204 %Rec
					17 %RPD

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.992392
R Square	0.984842
Adjusted R	0.981053
Standard E	0.037286
Observatio	6

ANOVA

	df	*SS*
Regressior	1	0.361322
Residual	4	0.005561
Total	5	0.366883

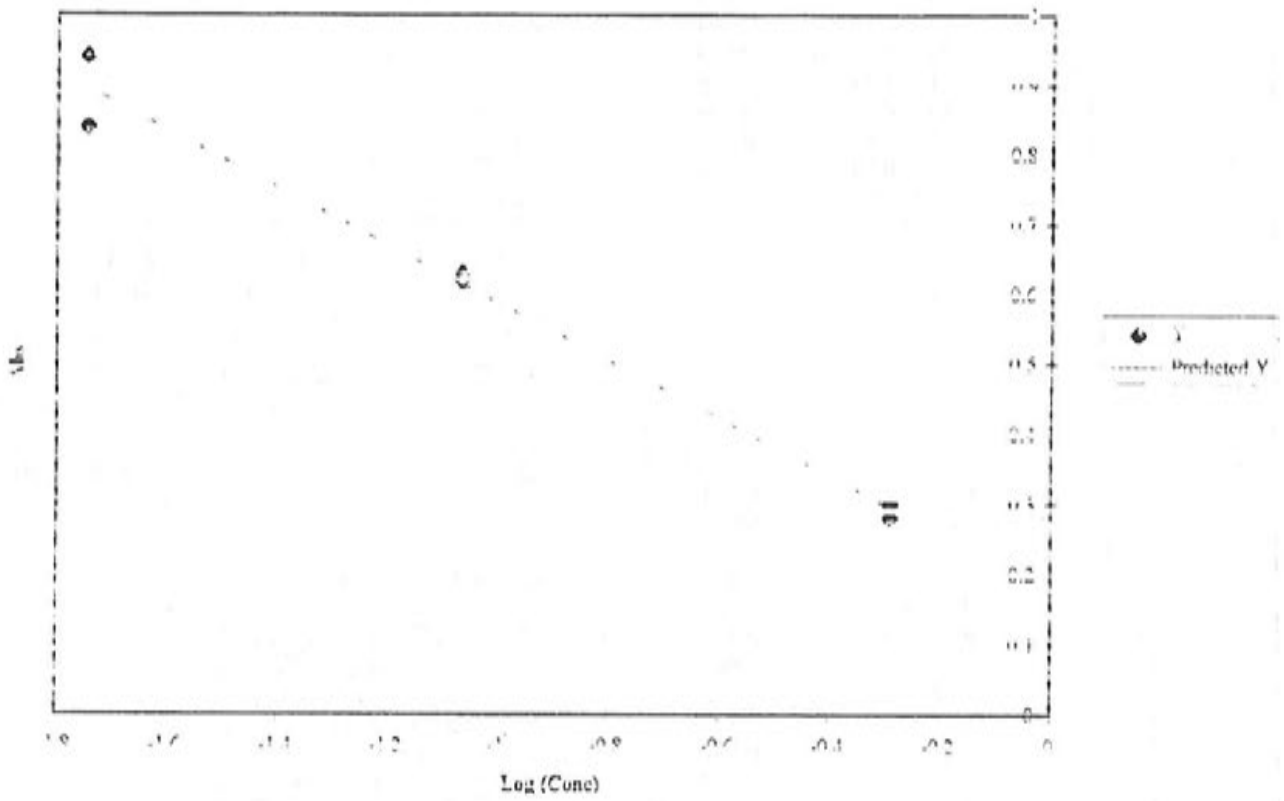
	Coefficients	*standard Err*
Intercept	0.174649	0.03055
X Variable	-0.41312	0.025626

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.895422	0.044578
2	0.895422	-0.05542
3	0.614824	0.015176
4	0.614824	0.005176
5	0.294754	0.005246
6	0.294754	-0.01475
3	0.585417	0.014583
4	27.57342	12.42658

Notes: Lab duplicates do not match, however LCS duplicates do. The analysis is accepted.
Good calibration. M.W. 10/27/97

Chlordane Batch 11 Calibration 10/14/97



Calibration good
RW

Chlordane Batch 12 Calibration and Sample Data 10/23/97

	conc	abs	log(conc)	predconc
neg	0	1.26	#NUM!	0.005
neg	0	1.28	#NUM!	0.004
cal 1	0.018	0.95	-1.74473	0.020
cal 1	0.018	1	-1.74473	0.016
cal 2	0.172	0.43	-0.76447	0.205
cal 3	0.512	0.23	-0.29073	0.505
cal 3	0.512	0.25	-0.29073	0.461

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	FC1A	0.61		0.091	
S2	FC1B	0.64		0.079	
S3	FC1C	0.97		0.018	
S4	FC6A	0.33		0.322	
S5	FC6B	0.41	LD1	0.224	
S6	FC6B-A	0.44	LD2	0.196	14 %RPD
S7	FC6C	0.09		0.950	
S8	FC7A	0.43		0.205	
S9	FC7B	0.73		0.053	
S10	FC7C	0.45		0.187	
S11	FC9A	0.66		0.073	
S12	LCS5X2	0.21		0.553	239 %Rec

Notes: Acceptable calibration and QC.
LCS is within 20% (relative) of a "true value" of 200%.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99703
R Square	0.994069
Adjusted R	0.992092
Standard E	0.033477
Observatio	5

ANOVA

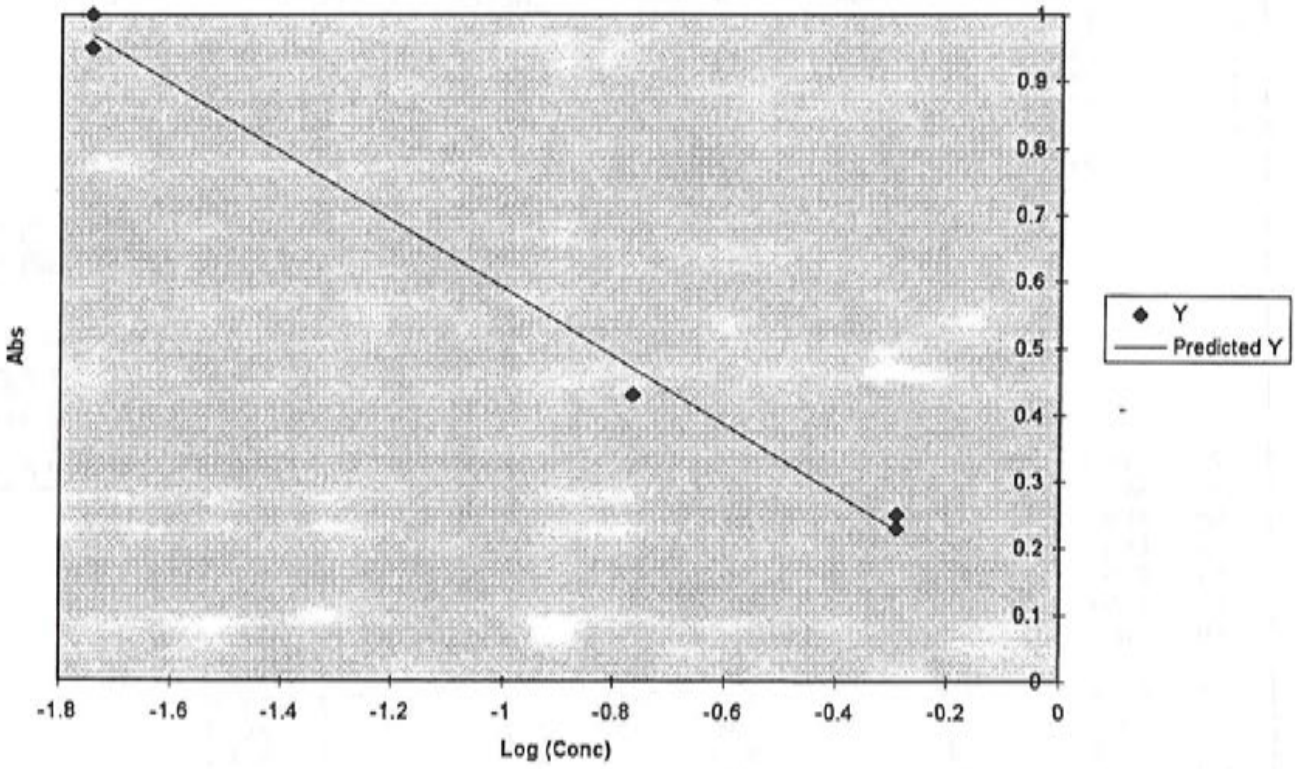
	df	*SS*	*MS*	*F*
Regressior	1	0.563518	0.563518	502.8372
Residual	3	0.003362	0.001121	
Total	4	0.56688		

	Coefficients	*standard Erı*	*t Stat*	*P-value*
Intercept	0.078663	0.026611	2.956005	0.059735
X Variable	-0.51013	0.022749	-22.424	0.000194

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.968704	-0.0187
2	0.968704	0.031296
3	0.468644	-0.03864
4	0.226973	0.003027
5	0.226973	0.023027

Chlordane Calibration Batch 12 10/23/97



double spiked middle calibrator (0.172 ppm)
MW 10/25/97

Chlordane Batch 13 Calibration and Sample Data 10/24/97

	conc	abs	log(conc)	predconc
neg	0	0.9	#NUM!	0.004
cal 1	0.018	0.66	-1.74473	0.018
cal 1	0.018	0.69	-1.74473	0.015
cal 2	0.086	0.41	-1.0655	0.103
cal 2	0.086	0.42	-1.0655	0.096
cal 3	0.512	0.18	-0.29073	0.496
cal 3	0.512	0.19	-0.29073	0.463

x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.996179
R Square	0.992373
Adjusted R	0.990466
Standard E	0.021434
Observatio	6

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.239112	0.239112	520.4542
Residual	4	0.001838	0.000459	
Total	5	0.24095		

	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	0.077624	0.017562	4.419978	0.011511
X Variable	-0.33607	0.014731	-22.8135	2.19E-05

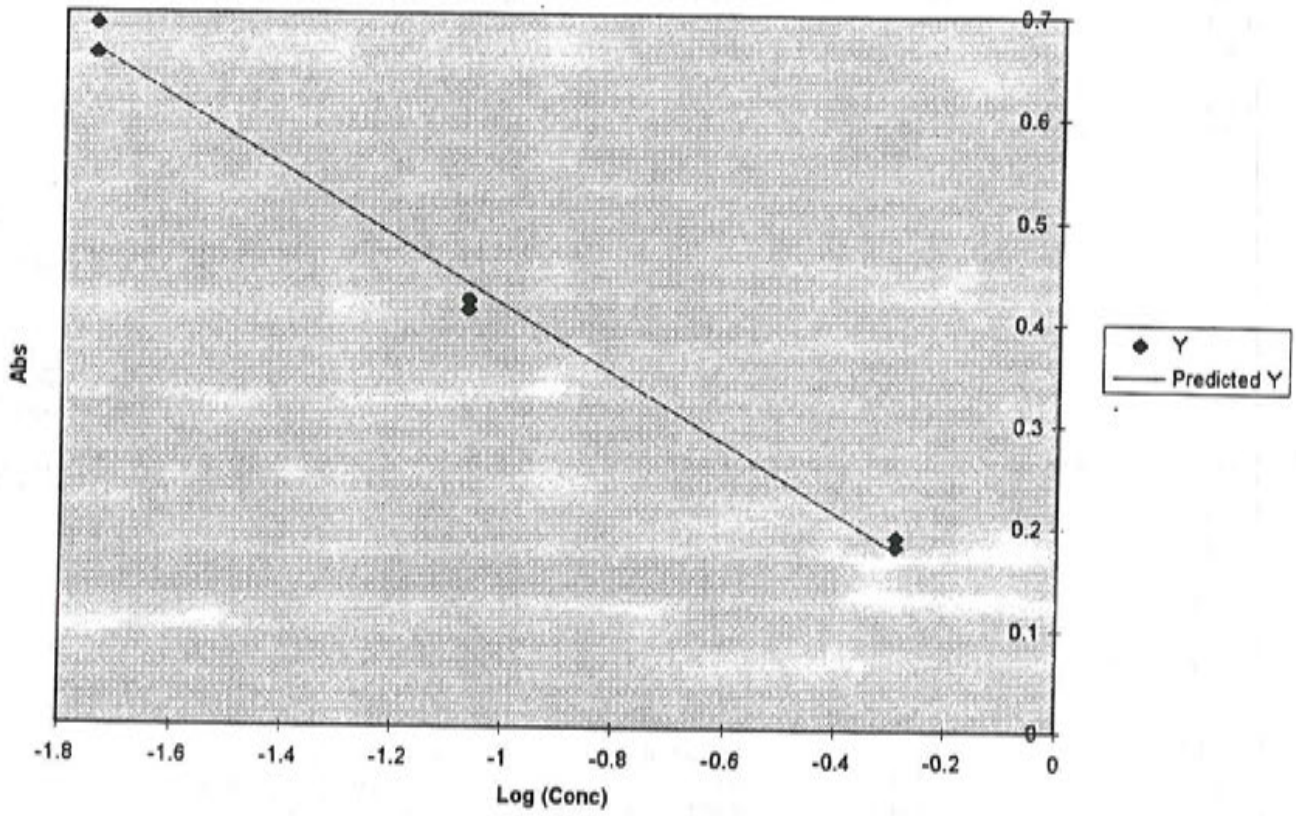
seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	SW6	0.72		0.012	9B(0-1)
S2	SW5	0.55		0.039	9AE(1-2)
S3	SW1	0.57		0.034	9AN(1-2)
S4	SW7	0.29		0.233	9C(0-1)
S5	SW11	0.87	FD1	0.004	FD1 5C(0-1)
S6	SW2	0.19		0.463	8A(0-1)
S7	SW4	0.34		0.166	6A(1-2)
S8	SW22	0.85		0.005	6C(1-2)
S9	FC5A	0.43		0.089	
S10	FC5B	0.8		0.007	
S11	FC5C	0.25		0.307	
S12	SW8	0.88	FD2	0.004	7 %RPD
S13	LCS6X2	0.22		0.377	163 %Rec
S14				#VALUE!	

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.663968	-0.00397
2	0.663968	0.026032
3	0.435703	-0.0257
4	0.435703	-0.0157
5	0.175329	0.004671
6	0.175329	0.014671

NOTES: Calibration and QC acceptable. LCS is within 20% (relative) of a "true value" of 200%.
Field duplicates were blind.

Chlordane Batch 13 Calibration 10/24/97



MW 10/25/97

Chlordane Batch 14 Calibration and Sample Data 10/24/97

	conc	abs	log(conc)	predconc
neg	0	1.27	#NUM!	0.003
cal 1	0.018	0.86	-1.74473	0.020
cal 1	0.018	0.93	-1.74473	0.014
cal 2	0.086	0.5	-1.0655	0.117
cal 3	0.512	0.22	-0.29073	0.465
cal 3	0.512	0.21	-0.29073	0.489

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	4A	0.48		0.129		
S2	4B	0.52		0.106		
S3	4C	0.11		0.801		
S4	2A	0.63		0.061		
S5	2B	0.94		0.013		
S6	2C	0.94		0.013		
S7	SW3	0.26		0.382	7A(0-1)	
S8	SW10	0.7		0.043	7C(1-2)	
S9	SW9	0.55		0.091	8C(0-1)	
S10	SW20	0.81		0.025	9AN(0-1)	
S11	3A	0.22	LD1	0.465		
S12	3A-A	0.25	LD2	0.401	15 %RPD	
S13	3B	0.53		0.101		
S14	3C	0.5		0.117		
S15	LCS6X2	0.24		0.421	182 %Rec	

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.992179
R Square	0.984419
Adjusted R	0.979225
Standard E	0.049266
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.460039	0.460039	189.5419
Residual	3	0.007281	0.002427	
Total	4	0.46732		

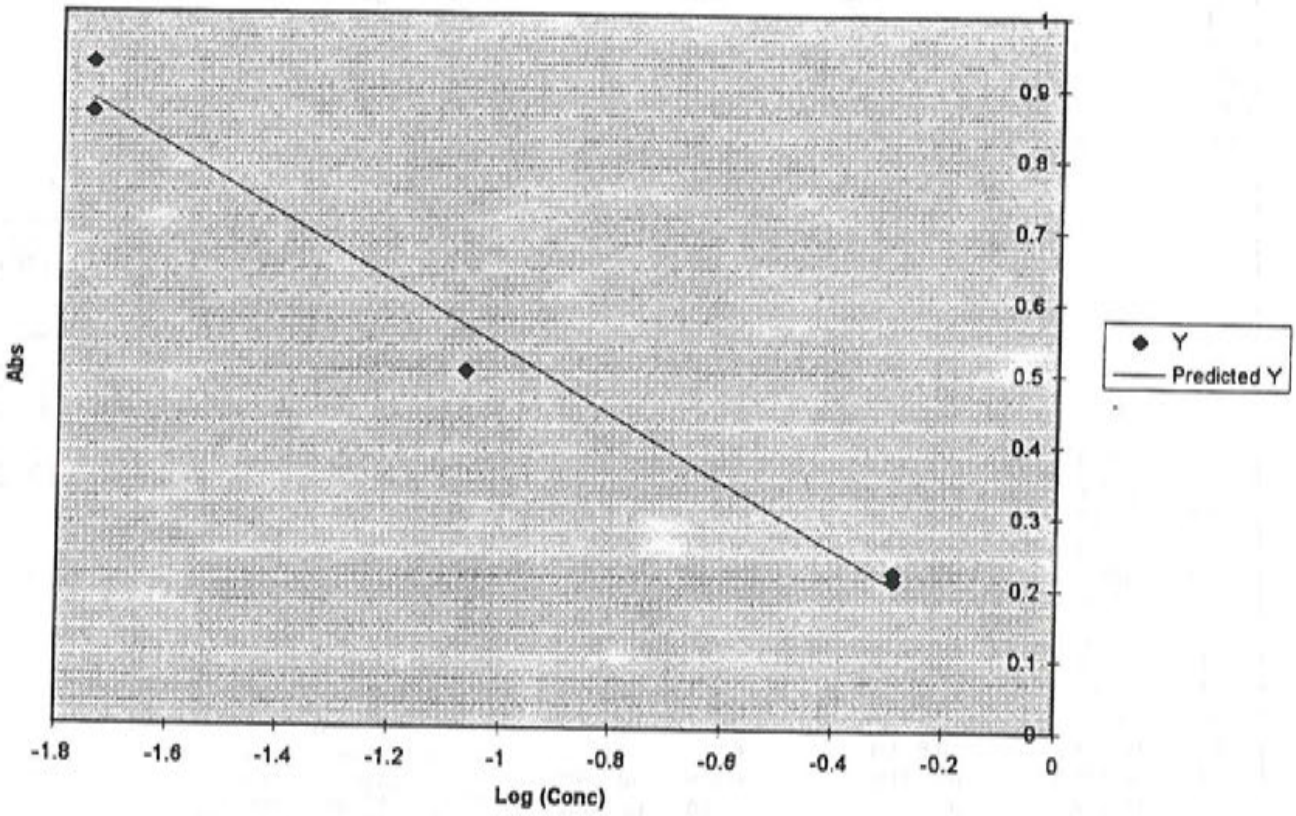
	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	0.064999	0.041182	1.578351	0.212596
X Variable	-0.46628	0.033868	-13.7674	0.000829

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.878529	-0.01853
2	0.878529	0.051471
3	0.56182	-0.06182
4	0.20056	0.01944
5	0.20056	0.00944
6	0.175329	0.014671

Notes: Acceptable calibration and QC. LCS is within 20% (relative) of a "true value" of 200%.

Chlordane Batch 14 Calibration 10/24/97



JMO 10/26/97

Chlordane Batch 15 Calibration and Sample Data 10/24/97

	conc	abs	log(conc)	predconc
neg	0	0.97	#NUM!	0.003
cal 1	0.018	0.7	-1.74473	0.015
cal 1	0.018	0.66	-1.74473	0.020
cal 2	0.086	0.43	-1.0655	0.094
cal 3	0.512	0.18	-0.29073	0.502
cal 3	0.512	0.18	-0.29073	0.502

	x	y	log x

seq #	sample #	abs	QC	conc	SW Key/ %QC
S1	SW12	0.99		0.002	4C(0-1)
S2	SW13	0.89		0.004	3C(0-1)
S3	SW14	0.91	FD2	0.004	46 %RPD
S4	SW15	0.43		0.094	1A(0-1)
S5	SW16	0.91		0.004	2A(0-1)
S6	SW17	0.98	FD1	0.002	3A(2-3)
S7	SW18	0.91		0.004	4A(0-1)
S8	SW19	0.49		0.063	5A(0-1)
S9	SW21	0.34		0.172	1B(0-1)
S10	6A924	0.8	LD1	0.008	
S11	6A924-A	0.86	LD2	0.005	40 %RPD
S12	LCS6X2	0.23		0.359	155 %Rec

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.997973
R Square	0.99595
Adjusted R	0.9946
Standard E	0.0184
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.249784	0.249784	737.7559
Residual	3	0.001016	0.000339	
Total	4	0.2508		

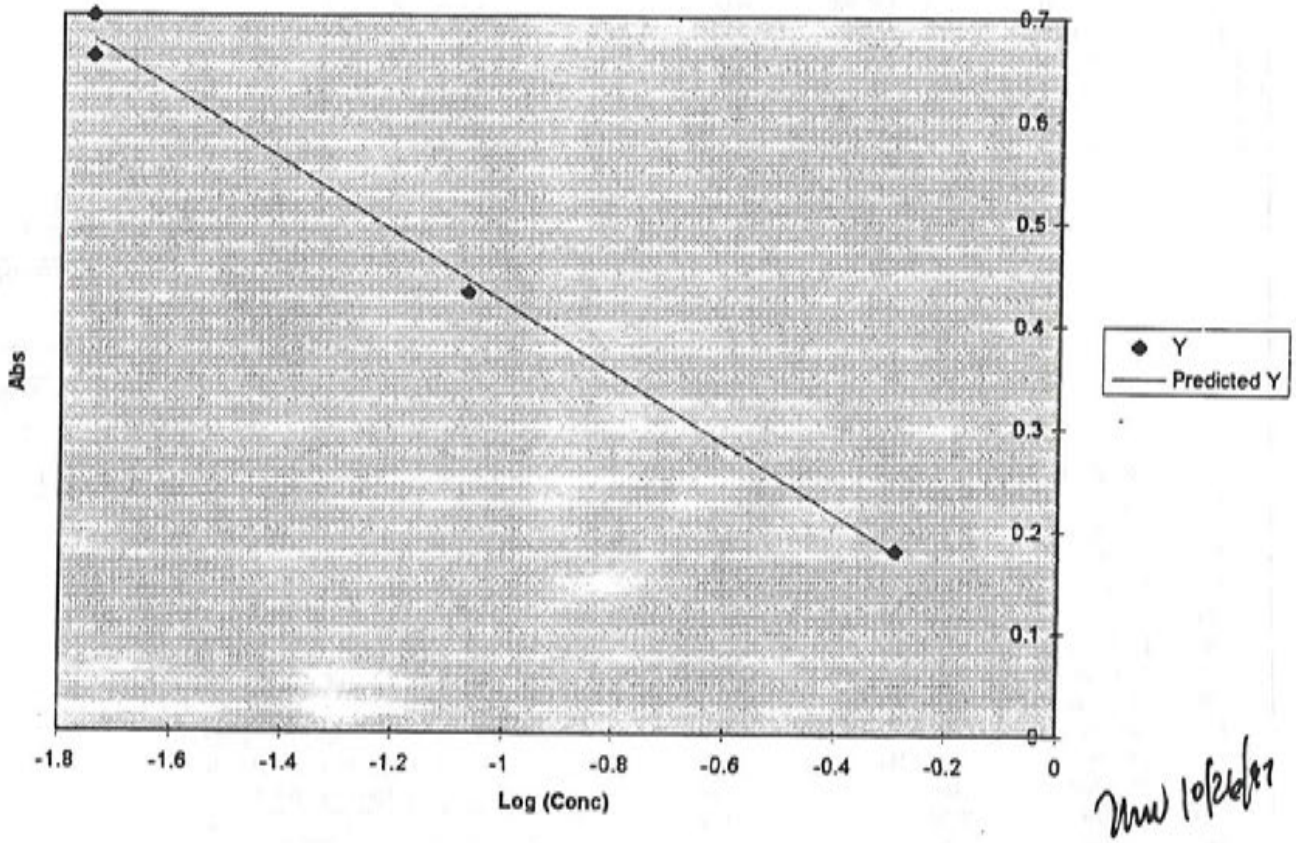
	Coefficients	*tandard Err*	*t Stat*	*P-value*
Intercept	0.077043	0.015381	5.008967	0.015317
X Variable	-0.34358	0.01265	-27.1617	0.00011

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.676501	0.023499
2	0.676501	-0.0165
3	0.443131	-0.01313
4	0.176933	0.003067
5	0.176933	0.003067
6	0.175329	0.014671

Notes: Acceptable calibration and QC.
All duplicates are at concentrations below the lowest calibrator where higher RPD is acceptable.
LCS is approximately 20% below the "true value" at 200%.

Chlordane Batch 15 Calibration 10/24/97



MW 10/26/97

Chlordane Batches 17 and 18 Calibration and Sample Data 11/3/97

	conc	abs	log(conc)	predconc
neg	0	0.98	#NUM!	0.004
cal 1	0.018	0.76	-1.74473	0.015
cal 2	0.086	0.43	-1.0655	0.104
cal 2	0.086	0.43	-1.0655	0.104
cal 3	0.512	0.18	-0.29073	0.455
cal 3	0.512	0.17	-0.29073	0.483

	x	y	log x

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.992115
R Square	0.984291
Adjusted R	0.979055
Standard E	0.034893
Observatio	5

ANOVA

	df	*SS*	*MS*	*F*
Regressior	1	0.228867	0.228867	187.9784
Residual	3	0.003653	0.001218	
Total	4	0.23252		

	Coefficients	*standard Err*	*t Stat*	*P-value*
Intercept	0.046994	0.029733	1.580504	0.212124
X Variable	-0.38927	0.028392	-13.7105	0.00084

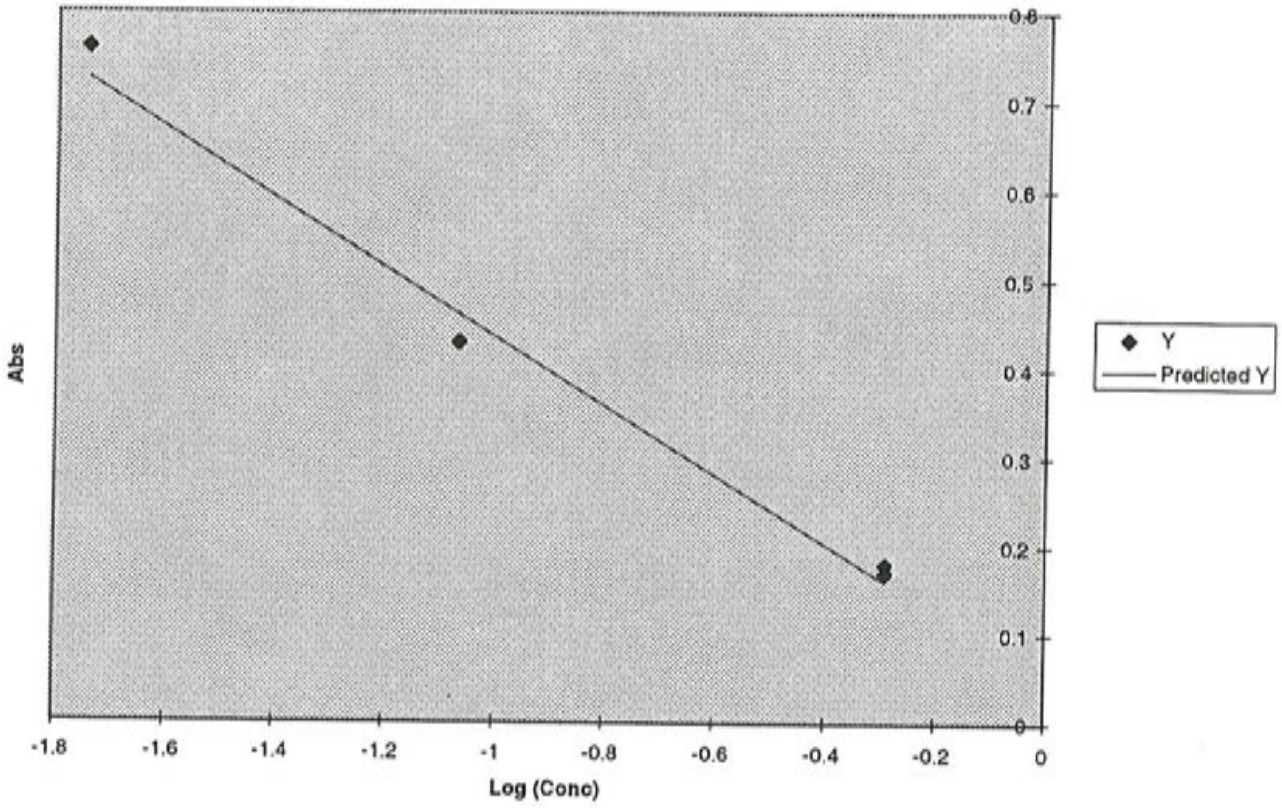
seq #	sample #	abs	QC	conc	SW Key/ %QC	
S1	LCS6X2	0.23		0.339	147 %Rec	
S2	FC4A1	0.41		0.117		
S3	FC4B1	0.4		0.124		
S4	FC4C3	0.44		0.098		
S5	FC4A3	0.64	FD1	0.030		
S6	FC4A3-2	0.68	FD2	0.024	24 %RPD	
S7	SW1AW	0.73		0.018		
S8	SW1BW	0.7		0.021		
S9	SW5AN	0.72		0.019		
S10	SW53	0.32	FD1	0.199		
S11	SW6AN	0.8		0.012		
S12	SW7AN	0.34		0.177	12 %RPD	
S13	SW8AN	0.54		0.054		
S14	SW9AE	0.45		0.092		
S15	SW9CE	0.57		0.045		

RESIDUAL OUTPUT

Observatior	*Predicted Y*	*Residuals*
1	0.726156	0.033844
2	0.461757	-0.03176
3	0.461757	-0.03176
4	0.160165	0.019835
5	0.160165	0.009835
6	0.175329	0.014671

Notes: LCS is approximately 25% below the "true value" at 200%. This is acceptable.
The duplicates for FC4A3 are outside of the project DQO target. Pebbles were noted during extraction (Batch 17). The second field duplicate was done as corrective action for Batch 17 and is acceptable.
The calibration is excellent. These data are accepted.

Chlordane Batches 17&18 Calibration 11/3/97



Appendix H

Toxaphene GC/MS Confirmation and Chemical Structures and Acronyms for Project Pesticides of Concern

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FILE
File w/ DCQCRs

GARRY STRUTHERS ASSOCIATES, INC.

MEMORANDUM

Date: December 4, 1997 Project: Wenatchee TFREC

To: Kira Lynch Project No.: 97-004.38

From: Mike Webb

Subject: Toxaphene Mass Spectral Confirmation

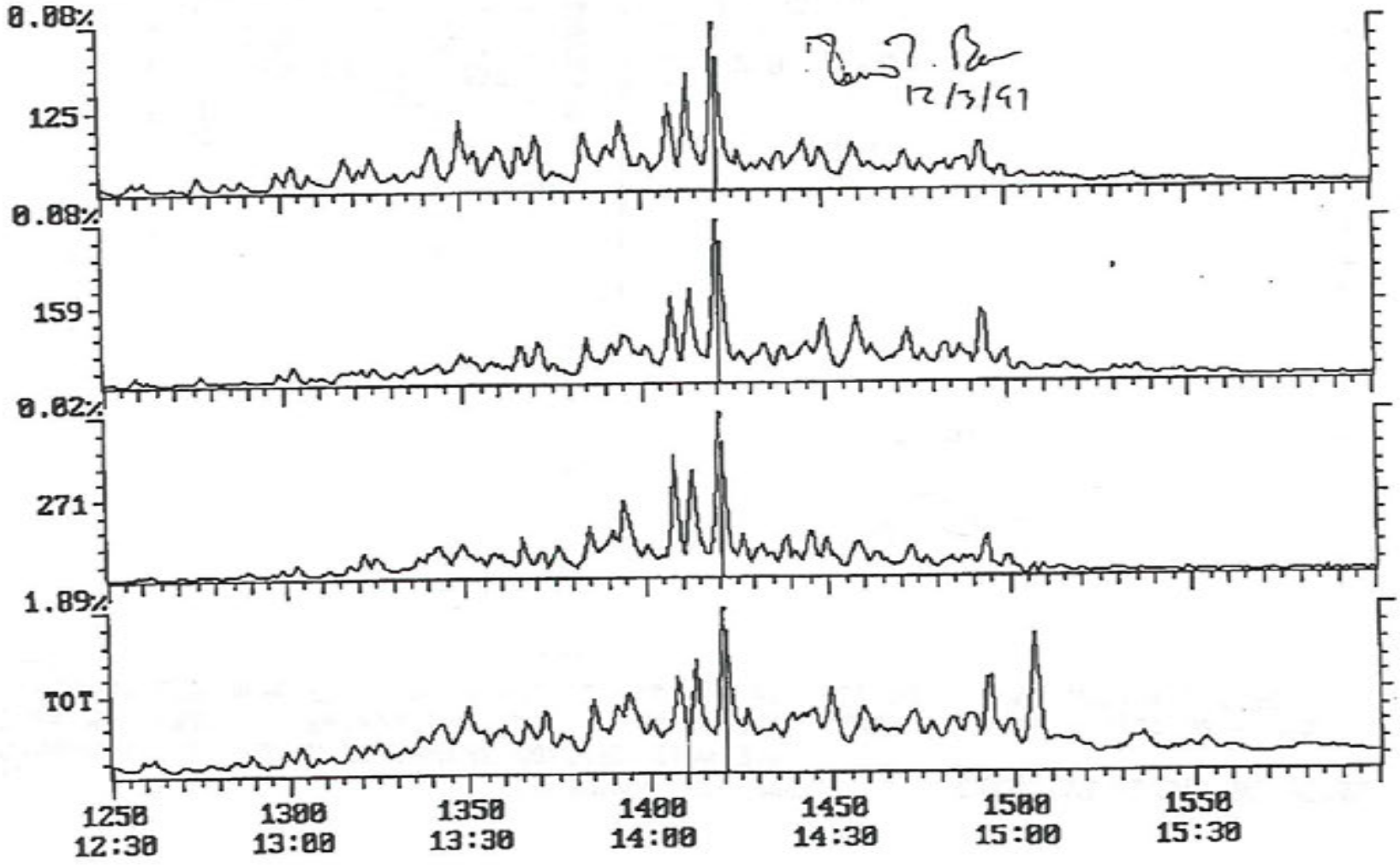
I have attached the chemical structures of the major and minor components we have found in the samples in question, along with some related compounds and camphene. Camphene is the backbone structure of toxaphene, which is a mixture of chlorinated camphenes. It appears that the breakdown of endrin-type compounds could result in similar structures to the toxaphene mix. Whether such a mechanism is probable I do not know. The point is that whatever the source of the profusion of chromatographic peaks, they are possibly as toxic as the toxaphene mix even if we cannot put that label on them. The GC/MS spectra clearly indicate "chlorine clusters" characteristic of multiple chlorination of some backbone structures of similar mass as those found in the toxaphene spectrum.

The structures of the range of compounds of this type that I evaluated are significantly different from the DDT/DDE family (attached), which have fewer chlorines than the endrin and a different backbone. The mass spectrum of DDT indicates fewer chlorines in the DDTfragments than in the spectra of the samples and toxaphene. In addition, the DDT spectrum shows a different primary cluster. What has been reported as toxaphene is therefore not related to the DDT/DDE family.

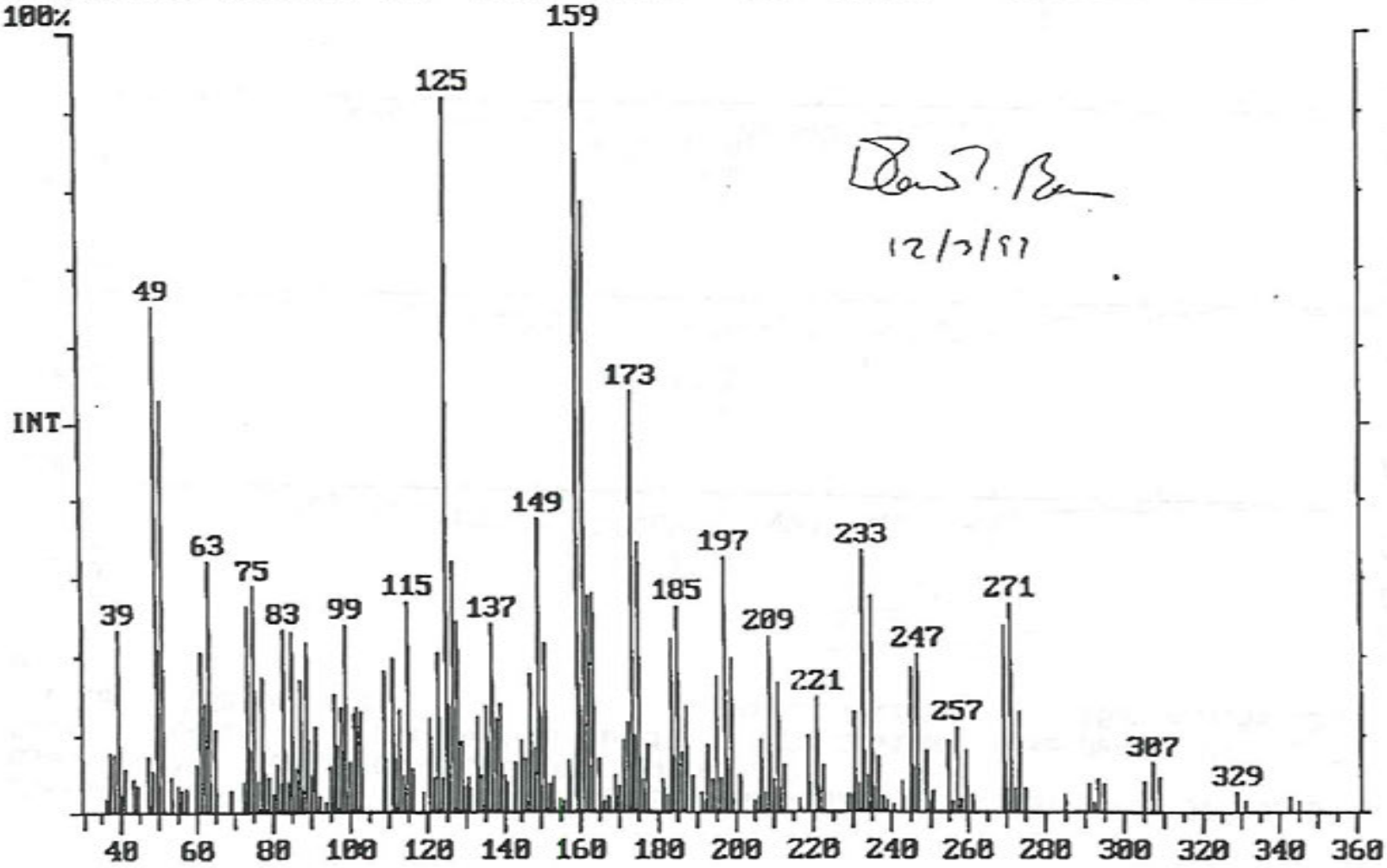
My conclusion is that whatever the source or true identity of the toxaphene found at the site, removal is the best solution. The source could be an unrecorded experiment with chlorinated camphenes or a degradation of some of the other compounds that are recognized as having been used at this site. The end result was chlorinated chemical structures that are most likely of significant toxicity.

SAS samples 68872-6 and 68600-7 showed evidence in the 8080 pesticide analysis that Toxaphene was present at low levels. Due to the high concentrations of DDT, DDE, and DDD in the vicinity of the Toxaphene envelope, the identification of Toxaphene was difficult to assess. The samples were concentrated and analyzed on a Finningan MAT ITS40 ion trap mass spectrometer to confirm the presence of Toxaphene. Because Toxaphene is a mixture of compounds resulting from the chlorination of Camphene, a small region of the chromatogram which had distinctive ions for a major component of the mix was chosen for the confirmation. Background-subtracted mass spectra from both samples were compared to a known toxaphene standard and showed good correlation with these Toxaphene components. The spectra show excellent correlation with the chlorinated ion clusters at masses 125, 159 and 233 as well as significant matches with some lesser ions in the spectra. These ion clusters show the expected pattern for the degree of chlorination expected in Toxaphene and do not appear to be hydrocarbons which were also present in the sample.

Chromatogram Plot C:\ITS40\DATA\P26329 Date: 12/03/97 09:55:45
Comment: 2.0 NG/UL TOXAPHENE CONFIRMATION STD.
Scan No: 1421 Retention Time: 14:13 RIC: 6141939 Mass Range: 36 - 345
Plotted: 1250 to 1600 Range: 1 to 2000 100% = 335914255



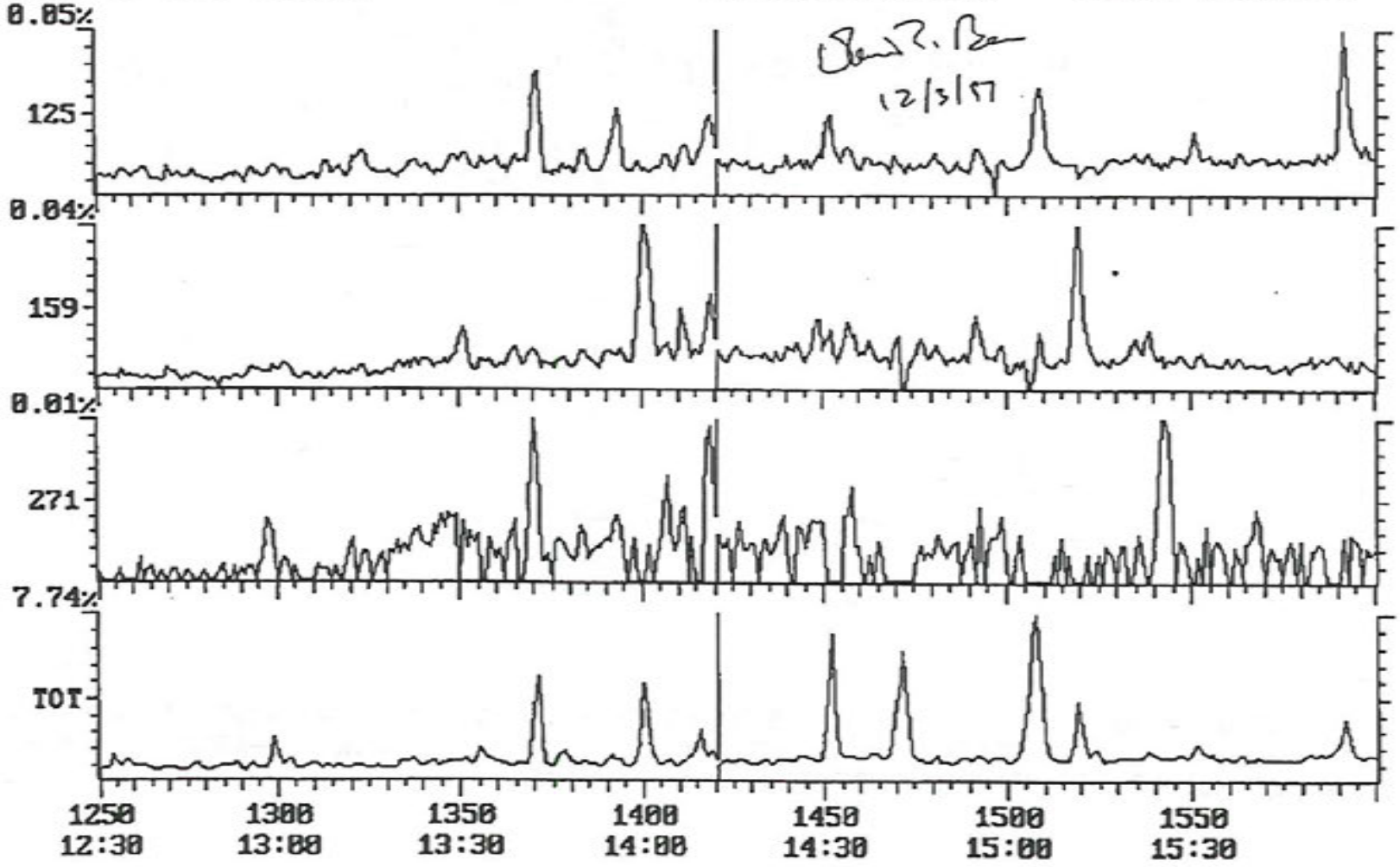
Spectrum Plot C:\ITS40\DATA\P26329 Date: 12/03/97 09:55:45
Comment: 2.0 NG/UL TOXAPHENE CONFIRMATION STD.
Scan No: 1421 Retention Time: 14:13 RIC: 6141939 Mass Range: 36 - 345
Peaks: 187 Base Pk: 159 Ioniz: 91 us Int: 281868 100.00% = 281868



12/3/97

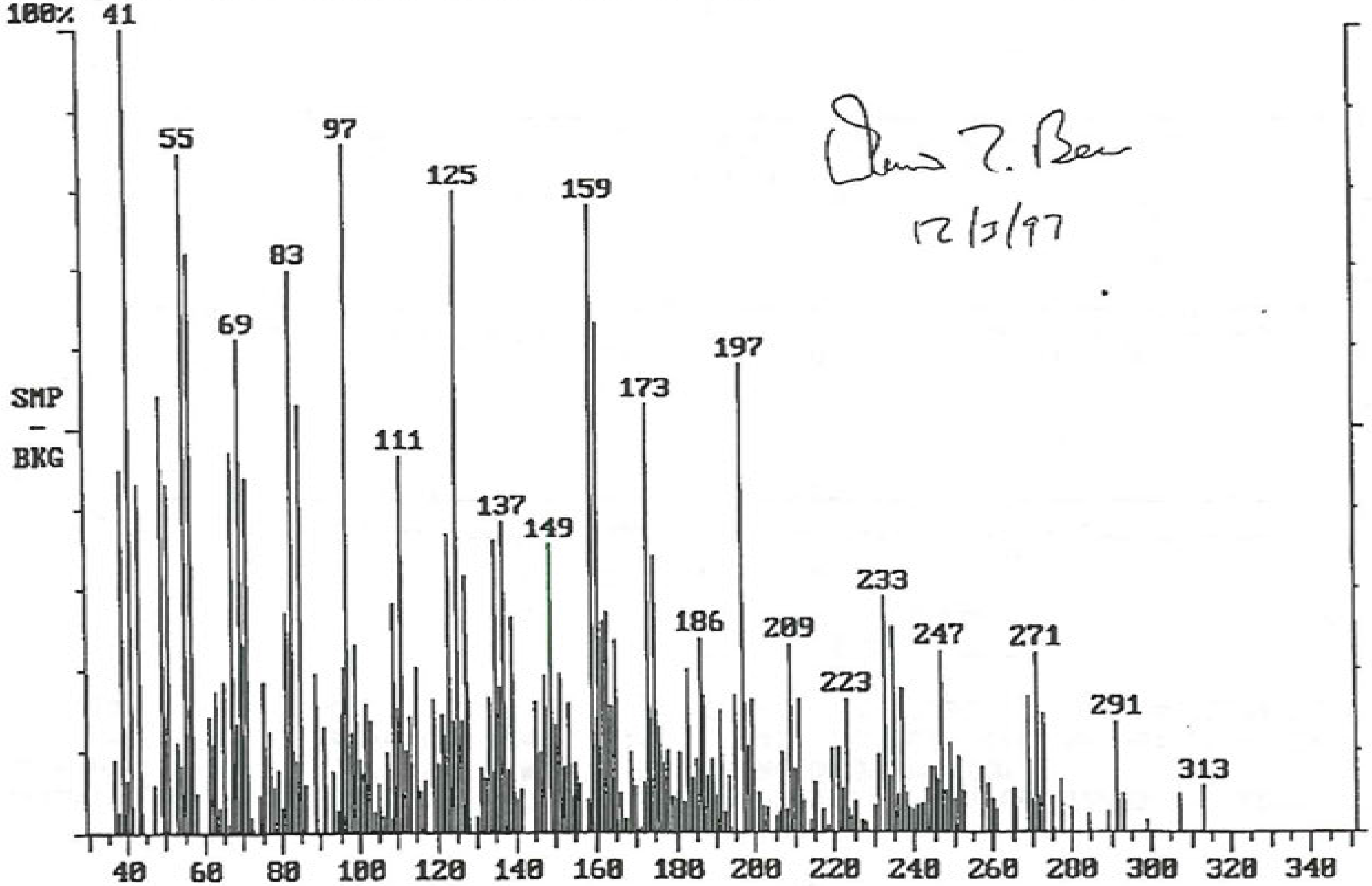
Dec-03-97 03:24P Sound Analytical Services 253 922 5047

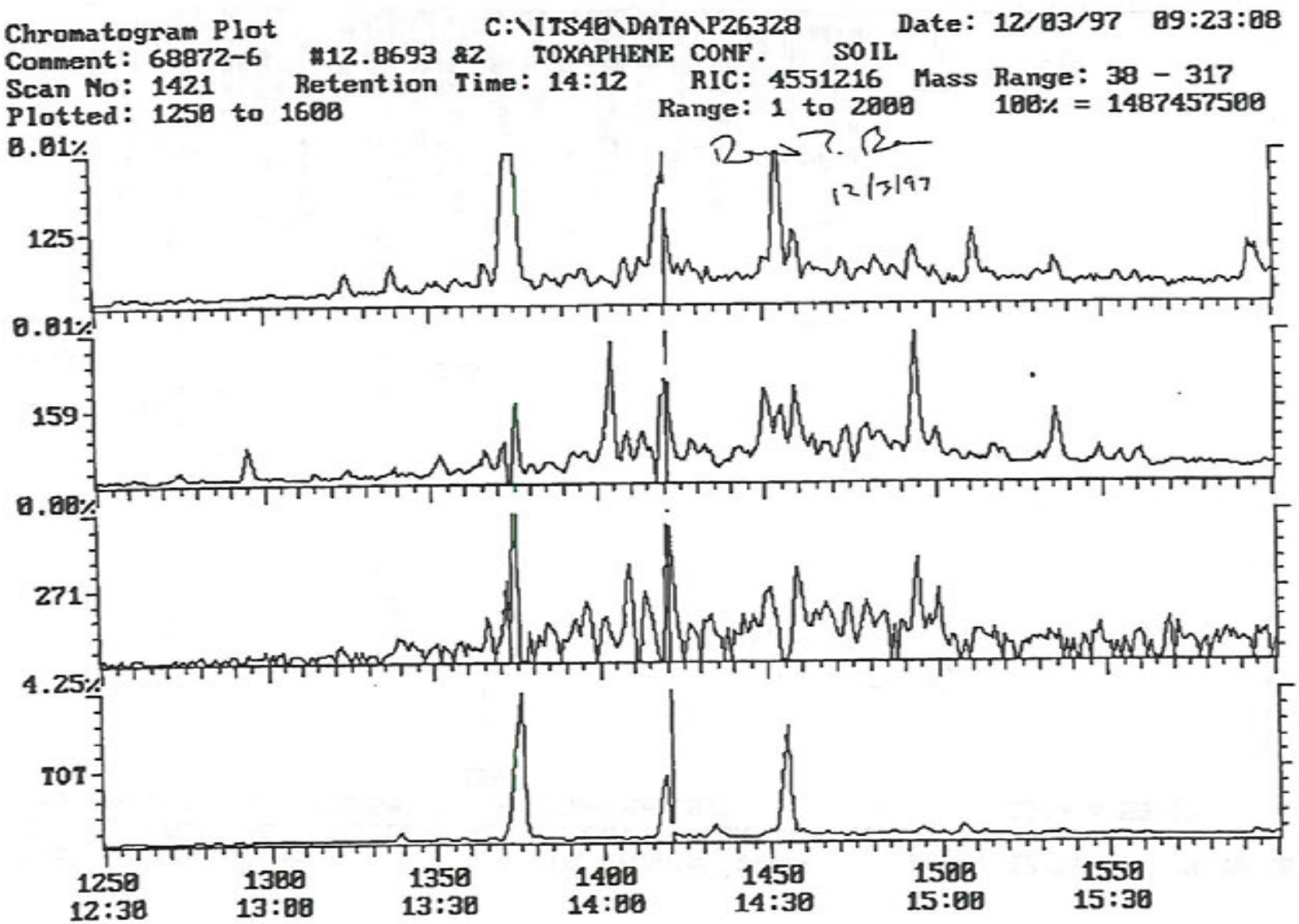
Chromatogram Plot C:\ITS40\DATA\P26332 Date: 12/03/97 12:21:47
Comment: 68600-7 #12.7727 &2 TOXAPHENE CONFIRMATION
Scan No: 1421 Retention Time: 14:13 RIC: 2653401 Mass Range: 36 - 331
Plotted: 1250 to 1600 Range: 1 to 1836 100% = 329344709



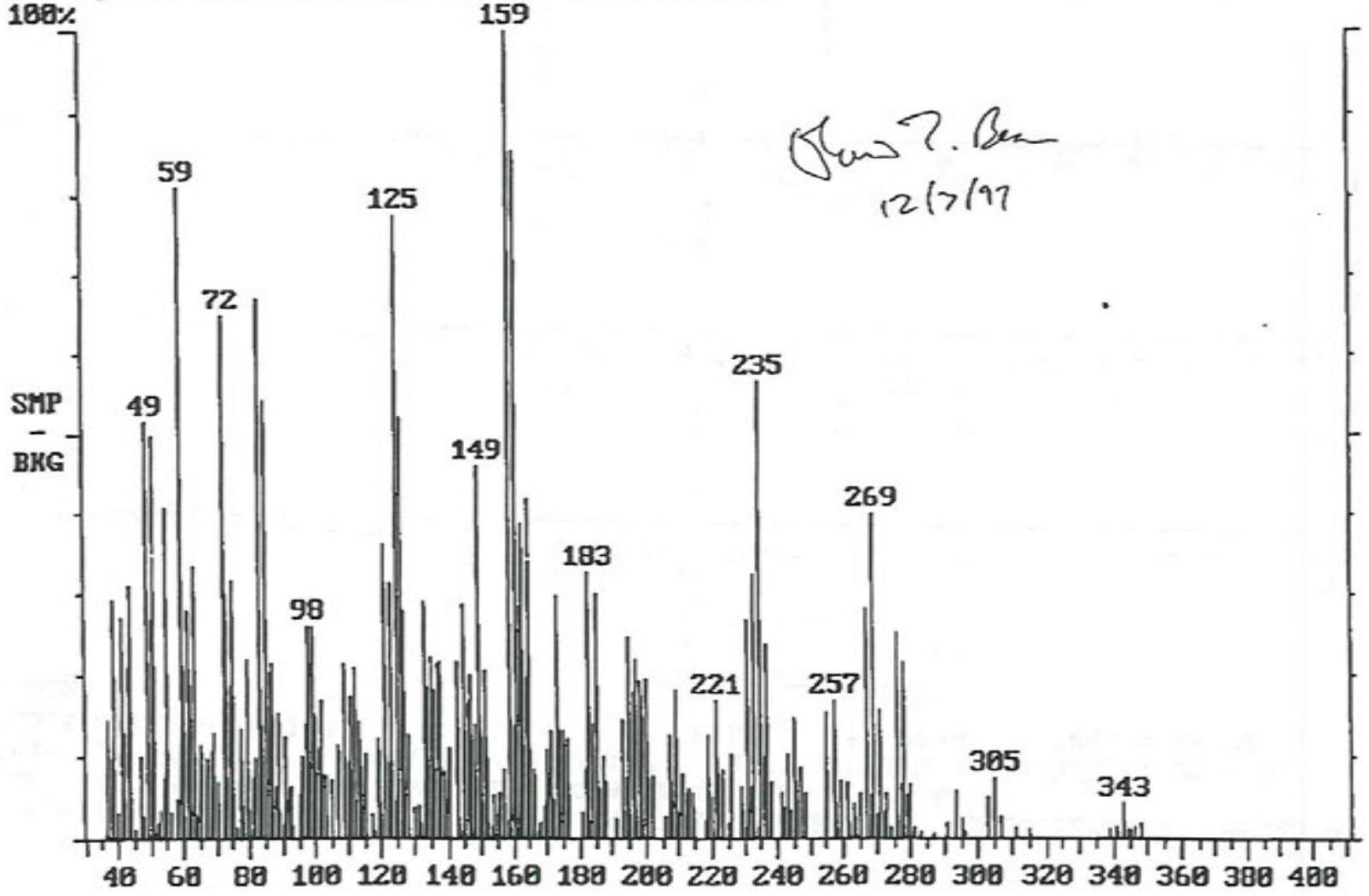
12/3/97

Background Subtract C:\ITS40\DATA\P26332 Date: 12/03/97 12:21:47
Comment: 68600-7 #12.7727 &2 TOXAPHENE CONFIRMATION
Average of: 1419 to 1419 Minus: 1259 to 1266 100% = 78728

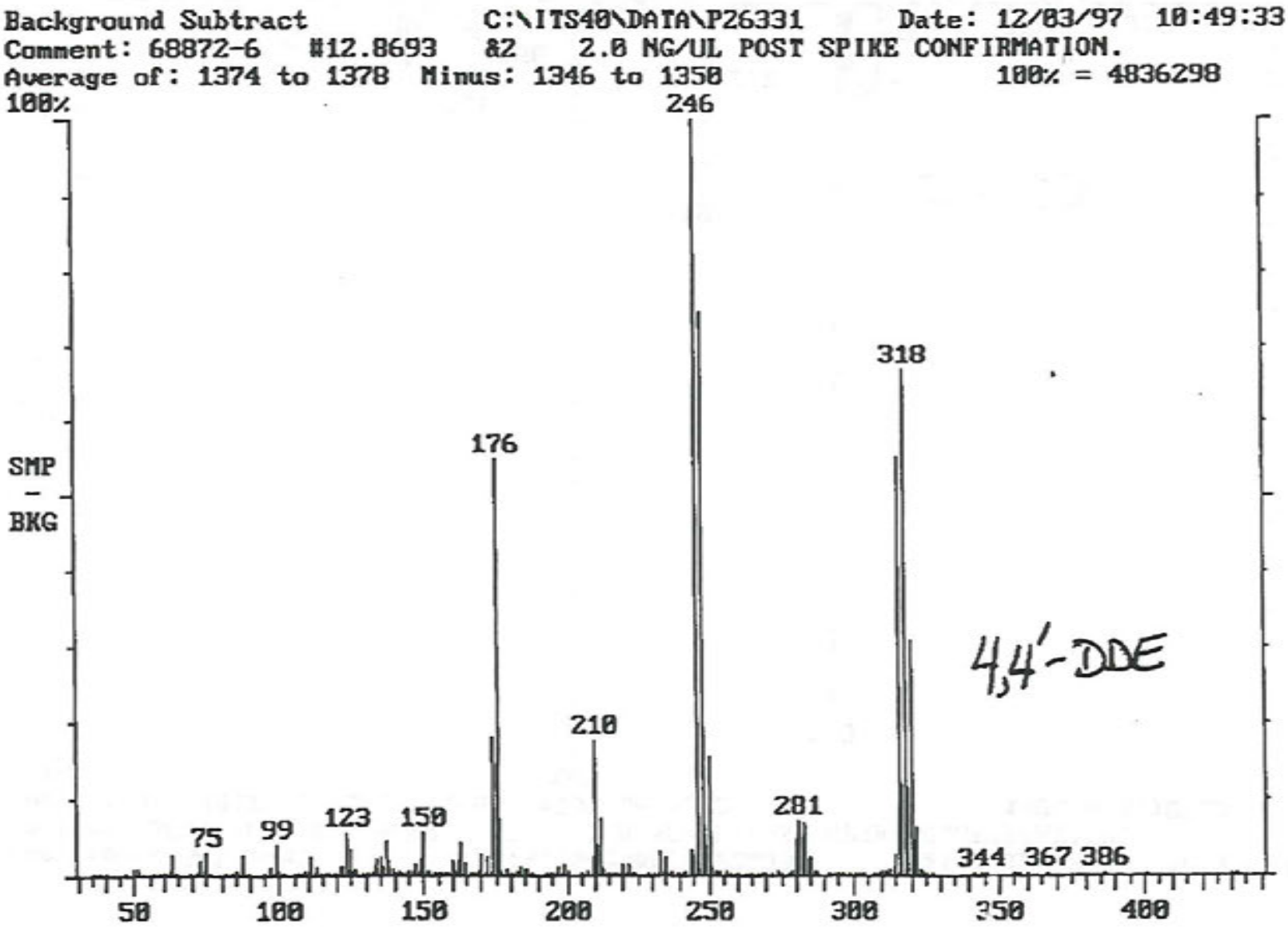



Chromatogram Plot
C:\ITS40\DATA\P26328
Date: 12/03/97 09:23:08
Comment: 68872-6 #12.8693 &2 TOXAPHENE CONF. SOIL
Scan No: 1421 Retention Time: 14:12 RIC: 4551216 Mass Range: 38 - 317
Plotted: 1250 to 1600 Range: 1 to 2000 100% = 1487457500
8.01%
125
8.01%
159
8.00%
271
4.25%
TOT
1250
12:30
1300
13:00
1350
13:30
1400
14:00
1450
14:30
1500
15:00
1550
15:30

Background Subtract C:\ITS40\DATA\P26328 Date: 12/03/97 09:23:08
Comment: 68872-6 #12.8693 &2 TOXAPHENE CONF. SOIL
Average of: 1458 to 1460 Minus: 1584 to 1589 100% = 53637



12/7/97


Background Subtract C:\ITS40\DATA\P26331 Date: 12/03/97 10:49:33
Comment: 68872-6 #12.8693 &2 2.0 NG/UL POST SPIKE CONFIRMATION.
Average of: 1374 to 1378 Minus: 1346 to 1350 100% = 4836298
100%
SMP
-
BKG
246
318
176
210
281
75
99
123
150
344
367
386
4,4'-DDE
50
100
150
200
250
300
350
400

Background Subtract C:\ITS40\DATA\P26331 Date: 12/03/97 10:49:33
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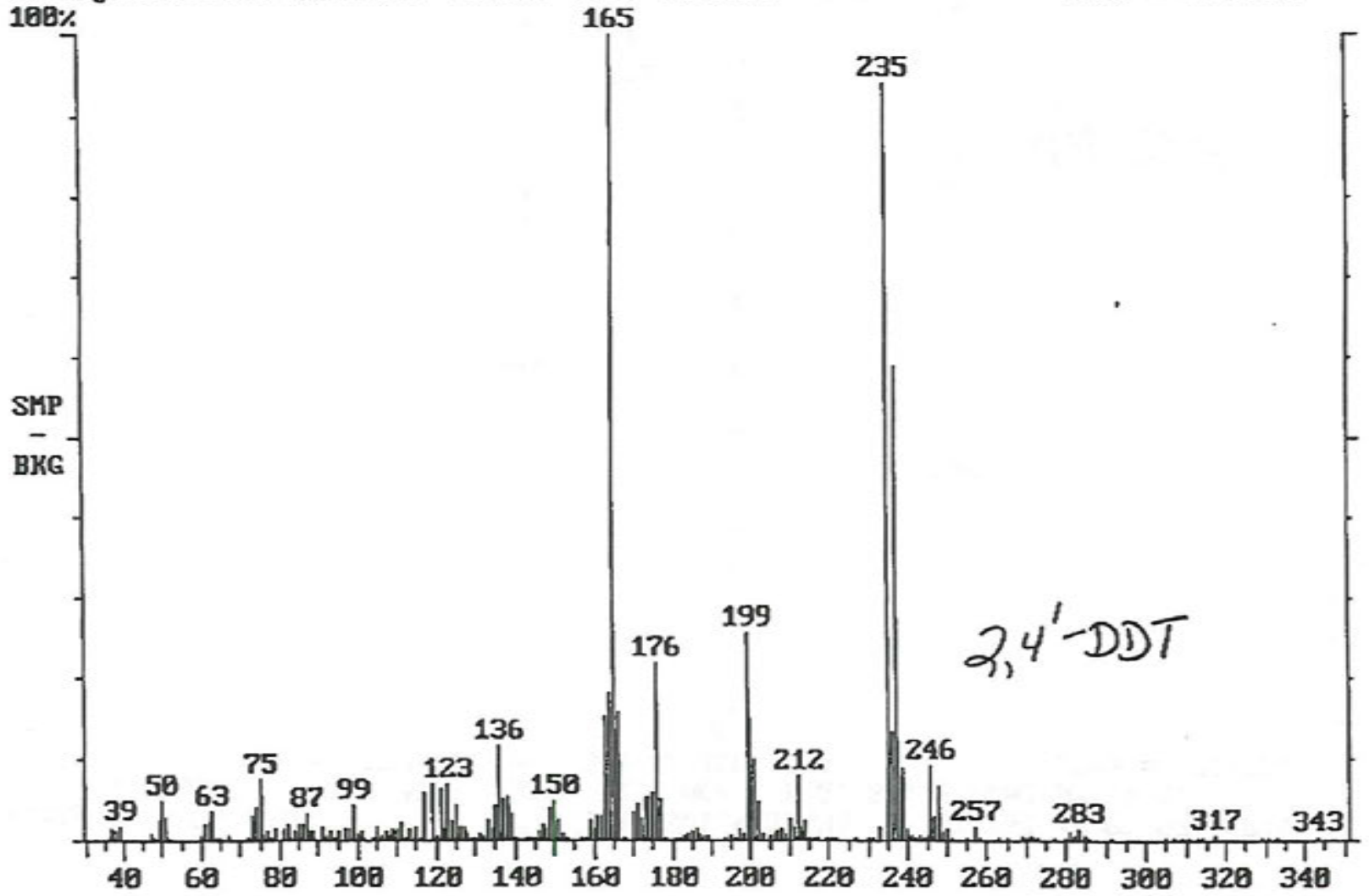
Average of: 1417 to 1421 Minus: 1389 to 1393 100% = 1910213



Background Subtract C:\ITS40\DATA\P26331 Date: 12/03/97 10:49:33
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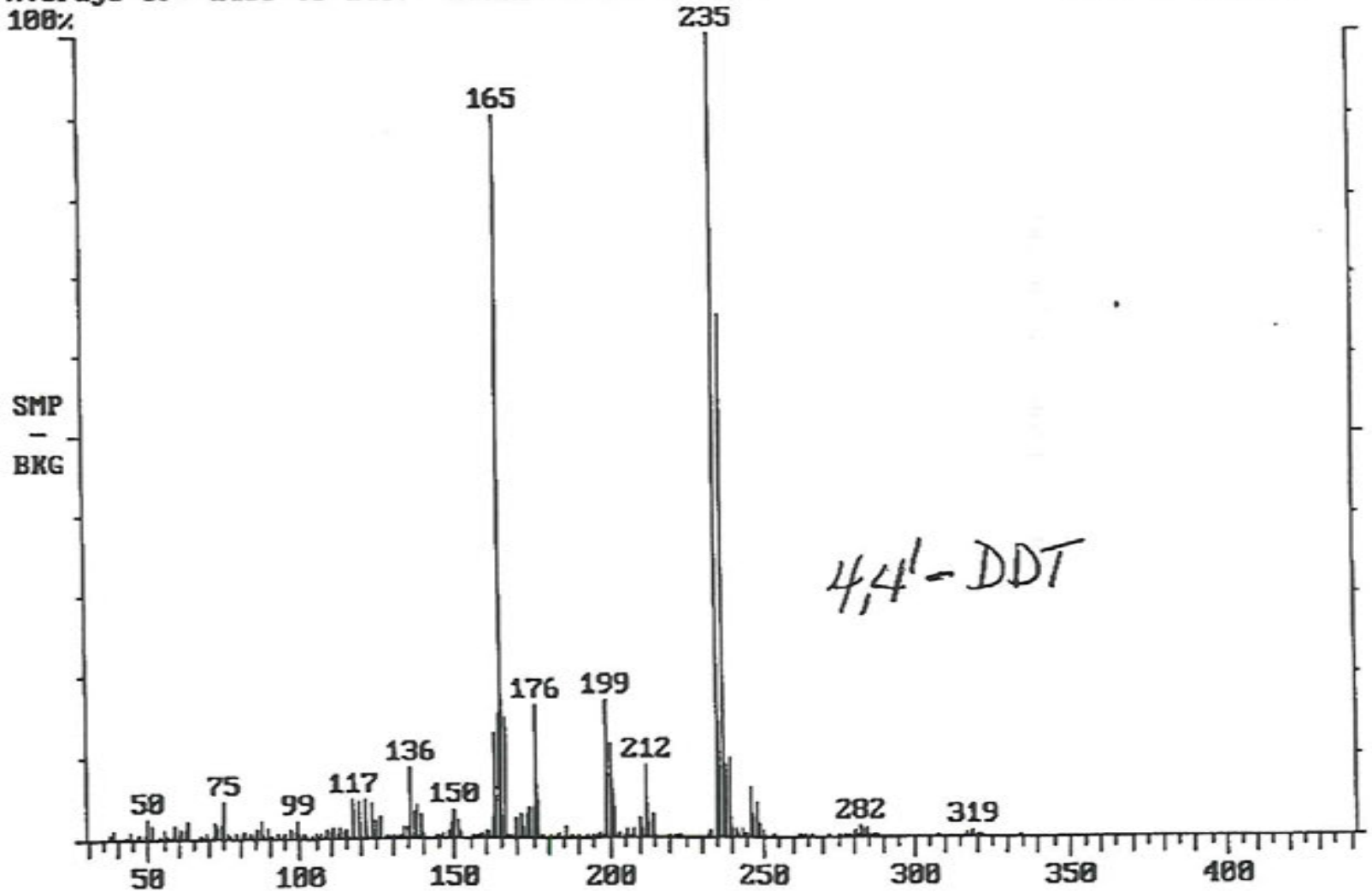
Average of: 1453 to 1457 Minus: 1437 to 1441 100% = 4297321



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Chlorinated Camphene [8001-35-2]

Synonyms: toxaphene; camphechlor; chlorinated champhene; toxakil; phenacide; Campheclor; Polychlorinated camphenes; polychlorocamphene; Hercules 3956; Alltox; Strobane-T; Geniphene; Motox; Penphene; Phenatox; Chlorocamphene; camphochlor; octachlorocamphene; agricide maggot killer (f); alltex; attac 6; attac 8; attac 4-2; attac 4-4; attac 6-3; camphoclor; camphofene huileux; chem-phene; clor chem t-590; compound 3956; crestoxo; cristoxo; cristoxo 90; estonox; fasco-terpene; gy-phene; hercules toxaphene; kamfochlor; M 5055; melipax; strobane t-90; toxadust; toxon 63; toxyphen; vertac toxaphene 90; Agricide; Camphene, chlorinated; Chlorinated Camphenes; Coopertox; Polychorinated camphenes

This substance is a mixture of many individual compounds and cannot be adequately represented by a single molecular structure.

Melting Point (°C)	65-90	**Specific Gravity**	1.66
Boiling Point (°C)	(dec)	**Vapor Density**	--
Evaporation Rate	--	**Water Solubility**	Practically insoluble.
Flash Point (°C)	-18	**EPA Code**	K041; K098; P123; D015
DOT Number	NA 2761 Poison	**RTECS**	XW5250000
Comments	Yellow or amber waxy solid with a mild turpentine-like odor.		

More information about this compound is available from

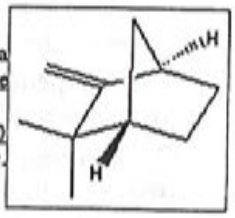
'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ACGIH Threshold Limit Values (USA)
  Information about this particular compound
  Information about this particular compound
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular compound
Australian Atmospheric Exposure Standards
  Information about this particular compound
Australian Hazardous Substances Database
  Information about this particular compound
  Information about this particular compound
  Information about this particular compound
Berkeley Carcinogenic Potency Database
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Candidate Substances List for Bans or Phase-outs (Ontario)
  Information about this particular compound
Carcinogenic Substances in the EEC List of Dangerous Substances
  Information about this particular compound
Center for Food Safety & Applied Nutrition
  Information about this particular compound
CERCLA Hazardous Substances (USA)
  Information about this particular compound
Characteristics of pesticides

(-)-Camphene

[5794-04-7]

Synonyms:

$C_{10}H_{16}$
136.24



This picture is a live chemical image

CS ChemOffice Pro 4.0 started shipping in Feburary. Are you using an older version?

Melting Point (°C)	36-38	**Specific Gravity**	--
Boiling Point (°C)	79-80 at 58 mm Hg	**Vapor Density**	--
Evaporation Rate	--	**Water Solubility**	--
Flash Point (°C)	36	**EPA Code**	--
DOT Number	--	**RTECS**	--
Comments			

More information about this compound is available from

Acros Chemicals Catalog (with MSDSs)
(-)-Camphene, 95%

Return to searching

Camphene [79-92-5]

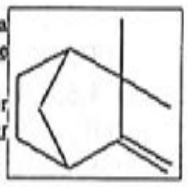
Synonyms: 2,2-Dimethyl-3-Methylene-Bicyclo[2.2.1]Heptane; 2,2-Dimethyl-3-Methylene Norbornane; 3,3-Dimethyl-2-Methylene Norcamphone; 3,3-Dimethyl-2-methylene-norcamphane

$C_{10}H_{16}$

136.24

This picture is a live chemical image

Instructions for Configuring your browser to view chemical structures



Melting Point (°C)	114	Specific Gravity	0.839
Boiling Point (°C)	318 at 0 mm	Vapor Density	--
Evaporation Rate	--	Water Solubility	Insoluble
Flash Point (°C)	36	EPA Code	--
DOT Number	NA 9011 ORM-A	RTECS	EX1055000
Comments	Colorless crystals		

More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
Acros Chemicals Catalog (with MSDSs)
  Camphene, 75%, remainder mainly alpha-fenchene
Biodegradation and Bioaccumulation. Data of Existing Chemicals based on the CSCL, Japan (MITI)
  Information about this particular compound
BUA 3rd Priority Lists (Germany)
  Information about this particular compound
BUA List of Existing Chemicals of Environment Relevance, incl. 1st and 2nd Priority Lists (Germany)
  Information about this particular compound
ChemFinder (Macintosh) WebServer
  Information about this particular compound
CyberMol collection of molecules in VRML format
  Information about this particular compound
Dielectric Constant Reference Guide
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
  Information about this particular compound
Existing Chemicals: Literature Reviews and Evaluations
  Information about this particular compound
Flavornet
  Information about this particular compound
Great Lakes Chemicals (IJC)
  Information about this particular compound
Hazardous Chemicals Database at the University of Akron
  Information about this particular compound
Identifications of Volatile Compounds in Mother's Milk (USA)

Endrin

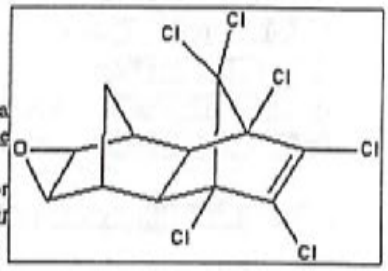
Synonyms: 1,4-endo-endo-5,8-dimethanonaphthalene; Mendrin; Nendrin; endrin mixture; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-endo-5,8-dimethano-naphtha (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-c 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth(2,3-b)oxirene; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthale 269; Endrex; hexachloroepoxyoctahydro-endo,endo-dimethanonaphthalene; experimental insecticide 2(3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth(2,3-b)oxirene, (1aA,2B, (1R,4S,5R,8S)-1,2,3,4,10,10-hexachloro-1,4,4a,5,6,7,8,8a-octahydro-6,7-epoxy-1,4:5,8-dimethanonaph 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,3alpha,6alpha,6abeta,7beta,7aalp

$C_{12}H_8Cl_6O$

380.91

This picture is a live chemical image

Instructions for Configuring your browser to view chemical structures



Melting Point (°C)	200 (dec)	Specific Gravity	--
Boiling Point (°C)	245 (dec)	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	P051; D012
DOT Number	NA 2761 Poison B	RTECS	IO1575000
Comments	Colorless to tan solid with a mild chemical odor.		

More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
ACGIH Threshold Limit Values (USA)
  Information about this particular compound
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular compound
ATSDR Priority List
  This compound in MDL Molfile format
Australian Atmospheric Exposure Standards
  Information about this particular compound
Australian Hazardous Substances Database
  Information about this particular compound
Berkeley Carcinogenic Potency Database
Biodegradation and Bioaccumulation. Data of Existing Chemicals based on the CSCL, Japan (MITI)
  Information about this particular compound
California EPA List of Lists
Catalogue of Substances Hazardous to the Aquatic Environment (Germany)
  Information about this particular compound

Endosulfan sulfate

[1031-07-8]

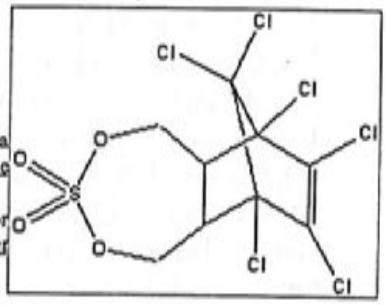
Synonyms:
6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-Methano-2,4,3-benzodioxathiepin 3,3-dioxide; Thiodan sulfate; 6,9-Methano-2,3,4-benzodioxathiepin, 6,7; Hexachloro-5-norbornene-2,3-dimethanol, cyclic sulfate

$C_9H_6Cl_6O_4S$

422.92

This picture is a live chemical image

Instructions for Configuring your browser to view chemical structures



Melting Point (°C)	181	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	--
Comments			

More information about this compound is available from

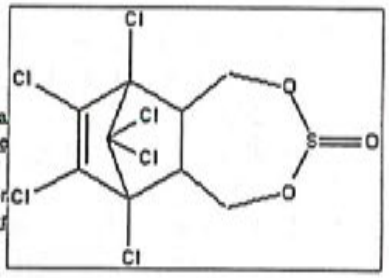
ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
ATSDR Priority List
This compound in MDL Molfile format
California EPA List of Lists
Chemicals in the Environment (Japan)
Information about this particular compound
Clean Water Act Section 307, Priority Pollutans (USA)
Information about this particular compound
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular compound
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
Information about this particular compound
FDA Pestrak files
GIF images of some pesticides
Information about this particular compound
NIST Chemistry WebBook
Information about this particular compound
NTP Chemical Health and Safety Data
Information about this particular compound
SARA Section 110, Priority List of CERCLA Hazardous Substances (USA)
Information about this particular compound

Thiosulfan

Synonyms: benzo[e]dioxathiepin-3-oxide; Benzoepin; (6,7,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin-3-oxide); 6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-3-oxide; 1,5,5a,6,9,9a-hexahydro-3-methyl-6,7,8,9,10,10-Hexachloro-6,9-methano-2,4,3-benzodioxathiepin; 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin 3-oxide; 1,4,5,6,7,7-hexachloro-5-norbornene-2,3-dimethanol cyclic sulfite; 1,2,3,4,7,7-hexachlorobicyclo[2.2.1]-2-heptene-5,6-bisoxymethylene sulfite; chlorthiepin; Malix; Thior 1,4,5,6,7,7-hexachloro-5-norbornene-2,3-dimethanol, cyclic sulfate; alpha, beta-1,2,3,4,7,7-hexachlorobicyclo[2.2.1]-2-heptene-5,6-bisoxy-methylene sulfite; 1,2,3,4,7,7-hexachlorobicyclo[2.2.1]hepten-5,6-bioxymethylene sulfite; hexachlorohexahydromethano 2,4,3-benzodioxathiepin-3-oxide; crisulfan; devisulfan; endocel; endosol; ensure; hildan; beosit; insectc kop-thiodan; thifor; thimul; thiofor; thiomul; tionel; tiovel; cyclodan; fmc 5462; bio 5,642; hoe 2,671; n niagra 5462; oms 570; Alpha,beta-1,2],3,4,7,7-hexachlorobicyclo[2.2.1]hepten-2-bis(oxymethylon-5,6- Beta-6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-endo-6,9-methano-2,4,3-benzodioxathiepin 3-c 5462; endosulfan; Endosulfan 35EC; Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin-3-oxide; Hexachloro-5-norbornene-2,3-dimethanol, cyclic sulfite; Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide; Norbornene-2,3-dimethanol, 1,4,5,6,7,7-hexachloro-, cyclic sulfite; Sulfurous acid, cyclic ester with 1,4,5,6,7,7-hexachloro-5-norbornene-2,3-dimethanol; Thiodan

$C_9H_6Cl_6O_3S$

406.92



This picture is a live chemical image

Instructions for Configuring your browser to view chemical structures

Melting Point (°C)	106	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	P050
DOT Number	NA 2761 Poison B	RTECS	RB9275000
Comments	Solid. Tan or white crystals		

More information about this compound is available from

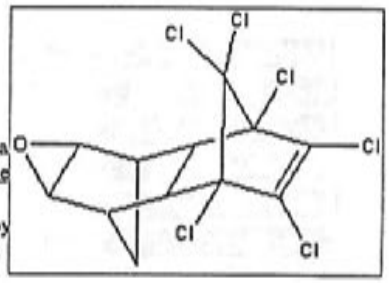
49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ACGIH Threshold Limit Values (USA)
Information about this particular compound
ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
ATSDR Priority List

Dieldrin

Synonyms: endo, exo-1,4:5,8-dimethanonaphthalene; hydro-1,4-endo-exo-5,8-dimethanonaphthalene; 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a7,7a-octahydro-2,7:3,6-Dimethanonaphth[2,3-beta]oxirene; (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-c Dieldrex; Dieldrite; hexachloroepoxyoctahydro-endo,exo-dimethanonaphthalene; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-exo-1,4-endo-5,8-dimethanonaphthalei endo,exo-1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalei illoxol; panoram D-31; octalox; 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethan (1aA,2B,2aA,3B,6B,6aA,7B,7aA)-; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-e epoxide; Dimethanonaphth(2,3-b)oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalp alpha.)-; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-exo-5,8-dimethano

$C_{12}H_8Cl_6O$

380.91



Melting Point (°C)	176	**Specific Gravity**	--
Boiling Point (°C)	--	**Vapor Density**	--
Evaporation Rate	--	**Water Solubility**	110 ppb. Insoluble.
Flash Point (°C)	--	**EPA Code**	P037
DOT Number	NA 2761 Poison	**RTECS**	IO1750000
Comments	Colorless to light tan solid with a mild, chemical odor.		

More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
ACGIH Threshold Limit Values (USA)
  Information about this particular compound
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular compound
ATSDR Priority List
  This compound in MDL Molfile format
ATSDR ToxFAQs
  Information about this particular compound
Australian Atmospheric Exposure Standards
  Information about this particular compound
Australian Hazardous Substances Database
  Information about this particular compound
Berkeley Carcinogenic Potency Database
Biodegradation and Bioaccumulation. Data of Existing Chemicals based on the CSCL, Japan (MITI)

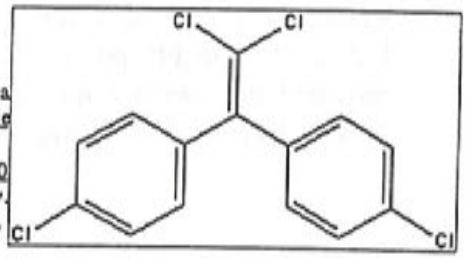
p,p'-DDE

[72-55-9]

Synonyms: DDE; 4,4-DDE; Dichlorodiphenyldichloroethylene; 1,1'-(dichloroethenylidene)bis[4-chlorobenzene;2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; 2,2-bis(p-chlorophenyl)-1,1-dichloroethene; ddt dehydrochloride; p,p'-dichlorodiphenyl dichloroethylene; 1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene

$C_{14}H_8Cl_4$

318.03



Melting Point (°C)	88.4	Specific Gravity	--
Boiling Point (°C)	316.5	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	KV9450000
Comments	White crystalline solid		

More information about this compound is available from

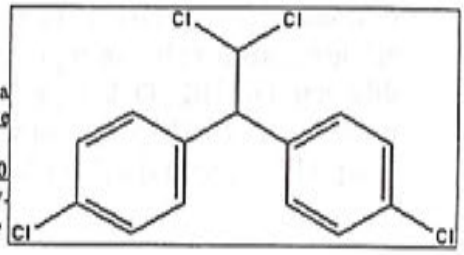
Acros Chemicals Catalog (with MSDSs)
2,2-Bis(4-chlorophenyl)-1,1-dichloroethylene, 99%
ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
ATSDR Priority List
This compound in MDL Molfile format
ATSDR ToxFAQs
Information about this particular compound
Berkeley Carcinogenic Potency Database
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Catalogue of Substances Hazardous to the Aquatic Environment (Germany)
Information about this particular compound
Center for Food Safety & Applied Nutrition
Information about this particular compound
CERCLA Hazardous Substances (USA)
Information about this particular compound
Information about this particular compound
Chemicals in the Environment (Japan)
Information about this particular compound
Clean Air Act Section 112, Statutory Air Pollutants (USA)
Information about this particular compound
Clean Water Act Section 307, Priority Pollutans (USA)
Information about this particular compound

Dichlorodiphenyldichloroethane [72-54-8]

Synonyms: DDD; 1,1'-(2,2-dichloroethylidene)bis[4-chlorobenzene]; p,p'-DDD; TDE; 4,4-DDD; 1,1-Dichloro-2,2-bis(p-chlorophenyl)ethane; p,p'-TDE; Rhothane; 2,2-bis-(4-chlorophenyl)-1,1-dichloroethane; p,p'-Dichlorodiphenyl dichloroethane; 1,1-bis(p-chlorophenyl)-2,2-dichloroethane; tetrachlorodiphenylethane; dilene; rothane; rhothane D-3; me-1700; oms 1078; Dichloro-2,2-bis(p-chlorophenyl)ethane

$C_{14}H_{10}Cl_4$

320.05



Melting Point (°C)	109	Specific Gravity	1.385
Boiling Point (°C)	193	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	U060
DOT Number	NA 2761 ORM-A	RTECS	KI0700000
Comments	Colorless crystals		

More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
Acros Chemicals Catalog (with MSDSs)
2,2-Bis(4-chlorophenyl)-1,1-dichloroethane, 99+%
ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
ATSDR Priority List
This compound in MDL Molfile format
ATSDR ToxFAQs
Information about this particular compound
Berkeley Carcinogenic Potency Database
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Catalogue of Substances Hazardous to the Aquatic Environment (Germany)
Information about this particular compound
Center for Food Safety & Applied Nutrition
Information about this particular compound
CERCLA Hazardous Substances (USA)
Information about this particular compound
Information about this particular compound
Information about this particular compound
ChemFinder (Macintosh) WebServer
Information about this particular compound
Chemicals in the Environment (Japan)

DDT [50-2

Synonyms: 2,2-bis(p-chlorophenyl)-1,1,1-trichloroethane; Dichlorodiphenyltrichloroethane; Dicopha
1,1'-(2,2,2-trichloroethylidene)bis[4-chlorobenzene]; para,para'-DDT; 4,4'-ddt;
1,1,1-Trichlorobis(chlorophenyl)ethane; 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane;
alpha,alpha-bis(p-chlorophenyl)-beta,beta,beta-trichlorethane; chlorophenothane; clofenotane;
pentachlorin; Agritan; Gesapon; Gesarex; Gesarol; Geusapon; p,p'-DDT;
4,4'-Dichlorodiphenyltrichloroethane; p,p'-dichlorodiphenyltrichloroethane;
1,1-bis(p-chlorophenyl)-2,2,2-trichloroethane; diphenyltrichloroethane; anofex; didigam; didimac;
estonate; genitox; Gyron; ixodex; neocid; santobane; trichlorobis(4-chlorophenyl)ethane; zeidane; zerd
arkotine; azotox; bosan supra; bovidermol; chlorophenotoxum; Citox; dedelo; deoval; Detox; detoxan;
dibovan; DNSBP; Dykol; gesafid; guesapon; guesarol; havero-extra; hildit; ivoran; kopsol; micro ddt 7
mutoxin; OMS 16; parachlorocidum; PEB1; pentech; ppzeidan; R50; rukseam; tech ddt;
Bis(p-chlorophenyl)-2,2,2-trichloroethane; Trichloro-2,2-bis(p-chlorophenyl)ethane

$C_{14}H_9Cl_5$

354.49

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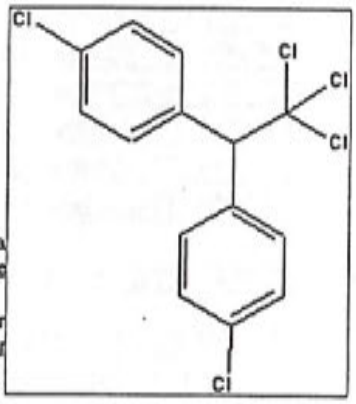
Instructions for Configuring your browser to view chemical structures



Melting Point (°C)	108.5	Specific Gravity	--
Boiling Point (°C)	260	Vapor Density	--
Evaporation Rate	--	Water Solubility	0.00001. Slightly soluble.
Flash Point (°C)	--	EPA Code	U061
DOT Number	NA 2761 Poison	RTECS	KJ3325000
Comments	Colorless solid with a weak, chemical odor.		

More information about this compound is available from

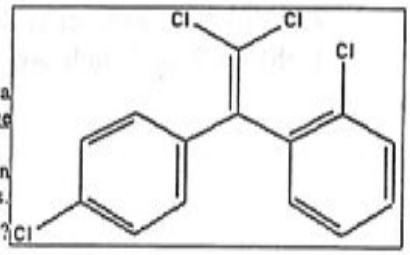
'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
ACGIH Threshold Limit Values (USA)
  Information about this particular compound
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular compound
ATSDR Priority List
  This compound in MDL Molfile format
ATSDR ToxFAQs
  Information about this particular compound
Australian Atmospheric Exposure Standards

o,p'-DDE [3424-82-6]

Synonyms: 1-chloro-2-(2,2-dichloro-1-(4-chlorophenyl)ethenyl)benzene;
1,1-Dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl) ethylene

$C_{14}H_8Cl_4$

318.03



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Melting Point (°C)	--	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	--
Comments			

More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
FDA Pestrak files
GIF images of some pesticides
Information about this particular compound
NIST Chemistry WebBook
Information about this particular compound
Organic Micropollutants in the European Aquatic Environment (COST)
Information about this particular compound
Spectrum Laboratories, Inc.
Information about this particular compound

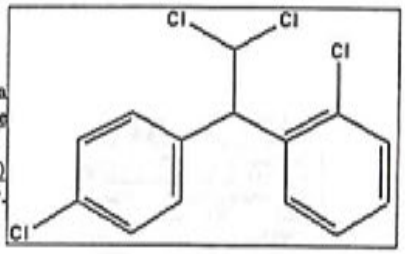
Return to searching

o,p'-DDD [53-19-0]

Synonyms: Chlodithane; o,p'-Dichlorodiphenyldichloroethane; o,p'-TDE; Chloditan; CB 313; Khlodithan; Lysodren; Mitotan; 1,1-Dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)ethane; 1,1-Dichloro-2,2-bis(2,4'-dichlorophenyl)ethane; 2-(o-Chlorophenyl)-2-(p-chlorophenyl)-1,1-dichloroethane; 2,2-Bis(2-chlorophenyl-4-chlorophenyl)-1,1-dichloroethane; 2,4'-Dichlorodiphenyldichloroethane; 1-chloro-2-(2,2-dichloro-1-(4-chlorophenyl))ethylbenzene; Opeprim

$C_{14}H_{10}Cl_4$

320.05



Melting Point (°C)	76	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	U060; U061
DOT Number	--	RTECS	KH7880000
Comments	Colorless powder		

More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
Berkeley Carcinogenic Potency Database
Database for 3D Structures of drugs
Information about this particular compound
EPA Codes at LANL
FDA Pestrak files
GIF images of some pesticides
Information about this particular compound
IARC (International Agency of Research on Cancer) Database
Information about this particular compound
NIST Chemistry WebBook
Information about this particular compound
NTP Chemical Health and Safety Data
Information about this particular compound
Spectrum Laboratories, Inc.
Information about this particular compound
Standard Anti-cancer agents
Information about this particular compound
UMCP Partial list of teratogens
US Customs Pharmaceutical Appendix to the Harmonized Tariff Schedule
Web Molecules (in VRML)

o,p'-DDT [789-02-6]

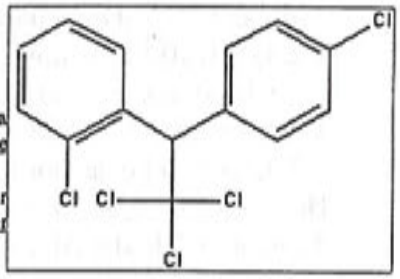
Synonyms: 2,2-Bis (ortho, para-chlorophenyl)-1,1,1-trichloroethane;
1-chloro-2-(2,2,2-trichloro-1-(4-chlorophenyl)ethyl)benzene;
1-(2-Chlorophenyl)-1-(4-chlorophenyl)-2,2,2-trichloroethane

$C_{14}H_9Cl_5$

354.49

This picture is a live chemical image

Instructions for Configuring your browser to view chemical structures



Melting Point (°C)	74.2	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	U061
DOT Number	--	RTECS	KH7910000
Comments			

More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular compound
Chemicals in the Environment (Japan)
Information about this particular compound
Effects of Hormone-Disrupting Chemicals
Information about this particular compound
EPA Codes at LANL
FDA Pestrak files
GIF images of some pesticides
Information about this particular compound
IARC (International Agency of Research on Cancer) Database
Information about this particular compound
Information about this particular compound
NIST Chemistry WebBook
Information about this particular compound
Organic Micropollutants in the European Aquatic Environment (COST)
Information about this particular compound
Proton NMR Spectral Molecular Formula Index
Information about this particular compound
Spectrum Laboratories, Inc.
Information about this particular compound
UMCP Partial list of teratogens

Aldrin

Synonyms: Octalene; Aldrite; Aldrosol; HHDN; Seedrin; aldrin mixture; 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-exo-1,4-endo-5,8-dimethanonaphthalene; 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-Dimethanonaphthalene; compd 118; (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1, Aldrex; 1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-; c hexachlorohexahydro-endo-exo-dimethanonaphthalene; octalene compound 118; 1,4:5,8-Dimetha 1,2,3,4,10,10-hexachloro-, 1,4,4a,5,8,8a-hexahydro-, endo,exo-; Aldocit; Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-; Hexachloro-1,4,4a,5,8,8a-hexahydro-endo-1,4-exo-5,8-dimethanonaphthalene; HHDM; HHPN; K Tatuzinho; Tipula; Aldrin-R

C12H8Cl6
364.91

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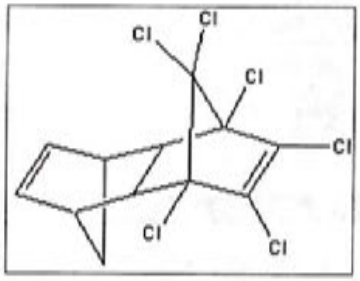

Melting Point (°C)	104	Specific Gravity	--
Boiling Point (°C)	145	Vapor Density	--
Evaporation Rate	--	Water Solubility	insoluble.
Flash Point (°C)	--	EPA Code	P004
DOT Number	NA 2761 Poison B; NA 2762 Poison B	RTECS	IO2100000
Comments	Tan to dark brown solid with a mild chemical odor.		

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More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
ATSDR ToxFAQs
  Information about this particular substance
Australian Atmospheric Exposure Standards
  Information about this particular substance

Azinphos-Methyl

Synonyms: guthion; Guthion, Gusation; S-(3,4-dihydro-4-oxobenzol[d][1,2,3]triazin-3-ylmethyl) O,O-dimethyl phosphorodithioate; Azinphos-Me; Gusathion; Methyl guthion; Guthion(R); Phosphorodithioic acid O,O-dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(4H)-yl)methyl] ester; phosphorodithioic acid O,O-dimethyl ester, S-ester with 3-mercaptomethyl-1,2,3-benzotriazin-4(3H)-one; Bayer 17147; Cotnion-methyl; Gusathion M; Azimil; Bay; R 1582; Gusthion M; Gution; benzotriazinedithiophosphoric acid dimethoxy ester; O,O-dimethyl S-(4-oxobenzotriazino-3-methyl)phosphorodithioate; S-(3,4-dihydro-4-oxo-1,2,3-benzotriazin-3-ylmethyl) O,O-dimethyl phosphorodithioate; azinophos-methyl; bay 9027; bay 17147; bayer 9027; 3-(mercaptomethyl)-1,2,3-benzotriazin-4(3H)-one O,O-dimethyl phosphorodithioate; carfene; cotneon; crysthion 2l; crysthyon; DBD; S-(3,4-dihydro-4-oxo-benzo[alpha]1,2,3-triazin-3-ylmethyl) O,O-dimethyl phosphorodithioate; O,O-dimethyl-S-(benzaziminomethyl) dithiophosphate; O,O-dimethyl-S-(1,2,3-benzotriazinyl-4-keto)methyl phosphorodithioate; O,O-dimethyl S-(3,4-dihydro-4-keto-1,2,3-benzotriazinyl-3-methyl) dithiophosphate; dimethyldithiophosphoric acid N-methylbenzazimide ester; O,O-dimethyl S-(4-oxo-3H-1,2,3-benzotriazine-3-methyl)phosphorodithioate; O,O-dimethyl S-(4-oxo-1,2,3-benzotriazino(3)-methyl) thiothionophosphate; O,O-dimethyl S-4-oxo-1,2,3-benzotriazin-3(4H)-ylmethyl phosphorodithioate; gothnion; gusathion-20; gusathion 25; gusathion k; gusathion methyl; 3-(mercaptomethyl)-1,2,3-benzotriazin-4(3H)-one O,O-dimethyl phosphorodithioate S-ester; methylazinphos; N-methylbenzazimide, dimethyldithiophosphoric acid ester; metiltriazotion; Beetle Buster; Ketokil No. 52; Crysthyon 2L; Dimethoxy ester of (4-oxo-1,2,3-benzotriazin-3(4H)-yl)methyl ester of dithiophosphoric acid; Dimethyl S-((4-oxo-1,2,3-benzotriazin-3(4H)-yl)methyl) phosphorodithioate; Dimethyl S-(3-(mercaptomethyl)-1,2,3-benzotriazin-4(3H)-one) phosphorodithioate; Methyl gusathion

C9H12N3O3PS2

305.3

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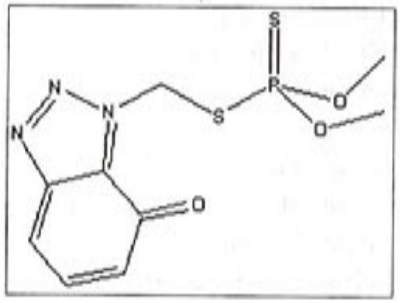

Melting Point (°C)	73	Specific Gravity	1.44
Boiling Point (°C)	(dec)	Vapor Density	--
Evaporation Rate	--	Water Solubility	30 mg/L
Flash Point (°C)	--	EPA Code	--
DOT Number	NA 2783 Poison B	RTECS	TE1925000
Comments	Brown, waxy solid.		

More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
82 structural descriptors for NTP compounds
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
  Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
Characteristics of pesticides
Environmental (Industrial/Agricultural) Chemicals
  Information about this particular substance
  Information about this particular substance
Environmental Assessment Information System
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
  Information about this particular substance
EPA Restricted-use Products
EXtension TOXicology NETwork
  Information about this particular substance
FDA Pestrak files
Florida Agricultural Information Retrieval System
  Information about this particular substance
Genium's Chemical Container Label Database
  Information about this particular substance
GIF images of some pesticides
  Information about this particular substance
Guide to NIOSH/OSHA Air Sampling Methods
  Information about this particular substance
  Information about this particular substance
Introduction to Insecticides

alpha-BHC [319-84-6]

Synonyms: alpha-1,2,3,4,5,6-Hexachlorocyclohexane; alpha-Benzene hexachloride; alpha-Hexachlorocyclohexane; alpha-HCH; HCH (alpha); Hexachlorocyclohexane-Alpha; (1alpha,2alpha,3beta,4alpha,5beta,6beta)-1,2,3,4,5,6-hexachlorocyclohexane; alpha-lindane; 1,2,3,4,5,6-hexachlorocyclohexane, alpha isomer; 1a,2a,3b,4a,5b,6b-hexachlorocyclohexane; benzene-trans-hexachloride; A-benzene hexochloride

C6H6Cl6
290.83

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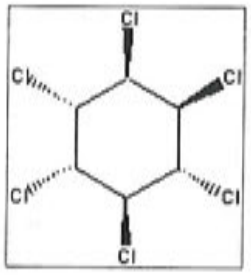

Melting Point (°C)	158	Specific Gravity	--
Boiling Point (°C)	288	Vapor Density	--
Evaporation Rate	--	Water Solubility	INSOLUBLE (1MG/100ML)
Flash Point (°C)	--	EPA Code	U129; D013
DOT Number	--	RTECS	GV3500000
Comments	White crystalline powder.		

More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
Berkeley Carcinogenic Potency Database
California EPA List of Lists
Chemicals Being Added to the EPCRA Section 313 List
Current List of Toxics Release Inventory Chemicals
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
Environmental Assessment Information System
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
Information about this particular substance
EPA Codes at LANL
Existing Chemicals: Literature Reviews and Evaluations
Information about this particular substance

beta-BHC

[319-85-7]

Synonyms: beta-1,2,3,4,5,6-Hexachlorocyclohexane; beta-Hexachlorocyclohexane; beta-HCH; HCH (beta); Hexachlorocyclohexane-Beta; (1alpha,2beta,3alpha,4beta,5alpha,6beta)-1,2,3,4,5,6-hexachlorocyclohexane; Beta-benzene hexachloride; trans-alpha-benzenehexachloride; beta-isomer; 1a,2b,3a,4b,5a,6b-hexachlorocyclohexane; beta-lindane; benzene-cis-hexachloride; B-benzene hexochloride

C6H6Cl6
290.83

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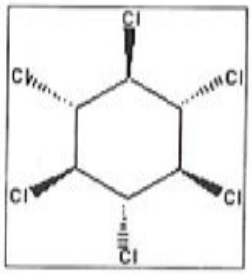

Melting Point (°C)	312	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	U129; D013
DOT Number	--	RTECS	GV4375000
Comments			

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More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
Berkeley Carcinogenic Potency Database
Biocatalysis/Biodegradation Database
Information about this particular substance
California EPA List of Lists
CyberMol collection of molecules in VRML format
Information about this particular substance
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
Environmental Assessment Information System
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
Information about this particular substance

Carbaryl [63-25-2]

Synonyms: Sevin; alpha-naphthyl N-methyl carbamate; 1-Naphthalenol methylcarbamate; methyl carbamic acid 1-naphthyl ester; 1-naphthyl N-methylcarbamate; OMS 29, UC 7744; Arylam; Carylderm; Clinicide; Derbac; Dicarbam; Ravyon; Seffein; Padrin; Bug Master; Carbamec; Carbamine; Crunch; Denapon; Devicarb; Hexavin; Karbaspray; Murvin; NAC; Patrin; Savit; Septene; Tercyl; Thinsec; Tornado; Tricarnam; Carbaril; Carbomate; 1-naphthyl methylcarbamate; Carbatox; Carpolin; Cekubaryl; Methyl-alpha-naphthylurethane; Methylcarbamate 1-naphthalenol; Methylcarbamate 1-naphthol; Naphthyl-N-methylcarbamate; Naphthylmethylcarbamate; Panam; Sevimol

C12H11NO2
201.22

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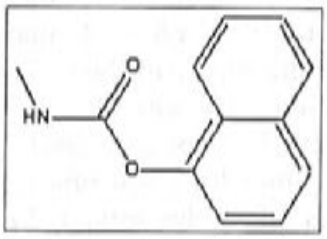

Melting Point (°C)	142	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	0.0004. Insoluble
Flash Point (°C)	202.7	EPA Code	U279
DOT Number	NA 2757; UN 2757 Poison, Keep Away From Food	RTECS	FC5950000
Comments	Colorless solid		

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More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
  Information about this particular substance
  Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
Characteristics of pesticides

Carbofuran [1563-66-2]

Synonyms: Crisfuran; Furadan; Bay 70143; Curaterr; D 1221; fmc 10242; nia 10242; Pillarfuran; Yalox; 2,3-Dihydro-2,2-dimethyl-7-Benzofuranyl, Methylcarbamate; Furadan(R); 2,3-Dihydro-2,2-dimethyl-7-benzofuranol methylcarbamate; methyl carbamic acid 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester; 2,2-dimethyl-2,3-dihydro-7-benzofuranyl-N-methylcarbamate; 2,2-dimethyl-7-coumaranyl N-methylcarbamate; Carbodan; Carbosip; Chinufur; Furacarb; Kenofuran; Nex; Yaltox; furodan; niagara 10242; 2,3-dihydro-2,2-dimethylbenzofuranyl methylcarbamate; 2,2-dimethyl-2,2-dihydrobenzofuranyl-7 N-methylcarbamate; Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate; Methylcarbamic acid, 2,2-dimethyl-2,3-dihydro-7-benzofuranyl ester; Methylcarbamic acid, 2,2-dimethyl-2,3-dihydrobenzofuran-7-yl ester; Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate; Dihydro-2,2-dimethyl-7-benzofuranyl N-methylcarbamate; Dihydro-2,2-dimethylbenzofuran-7-yl methylcarbamate; Dihydro-2,2-dimethylbenzofuranyl-7-N-methylcarbamate; Dimethyl-2,2-dihydrobenzofuranyl-7 N-methylcarbamate; Dimethyl-2,3-dihydro-7-benzofuranyl-N-methylcarbamate; Dimethyl-2,3-dihydrobenzofuranyl 7-methylcarbamate; Dimethyl-7-coumaranyl N-methylcarbamate

C12H15NO3
221.26

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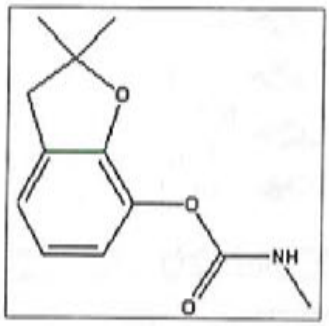

Melting Point (°C)	151	Specific Gravity	1.18
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	Slightly soluble
Flash Point (°C)	--	EPA Code	P127
DOT Number	NA 2757 Poison, Keep Away From Food	RTECS	FB9450000
Comments	Solid		

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More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements

Dichlorodiphenyldichloroethane [72-54-8]

Synonyms: DDD; 1,1'-(2,2-dichloroethylidene)bis[4-chlorobenzene];p,p'-DDD;TDE; 4,4-DDD; 1,1-Dichloro-2,2-bis(p-chlorophenyl)ethane; p,p'-TDE;Rhothane; 2,2-bis-(4-chlorophenyl)-1,1-dichloroethane; p,p'-Dichlorodiphenyldichloroethane; 1,1-bis(p-chlorophenyl)-2,2-dichloroethane; tetrachlorodiphenylethane; dilene; rothane; rhothane D-3; me-1700; oms 1078; Dichloro-2,2-bis(p-chlorophenyl)ethane

C14H10Cl4
320.05

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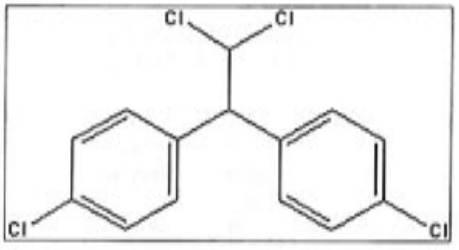

Melting Point (°C)	109	Specific Gravity	1.385
Boiling Point (°C)	193	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	U060
DOT Number	NA 2761 ORM-A	RTECS	KI0700000
Comments	Colorless crystals		

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More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
Acros Chemicals Catalog (with MSDSs)
2,2-Bis(4-chlorophenyl)-1,1-dichloroethane, 99+%
ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
ATSDR ToxFAQs
Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Center for Food Safety & Applied Nutrition
Information about this particular substance
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
Information about this particular substance
Environment Writer Chemical Backgrounder Index

p,p'-DDE

[72-55-9]

Synonyms: DDE; 4,4-DDE; Dichlorodiphenyldichloroethylene; 1,1'-(dichloroethenylidene)bis[4-chlorobenzene; 2,2-bis(4-chlorophenyl)-1,1-dichloroethylene; 2,2-bis(p-chlorophenyl)-1,1-dichloroethene; ddt dehydrochloride; p,p'-dichlorodiphenyldichloroethylene; 1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene

C14H8Cl4
318.03

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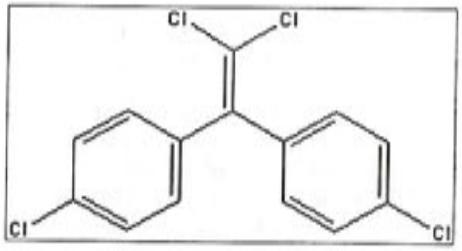

Melting Point (°C)	88.4	Specific Gravity	--
Boiling Point (°C)	316.5	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	KV9450000
Comments	White crystalline solid		

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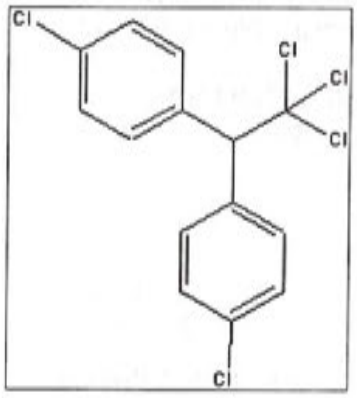
More information about this compound is available from

Acros Chemicals Catalog (with MSDSs)
2,2-Bis(4-chlorophenyl)-1,1-dichloroethylene, 99%
ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
ATSDR ToxFAQs
Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Center for Food Safety & Applied Nutrition
Information about this particular substance
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
Information about this particular substance
Effects of Hormone-Disrupting Chemicals
Information about this particular substance

DDT [50-29-3]

Synonyms: 2,2-bis(p-chlorophenyl)-1,1,1-trichloroethane; Dichlorodiphenyltrichloroethane; Dicophane; 1,1'-(2,2,2-trichloroethylidene)bis[4-chlorobenzene];para,para'-DDT;4,4'-ddt; 1,1,1-Trichlorobis(chlorophenyl)ethane; 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane; alpha,alpha-bis(p-chlorophenyl)-beta,beta,beta-trichlorethane; chlorophenothane; clofenotane; pentachlorin; Agritan; Gesapon; Gesarex; Gesarol; Geusapon; p,p'-DDT; 4,4'-Dichlorodiphenyltrichloroethane;p,p'-dichlorodiphenyltrichloroethane; 1,1-bis(p-chlorophenyl)-2,2,2-trichloroethane; diphenyltrichloroethane; anofex; didigam; didimac; estonate; genitox; Gyron; ixodex; neocid; santobane; trichlorobis(4-chlorophenyl)ethane; zeidane; zerdane; arkotine; azotox; bosan supra; bovidermol; chlorophenotoxum; Citox; dedelo; deoval; Detox; detoxan; dibovan; DNSBP; Dykol; gesafid; guesapon; guesarol; havero-extra; hildit; ivoran; kopsol; micro ddt 75; mutoxin; OMS 16; parachlorocidum; PEB1; pentech; ppzeidan; R50; rukseam; tech ddt; Bis(p-chlorophenyl)-2,2,2-trichloroethane; Trichloro-2,2-bis(p-chlorophenyl)ethane

C14H9Cl5
354.49



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Melting Point (°C)	108.5	Specific Gravity	--
Boiling Point (°C)	260	Vapor Density	--
Evaporation Rate	--	Water Solubility	0.00001. Slightly soluble.
Flash Point (°C)	--	EPA Code	U061
DOT Number	NA 2761 Poison	RTECS	KJ3325000
Comments	Colorless solid with a weak, chemical odor.		

More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query

Diazinon [333-41-5]

Synonyms: Spectracide; Dimpylate; Basudin; O,O-Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl), phosphorothioate; O,O-Diethyl-O-(6-methyl-2-(1-methylethyl)-4-pyrimidinyl)phosophorothioate; Phosphorothioic acid O,O-diethyl O-[6-methyl-2-(1-methylethyl)-4-pyrimidinyl]ester; thiophosphoric acid 2-isopropyl-4-methyl-6-primidyl diethyl ester; O,O-diethyl O-2-isopropyl-4-methyl-6-pyrimidyl thiophosphate; thionophosphate; Knox Out; dianon; gardentox; kayazinon; g-24480; diethyl 4-(2-isopropyl-6-methyl pyrimidinyl)phosphorothionate; Basudin, neocidol; O,O-diethyl O-(6-methyl-2-(1-methylethyl)-4-pyrimidinyl)phosphorothioate; Phosphorodithioic acid, O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl)ester; Dipofene; Diazitol; AG-500; Antigal; Dacutox; Dassitox; Dazzel; Diagran; Diaterr-fos; Diazajet; Diazide; Diazol; Diethyl 2-isopropyl-4-methyl-6-pyrimidinyl phosphorothionate; Diethyl 2-isopropyl-4-methyl-6-pyrimidyl thionophosphate; Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl)phosphorothioate; Dimpylatum; Dizinon; Drawizon; Dyzol; Exodin; Fezudin; Flytrol; Galesan; Isopropyl-4-methylpyrimidyl)O,O-diethyl phosphorothioate; Isopropylmethylpyrimidyl diethyl thiophosphate; Kayazol; Knox out 2FM; Neocidol; Nipsan; Nucidol; Sarolex

C12H21N2O3PS
304.34

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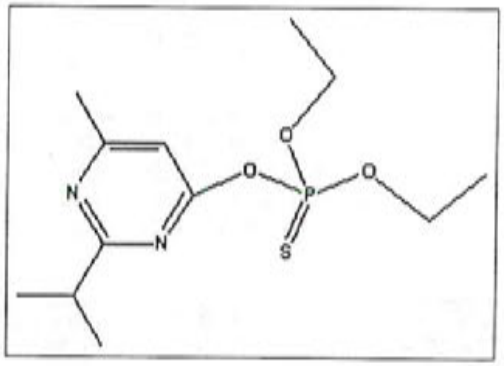

Melting Point (°C)	>120 (dec)	Specific Gravity	1.117
Boiling Point (°C)	>120 (dec)	Vapor Density	--
Evaporation Rate	--	Water Solubility	Slightly soluble. 60 mg/L
Flash Point (°C)	--	EPA Code	--
DOT Number	NA 2783 Poison	RTECS	TF3325000
Comments	Colorless liquid; Technical grade: yellow to dark brown		

More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ATSDR Internet HazDat Site Contaminant Query

dichlorovos

Synonyms: 2,2-Dichlorobinyldimethyl Phosphate; DDVP; dichlorophos; 2,2-dichlorovinyl dimethyl phosphate; Equigand; No-Pest Strip; 2,2-Dichlorovinyl-O,O-dimethyl phosphate; vapona; Phosphoric acid 2,2-dichloroethenyl dimethyl ester; phosphoric acid 2,2-dichlorovinyl dimethyl ester; SD 1750; Astrobot; Atgard; Canogard; Dedevap; Dichlorman; Divipan; Equigard; Equigel; Estrosol; Herkol; Nogos; Nuvan; Dimethyl dichlorovinyl phosphate; Phosphoric acid, 2-dichloroethenyl dimethyl ester; 2,2-dichloroethenyl dimethyl phosphate; 2,2-dichlorovinyl dimethyl phosphoric acid ester; 2,2-dichloroethenyl phosphoric acid dimethyl ester; dimethyl 2,2-dichloroethenyl phosphate; dimethyl 2,2-dichlorovinyl phosphate; O,O-dimethyl dichlorovinyl phosphate; O,O-dimethyl O-2,2-dichlorovinyl phosphate; 2,2-dichlorovinyl alcohol dimethyl phosphate; apavap; atgard c; atgard v; bay-19149; benfos; bibesol; brevinyl; brevinyl e50; chlorvinphos; deriban; derribante; devikol; duo-kill; duravos; estrosel; fecama; fly-die; fly fighter; herkal; krecalvin; lindan; MAFU; mafu strip; marvex; mopari; nerkol; nogos 50; nogos g; no-pest; NUVA; nuvan 100ec; OKO; OMS 14; phosvit; szklarniak; TASK; Tenac; task tabs; tetravos; UDVF; unifos; unifos 50 ec; vaponite; vapora ii; verdican; verdipor; vinylofos; vinylophos; bayer 19149; O,O-dimethyl 2,2-dichlorovinyl phosphate; fekama; insectigas d; nefrafos; nogos 50 ec; novotox; nuvan 7; panaplate; winylophos; 2,2-dichloroethenol dimethyl phosphate; Cekusan; Cypona; Delevap; Derriban; Dichloroethenyl dimethyl phosphate; Dichlorovinyl dimethyl phosphate; Equiguard; Prentox; Verdisol

C4H7Cl2O4P
220.98

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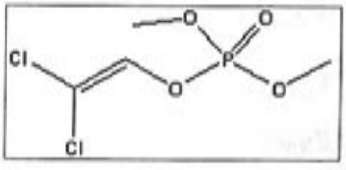

Melting Point (°C)	-60	Specific Gravity	1.415
Boiling Point (°C)	140	Vapor Density	--
Evaporation Rate	--	Water Solubility	Slightly soluble. 1 g/100g
Flash Point (°C)	--	EPA Code	--
DOT Number	NA 2783 Poison B	RTECS	TC0350000
Comments	Colorless to amber liquid with a mild, chemical odor		

More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
82 structural descriptors for NTP compounds
ABCR GmbH&Co KG
2,2-Dichlorovinyl dimethyl phosphate (DDVP)
ATSDR Internet HazDat Site Contaminant Query

Dimethoate [60-51-5]

Synonyms: Cygon; Perfekthion; Rogor; Roxion; Fosfamid; O,O-Dimethyl S-(N-Methylcarbamoylmethyl) Phosphorodithioate; Phosphorodithioic Acid O,O-Dimethyl S-(2-(Methylamino)-2-Oxoethyl) Ester; Phosphamide; Defend; Fostion M M; phosphorodithioic acid O,O-dimethyl ester, ester with 2-mercapto-N-methylacetamide; O,O-dimethyl S-methylcarbamoylmethyl phosphorodithioate; American Cyanamid 12880; O,O-Dimethyl methylcarbamoylmethyl phosphorodithioate; O,O-dimethyl S-(2-(methylamino)2-oxoethyl) phosphorodithioate; Dimethyl phosphorodithioate, S-ester with 2-mercapto-N-methylacetamide; Dimethyl S-((methylcarbamoyl)methyl) phosphorodithioate; Dimethyl S-(N-(methylcarbamoyl)methyl) phosphorodithioate; Phosphorodithioic acid, S-((methylcarbamoyl)methyl O,O-dimethyl ester; Rebelate

C5H12NO3PS2

229.2

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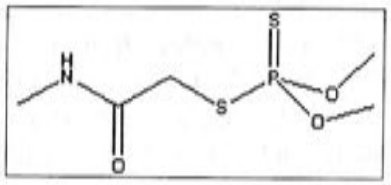

Melting Point (°C)	52-52.5	**Specific Gravity**	1.281
Boiling Point (°C)	107 at 0.05 mm Hg	**Vapor Density**	--
Evaporation Rate	--	**Water Solubility**	Slightly soluble. 1-10 mg/mL at 24 C.
Flash Point (°C)	--	**EPA Code**	P044
DOT Number	NA 2783	**RTECS**	TE1750000

Comments Crystals, systemic and contact insecticide. White crystalline solid

More information about this compound is available from

8(e) TRIAGE Chemical Studies Database
82 structural descriptors for NTP compounds
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
Characteristics of pesticides
Chemicals Being Added to the EPCRA Section 313 List
Current List of Toxics Release Inventory Chemicals

Disulfoton [298-04-4]

Synonyms: Solvirex; Thiodemeton; Disyston(R); Phosphorodithioic acid O,O-diethyl S-[2-(ethylthio)ethyl] ester; O,O-diethyl-S-ethylmercaptoethyl dithiophosphate; dithiodemeton; BAY 19639; Dithiosystox; Di-Syston; Frumin AL; Frumin G; Frumen AL; disulfoton+; O,O-diethyl S-(2-(ethylthio)ethyl) phosphorodithioate; thiometon-ethyl; Root-X; Dot-Son Brand Stand-Aid; Rigo Insyst-D; Terraclor Super-X; Diethyl S-(2-(ethylthio)ethyl) phosphorodithioate; Diethyl S-(2-ethylmercaptoethyl) dithiophosphate; Dimaz; Disipton; Disystox; Ekatin TD; Ethylthio)ethyl) O,O-diethyl ester of phosphorodithioic acid; Ethylthiometon; Glebofos

C8H19O2PS3
274.4

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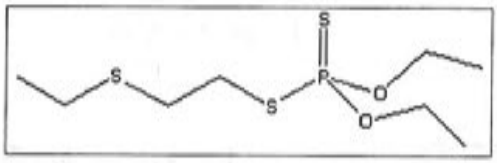

Melting Point (°C)	108	Specific Gravity	--
Boiling Point (°C)	62 at 0.01 mm Hg	Vapor Density	--
Evaporation Rate	--	Water Solubility	Insoluble
Flash Point (°C)	--	EPA Code	K036; K037; P039
DOT Number	NA 2783 Poison B	RTECS	TD9275000
Comments	Solid, pale yellow liquid		

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More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
California EPA List of Lists
Characteristics of pesticides
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
  Information about this particular substance
Environmental Assessment Information System
Environmental Science Center database of Experimental Log P coefficients, with Ozone

alpha-Endosulfan

Synonyms: Endosulfan I;
(3alpha,5aalpha,6alpha,9alpha,9aalpha)-6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-M
3-oxide; Endosulfan 1; Endosulfan A; 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-meth
3-oxide, (3alpha, 5abeta, 6alpha, 9alpha, 9abeta)-; Thiodan I; Hexachloro-5-norbornene-2,3-dimet

C9H6Cl6O3S
406.92

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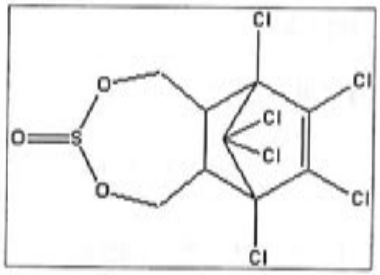

Melting Point (°C)	108-110	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	Insoluble
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	RB9275000
Comments	Brown crystals.		

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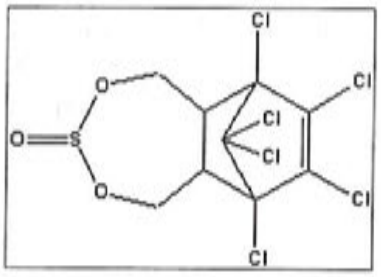
More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
California EPA List of Lists
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
Information about this particular substance
EPA Codes at LANL
FDA Pestrak files
NIST Chemistry WebBook
Information about this particular substance
NTP Chemical Health and Safety Data
Information about this particular substance
Protocol Analytical Supplies, Inc. Single-component standards
Spectrum Laboratories, Inc.

beta-Endosulfan

Synonyms: Endosulfan II; Endosulfan beta; (3alpha,5abeta,6beta,9beta,9abeta)-6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-Methan 3-oxide; Endosulfan 2; 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benz (3alpha, 5aalpha, 6beta, 9beta, 9aalpha)-; Thiodan II; Hexachloro-5-norbornene-2,3-dimethanol, c

C9H6Cl6O3S
406.92



Melting Point (°C)	208-210	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	Insoluble
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	RB9275000
Comments	Brown crystals.		

More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
California EPA List of Lists
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
  Information about this particular substance
EPA Codes at LANL
FDA Pestrak files
GIF images of some pesticides
  Information about this particular substance
NIST Chemistry WebBook
  Information about this particular substance
NTP Chemical Health and Safety Data
  Information about this particular substance
Protocol Analytical Supplies, Inc. Single-component standards
Spectrum Laboratories, Inc.
  Information about this particular substance

Endrin

Synonyms: 1,4-endo-endo-5,8-dimethanonaphthalene; Mendrin; Nendrin; endrin mixture; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-endo-5,8-dimethano-naphtha (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-c 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth(2,3-b)oxirene; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthale 269; Endrex; hexachloroepoxyoctahydro-endo,endo-dimethanonaphthalene; experimental insecticide 2(3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth(2,3-b)oxirene, (1aA,2B, (1R,4S,5R,8S)-1,2,3,4,10,10-hexachloro-1,4,4a,5,6,7,8,8a-octahydro-6,7-epoxy-1,4:5,8-dimethanonaph 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,3alpha,6alpha,6abeta,7beta,7aalp

$C_{12}H_8Cl_6O$

380.91

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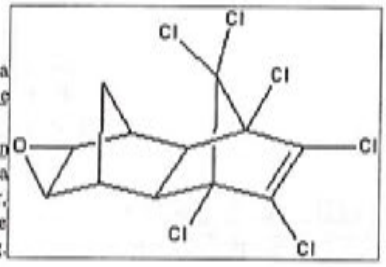

Melting Point (°C)	200 (dec)	Specific Gravity	--
Boiling Point (°C)	245 (dec)	Vapor Density	--
Evaporation Rate	--	Water Solubility	
Flash Point (°C)	--	EPA Code	P051; D012
DOT Number	NA 2761 Poison B	RTECS	IO1575000
Comments	Colorless to tan solid with a mild chemical odor.		

More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
Center for Food Safety & Applied Nutrition
  Information about this particular substance
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
  Information about this particular substance
Environmental (Industrial/Agricultural) Chemicals

Endrin ketone

Synonyms:

(2alpha,3abeta,3bbeta,4beta,5alpha,6abeta,7alpha,7abeta,8R*)-3b,4,5,6,6,6a-hexachlorodecahydr
Ketoendrin; Delta-ketoendrin; 3b,4,5,6,6,6a-hexachlorodecahydro-2,5,7-metheno-3H-cyclopenta(
5beta, 6abeta, 7alpha, 7abeta, 8R*)-; delta keto 153

Melting Point (°C)	--	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	--
Comments			

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More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
FDA Pestrak files
Protocol Analytical Supplies, Inc. Single-component standards
Spectrum Laboratories, Inc.
Information about this particular substance

Return to searching

Endrin aldehyde

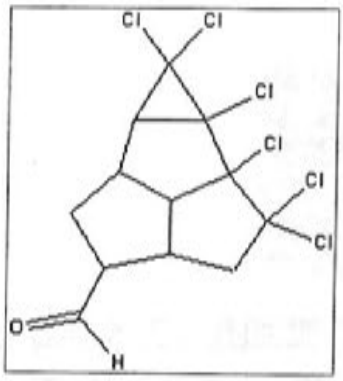
[7421-93-4]

Synonyms:

2,2a,3,3,4,7-hexachlorodecahydro-1,2,4-Methenocyclopenta[c,d]pentalene-5-carboxaldehyde

C12H10Cl6O

382.93



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Melting Point (°C)	--	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	--
Comments			

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More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
California EPA List of Lists
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
NIST Chemistry WebBook
Information about this particular substance
NTP Chemical Health and Safety Data
Information about this particular substance
Protocol Analytical Supplies, Inc. Single-component standards
Spectrum Laboratories, Inc.
Information about this particular substance
Title III List of Lists

Return to searching

Ethion [563-12-2]

Synonyms: Nialate; Diethion; Ethanox; Ethiol; FMC 1240; Hylemox; Niagra 1240; Rhodiacide; Rhodocide; RP-Thion; O,O,O,O-Tetraethyl S,S-methylene bisphosphorodithioate; Nialaten; Nialate(R); ethyl methylene phosphorodithioate; O,O,O',O'-tetraethyl S,S'-methylenediphosphorodithioate; bis[S-(diethoxyphosphinothioyl)mercapto]methane; Ethyl methylene; S,S-methylene O,O,O',O'-tetraethyl phosphorodithioate; S,S'-thiodimethylene bis(O,O-diethyl-)phosphorodithioate; Ethion 8; Phosphorodithioic acid, S,S'-methylene O,O,O',O'-tetaethyl ester; Bis(diethoxyphosphinothioylthio)methane; Embathion; Ethodan; Ethopaz; Fosfatox E; Fosfono 50; Itopaz; KWIT; Methanedithiol, S,S-diester with O,O-diethyl phosphorodithioate; Methylene O,O,O'o'-tetraethyl phosphorodithioate; Tetraethyl S,S'-methylene bis(phosphorodithioate)

C9H22O4P2S4

384.5

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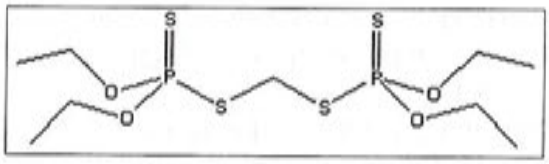

Melting Point (°C)	-25 to -24	Specific Gravity	1.22
Boiling Point (°C)	164-165 at 0.3 mm Hg	Vapor Density	--
Evaporation Rate	--	Water Solubility	practically insoluble
Flash Point (°C)	--	EPA Code	--
DOT Number	NA 2783 Poison B	RTECS	TE4550000
Comments	Liquid		

ChemInfo Searching is faster and more powerful. Click Here.

More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
California EPA List of Lists
Characteristics of pesticides

Melting Point (°C)	2.85	Specific Gravity	1.2076
Boiling Point (°C)	156-157	Vapor Density	--
Evaporation Rate	--	Water Solubility	130 mg/L
Flash Point (°C)	--	EPA Code	--
DOT Number	NA 2783 ORM-A	RTECS	WM8400000
Comments	Colorless to brown liquid with a mild, skunk-like odor. Deep brown to yellow liquid		

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More information about this compound is available from

49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
82 structural descriptors for NTP compounds
ABCR GmbH&Co KG
Methyl-alpha-D-glucopyranoside-2,6-dibenzoate-3,4-di(bis(3,5-dimethylphenyl)phosphinite), min 95% CARBOPHOS
ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
Australian Atmospheric Exposure Standards
Information about this particular substance
Australian Hazardous Substances Database
Information about this particular substance
Information about this particular substance
Berkeley Carcinogenic Potency Database
California EPA List of Lists
Characteristics of pesticides
Chemicals Being Added to the EPCRA Section 313 List
Current List of Toxics Release Inventory Chemicals
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay
Information about this particular substance
DuPont TYVEK® Protective Apparel Information Service
Information about this particular substance
Environmental (Industrial/Agricultural) Chemicals
Information about this particular substance
Environmental Assessment Information System
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
Information about this particular substance
EXtension TOXicology NETwork
Information about this particular substance
FDA Pestrak files
Florida Agricultural Information Retrieval System
Information about this particular substance

Heptachlor [76-44-8]

Synonyms: 3-Chlorochlordene; Rhodiachlor; Tetrahydro; 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-Tetrahydro-4,7-Methano-1H-Indene; 3,4,5,6,7,8,8a-Heptachlorodicyclopentadiene; 1H-1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene; E 3314; Velsicol 104; Heptamul; Heptagran; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-endomethanoindene; 1,4,5,6,7,8,8a-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane; 1(3a),4,5,6,7,8,8-heptachloro-3a(1),4,7,7a-tetrahydro-4,7-methanoindene; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7,7a-tetrahydro-4,7-methyleneindene; 1,4,5,6,7,10,10-heptachloro-4,7,8,9-tetrahydro-4,7-methyleneindene; 1,4,5,6,7,10,10-heptachloro-4,7,8,9-tetrahydro-4,7-endomethyleneindene; agroceres; drinox H-34; velsicol heptachlor; Hepta; heptachlorane; heptox; heptaklor; 6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-3-methyl-4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3A,4,7,7a-tetrahydro; Heptachlorotetrahydro-4,7-methanoindene; Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-

C10H5Cl7
373.32

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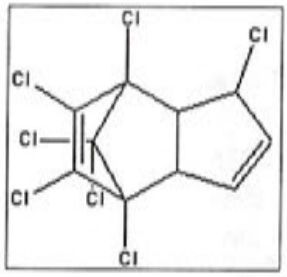


Melting Point (°C)	95	Specific Gravity	1.58
Boiling Point (°C)	135	Vapor Density	--
Evaporation Rate	--	Water Solubility	insoluble.
Flash Point (°C)	--	EPA Code	K097; P058; P059; D031
DOT Number	UN 2761 Poison Keep Away From Food	RTECS	PC0700000
Comments	Light tan, waxy solid with an odor like camphor. White crystals		

More information about this compound is available from

'Dirty Dozen' pesticides
8(e) TRIAGE Chemical Studies Database
ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance

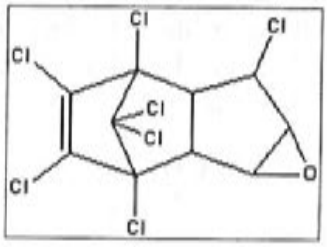
Heptachlor epoxide [1024-57-3]

Synonyms:

2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-2,5-Methano-2H-indeno[1,2-b]oxirene;
Epoxyheptachlor;
1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7a-tetrahydro-4,7-methanoindan; velsicol 53-cs-17;
2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-2,5-methano-2H-oxireno(a)indene;
2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-2,5-methano-2H-indeno(1,2-b)oxirene, (1aalpha, 1bbeta, 2alpha, 5alpha, 5abeta, 6beta, 6aalpha)-;
2,5-Methano-2H-indeno[1,2b]oxirene,
2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-(alpha, beta and gamma isomers)

C10H5Cl7O
389.32

This picture is a live chemical image



Melting Point (°C)	160	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	PB9450000
Comments			

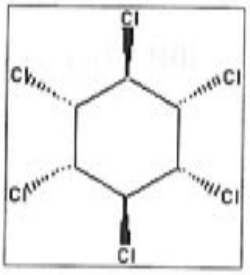
More information about this compound is available from

ATSDR Internet HazDat Site Contaminant Query
Information about this particular substance
ATSDR Priority List
This compound in MDL Molfile format
ATSDR ToxFAQs
Information about this particular substance
Australian Hazardous Substances Database
Information about this particular substance
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Center for Food Safety & Applied Nutrition
Information about this particular substance
Data Base of the Occurrence and Distribution of Pesticides in Chesapeake Bay

Lindane

Synonyms: Benzene hexachloride; gamma BHC; Isotox; 1,2,3,4,5,6-hexachlorohexane; gamma-hexachlorocyclohexane; Benhexachlor; Kwell-R; gamma-BHC Benhexachlor; BHC; Hexachlorane; 1,2,3,4,5,6-Hexachlorocyclohexane gamma isomer; 1,2,3,4,5,6-hexachlorocyclohexane (1alpha,2alpha,3beta,4alpha,5alpha,6beta); gamma-1,2,3,4,5,6-Hexachlorocyclohexane; gamma-HCH; 1alpha,2alpha,3beta,4alpha,5alpha,6beta-Hexachlorocyclohexane; gamma-benzene hexachloride; gamma hexachlor; Aparasin; Aphtitria; Esoderm; Gammalin; Gamene; Gamiso; Gammexane; Gexane; Jacutin; Kwell; (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-1,2,3,4,5,6-hexachlorocyclohexane; Benzex; Hexachlorocyclohexane, gamma-isomer; aficide; aalindan; agrisol g-20; agrocide; agrocide 2; agrocide 6g; agrocide 7; agrocide wp; agrocide iii; agronexit; aphtiria; arbitex; aplidal; ameisenatod; BBH; benhexol; ben-hex; bentox 10; benzene hexachloride-gamma-isomer; Bexol; celanex; chloresene; codechine; DBH; detmol-extrakt; detox 25; dol granule; drill tox-spezial aglukon; devoran; entomoxan; exagama; forlin; forst-nexen; gamacarbatox; gamma-COL; gammalin 20; Gammaterr; gammex; gallogama; gamacid; gamaphex; Gammahexa; gammahexane; geobilan; geolin g 3; HCC; HCCH; gamma-hexachlorane; gamma-hexachlorobenzene; hecoltox; hexatox; hexaverm; hexicide; hilbeech; hexyclan; HGI; hortex; hungaria 17; inexit; kokotine; lasochron; lendine; lentox; lidenal; lindafor; lindagam; lindagrain; lindagranox; lindapoudre; lindex; linvur; mglawik l; gammopaz; gamma-lindane; lindosep; lintox; lorexane; lindane (acgih,dot,osha); milbol 49; mszycol; Nexit; neo-scabicidol; nexen-fb; nexol-e; novigam; nexit-stark; nicochloran; pedraczak; omnitox; ovadziak; pflanzol; PLK; owadziak; quellada; Sang gamma; silvanol; spritzlindane; streunex; TAP 85; TRI-6; verindal ultra; Viton; Borer Spray; Benzene hexachloride, all isomers; Lindalo; Lindamul; Lindaterra; Novigan

C6H6Cl6
290.83



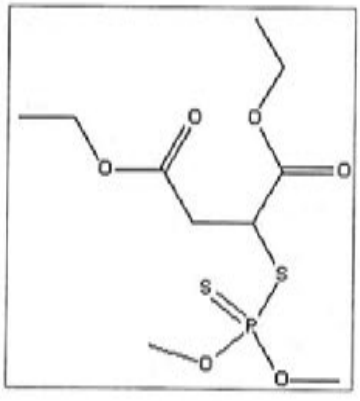
Melting Point (°C)	112.9	Specific Gravity	1.87
Boiling Point (°C)	323.4	Vapor Density	--
Evaporation Rate	--	Water Solubility	decomposes. 7 mg/L
Flash Point (°C)	--	EPA Code	D013; U129
DOT Number	NA 2761 ORM-A	RTECS	GV4900000
Comments	Colorless solid with a musty odor (pure material is odorless).		

Malathion

Synonyms: diethyl [(dimethoxyphosphinothioyl)thio]butanedioate; Maldison; O,O-dimethyl phosphorodithioate ester of diethyl mercaptosuccinate; [(Dimethoxyphosphinothioyl)thio]butanedioic acid diethyl ester; mercaptosuccinic acid diethyl ester S-ester with O,O-dimethyl phosphorothioate; insecticide no. 4049; carbofos; mercaptothion; phosphothion; Cythion; Dicarboethoxyethyl O,O-dimethyl phosphorodithioate; O,O-dimethyl S-(1,2-dicarbethoxyethyl) dithiophosphate; O,O-dimethyl S-(1,2-dicarbethoxyethyl)phosphorodithioate; Diethyl mercaptosuccinate, O,O-dimethyl phosphorodithioate; 1,2-di(ethoxycarbonyl)ethyl O,O-dimethyl phosphorodithioate; chemathion; carbophos; emmatos; fosfothion; fyfanon; karbofos; kop-thion; malacide; malagran; malamar; MLT; sadofos; S-(1,2-bis(carbethoxy)ethyl) O,O-dimethyl dithiophosphate; S-(1,2-bis(ethoxycarbonyl)ethyl O,O-dimethylphosphorodithioate; S-1,2-bis(ethoxycarbonyl)ethyl-O,O-dimethyl thiophosphate; calmathion; carbetox; carbethoxy malathion; carbetovur; celthion; cimexan; compound 4049; detmol ma; S-(1,2-di(ethoxycarbonyl)ethyl) dimethylphosphorothiolothionate; diethyl (dimethoxyphosphinothioylthio)succinate; diethyl mercaptosuccinate, O,O-dimethyl dithiophosphate, S-ester; diethyl mercaptosuccinate, O,O-dimethyl thiophosphate; diethyl mercaptosuccinate S-ester with O,O-dimethylphosphorodithioate; diethyl mercaptosuccinic acid O,O-dimethyl phosphorodithioate; O,O-dimethyl-S-(1,2-bis(ethoxycarbonyl)ethyl)dithiophosphate; O,O-dimethyl-S-(1,2-dicarbethoxyethyl) thiothionophosphate; O,O-dimethyl S-1,2-di(ethoxycarbamyl)ethyl phosphorodithioate; O,O-dimethyldithiophosphate diethylmercaptosuccinate; mercaptosuccinic acid diethyl ester; phosphorodithioic acid, O,O-dimethyl ester, S-ester with diethyl mercaptosuccinate; Malaspray; Dicarbethoxyethyl-O,O-dimethyldithiophosphate; Diethyl mercaptosuccinic acid, S-ester of O,O-dimethyl phosphorodithioate; Dimethyl dithiophosphate of diethyl mercaptosuccinate; Dimethyl phosphorodithioate of diethyl mercaptosuccinate; Dithiophosphoric acid, S-(1,2-dicarboxyethyl)-O,O-dimethyl ester; Ethiolacar; Etiol; Cleensheen; Lice Rid

C10H19O6PS2

330.35



Methoxychlor [72-43-5]

Synonyms: 2,2-bis(p-methoxyphenyl)-1,1,1-trichloroethane; Maralate; Marlate; Metox; Chemform; DMDT; Methoxy DDT; Maxie; 1,1'-(2,2,2-Trichloroethylidene)-bis[4-methoxybenzene]; 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)ethane; 2,2-bis(p-anisyl)-1,1,1-trichloroethane; 1,1-bis(p-methoxyphenyl)-2,2,2-trichloroethane; dianisyltrichloroethane; p,p'-dimethoxydiphenyltrichloroethane;di(p-methoxyphenyl)trichloromethyl methane; 1,1,1-trichloro-2,2-bis(p-anisyl)ethane; 2,2,2-trichloro-1,1-bis(4-methoxyphenyl)ethane; dimethoxy-ddt; methoxcide; methoxo; dimethoxy-dt; p,p'-dmdt; flo pro mcseed protectant; p,p'-methoxychlor; Moxie; oms 466; 4,4-(2,2,2-trichloroethylidene)dianisole; double-m ec; methoxychlor 2 ec; mezox k; Bis(p-anisyl)-1,1,1-trichloroethane; Bis(p-methoxyphenyl)-1,1,1-trichloroethane; Chemform methoxychlor; Dimethoxydiphenyltrichloroethane; Methoxyphenyl)-1,1,1-trichloroethane; Trichloro-2,2-bis(p-anisyl)ethane

C16H15Cl3O2
345.65

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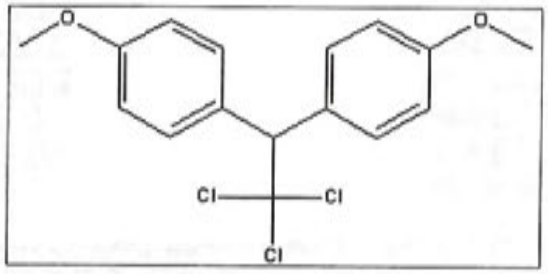


Melting Point (°C)	78	Specific Gravity	--
Boiling Point (°C)	86	Vapor Density	--
Evaporation Rate	--	Water Solubility	0.1 mg/L
Flash Point (°C)	--	EPA Code	U024; U247; D014
DOT Number	NA 2761	RTECS	KJ3675000
Comments	Colorless to tan solid with a slight, fruity odor.		

More information about this compound is available from

82 structural descriptors for NTP compounds
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
ATSDR ToxFAQs
  Information about this particular substance
Australian Atmospheric Exposure Standards

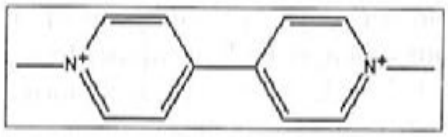
Paraquat [4685-14-7]

Synonyms: 1,1'-Dimethyl-4,4'-bipyridinium;N,N'-dimethyl-gamma,gamma'-dipyridylium; methyl viologen (2+); Prelude; Grammoxone; paraquat + linuron + metolachlor; Starfire 1.5; orthoparaquat; Bipyridinium, 1,1'-dimethyl-;Dimethyl-4,4'-bipyridinium; Dimethyl-4,4'-bipyridinium cation; Dimethyl-4,4'-bipyridiniumdication; Dimethyl-4,4'-bipyridiniumion; Paraquat dication; Paraquat ion

C12H14N2+2
186.26

This picture is a live chemical image

Need to find lots of related structures? Try ChemInfo Ltd. Web Edition. Subscription rates are just $49 for a whole year of searching.



Melting Point (°C)	--	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	--
Comments			

ChemInfo Searching is faster and more powerful. Click Here.

More information about this compound is available from

'Dirty Dozen' pesticides
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
  Information about this particular substance
Characteristics of pesticides
DCU Chime Pages
  This substance in MDL MOLFile format
Environmental Assessment Information System
EXtension TOXicology NETwork
  Information about this particular substance
FDA Pestrak files
Florida Agricultural Information Retrieval System
  Information about this particular substance
  Information about this particular substance
Guide to NIOSH/OSHA Air Sampling Methods
  Information about this particular substance

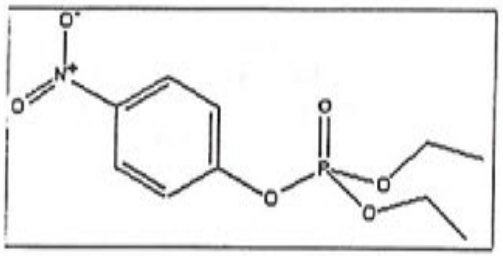
Paraoxon, ethyl

Synonyms: diethyl-O-p-nitrophenyl phosphate

C10H14NO5PO
275.26

This picture is a live chemical image

The ChemDraw Plugin lets you search by drawing structures in your web browser. Have you downloaded it yet?



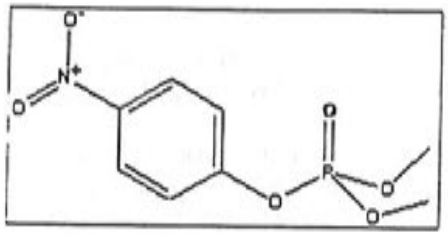
Paraoxon, methyl

Synonyms: Dimethyl O-p-nitrophenyl phosphate

C8H10NO6P
247.20

This picture is a
live chemical image

The ChemDraw Plugin
lets you search by drawing
structures in your web browser.
Have you downloaded
it yet?



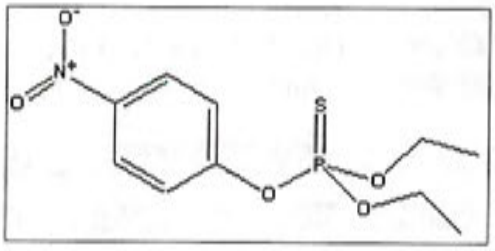
Parathion

Synonyms: ethyl parathion; parthion; alkron; Paraphos; Foliclal; Fosferno; Fostox; Rhodiatox; O,O-diethyl O-p-nitrophenyl phosphorothioate; diethyl-p-nitrophenyl monothiophosphate; DNTP; SNP; E 605; ac 3422; Alleron; Aphamite; Etilon; Folidol; Phoskil; deoxynucleoside 5'-triphosphate;Parathion-E; Aqua 9-Parathion; Bladen; Phosphorothioic acid O,O-diethyl-O-(4-nitrophenyl) ester; diethyl p-nitrophenyl thiophosphate; O,O-diethyl-O-(p-nitrophenyl)thionophosphate; diethylparathion; p-nitrophenol O-ester with O,O-diethylphosphorothioate; AAT; AATP; acc 3422; american cyanamid 3422; Aralo; B 404; bay e-605; bayer e-605; bladan f; compound 3422; corothion; corthione; danthion; ecatox; fosfive; fosova; fostern; genithion; kolphos; kypthion; lirothion; murfos; nitrostygmine; niuif-100; nourithion; oleofos 20; oleoparathion; Orthophos; panthion; Paramar; paramar 50; parathene; Parawet; pestox plus; pethion; phosphemol; phosphenol; phosphostigmine; RB; stabilized ethyl parathion; stathion; strathion; sulfos; T-47; thiophos 3422; TOX 47; vapophos; diethyl para-nitrophenol thiophosphate; diethyl 4-nitrophenyl phosphorothionate; diethyl p-nitrophenyl thionophosphate; drexel parathion 8E; E 605 F; e 605 forte; ekatin wf & wf ulv; ekatox; ethlon; folidol e605; folidol e & e 605; folidol oil; fosfermo; fosfex; gearphos; lethalaire g-54; oleoparaphene; OMS 19; PAC; Pacol; Paradust; rhodiasol; rhodiatrox; selephos; sixty-three special e.c.; soprathion; super rodiatox; vitrex; penncap e; thiomex; tiofos; Viran; Durathion; Thionspray No.84; Bladan; Diethyl O-p-nitrophenyl phosphorothioate; Fosferno 50; Niran; Ethyl parathion (O,O-diethyl-O-p-nitrophenylthiophosphate)

C10H14NO5PS
291.26

This picture is a live chemical image

The ChemDraw Plugin lets you search by drawing structures in your web browser. Have you downloaded it yet?



Melting Point (°C)	6.1	**Specific Gravity**	1.26
Boiling Point (°C)	375	**Vapor Density**	--
Evaporation Rate	--	**Water Solubility**	Slightly soluble. 12.4 mg/L
Flash Point (°C)	--	**EPA Code**	P089
DOT Number	UN 2052; NA 1967 Poison A; NA 2783 Poison B	**RTECS**	TF4550000
Comments	Pale yellow to dark brown liquid with an odor like garlic.		

ChemInfo Searching is faster and more powerful. Click Here.

More information about this compound is available from

'Dirty Dozen' pesticides

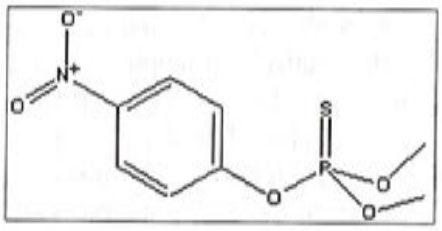
Methyl Parathion [298-00-0]

Synonyms: Parathion-methyl; Phosphorothioic acid O,O-dimethyl O-(4-nitrophenyl) ester; O,O-dimethyl O-p-nitrophenyl phosphorothioate; O,O-dimethyl O-p-nitrophenyl thiophosphate; dimethyl parathion; Metaphos; E 601; Dalf; Folidol-M; Metacide; Penncap-M; Metafos; Dimethyl 4-nitrophenyl phosphorothionate; Dimethyl p-nitrophenyl phosphorothionate; dimethyl p-nitrophenyl monothiophosphate; O,O-dimethyl O-(p-nitrophenyl) thionophosphate; dimethyl p-nitrophenyl thionophosphate; p-nitrophenyldimethylthionophosphate; Dalif; metron; nitrox 80; bladan m; nitrox; wofatox; bay e-601; folidol-80; Metaphor; parathion methyl homolog; Dimethyl O-p-nitrophenyl thiophosphate

C8H10NO5PS
263.20

This picture is a live chemical image

The ChemDraw Plugin lets you search by drawing structures in your web browser. Have you downloaded it yet?



Melting Point (°C)	36	Specific Gravity	1.36
Boiling Point (°C)	143 at 1.0 mm Hg	Vapor Density	--
Evaporation Rate	--	Water Solubility	55-60 mg/L
Flash Point (°C)	46.1	EPA Code	P071
DOT Number	UN 2052; NA 2783 Poison B	RTECS	TG0175000
Comments	White solid		

ChemInfo Searching is faster and more powerful. Click Here.

More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular substance
ATSDR Priority List
  This compound in MDL Molfile format
ATSDR ToxFAQs
  Information about this particular substance
Australian Atmospheric Exposure Standards
  Information about this particular substance
Australian Hazardous Substances Database
  Information about this particular substance
  Information about this particular substance

Parathion-amino [3735-01-1]

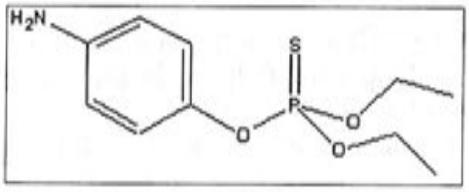
Synonyms: Aminoparathion

C10H16NO3PS

261.28

This picture is a live chemical image

The ChemDraw Plugin lets you search by drawing structures in your web browser. Have you downloaded it yet?



Melting Point (°C)	--	Specific Gravity	--
Boiling Point (°C)	--	Vapor Density	--
Evaporation Rate	--	Water Solubility	--
Flash Point (°C)	--	EPA Code	--
DOT Number	--	RTECS	--
Comments			

ChemInfo Searching is faster and more powerful. Click Here.

More information about this compound is available from

Biocatalysis/Biodegradation Database
Information about this particular substance
Environmental Science Center database of Experimental Log P coefficients, with Ozone Depletion Potentials and Atmospheric Oxidation Rates
Information about this particular substance

Return to searching

Chlorinated Camphene [8001-35-2]

Synonyms: toxaphene; camphechlor; chlorinated champhene; toxakil; phenacide; Campheclor; Polychlorinated camphenes; polychlorocamphene; Hercules 3956; Alltox; Strobane-T; Geniphene; Motox; Penphene; Phenatox; Chlorocamphene; camphochlor; octachlorocamphene; agricide maggot killer (f); alltex; attac 6; attac 8; attac 4-2; attac 4-4; attac 6-3; camphoclor; camphofene huileux; chem-phene; clor chem t-590; compound 3956; crestoxo; cristoxo; cristoxo 90; estonox; fasco-terpene; gy-phene; hercules toxaphene; kamfochlor; M 5055; melipax; strobane t-90; toxadust; toxon 63; toxyphen; vertac toxaphene 90; Agricide; Camphene, chlorinated; Chlorinated Camphenes; Coopertox; Polychorinated camphenes

This substance is a mixture of many individual compounds and cannot be adequately represented by a single molecular structure.

Melting Point (°C)	65-90	**Specific Gravity**	1.66
Boiling Point (°C)	(dec)	**Vapor Density**	--
Evaporation Rate	--	**Water Solubility**	Practically insoluble.
Flash Point (°C)	-18	**EPA Code**	K041; K098; P123; D015
DOT Number	NA 2761 Poison	**RTECS**	XW5250000
Comments	Yellow or amber waxy solid with a mild turpentine-like odor.		

More information about this compound is available from

'Dirty Dozen' pesticides
49 CFR Part 172: Hazardous materials shipping requirements
8(e) TRIAGE Chemical Studies Database
ACGIH Threshold Limit Values (USA)
  Information about this particular compound
  Information about this particular compound
Applied Agricultural Chemicals
ATSDR Internet HazDat Site Contaminant Query
  Information about this particular compound
Australian Atmospheric Exposure Standards
  Information about this particular compound
Australian Hazardous Substances Database
  Information about this particular compound
  Information about this particular compound
  Information about this particular compound
Berkeley Carcinogenic Potency Database
California EPA List of Lists
California Proposition 65: Chemicals known to the state to cause cancer or reproductive toxicity
Candidate Substances List for Bans or Phase-outs (Ontario)
  Information about this particular compound
Carcinogenic Substances in the EEC List of Dangerous Substances
  Information about this particular compound
Center for Food Safety & Applied Nutrition
  Information about this particular compound
CERCLA Hazardous Substances (USA)
  Information about this particular compound
Characteristics of pesticides

Appendix I

Shipping Documents

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CleanHarbors®

WASTE MATERIAL PROFILE SHEET

Profile Number CH 073906

GENERAL INFORMATION

GENERATOR EPA ID # WAH 000002816
GENERATOR CODE (Assigned by Clean Harbors) _____
GENERATOR NAME: U.S. E.P.A
ADDRESS 1100 N. Western Ave. Wenatchee Fruit tree farm
CITY Wenatchee STATE WA ZIP 98801
GENERATOR TECHNICAL CONTACT: Kira Lynch
PHONE: 206 764-6918
CUSTOMER CODE (Assigned by Clean Harbors) _____
CUSTOMER NAME: Philip Environmental Inc
ADDRESS 1100 Oaksdale SW
CITY Renton STATE WA ZIP 98055

B. WASTE DESCRIPTION

Common Name of Waste: Soil
Process Generating Waste: Contaminated Soils from fruit tree research Center

Process Generating Waste:
(check one) If spill, origin of spilled material

- ☐ Unused chemical or product
- ☐ Lab Pack
- ☐ Spent halogenated solvents
- ☐ Spent non-halogenated solvents
- ☐ Wastewater treatment sludge from electroplating or etching operations
- ☐ Spent plating bath solutions or residues of plating, stripping and cleaning baths where cyanides are used in the process
- ☐ Wood preservation
- ☐ Inorganic pigment production
- ☐ [illegible]anic chemical production
- ☐ [illegible]ganic chemical production
- ☐ [illegible]sticide production
- ☐ Explosives production
- ☐ Petroleum refining
- ☐ Iron or steel production or finishing
- ☐ Primary copper production
- ☐ Primary lead production
- ☐ Primary zinc production
- ☐ Primary Aluminum production
- ☐ Ferro alloy production
- ☐ Secondary lead smelting
- ☐ Veterinary pharmaceutical production
- ☐ Ink formulation
- ☐ Coking
- ☒ Other research
- ☐ Unknown

Source of Waste:
(check one)

- ☐ Unused Product or Chemical
- ☐ Waste by-product from process
- ☐ Spill clean up
- ☐ Lab Pack
- ☒ Planned site remediation
- ☐ Other: _____

Other Process Information:
(check all that apply)

- ☐ Still bottoms
- ☐ Process scrap
- ☐ Process development
- ☐ Out of date product
- ☐ Spent solvent waste
- ☐ Treatment residues
- ☐ Filter cake
- ☐ Degreasing
- ☐ Exempt recyclable material
- ☐ Packaged consumer goods
- ☐ Off-spec chemical product
- ☐ Zinc, Al, or tin plating
- ☐ Anodizing
- ☐ Cleaning/stripping
- ☐ Wastewater treatment sludges
- ☐ Washwaters
- ☐ Pot liners

Other Process Information:
(check all that apply)

- ☐ Electroplating
- ☐ Conversion coating
- ☐ Carbon steel plating
- ☐ Printed circuit mfg.
- ☐ Cyanide process
- ☐ Heat treating
- ☐ Separator sludge
- ☐ Oven residue
- ☐ Catalyst waste
- ☐ Centrifuged solids
- ☐ Condensate
- ☐ Air, steam, or vacuum stripping
- ☐ Emission control dust
- ☐ Acid leaching
- ☐ Dipping operations
- ☐ Chemical manufacturing
- ☐ Carbon adsorption
- ☐ Incineration or thermal treatment
- ☐ Refining
- ☐ Drug mfg.
- ☐ Distillation
- ☐ Pesticide mfg.
- ☐ Reclamation
- ☐ Etching of metals
- ☐ Bag house dust

Profile Number CH 073906

C. PHYSICAL PROPERTIES (at 25°C or 77°F)

PHYSICAL STATE
- ☒ SOLID WITHOUT FREE LIQUID
- ☐ POWDER
- ☐ MONOLITHIC SOLID
- ☐ LIQUID WITH NO SOLIDS
- ☐ LIQUID/SOLID MIXTURE
  - % FREE LIQUID _____
  - % SETTLED SOLID _____
  - % TOTAL SUSPENDED SOLID _____
- ☐ [illegible]AS/AEROSOL

NUMBER OF PHASES/LAYERS
☒ 1 ☐ 2 ☐ 3
% BY VOLUME (APPROX.)
TOP _____ MIDDLE _____ BOTTOM _____

VISCOSITY (If liquid present)
- ☐ LOW (e.g. WATER)
- ☐ MEDIUM (e.g. MOTOR OIL)
- ☐ HIGH (e.g. MOLASSES)

COLOR

ODOR
- ☒ NONE OR MILD
- ☐ STRONG

BOILING POINT (If liquid)
- ☐ ≤ 100°F
- ☒ > 100°F

MELTING POINT (for solids only)
- ☐ < 140°F
- ☐ 140-200°F
- ☒ > 200°F

F[illegible] POINT
- ☐ [illegible]3°F
- ☐ 73-100°F
- ☐ 101-140°F
- ☐ 141-200°F
- ☒ > 200°F

pH
- ☐ ≤ 2
- ☐ 2.1-4.9
- ☒ 5-9
- ☐ 9.1-12.4
- ☐ ≥ 12.5

SPECIFIC GRAVITY
- ☐ < 0.8 (e.g. Gasoline)
- ☐ 0.8-1.0 (e.g. Ethanol)
- ☐ 1.0 (e.g. Water)
- ☐ 1.0-1.2 (e.g. Antifreeze)
- ☒ > 1.2 (e.g. Methylene Chloride)

TOTAL ORGANIC CARBON (If liquid)
- ☐ ≤ 1%
- ☐ 1-9%
- ☐ ≥ 10%

BTU/LB
- ☒ < 2,000
- ☐ 2,000-5,000
- ☐ 5,000-10,000
- ☐ > 10,000

VAPOR PRESSURE (for liquids only) _____ mm Hg

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CleanHarbors®

Profile Number CH 073906

D. COMPOSITION (Must add up to at least 100%. Include inert materials and/or debris if applicable. Actual percent or range is acceptable.)

Soil	95 – 100 %				–	%
concrete Blocks	1 – 5 %				–	%
rocks	1 – 5 %				–	%
residual pesticides	1 – 5 %				–	%
	– %				–	%

☐ Check if MSDS attached.

E. CONSTITUENTS — Attach any available analysis. Enter values or ranges where known. For TCLP values, BRL signifies below regulatory level. None, unknown, and present are also acceptable answers.

Are these values based on ☒ Knowledge or ☒ Testing?

INORGANIC

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D004	ARSENIC	5.0	BRL	
D005	BARIUM	100.0		
D006	CADMIUM	1.0		
D007	CHROMIUM	5.0		
D007	CHROMIUM CR+6			
D008	LEAD	5.0		
D009	MERCURY	0.2		
D010	SELENIUM	1.0		
D011	SILVER	5.0		

OTHER METALS	TOTAL
ALUMINUM	BRL
ANTIMONY	
BERYLLIUM	
CALCIUM	
COPPER	
MAGNESIUM	
MOLYBDENUM	
NICKEL	
POTASSIUM	
SILICON	
SODIUM	
THALLIUM	
TIN	
VANADIUM	
ZINC	

NON-METALS	WT%
SULFUR	BRL
BROMINE	
CHLORINE	
FLUORINE	
IODINE	
	PPM
AMMONIA	BRL
REACTIVE SULFIDE	
CYANIDE-TOTAL	
CYANIDE AMENABLE	
CYANIDE REACTIVE	

ORGANIC

VOLATILE COMPOUNDS		REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D018	BENZENE	0.5	BRL	
D019	CARBON TETRACHLORIDE	0.5		
D021	CHLOROBENZENE	100.0		
D022	CHLOROFORM	6.0		
D028	1,2-DICHLOROETHANE	0.5		
D029	1,1-DICHLOROETHYLENE	0.7		
D035	METHYL ETHYL KETONE	200.0		
D039	TETRACHLOROETHYLENE	0.7		
D040	TRICHLOROETHYLENE	0.5		
D043	VINYL CHLORIDE	0.2		

SEMI-VOLATILE COMPOUNDS		REGULATORY LEVEL (mg/l)	TCLP	TOTAL
D023	o-CRESOL	200.0	BRL	
D024	m-CRESOL	200.0		
D025	p-CRESOL	200.0		
D026	CRESOL (TOTAL)	200.0		
D027	1,4-DICHLOROBENZENE	7.5		
D030	2,4-DINITROTOLUENE	0.13		
D032	HEXACHLOROBENZENE	0.13		
D033	HEXACHLOROBUTADIENE	0.5		
D034	HEXACHLOROETHANE	3.0		
D036	NITROBENZENE	2.0		
D037	PENTACHLOROPHENOL	100.0		
D038	PYRIDINE	5.0		
D041	2,4,5-TRICHLOROPHENOL	400.0		
D042	2,4,6-TRICHLOROPHENOL	2.0		

PESTICIDES AND HERBICIDES		REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D012	ENDRIN	0.02	BRL	
D013	LINDANE	0.4	BRL	
D014	METHOXYCHLOR	10.0		
D015	TOXAPHENE	0.5		
D016	2,4-D	10.0		
D017	2,4,5-TP (SILVEX)	1.0		
D020	CHLORDANE	0.03		
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008		

OTHER

PHENOL _____ PPM

TOTAL PETROLEUM HYDROCARBONS (SOILS ONLY) _____ PPM

PCB'S
- ☒ NONE
- ☐ ≤ 50 PPM
- ☐ ≥ 50 PPM
- ☐ IF PCB'S ARE PRESENT, CHECK IF REGULATED BY TSCA 40 CFR 761

HOC'S
- ☐ NONE
- ☐ < 1000 PPM
- ☐ ≥ 1000 PPM

OTHER HAZARDS	YES		YES		YES		YES
WATER REACTIVE	☐	PESTICIDE	☒	SHOCK SENSITIVE	☐	OXIDIZER	☐
IOACTIVE	☐	HERBICIDE	☐	THERMALLY SENSITIVE	☐	REDUCING AGENT	☐
IN	☐	EXPLOSIVE	☐	INFECTIOUS, PATHOGENIC, OR ETIOLOGICAL AGENT	☐	NONE OF THE ABOVE	
OSHA REGULATED CARCINOGENS	☐	SPONTANEOUSLY IGNITES WITH AIR	☐				

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED? YES ☐ NO ☒ (If yes, explain)

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CleanHarbors®

Profile Number CH 073906

F. REGULATORY STATUS

Y N

☐ ☐ USEPA HAZARDOUS WASTE? (If Yes List codes.) _____

☐ ☐ DO ANY GENERATOR STATE WASTE CODES APPLY? IF YES, LIST STATE CODES. WT01 WP01

LIST ANY FEDERAL OR STATE WASTE CODES WHICH MAY VARY FROM SHIPMENT TO SHIPMENT: _____

WILL THE DECISION TO VARY THESE WASTE CODES BE BASED ON ☐ KNOWLEDGE OR ☐ TESTING (check one).
IF KNOWLEDGE, DESCRIBE BASIS OF KNOWLEDGE: _____

☐ ☒ IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
THIS WASTE IS A: ☐ WASTEWATER ☐ NON WASTEWATER PER USEPA DEFINITION IN 40 CFR 268.2

☐ ☒ IF ANY WASTE CODES D001, D002, OR D012-D043 APPLY, ARE ANY UHC'S PRESENT ABOVE TREATMENT STANDARDS?

☐ ☒ DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

☐ ☒ IS THIS WASTE SUBJECT TO CATEGORICAL PRETREATMENT DISCHARGE STANDARDS?
IF YES, SPECIFY POINT SOURCE CATEGORY LISTED IN 40 CFR PART 401. _____

☐ ☒ IS THIS WASTE REGULATED UNDER THE BENZENE NESHAP RULES? (IS THIS WASTE FROM A CHEMICAL MANUFACTURING, COKE BY-PRODUCT RECOVERY, OR PETROLEUM REFINERY PROCESS?)

☐ ☒ DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS ≥ 100 PPM?

☒ ☐ DOES THIS WASTE CONTAIN ANY CONSTITUENTS REGULATED UNDER SECTION 112 OF THE CAA (AIR TOXICS).

G. D.O.T. INFORMATION: List all shipping names that may be used. Attach additional page if necessary.

D.O.T. SHIPPING NAME NON RCRA Waste Solid DOT HAZARD CLASS: N/A

UN/NA # N/A PACKING GROUP (Circle 1) I II III HAZARD ZONE (Circle 1) A B C D D.O.T. R.Q. _____ lbs.

WILL THIS SHIPPING NAME VARY? ☐ Y ☒ N IF YES, WILL ASSIGNMENT OF PROPER SHIPPING NAME BE BASED ON ☐ KNOWLEDGE OR ☐ TESTING? (check one) IF KNOWLEDGE, DESCRIBE BASIS OF KNOWLEDGE: _____

H. TRANSPORTATION REQUIREMENTS

GENERATION FREQUENCY: ☒ ONE TIME ☐ BATCH ☐ CONTINUOUS

ESTIMATED SHIPMENT FREQUENCY: ☐ WEEKLY ☐ SEMI-MONTHLY ☐ MONTHLY ☐ QUARTERLY ☒ OTHER 400 yds

☐ BULK LIQUID
___ GALLONS/SHIPMENT: _____ GAL.
___ FROM TANKS: TANK SIZE _____ GAL.
___ FROM DRUMS
VEHICLE TYPE:
___ VAC TRUCK
___ TANK TRUCK
___ RAILROAD TANK CAR
NOTE LENGTH & DIAMETER OF HOSE REQUIRED: _____
NOTE SPECIAL FITTINGS REQUIRED ___

☒ BULK SOLID
20 TON/YD PER SHIPMENT
STORAGE CAPACITY _____ TON/YD
VEHICLE TYPE:
___ DUMP TRAILER
___ ROLL OFF BOX
☒ INTERMODAL ROLLOFF BOX
___ OTHER _____

☐ CONTAINERIZED
_____ CONTAINERS/SHIPMENT
STORAGE CAPACITY: _____ CONTAINERS
CONTAINER TYPE:
___ CUBIC YARD BOX
___ PALLET
___ DRUM: SIZE _____
CIRCLE TYPE: STEEL, STAINLESS, FIBER, PLASTIC
___ PORTABLE TANK
___ OTHER _____
IS LIFTGATE TRUCK REQUIRED FOR PICKUP? _____

CHECK COMPATIBLE STORAGE MATERIALS:
☒ STEEL ☒ STAINLESS STEEL (316)
☒ RUBBER LINED ☒ FIBERGLASS LINED
☒ OTHER _____

I. SAMPLE STATUS

REPRESENTATIVE SAMPLE HAS BEEN SUPPLIED. ☒ YES ☐ NO SAMPLED BY Michael Webb DATE SAMPLED 9-23-97

J. SPECIFIC PROFILE REQUEST FOR DISPOSAL AND OR COMMENTS. _____

INCINERATION AND Cert. of Disposal regd.

SPECIAL WASTE HANDLING REQUIREMENTS (PPE, etc.) _____

K. BIENNIAL/ANNUAL REPORTING INFORMATION.

SIC CODE _____ SOURCE CODE _____ FORM CODE _____ ORIGIN CODE _____

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge. I also certify that any samples submitted are representative of the actual waste. If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to [illegible] the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE	NAME (PRINT)	TITLE	DATE
On behalf of USEPA Kim Converse/USACE	Kim Converse	Chemist	11/19/97

FOR CLEAN HARBORS USE ONLY

CHI REPRESENTATIVE COMPLETING PROFILE: _____

CleanHarbors®

WASTE MATERIAL PROFILE SHEET

Profile Number CH 073905

A. GENERAL INFORMATION

GENERATOR EPA ID # WAH 000002816

GENERATOR CODE (Assigned by Clean Harbors) _____

GENERATOR NAME: U.S. E.P.A.

ADDRESS 1100 N. Western Ave. Wenatchee fruit tree farm

CITY Wenatchee STATE WA ZIP 98801

GENERATOR TECHNICAL CONTACT: Kira Lynch PHONE: 206 764-6918

CUSTOMER CODE (Assigned by Clean Harbors) _____

CUSTOMER NAME: Philip Environmental Inc.

ADDRESS 1100 Oaksdale SW

CITY Renton STATE WA ZIP 98055

B. WASTE DESCRIPTION

Common Name of Waste: Soil

Process Generating Waste: Contaminated Soils from fruit tree research center

Process Generating Waste:
(check one) If spill, origin of spilled material

- ☐ Unused chemical or product
- ☐ Lab Pack
- ☐ Spent halogenated solvents
- ☐ Spent non-halogenated solvents
- ☐ Wastewater treatment sludge from electroplating or etching operations
- ☐ Spent plating bath solutions or residues of plating, stripping and cleaning baths where cyanides are used in the process
- ☐ Wood preservation
- ☐ Inorganic pigment production
- ☐ ganic chemical production
- ☐ rganic chemical production
- ☐ Pesticide production
- ☐ Explosives production
- ☐ Petroleum refining
- ☐ Iron or steel production or finishing
- ☐ Primary copper production
- ☐ Primary lead production
- ☐ Primary zinc production
- ☐ Primary Aluminum production
- ☐ Ferro alloy production
- ☐ Secondary lead smelting
- ☐ Veterinary pharmaceutical production
- ☐ Ink formulation
- ☐ Coking
- ☒ Other research
- ☐ Unknown

Source of Waste:
(check one)

- ☐ Unused Product or Chemical
- ☐ Waste by-product from process
- ☐ Spill clean up
- ☐ Lab Pack
- ☒ Planned site remediation
- ☐ Other: _____

Other Process Information:
(check all that apply)

- ☐ Still bottoms
- ☐ Process scrap
- ☐ Process development
- ☐ Out of date product
- ☐ Spent solvent waste
- ☐ Treatment residues
- ☐ Filter cake
- ☐ Degreasing
- ☐ Exempt recyclable material
- ☐ Packaged consumer goods
- ☐ Off-spec chemical product
- ☐ Zinc, Al, or tin plating
- ☐ Anodizing
- ☐ Cleaning/stripping
- ☐ Wastewater treatment sludges
- ☐ Washwaters
- ☐ Pot liners

Other Process Information:
(check all that apply)

- ☐ Electroplating
- ☐ Conversion coating
- ☐ Carbon steel plating
- ☐ Printed circuit mfg.
- ☐ Cyanide process
- ☐ Heat treating
- ☐ Separator sludge
- ☐ Oven residue
- ☐ Catalyst waste
- ☐ Centrifuged solids
- ☐ Condensate
- ☐ Air, steam, or vacuum stripping
- ☐ Emission control dust
- ☐ Acid leaching
- ☐ Dipping operations
- ☐ Chemical manufacturing
- ☐ Carbon adsorption
- ☐ Incineration or thermal treatment
- ☐ Refining
- ☐ Drug mfg.
- ☐ Distillation
- ☐ Pesticide mfg.
- ☐ Reclamation
- ☐ Etching of metals
- ☐ Bag house dust

Profile Numbe H 073905

C. PHYSICAL PROPERTIES (at 25°C or 77°F)

PHYSICAL STATE
- ☒ SOLID WITHOUT FREE LIQUID
- ☐ POWDER
- ☐ MONOLITHIC SOLID
- ☐ LIQUID WITH NO SOLIDS
- ☐ LIQUID/SOLID MIXTURE
  - % FREE LIQUID _____
  - % SETTLED SOLID _____
  - % TOTAL SUSPENDED SOLID _____
- ☐ AS/AEROSOL

NUMBER OF PHASES/LAYERS
- ☒ 1 ☐ 2 ☐ 3
- % BY VOLUME (APPROX.)
- TOP _____ MIDDLE _____ BOTTOM _____

VISCOSITY (If liquid present)
- ☐ LOW (e.g. WATER)
- ☐ MEDIUM (e.g. MOTOR OIL)
- ☐ HIGH (e.g. MOLASSES)

COLOR

ODOR
- ☒ NONE OR MILD
- ☐ STRONG

BOILING POINT (If liquid)
- ☐ ≤ 100°F
- ☒ > 100°F

MELTING POINT (for solids only)
- ☐ < 140°F
- ☐ 140-200°F
- ☒ > 200°F

FLASH POINT
- ☐ < 73°F
- ☐ 73-100°F
- ☐ 101-140°F
- ☐ 141-200°F
- ☒ ≥ 200°F

pH
- ☐ ≤ 2
- ☐ 2.1-4.9
- ☒ 5-9
- ☐ 9.1-12.4
- ☐ ≥ 12.5

SPECIFIC GRAVITY
- ☐ < 0.8 (e.g. Gasoline)
- ☐ 0.8-1.0 (e.g. Ethanol)
- ☐ 1.0 (e.g. Water)
- ☐ 1.0-1.2 (e.g. Antifreeze)
- ☒ > 1.2 (e.g. Methylene Chloride)

TOTAL ORGANIC CARBON (If liquid)
- ☐ ≤ 1%
- ☐ 1-9%
- ☐ ≥ 10%

BTU/LB
- ☒ < 2,000
- ☐ 2,000-5,000
- ☐ 5,000-10,000
- ☐ > 10,000

VAPOR PRESSURE (for liquids only) _____ mm Hg

CleanHarbors®

Profile Number CH 073905

D. COMPOSITION (Must add up to at least 100%. Include inert materials and/or debris if applicable. Actual percent or range is acceptable.)

Soil	95	– 100	%			–	%
concrete blocks	1	– 5	%			–	%
rocks	1	– 5	%			–	%
residual pesticides	1	– 5	%			–	%
		–	%			–	%

☐ Check if MSDS attached.

E. CONSTITUENTS — Attach any available analysis. Enter values or ranges where known. For TCLP values, BRL signifies below regulatory level. None, unknown, and present are also acceptable answers.

Are these values based on ☒ Knowledge or ☒ Testing?

INORGANIC

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D004	ARSENIC	5.0	BRL	
D005	BARIUM	100.0		
D006	CADMIUM	1.0		
D007	CHROMIUM	5.0		
D007	CHROMIUM CR+6			
D008	LEAD	5.0		
D009	MERCURY	0.2		
D010	SELENIUM	1.0		
D011	SILVER	5.0		

OTHER METALS	TOTAL
ALUMINUM	BRL
ANTIMONY	
BERYLLIUM	
CALCIUM	
COPPER	
MAGNESIUM	
MOLYBDENUM	
NICKEL	
POTASSIUM	
SILICON	
SODIUM	
THALLIUM	
TIN	
VANADIUM	
ZINC	

NON-METALS	WT%
SULFUR	BRL
BROMINE	
CHLORINE	
FLUORINE	
IODINE	
	PPM
AMMONIA	BRL
REACTIVE SULFIDE	
CYANIDE-TOTAL	
CYANIDE AMENABLE	
CYANIDE REACTIVE	

ORGANIC

	ATILE COMPOUNDS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D018	BENZENE	0.5	BRL	
D019	CARBON TETRACHLORIDE	0.5		
D021	CHLOROBENZENE	100.0		
D022	CHLOROFORM	6.0		
D028	1,2-DICHLOROETHANE	0.5		
D029	1,1-DICHLOROETHYLENE	0.7		
D035	METHYL ETHYL KETONE	200.0		
D039	TETRACHLOROETHYLENE	0.7		
D040	TRICHLOROETHYLENE	0.5		
D043	VINYL CHLORIDE	0.2		

SEMI-VOLATILE COMPOUNDS		REGULATORY LEVEL (mg/l)	TCLP	TOTAL
D023	o-CRESOL	200.0	BRL	
D024	m-CRESOL	200.0		
D025	p-CRESOL	200.0		
D026	CRESOL (TOTAL)	200.0		
D027	1,4-DICHLOROBENZENE	7.5		
D030	2,4-DINITROTOLUENE	0.13		
D032	HEXACHLOROBENZENE	0.13		
D033	HEXACHLOROBUTADIENE	0.5		
D034	HEXACHLOROETHANE	3.0		
D036	NITROBENZENE	2.0		
D037	PENTACHLOROPHENOL	100.0		
D038	PYRIDINE	5.0		
D041	2,4,5-TRICHLOROPHENOL	400.0		
D042	2,4,6-TRICHLOROPHENOL	2.0		

PESTICIDES AND HERBICIDES		REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D012	ENDRIN	0.02	5	
D013	LINDANE	0.4	BRL	
D014	METHOXYCHLOR	10.0		
D015	TOXAPHENE	0.5		
D016	2,4-D	10.0		
D017	2,4,5-TP (SILVEX)	1.0		
D020	CHLORDANE	0.03		
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008		

OTHER

PHENOL _____ PPM

TOTAL PETROLEUM HYDROCARBONS (SOILS ONLY) _____ PPM

PCB'S

☒ NONE

☐ ≤ 50 PPM

☐ ≥ 50 PPM

☐ IF PCB'S ARE PRESENT, CHECK IF REGULATED BY TSCA 40 CFR 761

HOC'S

☐ NONE

☐ < 1000 PPM

☐ ≥ 1000 PPM

OTHER HAZARDS	YES		YES		YES		YES
WATER REACTIVE	☐	PESTICIDE	☒	SHOCK SENSITIVE	☐	OXIDIZER	☐
IOACTIVE	☐	HERBICIDE	☐	THERMALLY SENSITIVE	☐	REDUCING AGENT	☐
IN	☐	EXPLOSIVE	☐	INFECTIOUS, PATHOGENIC, OR ETIOLOGICAL AGENT	☐	NONE OF THE ABOVE	☒
REGULATED CARCINOGENS	☐	SPONTANEOUSLY IGNITES WITH AIR	☐				

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED? YES ☐ NO ☒ (If yes, explain)

CleanHarbors®

Profile Number CH 073905

F. REGULATORY STATUS

Y N

☐ ☐ USEPA HAZARDOUS WASTE? (If Yes List codes.) D012

☐ ☒ DO ANY GENERATOR STATE WASTE CODES APPLY? IF YES, LIST STATE CODES.

LIST ANY FEDERAL OR STATE WASTE CODES WHICH MAY VARY FROM SHIPMENT TO SHIPMENT:

WILL THE DECISION TO VARY THESE WASTE CODES BE BASED ON ☐ KNOWLEDGE OR ☐ TESTING (check one).
IF KNOWLEDGE, DESCRIBE BASIS OF KNOWLEDGE:

☒ ☐ IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
THIS WASTE IS A: ☐ WASTEWATER ☒ NON WASTEWATER PER USEPA DEFINITION IN 40 CFR 268.2

☐ ☒ IF ANY WASTE CODES D001, D002, OR D012-D043 APPLY, ARE ANY UHC'S PRESENT ABOVE TREATMENT STANDARDS?

☐ ☒ DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

☐ ☒ IS THIS WASTE SUBJECT TO CATEGORICAL PRETREATMENT DISCHARGE STANDARDS?
IF YES, SPECIFY POINT SOURCE CATEGORY LISTED IN 40 CFR PART 401.

☐ ☒ IS THIS WASTE REGULATED UNDER THE BENZENE NESHAP RULES? (IS THIS WASTE FROM A CHEMICAL MANUFACTURING, COKE BY-PRODUCT RECOVERY, OR PETROLEUM REFINERY PROCESS?)

☒ ☐ DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS ≥ 100 PPM?

☒ ☐ DOES THIS WASTE CONTAIN ANY CONSTITUENTS REGULATED UNDER SECTION 112 OF THE CAA (AIR TOXICS).

G. D.O.T. INFORMATION: List all shipping names that may be used. Attach additional page if necessary.

D.O.T. SHIPPING NAME RQ, Hazardous Waste Solid N.O.S. (Endrin) DOT HAZARD CLASS: 9

UN/NA # NA 3077 PACKING GROUP (Circle 1) I II (III) HAZARD ZONE (Circle 1) A B C D D.O.T. R.Q. 1 lbs.

WILL THIS SHIPPING NAME VARY? ☐ Y ☒ N IF YES, WILL ASSIGNMENT OF PROPER SHIPPING NAME BE BASED ON ☐ KNOWLEDGE OR ☐ TESTING? (check one) IF KNOWLEDGE, DESCRIBE BASIS OF KNOWLEDGE:

H. TRANSPORTATION REQUIREMENTS

GENERATION FREQUENCY: ☒ ONE TIME ☐ BATCH ☐ CONTINUOUS

ESTIMATED SHIPMENT FREQUENCY: ☐ WEEKLY ☐ SEMI-MONTHLY ☐ MONTHLY ☐ QUARTERLY ☒ OTHER 400 yds

☐ BULK LIQUID

GALLONS/SHIPMENT: _____ GAL.
___ FROM TANKS: TANK SIZE ____ GAL.
___ FROM DRUMS
VEHICLE TYPE:
___ VAC TRUCK
___ TANK TRUCK
___ RAILROAD TANK CAR
NOTE LENGTH & DIAMETER OF HOSE REQUIRED: _____
NOTE SPECIAL FITTINGS REQUIRED ___

☒ BULK SOLID

20 TON/YD PER SHIPMENT
STORAGE CAPACITY ____ TON/YD
VEHICLE TYPE:
___ DUMP TRAILER
___ ROLL OFF BOX
☒ INTERMODAL ROLLOFF BOX
___ OTHER _____

☐ CONTAINERIZED

_____ CONTAINERS/SHIPMENT
STORAGE CAPACITY: ____ CONTAINERS
CONTAINER TYPE:
___ CUBIC YARD BOX
___ PALLET
___ DRUM: SIZE _____
CIRCLE TYPE: STEEL, STAINLESS, FIBER, PLASTIC
___ PORTABLE TANK
___ OTHER _____
IS LIFTGATE TRUCK REQUIRED FOR PICKUP? _____

CHECK COMPATIBLE STORAGE MATERIALS:
☒ STEEL ☒ STAINLESS STEEL (316)
☒ RUBBER LINED ☒ FIBERGLASS LINED
☒ OTHER _____

I. SAMPLE STATUS

REPRESENTATIVE SAMPLE HAS BEEN SUPPLIED. ☒ YES ☐ NO SAMPLED BY Michael Webb DATE SAMPLED 9-23-97

J. SPECIFIC PROFILE REQUEST FOR DISPOSAL AND OR COMMENTS.

Cert. of Disposal reqd.

SPECIAL WASTE HANDLING REQUIREMENTS (PPE, etc.)

K. BIENNIAL/ANNUAL REPORTING INFORMATION.

SIC CODE_____ SOURCE CODE_____ FORM CODE_____ ORIGIN CODE_____

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge. I also certify that any samples submitted are representative of the actual waste. If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE	NAME (PRINT)	TITLE	DATE
USEPA Kim Converse/USACE	Kim Converse/USACE	Chemist	11/17/97

FOR CLEAN HARBORS USE ONLY

CHI REPRESENTATIVE COMPLETING PROFILE: _____

ILING ADDRESS:
P.O. Box 400
nd View, ID 83624
(208) 834-2275

GENERATOR WASTE PRODUCT QUESTIONNAIRE

ENVIROSAFE SERVICES OF IDAHO

FACILITY AND LAB SAMPLE ADDRESS
10½ Miles NW Grand View
Missile Base Road
Grand View, Idaho 83624

U.S. EPA ID. Number IDD073114654
NOTE: Before completing profile, please read instruction booklet. *Indicates typical problem areas.

SECTION A - GENERATOR DATA

Mailing address as it will appear on manifest

Generator U.S. E.P.A
Address 1100 N. Western Ave. Wenatchee Tree Farm
City/State Wenatchee WA Zip 98801
Tech. Contact Kira Lynch Tel. 206-764-6918
Off-Spec Contact " Tel. "
(WHEN TRUCK ARRIVES AT ESII)
24 HR. 7 Day/Week Contact " Tel. "

U.S. EPA IDENTIFICATION NUMBER
WAH0000028716

Billing/Broker Philip Environmental Inc
Address 1100 Oaksdale SW
City/State Renton WA Zip 98055
Billing Contact Sue Thoman Tel. 425-227-7511

Envirosafe Service Only
WS ID
☐ Direct ☐ Billing Broker
Sales Zone Code
SAFETY ☐ Yes ☐ No
Safety Code
Cell 5/14 Waste ☐ P.O.A. ☐
MANIFEST NOTIFICATION/ CERTIFICATION REQUIRED ☐
Source Code A
System Type Code M
LDR Debris ☐

COMPLETENESS CHECK:

SECTION B - WASTE CHARACTERIZATION

Common Name for This Waste: Soil

Detailed Process Generating Waste: (We recommend 25 words or more. If there is insufficient space, use Section H or attach process letter. See latest instruction booklet for details. Note that incomplete information here, or elsewhere on form, will delay approval process.)
Contaminated soil from Fruit tree research center

Annual Quantity: 400 1 ☐ Tons 2 ☒ Yards 3 ☐ Gallons 4 ☐ Drums

Shipment Duration
1 ☒ Permanent (1 Year or Longer)
2 ☐ Temporary (Less Than 1 Year)

5. Shipment Mode:
1 ☒ Bulk 2 ☐ Palletized Boxes 3 ☐ Woven Cloth Bags 4 ☐ Metal Drums ____ (SIZE)
5 ☐ Buckets ____ (SIZE) 6 ☐ Overpacks ____ (SIZE) 7 ☐ Other ____

Service Requested From ESII: ☒ Direct Landfill Disposal ☐ Stabilization (One gallon sample sent with copy of questionnaire to facility address, original questionnaire sent to mailing address) ☐ Solidification Recontainerization ☐ Other ____ ☐ Unknown, please advise ☐ Transportation ☐ Debris Treatment
ESII will contact broker/generator if additional samples are required (see WPQ instructions for details).

Application Type: ☒ New ☐ Yearly renewal

SECTION C - PHYSICAL PROPERTIES

Describe physical state at 70°F
1 ☒ Dry Solid 2 ☐ Damp Solid 3 ☐ Powder 4 ☐ Semi-Solid/Gel 5 ☐ Flowable Liquid 6 ☐ Labpack 7 ☐ House Hold Pack
8 ☐ Other ____

Describe Load Bearing Strength at 70°F: 2.1 Penetrometer PSI: * 2.2 % Solids @ 105°C: % Solids Range
1 ☒ Solid/Rigid 2 ☐ Sludge 3 ☐ Weak/None ____ ____ ____ to ____
(2.2 required for stabilization, value must be exclusive of debris, use standard methods 209A.)

Detailed Physical Appearance of Waste
(Include color, texture, be specific with complete range and variation. See instructions.)
Brown

4. Apparent Density of Waste:
(Required for Bulk)
____ Lb./Cu. Yard

4/7/94

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Flash Point: 1 ☐ <70°F 2 ☐ 70-100°F 3 ☐ 101-140°F 4 ☐ 141-200°F 5 ☒ >200°F (Required for liquids) 5.1 Actual Flash Point: _____ °F

2 Will material burn in a flame: 1 ☐ Yes 2 ☒ No

3 num % of Lower Explosive Limit (LEL) as measured in the headspace of the shipping container by a combustible gas detector calibrated with propane _____

pH Range 4 to 10 *6.1 Actual pH (S.U.): _____

*(Please test for pH except for debris, ESII always tests pH when truck arrives. Solids are tested by first mixing with water one to one.)

Describe Odor of Waste: 1 ☒ None 2 ☐ Slight 3 ☐ Strong Describe _____

Viscosity (Liquids): Similar to: 1 ☐ Water 2 ☐ Motor Oil 3 ☐ Honey ☐ Other _____

Debris in Waste: (Indicate % and size by Debris Type in Section E.) ☒ Yes ☐ No

If debris requires stabilization by ESII:

a. Is the debris moisture absorptive? ☐ Yes ☐ No

b. Is the material surface contaminated only? ☐ Yes ☐ No N/A

c. Are all contaminated surface exposed? ☐ Yes ☐ No

The following materials will be used for spill clean-ups while handling waste or product at generator's facility:

N/A

Potential for presence/Separation of incidental liquids due to transport: (Question is provided to eliminate delays for profile amendment should load arrive with free liquids.) ☒ Yes ☐ No

Material is capable of liquefying or melting if exposed to temperatures between 32°F and 120°F: ☐ Yes ☒ No

SECTION D - ANALYTICAL REPORT

As Shipped to ESII

☒ All values left blank are considered certified as not applicable. (Note that D004 through D043 are only included for reference.)

Values are from: ☐ Lab Report Analysis ☐ Generator Knowledge ☐ MSDS ☐ Other _____

L[illegible]eport or MSDS is attached. ☐ Yes ☐ No

A[illegible]ysis method is: ☐ TC-TCLP SW-846 1311 (mg/l) ☐ Totals SW-846 (mg/kg)

☐ Other _____ Units _____

PARAMETER	UNITS	PARAMETER	UNITS	PARAMETER	UNITS	PARAMETER	UNITS
[illegible]inum		Chlordane (D020)		Butanol		Orthodichlorobenzene	
[illegible]mony		Heptachlor (D031)		Carbon Disulfide		Pentachlorophenol (D037)	
[illegible]nic (D004)		Total Cyanide		Carbon Tetrachloride (D019)		Pyridine (D038)	
[illegible]um (D005)		Amenable Cyanide		Chlorobenzene		Tetrachloroethylene (D039)	
[illegible]llium		Reactive Cyanide (D003)		Cresols-Cresylic Acid (D023-26)		Toluene	
[illegible]mium (D006)		Free Cyanide		Cyclohexanone		1, 1, 1-Trichloroethane	
[illegible]mium (hex) (D007)		Total Sulfide		1,2-Dichlorobenzene		1, 1, 2 - Trichloroethane	
[illegible]mium (tot) (D007)		Free Sulfide		1,4 Dichlorobenzene (D027)		Trichlorotrifluoroethane	
[illegible]alt		Reactive Sulfide (D003)		1, 1 Dichloroethylene (D029)		Trichloroethylene (D040)	
[illegible]per		Phenolics		2, 4 Dinitrotoluene (D030)		Trichlorofluoromethane	
		Chloride		2 - Ethoxyethanol		Xylene(s)	
[illegible] (D008)		Fluoride		Ethyl Acetate			
[illegible]cury (D009)		Phosphate		Ethyl Benzene			
[illegible]el +		Sulfate		Ethyl Ether			
[illegible]nium (D010)		Nitrate-N		Hexachlorobenzene (D032)			
[illegible]r (D011)		Ammonia-N		Hexachlorobutadiene (D033)			
[illegible]ium +		Kjeldahl-N		Hexachloroethane (D034)			
		Oil & Grease		Isobutanol			
[illegible]n (D012)		TOC (Carbon)		Methanol			
[illegible]ne (D013)		TOX (Halogen)		Methylene Chloride			
[illegible]oxychlor (D014)		PCB		Methyl Ethyl Ketone (D035)			
[illegible]phen 15)		Dioxins		Methyl Isobutyl Ketone			
[illegible] (D[illegible]		Acetone		Nitrobenzene (D036)			
[illegible]5-TP/Silvex (D017)		Benzene (D018)		2-Nitropropane			

[illegible]es of all analyticals, lab reports and/or Material Safety Data Sheets must be attached to this application.
[illegible]ples attached.

ENVIROSAFE SERVICES OF IDAHO, INC.

WSID

SECTION E - WASTE COMPOSITION

As Shipped to ESII

1. List all components within the waste stream by percentage. Account for 100 percent of waste in the TYPICAL % column.
(Include size and type of debris)

	Typical %	Range %
Soil		95 to 100
Concrete Blocks		1 to 5
rocks		1 to 5
residual pesticides		0 to 1
		to
		to
		to
		to
		to
*TOTAL	=100?	☒ Yes ☐ No

SECTION F - WASTE CLASSIFICATION

As Shipped to ESII

1. Choose one. Waste as shipped will be: ☒ RCRA NON-HAZARDOUS ☐ RCRA HAZARDOUS
2. RCRA EPA Waste Code(s) from 40 CFR 261:

4. Does Waste Exhibit or Contain the Following:

EXPLOSIVE	☐ YES ☒ NO	ETIOLOGICAL	☐ YES ☒ NO
SHOCK SENSITIVE	☐ YES ☒ NO	THERMALLY UNSTABLE	☐ YES ☒ NO
PYROPHORIC	☐ YES ☒ NO	RADIOACTIVE	☐ YES ☒ NO
WATER REACTIVE	☐ YES ☒ NO	TIRES	☐ YES ☒ NO

If YES, Explain in Section H

5. Is this waste, or the generating facility, subject to regulation under 40 CFR Part 61 Subpart FF (Benzene Rule) of NESHAPS (58 FR No. 4 – 1/7/93) (Note: Waste generated from chemical manufacturing, coke-by-product recovery plants, petroleum refineries or treaters of such waste are subject to these requirements). ☐ YES ☐ NO

6. SIC CODE

FORM CODE B

Form Codes in ESII Waste Product Questionnaire Instruction Booklet

7. State Waste Codes: State of

WT01
WP01

☐ NOT APPLICABLE

SECTION G - U.S. DOT SHIPPING DESCRIPTION

(Note – Shipper is responsible for correctness of this information)

D.O.T. Hazardous Material? ☐ Yes ☒ No

D.O.T. RQ Required: ☐ Yes ☐ No ☒ N/A

P 3. D.O.T. Shipping Name: NON RCRA Waste Solid

L 4. Hazard Class: N/A 5. Packaging Group: N/A

D.O.T. ID Number: N/A

Additional D.O.T. Description: N/A

ENVIROSAFE SERVICES OF IDAHO, INC.

WSID

SECTION H - ADDITIONAL COMMENTS

1. Additional Comments, Descriptions, or Waste Stream Information:

PROCESS DIAGRAM OR PHOTOGRAPH

SECTION J - CERTIFICATION

1. Is this waste the result of a product spill clean-up? ☐ Yes ☒ No
2. Has this waste been treated (per 40 CFR 260.10) after the initial point of generation as a waste? ☐ Yes ☒ No
   If "Yes" then include a completed **Attachment A** which describes the waste prior to treatment, and respond to the following questions. (If no, skip to 3.)
2a. Attachment A Included. ☐ Yes
2b. Indicate treatment method: ☐ Solidification ☐ Stabilization ☐ Other _____
2c. ☐ Yes, If solidified or stabilized, all additives are listed in Section E.
3. Does the waste pass (i.e., is solid) the EPA specified paint filter test? ☒ Yes (Solid) ☐ No (Free liquids present)
4. The total 40 CFR 268, Appendix III Halogenated Organic Compounds present in this waste, as shipped to ESII are at the following levels?
   ☐ None Present ☐ 0 to 99 mg/Kg ☐ 100 to 499 mg/kg ☐ 500 to 999 mg/kg ☐ >1000 mg/KG
5. Is the waste restricted under the Land Disposal Restrictions under federal rules of 40 CFR 268. ☐ Yes ☒ No (If no, skip to 6.)
   (See Instructions) If yes, please answer the following:
5a. Treatment Sub-category: ☐ Wastewater (<1% TSS and <1% TOC) ☐ Non-wastewater ☐ Debris ☐ Other _____ Specify
5b. I certify that this material may be directly land disposed without further treatment. ☐ Yes ☐ No
5b1. If yes, specify: ☐ Meets numerical BDAT treatment standards by analysis, which are attached..
   ☐ Material has been treated by this technology from 40 CFR 268.42: _____
   ☐ Material is subject to a variance or extension as specified: _____
   ☐ Material has been treated to debris technology as specified: _____
6. GENERATOR CERTIFICATION STATEMENTS

A. FOR SOLIDS FOR DIRECT BURIAL AT ESII.

1. ☒ The waste was initially generated as a solid material containing no free liquid.

–OR–

2. ☐ The waste was initially generated as a liquid or waste containing free liquids. The waste has been treated to eliminate free liquids in compliance with Section 3004 (c) of the Resource Conservation and Recovery Act (RCRA) of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984. The materials used in the treatment process do not biodegrade or release liquids when compressed.The treatment process utilized (for bulk waste) did not employ the addition of absorbents to the waste (unless used in a stabilization process).

B. Certification Statement

I hereby certify that as an authorized representative of the generator named above, all information submitted in this and all the attached document are true and accurate. Pre-shipment and all other samples provided are a true representative sample of the waste and were sampled in accordance with 40 CFR Part 261.20. Any analysis of the waste was conducted in accordance with the approved test methods in 40 CFR Part 261 on a representative sample as defined in 40 CFR Part 261.20. To the best of my knowledge, all known (40 CFR Part 261/OSHA/NESHAP) and suspected hazardous components have been included in this documentation. All material, descriptions, and packaging will comply with all current regulations.

SIGNATURE on behalf of US EPA Kim Converse/USSC TITLE Chemist DATE 11/17/97

TO BE SIGNED BY A GENERATOR OR PERSON ASSIGNED A POWER OF ATTORNEY. NOTE THAT AN ORIGINAL INK SIGNATURE IS REQUIRED.

PRINTED NAME Kim Converse

☐ Power of Attorney is Attached

ESII USE ONLY

Comments _____

Initial Review _____ Second Review _____ Final Review _____

Date Approved _____ Date Denied _____

See WPQ summary sheet for fingerprints and waste routing.

Chemical Waste Management, Inc. BX 6347

Profile #

WASTE PROFILE

(Please carefully read the instructions before completing this form)

TSDF requested Arlington Technology requested Landfill Sales #

☐ Check here if this is a Recertification ☒ Check here if a Certificate of Destruction or Disposal is required

GENERAL INFORMATION

1. GENERATOR NAME: U.S. A.E.P.A. Generator USEPA ID: WAH000002816
2. Generator Address: 1100 N. Western Ave Wenatchee Fruit tree farm Billing Address: ☐ Same Philip Environmental Inc. 1100 Oaksdale SW Renton WA 98055
3. Technical Contact/Phone: Kim Lynch (206) 764-6918
4. Alternate Contact/Phone: _____ Billing Contact/Phone: Sue Thomon 425-227-7510

PROPERTIES AND COMPOSITION

5. A. Process Generating Waste: Soil removed from fruit tree research center
   B. Is the waste from a CERCLA or state mandated cleanup? Yes ☒ No ☐ Location name: Wenatchee Fruit tree farm
6. Waste Name: Soil
7. A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ☐ No ☒
   B. If D001, D002, D012- D043 do any underlying hazardous constituents (UHC's) apply? Yes ☐ No ☒ (If yes, attach UHC form)
   C. Does this waste contain debris (List size and type in chemical composition)? Yes ☒ No ☐
   D. Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): N/A
   State Waste Codes: _____
8. Physical State @ 70°F: A. Solid ☒ Liquid ☐ Both ☐ Gas ☐ B. Single Layer ☐ Multilayer ☐ C. Free liquid range _____ to _____ %
9. A. pH: Range 4 to 10 or Not applicable ☐ B. Strong Odor ☐: describe _____
10. Liquid Flash Point: < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☐ N.A. ☒
11. CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics and UHC's) present in any concentration and forward available analysis

Constituents	Range	Units	Constituents	Range	Units
Soil	95-100	%			
Concrete Blocks	1-5	%			
Rocks	1-5	%			
residual Pesticides	0-1	%			

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

12. OTHER: PCBs if yes, concentration ___ ppm, PCBs regulated by 40 CFR 761 ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐ Water Reactive ☐ Shock Sensitive ☐ Oxidizer ☐ Carcinogen ☐ Infectious ☐ Other _____
13. If Benzene, concentration ___ ppm. Is the waste subject to the Benzene Waste Operations NESHAP? Yes ☐ No ☐ Unknown ☐
14. Is the waste subject to RCRA subpart CC controls? Yes ☐ No ☒ Volatile organic concentration, if known _____ ppmw.
15. If the waste is subject to the land ban and meets the treatment standards, check here: ___ and supply analytical results where applicable.

SHIPPING INFORMATION

16. PACKAGING: Bulk Solid ☒ Type/Size: roll off Bulk Liquid ☐ Type/Size: _____ Drum ☐ Type/Size: _____ Other _____
17. SHIPPING FREQUENCY: Units 200 yds Per: ☐ Month ☐ Qtr. ☒ Year ☐ One Time ☐ Other _____

SAMPLING INFORMATION

18. A. Sample source (drum, lagoon, pond, tank, vat, etc.) [redacted]
    Date Sampled: _____ Sampler's Name/Company: _____
    18. B. Generator's Agent Supervising Sampling: _____ 19. No sample required (See instructions.) ☒

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261- Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. on behalf of USEPA

Kim Converse /USACE Kim Converse/chemist 11/17/97

Signature Printed (or typed) name and title Date

If the waste profile is approved, Chemical Waste Management, Inc. has the appropriate permits and will accept the waste pursuant to our agreement.

CWM Form 6000-D replaces the following forms: CWM-51, CWM 6000, CWM 50-A-2, CWM 50-B and CWM 6000C.

Printed on recycled paper.

***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (252) 872-7859 ***

#734 334839

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. AHOOOOO2816 . . . . MEO1 | Manifest Document No. | 2. Page 1 of 1

RECEIVED NOV 24 1997 Garry Struthers Assoc., Inc.

3. Generator's Name and Mailing Address (RETURN MANIFEST TO ADDRESS IN BOX 15)
US EPA
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE
4. Generator's Phone (WENATCHEE WA 98801 (206)764-6918

5. Transporter 1 Company Name: TW Company	6. US EPA ID Number: 14-098807-4717	A. Transporter's Phone: (801) 299 1900
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address: Chem Waste Mgmt of Northwest, 17629 Cedar Springs Lane, Arlington, OR 97812	10. US EPA ID Number: ORD089452353	C. Facility's Phone: (541) 454-2643

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. material not regulated by d.o.t.	0.01	CM	E57 0.00 12	4d
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a) ZEX6347-00 - - Pesticide cont. soils [ECOLOGY ECY # 9] - (5)
X004 BO 11-7-97

E. Handling Codes for Wastes Listed Above
W 8146 W 2540P 12Y
LB 4 24-25 D IV-1W

15. Special Handling Instructions and Additional Information
CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE
MAIL CD AND ORIGINAL MANIFEST TO: GSA, INC., ATTN: FRED LUKK, 3150 RICHARDS ROAD SUITE 100, BELLEVUE, WA 98005

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: ON BEHALF OF USEPA FREDERICK N. LUKK | Signature: ON BEHALF OF USEPA [signature] | Month Day Year 11 04 97

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Patrick Arnold | Signature: [signature] | Month Day Year 11 06 97

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

19. Discrepancy Indication Space: Added waste code per Lab FSG BO 11-7-97

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: BRENDA OFFER | Signature: [signature] | Month Day Year 11 07 97

ORIGINAL – RETURN TO GENERATOR

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/07/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE001.

Profile Number: BX6347
CWM Tracking ID: 33483901
Process: LANDFILL
Treatment Date: 11/07/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48308
11/17/97

6½ ***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (___) 872-7859 ***
( ) 970130

334925

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. [illegible]	Manifest Document No.	2. Page 1 of	RECEIVED NOV 24 1997 Garry Struthers Assoc., Inc.
3. Generator's Name and Mailing Address (RETURN MANIFEST TO ADDRESS IN BOX 15) US EPA WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE WENATCHEE WA 98801 (206)764-6818			
4. Generator's Phone (			
5. Transporter 1 Company Name TW COMPANY	6. US EPA ID Number UTD988074712		A. Transporter's Phone 801-299-1900
7. Transporter 2 Company Name	8. US EPA ID Number		B. Transporter's Phone ( ) -
9. Designated Facility Name and Site Address Chem Waste Mgmt of Northwest 17629 Cedar Springs Lane Arlington, OR 97812	10. US EPA ID Number ORD089452353		C. Facility's Phone (541) 454-2643

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Material not regulated by D.O.T.	001	CM	EST. 15 / 00078	YD
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a) [illegible] - Pesticide cont. soils [illegible] (S)
X004 BO 11-7-97

E. Handling Codes for Wastes Listed Above
a) 258401P 15Y
L13 4 24-25 0 IT-IK

15. Special Handling Instructions and Additional Information

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE.

MAIL CD AND ORIGINAL MANIFEST TO: GSA, INC
ATTN: FRED LUCK
3150 RICHARDS ROAD SUITE 100
BELLEVUE, WA 98005

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
ON BEHALF OF USEPA FREDERICK N. LUCK	ON BEHALF OF USEPA [signature]	11	04	97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Greg Sorensen	Greg Sorensen Per TW COMPANY	11	06	97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space Added waste code per leah FSG- BO 11-7-97

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
BRENDA OGREN	Brenda Ogren	11	07	97

ORIGINAL – RETURN TO GENERATOR

GENERATOR / TRANSPORTER / FACILITY

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/07/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE002.

Profile Number: BX6347
CWM Tracking ID: 33482501
Process: LANDFILL
Treatment Date: 11/07/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for
DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48303
11/17/97

34 ***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (800) 872-7858 ***

973430

334868

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of

Generator's Name and Mailing Address (RETURN MANIFEST TO ADDRESS IN BOX 15)

US EPA

WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE

WENATCHEE WA 98801 (206)764-6918

4. Generator's Phone (

5. Transporter 1 Company Name: T W Company	6. US EPA ID Number: UTD988074712	A. Transporter's Phone: 801 299-1900
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address: Chem Waste Mgmt of Northwest, 17629 Cedar Springs Lane, Arlington OR 97812	10. US EPA ID Number	C. Facility's Phone: (541) 454-2643

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. material not regulated by d.o.t.	001	CM	EST ~~00012~~ 0002	YD
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

a. pesticide cont. soils

E. Handling Codes for Wastes Listed Above

28320 P X004 21Y

L13 4 24-25 0 1X-14

15. Special Handling Instructions and Additional Information

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE

MAIL CD AND ORIGINAL MANIFEST TO: GSA, INC.
ATTN: FRED LUCK
3150 RICHARDS ROAD SUITE 100
BELLEVUE, WA 98005

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: ON BEHALF OF USEPA FREDERICK N. LUCK | Signature: ON BEHALF OF USEPA [signature] | Month Day Year 11 04 97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Patrick Arnold | Signature: [signature] | Month Day Year 11 07 97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

19. Discrepancy Indication Space: QD corrected by driver/DH 11/11/97

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: BRENDA OGPEN | Signature: [signature] | Month Day Year 11 10 97

ORIGINAL – RETURN TO GENERATOR

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/10/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE003.

Profile Number: BX6347
CWM Tracking ID: 33486801
Process: LANDFILL
Treatment Date: 11/10/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48341
11/20/97

.6A ***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (253) 872-7859 ***

334966

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1
[illegible]		

3. Generator's Name and Mailing Address (SEND MANIFEST TO ADDRESS IN BOX 15)
US EPA
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE
WENATCHEE WA 98801 (206)764-6918
4. Generator's Phone ( )

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
TW COMPANY	4TD988074712	301 299-1900
7. Transporter 2 Company Name	**8. US EPA ID Number**	**B. Transporter's Phone**
		( ) -
9. Designated Facility Name and Site Address	**10. US EPA ID Number**	**C. Facility's Phone**
Chem Waste Mgmt of Northwest 17629 Cedar Springs Lane Arlington, OR 97812	ORD089452353	(541) 454-2643

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. [illegible]	001	CM	EST 15 ~~00020~~	YD
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
[illegible]

E. Handling Codes for Wastes Listed Above
30780P 15Y
~~X~~004
L13 4 24-25 01Y-12

15. Special Handling Instructions and Additional Information
CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE
MAIL CD AND ORIGINAL MANIFEST TO! GSA, INC.
ATTN: FRED LUCK
3150 RICHARDS ROAD SUITE 100
BELLEVUE, WA 98005

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
ON BEHALF OF THE USDA FREDERICK N. LUCK	ON BEHALF OF THE USDA [signature]	11	04	97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Greg Sorensen	[signature] Per TW company	11	07	97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
QD changed by driver/DH 11/11/97

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
BRENDA OGREN	[signature]	11	10	97

ORIGINAL – RETURN TO GENERATOR

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/10/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE004.

Profile Number: BX6347
CWM Tracking ID: 33486601
Process: LANDFILL
Treatment Date: 11/10/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48339
11/20/97

***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (…) [illegible] ***

13101b 335023

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of
[illegible]	[illegible]	

3. Generator's Name and Mailing Address (SEND MANIFEST TO ADDRESS IN BOX 15)

US EPA
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE
WENATCHEE WA 98801 (206)764-6918

4. Generator's Phone ( )

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
CWMNN	ORD.0.894.5.23.5.3	(541) 454-2643
7. Transporter 2 Company Name	**8. US EPA ID Number**	**B. Transporter's Phone**
9. Designated Facility Name and Site Address	**10. US EPA ID Number**	**C. Facility's Phone**
Chem Waste Mgmt of Northwest 17629 Cedar Springs Lane Arlington OR 97812	[illegible]	(541) 454-2643

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. material not regulated by D.O.T.	001	CM	22800	P
b.				
c.				
d.				

J. Additional Descriptions for Materials Listed Above

a) [illegible] - - Pesticide cont. soils [ROLLOFF # 1] - (5)

E. Handling Codes for Wastes Listed Above

a) 22000P

L13 4 24-25 0 10-1P

15. Special Handling Instructions and Additional Information

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INDICATE MANIFEST DOCUMENT NUMBER ON CERTIFICATE X004

MAIL CD AND ORIGINAL MANIFEST TO: GSA, INC
ATTN: FRED LUCK
3150 RICHARDS ROAD SUITE 100
BELLEVUE, WA 98005

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
ON BEHALF OF THE USEPA FREDERICK N. LUCK	ON BEHALF OF THE USEPA [signature]	11	04	97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
James M Hassing	[signature]	11	19	97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
BRENDA OGDEN	[signature]	11	20	97

ORIGINAL – RETURN TO GENERATOR

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/20/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE005.

Profile Number: BX6347
CWM Tracking ID: 33502301
Process: LANDFILL
Treatment Date: 11/20/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for
DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48472
11/25/97

(253) 872-7853 007101

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of

3. Generator's Name and Mailing Address (SEND MANIFEST TO ADDRESS IN BOX 15)

4. Generator's Phone ( )

5. Transporter 1 Company Name: TW Company | 6. US EPA ID Number: WTD988077712 | A. Transporter's Phone: (801) 299-1900

7. Transporter 2 Company Name | 8. US EPA ID Number | B. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number | C. Facility's Phone

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a.	001	CM	0012 ~~10~~ YD	
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above: X004

E. Handling Codes for Wastes Listed Above: 30380 P 12,

L13 4 24-25 0 IT-IU

15. Special Handling Instructions and Additional Information

MAIL CI AND ORIGINAL MANIFEST TO: GSA, INC.
ATTN: FRED LUCK
3150 RICHARDS ROAD SUITE 100
BELLEVUE, WA 98005

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: ON BEHALF OF THE USERA FREDERAL N LUCK | Signature: ON BEHALF OF THE USERA | Month 11 | Day 04 | Year 97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Patrick Arnold | Signature | Month 11 | Day 7 | Year 97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Melissa Steward | Signature: Melissa Steward | Month 11 | Day 18 | Year 97

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL – RETURN TO GENERATOR

CW

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/18/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE006.

Profile Number: BX6347
CWM Tracking ID: 33498101
Process: LANDFILL
Treatment Date: 11/18/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48450
11/25/97

H

(circled mark) ✓ LDR Not Required ✓

9701832

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB no. 2050-0039. Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. [illegible]

Manifest Document No. [illegible]

2. Page 1 of [illegible]

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
US EPA [illegible]

4. Generator's Phone [illegible]

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: TW Company

6. US EPA ID Number: 14+D988074712

C. State Transporter's ID

D. Transporter's Phone (801) 299-1900

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
[illegible], Inc. – Kimball on Hwy 71
[illegible], NE 69145

10. US EPA ID Number: NED981723513

G. State Facility's ID

H. Facility's Phone (308) 235-4012

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. [illegible]		1	CM	~~ES~~ 19	~~Y~~ Y	NY01 NF01
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above (37,140 Pre'd)
a) ZCH073506-00 – Pesticide cont. soils [illegible] (11)

K. Handling Codes for Wastes Listed Above
a) T08

15. Special Handling Instructions and Additional Information
[illegible]

WO # NB 86164

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
on behalf of EPA Kim Converse / USACE	Kim Converse	11 13 97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
Patrick Arnold	Patrick Arnold	11 13 97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space: Section 9: should Read "Clean Harbors Environmental Services, Inc. 5 miles South of Kimball on Hwy 71. Kimball, NE 69145.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
David E. Hickman	[signature]	12 08 97

70 of 521

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

ORIGINAL-RETURN TO GENERATOR

Philip Environmental Inc.
Notification Exemption Form

These wastes are not subject to the Notification or Certification requirements of 40CFR Part 268 for the reason indicated below:

Generator: U.S. EPA **U.S. EPA I.D. #:** WAH 000 002 816

Generator Signature: on behalf of USEPA Kim Converse/USACE **Date :** 11/13/97

Profile #'s: ZCH073906 **Manifest #:** WE007

☐ This waste is conditionally exempt from RCRA as **SMALL QUANTITY GENERATOR** waste per 40CFR 261.5 and WAC 173-303-070(8)(a)-8(b).

☐ This waste is exempt from RCRA as **HOUSEHOLD HAZARDOUS WASTE** per 40CFR 261.4(b)(1) and WAC 173-303-071(3)(c).

☐ This waste is **NOT REGULATED** as dangerous waste per 40CFR 261 or WAC 173-303.

☐ This RCRA waste is a regulated waste under 40CFR Part 261, for which land disposal restrictions of 40CFR Part 268 have not been promulgated.

☒ This waste is a **WASHINGTON STATE-ONLY DANGEROUS WASTE**(WT01, WT02, WP01, WP02, WP03,WSC2, W001, WL01, WL02) and is not subject to the land disposal restrictions of 40CFR Part 268.

☐ This waste is exempt from regulation as dangerous waste based on meeting the requirements for **USED OIL** as specified in Subpart E of 40CFR 266 and WAC 173-393-515.

☐ This material is contaminated media or debris waste from the removal of a petroleum **UNDERGROUND STORAGE TANK (UST)** which is deferred from regulations as hazardous waste, specified in 40CFR Part 268.10(b)(1). [Note: This deferral does not apply to material removed from inside the UST].

Generator Signature:_____

☐ This material is a petroleum product which is **NOT SUBJECT TO TITLE C** hazardous waste rules because it will be beneficially used, re-used, recycled or reclaimed for energy recovery. [Note: A petroleum product which is contaminated with waste is considered exempt if there is recoverable petroleum present.]

Generator Signature:_____

☐ This material is a petroleum product that has **NOT BEEN MIXED with a LISTED WITH A RCRA WASTE.**

Generator Signature:_____

Revised 12/95

Clean Harbors®
ENVIRONMENTAL SERVICES, INC.
HC54 BOX 2B • KIMBALL, NE 69145
(308) 235-4012 • FAX (308) 235-4307

EPA/State ID No. NED981723513

CERTIFICATE OF DESTRUCTION

GENERATOR: UNITED STATES EPA
ADDRESS: 1100 NORTHWESTERN AVENUE
WENATCHEE, WA 98801

MANIFEST No. : WAWE007-NB86164
AUTHORIZATION No. : 9701832

The above described waste, received by Clean Harbors Environmental Services, Inc. (Clean Harbors) pursuant to the manifest identified above, has been incinerated as of 12/17/97 by Clean Harbors, and the resultant by-products disposed in accordance with applicable federal and state laws and regulations.

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Donna J. Barrett
By: Donna J. Barrett
Waste Tracking Administrator

02/24/98
Date

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9701789

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB no. 2050-0039. Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: [illegible]
Manifest Document No.: [illegible]
2. Page 1 of
Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address
US EPA [illegible]
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN [illegible]
4. Generator's Phone [illegible] WA [illegible]

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: TW Company
6. US EPA ID Number: IL7098804712

C. State Transporter's ID
D. Transporter's Phone ( )

7. Transporter 2 Company Name
8. US EPA ID Number

E. State Transporter's ID
F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
[illegible] HARBORS ENV. SERVICES
[illegible] S OF NE State HWY 71
[illegible] NE [illegible]
10. US EPA ID Number: [illegible]

G. State Facility's ID
H. Facility's Phone
(402) 235-4012

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. [illegible]		1	CM	EST 15	[illegible]	WT01 WP01
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a) 2CH073305-00 - Pesticide cont. soils [ROLLOFF # 3] - (12)

K. Handling Codes for Wastes Listed Above
a) T08

15. Special Handling Instructions and Additional Information
[illegible]

ROF #131 WO# NB 86164

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
For USEPA Kim Converse	Kim Converse	11	25	97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Patrick Arnold	Patrick Arnold	11	25	97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
Section 13 should read 22,640 P (11 T) per generator, KimConverse 12/3/97.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
David E. Hickman	[signature]	12	01	97

692652

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

ORIGINAL-RETURN TO GENERATOR

Philip Environmental Inc.
Notification Exemption Form

These wastes are not subject to the Notification or Certification requirements of 40CFR Part 268 for the reason indicated below:

Generator: U.S. EPA **U.S. EPA I.D. #:** WAH 000 002 816

On Behalf of US EPA

Generator Signature: Kim Conners/USACE **Date :** 11/13/97

Profile #'s: ZCH073906 **Manifest #:** WE008

_____☐ This waste is conditionally exempt from RCRA as **SMALL QUANTITY GENERATOR** waste per 40CFR 261.5 and WAC 173-303-070(8)(a)-8(b).

_____☐ This waste is exempt from RCRA as **HOUSEHOLD HAZARDOUS WASTE** per 40CFR 261.4(b)(1) and WAC 173-303-071(3)(c).

_____☐ This waste is **NOT REGULATED** as dangerous waste per 40CFR 261 or WAC 173-303.

_____☐ This RCRA waste is a regulated waste under 40CFR Part 261, for which land disposal restrictions of 40CFR Part 268 have not been promulgated.

_____☒ This waste is a **WASHINGTON STATE-ONLY DANGEROUS WASTE**(WT01, WT02, WP01, WP02, WP03,WSC2, W001, WL01, WL02) and is not subject to the land disposal restrictions of 40CFR Part 268.

_____☐ This waste is exempt from regulation as dangerous waste based on meeting the requirements for **USED OIL** as specified in Subpart E of 40CFR 266 and WAC 173-393-515.

_____☐ This material is contaminated media or debris waste from the removal of a petroleum **UNDERGROUND STORAGE TANK (UST)** which is deferred from regulations as hazardous waste, specified in 40CFR Part 268.10(b)(1). [Note: This deferral does not apply to material removed from inside the UST].

Generator Signature:_____

_____☐ This material is a petroleum product which is **NOT SUBJECT TO TITLE C** hazardous waste rules because it will be beneficially used, re-used, recycled or reclaimed for energy recovery. [Note: A petroleum product which is contaminated with waste is considered exempt if there is recoverable petroleum present.]

Generator Signature:_____

_____☐ This material is a petroleum product that has **NOT BEEN MIXED** with a **LISTED WITH A RCRA WASTE.**

Generator Signature:_____

CleanHarbors®
ENVIRONMENTAL SERVICES, INC.
HC54 BOX 2B • KIMBALL, NE 69145
(308) 235-4012 • FAX (308) 235-4307

EPA/State ID No. NED981723513

CERTIFICATE OF DESTRUCTION

GENERATOR: UNITED STATES EPA

ADDRESS: 1100 NORTHWESTERN AVENUE
WENATCHEE, WA 98801

MANIFEST No. : WAWE008-NB86164

AUTHORIZATION No. : 9701789

The above described waste, received by Clean Harbors Environmental Services, Inc. (Clean Harbors) pursuant to the manifest identified above, has been incinerated as of 12/09/97 by Clean Harbors, and the resultant by-products disposed in accordance with applicable federal and state laws and regulations.

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Donna J. Barrett

By: Donna J. Barrett
Waste Tracking Administrator

02/24/98
Date

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97330015 — 37460

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB no. 2050-0039. Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. [illegible] Manifest Document No. [illegible]

2. Page 1 of [illegible]

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
US EPA
WENATCHEE TREE FRUIT [illegible] AVE
WENATCHEE WA 98801 (206)7[illegible]

4. Generator's Phone

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: T W COMPANY

6. US EPA ID Number: UTD 988074712

C. State Transporter's ID

D. Transporter's Phone: 801 569-9593

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
[illegible] SERVICES OF IDAHO, INC.
10.5 MI/NW GRAND VIEW, MISSILE BASE
GRAND VIEW, ID 83624

10. US EPA ID Number: [illegible]

G. State Facility's ID

H. Facility's Phone: (208) 834-2275

HM	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	[illegible]	1	CM	[illegible]	[illegible]	WT01 WP01
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a) [illegible]-00 - PESTICIDE CONTAMINATED SOILS [illegible] - LF07 (13)

K. Handling Codes for Wastes Listed Above
a)

15. Special Handling Instructions and Additional Information
[illegible]

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
on Behalf of EPA Kim Converse /USACE	Kim Converse	11	25	97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
JACK MARTIN	Jack Martin	11	25	97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Gina Jacobs	Gina Jacobs	11	26	97

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

ORIGINAL-RETURN TO GENERATOR

Philip Environmental Inc.
Notification Exemption Form

These wastes are not subject to the Notification or Certification requirements of 40CFR Part 268 for the reason indicated below:

Generator: U.S. EPA **U.S. EPA I.D. #:** WAH 000 002 816

Generator Signature: on behalf of USEPA Tom Compere/USACE **Date :** 11/13/97

Profile #'s: Z20070001 **Manifest #:** WE009

☐ This waste is conditionally exempt from RCRA as **SMALL QUANTITY GENERATOR** waste per 40CFR 261.5 and WAC 173-303-070(8)(a)-8(b).

☐ This waste is exempt from RCRA as **HOUSEHOLD HAZARDOUS WASTE** per 40CFR 261.4(b)(1) and WAC 173-303-071(3)(c).

☐ This waste is **NOT REGULATED** as dangerous waste per 40CFR 261 or WAC 173-303.

☐ This RCRA waste is a regulated waste under 40CFR Part 261, for which land disposal restrictions of 40CFR Part 268 have not been promulgated.

☒ This waste is a **WASHINGTON STATE-ONLY DANGEROUS WASTE**(WT01, WT02, WP01, WP02, WP03.WSC2. W001, WL01, WL02) and is not subject to the land disposal restrictions of 40CFR Part 268.

☐ This waste is exempt from regulation as dangerous waste based on meeting the requirements for **USED OIL** as specified in Subpart E of 40CFR 266 and WAC 173-393-515.

☐ This material is contaminated media or debris waste from the removal of a petroleum **UNDERGROUND STORAGE TANK (UST)** which is deferred from regulations as hazardous waste, specified in 40CFR Part 268.10(b)(1). [Note: This deferral does not apply to material removed from inside the UST].

Generator Signature:_____

☐ This material is a petroleum product which is **NOT SUBJECT TO TITLE C** hazardous waste rules because it will be beneficially used, re-used, recycled or reclaimed for energy recovery. [Note: A petroleum product which is contaminated with waste is considered exempt if there is recoverable petroleum present.]

Generator Signature:_____

☐ This material is a petroleum product that has **NOT BEEN MIXED** with a **LISTED WITH A RCRA WASTE.**

Generator Signature:_____

C E R T I F I C A T E O F D I S P O S A L

12/04/97

USEPA
1100 N WESTERN AVENUE WENATCHEE TREE FARM

WENATCHEE WA 98801

THIS IS TO CERTIFY THAT WASTE AS DEFINED ON UNIFORM HAZARDOUS MANIFEST NUMBER WE009 / WAS RECEIVED BY ENVIROSAFE SERVICES OF IDAHO, INC., ON 11/26/97 . THE WASTE(S) WERE SUBSEQUENTLY TREATED, IF REQUIRED BY 40 CFR PART 268 AND ESII'S PERMITS, AND DISPOSED OF BY 11/26/97 IN ACCORDANCE WITH PERMITS AND LAWS REGULATING THIS FACILITY (EXCEPT AS NOTED IN SECTION 19 OF THE UNIFORM HAZARDOUS WASTE MANIFEST LISTED ABOVE).

FINAL DISPOSITION: PERMITTED LANDFILL

PRINTED NAME: LYNN LAWSON

SIGNATURE: Lynn Lawson

TITLE: RECEIVING SUPERVISOR

REFERENCE NO: 97330015 001 000

FACILITY: ENVIROSAFE SERVICES OF IDAHO, INC.
P.O. BOX 400
GRAND VIEW, IDAHO 83624
EPA ID: IDD073114654

BROKER: PHILIP ENVIRONMENTAL INC/CORPORATE OFFICE

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PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

334980

SHIPPING PAPER

LADING MANIFEST WE010

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA WAH000002816	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: TW COMPANY UTD988074712	PHONE #: 801-299-1900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD089452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	18 16 22	YD
B					
C					
D				33460 P 16Y	
				L13 4 24-25 0 IT-IU	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 5 X 004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____ Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X FREDERICK N. LUCK ON BEHALF OF USCOE	SIGNATURE: X ON BEHALF OF USCOE	11	07	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Greg Sorensen	SIGNATURE: X Greg Sorensen	11	17	9
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Melissa Steward	SIGNATURE: X Melissa Steward	11	18	97

CONSIGNEE

One

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/18/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE010.

Profile Number: BX6347
CWM Tracking ID: 33498001
Process: LANDFILL
Treatment Date: 11/18/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48449
11/25/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

334919

34

LADING MANIFEST: WE011

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA 11-14-97 WAH 000 002 816	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: TW Company 11-14-97 WTD 988 074 712	PHONE #: 801 2991900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD 089 452 353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	18 PA	Y
B					
C					
D		13Y		26620 P	

L13 4 24-25 X004

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 11

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _______ NO _______

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME ON BEHALF OF USEPA X FREDERICK N. LOCK	SIGNATURE ON BEHALF OF USEPA X [signature]	11	07	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME X Patrick Arnold	SIGNATURE X [signature]	11	11	
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME X BRENDA OGREN	SIGNATURE X [signature]	11	12	97

CONSIGNEE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/12/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE011.

Profile Number: BX6347
CWM Tracking ID: 33491901
Process: LANDFILL
Treatment Date: 11/12/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48398
11/24/97

PSC
PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

34 334892

LADING MANIFEST WE012

DELIVERY DATE	JOB #
	97G430

SHIPPER / CUSTOMER US EPA WAH 000 002 816 11-13-97 cme	POINT OF CONTACT KIRA LYNCH (USACE)
ADDRESS WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE # (206) 7646916
CITY, STATE, ZIP WENATCHEE WA 98801	
CARRIER / TRANSPORTER TW Company UTD 988074712 11-13-97 cme	PHONE # 801-299-1900
CONSIGNEE / FACILITY CHEM WASTE MGMT OF NORTHWEST	POINT OF CONTACT
ADDRESS 17629 CEDAR SPRINGS LANE	PHONE # (541) 4542643
CITY, STATE, ZIP ARLINGTON OR 97812 ORD 089452353 11-13-97 cme	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	18	~~T~~ Yd
B					
C					
D				26700P L13 4 24-25 0 1W-1X	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 12 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____ Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME X FREDERICK N. LUCK	SIGNATURE X ON BEHALF OF USEPA	11	07	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME X TW Company Patrick Arnold	SIGNATURE X	11	10	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME X BRENDA OGREN	SIGNATURE X	11	11	97

CONSIGNEE

cme

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/11/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE012.

Profile Number: BX6347
CWM Tracking ID: 33489201
Process: LANDFILL
Treatment Date: 11/11/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48362
11/20/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

67 334963 LADING MANIFEST : WE013

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA WAH000002816	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: TW COMPANY UTd 988074712	PHONE #: 801-299-1900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD089452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	20	Y
B					
C					
D				34580 19	Y
		4134	21-23	01M-IN	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 13 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____ Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME ON BEHALF OF USEPA: X Frederick N. Lynch	SIGNATURE ON BEHALF OF USEPA: X	11	10	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Greg Sorensen	SIGNATURE: X	11	13	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Brenda Ogren	SIGNATURE: X	11	14	97

CONSIGNEE

Cwe

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/14/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE013.

Profile Number: BX6347
CWM Tracking ID: 33496301
Process: LANDFILL
Treatment Date: 11/14/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for
DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48439
11/25/97

PSC
PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

34 334961 LADING MANIFEST WE014

DELIVERY DATE	JOB #
	97G430

SHIPPER / CUSTOMER: US EPA WAH000002816	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: TW UTd 988074712 DA	PHONE #: 801-299-1900 PO
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORd089452353	POINT OF CONTACT:
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

	HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A		MATERIAL NOT REGULATED BY D.O.T.	1	CM	27	Y
B						
C						
D			21Y		27400 P	
			L13 4	21-23	0 1M-1N	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 14 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____ Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X FREDERICK N. WIK (ON BEHALF OF USEPA)	SIGNATURE: X (ON BEHALF OF USEPA)	11	10	97
(C. /TRANSPORTER) PRINT OR TYPE NAME: X Patrick Brindel	SIGNATURE: X	11	13	91
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X BRENDA OGDEN	SIGNATURE: X	11	14	97

CONSIGNEE

Copy

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/14/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE014.

Profile Number: BX6347
CWM Tracking ID: 33496101
Process: LANDFILL
Treatment Date: 11/14/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48437
11/25/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

34 334939 LADING MANIFEST WE015

DELIVERY DATE	JOB #
	97G430

SHIPPER / CUSTOMER: US EPA	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801 WAH 000002816	
CARRIER / TRANSPORTER: TW Company UTd 933074712	PHONE #: (801) 2991900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORd 089452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	15	Y
B					
C					
D				22780 P 15Y L13 4 24-25 01Y-12	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 15 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____ Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X Kirk Lynch ON BEHALF OF USEPA	SIGNATURE: X ON BEHALF OF USEPA	11	07	97
(TRANSPORTER) PRINT OR TYPE NAME: X Patricia Arnold	SIGNATURE: X	11	12	9
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X BRENDA EGGEN	SIGNATURE: X	11	12	97

CONSIGNEE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/13/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE015.

Profile Number: BX6347
CWM Tracking ID: 33493901
Process: LANDFILL
Treatment Date: 11/13/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48412
11/24/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

334937

SHIPPING PAPER

1805

LADING MANIFEST WE016

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801 WAH000002816	
CARRIER / TRANSPORTER: Jack Gray Transport Inc IND042534875	PHONE #: 1-800-772-9307
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD089452353	POINT OF CONTACT: Doug DiVries
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T. Bin #4289	1	CM	15	Y
B					
C					
D				23360 P 15Y	
				L13 4 24-25 01Y-12	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 16 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____ Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X FREDERICK N. LOCK ON BEHALF OF USEPA	SIGNATURE: X ON BEHALF OF USEPA	11	10	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Dawn Wellock	SIGNATURE: X Dawn Wellock	11	12	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Brenda Dyker	SIGNATURE: X Brenda Dyker	11	13	97

CONSIGNEE

CM

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/13/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE016.

Profile Number: BX6347
CWM Tracking ID: 33493701
Process: LANDFILL
Treatment Date: 11/13/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48410
11/24/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW 1805
Renton, WA 98055
Phone 425/227-0311 Bin 42127

SHIPPING PAPER

334969

LADING MANIFEST WE017

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA (EPA ID# WAH000002816)	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: Jack Gray Transport Inc (EPA ID# IND042534875)	PHONE #: 1-800-772-9307
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST (EPA ID# ORD089452353)	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	Est. WT 15 (BW)	Y
B					
C					
D				26460#	15Y

L13 4 23-24 0 1M-1N

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 17 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: ON BEHALF OF USACE — SIGNATURE: ON BEHALF OF USACE		11	10	97
X FREDERICK N. LYNCH	X			
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME	SIGNATURE	MONTH	DAY	Y
X Dave M Woods	X Dave Woods	11	13	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME	SIGNATURE	MONTH	DAY	YEAR
X BRENDA DIXON	X Brenda Dixon	11	14	97

CONSIGNEE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/14/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE017.

Profile Number: BX6347
CWM Tracking ID: 33496901
Process: LANDFILL
Treatment Date: 11/14/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48442
11/25/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

1822

SHIPPING PAPER

334976

LADING MANIFEST WE018

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA WAH000002816	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: Jack Gray Transport Inc. IND042534875	PHONE #: 800 722 9302
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD089452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	13	TY
B					
C					
D				30480 / 12Y L13 4 20-22.0 IM-IN	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 18 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X Frederick N. Lurk (ON BEHALF OF USACE)	SIGNATURE: X (ON BEHALF OF USACE)	11	07	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Ralph Bunney	SIGNATURE: X Ralph Bunney	11	16	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Brenda Green	SIGNATURE: X Brenda Green	11	17	97

CONSIGNEE

Cmw

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/17/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE018.

Profile Number: BX6347
CWM Tracking ID: 33497601
Process: LANDFILL
Treatment Date: 11/17/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48446
11/25/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

62 334893 LADING MANIFEST WE019

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA — WAH 000 002 816 (11-13-97 Cme)	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: TW Company — UTD 988 074 712 (11-13-97 Cme)	PHONE #: 801-299-1900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812 — ORD 089 452 353 (11-13-97 Cme)	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	17	YD
B					
C					
D				32640 #	

L13 4 24-25 0140-1

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 19 18Y X004 60 11-11-97

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X Frederick N. Lyon (ON BEHALF OF USACE)	SIGNATURE: X (ON BEHALF OF USEPA)	11	07	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Greg Sorensen	SIGNATURE: X Greg Sorensen	11	10	9,
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Brenda Ogren	SIGNATURE: X Brenda Ogren	11	11	97

CONSIGNEE

Cme

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/11/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE019.

Profile Number: BX6347
CWM Tracking ID: 33489301
Process: LANDFILL
Treatment Date: 11/11/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48363
11/20/97

***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (253) 872-7859 *** 9701859

( ) 97G430 11/06/97

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB no. 2050-0039. Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAH000002816 | Manifest Document No. WK020

2 Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
US KPA
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE
WENATCHEE WA 98801 (206)764-6918
4. Generator's Phone

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: T.W. COMPANY | 6. US EPA ID Number: UTD988074712
C. State Transporter's ID
D. Transporter's Phone: (801)292-1900

7. Transporter 2 Company Name | 8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CLEAN HARBORS ENV. SERVICES, INC
5 MILES S OF NE State HWY 71
KIMBALL, NE 69145
10. US EPA ID Number: NED981723513
G. State Facility's ID
H. Facility's Phone: (308) 235-4012

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Hazardous waste, solid, n.o.s.(endrin) 9 NA3077 PGIII ERG#171	X	1	CM	14	T	D012
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a) ZCB073905-00 - - pesticide cont. soils - (12)
[ROLLOFF #204]

K. Handling Codes for Wastes Listed Above
a) T08

15. Special Handling Instructions and Additional Information
CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: ON BEHALF OF ENVIRONMENTAL PROTECTION AGENCY. PHILIP N. STOA, USACE | Signature: Philip N. Stoa | Month 12 Day 10 Year 97

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: CURT SELL FOR T.W. CO. | Signature | Month 12 Day 10 Year 97

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: Greg Sorensen FOR T.W. CO. | Signature | Month 12 Day 17 Year 97

19. Discrepancy Indication Space
Section 9: added "Inc." to facility name. ~~Per generator~~ 12/22/97.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: SHAUN EVERTSON | Signature | Month 12 Day 18 Year 97

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete ORIGINAL-RETURN TO GENERATOR

Burlington Environmental Inc. d.b.a PHILIP ENVIRONMENTAL

RCRA Land Disposal Restriction Notification Form EZ

This form is applicable to characteristic wastes (D codes), listed wastes (F, K, U and P codes), California List Wastes, and Hazardous Debris.

Generator: US EPA U.S. EPA I.D. #: WAH 000 002 816

Burlington Profile #: ZCH073905 Manifest #: WE020

The wastes identified on this form are subject to the land disposal restrictions of 40 CFR Part 268. The wastes do not meet the treatment standards specified in Part 268, Subpart D or do not meet the applicable prohibition levels specified in 268.32 or RCRA Section 3004(d). Pursuant to 40 CFR 268.7(a), the required information applicable to each waste is identified below (check all boxes that apply):

Treatability Group: ☐ Wastewater ☒ Nonwastewater

(Wastewaters contain less than 1% filterable solids and less than 1% Total Organic Carbon)

- ☐ **D001 Ignitable (except for High TOC) managed in non-CWA/non-CWA-equivalent/non Class I SDWA systems** *(Complete form UC.. Underlying hazardous constituents need not be addressed if the waste is to be combusted or recovered.)*
- ☐ D001 Ignitable (except for High TOC) managed in CWA/ CWA-equivalent/Class I SDWA systems
- ☐ D001 High TOC Ignitable (greater than 10% total organic carbon)
- ☐ **D002 Corrosive managed in non-CWA/non-CWA-equivalent/non Class I SDWA systems** (Complete form UC)
- ☐ D002 Corrosive managed in CWA/ CWA-equivalent/Class I SDWA systems
- ☐ D003 Reactive Sulfides based on 261.23(a)(5)
- ☐ D003 Reactive Cyanides based on 261.23(a)(5)
- ☐ **D003 Water Reactives based on 261.23(a)(2),(3) and (4) managed in non-CWA/non-CWA-equivalent/non Class I SDWA systems** (Complete form UC)
- ☐ D003 Water Reactives based on 261.23(a)(2),(3) and (4) managed in CWA/ CWA-equivalent/Class I SDWA systems
- ☐ D003 Other Reactives based on 261.23(a)(1)
- ☐ D004 Arsenic ☐ D005 Barium ☐ D006 Cadmium ☐ D006 Cadmium-containing batteries
- ☐ D007 Chromium ☐ D008 Lead ☐ D008 Lead acid batteries
- ☐ D009 High mercury inorganic (>260 mg/kg total), including incinerator residue and residues from RMERC
- ☐ D009 High-mercury organic (>260 mg/kg total), not including incinerator residue
- ☐ D009 Low-mercury (<260 mg/kg total) ☐ D009 All D009 wastewaters
- ☐ D010 Selenium ☐ D011 Silver

If D012-43 boxes are checked, complete and attach Form UC to address underlying hazardous constituents (unless these wastes are to be managed in CWA/CWA-equivalent/Class I SDWA systems):

- ☒ **D012 Endrin**
- ☐ **D013 Lindane**
- ☐ **D014 Methoxychlor**
- ☐ **D015 Toxaphene**
- ☐ **D016 2,4-D**
- ☐ **D017 2,4,5-TP (Silvex)**
- ☐ **D018 Benzene**
- ☐ **D019 Carbon tetrachloride**
- ☐ **D020 Chlordane**
- ☐ **D021 Chlorobenzene**
- ☐ **D022 Chloroform**
- ☐ **D023 *o*-Cresol**
- ☐ **D024 *m*-Cresol**
- ☐ **D025 *p*-Cresol**
- ☐ **D026 Cresols (Total)**
- ☐ **D027 *p*-Dichlorobenzene**
- ☐ **D028 1,2-Dichloroethane**
- ☐ **D029 1,1-Dichloroethylene**
- ☐ **D030 2,4-Dinitrotoluene**
- ☐ **D031 Heptachlor**
- ☐ **D032 Hexachlorobenzene**
- ☐ **D033 Hexachlorobutadiene**
- ☐ **D034 Hexachloroethane**
- ☐ **D035 Methyl ethyl ketone**
- ☐ **D036 Nitrobenzene**
- ☐ **D037 Pentachlorophenol**
- ☐ **D038 Pyridine**
- ☐ **D039 Tetrachloroethylene**
- ☐ **D040 Trichloroethylene**
- ☐ **D041 2,4,5-Trichlorophenol**
- ☐ **D042 2,4,6-Trichlorophenol**
- ☐ **D043 Vinyl chloride**

In addition, the following wastes are included in this shipment:

- ☐ F001-F005 spent solvents. *(If this box is checked, complete the F001-F005 section on the back of this form. Check the hazardous waste number(s) that applies, and identify the constituents likely to be present in the waste.)*
- ☐ F039 multisource leachate. *(If this box is checked, complete and attach Form UC to identify the individual constituents.)*
- ☐ RCRA Section 3004(d) California list wastes. *(If this box is checked, complete the California List section on the back page of this form.)*
- ☐ Hazardous Debris *(If this box is checked, complete the Hazardous Debris section on the back page of this form.)*

If this shipment carries additional waste codes that are not addressed above, identify them here:

EPA Waste Code	Subcategory (if applicable)	EPA Waste Code	Subcategory (if applicable)

Form EZ Revised 2/26/97

This is a two sided form

F001-F005 Spent Solvents

Check the box(es) that applies; identify the individual constituents likely to be present.

Hazardous waste description	Regulated hazardous constituents	
☐ F001 Spent halogenated solvents used in degreasing	Carbon tetrachloride Tetrachloroethylene Trichloroethylene Trichloromonofluoromethane	Methylene chloride 1,1,1-Trichloroethane 1,1,2-Trichloro-1,2,2-trifluoroethane
☐ F002 Spent halogenated solvents	Chlorobenzene Methylene chloride 1,1,1-Trichloroethane Trichloroethylene Trichloromonofluoromethane	*o*-Dichlorobenzene Tetrachloroethylene 1,1,2-Trichloroethane 1,1,2-Trichloro-1,2,2-trifluoroethane
☐ F003 Spent non-halogenated solvents	Acetone Cyclohexanone* Ethyl benzene Methanol* Xylenes (total)	*n*-Butyl alcohol Ethyl acetate Ethyl ether Methyl isobutyl ketone
☐ F004 Spent non-halogenated solvents	*m*-Cresol *p*-Cresol Nitrobenzene	*o*-Cresol Cresol-mixed isomers (cresylic acid)
☐ F005 Spent non-halogenated solvents	Benzene 2-Ethoxyethanol Methyl ethyl ketone Pyridine	Carbon disulfide* Isobutyl alcohol 2-Nitropropane Toluene

**The treatment standards for carbon disulfide, cyclohexanone, and methanol nonwastewaters are based on the TCLP and apply to spent solvent nonwastewaters containing only one, two, or all three of these constituents. The treatment standards for these three constituents do not apply when any of the other F001-F005 constituents are present in the waste.*

California List Wastes

Check applicable boxes; only RCRA-regulated hazardous wastes can be subject to the California List prohibitions. Note that the California List prohibitions do not apply to newly identified (e.g., D018-D043) or newly listed wastes.

- ☐ Liquid wastes containing Nickel at >134 mg/L
- ☐ Liquid wastes containing PCBs at ≥50 ppm
- ☐ Liquid wastes containing Thallium at >130 mg/L
- ☐ Liquid or nonliquid wastes containing Halogenated Organic Compounds listed in 40 CFR 268 Appendix III at ≥1,000 mg/kg (solids) or ≥1,000 mg/L (liquids)

Hazardous Debris

The definitions of "debris" and "hazardous debris" are in 40 CFR 268.2. Per 268.45, hazardous debris must be treated for each "contaminant subject to treatment." To determine these, look up the waste code in 268.40 and list the regulated hazardous constituents for each code. Check the box that applies.

- ☐ This shipment contains hazardous debris that will be treated to comply with the alternative treatment standards of 268.45 (e.g., macroencapsulation or abrasive blasting).
- ☐ This shipment contains hazardous debris that will be treated to meet the 268.40 treatment standards for the waste(s) contaminating the debris).

The contaminants subject to treatment for this debris are identified below:

EPA Waste Code	Subcategory	Contaminants subject to treatment	

Philip Environmental Inc.
RCRA Land Disposal Restriction Notification Form-UC

Generator: U.S. EPA U.S. EPA I.D. #: WAH 000 002 816

Profile #: ZCH073905 Manifest #: WE020

In accordance with 40 CFR 268.7(a), the underlying hazardous constituents must be addressed in this waste. Per 268.2(i), "underlying hazardous constituent" means any constituent listed in 268.48, Table UTS—Universal Treatment Standards, except zinc, which can reasonably be expected to be present at the point of generation of the hazardous waste, at a concentration above the constituent-specific UTS treatment standard. Refer to Form-EZ (attached) for the waste code(s), treatability group, and subcategory applicable to this waste. This form may also be used to identify F039 constituents.

Please check the appropriate box:

☐ This shipment includes F039 multisource leachate. The individual constituents likely to be present are identified on the back page of this form.

☒ This shipment includes D001 [other than 1) High TOC ignitables, or 2) other ignitables that will be combusted or recovered], D002, and/or D012-D043 characteristic wastes. The wastes will not be managed in CWA/CWA-equivalent/Class I SDWA systems. The underlying hazardous constituents must be addressed for this waste.

In order to address underlying hazardous constituents in characteristic wastes, please check the appropriate box:

☐ I have reviewed the UTS list of 268.48, and per 268.7(a), I have determined that there are no underlying hazardous constituents reasonably expected to be present in this waste.

☒ I have reviewed the UTS list of 268.48, and per 268.7(a), I have determined that underlying hazardous constituents are present in this waste. The underlying hazardous constituents are identified on the back page of this form.

The determination of underlying hazardous constituents was based on:

☒ Generator's knowledge of the waste

☒ Analysis

I certify that I personally have examined and am familiar with the waste throught analysis and testing, or through knowledge of the waste to support this certification. I certify that as an authorized representative of the generator named above, all the information submitted in this notification is true and correct to the best of my knowledge.

on behalf of US Environmental Protection Agency

PHILIP N. STOA USACE — Printed Name

Philip N. Stoa — Signature

10 Dec 97 — Date

Form UC Revised 12/16/94 **This is a two-sided form**

Form UC (page 2)

Circle or otherwise identify the underlying hazardous constituents (or F039 constituents) present in the waste:

Constituent
Acenapthene
Acenaphthylene
Acetone
Acetonitrile
Acetophenone
2-Acetylaminofluorene
Acrolein
Acrylamide
Acrylonitrile
Aldrin
4-Aminobiphenyl
Aniline
Anthracene
Aramite
alpha-BHC
beta-BHC
delta-BHC
Benz(a)anthracene
Benzal chloride*
Benzene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(g,h,i)perylene
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Bis(2-ethylhexyl)phthalate
Bromodichloromethane
Bromomethane (methyl bromide)
4-Bromophenyl phenyl ether
n-butyl alcohol
Butyl benzyl phthalate
2-*sec*-Butyl-4,6-dinitrophenol (Dinoseb)
Carbon disulfide
Carbon tetrachloride
Chlordane (alpha and gamma isomers)
p-Chloroaniline
Chlorobenzene
Chlorobenzilate
2-Chloro-1,3-butadiene
Chlorodibromomethane
Chloroethane
Chloroform
p-Chloro-*m*-cresol
2-Chloroethyl vinyl ether*
Chloromethane (methyl chloride)
2-Chloronaphthalene
2-Chlorophenol
3-Chloropropylene

Constituent
Chrysene
o-Cresol
m-Cresol
p-Cresol
Cyclohexanone
o,p'-DDD
p,p'-DDD
o,p'-DDE
p,p'-DDE
o,p'-DDT
p,p'-DDT
Dibenz(a,h)anthracene
Dibenzo(a,e)pyrene
1,2-Dibromo-3-chloropropane
1,2-Dibromoethane (ethylene dibromide)
Dibromomethane
m-Dichlorobenzene
o-Dichlorobenzene
p-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
trans-1,2-Dichloroethylene
2,4-Dichlorophenol
2,6-Dichlorophenol
2,4-Dichlorophenoxyacetic acid (2,4-D)
1,2-Dichloropropane
cis-1,3-Dichloropropylene
trans-1,3-Dichloropropylene
Dieldrin
Diethyl phthalate
p-Dimethylaminoazaobenzene*
2,4-Dimethyl phenol
Dimethyl phthalate
Di-*n*-butyl phthalate
1,4-Dinitrobenzene
4,6-Dinitro-*o*-cresol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-*n*-octyl phthalate
Di-*n*-propylnitrosamine
1,4-Dioxane
Diphenylamine
Diphenylnitrosamine
1,2-Diphenyl hydrazine
Disulfoton
Endosulfan I
Endosulfan II

Constituent
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl acetate
Ethyl benzene
Ethyl ether
Ethyl methacrylate
Ethylene oxide
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachlordibenzo-*p*-dioxins
Hexachlorodibenzofurans
Hexachloroethane
Hexachloropropylene
Indeno(1,2,3-c,d)pyrene
Iodomethane
Isobutyl alcohol
Isodrin
Isosafrole
Kepone
Methacrylonitrile
Methanol
Methapyrilene
Methoxychlor
3-Methylcholanthrene
4,4-Methylene-bis(2-chloroaniline)
Methylene chloride
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl methacrylate
Methyl methansulfonate
Methyl parathion
Naphthalene
2-Naphthylamine
o-Nitroaniline*
p-Nitroaniline
Nitrobenzene
5-Nitro-*o*-toluidine
o-Nitrophenol
p-Nitrophenol
N-Nitrosodiethylamine
N-Nitrosodimethylamine
N-Nitrosodi-*n*-butylamine
N-Nitrosomethylethylamine
N-Nitrosomorpholine
N-Nitrosopiperidine

Constituent
N-Nitrosopyrrolidine
Parathion
PCBs(total)
Pentachlorobenzene
Pentachlorodibenzo-*p*-dioxins
Pentachlorodibenzofurans
Pentachloroethane*
Pentachloronitrobenzene
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
Phorate
Phthalic acid*
Phthalic anhydride
Pronamide
Propanenitrile (ethyl cyanide)
Pyrene
Pyridine
Safrole
Silvex (2,4,5-TP)
1,2,4,5-Tetrachlorobenzene
Tetrachlorodibenzo-*p*-dioxins
Tetrachlorodibenzofurans
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
2,3,4,6-Tetrachlorophenol
Toluene
Toxaphene
Tribromomethane (bromoform)
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichloromonofluoromethane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)
1,2,3-Trichloropropane
1,1,2-Trichloro-1,2,2-trifluoroethane
Tris(2,3-dibromopropyl)phosphate
Vinyl chloride
Xylenes (total)
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium (total)
Cyanide (total)
Cyanide (amenable)
Mercury (retort residues)*
Mercury (all others)
Fluoride
Lead
Nickel
Selenium
Silver
Sulfide
Thallium
Vanadium

*This constituent is not a regulated hazardous constituent in F039

Clean Harbors®
ENVIRONMENTAL SERVICES, INC.
HC54 BOX 2B • KIMBALL, NE 69145
(308) 235-4012 • FAX (308) 235-4307

EPA/State ID No. NED981723513

CERTIFICATE OF DESTRUCTION

GENERATOR: UNITED STATES EPA
ADDRESS: 1100 NORTHWESTERN AVENUE
WENATCHEE, WA 98801

MANIFEST No. : WAWE020-NB86164
AUTHORIZATION No. : 9701889

The above described waste, received by Clean Harbors Environmental Services, Inc. (Clean Harbors) pursuant to the manifest identified above, has been incinerated as of 12/21/97 by Clean Harbors, and the resultant by-products disposed in accordance with applicable federal and state laws and regulations.

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Donna J Barrett
By: Donna J. Barrett
Waste Tracking Administrator

02/24/98
Date

***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (253) 872-7859 *** 9701818

( ) 97G430 11/06/97

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB no. 2050-0039. Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WAH0000002816 | Manifest Document No.: WR021

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
US KPA
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE
WENATCHEE WA 98801 (206)764-6918

4. Generator's Phone

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: TW COMPANY | 6. US EPA ID Number: 4TD988074712

C. State Transporter's ID

D. Transporter's Phone: (801) 277-1705

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CLEAN HARBORS ENV. SERVICES, INC.
5 MILES S OF NE State HWY 71
KIMBALL, NE 69145

10. US EPA ID Number: NKD981723513

G. State Facility's ID

H. Facility's Phone: (308) 235-4012

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Hazardous waste, solid, n.o.s.(endrin) 9 NA3077 PGIII ERG#171	X	1	CM	E 51 19 C	YD	D012
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a) ZCB073905-00 - - pesticide cont. soils - (12) (24,940 P recd)
[ROLLOFF #21]

K. Handling Codes for Wastes Listed Above
a) T08

15. Special Handling Instructions and Additional Information
CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE

WO# NB 86164

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Kim Converse USACE	Kim Converse	11	13	97

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Greg Sorensen	Greg Sorensen	11	13	97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
David E. Hickman		12	05	97

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete

ORIGINAL-RETURN TO GENERATOR

698417

Burlington Environmental Inc. d.b.a PHILIP ENVIRONMENTAL

RCRA Land Disposal Restriction Notification Form EZ

This form is applicable to characteristic wastes (D codes), listed wastes (F, K, U and P codes), California List Wastes, and Hazardous Debris.

Generator: US EPA U.S. EPA I.D. #: WAH 000 002 816

Burlington Profile #: ZCH073905 Manifest #: WE021

The wastes identified on this form are subject to the land disposal restrictions of 40 CFR Part 268. The wastes do not meet the treatment standards specified in Part 268, Subpart D or do not meet the applicable prohibition levels specified in 268.32 or RCRA Section 3004(d). Pursuant to 40 CFR 268.7(a), the required information applicable to each waste is identified below (check all boxes that apply):

Treatability Group: ☐ Wastewater ☒ Nonwastewater

(Wastewaters contain less than 1% filterable solids and less than 1% Total Organic Carbon)

☐ **D001 Ignitable (except for High TOC) managed in non-CWA/non-CWA-equivalent/non Class I SDWA systems**
(Complete form UC.. Underlying hazardous constituents need not be addressed if the waste is to be combusted or recovered.)

☐ D001 Ignitable (except for High TOC) managed in CWA/ CWA-equivalent/Class I SDWA systems

☐ D001 High TOC Ignitable (greater than 10% total organic carbon)

☐ **D002 Corrosive managed in non-CWA/non-CWA-equivalent/non Class I SDWA systems** (Complete form UC)

☐ D002 Corrosive managed in CWA/ CWA-equivalent/Class I SDWA systems

☐ D003 Reactive Sulfides based on 261.23(a)(5)

☐ D003 Reactive Cyanides based on 261.23(a)(5)

☐ **D003 Water Reactives based on 261.23(a)(2),(3) and (4) managed in non-CWA/non-CWA-equivalent/non Class I SDWA systems** (Complete form UC)

☐ D003 Water Reactives based on 261.23(a)(2),(3) and (4) managed in CWA/ CWA-equivalent/Class I SDWA systems

☐ D003 Other Reactives based on 261.23(a)(1)

☐ D004 Arsenic ☐ D005 Barium ☐ D006 Cadmium ☐ D006 Cadmium-containing batteries

☐ D007 Chromium ☐ D008 Lead ☐ D008 Lead acid batteries

☐ D009 High mercury inorganic (>260 mg/kg total), including incinerator residue and residues from RMERC

☐ D009 High-mercury organic (>260 mg/kg total), not including incinerator residue

☐ D009 Low-mercury (<260 mg/kg total) ☐ D009 All D009 wastewaters

☐ D010 Selenium ☐ D011 Silver

If D012-43 boxes are checked, complete and attach Form UC to address underlying hazardous constituents (unless these wastes are to be managed in CWA/CWA-equivalent/Class I SDWA systems):

☒ D012 Endrin
☐ D013 Lindane
☐ D014 Methoxychlor
☐ D015 Toxaphene
☐ D016 2,4-D
☐ D017 2,4,5-TP (Silvex)
☐ D018 Benzene
☐ D019 Carbon tetrachloride
☐ D020 Chlordane
☐ D021 Chlorobenzene
☐ D022 Chloroform
☐ D023 *o*-Cresol
☐ D024 *m*-Cresol
☐ D025 *p*-Cresol
☐ D026 Cresols (Total)
☐ D027 *p*-Dichlorobenzene
☐ D028 1,2-Dichloroethane
☐ D029 1,1-Dichloroethylene
☐ D030 2,4-Dinitrotoluene
☐ D031 Heptachlor
☐ D032 Hexachlorobenzene
☐ D033 Hexachlorobutadiene
☐ D034 Hexachloroethane
☐ D035 Methyl ethyl ketone
☐ D036 Nitrobenzene
☐ D037 Pentachlorophenol
☐ D038 Pyridine
☐ D039 Tetrachloroethylene
☐ D040 Trichloroethylene
☐ D041 2,4,5-Trichlorophenol
☐ D042 2,4,6-Trichlorophenol
☐ D043 Vinyl chloride

In addition, the following wastes are included in this shipment:

☐ F001-F005 spent solvents. *(If this box is checked, complete the F001-F005 section on the back of this form. Check the hazardous waste number(s) that applies, and identify the constituents likely to be present in the waste.)*

☐ F039 multisource leachate. *(If this box is checked, complete and attach Form UC to identify the individual constituents.)*

☐ RCRA Section 3004(d) California list wastes. *(If this box is checked, complete the California List section on the back page of this form.)*

☐ Hazardous Debris *(If this box is checked, complete the Hazardous Debris section on the back page of this form.)*

If this shipment carries additional waste codes that are not addressed above, identify them here:

EPA Waste Code	Subcategory (if applicable)	EPA Waste Code	Subcategory (if applicable)

F001-F005 Spent Solvents

Check the box(es) that applies; identify the individual constituents likely to be present.

Hazardous waste description	Regulated hazardous constituents	
☐ F001 Spent halogenated solvents used in degreasing	Carbon tetrachloride Tetrachloroethylene Trichloroethylene Trichloromonofluoromethane	Methylene chloride 1,1,1-Trichloroethane 1,1,2-Trichloro-1,2,2-trifluoroethane
☐ F002 Spent halogenated solvents	Chlorobenzene Methylene chloride 1,1,1-Trichloroethane Trichloroethylene Trichloromonofluoromethane	*o*-Dichlorobenzene Tetrachloroethylene 1,1,2-Trichloroethane 1,1,2-Trichloro-1,2,2-trifluoroethane
☐ F003 Spent non-halogenated solvents	Acetone Cyclohexanone* Ethyl benzene Methanol* Xylenes (total)	*n*-Butyl alcohol Ethyl acetate Ethyl ether Methyl isobutyl ketone
☐ F004 Spent non-halogenated solvents	*m*-Cresol *p*-Cresol Nitrobenzene	*o*-Cresol Cresol-mixed isomers (cresylic acid)
☐ F005 Spent non-halogenated solvents	Benzene 2-Ethoxyethanol Methyl ethyl ketone Pyridine	Carbon disulfide* Isobutyl alcohol 2-Nitropropane Toluene

**The treatment standards for carbon disulfide, cyclohexanone, and methanol nonwastewaters are based on the TCLP and apply to spent solvent nonwastewaters containing only one, two, or all three of these constituents. The treatment standards for these three constituents do not apply when any of the other F001-F005 constituents are present in the waste.*

California List Wastes

Check applicable boxes; only RCRA-regulated hazardous wastes can be subject to the California List prohibitions. Note that the California List prohibitions do not apply to newly identified (e.g., D018-D043) or newly listed wastes.

- ☐ Liquid wastes containing Nickel at >134 mg/L
- ☐ Liquid wastes containing PCBs at ≥50 ppm
- ☐ Liquid wastes containing Thallium at >130 mg/L
- ☐ Liquid or nonliquid wastes containing Halogenated Organic Compounds listed in 40 CFR 268 Appendix III at ≥1,000 mg/kg (solids) or ≥1,000 mg/L (liquids)

Hazardous Debris

The definitions of "debris" and "hazardous debris" are in 40 CFR 268.2. Per 268.45, hazardous debris must be treated for each "contaminant subject to treatment." To determine these, look up the waste code in 268.40 and list the regulated hazardous constituents for each code. Check the box that applies.

- ☐ This shipment contains hazardous debris that will be treated to comply with the alternative treatment standards of 268.45 (e.g., macroencapsulation or abrasive blasting).
- ☐ This shipment contains hazardous debris that will be treated to meet the 268.40 treatment standards for the waste(s) contaminating the debris).

The contaminants subject to treatment for this debris are identified below:

EPA Waste Code	Subcategory	Contaminants subject to treatment	

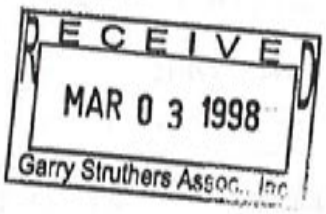
CleanHarbors®
ENVIRONMENTAL SERVICES, INC.
HC54 BOX 2B • KIMBALL, NE 69145
(308) 235-4012 • FAX (308) 235-4307

EPA/State ID No. NED981723513

CERTIFICATE OF DESTRUCTION

GENERATOR: UNITED STATES EPA

ADDRESS: 1100 NORTHWESTERN AVENUE
WENATCHEE, WA 98801



MANIFEST No. : WAWE021-NB86164

AUTHORIZATION No. : 9701818

The above described waste, received by Clean Harbors Environmental Services, Inc. (Clean Harbors) pursuant to the manifest identified above, has been incinerated as of 12/11/97 by Clean Harbors, and the resultant by-products disposed in accordance with applicable federal and state laws and regulations.

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Donna J. Barrett

By: Donna J. Barrett
Waste Tracking Administrator

02/24/98
Date

PSC PHILIP SERVICES corp

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

334938

62

LADING MANIFEST WE022

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801 WAH 00000 2816	
CARRIER / TRANSPORTER: TW COMPANY UTD 988074712	PHONE #: 801-299-1900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD 087452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	R>T 17 19	T Y 1H4 Gm
B					
C					
D				26120 P	
		L13 4		24-25 01412	

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 22 X-004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X FREDERICK N. LYNN ON BEHALF OF USEPA	X SIGNATURE ON BEHALF OF USEPA	11	07	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Greg Sorensen	X SIGNATURE	11	12	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Brenda Ogren	X SIGNATURE	11	13	97

CONSIGNEE

Cne

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/13/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE022.

Profile Number: BX6347
CWM Tracking ID: 33493801
Process: LANDFILL
Treatment Date: 11/13/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48411
11/24/97

PSC PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

WE023

#1822 334986

LADING MANIFEST WE023

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA WAH000002816 ETS 25103	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 764-6916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: Jack Gray Transport IND 042534875 INC.	PHONE #: 800 722 9307
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD 089452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 454-2643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	17 YD	Y
B					
C					
D		17Y		36580 P	
	CD corrected by driver 11/18/97 cfe	L13 4 24-25 0 T-IN			

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 - Pesticide cont. soils - Roll off # 23 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X Frederick N. Lorz ON BEHALF OF USEPA	SIGNATURE: X Frederick N. Lorz ON BEHALF OF USEPA	11	10	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Ralph Burney	SIGNATURE: X Ralph Burney	11	10	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X CAROL EVANS	SIGNATURE: X Carol Evans	11	18	97

CONSIGNEE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/18/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE023.

Profile Number: BX6347
CWM Tracking ID: 33498601
Process: LANDFILL
Treatment Date: 11/18/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carla Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48452
11/25/97

PSC HILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

62 334918 LADING MANIFEST WE024

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA (11-14-97 one WAH 000 002 816)	POINT OF CONTACT: KIRA LYNCH (USACE)
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 N WESTERN AVE	PHONE #: (206) 7646916
CITY, STATE, ZIP: WENATCHEE WA 98801	
CARRIER / TRANSPORTER: TW COMPANY (11-14-97 one 4TD 988 074 712)	PHONE #: 801-299-1900
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST (ORD 089 452 353)	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 4542643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	1	CM	17	YD
B					
C					
D	L13 4 24-25 0.1V-1W 24660 P-418Y				

Special Handling Instruction and Additional Information:

PROFILE NUMBER ZBX6347 Pesticide cont. soils Roll off # 24 X004

CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED PLEASE INCLUDE DOCUMENT NUMBER ON CERTIFICATE

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME ON BEHALF OF USEPA: X Frederick N. Beck	SIGNATURE ON BEHALF OF USEPA: X	11	10	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Greg Sorensen	SIGNATURE: X Greg Sorensen	11	11	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Brenda Owen	SIGNATURE: X Brenda Owen	11	12	97

CONSIGNEE

One

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/12/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE024.

Profile Number: BX6347
CWM Tracking ID: 33491801
Process: LANDFILL
Treatment Date: 11/12/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48397
11/24/97

PSC
PHILIP SERVICES CORP

1100 Oakesdale Ave SW
Renton, WA 98055
Phone 425/227-0311

SHIPPING PAPER

LADING MANIFEST WE025 335281

DELIVERY DATE	JOB # 97G430
SHIPPER / CUSTOMER: US EPA WAH 00000 28116	POINT OF CONTACT: KIRA LYNCH
ADDRESS: WENATCHEE TREE FRUIT RES CTR 1100 WESTERN AVE	PHONE #: (206) 764-6916
CITY, STATE, ZIP: WENATCHEE WA ~~09901~~ 77 98801	
CARRIER / TRANSPORTER: Burlington Environmental Transport. WAH000007743	PHONE #: 253-383-3044
CONSIGNEE / FACILITY: CHEM WASTE MGMT OF NORTHWEST ORD089452353	POINT OF CONTACT
ADDRESS: 17629 CEDAR SPRINGS LANE	PHONE #: (541) 454-2643
CITY, STATE, ZIP: ARLINGTON OR 97812	

HM	US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	Containers No.	Containers Type	Total Quantity	UOM
A	MATERIAL NOT REGULATED BY D.O.T.	22	DM	18,500	P
B					
C					
D				9680 P	

Special Handling Instruction and Additional Information:

X004 L124 14-15 D 1X-14

a) ZBX6347-00 - - Pesticide cont. soils (drums) - (14)
CERTIFICATE OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTI

Placards Provided YES _____ NO _____

Emergency Phone # (253) 872-7859

SHIPPER'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway, vessel, and rail according to applicable international and national government regulations.

		MONTH	DAY	YEAR
(SHIPPER) PRINT OR TYPE NAME: X FREDERICK N. LYNCH ON BEHALF OF USEPA	SIGNATURE: X Fredrick N. Lynch ON BEHALF OF USEPA	11	18	97
(CARRIER/TRANSPORTER) PRINT OR TYPE NAME: X Jim Vobel	SIGNATURE: X	12	09	97
(CONSIGNEE/FACILITY) PRINT OR TYPE NAME: X Melissa Steward	SIGNATURE: X Melissa Steward	12	10	97

CONSIGNEE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 12/10/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE025.

Profile Number: BX6347
CWM Tracking ID: 33528101
Process: LANDFILL
Treatment Date: 12/10/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48775
12/15/97

976430 335007 WE026

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAH000002816

Manifest Document No. WE026

2. Page 1 of 1

3. Generator's Name and Mailing Address USEPA
WENATCHEE TREE FRUIT RES CTR.
1100 N. WESTERN AVE.
WENATCHEE WA 98801

4. Generator's Phone (206) 764-6918

5. Transporter 1 Company Name Jack Gray Transport

6. US EPA ID Number IND042534875

A. State Transporter's ID

B. Transporter 1 Phone 800 772 9307

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
CHEM WASTE MGMT OF NW
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD089452353

E. State Facility's ID

F. Facility's Phone (541) 454-2643

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.	01	CM	12	YD
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above

a) ZBX6347-00 PESTACIDE CONT. SOILS ROLLOFF BIN # 25 X004

H. Handling Codes for Wastes Listed Above

34880 P - 12Y -

L13 4 23-24 O IN-10

15. Special Handling Instructions and Additional Information

CERT. OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE

GENERATOR

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name ON BEHALF OF USEPA FREDERICK N. LOCK. Signature [signature] Date Month 11 Day 18 Year 97

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name Ralph Bennett Signature [signature] Date Month 11 Day 18 Year 97

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name Signature Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name BRENDA OLSEN Signature [signature] Date Month 11 Day 19 Year 97

NON-HAZARDOUS WASTE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 11/19/97 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE026.

Profile Number: BX6347
CWM Tracking ID: 33500901
Process: LANDFILL
Treatment Date: 11/19/97

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans for

DELLA HEIDEMAN
RECORDS MANAGER
Certificate # 48465
11/25/97

24 HOUR EMERGENCY RESPONSE (253) 872 1851 6928

JOB# 976430

NON-HAZARDOUS WASTE MANIFEST

335970

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. WAH000002816	Manifest Document No. WE027	2. Page 1 of 1

3. Generator's Name and Mailing Address: US EPA
WENATCHEE TFREC
1100 N. WESTERN AVE.
WENATCHEE WA 98801

4. Generator's Phone (206) 764 6918

5. Transporter 1 Company Name: ALLWaste Transportation inc	6. US EPA ID Number: WA0000998518	A. State Transporter's ID	B. Transporter 1 Phone: 1800-321-1030
7. Transporter 2 Company Name	8. US EPA ID Number	C. State Transporter's ID	D. Transporter 2 Phone
9. Designated Facility Name and Site Address: CHEM WASTE MGMT OF NW, 17629 CEDAR SPRINGS LANE, ARLINGTON, OR 97812	10. US EPA ID Number: ORD089452353	E. State Facility's ID	F. Facility's Phone: (541) 454-2643

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.	01	CM	~~20Y~~ 11 Y BCL	
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above

a) ZBX6347-00 BISTACIDE CONT. SOILS X004
ROLL OFF BIN #26

H. Handling Codes for Wastes Listed Above

29440P - 11Y
L134 6-7 01Y-12

15. Special Handling Instructions and Additional Information

CERT. OF TRANSPORTATION/DISPOSAL REQUIRED PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name	Signature	Month	Day	Year
ON BEHALF OF USEPA FREDERICK N. LOCK	[signature]	11	18	97

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Brian Leaf	[signature]	02	09	98

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space: Q.D. Corrected By Driver BL 2-9-98

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Month	Day	Year
BRENDA OGDEN	[signature]	02	09	98

NON-HAZARDOUS WASTE — GENERATOR — TRANSPORTER — FACILITY

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 02/09/98 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE027.

Profile Number: BX6347
CWM Tracking ID: 33597001
Process: LANDFILL
Treatment Date: 02/09/98

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans

DELLA HEIDEMAN
RECORDS SUPERVISOR
Certificate # 49559
02/16/98

(14) 24 HOUR EMERGENCY RESPONSE INFORMATION CALL (253) 872-7551

NON-HAZARDOUS WASTE MANIFEST

JOB 97G430

335-745

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAH000002816

Manifest Document No. WE028

2. Page 1 of 1

3. Generator's Name and Mailing Address USEPA
WENATCHEE TREE FRUIT RES. CTR.
1100 N. WESTERN AVE.

4. Generator's Phone (206) 764-6918 WENATCHEE, WA 98801

5. Transporter 1 Company Name BEI TRANS

6. US EPA ID Number TWAR000001743

A. State Transporter's ID

B. Transporter 1 Phone 253-383-3044

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
CHEM WASTE MGMT OF NW
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD089452353

E. State Facility's ID

F. Facility's Phone (541) 454-2643

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.	01	CM	10	YD
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
a) ZBX 6347.00 PESTICIDE CONT. SOILS
ROLL OFF BIN # 27

H. Handling Codes for Wastes Listed Above
10Y X004 16620 P
L13 4 6-7 0 1R-1S

15. Special Handling Instructions and Additional Information
CERT OF TREATMENT/DISPOSAL REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE

GENERATOR

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name ON BEHALF OF USEPA FREDERICK N. LUCK

Signature ON BEHALF OF USEPA

Date Month 12 Day 12 Year 97

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name Roy Hollenberger

Signature

Date Month 1 Day 21 Year 98

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date Month Day Year

F

19. Discrepancy Indication Space

ILITY

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name BRENDA OAKES

Signature

Date Month 01 Day 21 Year 98

NON-HAZARDOUS WASTE

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

US EPA
ATTN: MANIFEST SECTION
WAH000002816
1100 N WESTERN AVE
WENATCHEE WA 98801-1299

CERTIFICATE OF DISPOSAL

Chemical Waste Management, Inc. has received waste material from US EPA on 01/21/98 as described on [State Manifest or Uniform] Hazardous Waste Manifest number WE028.

Profile Number: BX6347
CWM Tracking ID: 33574501
Process: LANDFILL
Treatment Date: 01/21/98

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Carol Evans

DELLA HEIDEMAN
RECORDS SUPERVISOR
Certificate # 49322
01/27/98

***FOR 24 HOUR EMERGENCY RESPONSE INFORMATION, CALL (253) 872-7859 ***

( ) 97G430 12/08/97

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB no. 2050-0039. Expires 9-30-99

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: WAH000002816 | Manifest Document No.: WE030

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
US EPA
WENATCHEE TREE FRUIT RES CENTR 1100 NORTH WESTERN AVENUE
WENATCHEE WA 98801 (206)764-6918

4. Generator's Phone

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: Burlington Environmental, Inc. | 6. US EPA ID Number: WAR000001743

C. State Transporter's ID

D. Transporter's Phone: (253)383-3044

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone ( ) -

9. Designated Facility Name and Site Address
BURLINGTON ENVIRONMENTAL, INC. KENT
20245 77TH AVENUE SOUTH
KENT , WA 98032

10. US EPA ID Number: WAD991281767

G. State Facility's ID

H. Facility's Phone: (253) 872-8030

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Waste flammable liquids, n.o.s. (METHANOL) 3 UN1993 PGII ERG#(128)	X	1	DM	16	L	D001
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a) 151074-00 - - LABPACK OF METHANOL LAB EXTRACTION RESIDUALS [10 GAL] - INC14 (32)

K. Handling Codes for Wastes Listed Above
a)

15. Special Handling Instructions and Additional Information
FINAL CERTIFICATE OF DISPOSAL/TREATMENT REQUIRED. PLEASE INCLUDE MANIFEST DOCUMENT NUMBER ON CERTIFICATE.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Kim Converse on Behalf of USEPA	Kim Converse	2	13	98

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Jim Nobl		02	13	98

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
RICK GILBERT	Rick Gilbert	2	13	98

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete ORIGINAL-RETURN TO GENERATOR

WR52158

Philip Environmental Inc.

RCRA Land Disposal Restriction Notification Form-LP

This form is applicable to shipments of lab packs containing RCRA hazardous wastes.

Generator: U.S. EPA - TREE ~~TOP~~ FRUIT (Research) FARM U.S. EPA I.D. #: WAH 000 002 816

Profile #'s: 151074 Manifest #: WE030

The hazardous waste lab pack(s), as indicated below, are included in this waste shipment and are subject to the U.S. EPA land disposal restrictions of 40 CFR Part 268. The wastes do not meet the treatment standards specified in Part 268, Subpart D or do not meet the applicable prohibition levels specified in 268.32 or RCRA Section 3004(d). This notification and certification form is submitted to Burlington Environmental in accordance with 40 CFR 268.7(a). The applicable notification/certification statement is designated by a check mark in the appropriate box(es) and has been signed by an authorized representative of the waste generator.

NOTIFICATION: The following type(s) of lab pack(s), as designated by a check mark in the appropriate box(es), are included in this waste shipment. Individual lab packs are identified below by their associated drum identification number. The accompanying Lab Pack Drum Inventory Sheet(s) lists the wastes contained in each lab pack and the corresponding land disposal restriction information.

☑ PACKED TO MEET ALTERNATIVE TREATMENT STANDARDS as defined by 40 CFR 268.42(c). Such lab packs may not include the following waste codes, as specified in Appendix IV to part 268: D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, U151. EPA waste codes and subcategories are included on the attached inventory sheet(s). Notifications for lab packs managed using the alternative treatment standards do not need to address underlying hazardous constituents.

Treatability Group: ☒ Nonwastewater ☐ Wastewater *(< 1% filterable solids and < 1% Total Organic Carbon)*

This notification and certification applies to the following drums included in this waste shipment:

Drum identification number(s) include: 3-1

"I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack does not contain any wastes identified at Appendix IV to part 268. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment".

☐ NOT PACKED TO MEET ALTERNATIVE TREATMENT STANDARDS. Notifications for lab packs not managed under the alternative treatment standards of 40 CFR 268.42(c) must meet the requirements of 40 CFR 268.7(a)(1). Complete and attach Form EZ. Complete and attach Form UC if needed to address underlying hazardous constituents reasonably expected to be present.

This notification applies to the following drums included in this waste shipment:

Drum identification number(s) include:

CERTIFICATION STATEMENT: In addition to the applicable certification(s) above, I hereby certify that all information submitted in this and all associated documents is complete and accurate to the best of my knowledge and information.

On Behalf of US EPA

Signature Kim Converse Title Chemist

Name Kim Converse Date 2/13/98

Form LP Revised 2/22/95

Starts : 04 DEC 97
Expires: 31 DEC 98
Printed: 08 DEC 97

GENERATOR'S WASTE MATERIAL PROFILE SHEET

PROFILE # : 151074-00
Status: PENDING
Sales Rep: 054 Colbert, Stepha
Acct Mgr: 758 McDonald, Chris

A. GENERATOR SITE INFORMATION

Generator # 24459
US EPA
WENATCHEE TREE FRUIT RES CENTR
1100 NORTH WESTERN AVENUE
WENATCHEE WA 98801

EPA # WAH000002816
Phone (206) 764-6918
Contact KIRA LYNCH (USACE)
SIC Codes 9511

B. CUSTOMER ADDRESS:

Customer # 19630
Garry Struthers Associates Inc
3150 Richards Road, Suite-100
Bellevue WA 98005-4446

C. WASTE INFORMATION

On File: MSDS No Analysis No Sample No

Waste Name: LABPACK OF METHANOL LAB EXTRACTION RESIDUALS
Process : SOIL SAMPLING

D. PHYSICAL CHARACTERISTICS OF WASTE

PhysStates: S-Sol
L-Liq
G-Slu

Top Color: VARIES
Mid Color:
Bot Color:

Layers: 3 Multi-Layered
Spec Grav: 0.8 -
Free Liq %: >50%

PH Range: 4.1-10
FlashTest: Gen Knowledge
FlashRange: <73F

E. COMPOSITION OF WASTE

Info Provided by: Gen

PCBs: Cyanides: Phenolics: NS Sulfides:

Chemical METHANOL, DILUTE HCL, TRACE PESTICIDES FROM SOILS SAMPLING/TESTING.

Min-Max% Range 100

F. METALS

Metals Method: GEN Knowledge

Arsenic:	<5	Lead:	<5	Silver:	<5	Zinc:	
Barium:	<100	Chromium:	<5	Nickel:	<134	Copper:	
Cadmium:	<1	Selenium:	<1	Thallium:	<130	Chrome-6:	
MercTCLP:	<0.2	MercTotal:					

G. OTHER CHARACTERISTICS OF WASTE

Ign. Solid? No Oxidizer? No Explosive? No
Shock Sensitive? No Water Reactive? No Reactive? No

H. EPA / STATE WASTE IDENTIFICATION

Dang/Haz Waste: Yes
DW / EHW: DW
NESHAPS: N

Form Code: B009
Source Code:
Origin Code: 1

TSCA: N
Debris: No
Waste Water: No

CA List: No
HOC's>1000: No
SubPartCC: Yes

CERCLA: No

EPA Codes: D001
State Codes:

I. SHIPPING INFORMATION

Poisonous? No Dangerous When Wet? No Inhalation Hazard? No Marine Pollutant? No

Container Type: DM Metal Drum
Container Type:

Qty to Ship Now:
Projected Volume: / Month

DOT Shipping Name: Waste flammable liquids, n.o.s. (METHANOL) 3 UN1993 PGII ERG#(128)
Additional Description:

J. SPECIAL HANDLING INFORMATION

SAMPLE EXTRACTION RESIDUALS FROM SOILS.

GENERATOR CERTIFICATION

I hereby certify, as an authorized representative of the Generator named above, that BEI has been fully informed of all information known about this waste, including but not limited to, the waste's generation process, composition, and physical characteristics, necessary to identify proper treatment and disposal of waste and this information is true and accurate.

If this is an existing profile which is being renewed, I hereby certify that there have been no changes in this waste, chemical, physical, or regulatory designation since full characterization by sample testing.

This profile has a greater than 500 ppm volatile organic compounds and is subject to Subpart CC of the RCRA regulations.

on behalf of US EPA

Signature	Printed Name	Title	Date
Kim Converse	on behalf Kim Converse	Chemist	2/13/98

PHILIP ENVIRONMENTAL NATIONAL SERVICES — ATTACHMENT TO HAZARDOUS WASTE MANIFEST #: WED30 — Page: 1 of 1

LABPACK / COMMERCIAL PRODUCT PACK — Drum #: 3-1 — Drum Type/Size: 10GBM — Project #: 976430 — Date: 12/97

Generator: U.S. EPA / WENATCHEE TREE FRUIT FARM — Profile #: 151074

EPA ID#: WAH 000 002 8K6 — DOT Proper Shipping Name: WASTE FLAMMABLE LIQUIDS N.O.S.

Constituents: Methanol, % — (circle RQ constituent, otherwise specify):

Haz. Class: 3 — Add. Label: — DOT ID#: UN1993 — Packing Group: II — RQ= — lb. Approval:

State Codes: (circle all applicable) WL01 WL02 — Other Codes:

A Item #	B Description (chemical and physical)	C1 DOT haz. class (sub. haz. class)	C2 DOT ID #	C3 DOT Packing Group	D1 EPA Waste Code	D2 EPA Sub. Cat.	D3 State Waste Code	E. Gas / Solid / Liquid	F. # of Cont.	G. Container Type / Size	H. Waste Amount	I DOT ERCLA RQ (lb)
	Methanol waste extract	3	UN1230	II	D001	TOC >10%		L	2	GL/2	2 l	
	Work water mixture consists of: enzymes, dilute HCl (pH adj.), methanol, trace pesticides (<D012)	3	UN1230	II	D001	TOC >10%		L	4	GL/2	16 l	

For all labpacks with RCRA codes, use LDR Form LP. REVISED 8/95

The following wastes are excluded from 40 CFR 268.42(c) alternative treatment standard (NCIN) per Appendix IV and will require form EZ: D009, F019, K0033-6, K062, K071, K100, K106, P010-12, P076, P078, U134.

Note:
- All RCRA labpacks must meet 40 CFR 264.316 and 265.316.
- DOT's labpack exemption (49 CFR 173.12) includes only Class 3, 4.1, 4.2, PGII, III, 4.3, 5.1, 6.1, PGII, III, 8 or 9, transported by highway only.
- Only the same hazard class can be packaged in an outer package (drum). Inner packages must be < = 5.3 gallons in metal or plastic.
- The following hazardous materials are excluded from DOT's labpack exemption: 6.1 PG 1, 4.2 PG 1, bromine pentafluoride, bromine trifluoride, chloric acid, and fuming sulfuric acid.

M = metal, GL = glass, PL = plastic, CB = cardboard, CBT = CB tube, P = paper

G = gallon, QT = quart, PT = pint, L = liter, ml = milliliter, lb = pound, oz = ounce, g = gram, mg = milligram

NOTE:

CD FOR LABPACK DISPOSAL (MANIFEST # WE030
WILL BE SUBMITTED UPON RECEIPT

Douglas County Sewer District No. 1
P.O. Box 7129
692 Eastmont Avenue
East Wenatchee, WA 98802
(509) 884-2484 FAX (509) 884-8091

INVOICE

TO: Gary Struthers Associates, Inc.
Attn.: Mike Webb
3150 Richards Road, Suite 100
Bellevue, WA 98005-4446

Date: 1/6/98

Invoice #	Date	Description	Quantity	Price per Unit	Extended Amount
971216	12/16/97	Contaminated Rinse Water:			
		Pickup of 550 gallons	1	100.00	$ 100.00
		Treatment of 550 gallons	550	0.25	$ 137.50
		Total Due			$ 237.50

RECEIVED
JAN 09 1998
Garry Struthers Assoc

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Appendix J

Field Notes and Field Laboratory Notebook

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Inventory of Supplies	1-2
Temperature Log	3-6
Initial Calibration / Calculations	7-12
Corrective Action Log	13-16
Field Lab Notes	17-38
Extraction Log	18

Initials used in this notebook:
Michael Webb MW

Chlordane Kits: received 7/17/97 chilled with coolant packs. M.W.
lot 7E6109 #1-18

DDT Kits:

lot 742308 #30-47

1800 repacked reagents into a cooler and put on ice. Returned kits to boxes with coolant packs.

ERA Performance samples M.W.
OC Pesticides (5) OP Pesticides (4)
lot:
received 7/17/97 in cooler with coolant packs in bottom. Ambient temperature was 67°F in cooler. Repacked in cooler with ice! (CA#1)

Thermometer Taylor model 5395 Digital: M.W.

Ice 4oz Sample jars lot 7195030 w/ custody seal
2 new refrigerators set up & verified temperature @ 40°F @ 18:30. Placed all IFA reagents in refrigerators. Place for samples in refrigerators.

Recd 2 L wide jars, 30 cases on 9/23
Recd 2½ L narrow ambers 2 cases/6 on 9/23
Recd 1 case of 8oz tall jars from Cascade Analytical 9/23
Recd 1 cooler of 8oz jars from Sound Analytical 9/22
Recd 1 cooler of 1 L amber jars from Sound Analytical 9/22
Recd 30 cases 4oz jars, from Eagle Pitcher 9/24 Lot G7216060
Recd 1 case 4oz jar Sound Analytical Lot G7195030

Recd calibration kit for SDI equipment. 9/24

Recd 1 L reagent methanol MX0480-6 and more nitrile gloves 10/2/97 M.W.
Opened 1 L reagent methanol MX0480-6 10/13/97 M.W.
Recd 3 500 mL HDPE jars acid washed & acidprepped from Cascade 10/13/97

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Read and Understood By

Signed Date Signed Date

PROJECT _____ Notebook No. _____

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10/23/97 received 5 DDT kits from SDI Lot# 7H23Ø6 MW 10/23
received 3 5ml & 3 12.5 ml pipette tips from SDI MW 10/23
10/23 received 1 L HPLC-grade (Mallinbradt) Methanol from Cascade MW
received 8 L Reagent Grade DI water
gave 1 case 402 jars LOT G 72/6060
10/28 shipped one lab kit set up back to SDI via FedX.
10/31 Recd. 2 DDT kits and 1 Chlordane kit from SDI
Lot 7H23Ø6 for DDT & 7F6189 for Chlordane
11/3 Recd on additional metals in water sampling jar (w/ HNO3)
from Cascade Analytical.
Recd 1 L HPLC grade MeOH from Cascade
Recd 1 precleaned sampling cup for water
(cleaned for metals and organics).

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Read and Understood By

Signed Date Signed Date

9/18/97	9:00	AA Reagents Cooler	47.2°F	(8.5°C)		ok	M.W.
9/18/97	9:00	PE sample cooler	45.8°F	(8°C)		2°>6° ok (CA*)	M.W.
9/18/97	10:00	Refrig. 1	44.0F				MW
9/18/97	1800	Refrig 2	42.0F				MW
9/22/97	8:30	Refrig 1	7°F			turned down	MW
9/22/97	8:30	Refrig #2	44°F			turned on more	MW
9/23/97	7:30	Refrig 1	repairman fixed @ 11:00 AM				MW
9/23/97	7:30	Refrig 2	43°F	6°C		OK	MW
9/23	19:30	Refrig 1	46°F	7°C		turned up some	MW
9/23	19:30	Ref 2	41.3F			ok	MW
9/24	7:30	Ref 1	38.5°F	4°C		ok	MW
9/24	7:30	Ref 2	41.2	5		ok	MW
9/25	7:10	Ref 1	42.7	6°		O.K	MW
	7:10	Ref 2	43.1	6°		OK	MW
		Cooler 1	43.2	6°		ok	MW
		Cooler 2	40.2	4°		ok	MW
		Cooler 3	37.2	3°		ok	MW
		Cooler 4	35.6	2°		ok	MW
		Cooler 5	43.1	6°		ok	MW
		Cooler 6	39.2	2°		ok	MW
		Cooler 7	38.9	2°		ok	MW
9/25	8:30	Cooler 5	42.4	5°		ok	MW
	18:30	Cooler 4	40.5				
	"	Cooler 1	41.5				
	"	Cooler 6	44.1				
	"	Cooler 7	43.1				
	16:45	Ref 1	47.1			sit lower	MW
		Ref 2	37.9			ok	MW
9/26	7:00	Ref 1	42.9				MW
		Ref 2	40.3				
		cooler 7	36.3	2°		ok	
		cooler 6	43.0	6°		ok	
		cooler 1	42.3	6°		ok	
		cooler 5	43.5	6°		ok	
		cooler 4	36.6	2°		ok	

Continued on Page

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MW

Signed	Date	Signed	Date
		MW	9/26/97

9/26 Ref
18:00 Ref 1 42.5 ok mw
18:00 Ref 2 44.5 7° turned down ½ number MW
3000 All samples placed in refrigerators ~~with~~ except those going to Sound Analytical and IAA samples for 9/29 that were placed in coolers. IAA Chemicals were also placed in coolers. MW.

9/27 12:00
Sound Cooler 37° ok MW
IAA samples 42.1° ok MW
IAA Chemicals 44°0 ok MW

9/28 14:00
Sound Cooler 35° ok MW
IAA Samples 43.5° Added more ice MW
IAA Chemicals 50°F Added more ice MW

9/29 8:00
Sound Cooler 32.4°F delivered to Sound Analytical MW
IAA Samples 38.4°F
IAA Chemicals 48°F Added Ice

9/30 20:00
IAA Samples 44.0°F Added ice MW
IAA Chemicals 45.3°F Added ice MW

10/1 no measurements

10/2 6:00 IAA Samples 39.5° MW
IA chemicals 40° MW

10/3 15:00 IAA Samples 42.5° added ice MW
16:00 Samples from Wenatchee brought by Fred Lack: 2° at logging - combined IAA samples into cooler @ 17:15 with new archived samples. In addition to the 16 samples (+ 2 PE samples and 2 duplicates) brought by Fred, 3 samples from column 3 were already in possession at Sound and on hold. MW

Continued on Page

Read and Understood By

Signed Date Signed Date

10/4	no measurements				
10/5	10:00	Sample cooler	38.4	added ice	
		IAA Reagents	55.6	added ice	mw
10/6	19:00	sample cooler	37.6		
		IAA	38.7		mw
10/7	no measurements				
10/8	6:00	sample cooler	37.6		
		IAA	39.9		mw
10/9	20:00	sample cooler	37.8	added ice	
		IAA	47.5	added ice	mw
10/10	9:00	refrigerator #1	40.2		
		ref #2	37.2		mw
		sample cooler		placed in refrigerators	
		IAA			mw
10/13	13:30	ref 1 41.2	41.2		
		ref 2	40.3		mw
10/14	7:30	ref 1 42.8	42.8		
		ref 2 41.5	41.5		mw
10/15	7:35	ref 1 41.8	41.8		
		ref 2 41.5	41.5		mw
10/23/93	14:30	ref 1 42.1	42.1		mw
		ref 2 28.1 (air temp)	28.1	this is outside of specification for the IAA reagents, but there are in the bottom drawer. The temp blank for that drawer is 42.1°	OK. Turned up ref #2. mw 10/13
10/23	17:00	ref #2 is	39.1°	ok	mw
10/24	7:15	Ref #1	41.5		
	7:15	Ref #2	32.0	Turned up.	
	Samples OK and reagent are in drawer (note above) mw				
10/29	10:00	Ref 1 36.3			mw
		Ref 2	40.1		
11/3	8:30	Ref 1	41.8		ok MW
		Ref 2	40.0		

Continued on Page

Read and Understood By

Signed	Date	Signed	Date

PROJECT

Notebook No. _____

Continued From Page _____

11/17/97 Ref #1 40.19

Continued on Page

Read and Understood By

Signed	Date	Signed	Date

9/18/97 Calibration of Digital Thermometer.
ice/water slurry 32.1°F M.W.

9/24 Used SDI calibration kit to check
spectrometers: #1: 0.72 #2 0.72 Spec: .7 - 0.9
balance: 10g gram wt. = 10g
pipetter: 55 uL - OK

9/24 Calibration for IAA analysis use linear regression for log transformed.

9/25 Used SDI calibration kit to check 7:30
Spectronics: #1 0.72 #2 0.72 Range (0.7-0.9) ok
balance: 10g: 10.0g
pipette: 550 uL

9/26 Used SDI calibration kit to check 8:00
spectrocheck: #1 0.73 #2 0.72 Range (0.7-0.9) ok MW
balance: 10g: 10.0 ok
pipetter: 55ul - delivers ~ 58 ul ok MW
6% difference - gets same in calibrator and sample.
Called SDI - and was told this was OK.

9/29 Used SDI calibration kit to check the following @ 14:00:
spectro: #1 0.73
balance: calibrated @ 100 gr. checked @ 10.0g.
pipette: 55ul - delivers ~ 60ul OK MW
10% diff - gets same in calibrators and samples

10/1/3 Used SDI Cal kit to check following @ 13:45
spectro: #1 0.73 ok
balance: 10.1 ok
pipetter #1 55ul: delivers ~60u (for chlordane)
pipetter #2 55ul: delivers ~60u (for DDT)
This is ok - gets the same in calibrators and samples MW.

Continued on Page

Read and Understood By

Signed Date Signed Date

10/4 – SDI cal kit
Spectro – 0.73 acceptable MW

10/15 SDI cal kit
Spectro – 0.73 acceptable
pipetter 55 uL ≈ 58 uL acceptable

10/23 SDI cal kit
spectro – 0.73 acceptable
balance 10.0g acceptable
pipette DDT 58 ok
pipette Chlordane 60 ok – same as before

10/24 SDI Cal Kit
Spectro 0.74 ✓
Balance 10.0 ✓ K. Eastman

10/29 SDI Cal Kit
Spectro 0.73 ✓ MW
Balance 10.0

11/3 SDI Cal Kit
spectro 0.72 ok MW
balance 10.0 ok
pipetter

11/17 SDI Cal Kit
spectro 0.72 ok MW
balance 10.0 ok
pipetter 60 uL ok

Continued on Page

Read and Understood By

Signed Date Signed Date

Eagle-Picher
Certificate of Analysis

Organic and Inorganic Quality Assurance For Assistance Call 800-331-7425

Bottle Type & QA Level: G Level 1

Approved: Thomas J. Wakeland

Description: 120 mL Clear Wide Mouth Lot No.: G7216060

Eagle-Picher Level 1 products have been tested and found to comply with or to be lower than the EPA detection limits as stated in OSWER Directive # 9240.0-05A "Specifications And Guidance For Contaminant-Free Sample Containers 12/92". Eagle-Picher pass/fail criteria considers all significant non-target compounds.

SEMIVOLATILES ANALYTES	(µg/L)
Phenol	< 5
bis-(2-Chloroethyl)ether	< 5
2-Chlorophenol	< 5
2-Methylphenol	< 5
2,2'-oxybis (1-Chloropropane)	< 5
4-Methylphenol	< 5
N-Nitroso-di-n-propylamine	< 5
Hexachloroethane	< 5
Nitrobenzene	< 5
Isophorone	< 5
2-Nitrophenol	< 5
2,4-Dimethylphenol	< 5
bis-(2-Chloroethoxy)methane	< 5
2,4-Dichlorophenol	< 5
1,2,4-Trichlorobenzene	< 5
Naphthalene	< 5
4-Chloroaniline	< 5
Hexachlorobutadiene	< 5
4-Chloro-3-methylphenol	< 5
2-Methylnaphthalene	< 5
Hexachlorocyclopentadiene	< 5
2,4,6-Trichlorophenol	< 5
2,4,5-Trichlorophenol	< 20
2-Chloronaphthalene	< 5
2-Nitroaniline	< 20
Dimethylphthalate	< 5
Acenaphthylene	< 5
2,6-Dinitrotoluene	< 5
3-Nitroaniline	< 20
Acenaphthene	< 5
Benzyl alcohol*	< 5
1,2-Dichlorobenzene*	< 5
Benzoic Acid*	< 5
N-Nitrosodimethylamine*	< 5

SEMIVOLATILE ANALYTES	(µg/L)
2,4-Dinitrophenol	< 20
4-Nitrophenol	< 20
Dibenzofuran	< 5
2,4-Dinitrotoluene	< 5
Diethylphthalate	< 5
4-Chlorophenyl-phenylether	< 5
Fluorene	< 5
4-Nitroaniline	< 20
4,6-Dinitro-2-methylphenol	< 20
N-Nitrosodiphenylamine	< 5
4-Bromophenyl-phenylether	< 5
Hexachlorobenzene	< 5
Pentachlorophenol	< 20
Phenanthrene	< 5
Anthracene	< 5
Di-n-butylphthalate	< 5
Fluoranthene	< 5
Pyrene	< 5
Butylbenzylphthalate	< 5
3,3'-Dichlorobenzidine	< 5
Benzo(a)anthracene	< 5
Chrysene	< 5
bis-(2-Ethylhexyl)phthalate	< 5
Di-n-octylphthalate	< 5
Benzo(b)fluoranthene	< 5
Benzo(k)fluoranthene	< 5
Benzo(a)pyrene	< 5
Indeno(1,2,3-cd)pyrene	< 5
Dibenz(a,h)anthracene	< 5
Benzo(g,h,i)perylene	< 5
1,3-Dichlorobenzene*	< 5
Carbazole*	< 5
1,4-Dichlorobenzene*	< 5
Azobenzene*	< 5

INORGANIC ANALYTES		(µg/L)
Ag	(Silver)	< 5
Al	(Aluminum)	< 50
As	(Arsenic)	< 0.5
Ba	(Barium)	< 10
Be	(Beryllium)	< 0.5
Ca	(Calcium)	< 500
Cd	(Cadmium)	< 1
CN	(Cyanide)	< 10
Co	(Cobalt)	< 5
Cr	(Chromium)	< 5
Cu	(Copper)	< 5
F	(Fluoride)	< 200
Fe	(Iron)	< 50
Hg	(Mercury)	< 0.2
K	(Potassium)	< 100
Mg	(Magnesium)	< 50
Mn	(Manganese)	< 5
Na	(Sodium)	< 5000
Ni	(Nickel)	< 10
Pb	(Lead)	< 1
Sb	(Antimony)	< 2
Se	(Selenium)	< 2
Tl	(Thallium)	< 5
V	(Vanadium)	< 5
Zn	(Zinc)	< 10

PESTICIDE ANALYTES	(µg/L)
alpha-BHC	< 0.01
beta-BHC	< 0.01
delta-BHC	< 0.01
gamma-BHC (Lindane)	< 0.01
Heptachlor	< 0.01
Aldrin	< 0.01
Heptachlor epoxide	< 0.01
Endosulfan I	< 0.01
Dieldrin	< 0.02
4,4'-DDE	< 0.02
Endrin	< 0.02
Endosulfan II	< 0.02
4,4'-DDD	< 0.02
Endosulfan sulfate	< 0.02
4,4'-DDT	< 0.02
Methoxychlor	< 0.10
Endrin ketone	< 0.02
Endrin aldehyde	< 0.02
alpha-Chlordane	< 0.01
gamma-Chlordane	< 0.01
Toxaphene	< 1.0
Aroclor-1016, Aroclor-1232	< 0.20
Aroclor-1242, Aroclor-1248	< 0.20
Aroclor-1254, Aroclor-1260	< 0.20
Aroclor-1221	< 0.40
Aroclor-1262*, Aroclor-1268*	< 0.20

*Analyte not listed as a target compound in the OSWER Directive.

Eagle-Picher Technologies Division 200 B.J. Tunnell Blvd. Miami, OK 74354 Fax (918)540-1659

10
PROJECT

Certificate of Analysis

Organic and Inorganic Quality Assurance

For Assistance Call 800-331-7425

QA Level: F Level 1

Approved: Thomas J. Wieland (138)

Description: 250 mL. Clear W.M.

Lot No.: F/113080

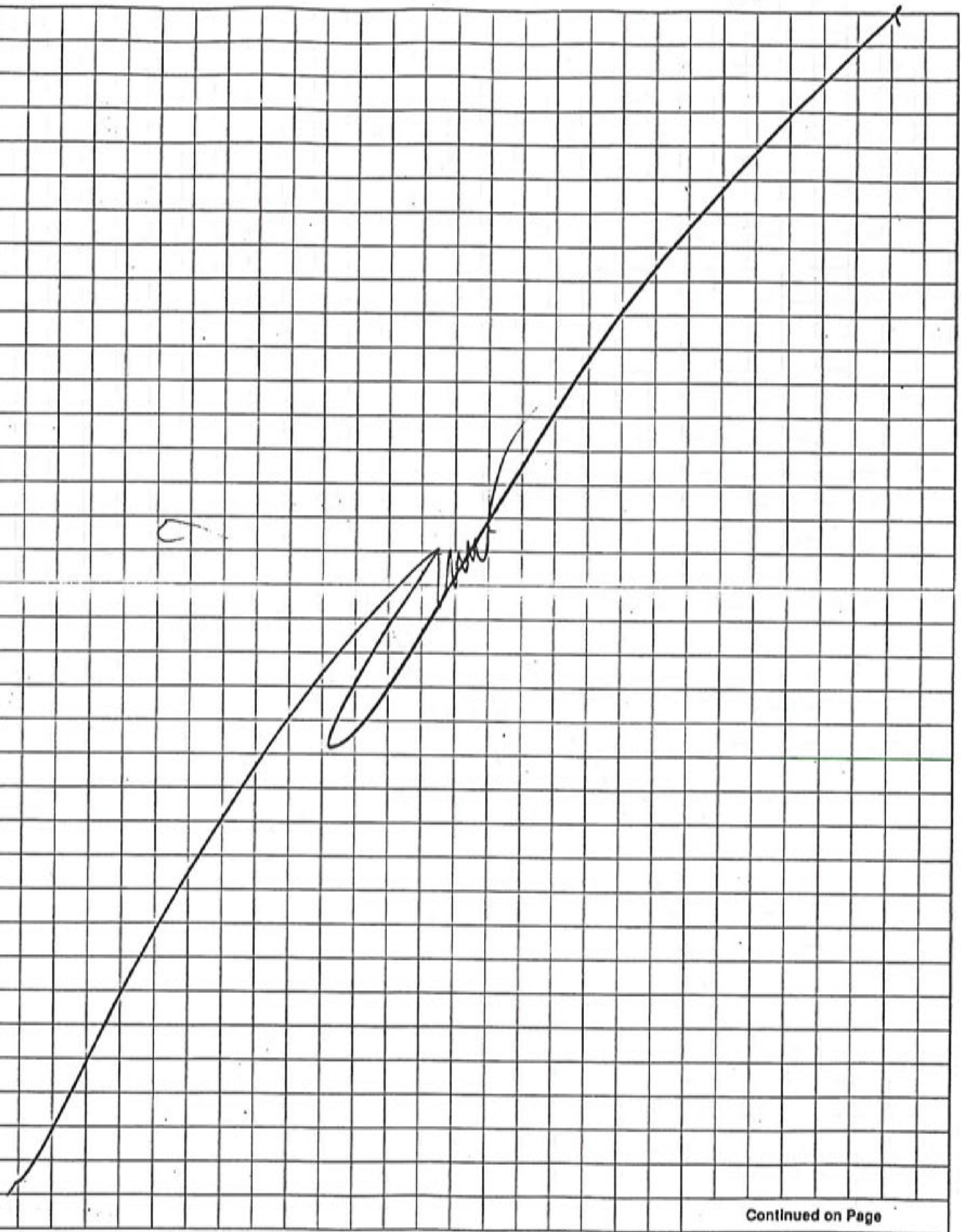
This Certificate verifies that this lot of bottles has been tested to the EPA specifications as set forth in the EPA Statement of Work "Superfund Analytical Methods For Low Concentration Water For Organics Analysis 6/91", (Document #OLC02.0). Eagle-Picher pass/fail criteria considers all significant non-target compounds.

SEMIVOLATILES ANALYTES	(pg/L)
Phenol	< 5
bis-(2-Chloroethyl)ether	< 5
2-Chlorophenol	< 5
2-Methylphenol	< 5
2,2'-oxybis (1-Chloropropane)	< 5
4-Methylphenol	< 5
N-Nitroso-di-n-propylamine	< 5
Hexachloroethane	< 5
Nitrobenzene	< 5
Isophorone	< 5
2-Nitrophenol	< 5
2,4-Dimethylphenol	< 5
bis-(2-Chloroethoxy)methane	< 5
2,4-Dichlorophenol	< 5
1,2,4-Trichlorobenzene	< 5
Naphthalene	< 5
4-Chloroaniline	< 5
Hexachlorobutadiene	< 5
4-Chloro-3-methylphenol	< 5
2-Methylnaphthalene	< 5
Hexachlorocyclopentadiene	< 5
2,4,6-Trichlorophenol	< 5
2,4,5-Trichlorophenol	< 20
2-Chloronaphthalene	< 5
2-Nitroaniline	< 20
Dimethylphthalate	< 5
Acenaphthylene	< 5
2,6-Dinitrotoluene	< 5
3-Nitroaniline	< 20
Acenaphthene	< 5

SEMIVOLATILE ANALYTES	(pg/L)
2,4-Dinitrophenol	< 20
4-Nitrophenol	< 20
Dibenzofuran	< 5
2,4-Dinitrotoluene	< 5
Diethylphthalate	< 5
4-Chlorophenyl-phenylether	< 5
Fluorene	< 5
4-Nitroaniline	< 20
4,6-Dinitro-2-methylphenol	< 20
N-Nitrosodiphenylamine	< 5
4-Bromophenyl-phenylether	< 5
Hexachlorobenzene	< 5
Pentachlorophenol	< 20
Phenanthrene	< 5
Anthracene	< 5
Di-n-butylphthalate	< 5
Fluoranthene	< 5
Pyrene	< 5
Butylbenzylphthalate	< 5
3,3'-Dichlorobenzidine	< 5
Benzo(a)anthracene	< 5
Chrysene	< 5
bis-(2-Ethylhexyl)phthalate	< 5
Di-n-octylphthalate	< 5
Benzo(b)fluoranthene	< 5
Benzo(k)fluoranthene	< 5
Benzo(a)pyrene	< 5
Indeno(1,2,3-cd)pyrene	< 5
Dibenz(a,h)anthracene	< 5
Benzo(g,h,i)perylene	< 5

INORGANIC ANALYTES		(pg/L)
Ag	(Silver)	< 5
Al	(Aluminum)	< 50
As	(Arsenic)	< 0.5
Ba	(Barium)	< 10
Be	(Beryllium)	< 0.5
Ca	(Calcium)	< 500
Cd	(Cadmium)	< 1
CN	(Cyanide)	< 10
Co	(Cobalt)	< 5
Cr	(Chromium)	< 5
Cu	(Copper)	< 5
F	(Fluoride)	< 200
Fe	(Iron)	< 50
Hg	(Mercury)	< 0.2
K	(Potassium)	< 100
Mg	(Magnesium)	< 50
Mn	(Manganese)	< 5
Na	(Sodium)	< 5000
Ni	(Nickel)	< 10
Pb	(Lead)	< 1
Sb	(Antimony)	< 2
Se	(Selenium)	< 2
Tl	(Thallium)	< 5
V	(Vanadium)	< 5
Zn	(Zinc)	< 10

PESTICIDE ANALYTES	(pg/L)
alpha-BHC	< 0.01
beta-BHC	< 0.01
delta-BHC	< 0.01
gamma-BHC (Lindane)	< 0.01
Heptachlor	< 0.01
Aldrin	< 0.01
Heptachlor epoxide	< 0.01
Endosulfan I	< 0.01
Dieldrin	< 0.02
4,4'-DDE	< 0.02
Endrin	< 0.02
Endosulfan II	< 0.02
4,4'-DDD	< 0.02
Endosulfan sulfate	< 0.02
4,4'-DDT	< 0.02
Methoxychlor	< 0.10
Endrin ketone	< 0.02
Endrin aldehyde	< 0.02
alpha-Chlordane	< 0.01
gamma-Chlordane	< 0.01
Toxaphene	< 1.0
Aroclor-1016, Aroclor-1232	< 0.20
Aroclor-1242, Aroclor-1248	< 0.20
Aroclor-1254, Aroclor-1260	< 0.20
Aroclor-1221	< 0.40



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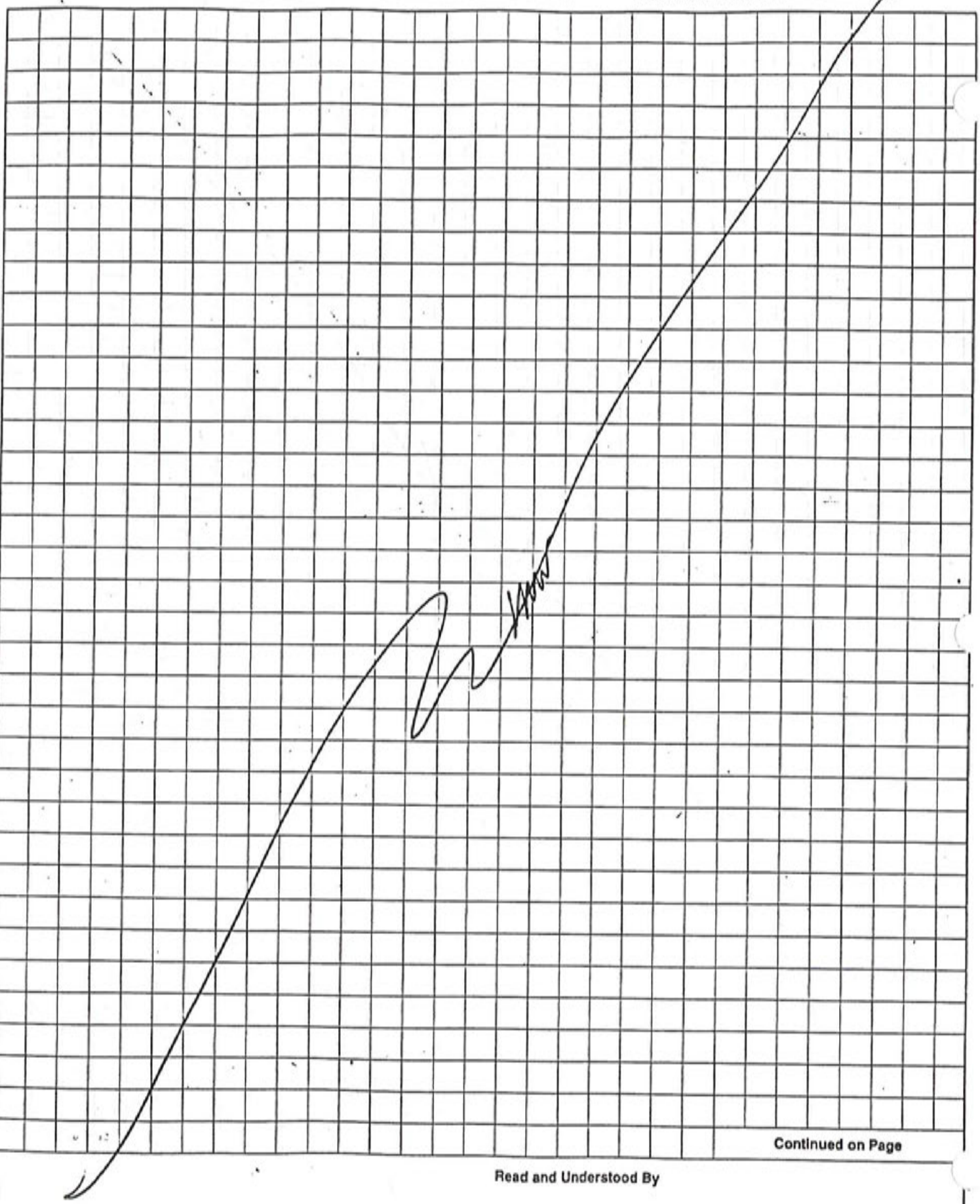

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PROJECT Corrective Action Log

Notebook No. 1

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1\. 9/19/97 PE samples at 67°F = 35°C. Samples are dry soil. The chemicals are not susceptible to degradation if kept in dark. Short temperature variances of 24 hrs are not critical. Next day, samples are at 8°C. Still not 4±2, but acceptable for use. MW

2\. 9/24 Reported to COD that IAA LCS sample is responding high, but this is expected due to bias built into the kit. Will follow up again later. MW

3\. 9/25 The Lab duplicates for Batch 1 - Chlordane were not acceptable - I had the critical samples re-extracted and analyzed in Batch 8. Will follow up later. (DCQCR #4) MW

4\. 9/1 Duplicate samples do not match. W1 & W1 one has dieldrin and the other does not. 4583/4583 has 4 times in one sample compared to the other. See corrective action report w/ DCQCR #8. MW

5\. PE Results for DDT were high by 30% which exceeds the standard limits provided by the manufacturer. Notified COR & Kim Converse on 10/6. Initiated an action with the laboratory. On 10/9 the lab responded with and explanation that the sample weight had been incorrectly recorded. The corrected results were submitted. Notified Kim 10/9.

6\. Blank spike results were low for water analysis samples not affected. (#13)

7\. First IAA DTT analysis on 10/24 did not work. Worked Disposed of all reagents for that kit. Disposed of transfer pipettes for reagents. In starting next batch, found that wrong reagent (chlordane conjugate) was most likely problem because they seemed to be less chlordane reagent kits than Tube kits. Next calibration was not linear - called SDI and found standard vials with no solution and loose caps. (See DCQCR #18)

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PROJECT

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8. Samples taken 10/14 from waste bins W09 and W02 were reported with sample W02 miss numbered by lab. (Sound and Torch Co. ... and lab made correction.) Sample duplicates are significantly different for (See DCQCR #19)

9. 11/5 Carbonate results for waste taken 10/24:
MS shows variable results. Reanalysis also variable (results vary from 6 ppm to 120 ppm in spiked sample). (See DCQCR #28)

10. 11/10 PE SAMPLE FOR DDT IS TOO HIGH.
CALLED LAB & THEIR EVALUATION SHOWS THAT THE INITIAL RUN (10% OVER THE CALIBRATION RANGE) WAS WITHIN THE CORRECT ACCURACY WINDOW.
SEE DCQCR # 29

11. 11/11 Surrogates low for water analysis. Also Dieldrin is not confirmed and ~~max~~ lower of two results has been reported. The assumption is that there is an interference. This was confirmed by looking at chromatograms. See DCQCR #30.

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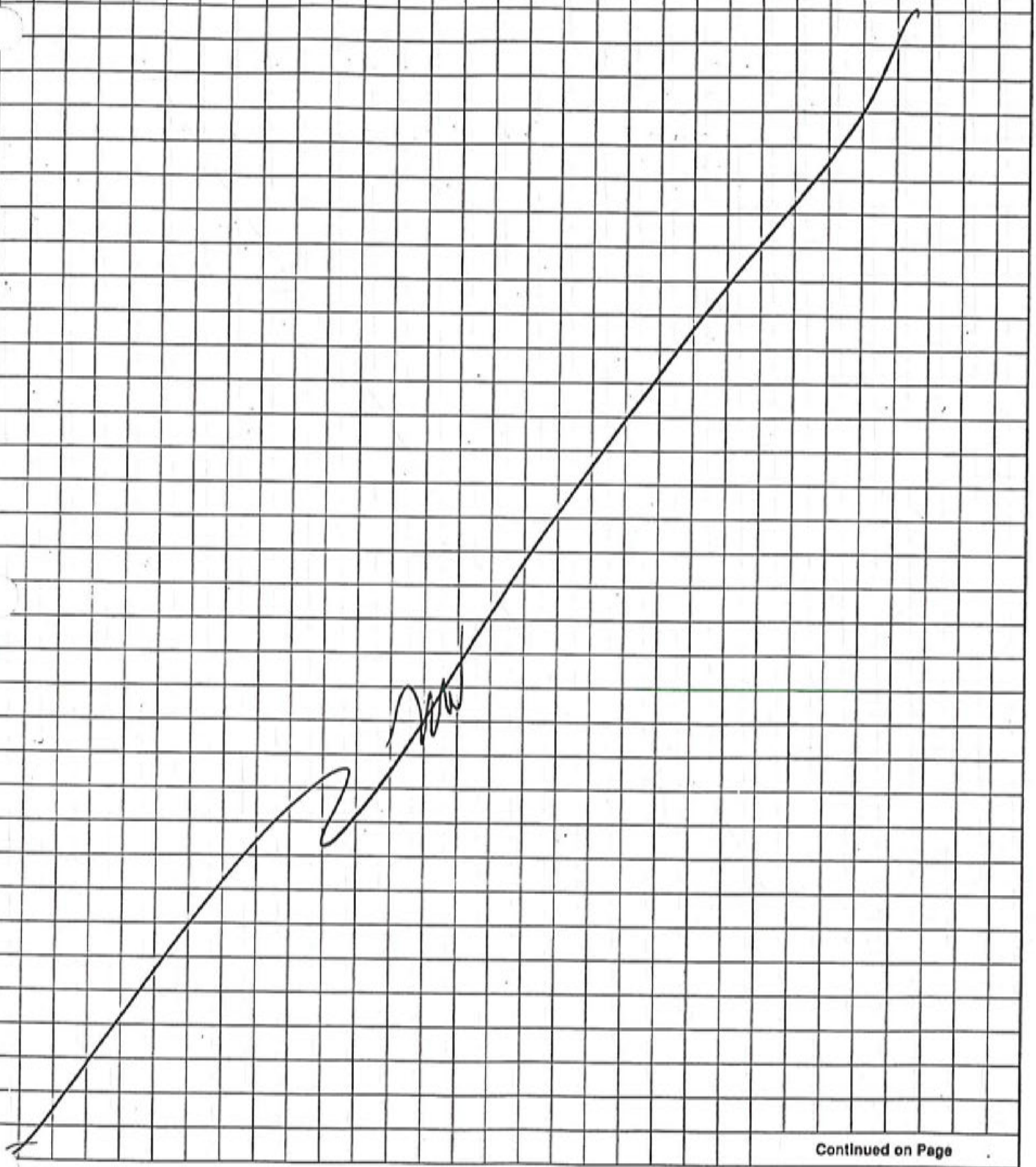

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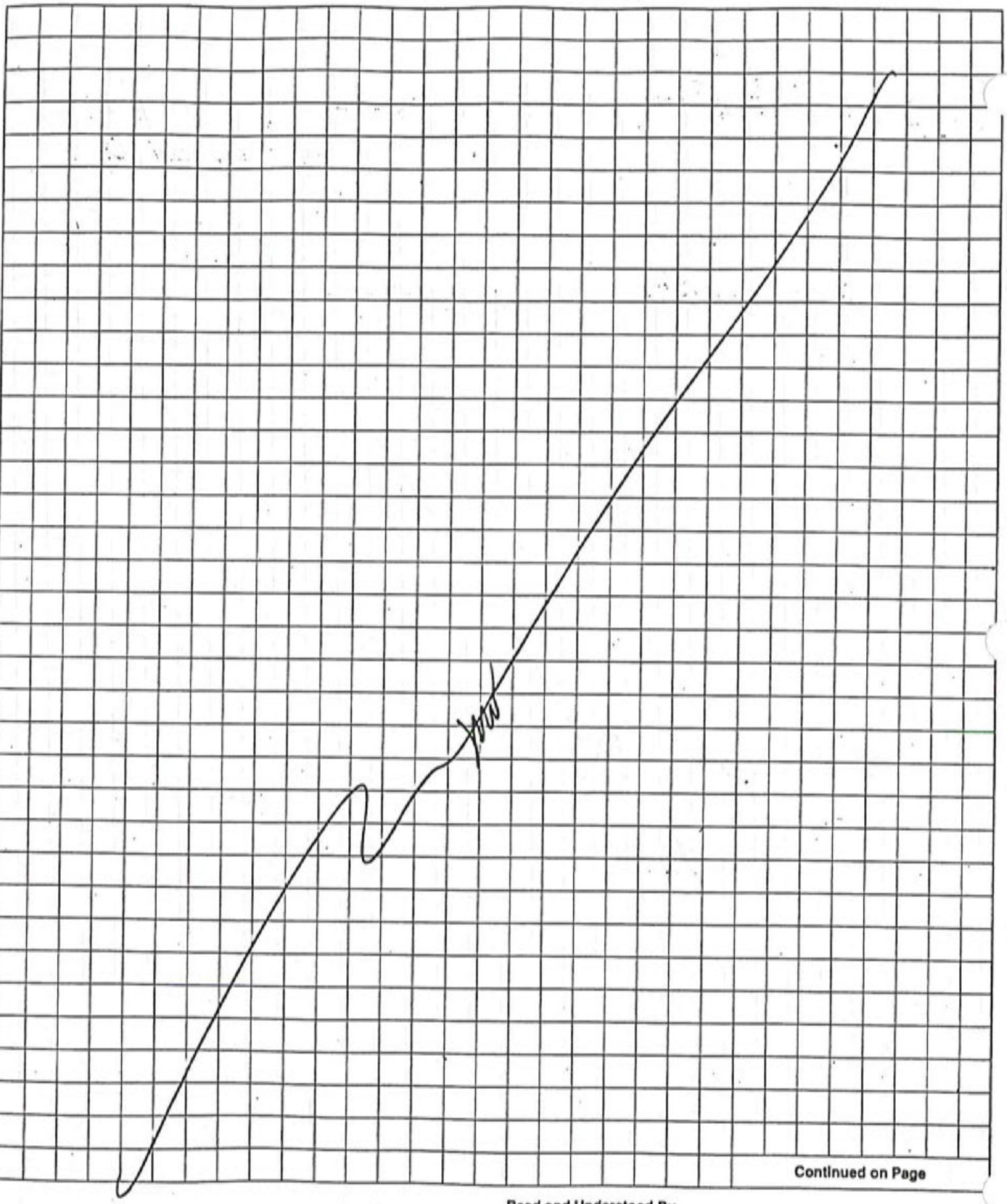

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Signed	Date	Signed	Date

9/23
15:10 Mike Webb decon spoons with Alconox, DI water, methanol, + DI water.
15:30 Created Rinse blank with decon'd spoon
9/24 Lot for 40z jars G72160G0 (also 9/24 9A1, 9B1, 9C1)
~~9/24 Lot for 40z jars G7195030 9B1~~
9/23 Lot for 40z jars G7195030 All FR samples + 9A1, 9B1, 9C1 on 9/24
9/24 Lot G72160G0 for 8A1 —
9/24 C3B1 push sample had 1" diameter white mass very difficult to break up. The sample had a sharp pungent odor. The mass was not put in one of the split samples, but small pieces were broken off and mixed with the soil.
C7B2 Push sample had 1/8" diameter white mass. Very hard, does not break up. Did not include in samples.
C1B1 push sample had 1/4" diameter white mass. Very hard, did not include in samples.
9/24 17:00 decon'd blades and spoons and created rinsate blank C[illegible]92471 MW.
9/25 Bev Stevens decon'd set of spoons to do sample homogenization. Bev S., Fred Luck and Mike Webb homogenized samples while Dang Cresham and Kent Easthouse did analyses.
Started calibration curves on computer and data calculation.
Extracted all samples down to 2' (3' for 2,3,45)
9/26 MW

Continued on Page

Read and Understood By

MW — Signed
9/26 — Date
_____ — Signed
_____ — Date

Extraction Log:

9-23 Batch 1
9-24 Batch 2 and 3
9-25 Batch 4, 5, 6, 7, 8
9-26 Batch 9
9/29 Batch 10
10/3 Batch 11 ~~9:35~~ 20:30 extracted
LCS4 in duplicate Diluted LCS x5
with 8 x 250 uL + 2 x 250 L of LCS
10/23 Batch 12 with LCS4 (stirred for a bit)
Diluted x2 with 5 x 250 uL each of LCS5 and MeOH
11/4
11/7 Batch 19 with LCS7

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Read and Understood By

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9/26- Based on previous results, it was nessary to homogenize, split and extract a set of deeper samples.
Nitke Webb started first real analytical batch.
After analysis of Batches 7, 8, 9, it was determined that deeper samples in columns 3, 5 & 8 needed to be analyzed. These were homogenized and split and placed in a cooler. The IAA lab was packed up and taken with the samples to Nitke Webb's house in Tacoma WA for analysis.

9/29 All samples that potentially needed analysis at the fixed lab were delivered to Lodestar Analytical 10:30. Samples from columns 3, 5 & 8 were placed on hold.

IAA analysis was performed on Batch 10 covering 3, 5, and 8 including extraction. Lodestar Analytical was notified that results for selecting samples for analysis from the ones on hold would be processed by 10:00 Tuesday and a decision made.

9/30 All liquid waste was placed in a jar labeled as "waste methanol and acid". Lab solid waste was placed in trash can.

10/1 Lodestar was notified of samples to analyze @ 11:20. They estimated results by 5:00 Friday, we asked for 10:00 am in order to keep with 72 hour TAT and our decision needs.

10/3 Decision for additional grid confirmation samples made and Grid Jack brought them from Wenatchee. Additional samples were homogenized and split as necessary. See temperature log for more detail.

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Signed and Understood By

MK 10/3
Signed Date Signed Date

10/10 • Placed samples in refrigerators and IAA reagents in ref. 2.

• Composited the 4 waste samples from W1, W3, W4, W6 that had been saved for profiling for the waste company. (stored in refrigerator 1)

10/13 Deconned 4 bowls. ~~Prepared 2 L jars with~~ Deconned spoons. Got out 2 L jars. Deconned hand auger.

Took 2 samples outside of grids 1A and 9A with auger 12" deep. Took IAA final confirmation samples. Sloughed soil at edge of hole had been raked down across the hole. I found that sample 9B has grass fragments on it, indicating that some residue from this surface raking remained in the surface soil.

8:00
10/14 Fred Luck deconned 3 bowls and used deconned auger and spoons to collect waste samples.

9:00 M. Webb deconned 6 bowls and stored upside-down on aluminum foil in the lab.

10/23 Took IAA analysis samples for final confirmation.

		Subgrid
FC1A	18:50	#5
FC1B	18:53	#2
FC1C	14:56	#3
FC6A	19:00 (grid 8)	#8
FC6B	19:04	#
FC6C	19:07	
FC7C	19:10	
FC7B	19:14	
FC7A	19:17	
9A1	19:20	taken under 9A(9,17) location

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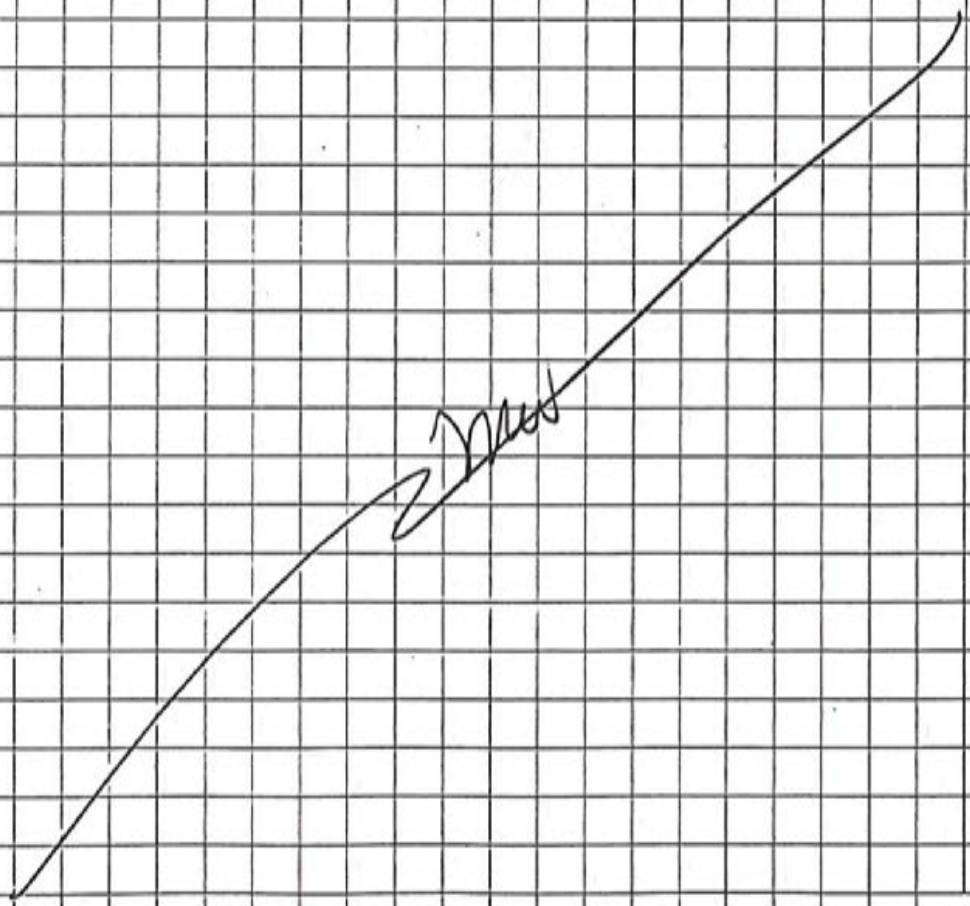
10/24	5A	10:15
	5B	10:19
	5C	10:24
	4C	13:15
	4B	13:20
	4A	13:25
	2C	13:35
	2B	13:40
	2A	13:45
	3C	2:15
	3B	2:49
	3A	2:58

(used #9)

(found bentonite from boring on edge and did not incorporate)



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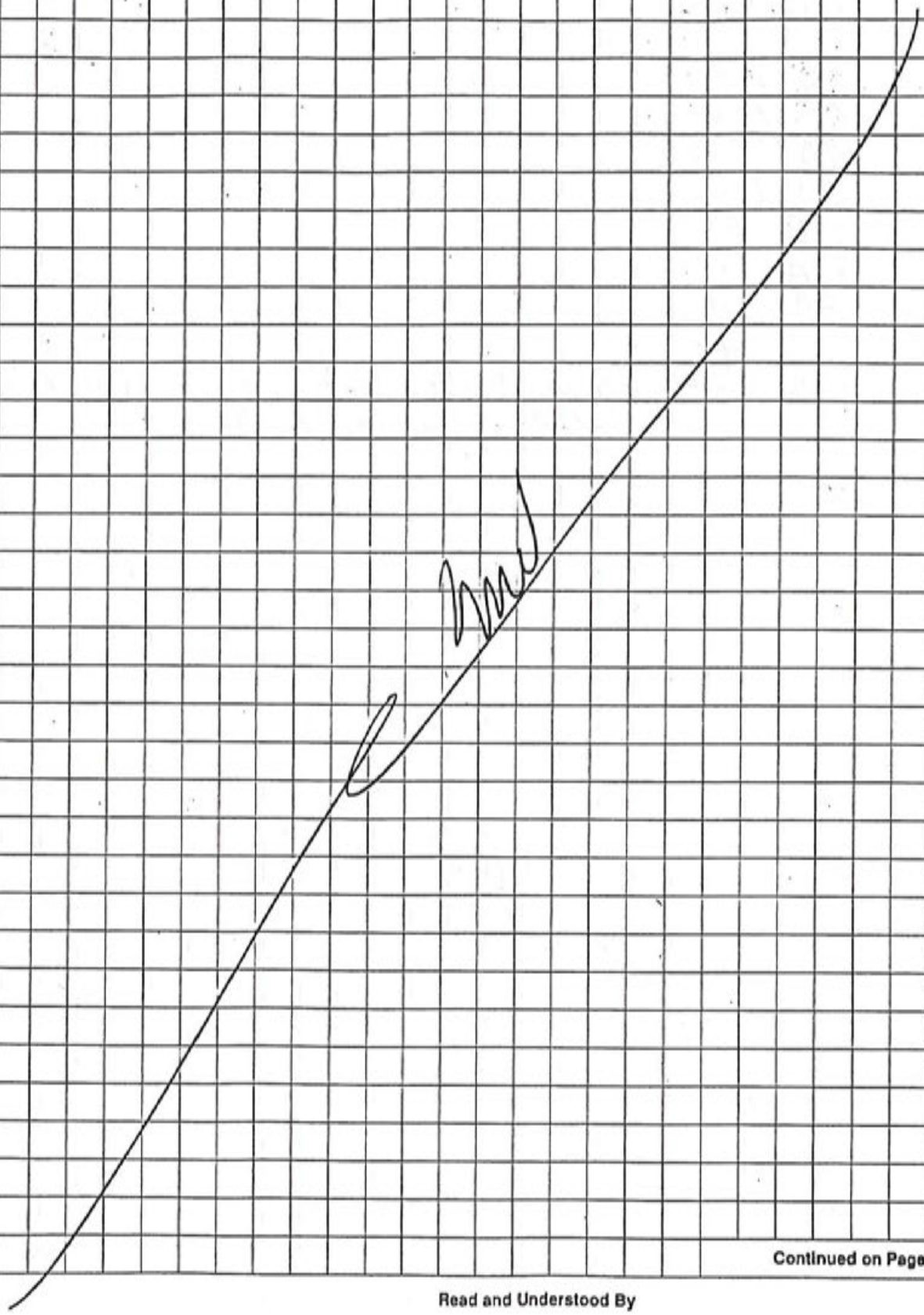

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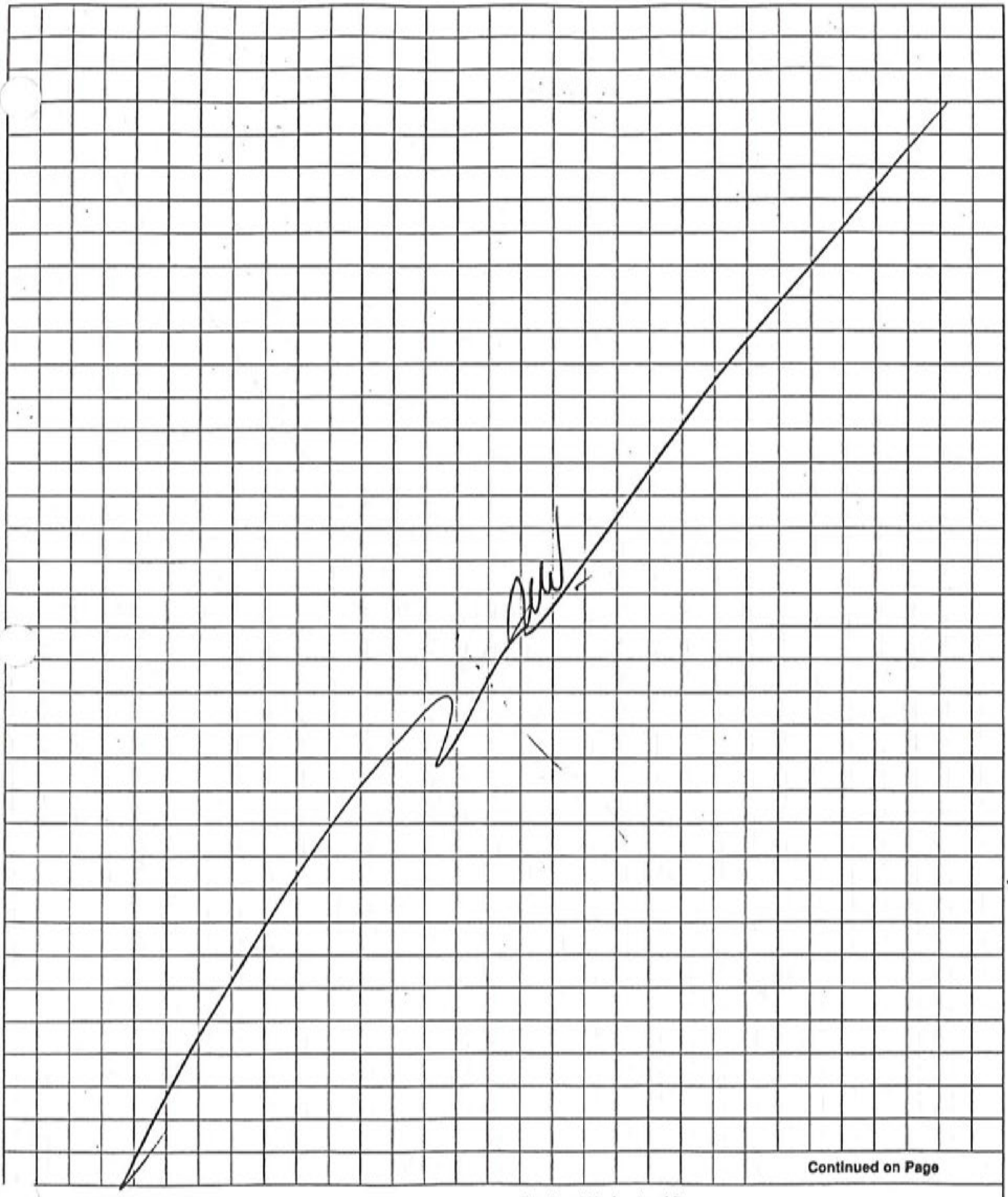

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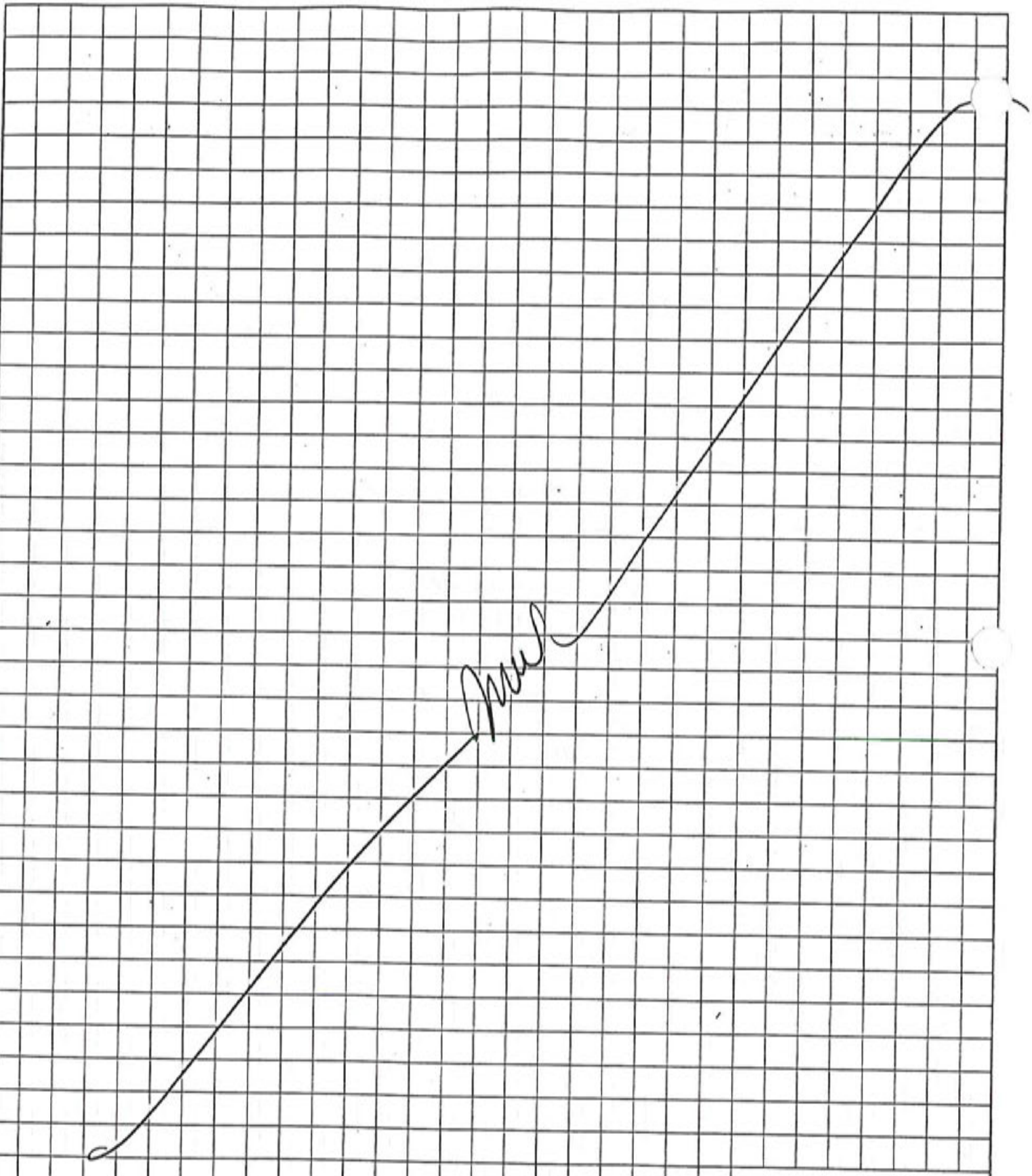

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Read and Understood By

Signed	Date	Signed	Date

9/24/97

0800 Batch #1 DDT Lot #7H2308

SAMPLE JARS 4oz for FR set are Lot G7195030

Sample		Abs 1	Abs 2	X	C2/NC	Interpretation
NC		1.55	1.50	1.53		
C1	(0.8)	1.09	1.20	1.15		
C2	(4.0)	0.82	0.92	0.87		
C3	(40)	0.64	0.57	0.60		
45B2		0.32				45B-2 > 40 ppm
45C1		1.35				45C-1 < 0.8 ppm
45A-4		0.53				45A-4 > 40 ppm
45B-3		0.37				45B-3 > 40 ppm
23A-5		0.60				23A-5 = 40 ppm
23B6A		1.41				23B6A < 0.8 ppm
23B6B		1.52				23B6B < 0.8 ppm
23B7		0.36				23B-7 > 40 ppm
23C8		1.44				23C-8 < 0.8 ppm
LCS-1		0.65				4 ppm < LCS-1 < 40 ppm
W1-3		0.92				0.8 ppm < W1-3 < 4 ppm
W4-5		0.50				W4-5 > 40 ppm
WCan 6		1.62				W Can 6 < 0.8 ppm

0800-0900 Dawg G & Kent E extract samples collected on 9/23/97 by Dawg G & Mike W

0900-1030 Kent E. performs DDT Analysis

1045 Begin chlordane tests

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Read and Understood By

Signed Date Signed Date

Chlordane Batch 1

11[35] Lot # 7F6189

Sample	Abs 1	Abs 2	X	C1/NC	Interpretation
NC	1.19	1.25	1.22		
C1 (18ppb)	2.84	0.90	0.87		
C2 (86ppb)	0.52	0.56	0.54		
C3 (512ppb)	0.24	0.28	0.26		
45 B-2	0.78				18ppb < 45 B-2 < 86 ppb
45 C-1	1.03				45 C-1 < 18 ppb
45 A-4	0.81				18ppb < 45 A-4 < 86 ppb
45 B-3	0.86				45 B3. ≤ 18 ppb
23 A-5	0.78				18ppb < 23 A-5 < 86 ppb
23 B-6A	0.64				18ppb < 23 B-6A < 86 ppb
23 B-6B	0.89				23 B-6B ≤ 18 ppb
23 B-7	0.61				18 ppb < 23 B-7 < 86 ppb
23 C-8	0.94				23 C-8 < 18 ppb
LCS-1	0.22				LCS-1 > 512 ppb
W1-3	0.16				W1-3 > 512 ppb
W4-5	0.41				86 ppb < W4-5 < 512 ppb
W Can-6	0.90				W Can-6 < 18 ppb

12[15] - 13[15] Lunch

13[15] - 16[00] Homogenize samples, extract samples

16[00] Begin Batch 2 DDT

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Read and Understood By

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16th DDT2, Lot # 711308

Sample	Abs 1	Abs 2	$\bar{X}$	C2/NC	Interpretation
NC	2.36	2.48	2.42		
C1	1.82	1.81	1.82		
C2	1.42	1.41	1.42		
C3	0.86	0.90	0.88		
9-A-1	1.16				4ppm < 9-A-1 < 40 ppm
9-B-1	1.18				4ppm < 9-B-1 < 40 ppm
9-C-1	0.98				4ppm < 9-C-1 < 40 ppm
8-B-1	0.75				8-B-1 > 40 ppm
8-C-1	0.82				8-C-1 > 40 ppm
7-B-1	1.09				4ppm < 7-B-1 < 40 ppm
Field Dup < 7-C-1	1.40				*4ppm < 7-C-1 < 40 ppm
Field Dup < 7-C-1	1.41				*4ppm < 7-C-1 < 40 ppm
6-B-1	0.95				4ppm < 6-B-1 < 40 ppm
Field Dup < 6-B-1	0.93				4ppm < 6-B-1 < 40 ppm
6-C-1	1.61				0.8ppm < 6-C-1 < 4 ppm
5-B-1	1.03				4ppm < 5-B-1 < 40 ppm
Lab Dup < 5-C-1	1.02				4ppm < 5-C-1 < 40 ppm
Lab Dup < 5-C-1A	0.99				4ppm < 5-C-1A < 40 ppm
LCS-1	1.02				4ppm < LCS-1 < 40 ppm

* - May be ≈ 4ppm

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Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

17[57] Chlordane, Batch 2, Lot 7H23D08

Sample #	Abs 1	Abs 2	X	C2/NC	Interpretation
NC	2.18	2.21	2.20		
C1 (18ppb)	1.78	1.77	1.78		
C2 (86ppb)	1.29	1.34	1.32		
C3 (512 ppb)	0.62	0.71	0.67		
9-A-1	1.09				86ppb < 9-A-1 < 512ppb
9-B-1	1.88				9-B-1 < 18ppb
9-C-1	1.60				18ppb < 9-C-1 < 86ppb
8-B-1	1.41				18ppb < 8-B-1 < 86ppb
8-C-1	1.33				18ppb < 8-C-1 < 86ppb
7-B-1	1.18				86ppb < 7-B-1 < 512ppb
7-C-1	0.82				86ppb < 7-C-1 < 512ppb
7-C-1	0.95				86ppb < 7-C-1 < 512ppb
6-B-1	0.06				6-B-1 > 512ppb
6-B-1	0.09				6-B-1 > 512ppb
6-C-1	1.35				18ppb < 6-C-1 < 86ppb
5-B-1	0.99				18ppb < 5-B-1 < 86ppb
5-C-1	0.12				5-C-1 > 512ppb
5-C-1A	0.11				5-C-1A > 512ppb
LCS-1	0.64				LCS-1 > 512ppb

1845 Finish Tests
1850-1930 Extract Batch 3 Samples with Dexy 6

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Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

9/25/97

0800 DDT Batch 3, Lot 7H23D88

Sample #	Abs 1	Abs 2	X	C2/NC	Interpret/Tic
NC					
C1					
C2					
C3					
5-C-2					
5-B-2					
5-B-3					
5-A-3					
3-C-1					
5-A-3					
7-A-1					
3-C-1A					
4-B-1					
5-A-1					
5-A-1					
6-A-1					
3-B-1					
8-A-1					
LCS-1					

9/25 PTT BATCH 4

9/25 Chlordane Batch 3

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9/25 DTT Batch 5

9/25 DTT Batch Practice for Mike Webb

9/25 Chlordane Batch 4

9/25 Chlordane Batch 5

9/26 DTT Batch 6 7:10

9/26 ~~DTT~~ Chlordane 6 7:40

Continued on Page

DDT Batch 7 10:58 M. Webb
Rejected due to poor calibration duplicates

DDT Batch 8 11:00 K. Easthouse

Chlordane Batch 8 11:50 K Easthouse

DDT Batch 7 12:45 M. Webb

DDT Batch 8 B00 K. Easthouse

~~DDT~~ Chlordane Batch 7 13:40 K. Easthouse

Continued on Page

Read and Understood By

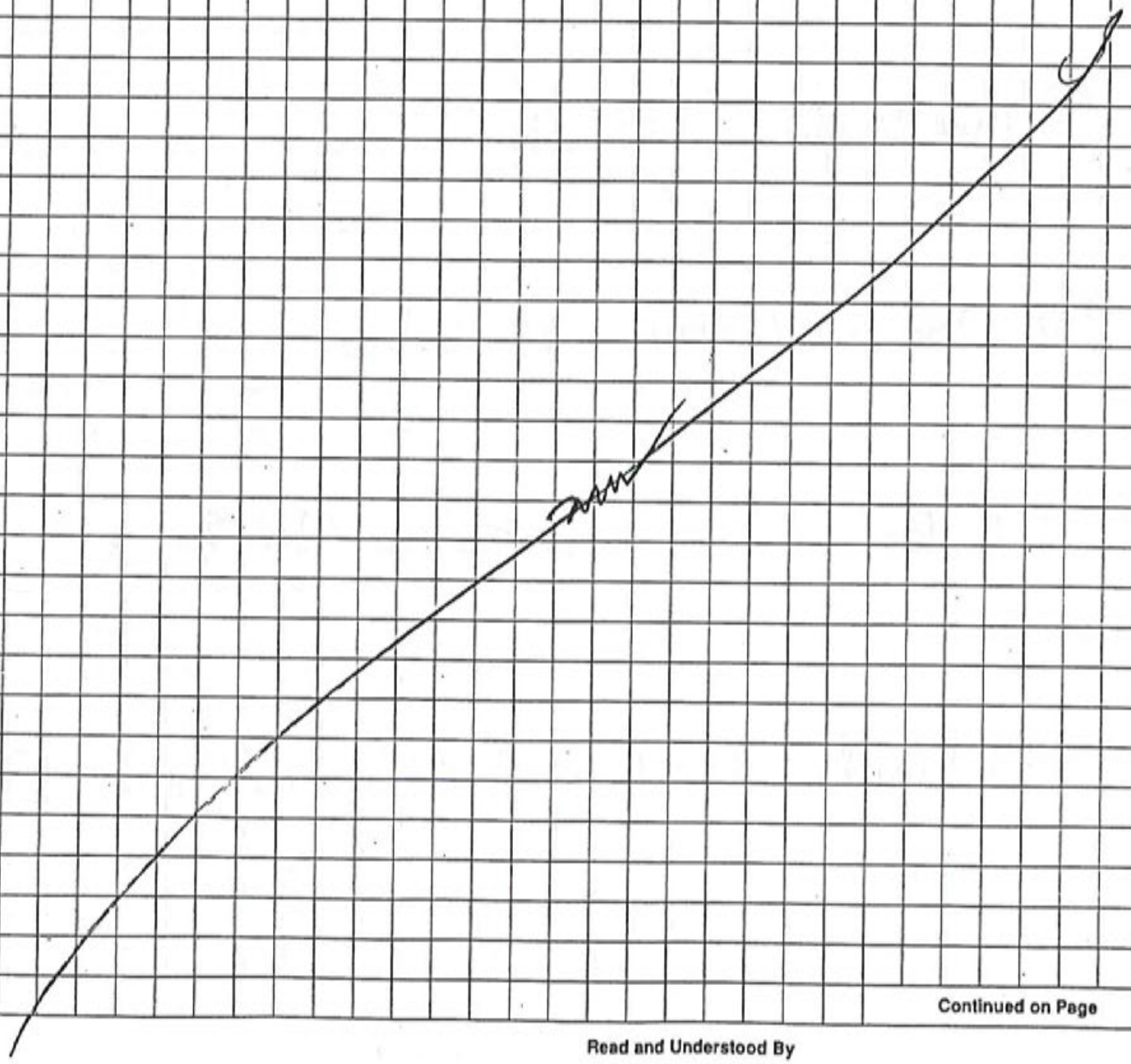
Signed Date Signed Date

PROJECT _____ Notebook No. _____

Continued From Page _____

DDT Batch 9 14:30 Kent Easthouse

Chlordane Batch 9 17:00 Kent Easthouse



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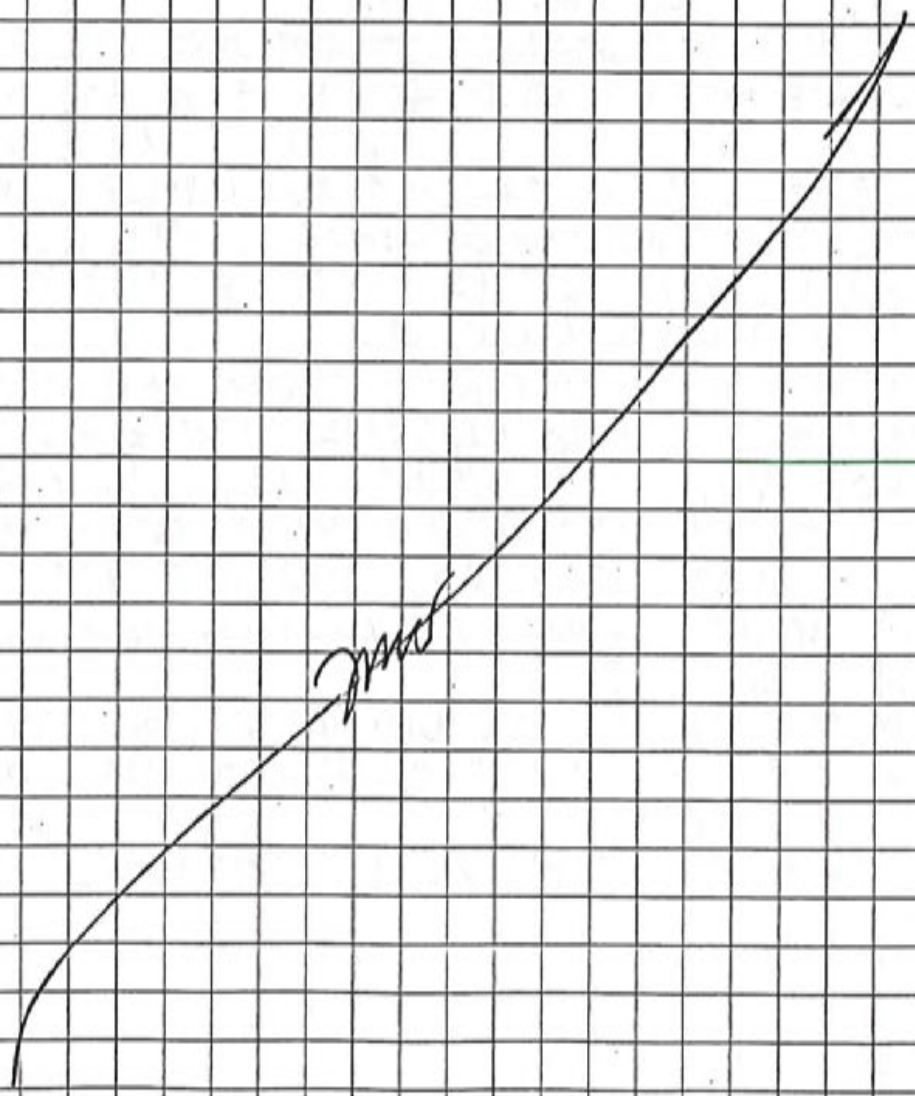
Read and Understood By

Signed	Date	Signed	Date

9/29 Extracted batch 10 2:00

DBT: Batch 10 : 4:30 MW.

Chlordane Batch 10 : @ 20:00 MW



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Read and Understood By

Signed	Date	Signed	Date

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10/13 extracted Batch 11. Diluted LCS x5.

10/14 DDT Batch 11 8:30

Color did not develop: checked reagents and decided that I used the wrong reagents. In case it was contamination, I threw out the repeating pipette tips.

DDT Batch 11 rerun 10:40

Noticed that ~~C3 [illegible] appeared~~. Calibrator 3 after spiking in one ~~that~~ it appeared as though I had spiked the duplicate calibrator 3. Proceeded with spiking it again, believing in the pattern rather than the visual clue.

The double spike was clear after color development. Hence that calibrator is @ 80 ppm rather than 40. The colors for the other standards did not look good though.

10/14 13:30 I rediluted LCS4 to ~~[illegible]~~ 1:1 with 250 uL pipet (4 of each LCS4 and methanol)

10/14 Then the calibration for DDT was decided not to be acceptable, especially for high results.

Ran the chlordane batch 11. It was a good calibration

Continued on Page

Read and Understood By

Signed ________ Date ________ Signed ________ Date ________

10/15 Warmed room with heater in morning. Set up and ran batch 11 screen. got an acceptable calibration.

10/23/97 extracted batch 12 with Kent EastHouse @ 29:00 min
Calibrated scale + Photometer @ 21.3° Photo - 0.72
DDT Batch 12 Kent EastHouse
Chlordane Batch 12 Mike Webb

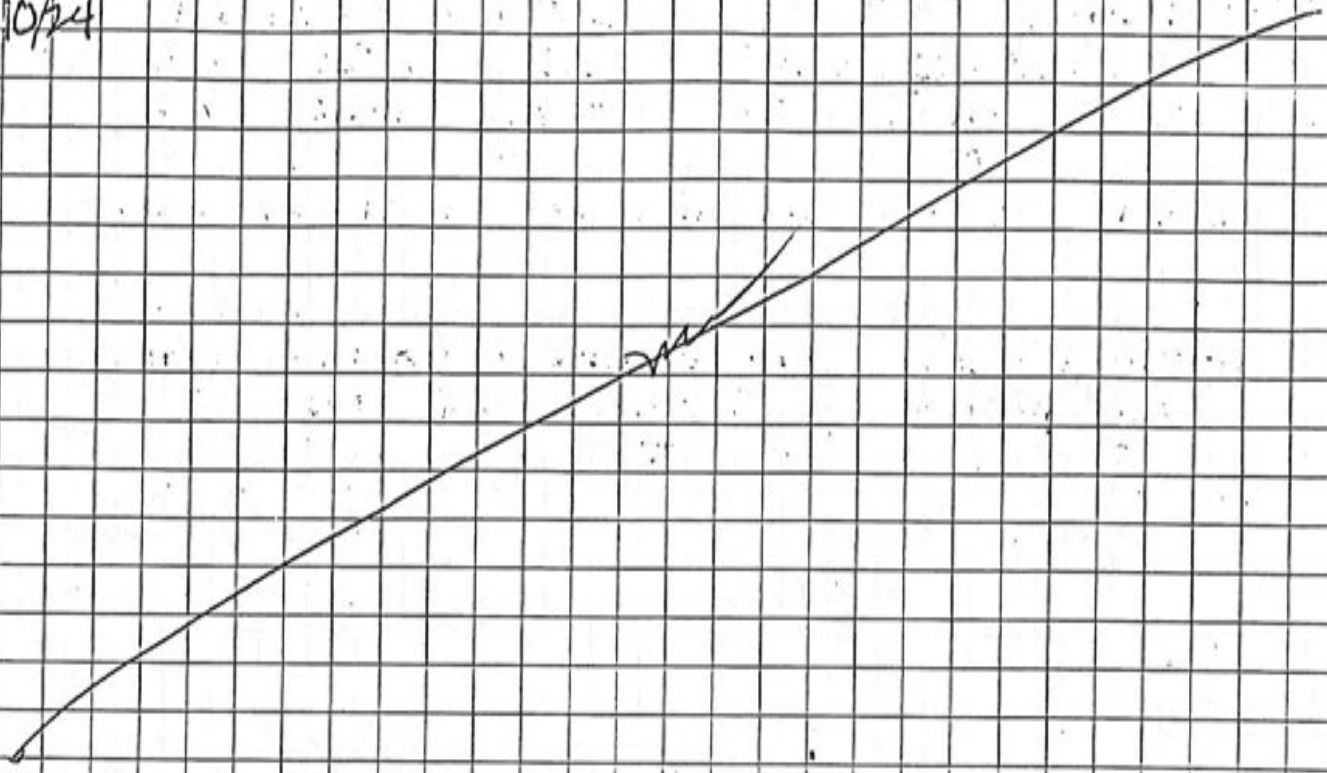
10/23/97 Extracted 4 sidewall samples for Batch 13 @ 23°

10/24/97 Calibrate scale & photometer. Photo reads 0.74
Extracted Batch ~~12~~ 13E, 13, 14, 15 Kent
DDT Batch 13 Kent
Chlordane Batch 13 Mike
DDT Batch 14 Kent
Chlordane Batch 14 Mike
DDT Batch 15 Kent
Chlordane Batch 15 Mike
Make new LCS, LCS6, dilute 2X Kent

Continued on Page

* New LCS6 2X reads better than LCS52X, maybe LCS52X Was contaminated

10/24



10/29 Diluted LCS 6 1:1 to create new solution LCS6X2-10/29

Extracted sample 4AC to create a duplicate
Rest of solutions are extracts from Batch 14 & 15 (10/24).

11/3 Used LCS6X2 from 10/29
Extracted 4 samples + 1 field FD

DAT Batch 17
extracted 4A1, 4B1, 4C3, 4A3, 4A3-2
4A3 is pebbly, may be inhomogeneous.
When I pipetted 4A3-2, the pipette tip seemed to be sticky; it vibrated and may not have returned very well.

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

11/03 DDT/Chlordane Batches 17/18 – extracted the 8 sidewall samples plus one additional field duplicate to evaluate problem both FD in Batch 17 DDT. Added 4th column of 4 samples to Chlordane batch (hence "Batch 17 & 18")

The rerun of HA3 and HA3-2 shows evidence that the solutions are truly different, showing inhomogeneity for DDT. Chlordane test however was excellent for this pair.

LCS in DDT Batch 18 is 70% high. Calibration is good so there is little explanation.

Deconned 9 bowls and 20 spoons.

11/4 Set up for sampling the bottom of hole final confirmation samples and rinsate blanks. Sampling plan calls for the following:
9 samples
1 field dup
1 Rinsate Blank

11/17 Deconned 7 bowls. Also set out 2 2L precleaned jars for homogenizing samples. Kim Conyers said that a rinse blank will not be required because the last one came out all ND.

Set up DDT calibration set up. Extracted 4B, 9A, 9B, 9C, 1AW, 1BW, 7AN, 8AN sidewall samples extracted LCS/D diluted 1:1

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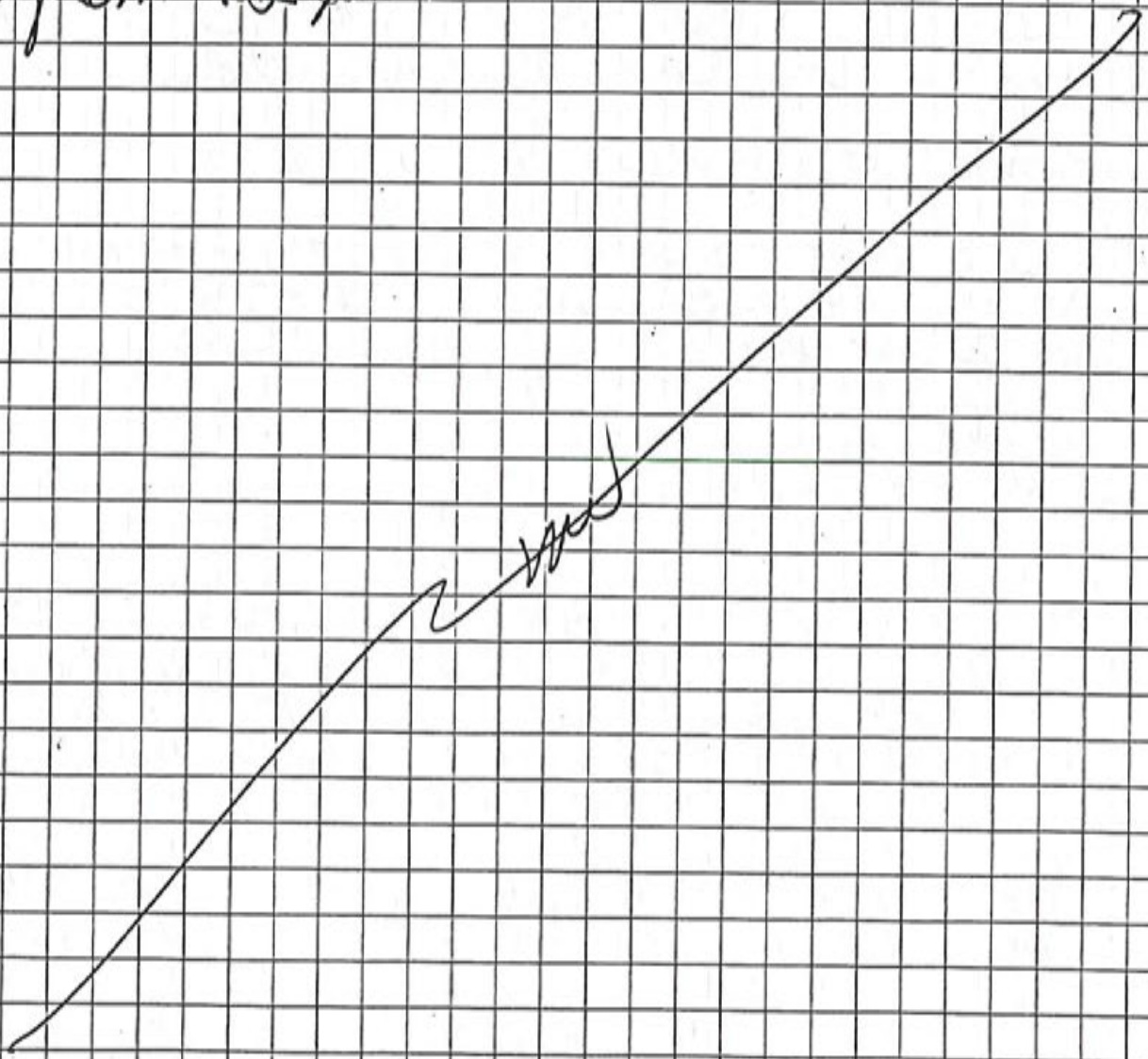
4/30 extracted FC3 (re-sampled) for 4A, 8A and 8A deep sample. Had 4 tubes left including * one that had been pipetted with diluent during Batch 19 setup, but not used. This tube was assigned to the 8A deep sample. A single calibrator at 4 ppm DDT was analyzed. Result for this calibrator with the same slope as calibration Batch 19 was forced to be 4 only adjusting the intercept (down to 1.07 from 1.12).



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Read and Understood By

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"Rite in the Rain®"

ALL-WEATHER

TRANSIT

Notebook No. 301

TASK ORDER #38:

WENATCHEE TREE FRUIT

RESEARCH & EXTENSION

CENTER

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

Name _____

_____

Address _____

_____

Phone _____

Project _____

_____

_____

_____

Yellow Polyethylene Protective Slipcovers (Item #31) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation.

CONTENTS

PAGE	REFERENCE	DATE
	WSU - Kleengelden	
	Dennis O'Neil 562-4200 ext 213	
	mobile 499-1712	

9-15-97

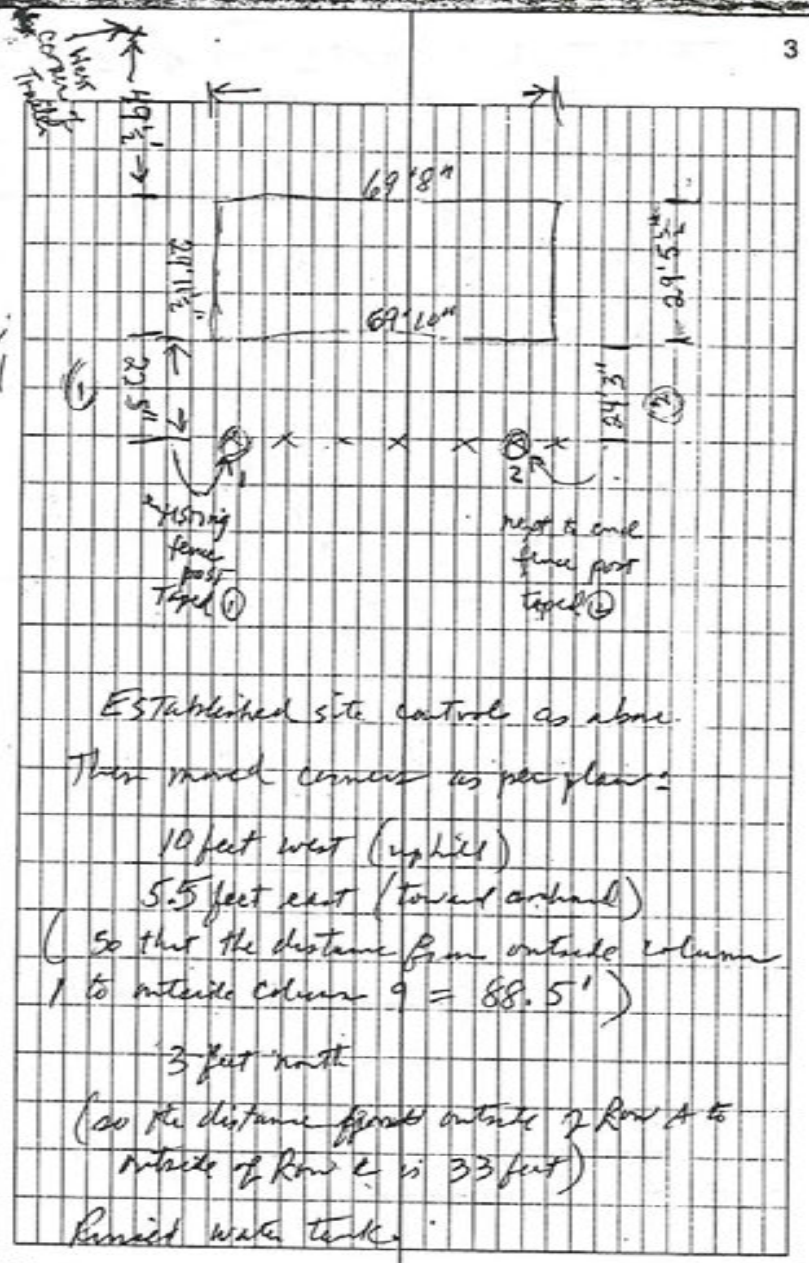
Depart Seattle 5 AM.
Arrive Wenatchee 8 AM.
Mtg - orientation at HQ's 8-8:45 AM:
Dick Bishop, Don Elving, Craig Root, GSA, Greg Gervais

10 AM - Begin fence dismantling
12:45 Lunch
12:45 - 5:30 All posts removed. Temporary fence established. Site controls in place.

Coordinated with Chelan County PUD at request of Dick Bishop. Spoke with Kerry Newbury 663-8121 ext 4253
(509) 664-4872
Regents letter of credit for GSA account
Will begin Semis to our trailer 9/17.
We must request the Switch back to WSU.

Dick Bishop 662-4813 (pager)
Greg Gervais (206) 601-0243 (cell)

Bill McCarty (253) 395-0501 GE Capital
Modular - continues to express difficulty in providing office/lab Trailers as promised.

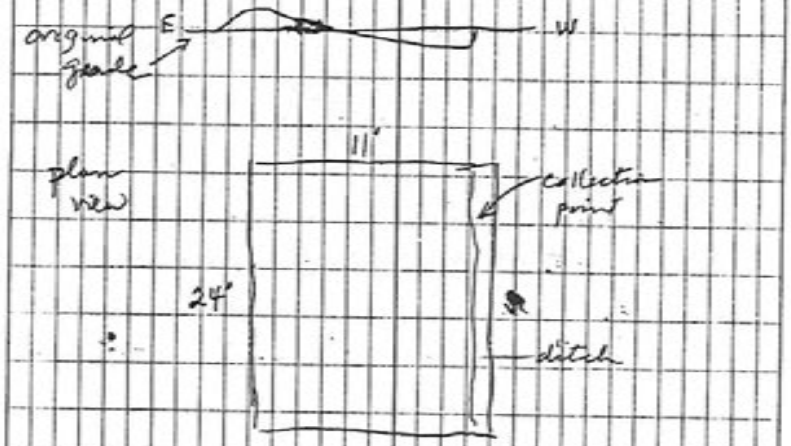


6-7pm paperwork

9-16-97

7:15 am at site
7:30 Safety Mtg
7:45 Began with weedeater & 555-D. Hose used to wet surfaces & keep dust down.
9:40 Informed that pipe on SW edge of plot boundary is not in use & can be destroyed if need be.
10:15 Waste mgmt delivered solid waste dumpster.
Loaded debris in dumpster, re-secured fence
11:30 Lunch
12:00 moved, fencing. Finished debris
1:45 Loaded shack successfully on flat bed/low boy.
2:00 Screened scraped shack soil (beneath shack's location). Surface screening in several locations, using PID.
Specifically screened the soil in front area (where benzene was over stored in shack). All readings were zero.
Soil was dry silty sand with occasional coarse gravel near front

2:10 Began construction of temporary decon pad.



4:00 Again phone GE Capital Modular Space regarding trailers. Two trailers were not delivered yesterday as originally agreed. One trailer was not delivered by 4pm today as was agreed yesterday. They continue to assure us the trailer is on its way. We told them we would be on site at 7:30 am Weds. We expect one trailer to be waiting for us. The second to arrive at noon.
4:20 Secure site & depart. Shed departed at 4pm

7:30 pm Receive 10x24 trailer (Fred).

9-17-97

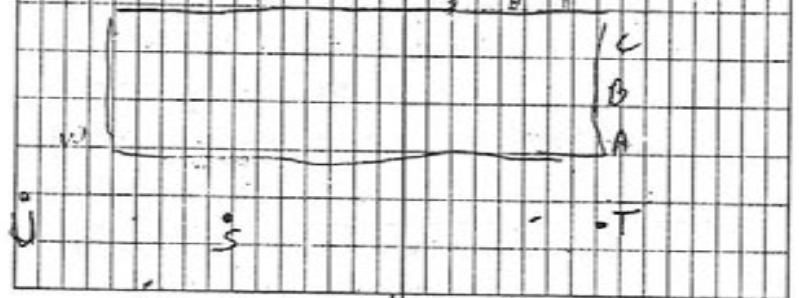
7:30 Safety mtg - glasses, spikes while raking
8:40 Arrival of relay boxes.
Rake test plot.
Stake & measure test plot.
String & label areas.
Label fence to identify areas easily (1-9),
Flagged spikes with blue tape.
Outside stakes painted orange (columns)
Blue stakes outside edge of fenced removal
Yellow stakes in middle of plot designating row demarcation

Phone calls to GE Capital initially indicated 10x32 trailer with "wet well" still in Englewood due to high winds. Mid morning call confirmed driver with trailer on its way to Site.

All Weld crew will return Monday morning at 6 AM with two more boxes and a rig which can drop a trailer, thereby allowing placement of all trailers in more exact locations (with "tighter" fit). It will require the one trailer still containing dirt with them.
Two more boxes anticipated to arrive Tomorrow A.M.

1:00 Reestablish control points (refer to bottom of page)
11:55 Receive 2 refrigerators
~~2:45~~ Make dinner
3:45 Phone company arrives (664-8936)
4:40 Phone departs
Put depots with hose
5:10 Attempted unsuccessfully to contact trailer driver by phone.

ST = 79'10"
SW = 19'11"
WT = 81'0"
UW = 48'9"
XT = 20'9"
SX = 82'10"
UY = 131'3"



S pt., U Marked with Blue Tape on EXISTing Fence.

9-18-97

7:45 Phoned trucker hauling office trailer. He was stopped in Umatilla OR yesterday by high winds. Expects to be here by 1PM today. Phoned electrician to request work at 1 PM

-8:40 2 roll off bins arrive. Out of necessity bins placed in such a way that tops open (hydraulically) opposite to our needs. When the Monday delivery of roll offs arrive, the tractor will be able to reposition these properly as well.

2:30 Office trailer arrives. It is somewhat dirty inside - swept out. Driver does not have keys. He will mail them FedEx tomorrow; next day delivery. We will receive them Monday.

4:00 Electrician arrives to hook up power to trailer.

4:45 Mike picks up & delivers project sign to site.

9-22-97

5:50 am Field opens site.

6:05 Receive 2 additional roll off boxes.

Juggle boxes around

8:25 H&S mtg

8:40 Prep mtg

9:10 Placed sign (project) on S side office entrance

9:25 Open pit signs installed.

9:45 Adjusted location of decon pad moving it 10 feet or so south.

10:30 Site organization & begin excavation

Began at upper area (#2/3)

Soil is sandy loam. Placed plastic around receiving roll off box (#1)

Placed plastic under receiving bucket of the LBH used as transfer vehicle.

Roll off box scheme:

Funnel Area #2/3	0-18"	Box 1
	18"-bag	Box 2
	Bag-below	Box 3
Funnel Area 4/5	0-18"	Box 4
	18"-bag	Box 5
	Bag-below	Box 6

Dust suppression with hose misting

Dust monitoring in cab of backhoe

11:40 Descovered tops of 3 bags at approximately 18" (±3").
G. Cervia (USACE) concurred that we deviate from SOW in Area 2/3. Now to excavate this area in 2 lifts (0" + top of bag; top of bag to 6" below bag).

12:30 Completed 0" top of bag in Area 2/3. All soil taken from this excavation placed in Rollgy #1. Rollgy sealed. Both buckets rinsed clean. Rinsewater drained into excavation hole.

12:45 Lunch

1:50 Resumed in Area #4/5

2:55 Uncovered a bag at approximately 18" (±3") below ground surface. Greg Cervia agreed that we now handle this Fenced Removal Area (4/5) in a similar fashion to Area 2/3, i.e. 0" top of bag in one container, top to 6" below bag in a second container. Soil from this area (4/5) 0 - top of bag is being placed into container #4.

3:30 Completed work for day. Excavation with subsurface test pit yielded bags of pesticide at less than 12" bgs. Excavation stopped at spot where pesticide product was evident. These bags are apparently buried at a shallower depth than expected. This may be due to wind erosion (predominant wind north to south).

4:30 Apple City Electric responded to an urgent request for service - power in office trailer was shorting out regularly all day. Allen discovered a faulty 80-amp breaker in trailer which he replaced. GE Capital not only provided trailer late, but in addition lab trailer has no air conditioning as requested & office trailer has faulty electrical.

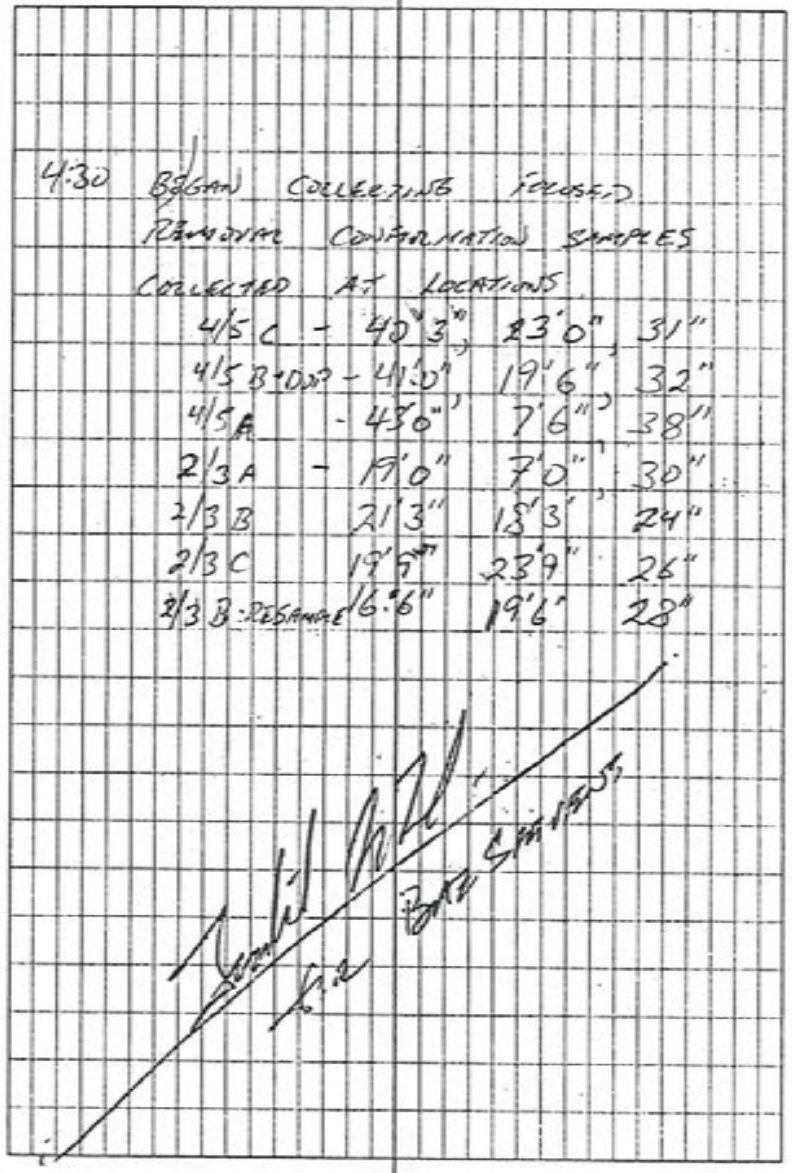
9-23-97

7:05	H₂S mtg. Respirator use. Communications
7:20	Commence excavation in Former Removal Area 4/5. Soil deposited in rolloff Box #6. (Full) 6" below bag bottom appears to be at approximately 38" bgs. at the South end of F.R. Area 4/5.
9:30	Break
10:00	Begin Area 2/3. Excavate approximately 34" in depth (±6" below bottom of bag) Soil placed in Rolloff Box #3
11:45	Complete excavation
12:00	Complete decon of vehicles
12:10	Complete cleaning out of former area for push sampling rig
12:15	lunch break
1:15	Back hoe depart
2:50	Begin sampling efforts (4 bores, trench comp, F.R. area - 6 samples). Agree Rolloffs #3, 6 & 1 are "Full". Rolloff #4 is "3/8 Full".

4:30 BEGAN COLLECTING CLOSEOUT CONFIRMATION SAMPLES

COLLECTED AT LOCATIONS

4/5 C	45'3"	23'0"	31"
4/5 B+DUP	41'0"	19'6"	32"
4/5 A	43'0"	7'6"	38"
2/3 A	19'0"	7'0"	30"
2/3 B	21'3"	15'3"	24"
2/3 C	19'5"	23'9"	26"
2/3 B: RESAMPLE	16'6"	19'6"	28"



9-24-97

645 Set up
700 H&S mtg
730 Summit arrives & sets up.
830 Bentonite delivered
850 Begin post sampling effort at 9A. Uniform homogeneous isotropic layer (Glacial Lake Mesomile)) comprising equally across the 0-3 and 3-6 foot depth.
930 Decon procedures discussed.
Potable water - alconox scrub - final rinse.
940 9D Location determined core by core per grid, seeking potentially more contaminated locations. Agreed that we will divide the recovered column into thirds.
1000 9C
Agreed with Greg G. as to locations for core drilling of all 27 grids. Marked with blue X paint.
SEE NOTES on SAMPLING FIELD BOOK
600 pm Push Sampling complete. Decon. Rinsate sample collected.

9-25-97

7:00 Begin temp. checks
7:15 H&S mtg
Continue with lab work.
11:00 Establish exact sampling location
Establish corners of former removal area:

FRA 4/5

	X	Y
NE	4'9"	4'3"
SE	46'9"	28'0"
NW	35'0"	4'0"
SW	36'9"	28'3"

FRA 2/3

NE	22'9"	4'9"
SE	24'0"	27'9"
NW	12'9"	5'0"
SW	14'0"	29'0"

1pm Spoke with Jill Weakley of GE Capital Modular Space and formally recorded GSA's complaint regarding office (178965) and lab (865139) trailers.

Continued with lab work.
Prepare CRC Report.

10/13/97

0530 Open trailer. Observe 4 rolloff boxes delivered on Friday 10-10. Do not see additional rolloffs thought to be delivered on Saturday.

0900 H&S mtg

0700 Brian arrived (driver with 2 boxes) Feeling ill. Spent next 2 1/2 hrs moving 3 full boxes (1, 3, 6) to designated storage area and placing empty boxes as directed.

0930 More heavy machines (Ford 555D and John Deere 624(G) and begin work. (Top 5 feet Column 9-5).
Column 6 to Box #2
Column 8 & 9 to Box #7 [illegible]
Column 9, 8 to Box #8
Box #7 & 8 holding soils from Column 8 & 9
Remaining space in Box #10 for Column 8
Column 7 begun in Box #5

205 Lunch

100 Resumed with column 7
Column 8 - 3 & 4 foot depths Box #9 & #10

230 Long discussion / [illegible]
Trash cans disposed as solid waste after emptying contents in Box #5

Columns 6/7 (2 feet) in Box #11 & #12
~~[illegible]~~ Column 5 in Box #13 & #14

1830 Stop for Day Box #14 partially full

10-14-97

0730 Drum equipment & keep site.

1000 Conversation with Ralph T. and his need for GSI to write letter to USACE expressing willingness to extend Optional Item) award period to 10/31.

1045 Conversation with Brian Dick, WDOE about waste designation. He will phone Chris McDonald to help Philip become comfortable with their waste profiling. (509) 525-2477

1245 Conversation again with Brian Dick regarding waste codes.

1100 Conversation & discussion with Kyle L. re waste stream designation. Agreed to take 2 composite samples and 1 duplicate sample from the 10 boxes comprising what we believe to be the Non Designated waste stream. These will be analyzed for Total OC, Total OP, carbamate, paraquat and TCLP metals.

(206) 204-2087

1330 Spoke with Chris McDonald, Philip. Agreed on establishing 4 waste categories:

① WT01 / WP01 for incinerators

② WP01 / WP01 / state designated – Subtitle C

③ D012 / chlordane TCLP – incinerator

④ Non regulated waste – Subtitle C.

He will find out when the receiving facilities can accept waste (i.e. a BOL will work for non designated wastes) so we can plan for shipping.

1340 Phoned Kevin Allen re: probability of rolloff boxes here by Thursday P.M. She expressed very low confidence that this will happen (i.e. 10 boxes will be there).

10-23-91

0500 Trucker arrives. Difficulty placing roll off boxes. Loader bit, heavy boxes, truck size not optimal.

0830 Duke Bishop wants 5/8" – (4" thick) to replace/resurface where loam pad was. Also wants us to lay dressed lawn where heavy equipment was stored. (Cold temperatures ~ 40°)

0930 New loam pad construction.

1015 Commence excavation w/ column 1. Column #1 in Box #15.

1030 Truck breaks hydraulic seal. Unable to continue moving roll off boxes. Some dirt in Box #4 removed and placed in Box #15. Column #2 also in Box #15.

(Box #15 = Columns 1/2 + some from Box #4)

1205 Lunch

Crown drops 2 boxes on site.

12:50 Resume excavation Columns 1/2 Placed in Box #16 and Box #14

2:30 Column 4 in Box #17

3:30 Column 5 in Box #17 & Box #18

5:30 Complete Row 5. Begin clean up scraping of 1A1 and Column 6/7.
Place small amount of soil in Bin #19.
615 Mike stating sampling
630 Stop heavy equipment
715 Sampling complete. Begin setting up for 1AA.

10/29/97

0705 H&S mtg. Plan for day 6244G and 9410-D
0800 Excavate Column 4 FR top 3' placed in Bin #19
0900 Excavate first 2 feet of Column 3 place in Bin #20 & Bin #21
1000 Excavate feet 3 & 4 Column 3 place in Bins #22 & #23
Excavate 5-foot level Column 3 place in Bin #24
Excess 5-foot Column 3 into Bin #21
1330 TA extra 3" placed in Bin #19
1530 Sample waste bins. Composites created (refer to Sampling Field notes)
A - Bins 5, 11, 12
B - Bins 13, 14, 18
C - Bins 15, 16, 17, 19
D - Bins 20, 21
E - Bins 22, 23
F Bin 24
1635 Labeled bins
1730 Covered test pit with visqueen
Secured site & decon pad

03 NOV 97 WTFREC 40-50°F

OCCASIONAL LT RAIN

PT CLOUDY

0800 - SAFETY REVIEW. FRED LUCK (GSA)
J.A. BRADDOCK (GSA) MIKE WEBB (GSA)
KIM CONVERSE (OSACE) WALLACE REID (KLEINFELDER)

0850 - CLEANED UP SEDIMENT W/IN DECON PAD, BEGAN PREPING SITE FOR MANUAL EXCAVATION.

0945 BEGAN EXCAVATING IN COLUMN 4
REMOVED ±6" FROM FOCUSED REMOVAL SIDE WALL AND ±3" ±[illegible] BOTTOM OF FOCUSED REMOVAL. BEGAN SELECTED SIDEWALL EXCAVATION.

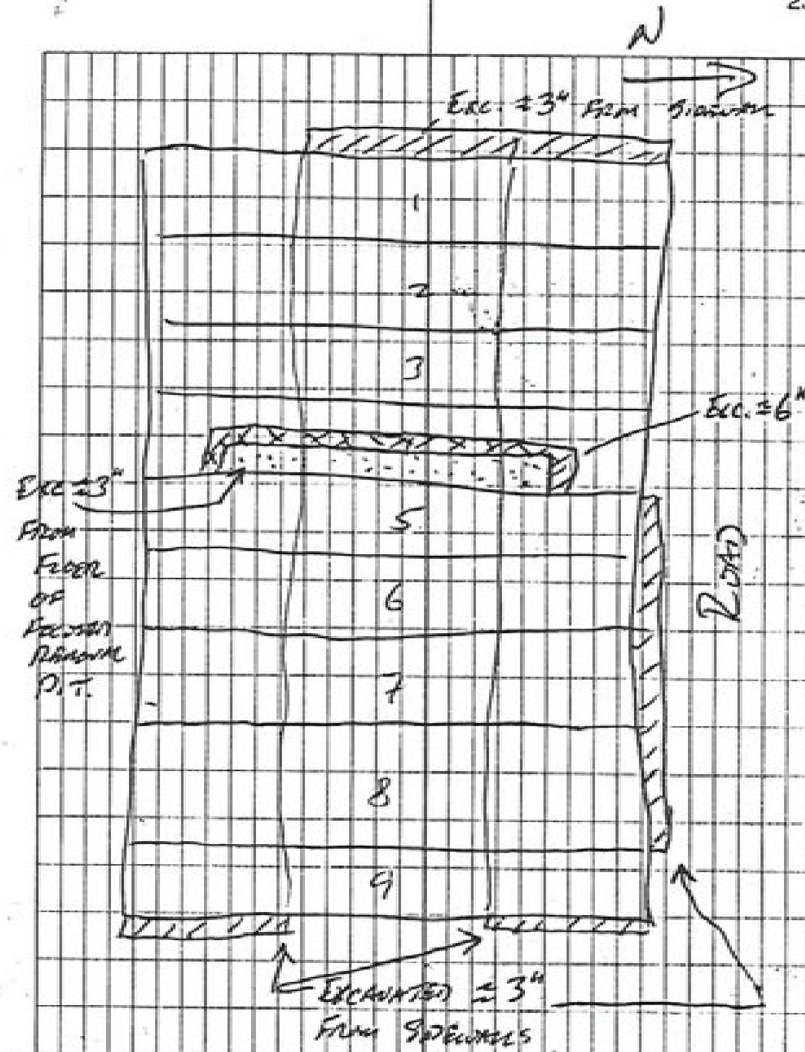
1245 COMPLETED COLUMN 4 EXCAVATION
MIKE WEBB BEGAN COLLECTION OF COLUMN 4 CONFIRMATION SAMPLES

1345-1415 ~~1345-16~~ LUNCH: BREAK.

1415-1600 CONTINUED SIDEWALL EXCAVATION.
FILLED 20-55 GALLON DRUMS + ±100 GALLONS INTO BW #19.

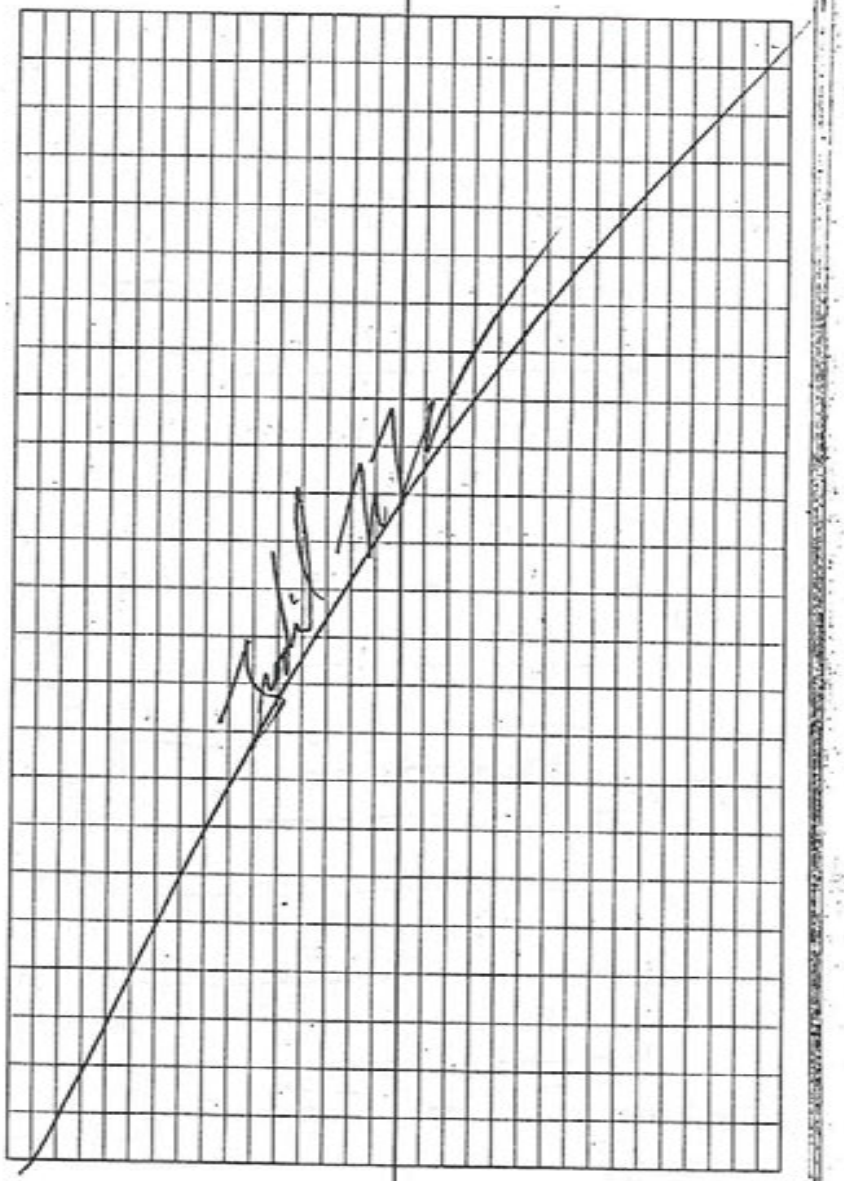
1600 OSACE BEGAN COLLECTING SIDEWALL SAMPLES.

1800 SECURED SITE.



04 NOV 97 WFREE 44-48° F
CLOUDY

0730 - 1A DATA REVIEW (MIKE WEBB, KIM CONVERSE, WALLACE REED & KYLA LYNCH.) IT WAS DETERMINED THAT THE EXTENT OF EXCAVATION APPEARED SATISFACTORY EXCEPT FOR THE SIDEWALLS OF 1A (WESTERN WALL ONLY) AND 1B. KIM INSTRUCTED GSA TO EXCAVATE 6" FROM THIS WALL & THEN COLLECT FIXED LAB CONFIRMATION SAMPLES. AN ADDITIONAL 1AA SAMPLE WAS DETERMINED TO NOT BE NECESSARY AT THIS LOCATION. USD WOULD PROVIDE
0900 BEGAN MANUAL EXCAVATION OF SIDEWALLS OF 1A AND 1B. RECEIVED APPROVAL FROM KIM TO HAVE MIKE BEGIN SAMPLING (FINAL CONFIRMATION SAMPLING), HE COULD START IN THE EASTERN CORNERS (9,8..) WHILE WE WERE STILL EXCAVATING IN "1".
1200 COMPLETED MANUAL EXCAVATION. FILLED 2 DRUMS + 400 GALLONS OF SOIL WAS



04 NOV 97 (CONT.)

~~1300~~ 1300	ADDED TO WASTE BIN #19.
1300	LABELED & SECURED ALL DRUMS. CLEANED & SECURED DECON PAD LINER. TYVEK BOOTIES WERE USED BY ALL PERSONNEL DURING THE REMAINDER OF THE DAY'S ACTIVITIES, AS NEEDED.
~1320	FINAL CONFIRMATION SAMPLING BEGAN
~1630	COMPLETED CONFIRMATION SAMPLING.
~1715	BEGAN SAMPLING OF GSA & SHANNON & WILSON DECON WATER.
1840	COMPLETED DECON WATER SAMPLING. BEGAN UPGRADING WASTE BIN STICKERS FROM "HOLD PENDING ANALYSIS" TO APPROPRIATE WASTE CATEGORY LABEL. ATTACHED MANIFESTS FOR NON-REGULATED WASTE BINS TO THE APPROPRIATE BINS THAT WERE READY FOR TRANSPORT. (BINS #4, 7, 8, 9)
2230	SECURED & DEPARTED SITE

~~16~~ 17 NOV 97

WTFREC

COLD ≈ 30
CLOUDY W/ TRACE OF SNOW ON GROUND

0730 PLANNED START. CREW DELAYED ONE DAY ON MOB DUE TO WEATHER

0820 BEGAN EXCAVATING ~6-9" FROM FLOOR OF 9B & 9C. ALSO ~1-2" FROM FLOOR OF 9A. USED BIN #25 (NON-REG HAUL TO ARLINGTON)

- CREW MOVED TO LOWER PORTION OF 4B FOR REMOVAL OF 8-12" OF SOIL FROM FLOOR
- CREW EXCAVATED 4-6" FROM SIDEWALL OF 8A & 7A (NORTH WALLS ONLY)
- CREW EXCAVATED ~8-12" FROM WEST SIDE WALLS OF 1A & 1B

~1200 MIKE WEBB BEGAN SAMPLING FROM COLUMN 9 . . . . .

1245 FINISHED EXCAVATING. CREW BEGAN STANDING BY FOR ~~THE~~ FIELD LAB DATA.

1500 RECEIVED FIELD LAB DATA INDICATING ELEVATED CONT. LEVELS ALONG N. SIDEWALL OF 7A & 8A. BEGAN OVER EXCAVATING ~~12-18"~~ 14-26" FROM THESE LOCATIONS.

2/11/98 [initials]

[signature]

[signature]

1545 OVEREXCAVATED 2-4" (± 1 BACKHOE SCOOP) FROM SITE OF W. END OF FORMER DECON PAD. FAG APPEARED TO SATISFY DENNIS (KLEINFELDER) & CRAIG ROOT (WSU) AND WERE OBSERVING ACTIVITIES AND DISCUSSING PLANS TO SAMPLE THIS AREA. USED BW #26 (NON-REG MAT)

1620 BACKHOE DEMOBED FROM SITE.

~1550 (LATE ENTRY) MIKE WEBB & KIM CONVERSE RESAMPLED SIDEWALL AREA OF 8A & 7A

18 NOV 97

WTHER @ 30-40°

P. CLOUDY

0800 DISPOSED OF RECYCLABLES AT LOCAL RECYCLING CENTER (BEHIND SAVMART).

0845 LABORATORY BREAK DOWN / SITE CLEANUP.

1615 DEPARTED SITE

03 DEC 97

W/ FREC — P. CUDDY

MID-LOAD 30's

1300 ARRIVED ON-SITE. CONTACTED DOUGLAS COUNTY SEWER DISTRICT (DSD) WORKERS WHO WILL BE ON-SITE SHORTLY

~1400 DOUGLAS COUNTY SEWER DIST. WORKERS ARRIVED. BEGAN PUMPING FROM SHANNON & WILSON DRUMS & HOSES TO GSA DELON WATER. PUMPED ~600 GALLONS. REMAINING WATER IN GSA TANK (±20 GALLONS - NON-PUMPABLE W/ ELEVATED TSS LEVELS) WAS DISPOSED OF IN BIN #26, ALSO TRIPLE-RINSED TANK

~1530 DOUGLAS COUNTY WORKERS DEPARTED SITE. PUMPED TRAILERS. LOADED DELON WATER TANK & MISC SUPPLIES ONTO TRUCK. STORED REMAINING SUPPLIES IN TEMP. STORAGE AREA BEHIND DUMPSTER.

1830 DEPARTED SITE

09 DEC 97

WEATHER: CLEAR/SCT. 32°-28° ≈ 2" SNOW/ICE ON GROUND

1300 ARRIVED ON SITE. MET BURLINGTON ENVIRONMENTAL TRANS PORTER + RCW DELIVERY TRUCK W/ FORKLIFT.

1330 BEGAN MOVING/LOADING DRUMS OF EXCAVATED SOIL - OPERATIONS WAS CONDUCTED SLOWLY DUE TO SNOW/ICEY CONDITIONS.

1630 COMPLETED LOADING OPERATIONS. BURLINGTON ENV. SECURED DRUMS ON TRUCK + DEPARTED SITE.

LATE ENTRY - 1315 - RETD DUMPSTER + SANICAN

05 DEC 97 (CONT)

HAVE BEEN REMOVED, ELECTRICAL LINES HAVE BEEN DISCONNECTED TO BOTH TRAILERS AS WELL AS TELEPHONE LINES.

10 DEC 97

W/FUEL — ONC 32°

NO WIND

0800 ONSITE

0820 TGSP / SAFETY M.T.G.

0900 BEGAN TRANSFER FROM BIN #7 TO PRESENT BIN

1000 RCVD LOAD FROM RICH MCMAHOOS THAT BILL BROOKS HAS DIRECTED US TO CLOSE UP EXCAVATION BUT STAY W/ EX. QUANTITIES.

1130 COMPLETED TRANSFER - DECOUPLED HOSE INTO #20 (NEW)

1200-1300 EXCAVATED LOAD 4B IS PLACED. (BIN #26)

1300 - BEGIN PLACING INC GRAVEL, PLACED IN EX.

1300-1400 EXCAVATED SIDEWALK OF 7A (6") AND 8A (12") - (BIN #27)

1500-1520 CONDUCTED FINAL CONFIRMATION SAMPLING

1700 - RCVD LAST LOAD OF GRAVEL

1730 COMPLETED GRAVEL PLACEMENT. DEPARTED SITE.

11 DEC 97

WITHEL

OVC 28-38°

CALM

0730	ARRIVED ONSITE.
0800	BEGAN RECEIVING BACKFILL. PLACED IN EX.
~1000	BSD LABORATORY at OFFICE TRAILER DEPARTED SITE.
LATE ENTRY	0840 RETURNED W/ QUANTITIES IN BINS # 26 & #27. DISPOSED OF REMAINDER DECON WATER INTO BIN # 27 (15-20 GALLONS) WHILE DECONNING BACKHOE INTO BIN. CRUSHED EMPTY DRUMS.
0940	DELIVERED MISC IDW SOLID WASTE TO WEMATCHEE TRANSFER STATION.
~1430	BEGAN REGRADING OF SITE ROADS.
~1630	PLACED 5/8" CRUSHED MATERIAL BACK ON ROADWAY AREAS TO BRING THEM BACK TO GRADE.
1800	DEPARTED SITE

12 DEC 97

D. TIBBE

OK 30-36°

CALM.

~~0800~~ 0730 - ARRIVED ONSITE.

0900 - RCVD TWO LOADS OF BACKFILL STOCKPILED IN TEST PLOT AREA.

1100 - DEMOBILIZED BACKHOE.

1200 - DELIVERED GARDEN HOSE TO DICK BISHOP (PUNCH LIST ITEM #10)

1230 - DEPARTED SITE.

"Rite in the Rain"®

ALL-WEATHER

TRANSIT

Notebook No. 301

TASK ORDER #38

WTFREC

SAMPLING FIELD BOOK

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

Name _____

_____

Address _____

_____

Phone _____

Project _____

_____

_____

_____

Yellow Polyethylene Protective Slipcovers (Item #31) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation.

CONTENTS

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Pesticide Sampling 9-24-97

Push cores by Summit Environ.

0930 Cores taken in grid A-9 from 0-3 feet and 3-6 feet put red cap on top and black cap on bottom using aluminum foil so caps can be reused. Removed keeper at bottom of each core & shook soil down cylinder.
0-3' core measured 26" so split into three parts each approx 8 5/8" long.
3-6 core measured 28 1/2" so split into 9.5" sections

0945 Cores taken from grid B-9
0-3' core measures 25 1/2" long so split into 8.5" sections
3-6' core measures 28" long so split into 9.3" sections

1000 Cores taken from grid C-9
0-3' core measured 29.5" so split into 9.8" sections

Pesticide Sampling 9-24-97

3

1010 Cores taken from grid C-9
3-6' core measured 29" so split into 9.6" sections

1015 Cores taken in grid C-8
0-3' core measured 25" so split into 8.3" sections

1020 Cores in grid C-8
3-6' core measured 28" so split into 9.3" sections

1030 Cores taken in grid C-7
0-3' core is 25.5" so split into 8.5" sections
0-3' core as duplicate measured 22" so split into 7.3" sections
3-6' core measured 24" so split into 8" sections

Pesticide Sampling 9-24-97

1045 Cores taken from grid C-6
0-3' core measured 26.5" so split into 8.8" sections
3-6' core measured 23.5" so split into 7.7" sections

1055 Cores taken from grid C-5
0-3' core measured 27" so split into 9" sections
3-6' core measured 25" so split into 8.3" sections

1115 Cores taken from grid B-8
0-3' core measures 24.5" so split into 8.2" sections
3-6' core measures 26.5" so split into 8.8" sections

1130 Cores taken from grid B-6
0-3' core measured 24.5" so split into 8.2" sections
3-6' core measured 27" so split into 9" sections

Pesticide Sampling 9-24-97

1130 Grid B-6 ran duplicate 0-3' core as duplicate measured 25" so split into 8.3" parts

1150 Cores taken from grid B-7
0-3' core measured 26.5" so split into 8.8" sections
3-6' core measured 26.5" so split into 8.8" sections

1155 Cores taken from grid B5
0-3' core measured 23.5" so split into 7.8" sections
3-6' core measured 30.5" so split into 10.2" sections
1200 Took lunch break

1315 Cores taken from grid A-8
0-3' core measures 24.5" so split into 8.2" sections
3-6' core measures 28." so split into 9.3" sections

Pesticide Sampling 9-24-97

1330 Took cores from grid A-7
0-3' core measures 23" so split into 7.6" sections
3-6' core measures 31" so split into 10.3" sections

1345 Cores taken from grid A-6
0-3' core measures 26" so split into 8.6" sections
3-6' core measures 34.75" so split into 11.5" sections

1355 Cores taken from grid A-5
0-3' core measures 25.5" so split into 8.5" sections
D-3' core as duplicate measures 23.75" so split into 7.9" parts
3-6' core measures 31.5" so split into 10.5" sections

1430 Cores taken from grid C-4
0-3' core measures 24" so split into 8" sections

Pesticide Sampling 9-24-97

1430 Grid C-4
3-6' core measures 24" so split into 8" sections

Methods for splitting samples in cores involves using sawhorse to cut thru with hacksaw. Each cut we used deconned blade (liganox clean, tap water rinse, distilled water rinse, methanol rinse, wrapped in alum.) soil within 1' long sections was dumped into large glass jar, put into coolers with ice and taken back to lab where they are homogenized & split into 3 jars. Core for outside lab, one for archive, one for field lab) then put into frig until analysis.
Duplicates were taken every 10 cores as colocated field duplicate. Both sections were put into same jar so double amount of soil.

8

Pesticide Sampling 9-24-97

1440 Cores taken from grid ~~A~~ C-3
0-3' core measures 25.5" so split into 8.5" sections
3-6' core measures 29.5" so split into 9.8" sections

1455 Cores taken from grid B-3
0-3' core measures 24" so split into 8" sections
3-6' core measures 25.25" so split into 8.4" sections

1515 Cores taken in grid B-4
0-3' core measures 25" so split into 8.3" sections
3-6' core measures 23.5" so split into 7.8" sections

1530 Summit Envirogervice told us they mislabeled cores in grids A3 + [illegible] they should have been C3 + [illegible]. Need to change labels on samples + in logbook.

Pesticide Sampling 9-24-97

1530 Cores taken in grid A-4
0-3' core measures 23.5 so split into 7.8" sections
0-3' duplicate core measures 19.5" so split into 6.5" sections
3-6' core measures 34" so split into 11.3" sections

1550 Cores taken in grid A-3
0-3' core measures 24.5" so split into 8.2" sections
3-6' core measures 30.5" so split into 10.2" sections

1620 Cores taken in grid A-2
0-3' core measures 27" so split into 9" sections
3-6' core measures 32.5" so split into 10.8" sections

1630 Cores taken from grid A-1
0-3' core measures 26.5" so split into 8.8" sections

10 Pesticide Sampling 9-24-97

1630 Grid A-1
3-6' core measures 32.5" so split into 10.8" sections

1640 Cores taken from grid B-2
0-3' core measures 23.5" so split into 7.8" sections
3-6" core measures 27" so split into 9" sections

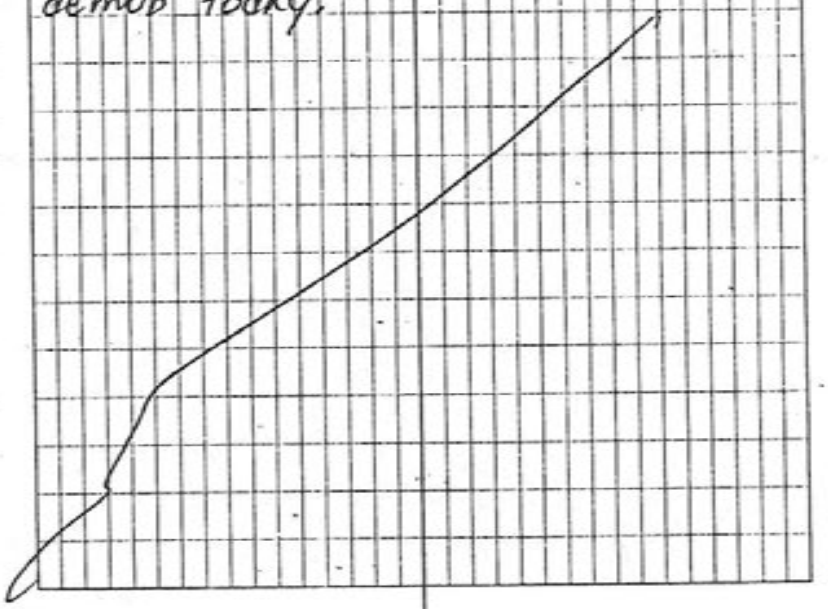
1655 Cores taken from grid B-1
0-3' core measures 25.5" so split into 8.5" sections
3-6' core measures 32.5" so split into 10.8" sections

1705 Cores taken from grid C-2
0-3' core measures 22" so split into 7.3" sections
0-3' duplicate core measures 28" so split into 9.3" sections
3-5' core measures 23.5" so split into 11.7" sections, Hit rock so there is no 6' section,

Pesticide Sampling 9-24-97

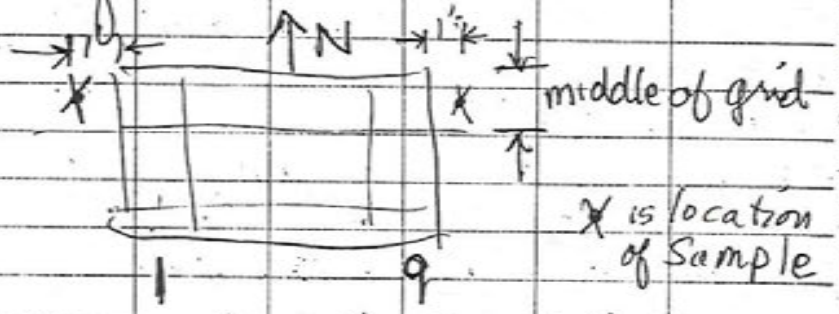
1930 Cores taken from grid C-1
0-3' core measures 23" so split into 7.6" sections
3-6' core measures 30.5" so split into 10.2" sections

1745 Finished pushing cores in all grids, Started cleaning up work area for day. Summit Envirosenvice is cleaning their equipment and will demob today.



10/13/97 Mike Webb Sample

Confirmation 1" outside of Grid 1A and 9A that the Clean layer is below action levels for DOT



"CX" means extra characterization - sample outside grids 9 & 1

CX9A01372 @ 16:15
CX1A01371 @ 15:50

#1 (1A1) cleared 4" of crushed stone (in a pile) and started core at original ground elevation. Placed directly across from original sample and 1 foot from grid boundary

16:15

#2 (9A1) Baz cleared additional soil away exposing original grass surface. Took sample at middle of grid dimension across from original sample and 1 foot from edge of hole.

Each sample was taken with a 6" hand auger driven in a total of 12" Soil was placed in S.S. bowl homogenized and split into 3 jars.

FINAL CONFIRMATION "FC"

9	8	7
6	5	4
3	2	1

N

Each grid was divided in to 9 grids and a number randomly selected.

10/13 cont'd

FC 9A 01373 Taken in #4 @ 17:15
FC9B01374 Taken in A 9 @ 17:30
FC9C01375 #5 @ 17:50
~~FC 8A 01376~~ 9B has grass in it.

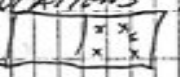
FC 8A 01376 #2 @ 18:20
FC 8B 01377 #1 @ 18:30
FC 8C 01378 #6 @ 18:40

#3 & #4 above were homogenized in a S.S. bowl and split into 3 samples. 5-8 were homogenized on the ground surface and placed in a single jar.

10/14 FRED LEEK SAMPLER

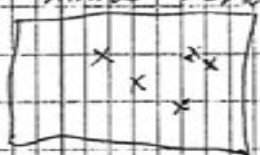
WASTE CHARACTERIZATION SAMPLING FROM BINS #9, #8, & #2. SAMPLES WERE COLLECTED W/A DECONTD HAND AUGER

0954 COLLECTED SAMPLE WD901471 AND FIELD DUP SAMPLE WD901472 FROM BIN #9. COLLECTED FROM 5 LOCATIONS AND HOMOGENIZED



1015 COLLECTED SAMPLE WD901473 FROM BIN #08. SAMPLE COLLECTED FROM FIVE LOCATIONS AND HOMOGENIZED.

1030 COLLECTED SAMPLE WD901474 FROM BIN #2



Sending 7-1, 7-2, & 7-4 to local lab for Total OP, Total OC, TCLP metals, paraquat, carbamate/urea.

10/23/97 Mike Webb

Forward removal confirmation AA samples:

		subgrid
FC 1A	18:50 (used random #)	7
FC 1B	18:53	2
FC 1C	18:56	3
FC 6A	19:00	8
FC 6B	19:04	9
FC 6C	19:07	1
FC 7C	19:00	8
FC 7B	19:14	2
FC 7A	19:17	6
9A1	19:20	5

Resampled after 6" removal took sample under original location of FC9A (10/13)

Subgrids (x9) selected with random number sets.

facing South, numbered subgrids as follows:

1	2	3
4	5	6
7	8	9

Samples were homogenized by clearing surface loose material (12" square), digging in 1-2" in 8" square, corners & quartering in place.

10/24/97 Mike Webb

Final confirmation AA:

Took samples 5A, B, C:

		subgrid
5C	10:15	8
5B	10:19	6
5C	10:24	3

FINAL CONFIRMATION AA:

4C	13:15 (used random #)	9
4B	13:20	5
4A	13:25	4
3C	13:35	6
3B	13:40	8
3A	13:45	3
3C	2:45	1
3B	2:49	5
3A	2:58 (found bentonite plug next to sampling spot)	1

MW

By direction from Christie CCR, column 3 was to be sampled under original push sample locations. So subgrid #'s 1 above do not apply to #3.

10-24 (cont)

WASTE BIN Samples collected by

Fred & BAZ

WASTE Samples

A = Bin 5, 11, 12

B = Bins 13, 14, 18

C = Bins 15, 16, 17, 19

D = Bins 20, 21

E = Bins 22, 23

F = Bins 24

4:15 WA 0247-1 (TCLP, Para, Carb, OC/OP)

430 WB 0247-2 (OC/OP)

445 WC 0247-3 (OC/OP)

500 WD 0247-4 (TCLP, OC/OP, paraquat)

515 WE 0247-5 (TCLP, OC/OP)

530 WF 0247-6 (TCLP, OC/OP)

10-29 Mike Webb

10:45: measurements in column 4 for FC IAA samples: From NW corner of column.

A: 7'0" S, 7'0" E

B: 19'9" S, 4'0" E

C: 28'0" S, 2'6" E

14:45: plastic started to peel back in strong gusty W wind. Collected stones and a pallet and weighted down. Also placed stones on east edge incase wind switches to Easterly instead of westerly.

MW 10/29

11/3 Mike Webb - COR Kim Converse
Re Sampling Log #28 & 29
Sample Column 4 after surgical removal of several inches for IAA analysis (FC4C3N0371) #336 4C3 - chosen from 9 subgrids for 4B & 4C. subgrid #2 (from random distribution: facing south sample #1 is from grid 2)

13:40 4B1 - right next to original sample on edge of focused removal, but back 6".

13:44 4A1 - subgrid #3 chosen from 9 (facing south)

13:46 4A3 - taken right at original 4A location.

13:48 4A3-2 - field duplicate

11/4/97 Mike Webb & Kim Converse
Re: Sampling Logs #30, 31
Took final confirmation samples ~~#28~~ at same locations as FC IAA samples (each was marked with a stake).

For the lower, focused removed area of Grid 4, random # 5 from phone book was chosen and subgrid #5 of 9 was used to locate the sample. For ~~lower~~ upper grid 4 sample (at B1), sample was taken from 6" west of stake because stake was right on the edge.

Some of the sampling areas had been inundated with water even though they were plastic covered. Areas 3 and 6 were very wet.

11/4 cont'd.

Loose surface soil was cleared in a 12" square, then soil was taken from an 8" square in the middle down to approximately 2" depth. Aldas 3 and 6 required a little more surface removal to get rid of wet mud that may have been transported from a neighboring side wall. Each sample was homogenized prior ~~The equipment~~ to splitting into jars for the various analyses. The samples for columns 3 and 5 were also split with Kleinfelder representative Wallace Reid.

The equipment blank was created by filling one deconned bowl and spoon with DI water. North Coast said that they

check the parquet rinsate in plastic bottles because product sticks to glass. Cascade Analytical provided 1 liter HDPE bottle, methanol rinsed and with custody seal intact.

11/4 1745-1840 FIELD LUCK

DECON WATER SAMPLE

COLLECTED EQUIPMENT BLANK SAMPLE IN FIELD LAB USING DECONED BAILING CUP (FROM CASCADE ANALYTICAL) (SAMPLE EB6SAN0473)

COLLECTED SAMPLE RWSWN0474 AS A 3-WAY COMPOSITE FROM THE 3 SHANNON & WILSON DECON DRUMS. DIPPED ALL SAMPLE CONTAINERS DIRECTLY INTO DECON WATER EXCEPT FOR THE METALS JAR (W/PRESERVATIVE). USED DECONNED BAILING CUP TO COLLECT 3-WAY COMPOSITE METALS SAMPLE.

COLLECTED SAMPLES RW6SAN0471 + RW6SAN0472 IN THE SAME

11/4 CONT.

MANNER AS ABOVE USING THE ONE GSA DECON WATER TANK.

11/17/97 Mike Webb

Set up for resampling column 4 and 9. Also side wall samples for 7A, 8A, 1A, 1B after excavation. Remeasured locations.

Each sample was taken by scraping back loose surface material (~1") for 12" square then digging in to 2" within an 8" circle. Soil was placed in clean SS bowl or 2L jar to be homogenized.

Dennis O'Neil of Kleinfelder used one 8oz jar for a split from each & so enough soil was taken.

11/17/ cont'd

Each sample was split into 2 4oz jars after homogenizing and one 8 oz jar. Sample # were placed on lid. The times of sampling were ~~was~~ placed on lid at the time soil was placed in jar. The numbering sequence for samples 9 and 10 ended up being reversed: #10 was taken at 13:05 and #9 was taken at 13:15.

Side wall samples were taken by Kim Converse and Dennis O'Neil (Kleinfelder). A separate set of notes were written by Kim. The samples were documented on the DEQCR because

no sampling log forms were available. Kim signed the form to document the chain of custody when transferring the samples to me.

After analysis and further excavation at 7A and 7B, more samples were taken for 7A and 8A. Also the hand auger was driven into a depth of 12" at 8A and the soil cleared. Then a sample was augered for a further depth of 13".

The sample numbering sequence ended up

MW 11/17

being reversed with #12 sampled 16:25 and #11 sampled at 16:35. The deep sample was labeled as #13.

Samples were selected for fixed lab analysis as follows:

9B (9A was higher, but 9B was initially higher than clean up, so confirmation was done here)

4B3 (confirmation after excavation)

1AN (historically higher)

7AN and 8AN both checked again.

MW 11/19

11/18 Mike Webb

Cleaned up waste samples and reagents in lab. All soil went to soil waste bin for soil. Reagents were packed as a lab pack in 10 gal. steel drum with vermiculite packing:

1. 2 x 1L methanol waste extracts
2. 4 x 4L lab waste water (enzymes, dilute HCl, trace methanol, trace pesticide)
3. 1 x 0.1L dilute HCl

MW 11/19

12/10/97

SET UP FOR SAMPLING GRIDS 2B (LOWER PORTION CORRESPONDING TO FOCUSED REMOVAL SAMPLE LOCATIONS) AND NORTHERN SEDIMENTS FOR 7A & 8A

DECONTED BOWLS & SPOONS IN HOTEL ROOM. DECON CONSTED OF A FRESH (TAP) WATER RINSE, FOLLOWED BY AN ALCONOX WASH WATER BATH, THEN REAGENT GRADE DI RINSE & METHANOL RINSE. ALLOWED TO AIR DRY. FOUR SETS OF BOWLS & SPOONS WERE DECONTED AND ~~WRA~~ TO WRAPPED IN ALUMINUM FOIL.

1445 PREPARED FOR SAMPLING CONFIRMED SAMPLING LOCATIONS AND SAMPLE NAMES W/ WSO REPRESENTATIVE (DENNIS ONSELL).

1500 COLLECTED SAMPLE FC4-SW8AD101 (8A SEDIMENT) AND FILLED 2-FOUR-OZ JARS AND 1-EIGHT-OZ JAR (WSO SPLIT) SAMPLED @ 8" X=71', Y=-383' Z=18"

1510 COLLECTED SAMPLE FC4-SW7AD102 (7A SEDIMENT) AND FILLED 2-FOUR OZ JARS FOR LAB ARCHIVE FOR POSSIBLE FUTURE DC PESTICIDE ANALYSIS @ X=65' Y=-283' Z=12"

1520 COLLECTED SAMPLE FC4FR2BD103 (GRID 2B) AND FILLED 2-FOUR OZ JARS FOR DC PESTICIDE ANALYSIS. @ X=16.5 Y=19.5 Z=

EACH OF THE SAMPLES WAS COLLECTED FROM THE SURFACE SEDS @ THE RESPECTIVE LOCATIONS.

SAMPLES PLACED IN COOLER W/ TRIP BLANK & RELINQUISHED @ 1530 TO ROBIN AMSON OF GSA

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12/10/97

SET UP FOR SAMPLING GRIDS 2B (LOWER PORTION CORRESPONDING TO FOCUSED REMOVAL SAMPLE LOCATIONS) AND BOUNDING SIDEWALLS FOR 7A & 8A

DECONTAM BOWLS & SPOONS IN HOTEL ROOM. DECON CONSTED OF A TRASH (TAP) WATER RINSE, FOLLOWED BY AN ALCONOX WASH/WATER BATH, THEN REAGENT GRADE DI RINSE & METHANOL RINSE. ALLOWED TO AIR DRY. FOUR SETS OF BOWLS & SPOONS WERE DECONTAM AND AIR DRIED WRAPPED IN ALUMINUM FOIL.

1445 PREPARED FOR SAMPLING CONFIRMED SAMPLING LOCATIONS AND SAMPLE NAMES W/ USN REPRESENTATIVE (DENNIS ENGEL).

1500 COLLECTED SAMPLE FC4-SW8AD101 (8A SIDEWALL) AND PLACED 2-FOUR OZ JARS AND 1-EIGHT OZ JAR (USN SPLIT) SAMPLED @ 8" x=71', y=-3.33' z=18"

1510 COLLECTED SAMPLE FC4-SW7AD102 (7A SIDEWALL) AND PLACED 2-FOUR OZ JARS FOR LAB ARCHIVE FOR POSSIBLE DDT PESTICIDE ANALYSIS @ x=65' y=-2.83' z=12"

1520 COLLECTED SAMPLE FC4FR2BD103 (GRID 2B) AND PLACED 2-FOUR OZ JARS FOR DDT PESTICIDE ANALYSIS. @ x=16.5 y=19.5 z=

EACH OF THE SAMPLES WAS COLLECTED FROM THE SURFACE SOILS @ THE RESPECTIVE LOCATIONS.

SAMPLES PLACED IN COOLER W/ TRIP BLANK & RELINQUISHED @ 1530 TO ROBIN LARSEN OF GSA.

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