O'BRIEN & GERE
LABORATORIES, INC.

September 7, 1999

Ms. Karuna Mirchandani
PARSONS ENGINEERING SCIENCE, INC.
8000 Centre Park Drive, Suite 200
Austin, TX 78754-5140

Re: Adequacy of corrective measures
File: Camp Stanley Storage Activity

Dear Ms. Mirchandani:

Please find enclosed the additional documentation to support the corrective measures itemized in our letter dated July 26, 1999. Sections in question have been expanded and either highlighted, bolded or italicized for ease of review. A Table of Contents assists in the review process.

Two items not included in the documentation are the following: The Chemical Hygiene Plan is expected to be completed by December 1, 1999 and the audit report from O'Brien & Gere Engineers' Certified Safety Professional is not expected for three weeks. Upon submittal, a copy will be forwarded to Parsons ES.

We trust this information meets with the project needs and should any questions arise in the review process, please feel free to contact us.

Very truly yours,

O'BRIEN & GERE LABORATORIES, INC.

David R. Hill
President

Enc.

RECEIVED
SEP 9 1999

O Brien & Gere Laboratories, Inc., an O Brien & Gere company
5000 Brittonfield Parkway, P.O. Box 4942, Syracuse, New York 13221
(315) 437-0200 / FAX (315) 463-7554 • http:// www obg com
. . . and offices in major U.S. cities

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8260/8270 SOP
Revisions 9-7-99

7.11 Quantitation

7.11.1 The presence of a target compound should normally be automatically identified by the integration algorithm of the acquisition software. Chromatograms which do not exhibit visible evidence of baseline abnormality due to some type of matrix effect should normally integrate the EICP of target compounds accurately. This includes calibration standards, blanks, LCS standards and samples (with an absence of matrix interference). The integration parameters should be routinely adjusted to ensure accurate automatic integration of any target compounds without manual integration. Since it is impractical to alter integration parameters within an analytical sequence (12 hr clock) the impetus for optimizing integration parameters shall be the automatic integration of the CCC-level calibration standard (or the corresponding concentration in an initial calibration sequence).

7.11.2 It must be recognized that the autointegration of some target compounds can present exceptional difficulty due to erratic chromatographic behavior (volatile gases and Benzoic acid are good examples). It is difficult to optimize the integration parameters for these compounds due to their tendency to exhibit jagged, non-gaussian peak shape (fronting or tailing are common peak shape problems for some compounds, but should be interpreted as an indicator that instrument maintenance may be required when the compound does not normally exhibit poor chromatography). Since peak shape can be erratic from injection to injection, these compounds may consistently require manual integration as opposed to repeated adjustment of the integration parameter file.

7.11.3 To provide accurate integration and quantitation of target compounds, it is occasionally necessary to manually adjust the integration of a chromatographic peak using the edit feature of the quantitation software. This is usually required only for environmental samples which exhibit matrix interference and thus alter the normal peak shape of a target. Manual integration should not be used as a substitute for a properly optimized integration parameter file. When manually integrating a peak, the integration drawn must be consistent with guidelines for automatic integration of the compound in the corresponding ***CCV or CCV-level*** standards, and should rely on obvious visual landmarks such as valleys and/or slope changes. ***In general, a target compound with good baseline resolution prior to the start of elution will be detected easily by a properly optimized integration parameter file due to the slope change. The absence of significant peak tailing should also provide an obvious slope change which is autodetected as the end of the eluting peak*** *(to extend the integration of a tailing compound beyond an obvious upward slope change would be improper). The manual integration drawn normally should not exceed the limits of the retention time window which has been established for that compound, except in cases where the peak may have tailed or shifted beyond the window due to a matrix effect or concentration beyond calibration limits.* ***Most target ion integrations are drawn in this manner, described as baseline/baseline integration. Difficulty in***

detecting the proper peak start may be encountered when a target compound closely elutes with another (ie. incomplete baseline resolution between compounds) and those compounds share similar mass spectra (Benzo{b}fluoranthene + Benzo{k}fluoranthene or Chlorobenzene + Chlorobenzene-d5 are good examples). In this case the integration parameter file must be optimized at a minimum to autodetect some portion of the coeluting pair and then manual integration employed. When the first peak in a coeluting pair is to be integrated, the integration drawn should be from the peak start at the resolved baseline/peak slope change to the valley between the two peaks. The integration should bisect the two peaks at the valley and be dropped to the area under the valley where a resolved baseline would appear in the absence of the second peak. This is known as a baseline/drop-baseline integration and the reverse procedure is employed for the integration of the second coeluting peak, a drop-baseline/baseline integration. The above types of integration are normally the only types necessary to properly integrate any calibration standards. For environmental samples, the presence of severe matrix interference or coextractables may create an elevated baseline which presents a scenario where the baseline should not be dropped and thus baseline/valley or valley/valley integrations are appropriate. In these manual integrations, it may be appropriate to connect the drawn baseline directly to a peak valley. Graphic examples of many of the above integration scenarios are provided in Appendix B.

7.11.4 Manual integration may not be used as a mechanism for obtaining acceptable quality control results. Adding or subtracting peak area to change a surrogate, internal standard, LCS, or other QC parameter from failing to passing is unacceptable unless obvious chromatographic abnormalities suggest it is necessary. Area adjustments of less than 5 percent should be avoided to eliminate the appearance of impropriety. In the absence of chromatographic aberrations the need for manual integration may signify an improperly optimized integration parameter file, as discussed above.

*7.11.5 The quantitation software will place an "m" next to the revised integrated area which appears on the target compound summary report . The "m" for this manual area must be initialed by the analyst who processes the raw data (date and time of edit are software stamped on the top of each page). By initialing the manual integration the analyst has certified that the manual integration he/she has drawn meets criteria outlined in this SOP for application of manual integration. For analysts who are being initially trained in the application of manual integration, the procedure must be demonstrated and trainee manual integrations visually verified by a senior analyst for a sufficient period of time to ensure the procedure is being properly applied. The verification must include the additional initialing and dating by a senior analyst of the manual integration performed by the trainee, until the section supervisor has determined that training is complete (**Parsons AFCEE deliverable requires the initials of the analyst and supervisor at all times regardless of training).***

7.11.6 If the manual integration of a surrogate or internal standard is required, the graphic report for the integration should be included with the raw data for that sample *if the deliverable does not already require this. Some project-specific deliverables may also require the submittal of "before and after" quantitation reports (required for Parson AFCEE deliverable) which give detailed information on how the target compound report has been altered by the analyst. The unedited quantitation report before analyst modifications should be submitted (with or without detailed target spectra and graphic report, as required), in addition to the final processed quantitation report which shows graphics reports for manually adjusted target areas, detailed spectra, and the addition/ removal of false negative/positive target compounds* ***(Parsons AFCEE deliverable also requires on the "before" report a brief written statement by the analyst of the reason for the manual integration such as matrix effect, tailing, etc.)*** .

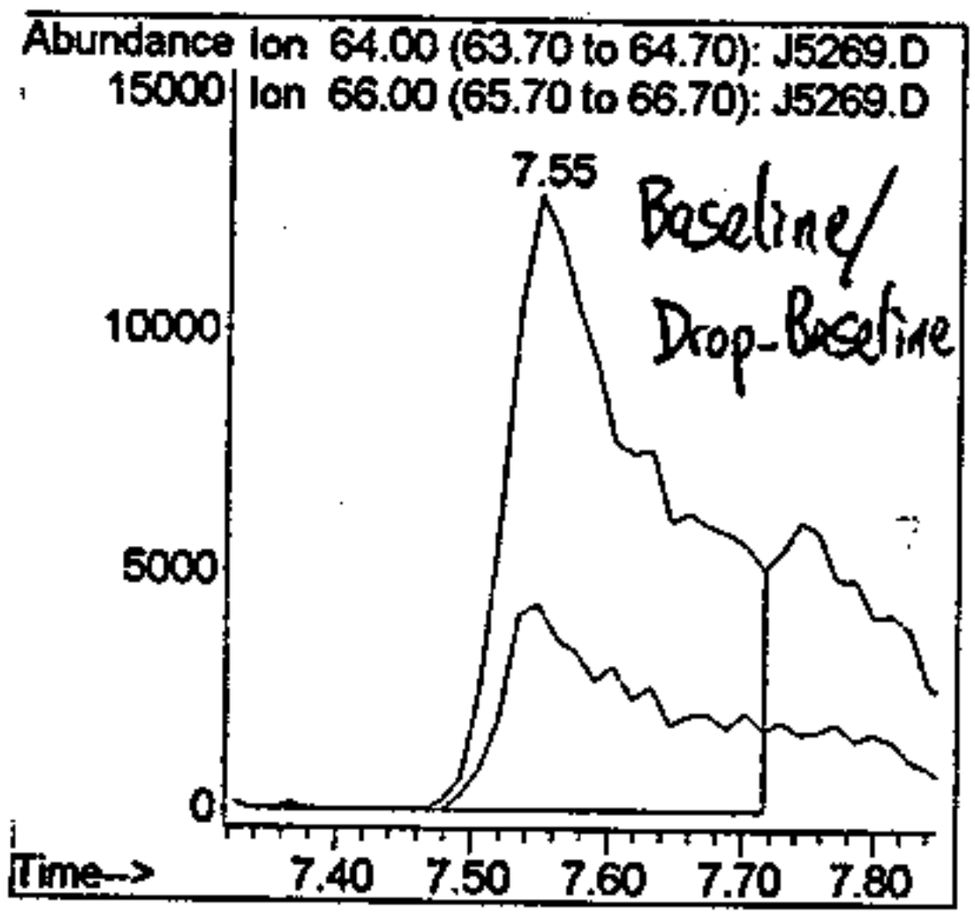
Appendix B

Before

#6
Chloroethane
Concen: 28.95 ug/L
RT: 7.55 min Scan# 147
Delta R.T. -0.00 min
Lab File: J5269.D
Acq: 4 Aug 1999 12:47

Tgt Ion: 64 Resp: 102479

Ion	Ratio	Lower	Upper
64	100		
66	26.9	0.0	50.0

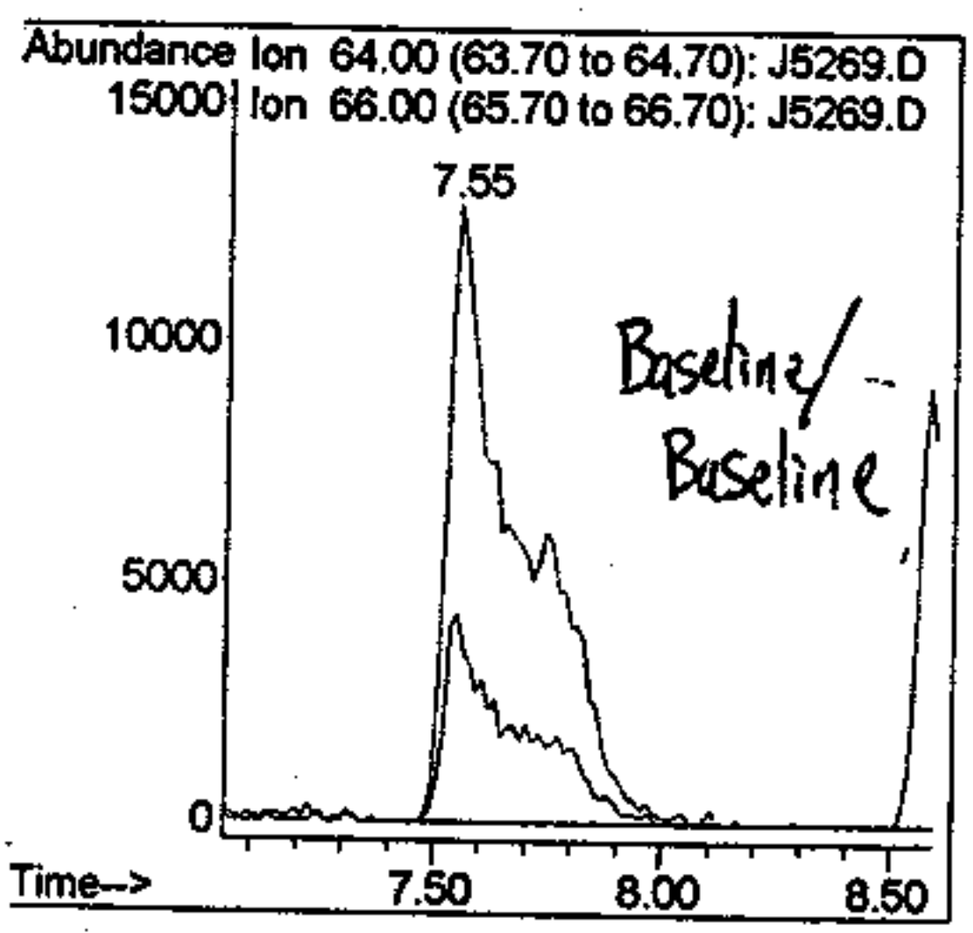


After

#6
Chloroethane
Concen: 41.21 ug/L m
RT: 7.55 min Scan# 147
Delta R.T. -0.00 min
Lab File: J5269.D
Acq: 4 Aug 1999 12:47

Tgt Ion: 64 Resp: 145905

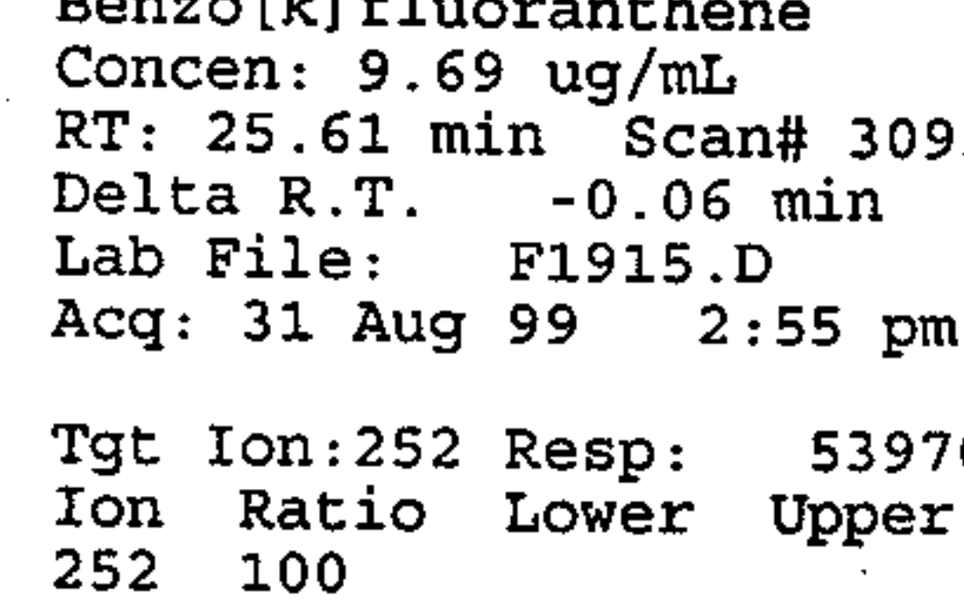
Ion	Ratio	Lower	Upper
64	100		
66	18.9	0.0	50.0



#20 Before
Benzo[k]fluoranthene
Concen: 9.69 ug/mL
RT: 25.61 min Scan# 3093
Delta R.T. -0.06 min
Lab File: F1915.D
Acq: 31 Aug 99 2:55 pm

Tgt Ion:252 Resp: 53970

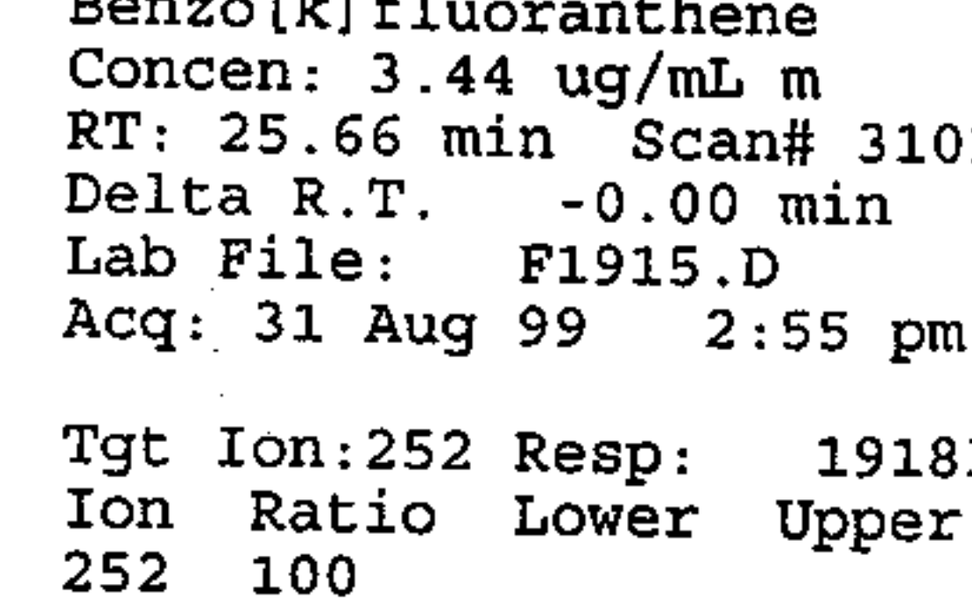
Ion	Ratio	Lower	Upper
252	100		
253	25.0	0.0	52.0
125	24.6	0.0	45.8
0	0.0	0.0	0.0



#20 After
Benzo[k]fluoranthene
Concen: 3.44 ug/mL m
RT: 25.66 min Scan# 3101
Delta R.T. -0.00 min
Lab File: F1915.D
Acq: 31 Aug 99 2:55 pm

Tgt Ion:252 Resp: 19183

Ion	Ratio	Lower	Upper
252	100		
253	23.5	0.0	52.0
125	16.8	0.0	45.8
0	0.0	0.0	0.0



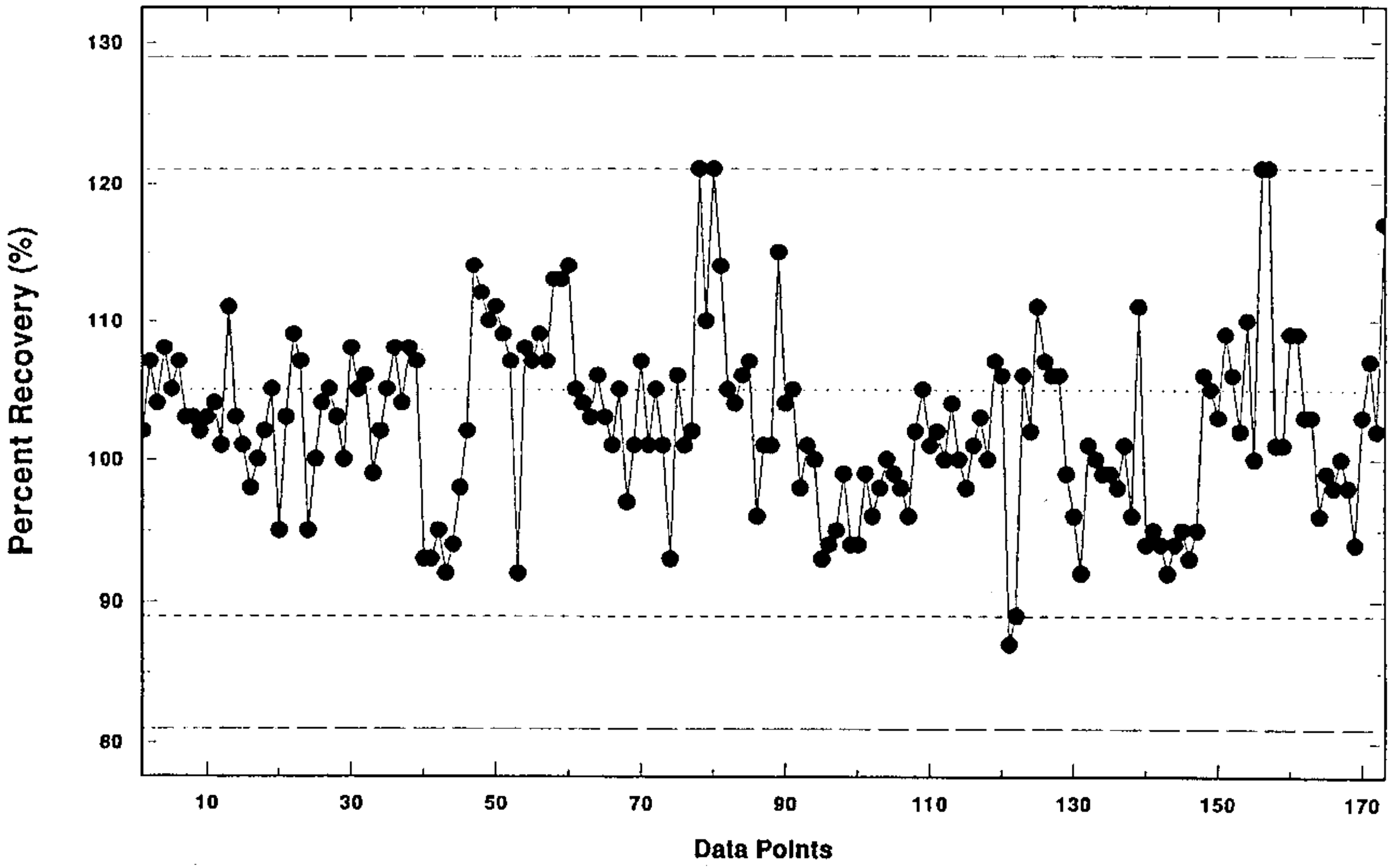
8.5 Matrix Spike/Matrix Spike Duplicate - at a minimum frequency of 5% (one in twenty) by matrix, samples are spiked with volatile organics to measure the influence of the matrix on recovery and to determine the precision of the test. Run daily when sample volume permits. If the program is a general survey and no specific compounds are requested, the following spike is performed *(Parsons AFCEE deliverable requires the MS/MSD concentration be the same as the LCS)*:

8.6 Laboratory Control Samples (QC check samples) - Daily, all the analytes to be quantitated are spiked into organic free water at a concentration at or below the CCC level *(Parsons AFCEE deliverable requires the LCS and MS/MSD be at the same concentration)*. The source of the spike must be different than the source of the standards. A different lot number from the same vendor does not satisfy this criteria. An LCS duplicate should be run in the absence of a sample MS/MSD pair and precision calculated.

8.11 *PQL Verification – When required (Parsons AFCEE deliverable requirement), a standard should be run at or below the required PQL to verify the PQL. The standard should be analyzed once after (or during) the initial calibration and before samples are analyzed. The PQL verification may be an initial calibration standard provided it is requantitated against the final processed initial calibration from which it is derived. The PQL verification control limits are 80-120% for Voas CCC compounds and 70-130% for non-CCC compounds, and 70-130% for Semi-Voas. If a control limit failure is noted and the failure is above control limits, no corrective is required. When a failure below limits is noted, corrective action including system recalibration will be taken.*

Bromochloromethane

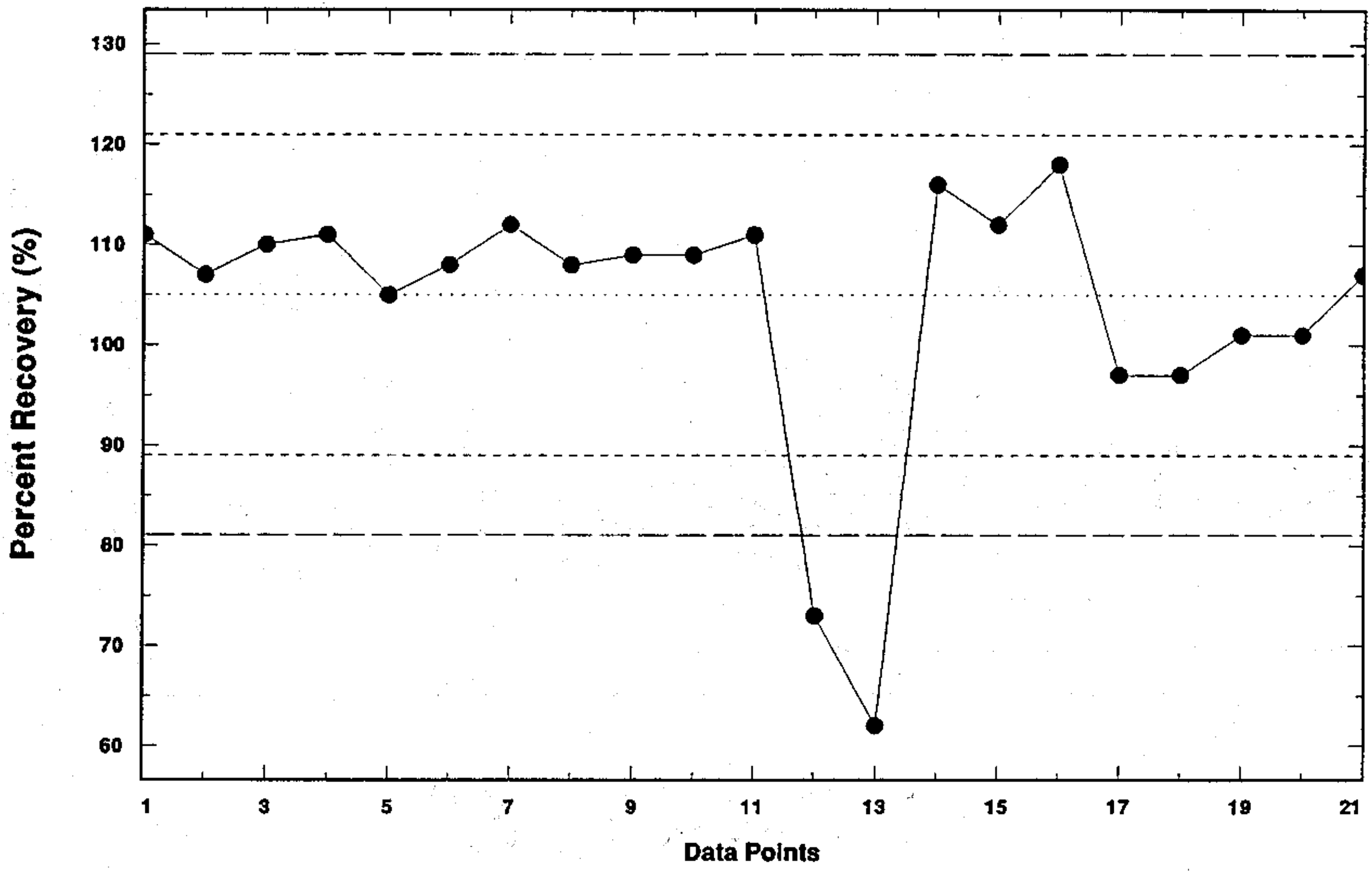
Laboratory Control Samples (Water)



August 1-31, 1999

Bromochloromethane

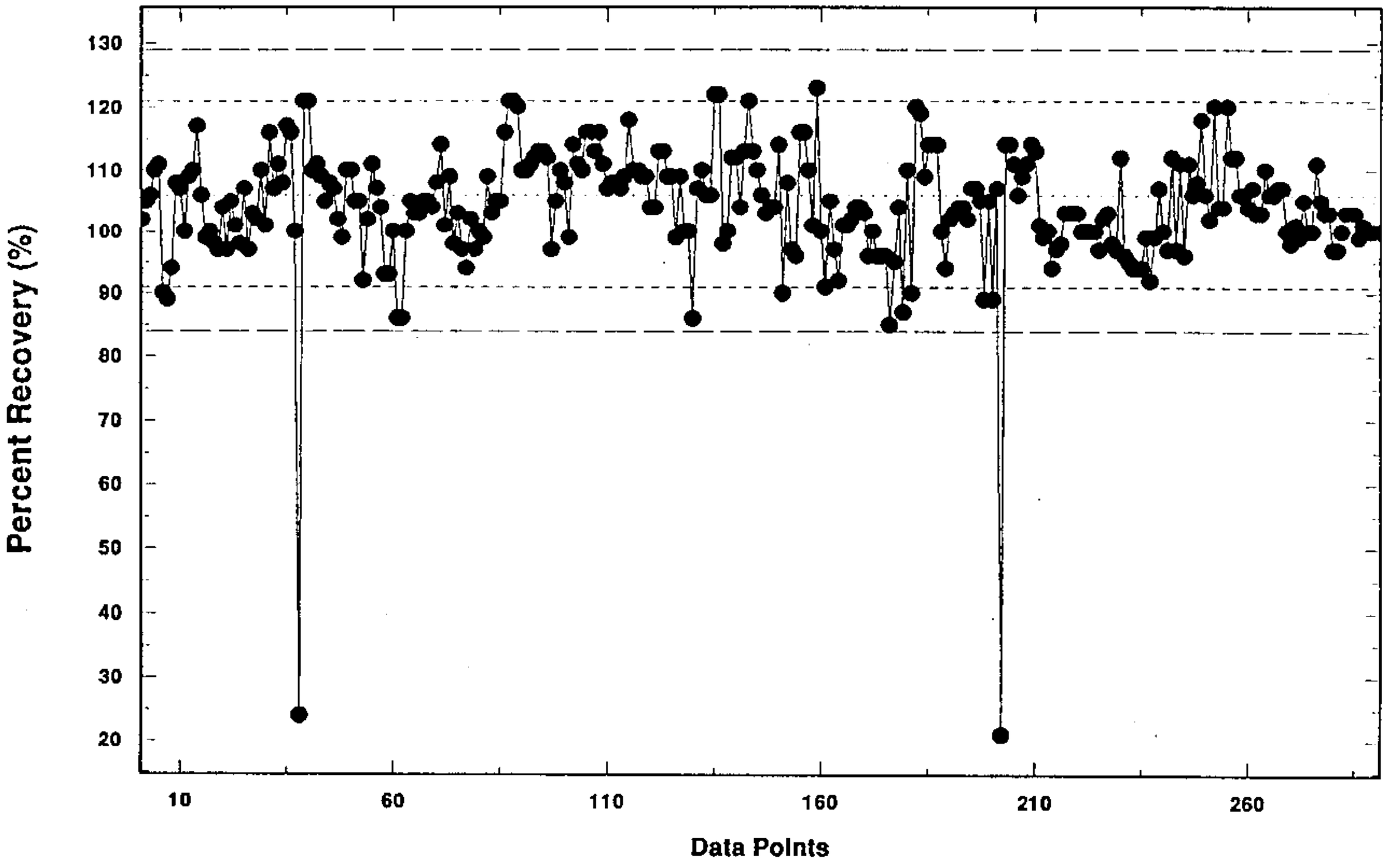
Laboratory Control Samples (Water)



Sept. 7, 1999

1,1-Dichloroethane

Laboratory Control Samples (Water)

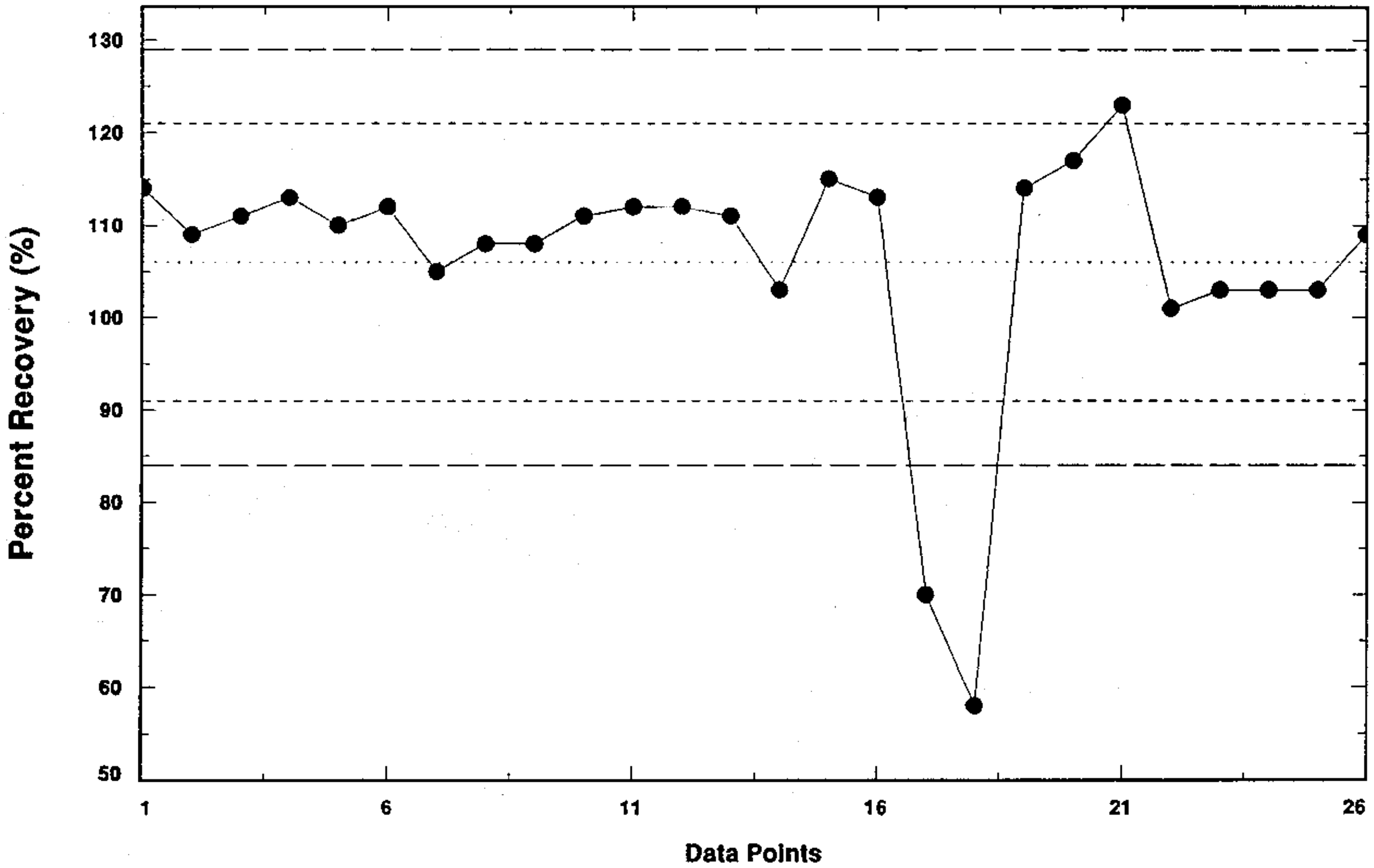


May 14, 1999

August 1-31, 1999

1,1-Dichloroethane

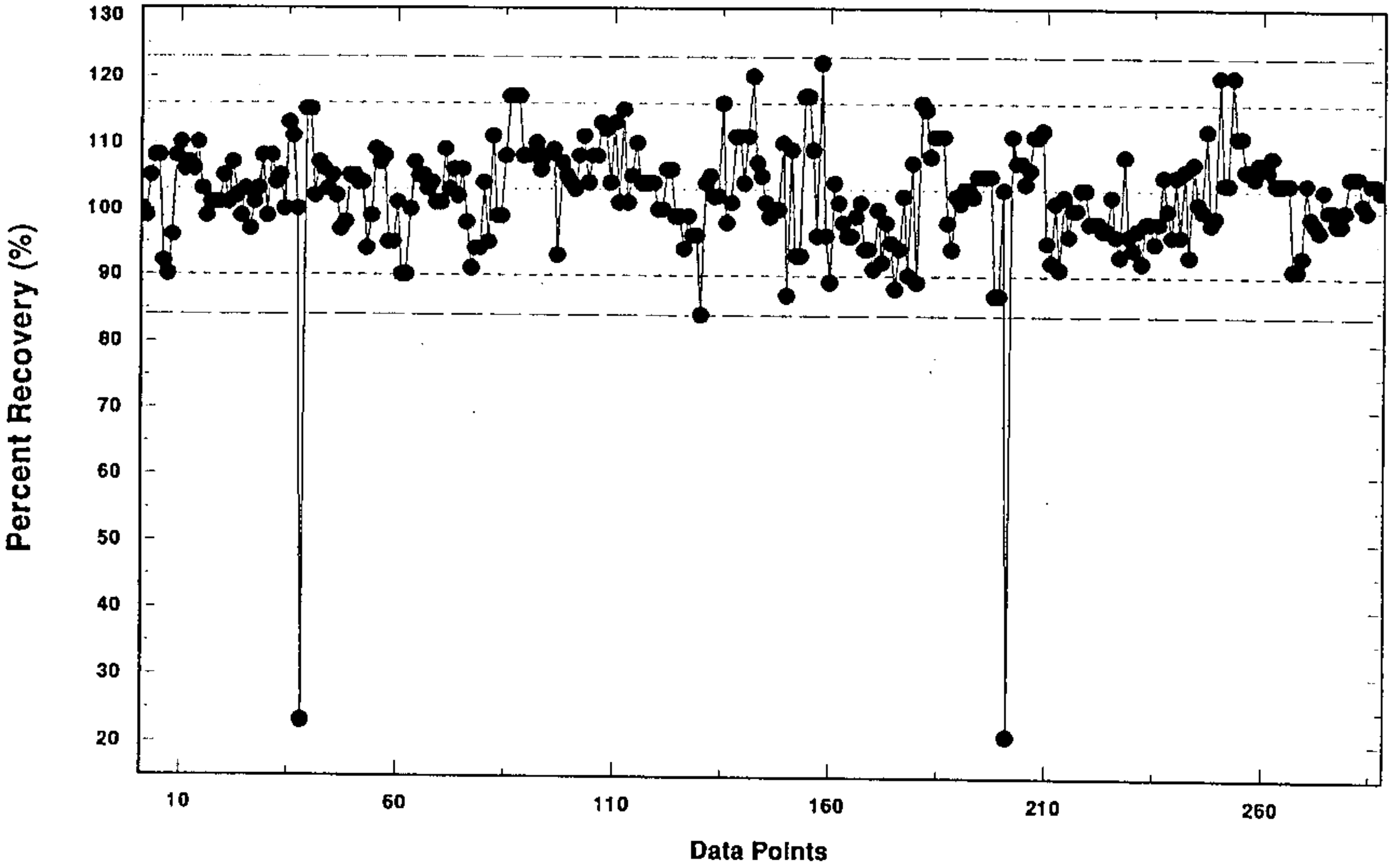
Laboratory Control Samples (Water)



Sept. 7, 1999

Chloroform

Laboratory Control Samples (Water)

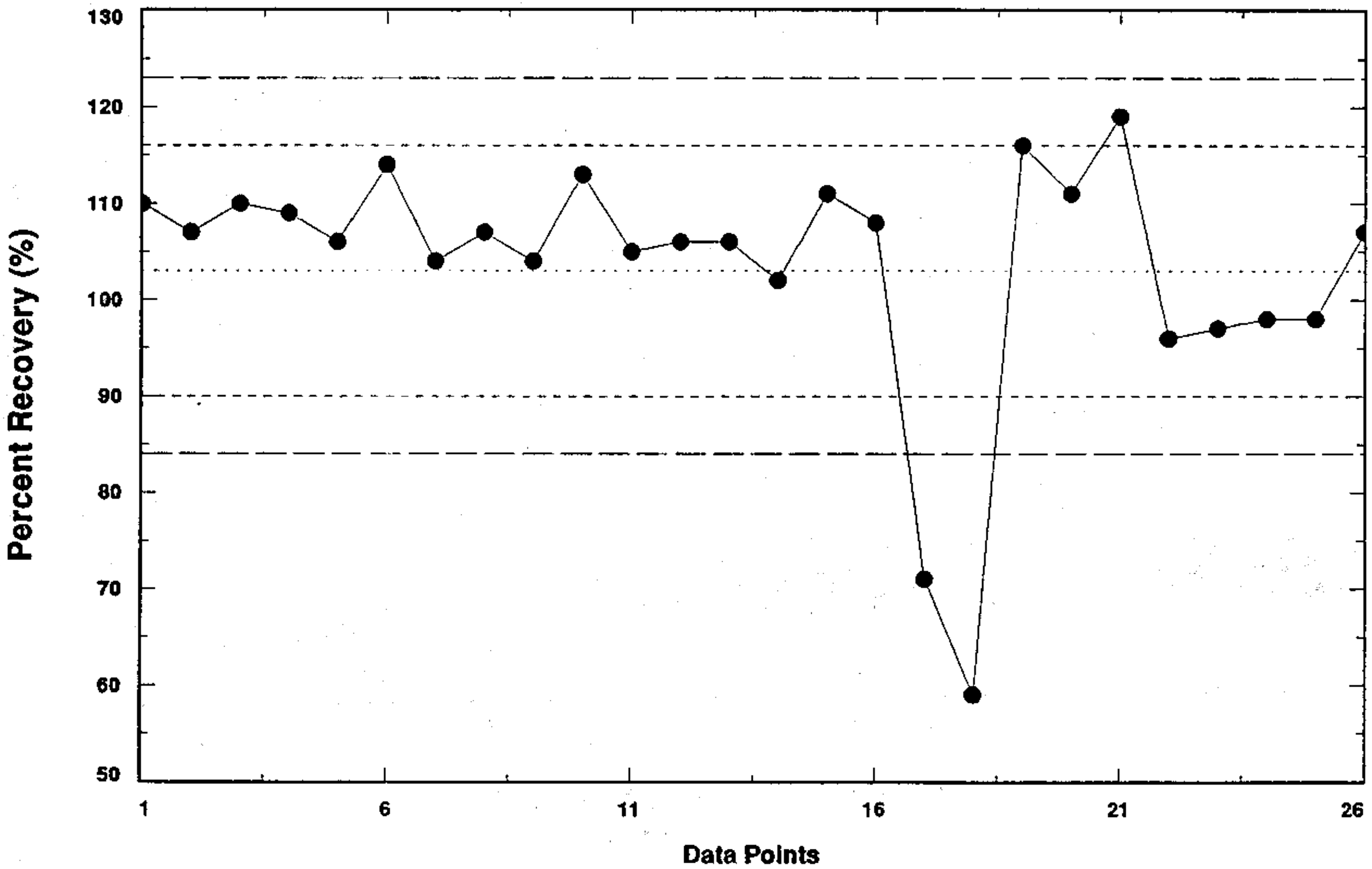


May 14, 1999

August 1-31, 1999

Chloroform

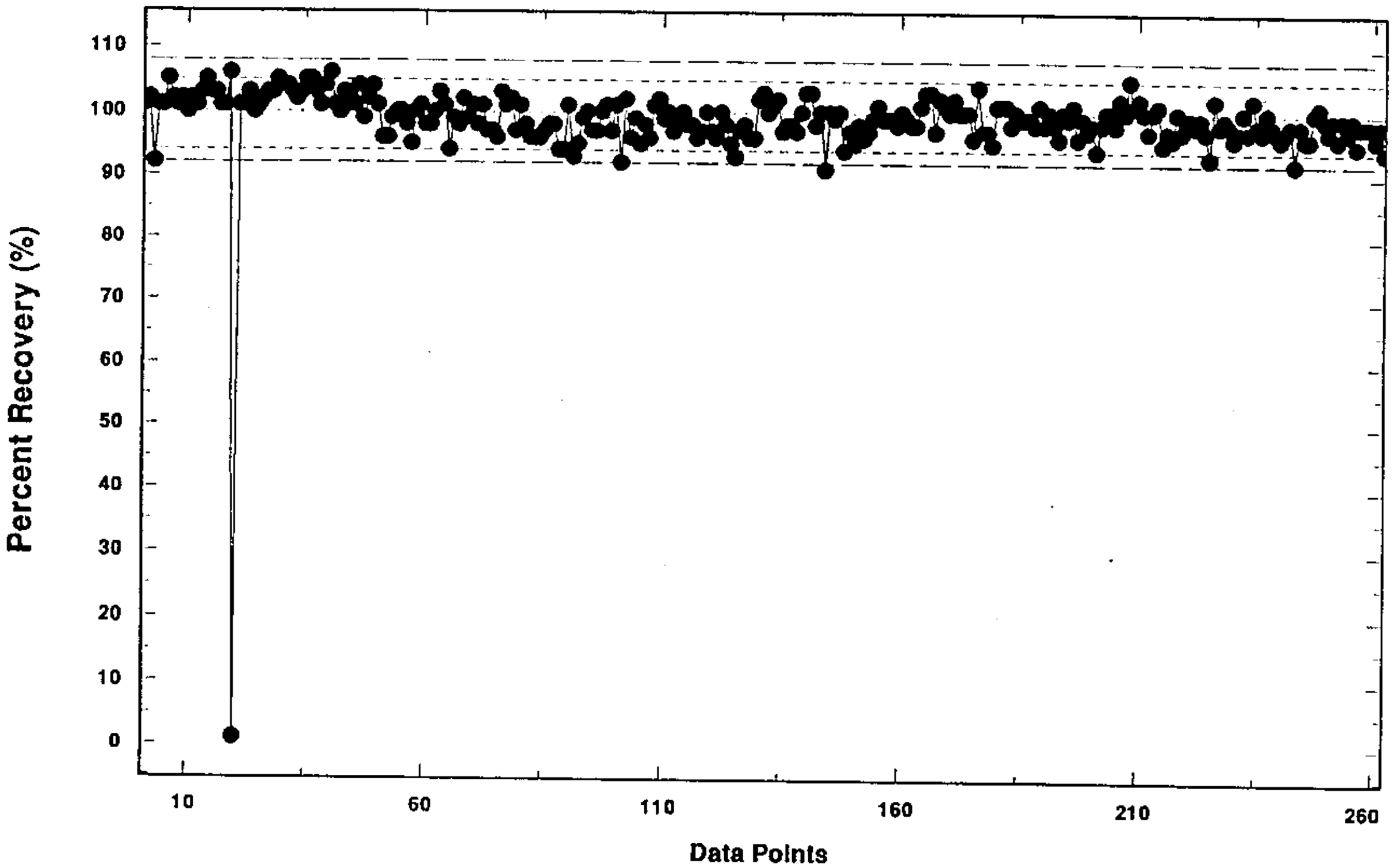
Laboratory Control Samples (Water)



Sept. 7, 1999

Copper

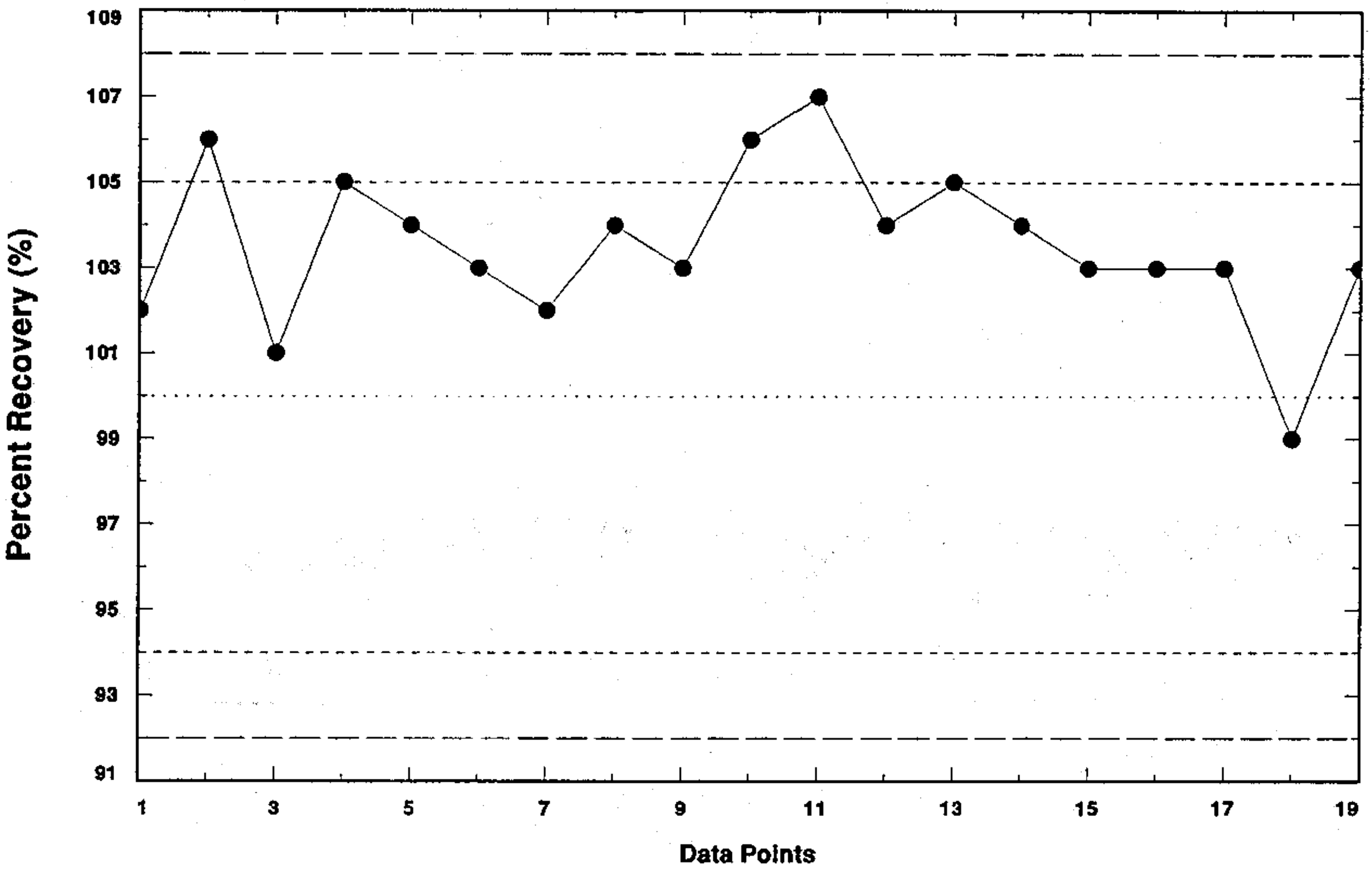
Laboratory Control Samples (Water)



August 1-31, 1999

Copper

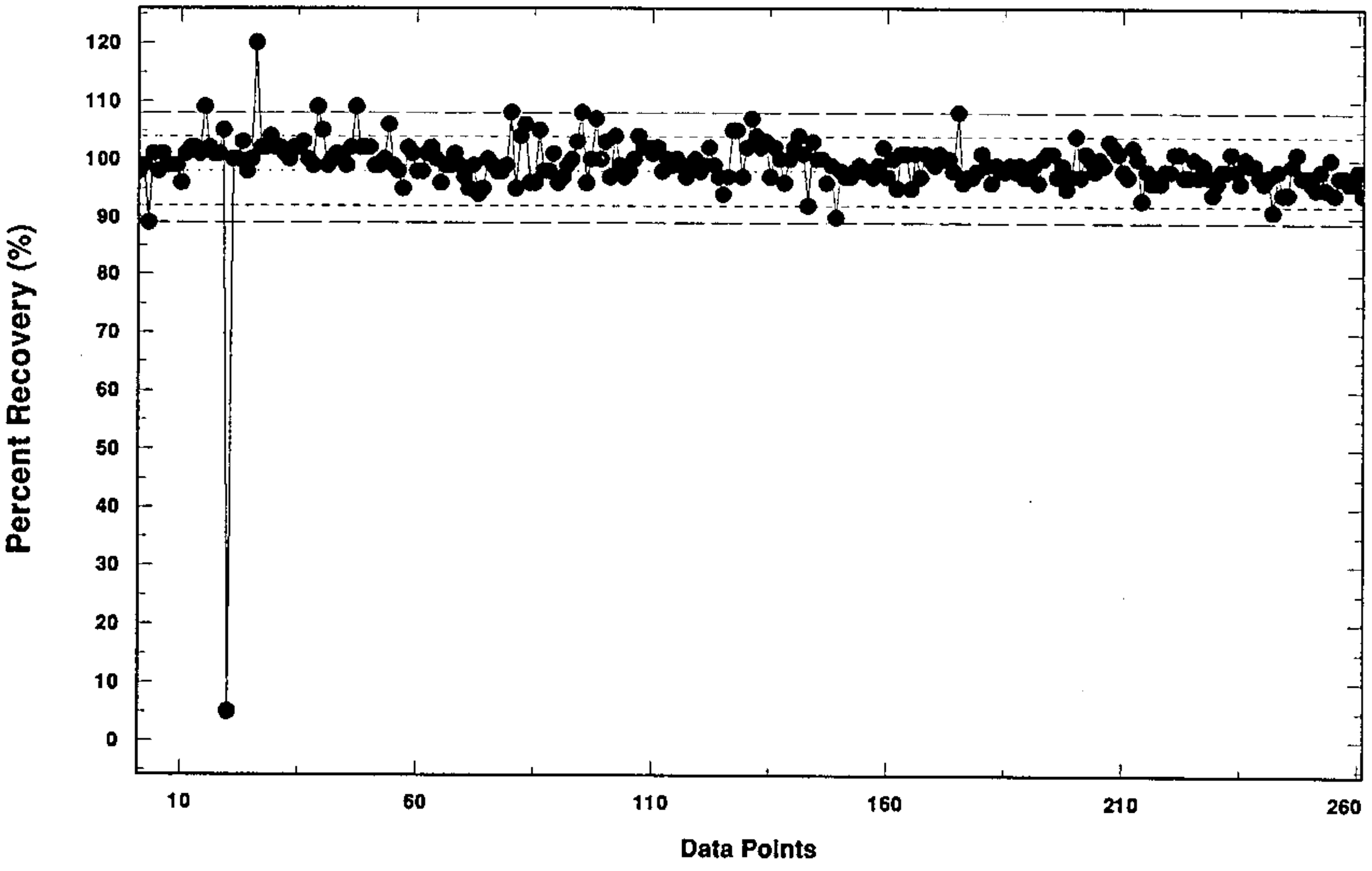
Laboratory Control Samples (Water)



Sept. 7, 1999

Iron

Laboratory Control Samples (Water)

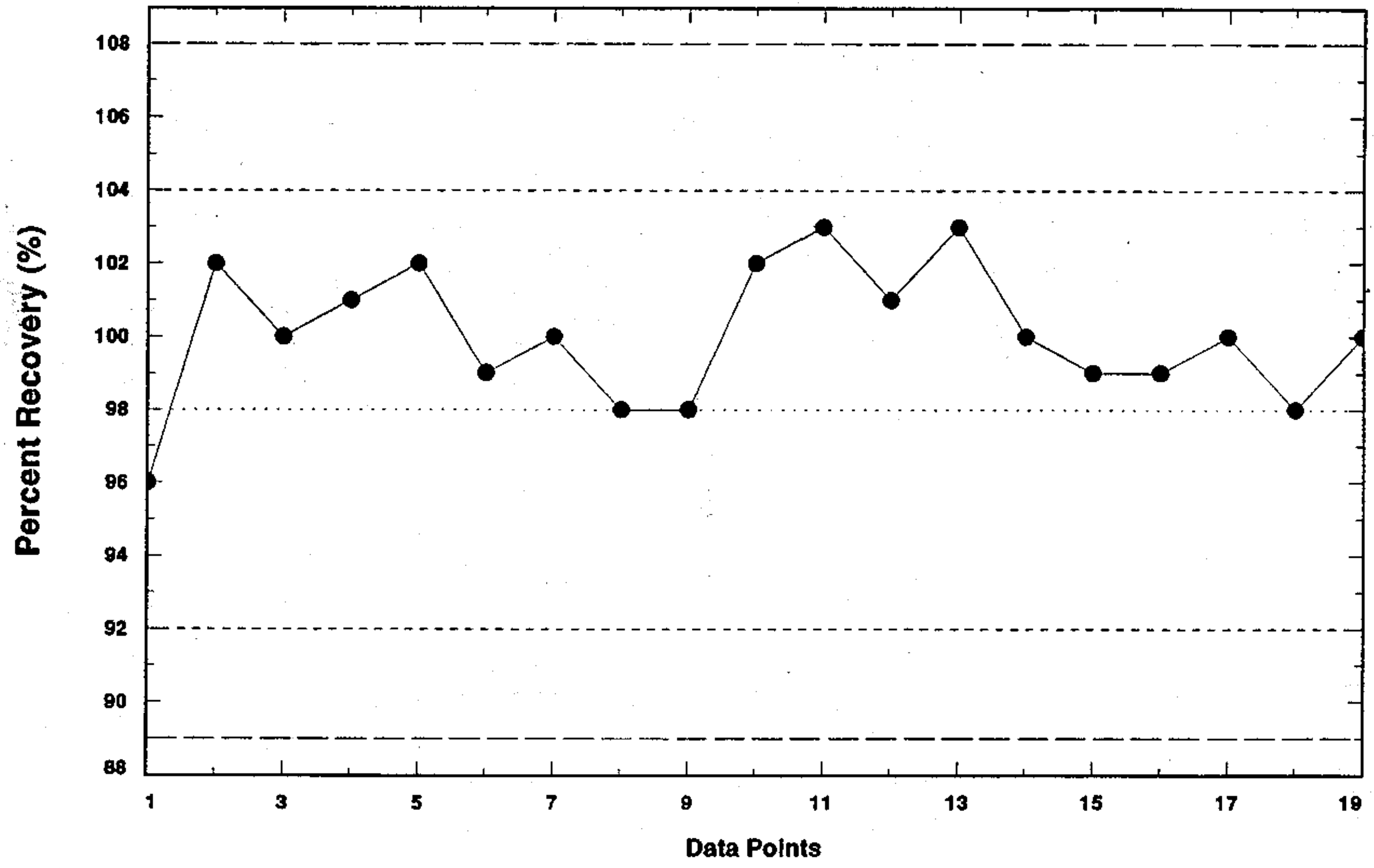


May 14, 1999

August 1-31, 1999

Iron

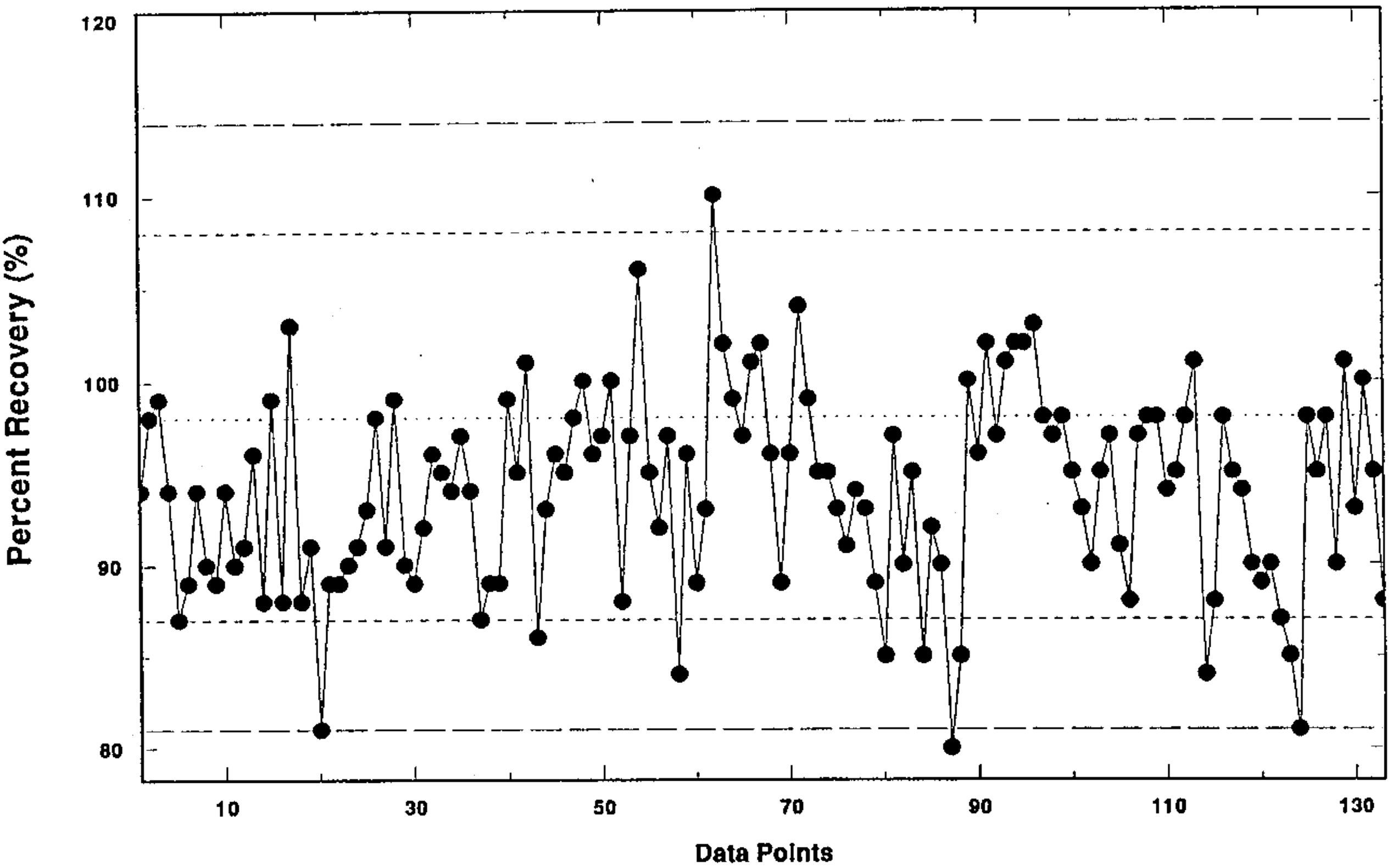
Laboratory Control Samples (Water)



Sept. 7, 1999

Mercury

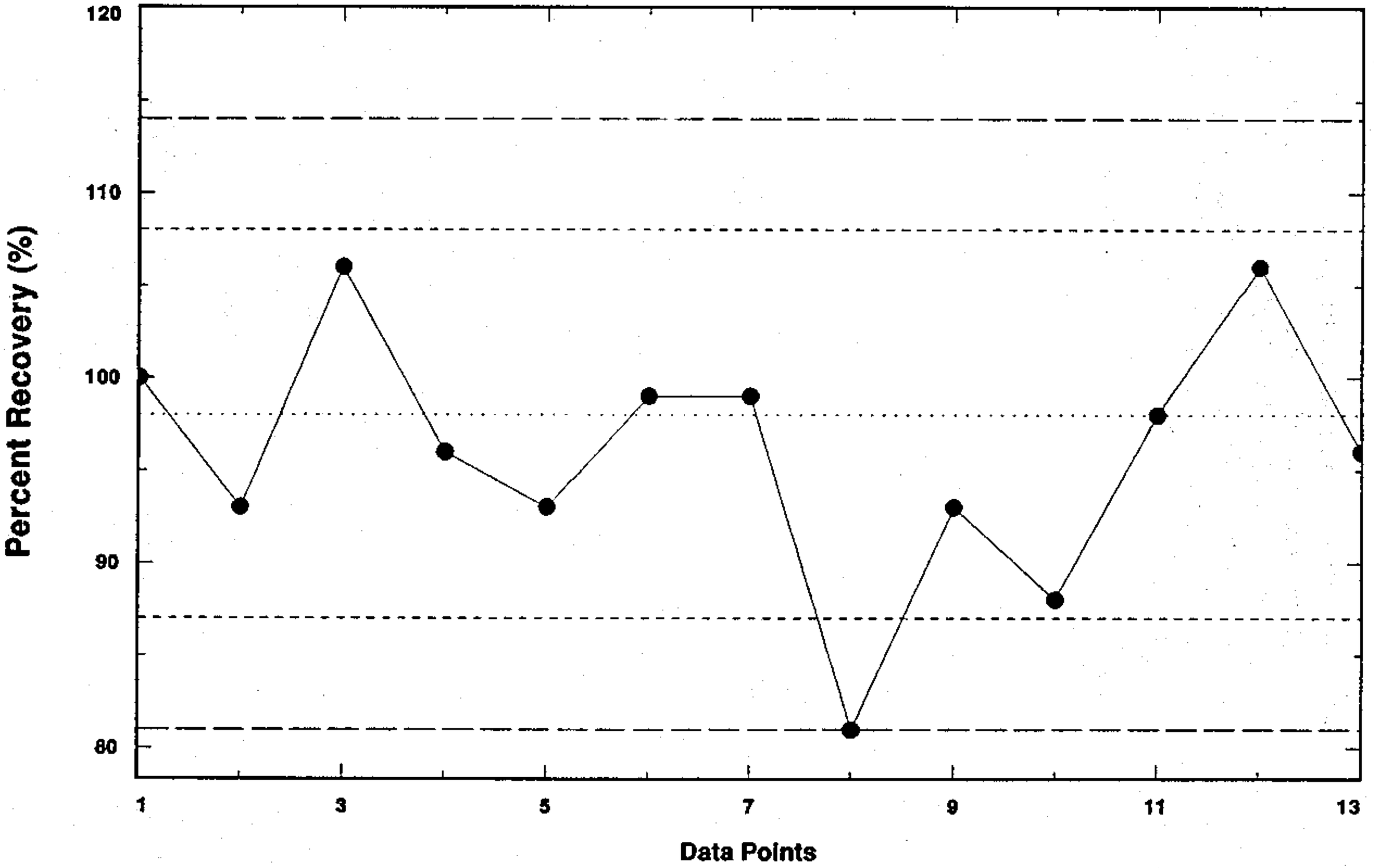
Laboratory Control Samples (Water)



August 1-31, 1999

Mercury

Laboratory Control Samples (Water)



8.19 Reporting Limit Standard (RL) AFCEE 3.0: To verify the RLs, a standard at the RL shall be analyzed after initial calibration. The percent recovery of each analyte should be within 70 –130%. If any analyte is outside this criteria, reanalyze the RL standard. If criteria still not met the instrument will be re-calibrated and the RL standard reanalyzed for the analyte (s) outside criteria.

13.2 Integration

Normally, the Turbochrom process method will automatically integrate peaks accurately. The integration parameters in the process file should be optimized to provide accurate and consistent integration of chromatographic peaks that have normal baselines. Due to the complex nature of many ECD chromatograms, using a single integration algorithm in the Turbochrom process method will, commonly, be insufficient to ensure accurate integration. In cases where the baseline and/or peak shape is not consistent with the calibration, manual integration is performed. Chapter 18 of the "Turbochrom Workstation User's Guide" outlines in great detail the criteria used by the acquisition software to determine peak start/end times, peak separation, baseline placement, and also the manual integration options.

13.2.1 Manual Integration

Each raw data file is processed into a result file using the methods that define the integration parameters and the identification of peaks. The analyst then reviews the chromatogram and determines whether manual integration is necessary or not. The analyst's changes to the integration parameters should attempt, as closely as possible, to reproduce the integration conditions found in the calibration. Ideally, for a well resolved peak, the start of a peak will be at the point where the baseline begins to slope upward and end at the point where it returns to the baseline or the start of a new peak, resulting in peaks with the best symmetry possible, and manual integration can be used to ensure this.

The manual changes can include, but are not limited to: redrawing of the baseline due to negative peaks or matrix interference, redefining peak start and end times, and/or forcing (or unforcing) exponential skims. The manually processed chromatogram will note these manual events on the plot of the chromatogram (The manual events are summarized in chapter 7 of the "Turbochrom Workstation User's Guide"). For example, the mark (M+) will identify a manually integrated peak start and (M-) will mark a manually integrated peak end. The Turbochrom software will draw the baseline between the two points. In a case where a large peak has a smaller, unresolved "shoulder" peak, Start Peak (S) will force a split between the shoulder and the parent peak, thus identifying the smaller peak. Three examples of commonly used manual integration are included with this SOP (see attached). Example one shows before and after manually integrating a negative peak or "dipping" of the baseline resulting in a more consistant, stable baseline. Example two shows before and after using the peak start event to separate two closely eluting, unresolved peaks. Example three shows before and after using the common baseline on/off event to redraw the baseline under a toxaphene standard, eliminating the valley to valley integration.

When manual integration is performed, the manual events will be initialed and dated on the chromatogram by the analyst. The chromatograms will then be reviewed and initialed and dated by the section supervisor. Upon request, both the automatically processed result file and any manually processed result file can be provided with a data report; however, all reported results are determined from the manually processed result file, if any.

Addendum to Standard Operating Procedure for:
Title: Organochlorine Pesticides - Method 8081A
AP#100-55A
Rev#2

Approved By:_____ Date: _____
Technical Review

Approved By:_____ Date:_____
Laboratory Management

Approved By:_____ Date:_____
QA/QC Section

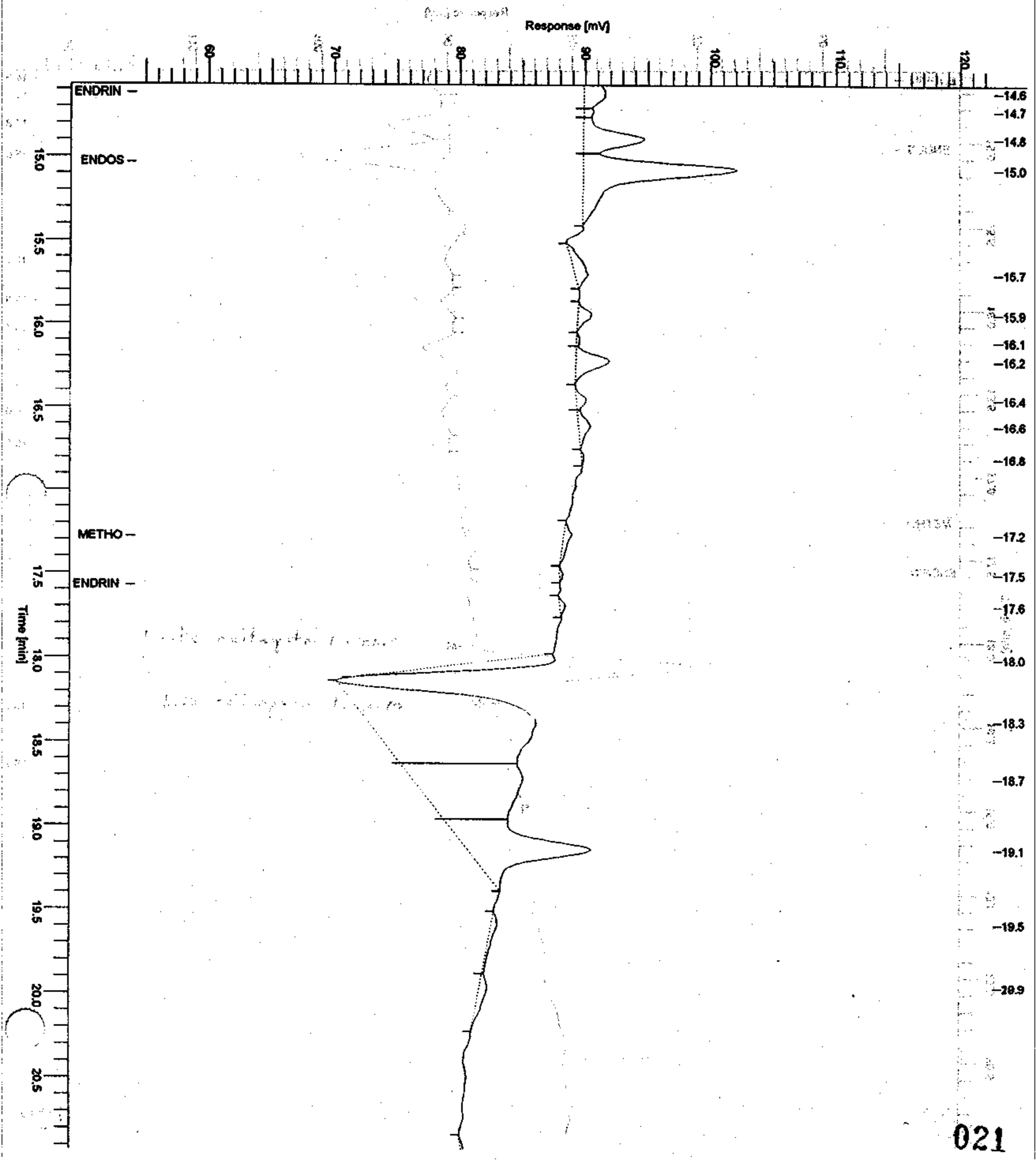
DB-608 - HP5890-90 (C)

Before

Example 1 + 11

Sample Name : N0002
FileName : E:\90aug99\C083013.raw
Date : 09/03/99 14:10:37
Method :
Start Time : 14.57 min End Time : 20.93 min Low Point : 54.26 mV High Point : 122.71 mV
Factor: 0.0 Plot Offset: 54.26 mV Plot Scale: 68.4 mV

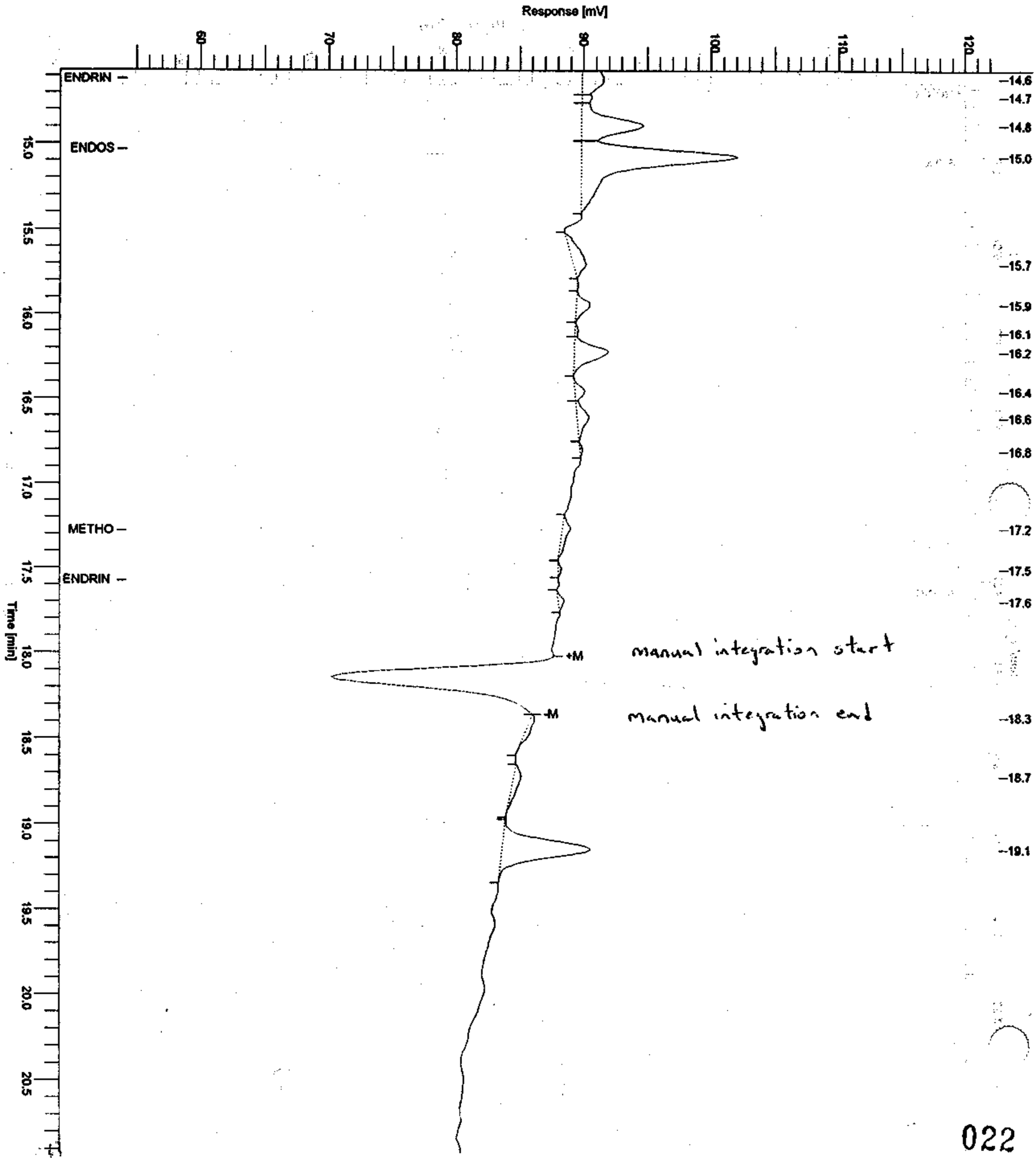
Sample #:



DB-608 - HP5890-90 (C)

Example 1

Sample Name : N0002 After Sample #: Page 1 of 1
FileName : E:\90aug99\C063013.raw
Date : 09/03/99 14:10:11
Method :
Time of Injection: 08/30/99 18:47:17
Start Time : 14.57 min End Time : 20.93 min Low Point : 54.26 mV High Point : 122.71 mV
Scale Factor: 0.0 Plot Offset: 54.26 mV Plot Scale: 68.4 mV



manual integration start

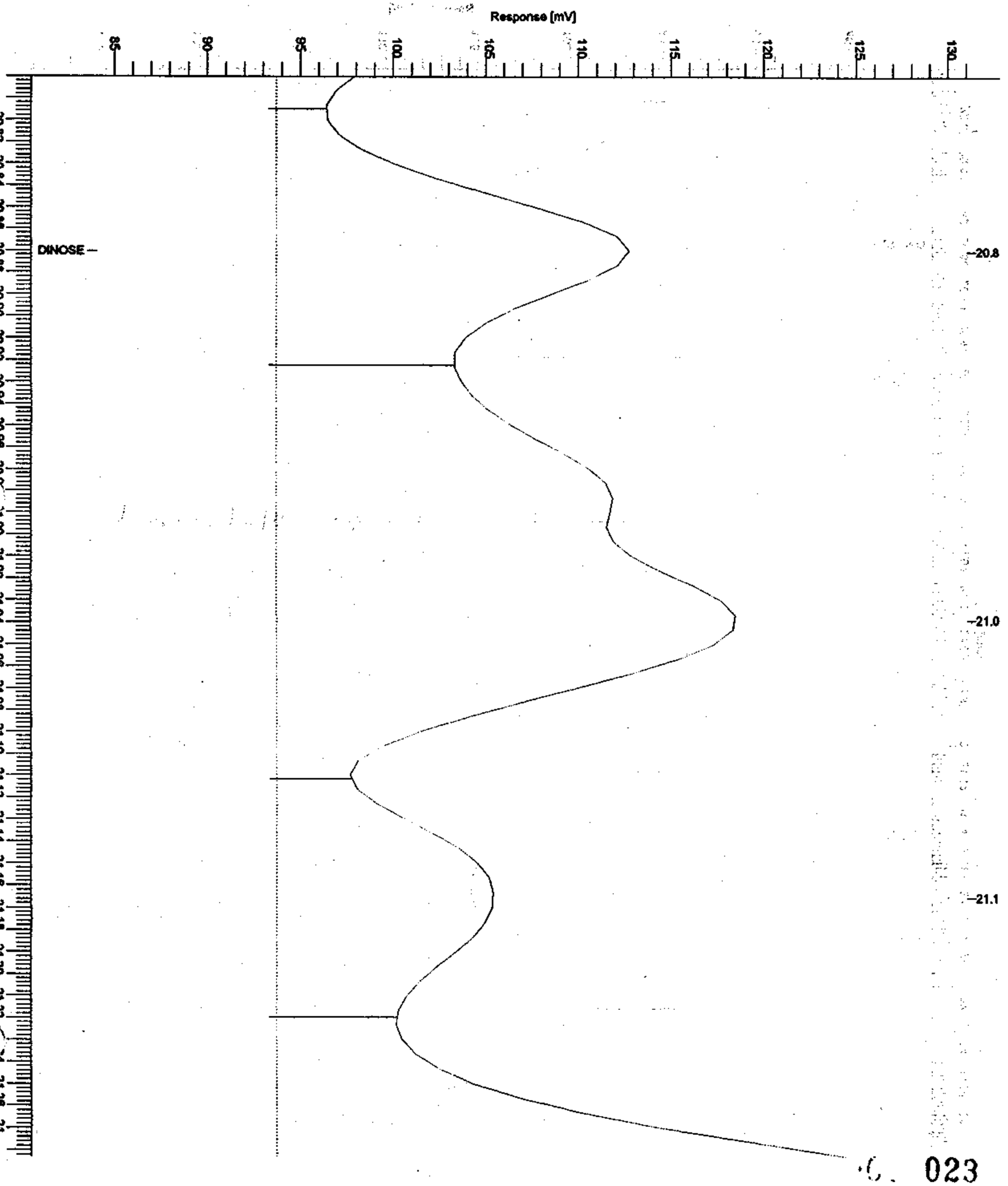
manual integration end

DB-608 - HP5890-90 (C)

Example 2

Before

Sample Name : HERB2 Sample #: Page 1 of 1
FileName : E:\90jun99\C061004.raw
Date : 09/03/99 14:18:43
Method :
Time of Injection: 06/10/99 17:52:34
Start Time : 20.80 min End Time : 21.29 min Low Point : 84.06 mV High Point : 131.02 mV
e Factor: 0.0 Plot Offset: 84.06 mV Plot Scale: 46.9 mV

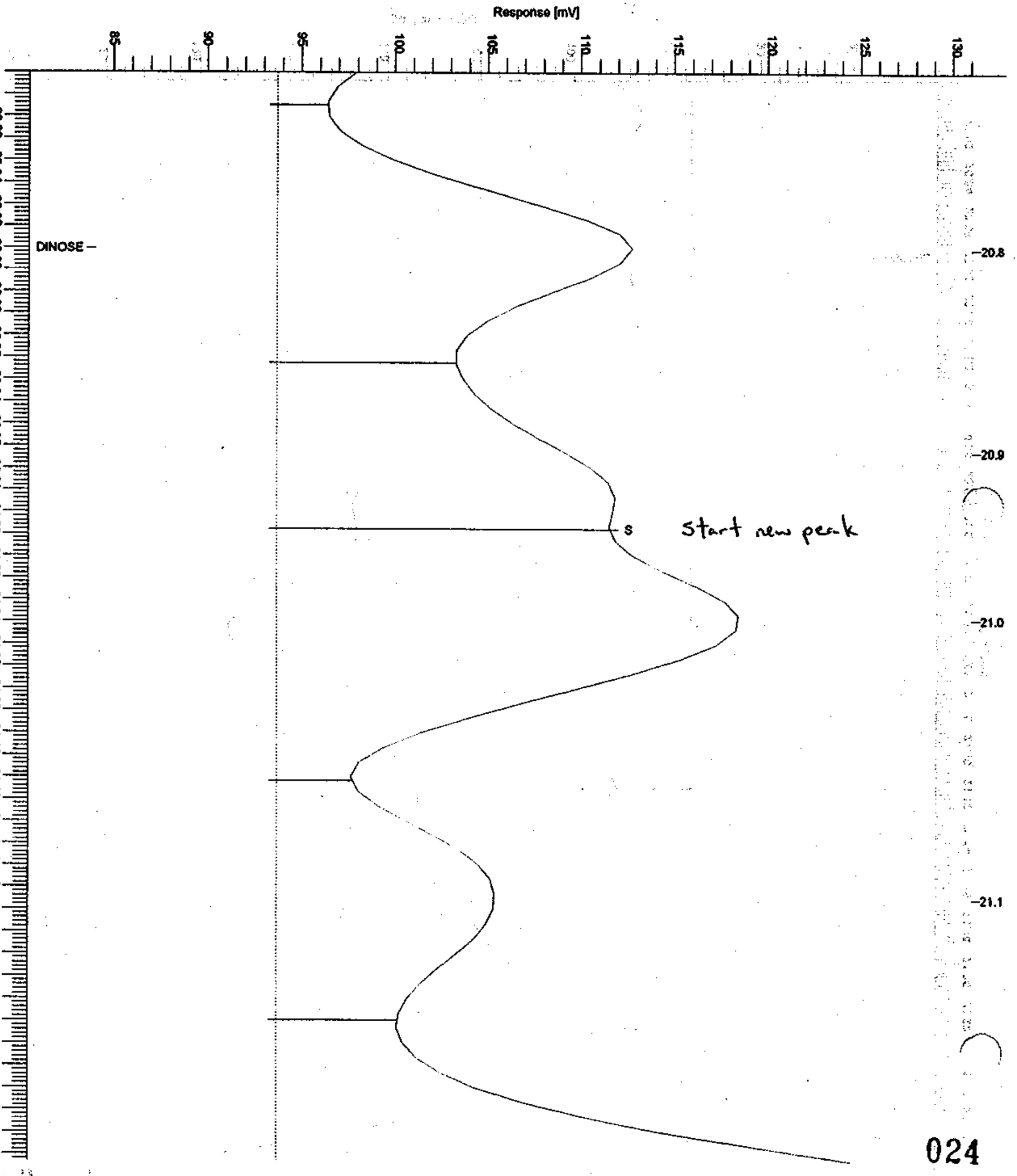


C 023

DB-608 - HP5890-90 (C)

Example 2

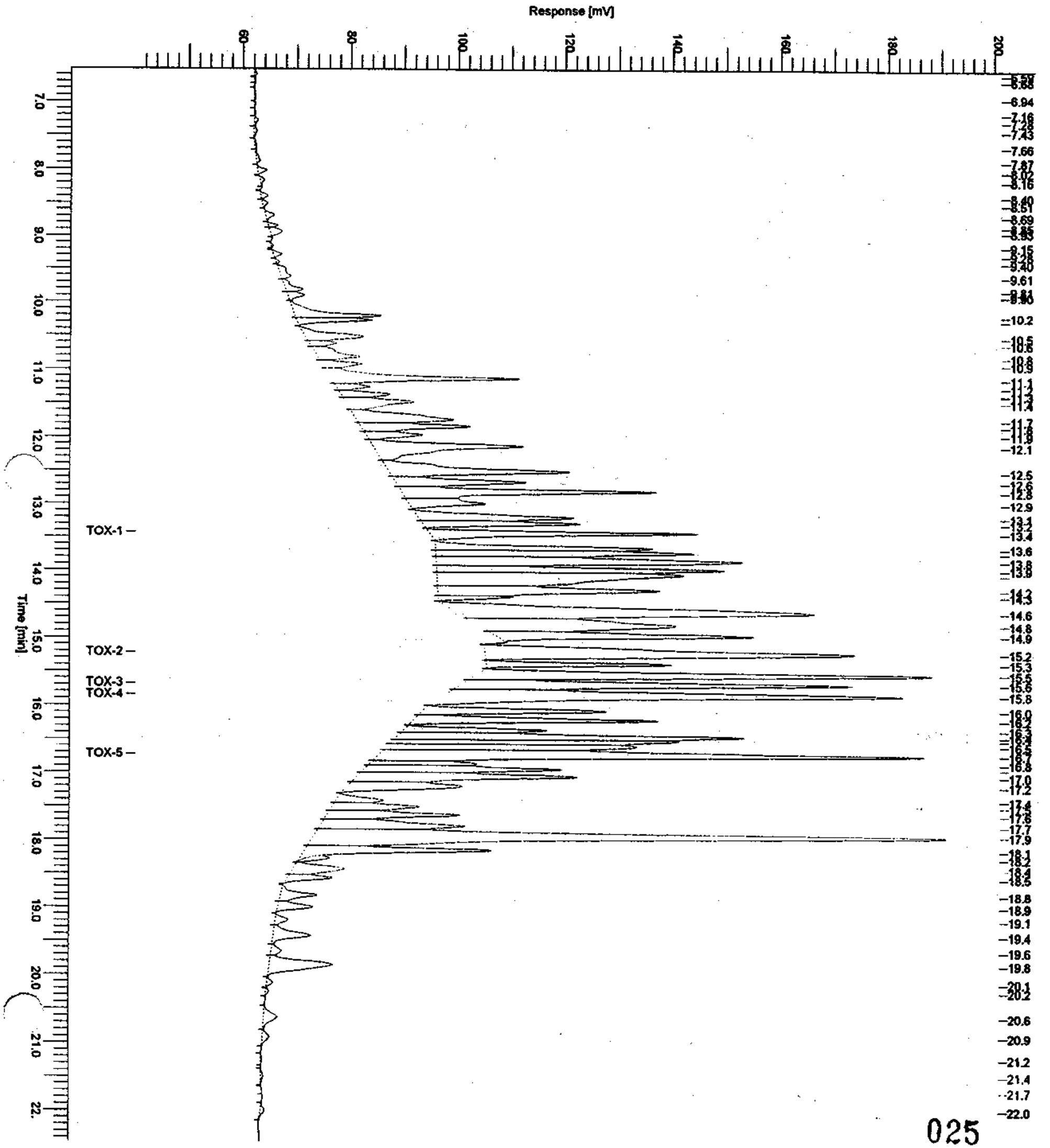
Sample Name : HERB2 After
FileName : E:\90jun99\C061004.raw
Date : 09/03/99 14:18:23
Method :
Sample #:
Page 1 of 1
Time of Injection: 06/10/99 17:52:34
Start Time : 20.80 min End Time : 21.29 min Low Point : 84.08 mV High Point : 131.02 mV
Scale Factor: 0.0 Plot Offset: 84.08 mV Plot Scale: 46.9 mV



DB-1701 - HP5890-90 (D)

Example 3

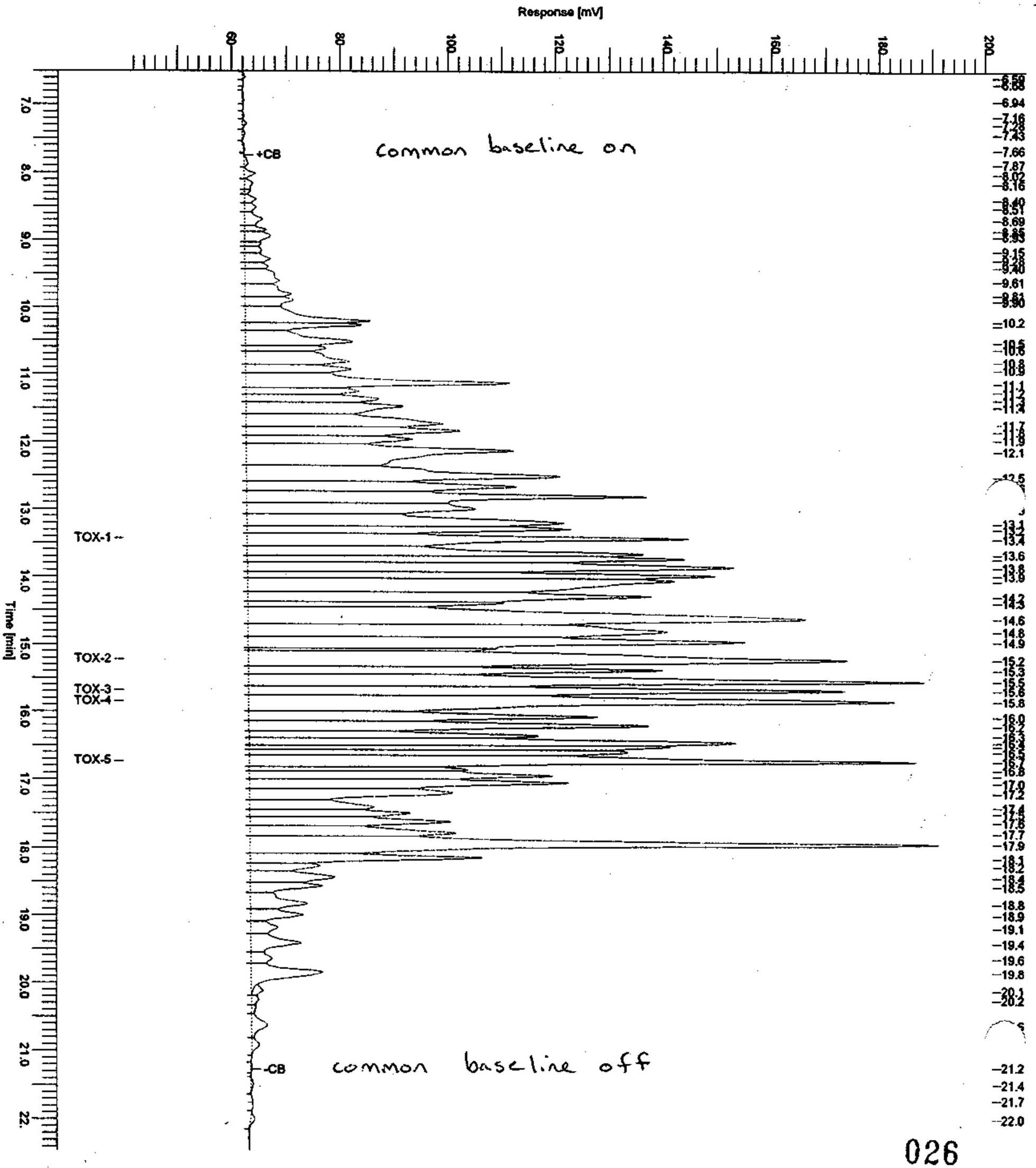
Sample Name : TOX-2 Before
Sample #: P6446
Page 1 of 1
FileName : E:\90aug99\D082738.raw
Date : 09/03/99 14:25:41
Method :
Time of Injection: 08/29/99 01:24:26
Time : 6.51 min
End Time : 22.47 min
Low Point : 40.41 mV
High Point : 201.30 mV
Factor: 0.0
Plot Offset: 40.41 mV
Plot Scale: 160.9 mV



DB-1701 - HP5890-90 (D)

Example 3

Sample Name : TOX-2 After
FileName : E:\90aug99\D082738.raw
Date : 09/03/99 14:25:19
Method :
Sample #: P6446
Page 1 of 1
Time of Injection: 08/29/99 01:24:26
Start Time : 6.49 min
End Time : 22.47 min
Low Point : 40.41 mV
High Point : 201.30 mV
Scale Factor: 0.0
Plot Offset: 40.41 mV
Plot Scale: 160.9 mV



Addendum to Standard Operating Procedure for:
Title: Organochlorine Pesticides - Method 8081A
AP#100-55A
Rev#2

13.1.3 The acceptance criteria for the PQL check standard is 60 to 140 percent.

Approved By:_____
Technical Review

Date:_____

Approved By:_____
Laboratory Management

Date:_____

Approved By:_____
QA/QC Section

Date:_____

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

Instrument: HP5890-90
Column: DB-608
Serial Number: 6231713
Date Installed: 1/12/98

MKY
Date Analyzed: 7/07/98
Method: 608/8081

Analyte	Run #1	Run #2	Run #3	Run #4	Conc. (ppb)	Avg.	Average % Rec.	STDev.
ALPHA-BHC	.486	.491	.492	.478	0.5	.487	97.4	.00640
LINDANE	.525	.529	.533	.519	0.5	.527	105	.00597
HEPTACHLOR	.442	.445	.453	.439	0.5	.445	89.0	.00602
ENDOSULFAN I	.458	.461	.463	.448	0.5	.458	91.6	.00666
DIELDRIN	.463	.467	.472	.455	0.5	.464	92.8	.00718
ENDRIN	.535	.540	.548	.530	0.5	.538	108	.00768
4-4-DDD	.495	.500	.505	.486	0.5	.497	99.4	.00810
4-4-DDT	.468	.480	.483	.456	0.5	.472	94.4	.0123
METHOXYCHLOR	.463	.479	.483	.441	0.5	.467	93.4	.0191
B-BHC	.452	.455	.459	.445	0.5	.453	90.6	.00591
D-BHC	.464	.466	.471	.458	0.5	.465	93.0	.00538
ALDRIN	.469	.473	.480	.464	0.5	.472	94.4	.00676
HEPTACHLOR EPOXIDE	.452	.450	.454	.445	0.5	.450	90.0	.00386
G-CHLORDANE	.446	.448	.452	.437	0.5	.446	89.2	.00634
A-CHLORDANE	.446	.445	.450	.434	0.5	.444	88.8	.00685
4-4-DDE	.485	.489	.495	.476	0.5	.486	97.2	.00797
ENDOSULFAN II	.464	.469	.473	.455	0.5	.465	93.0	.00776
ENDRIN ALDEHYDE	.452	.454	.462	.446	0.5	.454	90.8	.00661
ENDOSULFAN SULFATE	.687	.598	.587	.619	0.5	.623	125	.0448
ENDRIN KETONE	.506	.515	.516	.492	0.5	.507	101	.0111
TECHNICAL CHLORDANE					5.000			
TOXAPHENE	4.89	4.69	5.14	4.90	5.000	4.905	98.0000	.1841
AROCLOR 1016	1.91	1.97	2.01	1.87	2.000	1.940	97.0000	.0622
AROCLOR 1260	1.91	1.97	2.00	1.87	2.000	1.963	98.0000	.0377

1) Water P&A is based on a l L sample size and a 10ml extract volume.

Average Percent Recovery Acceptance Criteria for Pesticides is 70-130, for PCBs 80-120.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

MCY

Instrument: HP5890-90
Column: DB-1701
Serial Number: 7482925
Date Installed: 1/12/98

Date Analyzed: 07/07/98
Method: 608/8081

Analyte	Run #1	Run #2	Run #3	Run #4	Conc. (ppb)	Avg.	Average % Rec.	STDev.
ALPHA-BHC	.513	.529	.526	.513	0.5	.520	104.1	.00833
LINDANE	.501	.517	.514	.508	0.5	.510	102.0	.00681
HEPTACHLOR	.485	.493	.501	.503	0.5	.495	99.1	.00797
ENDOSULFAN I	.491	.502	.503	.496	0.5	.498	99.6	.00581
DIELDRIN	.501	.519	.518	.505	0.5	.511	102.1	.00896
ENDRIN	.566	.588	.588	.577	0.5	.580	116.0	.01045
4-4-DDD	.512	.532	.532	.519	0.5	.524	104.8	.00989
4-4-DDT	.492	.509	.502	.484	0.5	.497	99.4	.01103
METHOXYCHLOR	.546	.558	.554	.538	0.5	.549	109.8	.00873
B-BHC	.477	.492	.492	.481	0.5	.485	97.1	.00773
D-BHC	.484	.500	.499	.491	0.5	.493	98.7	.00742
ALDRIN	.510	.526	.531	.522	0.5	.522	104.4	.00889
HEPTACHLOR EPOXIDE	.477	.492	.495	.483	0.5	.487	97.4	.00842
G-CHLORDANE	.504	.517	.519	.510	0.5	.512	102.5	.00675
A-CHLORDANE	.491	.505	.504	.494	0.5	.499	99.7	.00723
4-4-DDE	.529	.547	.546	.532	0.5	.539	107.7	.00944
ENDOSULFAN II	.500	.516	.515	.501	0.5	.508	101.6	.00880
ENDRIN ALDEHYDE	.477	.491	.492	.482	0.5	.486	97.1	.00720
ENDOSULFAN SULFATE	.524	.541	.538	.524	0.5	.532	106.3	.00920
ENDRIN KETONE	.538	.557	.553	.535	0.5	.546	109.2	.01059
TECHNICAL CHLORDANE	.000	.000	.000	.000	5.000	.000	.0	.00000
TOXAPHENE	4.71	4.52	4.90	4.74	5.000	4.715	94.3	.15466
AROCLOR 1016	2.14	2.21	2.23	2.09	2.000	2.167	108.3	.06651
AROCLOR 1260	2.21	2.30	2.29	2.16	2.000	2.241	112.0	.06837

1) Water P&A is based on a I L sample size and a 10ml extract volume.
2) Solid P&A is based on a 30g sample size and a 10ml extract volume.

Average Percent Recovery Acceptance Criteria for Pesticides
is 70-130, for PCBs 80-120.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

MC4

Instrument: HP5890-90
Column: DB-608
Serial Number: 6231713
Date Installed: 1/12/98

Date Analyzed: 07/06/98
Method: 608/8081

Analyte	Run #1	Run #2	Run #3	Run #4	Conc. (ppm)	Avg.	Average % Rec.	STDev.
ALPHA-BHC	.0160	.0159	.0170	.0168	0.0167	.0164	98.2	.000556
LINDANE	.0170	.0169	.0181	.0179	0.0167	.0175	105	.000613
HEPTACHLOR	.0136	.0138	.0148	.0147	0.0167	.0142	85.0	.000613
ENDOSULFAN I	.0149	.0148	.0158	.0156	0.0167	.0153	91.6	.000499
DIELDRIN	.0151	.0150	.0161	.0159	0.0167	.0155	92.8	.000556
ENDRIN	.0174	.0174	.0188	.0185	0.0167	.0180	108	.000732
4-4-DDD	.0158	.0159	.0172	.0169	0.0167	.0165	98.8	.000705
4-4-DDT	.0152	.0154	.0167	.0165	0.0167	.0160	95.8	.000759
METHOXYCHLOR	.0150	.0156	.0172	.0166	0.0167	.0161	96.4	.000987
B-BHC	.0147	.0147	.0156	.0154	0.0167	.0151	90.4	.000469
D-BHC	.0150	.0148	.0159	.0157	0.0167	.0154	92.2	.000532
ALDRIN	.0156	.0148	.0159	.0160	0.0167	.0155	92.8	.000640
HEPTACHLOR EPOXIDE	.0146	.0145	.0155	.0153	0.0167	.0150	89.8	.000499
G-CHLORDANE	.0148	.0146	.0157	.0154	0.0167	.0151	90.4	.000512
A-CHLORDANE	.0147	.0146	.0155	.0153	0.0167	.0150	89.8	.000443
4-4-DDE	.0159	.0159	.0171	.0168	0.0167	.0164	98.2	.000618
ENDOSULFAN II	.0153	.0152	.0163	.0160	0.0167	.0157	94.0	.000535
ENDRIN ALDEHYDE	.0112	.0126	.0135	.0129	0.0167	.0126	75.4	.000975
ENDOSULFAN SULFATE	.0160	.0159	.0171	.0167	0.0167	.0164	98.2	.000574
ENDRIN KETONE	.0168	.0165	.0177	.0174	0.0167	.0171	102	.000592
TECHNICAL CHLORDANE					0.167			
TOXAPHENE	.1691	.1674	.1730	.1717	0.167	.1703	102	.02520
AROCLOR 1016	.06740	.06710	.06652	.06558	0.0667	.06660	99	.000797
AROCLOR 1260	.06768	.06796	.06733	.06552	0.0667	.06712	101	.00110

2) Soil P&A is based on a 30g sample size and a 10ml extract volume.

Average Percent Recovery Acceptance Criteria for Pesticides is 70-130, for PCBs 80-120.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

MCY

Instrument: HP5890-90
Column: DB-1701
Serial Number: 748925
Date Installed: 1/12/98

Date Analyzed: 07/06/98
Method: 608/8081

Analyte	Run #1	Run #2	Run #3	Run #4	Conc. (ppm)	Avg.	Average % Rec.	STDev.
ALPHA-BHC	.0157	.0158	.0166	.0164	0.0167	.0161	96.4	.000457
LINDANE	.0165	.0165	.0176	.0174	0.0167	.0170	101.7	.000573
HEPTACHLOR	.0156	.0156	.0167	.0164	0.0167	.0161	96.3	.000548
ENDOSULFAN I	.0161	.1609	.0172	.0168	0.0167	.0528	315.9	.072093
DIELDRIN	.0165	.0161	.0175	.0172	0.0167	.0168	100.6	.000605
ENDRIN	.0187	.0189	.0203	.0197	0.0167	.0194	116.3	.000744
4-4-DDD	.0168	.0168	.0181	.0176	0.0167	.0173	103.7	.000643
4-4-DDT	.0161	.0162	.0174	.0170	0.0167	.0166	99.7	.000617
METHOXYCHLOR	.0175	.0178	.0191	.0187	0.0167	.0183	109.4	.000743
B-BHC	.0158	.0157	.0168	.0165	0.0167	.0162	97.0	.000535
D-BHC	.0158	.0157	.0169	.0166	0.0167	.0163	97.4	.000579
ALDRIN	.0170	.0170	.0181	.0176	0.0167	.0175	104.6	.000584
HEPTACHLOR EPOXIDE	.0156	.0157	.0167	.0163	0.0167	.0161	96.2	.000519
G-CHLORDANE	.0164	.0164	.0175	.0172	0.0167	.0169	101.1	.000550
A-CHLORDANE	.0161	.0161	.0172	.0168	0.0167	.0166	99.3	.000543
4-4-DDE	.0175	.0175	.0188	.0183	0.0167	.0180	107.8	.000658
ENDOSULFAN II	.0165	.0165	.0176	.0172	0.0167	.0169	101.4	.000560
ENDRIN ALDEHYDE	.0135	.0141	.0149	.0145	0.0167	.0142	85.3	.000607
ENDOSULFAN SULFATE	.0172	.0172	.0184	.0180	0.0167	.0177	105.9	.000617
ENDRIN KETONE	.0178	.0179	.0190	.0186	0.0167	.0183	109.7	.000607
TECHNICAL CHLORDANE					0.167	.0000	.0	#DIV/0!
TOXAPHENE	.1603	.1583	.1617	.1685	0.167	.1622	97.1	.004426
AROCLOR 1016	.07124	.07155	.07147	.07074	0.0667	.0713	106.8	.000365
AROCLOR 1260	.07220	.07135	.07147	.07042	0.0667	.0714	107.0	.000731

2) Soil P&A is based on a 30g sample size and a 10ml extract volume.

Average Percent Recovery Acceptance Criteria for Pesticides is 70-130, for PCBs 80-120.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

Instrument: HP5890-90
Column: DB-1701
Serial Number: 7482925
Date Installed: 1/12/98

Analyst: DMS
Date Analyzed: 08/03-04/99
Method: 8081

Analyte	Run #1	Run #2	Run #3	Run #4	Conc. (ppm) (2)	Avg.	Average % Rec.	STDev.
ALPHA-BHC	.019	.018	.019	.019	0.0167	.019	113.0	.00046
B-BHC	.016	.016	.016	.017	0.0167	.016	96.6	.00035
D-BHC	.017	.016	.017	.018	0.0167	.017	103.1	.00066
LINDANE	.018	.018	.018	.018	0.0167	.018	107.5	.00035
HEPTACHLOR	.017	.017	.017	.017	0.0167	.017	102.1	.00029
ALDRIN	.018	.017	.017	.018	0.0167	.017	103.3	.00035
HEPTACHLOR EPOXIDE	.016	.015	.016	.016	0.0167	.016	94.0	.00036
ENDOSULFAN I	.017	.016	.016	.017	0.0167	.016	97.5	.00032
DIELDRIN	.018	.017	.017	.018	0.0167	.017	104.0	.00046
4-4-DDE	.019	.018	.018	.019	0.0167	.018	108.7	.00041
ENDRIN	.021	.020	.020	.021	0.0167	.020	121.6	.00042
ENDOSULFAN II	.017	.017	.017	.017	0.0167	.017	101.3	.00026
4-4-DDD	.017	.017	.017	.017	0.0167	.017	102.1	.00035
ENDOSULFAN SULFATE	.018	.017	.018	.018	0.0167	.018	107.5	.00038
4-4-DDT	.018	.017	.018	.018	0.0167	.018	105.1	.00025
METHOXYCHLOR	.019	.018	.019	.020	0.0167	.019	114.4	.00088
ENDRIN ALDEHYDE	.015	.013	.015	.015	0.0167	.014	85.2	.00096
ENDRIN KETONE	.019	.018	.019	.019	0.0167	.019	112.6	.00036
A-CHLORDANE	.017	.016	.016	.017	0.0167	.016	97.3	.00037
G-CHLORDANE	.017	.017	.016	.017	0.0167	.017	100.0	.00036

1) Water P&A is based on a I L sample size and a 10ml extract volume.
2) Solid P&A is based on a 30g sample size and a 10ml extract volume.

Average Percent Recovery Acceptance Criteria is 70-130.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

Instrument: HP5890-P
Column: DB-1701
Serial Number: 7555132
Date Installed: 7/20/98

Analyst: DMS
Date(s) Analyzed: 03/13,15,16,22/99
Method: 8082

Analyte	Run #1 L031299S1	Run #2 L031299S4	Run #3 L031599S1	Run #4 L031999S1	Conc. (mg/kg)	Avg.	Average % Rec.	STDev.
AROCLOR 1016	2.00	2.07	2.11	2.11	2.000	2.073	103.7	.04950
AROCLOR 1260	1.82	1.78	1.89	1.78	2.000	1.818	90.9	.05167

Average Percent Recovery Acceptance Criteria is 80-120.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

Instrument: HP5890-P
Column: DB-608
Serial Number: 7397361
Date Installed: 3/13/98

Analyst: DMS
Date(s) Analyzed: 03/13,15,16,22/99
Method: 8082

Analyte	Run #1 L031299S1	Run #2 L031299S4	Run #3 L031599S2	Run #4 L031999S1	Conc. (mg/kg)	Avg.	Average % Rec.	STDev.
AROCLOR 1016	2.03	2.12	2.17	2.14	2.000	2.116	105.8	.06151
AROCLOR 1260	2.11	2.14	2.23	2.13	2.000	2.152	107.6	.05219

Average Percent Recovery Acceptance Criteria is 80-120.

GC - SEMIVOLATILES

PRECISION & ACCURACY STUDY

Instrument: HP5890-P
Column: DB-608
Serial Number: 7397361
Date Installed: 3/13/98

Analyst: DMS
Date(s) Analyzed: 06/17,21,22/99
Method: 8082/608

Analyte	Run #1 L061699W1	Run #2 L061799W1	Run #3 D061799W1	Run #4 L062199W4	Conc. (ppb)	Avg.	Average % Rec.	STDev.
AROCLOR 1016	.1678	.1747	.1801	.1601	.200	.171	85.3	.00866
AROCLOR 1260	.1742	.1794	.1836	.1849	.200	.181	90.3	.00483

Average Percent Recovery Acceptance Criteria is 80-120.

GC/MS Volatile Organics Case Narrative

Client: General Motors Corporation-IFG
Job Number: 3247.009.517
Package #: 2940
Prepared for: TAA
Prepared by: JCH

QA/QC Review (Date/Initials): 9/7/99

File Name in G/ Drive:
G:\PROJMGT\REPORTS\JH\REPORTS\GM-TAA\2940.MSV

Methodology:

Volatile Organics 8260B

Reference:

New York State Department of Environmental Conservation Analytical Services Protocol, October 1995.

Quality Control Excursions:

Volatile Organics

The GC/MS Volatile instruments used a J&W DB-VRX, 75 m x 0.45 mm ID capillary column and a Vocarb 3000 trap.

Notes to the Project Manager which may be included in the narrative:

The sample MWI-3 [M9785] was analyzed over recommended holding time. The analysis was for qualitative purposes only.

Analyst Review

Date 9-7-99

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GC/MS Volatile Organics Case Narrative

Client: Sayreville Landfill
Job Number: 8061.008.517
Package #: 2988
Prepared for: MS
Prepared by: JCH

QA/QC Review (Date/Initials): 9/7/99

File Name in G/ Drive:
G:\PROJMGT\REPORTS\JH\REPORTS\SAYVILLE\2988.MSV

Methodology:

Volatile Organics 8260B

Reference:

Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update III, December 1996.

Quality Control Excursions:

Volatile Organics

The GC/MS Volatile instruments used a J&W DB-VRX, 75 m x 0.45 mm ID capillary column and a Vocarb 3000 trap.

Holding Times and Sample Preservation

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements. Samples had a pH of less than 2.

Laboratory Control Sample

All spike recoveries met method and/or project specific QC criteria.

MS/MSD

The following compound did not meet matrix spike/matrix spike duplicate percent recovery criteria:

Sample Description	Sample #	Compound	% REC	Corr. Action
P-5	N0006	Vinyl acetate	X	1

1. The MS/MSD met RPD criteria. This compound met LCS percent recovery criteria. No corrective action was taken.

Surrogate

All surrogate recoveries met method and/or project specific QC criteria.

Internal Standards

All internal standard areas met method and/or project specific QC criteria.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

For calibration check standard compounds that had a linear regression performed, a % drift was calculated between the true value of the calibration check standard and the calculated value. For compounds using an average response factor, the % difference between the average response factor and the daily response factor was calculated. Summary sheets for both calculations are included in the raw data section.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Miscellaneous
The following compound was detected in the following Field blank:

Sample Description	Sample #	Compound	Concentration	Corrective Action
FB81899	N0011	Methylene chloride	0.58 ug/L	1
FB81999	N0012	Acetone	20 ug/L	2
		Benzene	0.82 ug/L	2
		Toluene	0.90 ug/L	2
		Xylene (total)	0.59 ug/L	2

1. No corrective action was taken.

2. Sample was reanalyzed with similar results. Both sets of data are included. No further corrective action was taken.

Notes to the Project Manager which <u>may</u> be included in the narrative:

None

Analyst Review _____

Date 5/7/99

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Trace Metals Case Narrative

Client: Sayreville Landfill
Job Number: 8061.008.517
Package #: 2988
Prepared for: MS
Prepared by: JCH

QA/QC Review (Date/Initials):

File Name in G/ Drive: G:\PROJMGT\REPORTS\JH\REPORTS\SAYVILLE\2988.MET

Methodology:

ICP Metals	6010B
Mercury	7470A

Reference:

Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update III, December 1996.

Quality Control Excursions:

Trace Metals

Holding Times
All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements.

Laboratory Control Sample
All spike recoveries met method and/or project specific QC criteria.

D/MS/MSD
The following analytes did not meet matrix spike/matrix spike duplicate percent recovery and/or duplicate RPD criteria:

Sample Description	Sample #	Analyte	% REC	RPD	Corr. Action
P-5	N0020	Barium	X		1
		Calcium	X		2
		Iron	X		2
		Sodium	X		2

1. The low matrix spike recovery is due to matrix interference. A post-digestion spike was performed as required. No further corrective action was taken.

2. The concentration of the analyte in the sample was much greater than the concentration of the spike added. A post-digestion spike was performed as required. No further corrective action was taken.

ICP Serial Dilution
All percent differences met method and/or project specific QC criteria.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Notes to the Project Manager which <u>may</u> be included in the narrative:

None

Analyst Review M. Tibbetts

Date 9-7-99

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O'Brien & Gere Laboratories, Inc.

M E M O R A N D U M

To: Staff

From: DR Hill

Re Camp Stanley Storage Project

Date: September 7, 1999

File: Parsons ES

cc:

The purpose of this memo is to identify and communicate specific requirements for Parsons Engineering Science AFCEE projects. In a recent audit, the findings included the need to highlight areas where particular attention should be directed. We have itemized the procedures to follow when such projects are received. The following list of issues is brought to the analyst's attention.

1. Sample Receiving-If samples received are not properly preserved, contact Project Management immediately prior to any adjustment.

2. Project Management-For any non-compliant issue related to sample receipt, Project Management will not institute any corrective action until approved by Parsons ES.

3. Every AFCEE sample cooler must be opened in the hood.

4. When handling AFCEE samples it is imperative that when finished with the sample it must be returned to secure cold storage.

5. Volatile Analysis-From time to time, VOA samples exhibit the presence of air bubbles upon receipt and prior to analysis. If bubbles are present when received, the sample custodian must notify the project manager immediately. The project manager will contact Parsons ES QA and coordinate the corrective measures. In those specific cases the analyst must note the approximate bubble size and record it on the injection log.

6. Analysts are responsible for the review of data. Case narratives, raw data sheets and any other documentation must be reviewed. initialed and dated prior to submission to the client.

7. All active and analyzed VOA samples will be stored in the Sample Receiving refrigerator.

8. The majority of our services is in support of highly visible projects and requires a significant level of documentation and custody. We must maintain a high level of security and request that all exits remain closed at all times. When deliveries are made to the loading dock area, an O'Brien & Gere employee must be present while the door(s) are opened. Once secured the employee may return to his/her workstation.

Should you have any comment please direct them to the Section Leader, Project Management or Senior Management. Thank you for your cooperation.

STANDARD OPERATING PROCEDURE

Title: LIMS Software Testing and Validation

AP # xxx.xx Effective Date 06/11/99

Rev #0 Page 1 of 3

Prepared By: _____

Approved By: _____
Technical Review

Date: _____

Approved By: _____
Laboratory Management

Date: _____

Approved By: _____
QA/QC Section

Date: _____

1 Introduction

Data in the laboratory is generated from a variety of sources. This data must be manipulated to generate a consistent reporting format for the clients served. The Oracle database software was selected to accomplish task. Customization of the system was required to achieve the goal of efficient reporting of large volumes of analytical data. Raw data entering the LIMS, either through manual effort or computer generated files from an instrument workstation, are formatted by the LIMS into a final form that is reported to the client. Manipulated data reflects dilutions, dry weight conversion, sample size, rounding, significant digits and client specific reporting conventions. Any enhancements or modifications to the system are initiated via the LIMS Modification Request forms.

The manipulation of raw data makes it mandatory that results are checked or an algorithm verified to confirm that the LIMS programs are performing their correct function.

2 Responsibility

This procedure is not to be reproduced. See the QA/QC Section for additional copies.

2.1 LIMS preliminary testing is done by the LIMS programmer and final testing is done by the laboratory section. Laboratory section leaders are responsible for verifying that LIMS results are accurate and valid. This is done by a manual calculation and comparing it to the result generated by the LIMS. In case of a discrepancy where the LIMS has miscalculated or misrepresented the result a LIMS modification request must be initiated(SOP# xxx-xx). In the case where a LIMS modification is necessitated by a client's requirement no final results will be sent to the client until the modification has been tested and test results have been verified and approved by section leaders and project managers.

2.2 Project managers are responsible for informing section leaders of any and all client or regulatory requirements so that section leaders are fully informed in order to make a correct assessment of final results reported by the LIMS. Program administration require enhancements to include different QA/QC criteria, data qualifiers, disk deliverables and the like. Following acknowledgement from system administrator the project manager reviews the changes by signing and dating the confirmation space on the LIMS Modification Request form.

2.3 In the case of errors resulting from LIMS miscalculations of valid data transferred from instrument software a LIMS modification request must be initiated by either by a section leader, a bench chemist, or a project manager . The system analyst who assigns the version and modification number to each revision determines the date of previous revisions. Bench chemists review and rerun appropriate samples from the previous revision date to verify that the LIMS is calculating properly.

2.4 Any data used in testing the LIMS programs should be kept and used as a later check on the software after any additional modifications may have been made. Data should be kept in the form of ASCII files or database tables within the LIMS. The LIMS database administrator is responsible for this type of testing.

2.5 In the case of the LIMS using stored routines for calculations a test table should be maintained to re-check calculations. Re-checking is to be done whenever modifications to the LIMS involve stored routines. The LIMS database administrator is responsible for creating and maintaining such test tables. An example would be testing of the LIMS routine for determining significant digits. A test table is a database table used to store data that is retrieved to test LIMS programs.

This procedure is not to be reproduced. See the QA/QC Section for additional copies.

2.6 Where vendor specific software is utilized to process raw data, section chemists have contacted the vendor to receive documentation verifying the calculations. Current vendors include Hewlett Packard, Lachat, Perkin Elmer, Phillips, Wards, Canberra, Enviroforms, and Thermo Jarrell Ash. All documentation relating to changes in the vendor's software such as version changes and updates are to kept on file and stored in the laboratory section using the software.

3 References

None.

4 Attachments

LIMS Modification Request Form.

This procedure is not to be reproduced. See the QA/QC Section for additional copies.

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VISITORS LOG

DATE	NAME	REPRESENTING	TIME IN	TO SEE	TIME OUT
9/10	Jean Agostinelli	GTE	8:00	Jeff Baranski	3:00
9/10	Al Ludwig	GTE	8:00	"	3:00
9/10	Henriette M. Hanel	NYS DoH	8:14	Mark Dent	10:45
9/10	John Glatky	T.O.S.	8:20	"	10:30
9/10	John Barszkiewicz	"	"	"	10:30
9/10	Tom Kopp	"	"	"	10:30
9/10	Dave Mucha	"	"	"	10:30
9/10	Kim Meeks	Wheelsystems		Tom Wright	11:00
9/10	R. Heffernan	Bell Atlantic	9:05		11:10
9/10	S. Geiss	" "	9:05		11:10
9/10	R. DeSauc	ERCE	10:26	T. Brown	1:30
9/10	Bill Coe	TOWN OF SULLIVAN	8:30	MARK DENT	10:30
9/10	Steve Lamb	CPE	2:00	Chris Cangello	

O'Brien & Gere Laboratories, Inc.

Wet Chemistry Pipet Verification Logbook# WC101

Pipet Calibration Verification Daily Log

Pipet ID: WC #1
Annual calibration date: 12/21/98
Pipet volume (ul) 1000

Theoratical mass of pipet volume (g) 0.9976
Calculated average mass (g) 1.0019
Acceptable range: 0.9936 (g) to 1.0102 (g)

Date	Mass (g)	Temperature	Analyst	Date	Mass (g)	Temperature	Analyst
9-2-99	1.0002	23°C	ZK				
9-3-99	1.0001	23°C	ZK				
9/3/99	1.0002	23°C	ZK				
9-7-99	0.9980	23°C	ZK				

Comments:

Reviewed by:	Date:	Reviewed by:	Date:

O'Brien & Gere Laboratories, Inc.
Wet Chemistry Pipet Verification Logbook# WC101

Pipet Calibration Verification Daily Log

Pipet ID: WC#2
Annual calibration date: 7-30-99
Pipet volume (ul) 100.

Theoretical mass of pipet volume (g) 0.09976
Calculated average mass (g) 0.1001
Acceptable range: 0.0985 (g) to 0.1017 (g)

Date	Mass (g)	Temperature	Analyst	Date	Mass (g)	Temperature	Analyst
9/2/99	0.0999	23 °C	HS				
9/3/99	0.1000	23 °C	HS				
9/8/99	0.1000	23 °C	HS				

Comments:

Reviewed by: Date: Reviewed by: Date:

O'Brien & Gere Laboratories, Inc.
Trace Metals Pipet Verification Logbook# M101

Pipet Calibration Verification Daily Log

Pipet ID: M #1
Annual calibration date: 9-3-99
Pipet volume (ul) 1000

Theoratical mass of pipet volume (g) 0.9976
Calculated average mass (g) 0.9999
Acceptable range: 0.9982 (g) to 1.0016 (g)

Date	Mass (g)	Temperature	Analyst	Date	Mass (g)	Temperature	Analyst
9-2-99	1.0007	23°c	CT				
9-3-99	0.9992	23°c	CT				
9-8-99	0.9971	23°c	CT				
9-9-99	0.9986	23°c	CT				

Comments:

Reviewed by:	Date:	Reviewed by:	Date:

O'Brien & Gere Laboratories, Inc.
Trace Metals Pipet Verification Logbook# M101

Pipet Calibration Verification Daily Log

Pipet ID: M#3
Annual calibration date: 4-2-99
Pipet volume (ul) 100.

Theoratical mass of pipet volume (g) .0996
Calculated average mass (g) 0.09915
Acceptable range: 0.0981 (g) to 0.1003 (g)

Date	Mass (g)	Temperature	Analyst	Date	Mass (g)	Temperature	Analyst
9-2-99	0.1006	23°c	CT				
9-3-99	0.0997	23°c	CT				
9-8-99	0.9999	23°c	CT				
9-8-99	0.9998	23°c	CT				

Comments:

Reviewed by:	Date:	Reviewed by:	Date:

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