

**ALTERNATIVE SPECIFIC  
REMEDIAL INVESTIGATION REPORT  
SHEBOYGAN RIVER AND HARBOR**

**VOLUME 3 OF 4**

**Tecumseh Products Company**

**Sheboygan Falls, Wisconsin**

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ALTERNATIVE SPECIFIC REMEDIAL INVESTIGATION REPORT

SHEBOYGAN RIVER AND HARBOR

VOLUME 3 OF 4

TECUMSEH PRODUCTS COMPANY  
SHEBOYGAN FALLS, WISCONSIN

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ALTERNATIVE SPECIFIC REMEDIAL INVESTIGATION REPORT

SHEBOYGAN RIVER AND HARBOR

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ARMORING STUDY (ENSECO)

APPENDIX F-1

**APPENDIX F-8**

**B.E.S.T. SOLVENT EXTRACTION BENCH-SCALE-STUDY (RCC)**

**CERTIFICATION OF GOOD LABORATORY PRACTICES**

Submitted by:   Enseco Marblehead  
Doak's Lane at Little Harbor  
Marblehead, MA 01945

Certification:   The test was performed in accordance with the protocol issued by Blasland and Bouck Engineers, P.C., entitled, "Experimental Protocol for Sediment Capping Study" and the Aquatic Toxicology Laboratory Standard Operating Procedures Manual of Enseco Marblehead, and meets the requirements of said protocol. Data presented in this report were derived by methods and with materials identified in the section of this report entitled, "Methods and Materials." The sediment study was performed by Catherine Holmes, Michele Lee, Lisa Remington, Julie Scope and Adam Walker.

A project notebook was maintained during the study (Enseco Aquatic Toxicology Laboratory, Book 91684-1, pages 1-31 inclusive). All data transcribed from the notebook to the report were checked for accuracy by two persons, and all data were verified by Enseco's Quality Assurance Auditor.

All data will be archived at Enseco Marblehead under Good Laboratory Practice conditions for a period of not less than 10 years from the date of report issuance, unless otherwise specified by the client.

Confirmation:

Catherine M. Holmes 4/30/90  
Catherine M. Holmes  
Program Manager

Joseph B. Mackay  
Program Administrator

Terry L. Batchelder 4/30/90  
Terry L. Batchelder  
Director  
Quality Control/Quality Assurance

Margaret L. Matsui  
Director, Aquatic Toxicology Laboratory

Appendix D. QUALITY ASSURANCE CERTIFICATION

# Appendix

**Enseco Marblehead**

Doaks Lane at Little Harbor  
Marblehead, Massachusetts 01945  
617/639-2695 Fax: 617/639-2637

Attn: Tod HolleneyerEnseco Client 91684 BlacklandProject 91684 AM3833-AM3834

Sampling Co. \_\_\_\_\_

Sampling Site \_\_\_\_\_

Team Leader \_\_\_\_\_

**CHAIN OF CUSTODY**

No. \_\_\_\_\_

**SAMPLE SAFE™ CONDITIONS**

1. Packed by: C. Holleneyer Seal # \_\_\_\_\_
2. Seal Intact Upon Receipt by Sampling Co. Yes \_\_\_\_\_ No \_\_\_\_\_
3. Condition of Contents: Good
4. Sealed for Shipping by: Good
5. Initial Contents Temp.: 20.0 (on 10/10) Seal # \_\_\_\_\_
6. Sampling Status: Done \_\_\_\_\_ Continuing Until \_\_\_\_\_
7. Seal Intact Upon Receipt by Laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_
8. Contents Temperature Upon Receipt by Lab: \_\_\_\_\_ °C
9. Condition of Contents: \_\_\_\_\_

| Date  | Time | Sample ID/Description          | Sample Type | No. Containers | Analysis Parameters | Remarks |
|-------|------|--------------------------------|-------------|----------------|---------------------|---------|
| 10/10 | 5p   | Ref 2A AM3834 2/10/10<br>91684 | Sediment    | 1              | PCB                 |         |
|       |      | Ref 2B AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 2C AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 3A AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 3B AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 3C AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 4A AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 4B AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 4C AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 5A AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 5B AM3834 2/10/10<br>91684 |             |                |                     |         |
|       |      | Ref 5C AM3834 2/10/10<br>91684 |             |                |                     |         |

**CUSTODY TRANSFERS PRIOR TO SHIPPING**Relinquished by: (signed) T. Holleneyer Received by: (signed) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

1. Relinquished
2. \_\_\_\_\_
3. \_\_\_\_\_

**SHIPPING DETAILS**Delivered to Shipper by: T. HolleneyerMethod of Shipment: Fed Ex Airbill # \_\_\_\_\_

Received for Lab: \_\_\_\_\_ Signed: \_\_\_\_\_ Date/Time \_\_\_\_\_

Enseco Project No. \_\_\_\_\_

# Enseco Marblehead

Doaks Lane at Little Harbor  
Marblehead, Massachusetts 01945  
617/639-2695 Fax: 617/639-2637

Attn: Haj Vescio

Enseco Client Enseco Marblehead

Project 91684 QA/QC

Sampling Co. \_\_\_\_\_

Sampling Site \_\_\_\_\_

Team Leader \_\_\_\_\_

## CHAIN OF CUSTODY

### SAMPLE SAFE™ CONDITIONS

No. 5158

1. Packed by: C. Holmes Seal # \_\_\_\_\_
2. Seal Intact Upon Receipt by Sampling Co.: Yes \_\_\_\_\_ No \_\_\_\_\_
3. Condition of Contents: cool / good
4. Sealed for Shipping by: \_\_\_\_\_
5. Initial Contents Temp.: cool °C Seal # \_\_\_\_\_
6. Sampling Status: Done \_\_\_\_\_ Continuing Until \_\_\_\_\_
7. Seal Intact Upon Receipt by Laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_
8. Contents Temperature Upon Receipt by Lab: \_\_\_\_\_ °C
9. Condition of Contents: \_\_\_\_\_

| Date    | Time  | Sample ID/Description                                    | Sample Type | No. Containers | Analysis Parameters | Remarks                     |
|---------|-------|----------------------------------------------------------|-------------|----------------|---------------------|-----------------------------|
| 12/5/89 | 930 A | tetramin for PCB analysis<br>12/5/89 CH proj 91684 QA/QC | solid       | 1              | PCB                 | glass bottle -<br>fish feed |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |
|         |       |                                                          |             |                |                     |                             |

### CUSTODY TRANSFERS PRIOR TO SHIPPING

| Relinquished by (signed) | Received by (signed) | Date    | Time  |
|--------------------------|----------------------|---------|-------|
| 1 <u>C. Holmes</u>       | _____                | 12/5/89 | _____ |
| 2 _____                  | _____                | _____   | _____ |
| 3 _____                  | _____                | _____   | _____ |

### SHIPPING DETAILS

Delivered to Shipper by C. Holmes

Method of Shipment: N.S. Courier Airbill # \_\_\_\_\_

Received for Lab: Enco Signed [Signature] Date/Time 12/6/89  
1700

Enseco Project No. \_\_\_\_\_

White and Pink Copies to Lab

Yellow to Sample

SS-001(MA)

# Enseco Marblehead

Deaks Lane at Little Harbor  
Marblehead, Massachusetts 01945  
617/639-2693 Fax: 617/639-2637

Attn: Tod Noltemeyer

Enseco Client Blasland

Project 91684-AM3833

Sampling Co. \_\_\_\_\_

Sampling Site \_\_\_\_\_

Team Leader \_\_\_\_\_

## CHAIN OF CUSTODY

No. \_\_\_\_\_

### SAMPLE SAFE™ CONDITIONS

- Packed by: C. Holmes Seal # \_\_\_\_\_
- Seal Intact Upon Receipt by Sampling Co.: Yes \_\_\_\_\_ No \_\_\_\_\_
- Condition of Contents: good
- Sealed for Shipping by: \_\_\_\_\_
- Initial Contents Temp: Frozen °C Seal # \_\_\_\_\_
- Sampling Status: Done Continuing Until \_\_\_\_\_
- Seal Intact Upon Receipt by Laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_
- Contents Temperature Upon Receipt by Lab: \_\_\_\_\_ °C
- Condition of Contents: \_\_\_\_\_

| Date   | Time | Sample ID/Description                                        | Sample Type | No. Containers | Analysis Parameters | Remarks                                  |
|--------|------|--------------------------------------------------------------|-------------|----------------|---------------------|------------------------------------------|
| 3/5/90 | 1230 | Blasland 91684 AM3833<br>3/5/90 ML 3C Fatheads               | tissue      | 1              | PCB                 | In acetone -<br>rinsed foil - in plastic |
|        |      | Blasland 91684 AM3833<br>3/5/90 ML 3C Corb. aca              |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833<br>3/5/90 ML 4A Fatheads               |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833 3/5/90<br>ML 4A Matrix Spike Fatheads  |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833 3/5/90<br>ML 4A Corbizula              |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833 3/5/90<br>ML 4A Matrix Spike Corbizula |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833 3/5/90<br>ML 4B Fatheads               |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833<br>3/5/90 ML 4B Corbizula              |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833<br>3/5/90 ML 4C Fatheads               |             |                |                     |                                          |
|        |      | Blasland 91684 AM3833<br>3/5/90 ML 4C Corbizula              |             |                |                     |                                          |

certify that this is a true copy  
of the original data.

C. Holmes  
SIGNATURE

3/5/90  
DATE

### CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by: (signed) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

C. Holmes 3/5/90 Received by: (signed) \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

### SHIPPING DETAILS

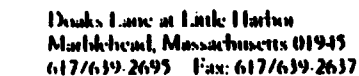
Delivered to Shipper by: C. Holmes

Method of Shipment: Fed Ex Airbill # \_\_\_\_\_

Received for Lab: \_\_\_\_\_ Signed: \_\_\_\_\_ Date/Time \_\_\_\_\_

Enseco Project No. \_\_\_\_\_





**Team Leader** \_\_\_\_\_

### SAMPLE SAFE™ CONDITIONS

No.

1. Packed by: \_\_\_\_\_ Seal # \_\_\_\_\_
2. Seal Intact Upon Receipt by Sampling Co.: Yes \_\_\_\_\_ No \_\_\_\_\_
3. Condition of Contents: \_\_\_\_\_
4. Sealed for Shipping by: \_\_\_\_\_
5. Initial Contents Temp.: \_\_\_\_\_ °C Seal # \_\_\_\_\_
6. Sampling Status: Done Continuing Until \_\_\_\_\_
7. Seal Intact Upon Receipt by Laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_
8. Contents Temperature Upon Receipt by Lab: \_\_\_\_\_ °C
9. Condition of Contents: \_\_\_\_\_

## CUSTODY TRANSFERS PRIOR TO SHIPPING

**3** \_\_\_\_\_

## SHIPPING DETAILS

**Enseco Project No.** \_\_\_\_\_

**Enseco Marblehead**

**Dunks Lane at Little Harbor  
Marblehead, Massachusetts 01945  
617/639-2695 Fax: 617/639-2637**

Attn: F. Kimble

Enseco Client AM3833 - Blasland

Project 91684

**Sampling Co.**

### Sampling Site

### Team Leader

## CHAIN OF CUSTODY

No.

### SAMPLE SAFE™ CONDITIONS

1. Packed by: C. Holmes Seal # \_\_\_\_\_
2. Seal Intact Upon Receipt by Sampling Co.: Yes \_\_\_\_\_ No \_\_\_\_\_
3. Condition of Contents: good
4. Sealed for Shipping by: \_\_\_\_\_
5. Initial Contents Temp.: cool °C Seal # \_\_\_\_\_
6. Sampling Status: Done \_\_\_\_\_ Continuing Until \_\_\_\_\_
7. Seal Intact Upon Receipt by Laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_
8. Contents Temperature Upon Receipt by Lab: 8 °C
9. Condition of Contents: \_\_\_\_\_

[illegible]

### CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by: (signed) 2/2/90 Received by: (signed)

**Date**                      **Time**

### Three

Catherine Holmes and

2 \_\_\_\_\_

**3** \_\_\_\_\_

## SHIPPING DETAILS

Delivered to Shipper by: C. Holmes

Method of Shipment: Exd Ex

— **Alcohol** #

Received for Lab:

**Signed:**

Date/Time 2-14-90

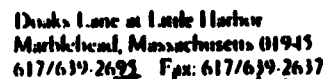
Enseco Project No.



3301 KINGSMAN BLVD. • P.O. BOX 7545 • MADISON, WISCONSIN 53707

[illegible]

**Distribution: White -- Accompanies Shipment; Pink -- Coordinator Field File; Yellow -- Laboratory File**



Attn: F. Kimble

Project 91684

**Sampling Co.** \_\_\_\_\_

**Sampling Site** \_\_\_\_\_

**Team Leader** \_\_\_\_\_

## No.

### SAMPLE SAFE™ CONDITIONS

1. Packed by: C. Holmes Seal # \_\_\_\_\_

| 2. Seal Intact Upon Receipt by Sampling Co | Yes | No |
|--------------------------------------------|-----|----|
|                                            |     |    |

3. Condition of Contents. good

4. Sealed for Shipping by: \_\_\_\_\_

5. Initial Contents Temp.. cool °C Seal # \_\_\_\_\_

**6. Sampling Status:** Done Continuing Until \_\_\_\_\_

7. Seal Intact Upon Receipt by Laboratory: ☒ Yes ☐ No

8. Contents Temperature Upon Receipt by Lab: 8 °C

**9. Condition of Contents:** \_\_\_\_\_

[illegible]

### CUSTODY TRANSFERS PRIOR TO SHIPPING

Relinquished by (signed) 3/2/91 Received by (signed) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Catherine Holmes and 2/14 11:20 AM

2

3

## SHIPPING DETAILS

Delivered to Shipper by: C. Holmes

Method of Shipment: Exd Ex Airbill # \_\_\_\_\_

Received for Lab: me Signed: \_\_\_\_\_ Date/Time: 3/10/06

Enseco Protect No. 11

**Enseco Marblehead**

Ducks Lane at Little Harbor  
Marblehead, Massachusetts 01945  
617/639-2695 Fax: 617/639-2637

Attn: Paul A. H. H. H. H.Enseco Client 91684 B. H. H. H.Project 91684 A. H. H. H. H. H. H. H. H. H.

Sampling Co. \_\_\_\_\_

Sampling Site \_\_\_\_\_

Team Leader \_\_\_\_\_

**CHAIN OF CUSTODY**

No. \_\_\_\_\_

**SAMPLE SAFE™ CONDITIONS**

1. Packed by: C. H. H. H. Seal # \_\_\_\_\_
2. Seal Intact Upon Receipt by Sampling Co. Yes \_\_\_\_\_ No \_\_\_\_\_
3. Condition of Contents: Good
4. Sealed for Shipping by: \_\_\_\_\_
5. Initial Contents Temp.: 20.0 °C / Seal # \_\_\_\_\_
6. Sampling Status: Done \_\_\_\_\_ Continuing Until \_\_\_\_\_
7. Seal Intact Upon Receipt by Laboratory: Yes \_\_\_\_\_ No \_\_\_\_\_
8. Contents Temperature Upon Receipt by Lab: \_\_\_\_\_ °C
9. Condition of Contents: \_\_\_\_\_

| Date   | Time | Sample ID/Description   | Sample Type | No. Containers | Analysis Parameters | Remarks |
|--------|------|-------------------------|-------------|----------------|---------------------|---------|
| 1/1/10 | 3p   | Sealed 1A 2/11/10 Amers | Seal # 1    | 1              | PCB                 |         |
|        |      | Sealed 1B 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1C 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1D 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1E 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1F 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1G 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1H 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1I 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1J 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1K 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1L 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1M 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1N 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1O 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1P 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1Q 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1R 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1S 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1T 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1U 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1V 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1W 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1X 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1Y 2/11/10 Amers |             |                |                     |         |
|        |      | Sealed 1Z 2/11/10 Amers |             |                |                     |         |

**CUSTODY TRANSFERS PRIOR TO SHIPPING**

Relinquished by: (signed) \_\_\_\_\_ Received by: (signed) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

**SHIPPING DETAILS**Delivered to Shipper by: C. H. H. H.Method of Shipment: 1A 1B 1C Airbill # \_\_\_\_\_

Received for Lab: \_\_\_\_\_ Signed: \_\_\_\_\_ Date/Time \_\_\_\_\_

Enseco Project No. \_\_\_\_\_

Appendix C. CHAIN OF CUSTODY RECORDS

# Appendix

**Enseco - CRL**

7440 Lincoln Way • Garden Grove, CA 92641  
(714) 898-4370 • (213) 998-0438 • (800) LAB-1-CRL  
FAX: (714) 891-5917

**Laboratory Report**

ENSECO - MARBLEHEAD  
DOAKS LANE AT LITTLE HARBOR  
MARBLEHEAD, MA 01945  
ATTN: MS. CATHERINE HOLMES  
Project: (91684) AM3833 - BLASLAND

Analysis No.: G-9004511-001/001  
Date Sampled: 11-FEB-1990  
Date Sample Rec'd: 14-FEB-1990  
Sample Type: SOLID

**QA/QC Summary**

| Date        | Parameter (Method)              | QC Type | Average Spike Recovery | Acceptable Range | Relative Percent Difference | Acceptable Range |
|-------------|---------------------------------|---------|------------------------|------------------|-----------------------------|------------------|
| 18-FEB-1990 | TOTAL ORGANIC CARBON (EPA 9060) | L       | 80                     | 70-130           | 3.                          | 30               |

M - Matrix Spike  
L - Laboratory Control Sample Spike

The Report Cover Letter is an integral part of this report.

This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without authorization is prohibited.

**Enseco - CRL**

7440 Lincoln Way • Garden Grove, CA 92641  
(714) 898-6370 • (213) 998-0458 • (800) LAB-1-CRL  
FAX: (714) 891-5917

**Laboratory Report**

ENSECO - MARBLEHEAD  
DOAKS LANE AT LITTLE HARBOR  
MARBLEHEAD, MA 01945  
ATTN: MS. CATHERINE HOLMES

Analysis No.: G-9004511-001/001  
Date Sampled: 11-FEB-1990  
Date Sample Rec'd: 14-FEB-1990  
Date Analyzed: 18-FEB-1990  
Sample Type: SOLID

Project: (91684) AM3833 - BLASLAND

| Sample ID | Total<br>Organic<br>Carbon<br>mg/kg<br>EPA 9060 |
|-----------|-------------------------------------------------|
|-----------|-------------------------------------------------|

|                      |          |
|----------------------|----------|
| AM3833 PROJECT 91684 | 13,500   |
| Blank                | ND(10.0) |

The Report Cover Letter is an integral part of this report.

This report pertains only to the samples investigated and does not necessarily apply to other, apparently identical, or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without authorization is prohibited.

**Enseco - CRL**

7440 Lincoln Way • Garden Grove, CA 92641  
(714) 898-6370 • (213) 598-0458 • (800) LAB-1-CRL  
FAX: (714) 891-5917

February 21, 1990

ENSECO-MARBLEHEAD  
DOAKS LANE AT LITTLE HARBOR  
MARBLEHEAD, MA 01945  
ATTN: MS. CATHERINE HOLMES

Analysis No.: G-9004511-001  
Date Sampled: 11-FEB-1990  
Date Sample Rec'd: 14-FEB-1990  
Project: (91684) AM3833-BLASLAND

Enclosed with this letter is the report on the chemical and physical analyses on the sample from ANALYSIS NO: G-9004511-001 shown above.

The sample was received by CRL in a chilled state, intact and with the chain-of-custody record attached.

Please note that ND( ) means not detected at the detection limit expressed within the parentheses.

Solid sample is reported on "as received" basis.

  
Reviewed

  
Approved

The Report Cover Letter is an integral part of this report.

This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without authorization is prohibited.

## TOC Analysis

BLASLAND AND BOUCK  
ENSECO PROJECT PCB ANALYSIS  
PROJECT NO. 91684-AM3833

| SAMPLE<br>NUMBER | SAMPLE<br>LOCATION     | DATE<br>RECEIVED | DATE<br>EXTRACTED | Values in ug/Kg |          |          | %Lipids |
|------------------|------------------------|------------------|-------------------|-----------------|----------|----------|---------|
|                  |                        |                  |                   | PCB-1242        | PCB-1248 | PCB-1254 |         |
| 00301012         | 1A Fatheads            | 03/06/89         | 03/08/90          | 7700            | <1400    | <1400    | 5.06    |
| 00301013         | 1A Corbicula           | 03/06/89         | 03/08/90          | 4500            | <1000    | <1000    | 2.28    |
| 00301014         | 1B Fatheads            | 03/06/89         | 03/08/90          | 18000           | <1300    | <1300    | 7.77    |
| 00301015         | 1B Corbicula           | 03/06/89         | 03/08/90          | 5700            | <1000    | <1000    | 2.17    |
| 00301016         | 1C Fatheads            | 03/06/89         | 03/08/90          | 7500            | <1500    | <1500    | 6.44    |
| 00301017         | 1C Corbicula           | 03/06/89         | 03/08/90          | 5900            | <1300    | <1300    | 2.16    |
| 00301018         | 2A Fatheads            | 03/06/89         | 03/08/90          | 1600            | <140     | <140     | 5.39    |
| 00301019         | Dup 2A Fatheads Thin   | 03/06/89         | 03/08/90          | 1400            | <160     | <160     | 8.02    |
| 00301020         | 2A Corbicula           | 03/06/89         | 03/08/90          | 770             | <100     | <100     | 2.20    |
| 00301021         | Dup 2A Corbicula Thin  | 03/06/89         | 03/08/90          | 710             | <100     | <100     | 2.29    |
| 00301022         | 2B Fatheads            | 03/06/89         | 03/08/90          | 280             | <160     | <160     | 5.67    |
| 00301023         | 2B Corbicula           | 03/06/89         | 03/08/90          | 470             | <100     | 780      | 2.17    |
| 00301024         | 2C Fatheads            | 03/06/89         | 03/08/90          | 290             | <130     | <130     | 5.64    |
| 00301025         | 2C Corbicula           | 03/06/89         | 03/08/90          | 150             | <100     | <100     | 2.18    |
| 00301026         | 3A Fatheads            | 03/06/89         | 03/09/90          | 400             | <150     | <150     | 6.34    |
| 00301027         | Dup 3A Fatheads Thick  | 03/06/89         | 03/09/90          | 300             | <170     | <170     | 5.03    |
| 00301028         | 3A Corbicula           | 03/06/89         | 03/09/90          | 110             | <110     | <110     | 2.33    |
| 00301029         | Dup 3A Corbicula Thick | 03/06/89         | 03/09/90          | 140             | <100     | <100     | 2.43    |
| 00301030         | 3B Fatheads            | 03/06/89         | 03/09/90          | 530             | <160     | <160     | 6.36    |
| 00301031         | 3B Corbicula           | 03/06/89         | 03/09/90          | 110             | <110     | <110     | 2.24    |
| 00301032         | 3C Fatheads            | 03/06/89         | 03/09/90          | 230             | <150     | <150     | 6.37    |
| 00301033         | 3C Corbicula           | 03/06/89         | 03/09/90          | 100             | <100     | <100     | 2.36    |
| 00301034         | 4A Fatheads            | 03/06/89         | 03/09/90          | 180             | <160     | <160     | 7.04    |
| 00301035         | MS 4A Fatheads MS      | 03/06/89         | 03/09/90          | <750            | 7800     | <750     | 6.41    |
| 00301036         | 4A Corbicula           | 03/06/89         | 03/09/90          | 42              | <50      | <50      | 2.30    |
| 00301037         | MS 4A Corbicula MS     | 03/06/89         | 03/09/90          | <520            | 5600     | <520     | 2.38    |
| 00301038         | 4B Fatheads            | 03/06/89         | 03/09/90          | 230             | <130     | <130     | 6.72    |
| 00301039         | 4B Corbicula           | 03/06/89         | 03/09/90          | 44              | <50      | <50      | 2.22    |
| 00301040         | 4C Fatheads            | 03/06/89         | 03/09/90          | 140             | <160     | <160     | 5.98    |
| 00301041         | 4C Corbicula           | 03/06/89         | 03/09/90          | 160             | <100     | <100     | 2.31    |
| Control Spike I  |                        |                  | 03/08/90          | 590             | <100     | 510      | 1.05    |
| Control Spike II |                        |                  | 03/09/90          | 590             | <100     | 590      | 1.13    |
| Method Blank I   |                        |                  | 03/08/90          | <50             | <50      | <50      |         |
| Method Blank II  |                        |                  | 03/09/90          | <50             | <50      | <50      |         |

Note: PCB-1016, PCB-1221, PCB-1232, PCB-1248, PCB-1254 and PCB-1260 not detected in any sample.

Note: Control Spike spiked with 670 ug/Kg with Aroclor 1242 and Aroclor 1254. The percent recoveries for Aroclor 1242 in Control Spike I and Control Spike II were 88% and 88% respectively. The percent recoveries for Aroclor 1254 in Control Spike I and Control Spike II were 76% and 88% respectively.

Note: Matrix Spike spiked with 10000 ug/Kg with Aroclor 1248. The percent recoveries for 00301035 MS (4A Fatheads) and 00301037 MS (4A Corbicula) were 78% and 56% respectively.

BLASLAND AND BOUCK  
ENSECO EXPOSURE STUDY  
SEDIMENT ANALYSIS

| SAMPLE<br>NUMBER | SAMPLE<br>LOCATION | DATE<br>RECEIVED | DATE<br>EXTRACTED | PERCENT<br>MOISTURE | Values in ug/kg Dry Weight |          |          |
|------------------|--------------------|------------------|-------------------|---------------------|----------------------------|----------|----------|
|                  |                    |                  |                   |                     | PCB-1242                   | PCB-1248 | PCB-1254 |
| 00203747         | Sediment 1-A       | 02/14/90         | 02/23/90          | 1.06                | 26000                      | <15000   | <15000   |
| 00203748         | Sediment 1-B       | 02/14/90         | 02/23/90          | 1.22                | 30000                      | <15000   | <15000   |
| 00203749         | Sediment 1-C       | 02/14/90         | 02/23/90          | 1.22                | 29000                      | <15000   | <15000   |
| 00203750         | Sediment 2-A       | 02/14/90         | 02/23/90          | 2.10                | 32000                      | <15000   | <15000   |
| 00203751         | Sediment 2-B       | 02/14/90         | 02/23/90          | 1.23                | 26000                      | <15000   | <15000   |
| 00203752         | Sediment 2-C       | 02/14/90         | 02/23/90          | 1.31                | 41000                      | <15000   | <15000   |
| 00203753         | Sediment 3-A       | 02/14/90         | 02/23/90          | 1.19                | 46000                      | <15000   | <15000   |
| 00203754         | Sediment 3-B       | 02/14/90         | 02/23/90          | 1.87                | 62000                      | <15000   | <15000   |
| 00203755         | Sediment 3-C       | 02/14/90         | 02/23/90          | 1.27                | 48000                      | <15000   | <15000   |
| 00203756         | Reference 2-A      | 02/14/90         | 02/23/90          | 0.07                | <50                        | <50      | <50      |
| 00203757         | Reference 2-B      | 02/14/90         | 02/23/90          | 0.10                | <50                        | <50      | <50      |
| 00203758         | Reference 2-C      | 02/14/90         | 02/23/90          | 0.05                | <50                        | <50      | <50      |
| 00203759         | Reference 3-A      | 02/14/90         | 02/23/90          | 0.10                | <50                        | <50      | <50      |
| 00203760         | Reference 3-B      | 02/14/90         | 02/23/90          | 0.05                | <50                        | <50      | <50      |
| 00203761         | Reference 3-C      | 02/14/90         | 02/23/90          | 0.06                | <50                        | <50      | <50      |
| 00203762         | Reference 4-A      | 02/14/90         | 02/23/90          | 0.11                | <50                        | <50      | <50      |
| 00203763         | Reference 4-B      | 02/14/90         | 02/23/90          | 0.10                | <50                        | <50      | <50      |
| 00203764         | Reference 4-C      | 02/14/90         | 02/23/90          | 0.10                | <50                        | <50      | <50      |
| 00303570         | Sediment 3-B DUP   | 02/14/90         | 02/23/90          | 1.77                | 51000                      | <15000   | <15000   |
| 00303571         | Sediment 3-B MS    | 02/14/90         | 02/23/90          | 1.87                | 49000                      | <15000   | <15000   |
| 00303572         | Reference 4-C DUP  | 02/14/90         | 02/23/90          | 0.06                | <50                        | <50      | <50      |
| 00303573         | Reference 4-C MS   | 02/14/90         | 02/23/90          | 0.06                | 4000                       | <2000    | <2000    |
| Control Spike    |                    |                  | 02/23/90          |                     | <50                        | 3100     | 3200     |
| Method Blank     |                    |                  | 02/23/90          |                     | <50                        | <50      | <50      |

Note: PCB-1016, PCB-1221, PCB-1232, PCB-1248, PCB-1254, and PCB-1260 not present in any sample

\* Control Spike was spiked at 5000 ug/Kg with Aroclor 1248 and Aroclor 1254.  
The percent recoveries were 62% and 64% respectively.

The matrix spikes were fortified with 5000 ug/Kg of Aroclor 1242. The recovery of the Aroclor 1242 from the spike of sample Sediment 3-B was not measurable due to the relatively high concentration of PCB's in the sample. The recovery of the Aroclor 1242 spike from sample Reference 4-C was 80%.

Only Aroclor 1242 was present in the sediments and tissues with the exception of sample 2B Corbicula (00301023) which also had Aroclor 1254 in it.

The response areas for the ongoing standards were within 20% of the initial calibration standards for that run.

If you have any questions concerning this data please call.

Sincerely,

*Tod Noltemeyer*

Tod Noltemeyer  
Project Manager  
Hazleton Environmental Services

cc: Dave Hills

central file



# HAZLETON

LABORATORIES AMERICA, INC.

3301 KINSMAN BLVD., P.O. BOX 7545  
MADISON, WI 53707 USA

March 26, 1990

Don Hughes  
Blasland & Bouck Engineers  
6723 Towpath Road  
Syracuse, NY 13214

Dear Don,

Enclosed are the results for the PCB analyses of the sediments and tissues from the aquatic exposure study set up at Enseco. The sediment samples were extracted and cleaned using the working protocol we have with Blasland & Bouck. The tissue samples were soxhlet extracted and cleaned using gel permeation chromatography and column chromatography with Florisil. The following items should be noted concerning these samples:

The method blanks were free of PCB's above the detection limit.

The sediment control spike was fortified with 5000 ug/Kg of Aroclor 1248 and 1254. The recovery of these Aroclors was 62% and 64% respectively.

The tissue control spikes were fortified with 670 ug/Kg of Aroclor 1242 and 1254. The recoveries of the Aroclor 1242 were 88% and 88%. The recoveries of the 1254 were 76% and 88%.

The sediment matrix spikes were fortified with 5000 ug/Kg of Aroclor 1242. The recovery of the Aroclor 1242 from the spike of sample Sediment 3B was not measurable because of the relatively high concentration of PCB's in the sample. The recovery of the spike from sample Reference 4-C was 50%.

The tissue matrix spikes were fortified with 10,000 ug/Kg of Aroclor 1248. The recovery of the Aroclor 1248 from the spike of sample 4A Fathead was 78%. The recovery from the spike of sample 4A Corbicula was 56%.

The relative percent deviation between the samples and the duplicates ranged from 0 to 20% for the sediments and 8 to 30% for the tissue samples.

PHONE (608) 241-4471  
FACSIMILE (608) 241-7227  
TELETYPE 703956 HAZRAL MDS UD

a CORNING Laboratory Services Company

BLASLAND & BOUCK  
MINNOW AND CLAM EXPOSURE STUDY  
ENSECO PROJECT # 91684

| HLA<br>SAMPLE # | Location | Date<br>Received | Date<br>Extracted | Percent<br>Lipids | PCB-1242<br>ug/Kg | PCB-1254<br>ug/Kg |
|-----------------|----------|------------------|-------------------|-------------------|-------------------|-------------------|
| 91204288        | T-5      | 12/21/89         | 01/05/90          | 2.17              | 12                | 27                |
| 91204289        | T-4      | 12/21/89         | 01/05/90          | 9.68              | 18                | 34                |
| Control Spike   |          |                  | 01/05/90          | 0.83              | 440               | 450               |
| Method Blank    |          |                  | 01/05/90          |                   | <10               | <10               |

Note: PCB-1016, PCB-1221, PCB-1232, PCB-1248 and PCB-1260 not detected in any samples.

Note: The Control Spike was spiked with 670 ug/Kg Aroclor 1242 and Aroclor 1254. The percent recoveries were 66% and 68% respectively.



**HAZLETON LABORATORIES AMERICA, INC.**

3301 KINSMAN BLVD. • P.O. BOX 7545 • MADISON, WI 53707 • (608) 241-4471 • TLX 703956 HAZRAL MDS UD

January 19, 1990

Don Hughes  
Blasland & Bouck Engineers  
6723 Towpath Road  
Syracuse, NY 13214

Dear Don,

Enclosed are the results of the PCB analysis of the clam and minnow samples sent to us on December 21, 1989 by Enseco Laboratories, Marblehead MA. These samples were aliquots of the organisms to be used in their in-house exposure study. Approximately 30 grams of each sample was sent to us. The samples were homogenized, mixed with sodium sulfate and extracted with methylene chloride in a soxhlet extractor. The extracts were cleaned by GPC and florisil column chromatography. The final extracts were analysed by gas chromatography. The following pertains to these sample analyses.

The method blank was free of Aroclors above the method detection limit.

The control spike was tuna fish fortified with 670 ug/Kg of Aroclor 1242 and Aroclor 1254. Recovery of the spiked Aroclors was 66% and 68% respectively.

The detection limits for these samples was 10 ug/Kg. This relatively low detection limit is a result of the extracts being concentrated to a method volume of 4 mL instead of 20 mL which would result in a 50 ug/Kg detection limit. Both of the samples had Aroclor 1242 and 1254 present in them above the 10 ug/Kg detection limit but below 50 ug/Kg.

All pattern recognition and quantitation was done from the initial GC run.

If you have any questions concerning this data please call me.

Sincerely,

*Tod Noltemeyer*

Tod Noltemeyer  
Project Manager  
Hazleton Laboratories

cc: Dave Hills  
Catherine Holmes - Enseco Laboratories

central file

Summary PCB Sediment and Tissue Analysis

METHOD BLANK REPORT  
Chromatography

| Analyte                                   | Result | Units | Reporting<br>Limit |
|-------------------------------------------|--------|-------|--------------------|
| Test: 8080-PCB-S                          |        |       |                    |
| Matrix: TISSUE                            |        |       |                    |
| QC Lot: 07 DEC 89-NA QC Run: 07 DEC 89-N2 |        |       |                    |
| Aroclor-1016                              | ND     | ug/kg | 80                 |
| Aroclor-1221                              | ND     | ug/kg | 80                 |
| Aroclor-1232                              | ND     | ug/kg | 80                 |
| Aroclor-1242                              | ND     | ug/kg | 80                 |
| Aroclor-1248                              | ND     | ug/kg | 80                 |
| Aroclor-1254                              | ND     | ug/kg | 80                 |
| Aroclor-1260                              | ND     | ug/kg | 80                 |

SINGLE CONTROL SAMPLE REPORT  
Chromatography

| Analyte                                                                                                    | Concentration |          | Accuracy(%) |        |
|------------------------------------------------------------------------------------------------------------|---------------|----------|-------------|--------|
|                                                                                                            | Spiked        | Measured | SCS         | Limits |
| Category: PCB-S<br>Matrix: SOIL<br>QC Lot: 07 DEC 89-NA QC Run: 07 DEC 89-N2<br>Concentration Units: ug/kg |               |          |             |        |
| Dibutylchloredate                                                                                          | 33.0          | 30.0     | 91          | 60-140 |

Calculations are performed before rounding to avoid round-off errors in calculated results.

**DUPLICATE CONTROL SAMPLE REPORT**  
**Chromatography**

| Analyte                                                                               | Spiked | Concentration |      | Measured | AVG | Accuracy   |        | Precision |
|---------------------------------------------------------------------------------------|--------|---------------|------|----------|-----|------------|--------|-----------|
|                                                                                       |        | DCS1          | DCS2 |          |     | Average(%) | Limits | (RPD)     |
|                                                                                       |        |               |      | DCS2     |     | DCS        |        | DCS Limit |
| Category: PCB-S<br>Matrix: SOIL<br>QC Lot: 07 DEC 89-NA<br>Concentration Units: ug/kg |        |               |      |          |     |            |        |           |
| Aroclor-1254                                                                          | 167    | 146           | 121  | 133      | 80  | 60-140     | 19     | 30        |

Calculations are performed before rounding to avoid round-off errors in calculated results.

---

QC LOT ASSIGNMENT REPORT  
Chromatography

| Laboratory<br>Sample Number | QC Matrix | QC Category | QC Lot Number<br>(DCS) | QC Run Number<br>(SCS/BLANK) |
|-----------------------------|-----------|-------------|------------------------|------------------------------|
| 005158-0001-SA              | SOIL      | PCB-S       | 07 DEC 89-NA           | 07 DEC 89-M2                 |

## QUALITY ASSURANCE/QUALITY CONTROL

As an indication of the overall quality of the data generated by Enseco - Erco Laboratory for this report, the following controls have been provided (when applicable).

Method blanks are analyzed to assess the level of contamination which exists in the analytical system. A method blank, analyzed with every batch of samples, consists of reagents specific to the method. This blank is carried through every aspect of the procedure, including preparation, cleanup, and analysis. Ideally, the concentration of an analyte in the blank is below the reporting limit for that analyte. However, some common laboratory solvents and metals are difficult to eliminate to the part-per-billion levels commonly reported in environmental analyses. Therefore, all method blank data is reported to the client. Data are not blank-corrected.

Duplicate control samples (DCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods. A DCS consists of a standard, control matrix which is spiked with a group of target compounds representative of the method analytes. The DCS is analyzed with environmental samples to provide evidence that the laboratory is performing the method within accepted QC guidelines.

A DCS has been established for most routine analytical methods. Reagent water is used as the control matrix for the analysis of aqueous samples. The DCS compounds are spiked into reagent water and carried through the appropriate steps of the analysis. As stated in SW-846 (third edition), a universal blank matrix does not exist for solid samples and therefore no matrix is used. The DCS for solid samples consists of the DCS compounds spiked into a reagent blank and carried through the appropriate steps of the analysis. The data thus obtained are used to set the DCS control limits. As sufficient laboratory data become available, the control limits are redefined based upon the most recent six months of DCS data. Control limits for accuracy are based on the historical average recovery of the DCS plus or minus three standard deviation units, or alternatively on established control limits defined in the methodology.

Surrogates are organic compounds that are similar to the analytes of interest in chemical behavior but which are not normally found in environmental samples. Enseco routinely adds surrogates to samples requiring GC/MS and most GC analysis and reports these surrogate recoveries to the client. These surrogates are added to samples to monitor the effect of the matrix on the accuracy of the analysis. Results are reported in terms of percent recovery.

**QUALITY ASSURANCE/QUALITY CONTROL**

# POLYCHLORINATED BIPHENYLS (PCBs)

## Method 8080

Client Name: Enseco, Incorporated  
 Client ID: Prestudy fish food scan for PCBs  
 Lab ID: 005158-0001-SA      Enseco ID: 2033926  
 Matrix: TISSUE      Sampled: 05 DEC 89      Received: 06 DEC 89  
 Authorized: 06 DEC 89      Prepared: 06 DEC 89      Analyzed: 20 DEC 89

| Parameter    | Result | Wet Weight Reporting |       |
|--------------|--------|----------------------|-------|
|              |        | Units                | Limit |
| Aroclor-1016 | ND     | ug/kg                | 80    |
| Aroclor-1221 | ND     | ug/kg                | 80    |
| Aroclor-1232 | ND     | ug/kg                | 80    |
| Aroclor-1242 | ND     | ug/kg                | 80    |
| Aroclor-1248 | ND     | ug/kg                | 80    |
| Aroclor-1254 | ND     | ug/kg                | 80    |
| Aroclor-1260 | ND     | ug/kg                | 80    |

N.D. = Not Detected  
 N.A. = Not Applicable

Reported By: Thomas Cavalier

Approved By: Ellie Kwong

SAMPLE DESCRIPTION INFORMATION  
for  
Enseco, Incorporated

| Lab ID         | Client ID                      | Matrix | Sampled<br>Date | Time  | Received<br>Date |
|----------------|--------------------------------|--------|-----------------|-------|------------------|
| 005158-0001-SA | Prestudy fish food scan for PC | TISSUE | 05 DEC 89       | 09:30 | 06 DEC 89        |

## ANALYTICAL RESULTS

The method number provided on each data report sheet refers to a publication originating from a regulatory or standard-setting organization. In general, the methods employed are those specified by the U.S. Environmental Protection Agency and other state and federal agencies. In cases where an approved regulatory method does not exist, a method developed by Enseco will be employed to meet the specific needs of the client. The methods commonly employed by Enseco are based on methods from the following references.

U.S. Environmental Protection Agency. 1983. Methods for chemical analysis of water and wastes. EPA-600/4-79-020. Cincinnati, OH, March.

U.S. Environmental Protection Agency. 1984. Test methods for evaluating solid waste, physical/chemical methods. (SW-846); Washington, D.C. April.

U.S. Environmental Protection Agency. 1986. Methods for determination of organic compounds in finished drinking water and raw source water. Cincinnati, OH, March.

"Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," 40 CFR, Part 136; Federal Register, Vol. 49, No. 209.

American Public Health Association, American Water Works Association, Water Pollution Control Federation. 1985. Standard methods for the examination of water and wastewater, 16th edition. Washington, D.C., April.

Current EPA Contract Laboratory Program (CLP) protocols for the analysis of organic and inorganic hazardous substances including chlorinated dioxins and furans.

Tetramin (Fish Food) Analysis

Appendix B. ANALYTICAL RESULTS

# Appendix

3. **Results, which includes:** all observations from definitive tests and the measured concentration of test material.
4. **References.**
5. **Appendices:**
  - A. **Raw data, which includes:** all biological observations and water quality measurements, all analytical data (TSS, hardness, TOC) and chain-of-custody forms for all samples sent elsewhere for analysis.
  - B. **Certification of good laboratory practices** signed the study director and quality assurance personnel. The certification will include lab notebook numbers and pages, names of laboratory personnel who performed the test, and the location and the time period for data archiving.
  - C. **A minimum of two photographs of each aquarium, one taken at the first day of exposure and one taken on the last day of exposure.** Additional photographs of the overall flow-through system, sediments and capping material prior to their introduction to the aquaria, and any other pertinent items would be helpful.

aeration be required, an air sparge will be placed in the center of the water column and a single bubble rate be used.

At the end of the ten day test, all organisms will be transferred to identical tanks containing only flow-through water for a two-day depuration period. Organisms from respective tanks will be kept together, i.e., the 12 aquaria will be transferred to 12 aquaria.

When the two day period is over, each species will be frozen separately as a tank composite for chemical analyses. Two composite samples of each species will be collected from the three tanks designated above for QA/QC analyses. The composite samples (a total of 30) will be appropriately labelled and packaged. All samples will be shipped by overnight carrier, Monday through Thursday, to:

Hazleton Laboratories  
515 Science Drive  
University of Wisconsin Research Park  
Madison, Wisconsin 53711

Hazleton will perform PCB and lipid analysis on each sample.

#### WATER CHEMISTRY:

Dissolved oxygen, pH, specific conductivity, flow rate, total suspended solids (TSS), and temperature will be measured initially and at 24-hour intervals in each test chamber. All such tests will be performed on site at Enseco-Marblehead. Temperature in one control exposure vessel and the environmental chamber will be continuously recorded.

#### QUALITY ASSURANCE:

This study will be conducted in accordance with Good Laboratory Practice Standards. All phases of the program conducted at Marblehead will be inspected by Enseco's quality assurance personnel.

#### REPORT:

The final report submitted at the conclusion of the study will include, but not be limited to, the following items:

1. Summary, which includes: sponsor name, title and description of test, study number, description of test material, test date, a description of the test organism, water, and results of the test.
2. Methods and Materials, which includes: protocol, test dates, a description of test methods and any deviation from the protocol, description of the stock preparation procedures, identification and source of test organisms, loading rate, description of culture conditions, description of dilution water, and a description of the analytical technique.

**Environmental Chamber:** A Harris Environmental Systems walk-in environmental chamber will be used to keep the temperature at a constant  $20 \pm 0.5^\circ\text{C}$ . The incoming water will also be kept at  $20 \pm 0.5^\circ\text{C}$ .

### **TEST PROCEDURE:**

The test will be performed under flow-through conditions (100 ml/min) with 60 L of water and the following exposure regimen:

| <u>Capping<br/>Thickness</u> | <u>Sediment<br/>Thickness</u> | <u>Number<br/>of Aquaria</u> |
|------------------------------|-------------------------------|------------------------------|
| 0"                           | 6"                            | 3                            |
| 4"                           | 6"                            | 3                            |
| 8"                           | 6"                            | 3                            |
| 4"                           | 0                             | 3                            |
| Total                        |                               | <u>12</u>                    |

Before placing the PCB-contaminated sediment into all aquaria (excluding the control tanks), it will be inspected. Large organisms and predatory species will be removed by forceps. The sediment will be visually characterized regarding color, texture, presence of macrophytes, organic material, and odor. Three sub-samples of sediment will be collected and analyzed for Total Organic Carbon (TOC). All containers of the sediments will be mixed together to form a homogeneous mixture. It will then be carefully placed in each aquaria (except controls), leveled out, and the capping material of varying thicknesses placed on top in such a manner as to minimize intermixing of the two layers. Sixty (60) liters of water (described above) will then be carefully added to each aquarium so as to minimize disturbance of the sediment and/or material cap. The aquaria will then be allowed to settle for a minimum of 48 hours before the addition of test organisms. Water in each aquarium shall be gently aerated during this time period to allow for dissipation of potentially toxic ammonia levels from the sediments. Ammonia concentrations will be monitored to ensure that ammonia is below levels toxic to either the minnows or the clams. If needed, the aquaria will be aerated beyond 48-hours to reduce ammonia toxicity to acceptable levels.

Ten (10) mature fathead minnows and approximately 30 Asiatic clams will then be placed in each aquarium. An additional 10 minnows and 30 clams will be placed in three aquaria to allow for QA/QC analysis. These aquaria, and the associated analyses, are as follows:

- |                                      |              |
|--------------------------------------|--------------|
| 1. Cap control (4" cap, no sediment) | Matrix Spike |
| 2. Thin cap (4" cap, 6" sediment)    | Duplicate    |
| 3. Thick cap (8" cap, 6" sediment)   | Duplicate    |

Neither organism will be fed during the test.

Water flow rate, temperature, hardness, dissolved oxygen, and suspended solids will be measured daily during the ten day test. Should additional

**Capping Material:** Capping material will also be supplied by the sponsor, and all necessary analyses of this material will be the responsibility of the sponsor. The quantity used per aquarium will vary from 0" to 8", with a total required volume of approximately 70 gallons. This material will be used in the test as the cap over the bottom contaminated sediment layer. There is no need to mix this material prior to its use.

After placing the capping material in the aquaria, ENSECO personnel will collect samples of this material from each aquarium. These 9 samples are also to be shipped to Hazleton Laboratories for compositing (in groups of 3), and analysis of the composites..

#### **TEST ORGANISMS:**

Mature fathead minnows (*Pimephales promelas*) (3-4g each) will be cultured at Enseco's Marblehead facility. They will be maintained at test conditions under flow-through or recirculating water for 7-10 days and will be fed a commercial fish food. A total of 150 fish will be required for the exposure study. An additional 10 fish will be required for pre-exposure analysis. A specific lot of fish will not be used if >3% mortality occurs during the 48 hours before test initiation.

The freshwater Asiatic clam, *Corbicula fluminea*, will be purchased from a commercial supplier and acclimated to test conditions for 7-10 days at Enseco's Marblehead facility. The clams will be fed the alga, *Chlorella*, or equivalent, during acclimation. Approximately 450 clams will be required for testing assuming that each clam yields a minimum of 1 gram of tissue for analysis. An additional 30 will be required for a pre-exposure analysis. A specific lot of clams will not be used if >3% mortality occurs during the 48 hours before test initiation. Documentation of culture conditions and test organisms will be provided.

Representative samples of both the minnows and the clams will be analyzed well in advance of the 10-day exposure to ensure that the test organisms are relatively free of PCB contamination.

#### **WATER:**

Dechlorinated, filtered tap water will be used for the test. The pH will be adjusted to between 7.5 and 8.5 and the hardness adjusted to approximately 300 mg/L as CaCO<sub>3</sub>. Aeration will be performed prior to addition to each aquarium.

#### **EQUIPMENT:**

**Aquaria:** Aquaria will be constructed similar to those used in Brannon et al (1987). Each will have approximate dimensions (in inches) of 18Wx18Lx32H. Each will be constructed of glass, with a minimum exposure of silicone aquarium adhesive. Incoming water will be introduced at mid-volume with overflow at the top of the water column.

## EXPERIMENTAL PROTOCOL FOR SEDIMENT CAPPING STUDY

### TITLE:

Bioaccumulation in fathead minnows (*Pimephales promelas*) and the Asiatic clam (*Corbicula fluminea*) of PCBs from capped and non-capped PCB-contaminated sediments in a freshwater environment.

### OBJECTIVE:

To determine the effect of capping PCB-contaminated sediments on bioaccumulation in minnows and clams under flow-through conditions.

### TESTING FACILITY:

Enseco - Marblehead  
Doaks Lane at Little Harbor  
Marblehead, MA 01945  
(617) 639-2695

### PERSONNEL:

|                      |                     |
|----------------------|---------------------|
| Study Administrator: | Jay McKay           |
| QA/QC Manager:       | Terry L. Batchelder |
| Laboratory Manager:  | Katie Holmes        |

### REFERENCES:

- Brannon, J.M., Hoeppe, R.E., and Gunnison, D. (1987). "Capping Contaminated Dredged Material," *Marine Pollution Bulletin*. 18(4):175-179.
- Mac, M.J., Edsall, C.C., Hesselberg, R.S., and Sayers Jr. R.E. (1984). "Flow-Through Bioassay for Measuring Bioaccumulation of Toxic Substances from Sediment." EPA-905/3-84-007.

### TEST MATERIALS:

Sediment: PCB-contaminated sediment will be supplied by the sponsor, and all necessary analyses of the sediment itself will be the responsibility of the sponsor. The quantity used per aquarium will vary from 0" to 6", with a total required volume of approximately 80 gallons. The material will be used in the test as the bottom sediment layer.

There is no need to mix this material prior to its use.

After placing sediments in the aquaria, ENSECO personnel will collect sediment samples from each aquarium containing sediments. These 9 samples are to be shipped to Hazleton Laboratories for PCB analysis.

Appendix A. COPY OF TEST PROTOCOL

# Appendix

**VI. DEVIATIONS**

1. Due to a laboratory error, only one TOC sediment sample was analyzed instead of the three stated in the protocol.
2. Due to space constraints in the environmental chamber, clear pictures of individual tanks could not be taken. Pictures of entire system and of all accessible tanks are included in the Addendum.

**V. REFERENCES**

Brannon, J.M., Hoeppel, R.E. and Gunnison, D., 1987. Capping Contaminated Dredged Material. Marine Pollution Bulletin, Volume 18, No. 4, pp. 175-179.

CRC Standard Mathematical Tables. Twelfth Edition. The Chemical Rubber Publishing Company, 1959.

Standard Methods for the Examination of Water and Wastewater, 17th Edition, American Public Health Association, 1989.

Table 4. Statistical analysis of *C. fluminea* tissue data

Step 1. Concentration of Aroclor 1242 in *C. fluminea* Tissue

| Replicate      | Concentration of Aroclor 1242 (ug/kg) |            |            |              |
|----------------|---------------------------------------|------------|------------|--------------|
|                | Capping Material Control              | Thick cap  | Thin cap   | Sediment     |
| A              | 42                                    | 110        | 770        | 4,500        |
| B              | 44                                    | 110        | 470        | 5,700        |
| C              | <u>160</u>                            | <u>100</u> | <u>150</u> | <u>5,900</u> |
| Mean $\bar{X}$ | 82.0                                  | 106.7      | 463.3      | 5366.7       |

Step 2. Parametric One-Way Analysis of Variance (ANOVA) of Data

| Source of Variation | df         | Sum of Squares     | Mean Square        | F(cal)                 |
|---------------------|------------|--------------------|--------------------|------------------------|
| Among               | t-1 = 3    | $5.99 \times 10^7$ | $2.00 \times 10^7$ | 118.55 * (significant) |
| Within              | t(r-1) = 8 | $1.35 \times 10^6$ | $1.69 \times 10^6$ |                        |
| Total               | tr-1 = 11  | $6.13 \times 10^7$ |                    |                        |

as compared to F(tab) = 4.07 for 95% confidence level

Step 3. Reproduction Data with Dunnett's Test

| Comparison                     | I(cal) | I(tab)                    |
|--------------------------------|--------|---------------------------|
| Capping material vs. Thick Cap | -0.07  | 2.42 ns (not significant) |
| Capping material vs. Thin Cap  | -1.14  | 2.42 ns                   |
| Capping material vs. Sediment  | -15.77 | 2.42 *                    |

Table 3. Statistical analysis of *P. promelas* tissue data

Step 1. Concentration of Aroclor 1242 in *P. promelas* Tissue

| Replicate       | Concentration of Aroclor 1242 (ug/kg) |           |          |          |
|-----------------|---------------------------------------|-----------|----------|----------|
|                 | Capping Material Control              | Thick cap | Thin cap | Sediment |
| A               | 180                                   | 400       | 1,600    | 7,700    |
| B               | 230                                   | 530       | 280      | 18,000   |
| C               | 140                                   | 230       | 290      | 7,500    |
| Mean, $\bar{X}$ | 183.3                                 | 386.7     | 723.3    | 11,066.7 |

Step 2. Parametric One-Way Analysis of Variance (ANOVA) of Data

| Source of Variation | df         | Sum of Squares     | Mean Square        | F(cal)               |
|---------------------|------------|--------------------|--------------------|----------------------|
| Among               | t-1 = 3    | $2.55 \times 10^8$ | $8.50 \times 10^7$ | 9.27 * (significant) |
| Within              | t(r-1) = 8 | $7.33 \times 10^7$ | $9.17 \times 10^6$ |                      |
| Total               | tr-1 = 11  | $3.28 \times 10^8$ |                    |                      |

as compared to F(tab) = 4.07 for 95% confidence level

Step 3. Reproduction Data with Dunnett's Test

| Comparison                     | T(cal) | T(tab)                    |
|--------------------------------|--------|---------------------------|
| Capping material vs. Thick Cap | -0.08  | 2.42 ns (not significant) |
| Capping material vs. Thin Cap  | -0.22  | 2.42 ns                   |
| Capping material vs. Sediment  | -4.40  | 2.42 *                    |

Table 2. (Continued)

| <u>Date</u> | <u>Tank</u> | <u>(mg/l)</u> | <u>Date</u> | <u>Tank</u> | <u>(mg/l)</u> |
|-------------|-------------|---------------|-------------|-------------|---------------|
| 2/27/90     | 1 A         | 28            | 2/28/90     | 1 A         | 39            |
|             | B           | 38            |             | B           | 41            |
|             | C           | 39            |             | C           | 40            |
|             | 2 A         | <5            |             | 2 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 3 A         | <5            |             | 3 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 4 A         | <5            |             | 4 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
| 3/1/90      | 1 A         | 33            | 3/2/90      | 1 A         | 30            |
|             | B           | 65            |             | B           | 48            |
|             | C           | 27            |             | C           | 54            |
|             | 2 A         | 7             |             | 2 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 3 A         | <5            |             | 3 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 4 A         | <5            |             | 4 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
| 3/3/90      | 1 A         | 37            |             |             |               |
|             | B           | 63            |             |             |               |
|             | C           | 31            |             |             |               |
|             | 2 A         | 6             |             |             |               |
|             | B           | <5            |             |             |               |
|             | C           | 5             |             |             |               |
|             | 3 A         | <5            |             |             |               |
|             | B           | <5            |             |             |               |
|             | C           | <5            |             |             |               |
|             | 4 A         | <5            |             |             |               |
|             | B           | <5            |             |             |               |
|             | C           | <5            |             |             |               |

Table 2. Results of Total Suspended Solids analysis performed on water samples taken daily from each test vessel. All analyses completed at Enseco Marblehead.

Total Suspended Solids

| <u>Date</u> | <u>Tank</u> | <u>(mg/l)</u> | <u>Date</u> | <u>Tank</u> | <u>(mg/l)</u> |
|-------------|-------------|---------------|-------------|-------------|---------------|
| 2/21/90     | 1 A         | 9             | 2/22/90     | 1 A         | 97            |
|             | B           | 9             |             | B           | 88            |
|             | C           | 5             |             | C           | 104           |
|             | 2 A         | 7             |             | 2 A         | 18            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | 5             |
|             | 3 A         | <5            |             | 3 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 4 A         | <5            |             | 4 A         | 6             |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
| 2/23/90     | 1 A         | 51            | 12/24/90    | 1 A         | 91            |
|             | B           | 80            |             | B           | 87            |
|             | C           | 52            |             | C           | 83            |
|             | 2 A         | <5            |             | 2 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 3 A         | <5            |             | 3 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 4 A         | <5            |             | 4 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
| 2/25/90     | 1 A         | 37            | 2/26/90     | 1 A         | 38            |
|             | B           | 52            |             | B           | 67            |
|             | C           | 32            |             | C           | 25            |
|             | 2 A         | <5            |             | 2 A         | 8             |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 3 A         | <5            |             | 3 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |
|             | 4 A         | <5            |             | 4 A         | <5            |
|             | B           | <5            |             | B           | <5            |
|             | C           | <5            |             | C           | <5            |

Table 1. Concluded

| TANK #               | Repli-<br>cate | Ammonia Concentration (ppm) |          |          |          |          |          |          |          |          |          |           |
|----------------------|----------------|-----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
|                      |                | Day<br>0                    | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)           | A              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.2      | --       | 0.2      | --        |
|                      | B              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.1      | --       | 0.1      | --        |
|                      | C              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.1      | --       | 0.1      | --        |
| 3<br>(Thick)         | A              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.2      | --       | 0.1      | --        |
|                      | B              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.1      | --       | 0.1      | --        |
|                      | C              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.1      | --       | 0.1      | --        |
| 2<br>(Thin)          | A              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.1      | --       | 0.1      | --       | 0.1      | --        |
|                      | B              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.1      | --       | 0.1      | --       | 0.1      | --        |
|                      | C              | 0.1                         | 0.0      | --       | 0.1      | --       | 0.0      | --       | 0.1      | --       | 0.1      | --        |
| 1<br>(Sedi-<br>ment) | A              | 0.3                         | 0.1      | --       | 0.2      | --       | 0.1      | --       | 0.2      | --       | 0.1      | --        |
|                      | B              | 0.4                         | 0.1      | --       | 0.2      | --       | 0.4      | --       | 0.3      | --       | 0.1      | --        |
|                      | C              | 0.4                         | 0.1      | --       | 0.3      | --       | 0.1      | --       | 0.2      | --       | 0.1      | --        |

Hardness of influent water after adjustment (2/20/90 - 3/4/90)

| Hardness (mg/l) |      |      |      |      |      |      |     |     |     |     |
|-----------------|------|------|------|------|------|------|-----|-----|-----|-----|
| 2/20            | 2/21 | 2/22 | 2/23 | 2/26 | 2/27 | 2/28 | 3/1 | 3/2 | 3/3 | 3/4 |
| 306             | 290  | 302  | 314  | 298  | 294  | 306  | 300 | 300 | 300 | 286 |

Table 1. (Continued)

| TANK #               | Repli-<br>cate | Flow Rate (ml/min) |          |          |          |          |          |          |          |          |          |           |
|----------------------|----------------|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
|                      |                | Day<br>0           | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)           | A              | 110                | 99       | 98       | 107      | 106      | 98       | 110      | 94       | 100      | 102      | 106       |
|                      | B              | 93                 | 96       | 100      | 94       | 100      | 94       | 92       | 108      | 90       | 90       | 97        |
|                      | C              | 100                | 92       | 96       | 99       | 97       | 106      | 104      | 110      | 98       | 108      | 94        |
| 3<br>(Thick)         | A              | 106                | 94       | 110      | 100      | 96       | 100      | 94       | 106      | 92       | 108      | 100       |
|                      | B              | 97                 | 98       | 96       | 103      | 99       | 104      | 102      | 108      | 102      | 104      | 103       |
|                      | C              | 99                 | 90       | 92       | 96       | 103      | 96       | 110      | 102      | 100      | 106      | 103       |
| 2<br>(Thin)          | A              | 103                | 90       | 108      | 99       | 101      | 110      | 102      | 98       | 92       | 94       | 97        |
|                      | B              | 109                | 100      | 110      | 109      | 100      | 102      | 100      | 96       | 110      | 92       | 94        |
|                      | C              | 110                | 91       | 100      | 107      | 99       | 102      | 92       | 90       | 94       | 108      | 106       |
| 1<br>(Sedi-<br>ment) | A              | 97                 | 108      | 108      | 100      | 104      | 102      | 104      | 102      | 98       | 98       | 104       |
|                      | B              | 96                 | 98       | 90       | 109      | 109      | 98       | 96       | 100      | 96       | 104      | 101       |
|                      | C              | 100                | 110      | 90       | 93       | 108      | 98       | 100      | 100      | 90       | 90       | 107       |

| TANK #               | Repli-<br>cate | NUMBER OF FISH SURVIVING <sup>a</sup> |          |          |          |          |          |          |          |          |          |           |
|----------------------|----------------|---------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
|                      |                | Day<br>0                              | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)           | A              | 20 <sup>b</sup>                       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20        |
|                      | B              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
|                      | C              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
| 3<br>(Thick)         | A              | 20 <sup>b</sup>                       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20        |
|                      | B              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
|                      | C              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
| 2<br>(Thin)          | A              | 20 <sup>b</sup>                       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20       | 20        |
|                      | B              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
|                      | C              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
| 1<br>(Sedi-<br>ment) | A              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
|                      | B              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |
|                      | C              | 10                                    | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10       | 10        |

<sup>a</sup> Clams burrowed below sediment surface and could not be counted during the test. Final counts on day 10 indicated that all clams, except 1 in tank 3C, were alive.

<sup>b</sup> Extra organisms added per replicate to allow for QA/QC tissue analysis

Table 1. (Continued)

| Conductivity (umho/cm) |                |          |          |          |          |          |          |          |          |          |          |           |
|------------------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| TANK #                 | Repli-<br>cate | Day<br>0 | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)             | A              | 973      | 985      | 978      | 976      | 970      | 980      | 981      | 972      | 993      | 997      | 972       |
|                        | B              | 961      | 957      | 959      | 967      | 964      | 977      | 980      | 972      | 971      | 992      | 976       |
|                        | C              | 967      | 953      | 959      | 965      | 967      | 983      | 982      | 974      | 994      | 994      | 973       |
| 3<br>(Thick)           | A              | 976      | 960      | 961      | 969      | 973      | 977      | 981      | 981      | 994      | 998      | 976       |
|                        | B              | 969      | 953      | 959      | 959      | 971      | 979      | 980      | 976      | 994      | 993      | 975       |
|                        | C              | 974      | 944      | 960      | 964      | 967      | 976      | 980      | 971      | 992      | 989      | 978       |
| 2<br>(Thin)            | A              | 967      | 946      | 962      | 965      | 963      | 991      | 986      | 978      | 993      | 995      | 974       |
|                        | B              | 965      | 977      | 973      | 965      | 965      | 987      | 983      | 985      | 994      | 999      | 976       |
|                        | C              | 971      | 947      | 960      | 963      | 961      | 979      | 984      | 979      | 988      | 996      | 975       |
| 1<br>(Sedi-<br>ment)   | A              | 974      | 955      | 963      | 959      | 962      | 984      | 988      | 977      | 992      | 996      | 979       |
|                        | B              | 972      | 960      | 960      | 961      | 965      | 991      | 987      | 978      | 995      | 999      | 981       |
|                        | C              | 974      | 957      | 958      | 964      | 960      | 979      | 983      | 979      | 993      | 995      | 978       |

| Temperature (°C)     |                |          |          |          |          |          |          |          |          |          |          |           |
|----------------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| TANK #               | Repli-<br>cate | Day<br>0 | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)           | A              | 20.3     | 19.7     | 20.4     | 19.9     | 20.3     | 19.6     | 19.5     | 19.9     | 19.9     | 19.7     | 20.2      |
|                      | B              | 20.1     | 19.8     | 20.2     | 20.0     | 20.4     | 19.7     | 19.8     | 20.0     | 20.1     | 20.2     | 20.4      |
|                      | C              | 19.9     | 19.8     | 20.0     | 20.3     | 20.5     | 19.5     | 19.5     | 20.0     | 20.0     | 20.0     | 20.3      |
| 3<br>(Thick)         | A              | 20.0     | 19.9     | 20.1     | 20.1     | 20.5     | 19.8     | 19.8     | 19.9     | 20.3     | 20.1     | 20.2      |
|                      | B              | 20.1     | 19.8     | 19.9     | 19.8     | 20.3     | 19.6     | 19.7     | 19.9     | 20.1     | 20.0     | 20.2      |
|                      | C              | 20.4     | 20.1     | 20.4     | 20.4     | 20.5     | 19.8     | 19.9     | 20.2     | 20.3     | 20.4     | 20.4      |
| 2<br>(Thin)          | A              | 20.2     | 20.0     | 20.5     | 20.3     | 20.5     | 19.6     | 19.8     | 20.0     | 20.3     | 20.1     | 20.2      |
|                      | B              | 19.7     | 19.6     | 19.7     | 20.3     | 20.4     | 19.5     | 19.5     | 19.7     | 19.6     | 19.6     | 19.9      |
|                      | C              | 19.9     | 19.9     | 19.8     | 19.7     | 20.4     | 19.5     | 19.5     | 19.8     | 19.5     | 19.9     | 20.1      |
| 1<br>(Sedi-<br>ment) | A              | 20.1     | 19.8     | 20.3     | 19.9     | 20.5     | 19.6     | 19.6     | 20.0     | 19.7     | 20.0     | 19.7      |
|                      | B              | 20.3     | 19.8     | 20.1     | 20.2     | 20.2     | 19.6     | 19.8     | 20.0     | 20.1     | 20.0     | 20.0      |
|                      | C              | 20.3     | 19.8     | 19.8     | 20.3     | 20.4     | 19.5     | 19.6     | 20.0     | 19.8     | 20.0     | 20.1      |

Table 1. Parameters measured during solid phase portion of Enseco Marblehead study number 91684.<sup>a</sup>

| TANK #               | Repli-<br>cate | Dissolved oxygen (mg/L) |          |          |          |          |          |          |          |          |          |           |
|----------------------|----------------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
|                      |                | Day<br>0                | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)           | A              | 9.0                     | 8.3      | 8.3      | 8.2      | 8.5      | 8.5      | 8.4      | 8.2      | 8.1      | 8.3      | 8.2       |
|                      | B              | 8.8                     | 8.8      | 8.6      | 8.3      | 8.5      | 8.6      | 8.7      | 8.5      | 8.3      | 8.4      | 8.5       |
|                      | C              | 8.8                     | 8.9      | 8.6      | 8.3      | 8.4      | 8.8      | 8.4      | 8.4      | 8.3      | 8.4      | 8.4       |
| 3<br>(Thick)         | A              | 8.7                     | 8.8      | 8.6      | 8.4      | 8.5      | 8.6      | 8.6      | 8.6      | 8.3      | 8.5      | 8.5       |
|                      | B              | 8.8                     | 9.0      | 8.8      | 8.3      | 8.5      | 8.7      | 8.9      | 8.7      | 8.5      | 8.7      | 8.6       |
|                      | C              | 8.8                     | 8.9      | 8.7      | 8.3      | 8.4      | 8.8      | 8.7      | 8.6      | 8.7      | 8.6      | 8.6       |
| 2<br>(Thin)          | A              | 8.7                     | 8.9      | 8.8      | 8.4      | 8.4      | 8.1      | 8.5      | 8.4      | 8.4      | 8.6      | 8.5       |
|                      | B              | 8.7                     | 8.9      | 8.8      | 8.3      | 8.5      | 8.8      | 8.9      | 8.9      | 8.7      | 8.9      | 8.7       |
|                      | C              | 8.8                     | 8.9      | 8.7      | 8.3      | 8.4      | 8.7      | 8.7      | 8.5      | 8.5      | 8.6      | 8.5       |
| 1<br>(Sedi-<br>ment) | A              | 8.5                     | 8.5      | 8.6      | 8.4      | 8.4      | 8.5      | 8.3      | 8.2      | 8.2      | 8.4      | 8.4       |
|                      | B              | 8.5                     | 8.5      | 8.6      | 8.1      | 8.4      | 8.7      | 8.6      | 8.5      | 8.1      | 8.6      | 8.5       |
|                      | C              | 8.3                     | 8.2      | 8.8      | 8.1      | 8.2      | 8.8      | 8.8      | 8.6      | 8.6      | 8.6      | 8.4       |

| TANK #               | Repli-<br>cate | pH       |          |          |          |          |          |          |          |          |          |           |
|----------------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
|                      |                | Day<br>0 | Day<br>1 | Day<br>2 | Day<br>3 | Day<br>4 | Day<br>5 | Day<br>6 | Day<br>7 | Day<br>8 | Day<br>9 | Day<br>10 |
| 4<br>(Cap)           | A              | 8.5      | 8.3      | 8.4      | 8.4      | 8.4      | 8.5      | 8.4      | 8.2      | 8.5      | 8.4      | 8.5       |
|                      | B              | 8.5      | 8.4      | 8.5      | 8.4      | 8.4      | 8.5      | 8.5      | 8.3      | 8.5      | 8.5      | 8.5       |
|                      | C              | 8.5      | 8.5      | 8.5      | 8.4      | 8.4      | 8.5      | 8.5      | 8.3      | 8.5      | 8.5      | 8.5       |
| 3<br>(Thick)         | A              | 8.5      | 8.4      | 8.4      | 8.4      | 8.4      | 8.5      | 8.5      | 8.2      | 8.5      | 8.5      | 8.5       |
|                      | B              | 8.5      | 8.5      | 8.4      | 8.5      | 8.4      | 8.5      | 8.5      | 8.3      | 8.5      | 8.5      | 8.5       |
|                      | C              | 8.5      | 8.5      | 8.5      | 8.4      | 8.4      | 8.5      | 8.5      | 8.3      | 8.5      | 8.5      | 8.5       |
| 2<br>(Thin)          | A              | 8.5      | 8.5      | 8.5      | 8.4      | 8.4      | 8.3      | 8.5      | 8.3      | 8.5      | 8.5      | 8.5       |
|                      | B              | 8.5      | 8.4      | 8.4      | 8.5      | 8.4      | 8.5      | 8.5      | 8.3      | 8.5      | 8.5      | 8.5       |
|                      | C              | 8.5      | 8.5      | 8.4      | 8.5      | 8.4      | 8.5      | 8.5      | 8.3      | 8.4      | 8.5      | 8.5       |
| 1<br>(Sedi-<br>ment) | A              | 8.5      | 8.3      | 8.3      | 8.5      | 8.3      | 8.4      | 8.4      | 8.2      | 8.4      | 8.4      | 8.2       |
|                      | B              | 8.5      | 8.3      | 8.3      | 8.4      | 8.3      | 8.3      | 8.5      | 8.2      | 8.4      | 8.4      | 8.4       |
|                      | C              | 8.5      | 8.3      | 8.3      | 8.4      | 8.3      | 8.5      | 8.5      | 8.2      | 8.4      | 8.4      | 8.4       |

|                             | Cap    | Sediment    |
|-----------------------------|--------|-------------|
| <sup>a</sup> Tank # 4 (ABC) | 4"     | no sediment |
| Tank # 3 (ABC)              | 8"     | 6"          |
| Tank # 2 (ABC)              | 4"     | 6"          |
| Tank # 1 (ABC)              | No cap | 6"          |

#### IV. RESULTS

Table 1 contains the data from the 10-day solid phase portion of the study. Due to laboratory error only one TOC sediment sample was analyzed. The TOC of the harbor river sediment was 13,500 mg/kg. Associated data and QA/QC are included in Appendix B. A summary of results of chemical analyses of tissues of organisms exposed to sediment (6" sediment, no cap), thin cap (4" cap, 6" sediment), thick cap (8" cap, 6" sediment), and capping material control (4" cap, no sediment) are presented in Appendix B. Also in Appendix B are results of sediment and capping material PCB analyses run prior to test initiation. All PCB analyses were conducted by Hazleton Laboratories of Madison, Wisconsin.

While neither the contaminated sediment nor the capping material proved to be acutely toxic (all organisms, except 1 clam in tank 3C, survived the 10 day exposure), mean concentrations of Aroclor 1242 were elevated in organisms in the thick cap, thin cap, and sediment exposures when compared to the capping material control. Statistically significant differences in bioaccumulation of PCBs in *P. promelas* and *C. fluminea* were noted only in tanks with no capping material over the contaminated sediments. An analysis of variance (ANOVA) completed with *P. promelas* and *C. fluminea* data may be found in Tables 3 and 4 respectively.

than 3% mortality occurred in either organism lot during the acclimation period. Organisms were not fed during the test. An additional ten *P. promelas* and 30 *C. fluminea* were placed in three aquaria to allow for QA/QC analysis. These aquaria, and the associated analysis, are as follows:

- |                                      |                    |
|--------------------------------------|--------------------|
| 1. Cap Control (4" cap, no sediment) | Matrix spike       |
| 2. Thin Cap (4 " cap, 6" sediment)   | Duplicate Analysis |
| 3. Thick Cap (8" cap, 6" sediment)   | Duplicate Analysis |

Water flow rate, temperature, pH, dissolved oxygen, conductivity, number of fish surviving (clams were not counted, as most had burrowed into the solidwaste), and total suspended solids were monitored on Day 0 and at 24-hour intervals in each test chamber. Due to initially elevated levels of ammonia in sediment tanks, ammonia concentrations were measured every 48 hours. Aeration of test tanks was initiated at 7 hours due to falling dissolved oxygen concentrations. Aeration was performed at a single bubble rate mid-column to minimize sediment disturbance.

At the end of the 10-day test, March 3, 1990, organisms were carefully removed and transferred to all glass aquaria containing flow-through water similar to that used during the exposure period. Organisms from respective tanks were kept together. After two days of depuration, each species from each tank was placed in an acetone rinsed foil packet and frozen prior to shipment by overnight courier to Hazleton Laboratories of Madison, Wisconsin, for tissue analysis.

Care was taken to minimize the mixing of the two layers of materials during addition to the test tanks. Sediment was added and smoothed out prior to the careful addition of capping material. Location of the tanks within the chamber was randomized according to CRC Standard Mathematical Tables (1959), p. 241, Column 7. Appropriate subsampling of sediment and capping material for total organic carbon (TOC) and PCB analysis was conducted by Enseco personnel at this time.

Sixty liters of aerated, dechlorinated, tap water adjusted to a hardness of 300 mg/l as  $\text{CaCO}_3$ , a pH of 7.5-8.5, and a temperature of  $20 \pm 0.5^\circ\text{C}$ , were then slowly added to each aquarium. Hardness was adjusted as described in Table 801.I of Standard Methods for the Examination of Water and Wastewater (1989). Water was introduced horizontally at mid-column and overflow was at the top of the water column. Once filled to the desired level, tanks were gently aerated at mid-column and allowed to settle for 48 hours. The settling period was lengthened due to elevated ammonia levels. Because of continued high concentrations of ammonia (>1.0 ppm) in test tanks, aeration was increased on February 15, 1990. Care was taken not to disturb sediment. On February 17, 1990, water flow was initiated at 100 ml/min. in an attempt to decrease ammonia concentrations to acceptable levels. On February 21, 1990 ammonia levels in all test vessels fell below 1 ppm and ten fathead minnows, *Pimephales promelas*, and 30 Asiatic clams, *Corbicula fluminea*, were added to each tank.

Organisms employed in the 10-day bioaccumulation phase of the study were acclimated at  $20 \pm 0.5^\circ\text{C}$  at a hardness of 300 mg/l ( $\pm 5\%$ ) for a minimum of 10 days prior to use. Mature *P. promelas* (approximately 3-4 g each) were cultured at Enseco Marblehead and fed a diet of PCB-free commercial fish food. Results of PCB analysis performed on the fish food may be found in Appendix B. *C. fluminea* were purchased from a commercial supplier in California and fed a diet of the freshwater alga *Selenastrum capricornutum* during the acclimation period. Representative samples of both organisms were analyzed prior to testing to ensure that they were relatively free of PCB contamination. Results of these analyses may be found in Appendix B. Less

### III. METHODS AND MATERIALS

Uncontaminated outer harbor sediment and polychlorinated biphenyl (PCB) contaminated harbor river sediment were delivered to Enseco Marblehead by Clean Harbors of Kingston, Inc., on January 9, 1990. Upon arrival, the sediments were logged-in, assigned Enseco project number 91684 and placed in a walk-in refrigerator at 2-4°C until use. The protocol testing procedures are outlined in Appendix A.

Sediment bioassay testing was initiated on February 11, 1990, and was carried out in a Harris Environmental Chamber at  $20 \pm 0.5^\circ\text{C}$ . Contaminated harbor river sediment was visually characterized as smooth and dark brown with small amounts of organic matter (leaves and small sticks) and trash (one plastic bag, some aluminum foil). The sediment had a hydrogen sulfide/manure odor and appeared to be homogeneous. No macrophytes were found. The capping material (outer harbor sediment) was characterized as tan to light brown in color, having a sandy texture with no macrophytes or odors present. It was noted that the unlined 55 gallon drum containing the reference material, had started to rust. All water and the top 2-3" of material was removed from the surface of the sediment and an effort was made not to use reference material in contact with the side of the drum. A picture of the drum may be found in the addendum. Sediment and capping material were carefully added to all glass aquaria whose structure was similar to those described in Brannon et al. (1987) (approximate dimensions 18"W x 18"W x 36" H). The tanks contained the following thicknesses of capping and sediment material:

|        |   |                                     |
|--------|---|-------------------------------------|
| Tank 1 | A |                                     |
|        | B | > 6" Sediment (sediment)            |
|        | C |                                     |
| Tank 2 | A |                                     |
|        | B | > 6" Sediment, 4" Cap (thin cap)    |
|        | C |                                     |
| Tank 3 | A |                                     |
|        | B | > 6" Sediment, 8" Cap (thick cap)   |
|        | C |                                     |
| Tank 4 | A |                                     |
|        | B | > 4" Cap, no Sediment (cap control) |
|        | C |                                     |

## II. INTRODUCTION

The ability of uncontaminated capping material of two different thicknesses to reduce and/or eliminate the bioaccumulation of polychlorinated biphenyls (PCBs) from contaminated sediment in the tissue of the fathead minnow, *Pimephales promelas*, and the Asiatic clam, *Corbicula fluminea*, is evaluated in this study.

This report consists of five principal sections in addition to this Introduction. The first section, which precedes this Introduction, is a summary of the study. Section III reviews the methods and materials employed in the toxicological investigation and Section IV presents important results of the investigation. The fourth section contains references cited in the report, and the final is a list of deviations from the protocol.

This report also contains five appendices. The first appendix contains a copy of the test protocol. The second appendix presents all analytical results from tissue, sediment, and fish food analyses. The third includes all chain of custody records associated with the samples and the fourth is a quality assurance certification. An addendum contains photographs of the test in progress.

## 1. SUMMARY

The ability of uncontaminated capping material (outer harbor sediment) of two different thicknesses to reduce and/or eliminate the bioaccumulation of polychlorinated biphenyls (PCBs) from contaminated sediments (harbor river sediment) in the tissue of the fathead minnow, *Pimephales promelas*, and the Asiatic clam, *Corbicula fluminea*, is evaluated in this study. Enseco's aquatic toxicology laboratory in Marblehead, Massachusetts, was contracted by Blasland & Bouck Engineers, P.C. to perform the bioassay testing portion of the study entitled, "Bioaccumulation of PCBs in Fathead Minnows, *Pimephales promelas*, and Asiatic Clams, *Corbicula fluminea*, from Capped and Non-capped PCB Contaminated Sediments in a Freshwater Environment." The Enseco Marblehead project number assigned to the study was 91684. Testing was carried out during February 11, 1990 - March 3, 1990. Water used in the evaluation was aerated, dechlorinated, tap water adjusted to a hardness of 300 mg/l as CaCO<sub>3</sub>, a pH of 7.5-8.5, and a temperature of 20 ± 0.5° C.

While neither the contaminated sediment or the capping material proved to be acutely toxic (at least 98% organism survived in all test chambers), statistical differences in bioaccumulation of PCBs was noted in both test species. Specifically, *P. promelas* and *C. fluminea* held in tanks with no capping material over contaminated sediments accumulated significantly higher amounts of Aroclor-1242 than did organisms in tanks where capping material was present.

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Photographs of Test in Progress

DOF

Enseco

BIOACCUMULATION OF PCBs IN FATHEAD MINNOWS,  
*PINEPHALES PROMELAS*, AND  
ASIATIC CLAMS, *CORBICULA FLUMINEA*,  
FROM CAPPED AND NON-CAPPED PCB  
CONTAMINATED SEDIMENTS IN A FRESHWATER ENVIRONMENT

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April 1990

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**B.E.S.T.® BENCH-SCALE TREATABILITY  
FINAL TEST REPORT**

**SHEBOYGAN RIVER AND HARBOR SITE**

for

**Blasland & Bouck Engineers**

March, 1992

Prepared by  
**RESOURCES CONSERVATION COMPANY**  
3006 Northup Way  
Bellevue, WA 98004-1407

**B.E.S.T.<sup>®</sup> BENCH-SCALE TREATABILITY  
FINAL TEST REPORT**

Sheboygan River and Harbor Site

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**B.E.S.T.<sup>®</sup> BENCH-SCALE TREATABILITY  
FINAL TEST REPORT**

Blasland & Bouck Engineers  
Sheboygan River and Harbor Site

**I. INTRODUCTION**

**SUMMARY**

A bench-scale treatability test of the B.E.S.T. solvent extraction process was conducted on a sediment sample containing polychlorinated biphenyls (PCBs) from the Sheboygan River and Harbor site. A summary of the bench-scale treatability test results follows:

**BENCH-SCALE TREATABILITY TESTS RESULTS**

| <b><u>Feed PCB<br/>Content, mg/kg<br/>(dry basis)</u></b> | <b><u>Product Solids<br/>PCB Content, mg/kg<br/>(dry basis)</u></b> | <b><u>PCB Removal<br/>Efficiency, %</u></b> |
|-----------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------|
| 170                                                       | 0.7                                                                 | 99.6                                        |

As can be seen from the data above, the PCB residual of the treated solids (Product Solids) was 0.7 mg/kg, yielding a PCB removal efficiency of 99.6%. In addition, the treated solids readily passed the TCLP Toxicity Test for the leaching of metals.

**RESOURCES CONSERVATION COMPANY (RCC) BACKGROUND**

Resources Conservation Company (RCC), established in 1971, is a multi-discipline engineering service that specializes in the design of hazardous waste and wastewater treatment systems. RCC is a wholly owned subsidiary of the Halliburton Company whose headquarters are in Dallas, Texas. RCC's main office is located in Bellevue, Washington. RCC's treatability laboratory is located near the main office. RCC has a staff of over 85 personnel.

## THE B.E.S.T. SOLVENT EXTRACTION PROCESS

The B.E.S.T. process is a patented solvent extraction technology using triethylamine as the solvent. Triethylamine is an aliphatic amine that is produced by reacting ethyl alcohol and ammonia.

Triethylamine is an excellent solvent for treating hazardous wastes because it exhibits several characteristics that enhance its use in the solvent extraction system. These characteristics include:

- A high vapor pressure; therefore, the solvent can be easily recovered from the extract solution (oil, water, and solvent) via steam stripping.
- Formation of a low boiling temperature azeotrope with water, allowing the solvent to be recovered from the oil to very low residual levels (typically less than 100 ppm).
- A low heat of vaporization (1/7 of water), allowing solvent to be recovered from the treated solids with very low energy input.
- Triethylamine is alkaline (pH=10); therefore, some heavy metals are converted to the hydroxide form, precipitate and exit the system with the treated solids.
- Triethylamine readily biodegrades. Data available in EPA document EPA Data ORD USEPA Washington, D.C. 20460, Feb. 1983 (reprint) Manual, Volume 1 600/2-82-001a, shows that a level of 200 ppm triethylamine in water was degraded completely within 11 hours by the common soil bacteria *aerobacter*.

A block diagram of the B.E.S.T. process is presented in Figure 1. The first extraction of the feed is conducted at low temperatures (about 40 degrees F). At this temperature, triethylamine is soluble with water. Therefore, the extract solution contains most of the water in the feed sample. If the first extract solution contains sufficient water to allow a phase separation of the solvent and water, the extract is heated to a temperature above the miscibility limit (130 degrees F). At this temperature, the extract solution separates into two distinct phases, a solvent/oil phase and a water phase. The two phases are separated by gravity and decanted. The extract solution from subsequent stages is combined with the decanted solvent/oil phase from the first extraction stage. The solvent is recovered by steam stripping and evaporation.

Triethylamine is removed from the treated solids by indirect steam heating. A small amount of steam may be added directly to the dryer vessel to provide the water required to form the low boiling temperature azeotrope. Residual solvent remaining in the treated solids biodegrades readily, allowing the treated solids to be used as backfill at the site in some cases.

The B.E.S.T. process operates near ambient pressure and temperature and at an alkaline pH. Temperatures of the liquid streams within the unit vary from about 40 to 170 degrees F, and elevated pressures are not required. This gives the B.E.S.T. process the advantage that it can use standard off-the-shelf processing equipment.

## B.E.S.T. PROCESS CONCEPT

### Extraction

### Solvent Recovery

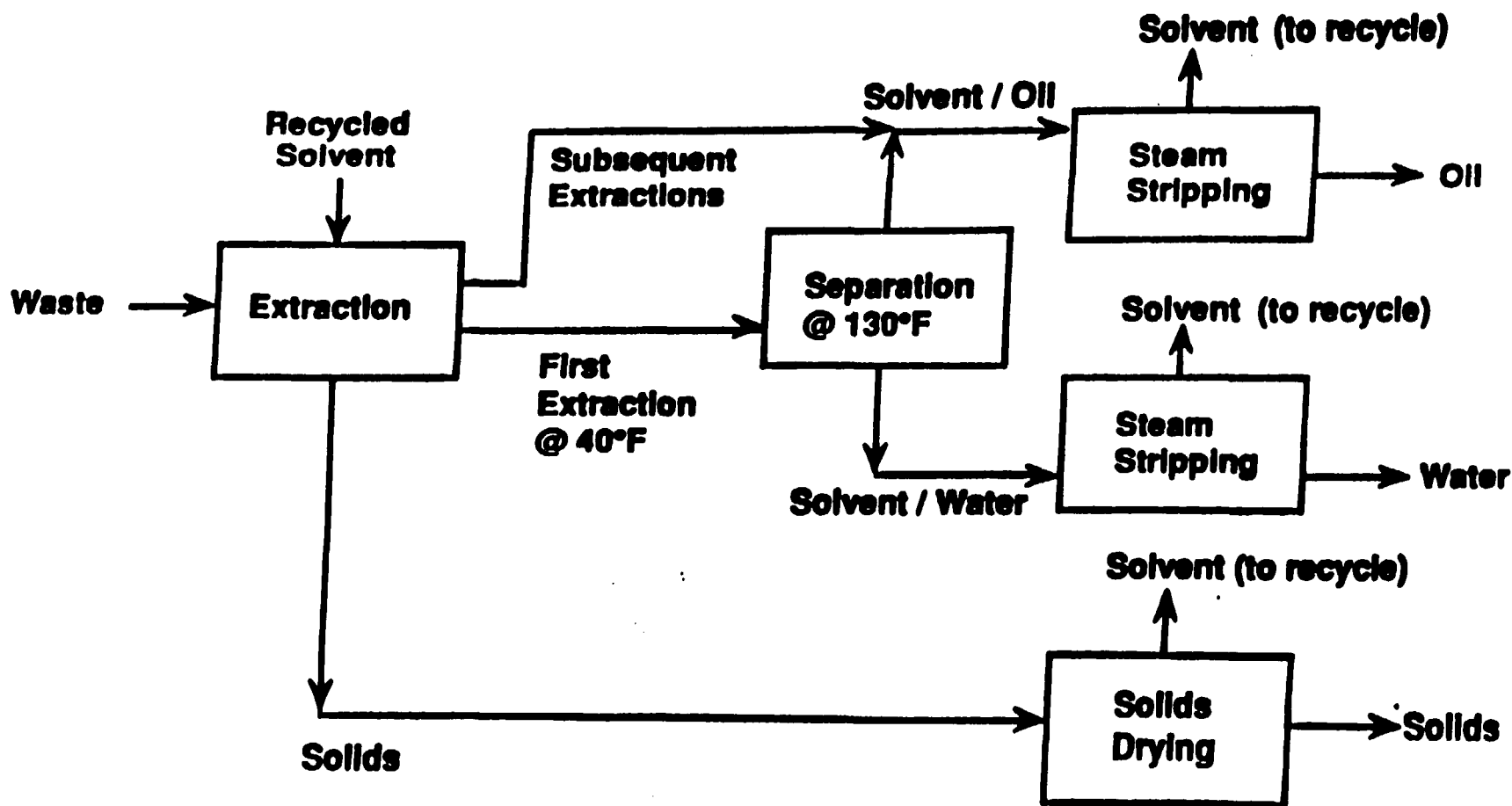


Figure 1

## EQUIPMENT DESCRIPTION

RCC proposes using a B.E.S.T. Model 615 unit to treat the PCB-containing material at this site. The B.E.S.T. Model 615 unit has a design capacity of approximately 200-300 tons of feed per day. A flow schematic for the B.E.S.T. Model 615 is presented in Figure 2.

The B.E.S.T. Model 615 uses an extractor/dryer vessel to extract and dry the PCB-containing materials. The extractor/dryer is a horizontal, steam-jacketed vessel that allows for solvent contacting, mixing, solids/solvent separation, solids drying, and solids conditioning in one vessel. The extractor/dryer vessel is an off-the-shelf assembly that has a long history of reliable performance in a wide range of process industry applications.

PCB-containing materials are excavated from the site and screened to one inch maximum dimension. The screened material is then loaded into top-loading, bottom discharge hoppers. An overhead crane facilitates the positioning and lowering of the loaded hopper onto the loading port of the extractor/dryer unit. The flow of material through the extractor/dryer system is shown in Figure 3. Treated solids are discharged into hoppers and transported to a holding area.

Figure 4 provides the standard Site Plan for RCC's B.E.S.T. Model 615.

## AIR EMISSIONS AND ABATEMENT

The B.E.S.T. process uses one vent to the atmosphere. The vent provides pressure equalization for the nitrogen blanketing system and a purge for noncondensable gases from process condensers. RCC uses a refrigerated condenser and an auxiliary water scrubber system to reduce solvent emissions from the vent.

During a performance test in February 1987 at the General Refining Superfund Site cleanup, a third party reported the following emissions from the B.E.S.T. process vent at a time when the auxiliary water scrubber was not in operation:

|               | <u>Emission Rate, lb/hr</u> |
|---------------|-----------------------------|
| Benzene       | 0.00114                     |
| Mercury       | < 0.000000043               |
| Toluene       | 0.000614                    |
| Triethylamine | 0.0954                      |
| Xylene        | 0.000884                    |

RCC expects air emissions from future operations to be lower than these results. The use of the auxiliary water scrubber will lower the triethylamine release rate even further. RCC now utilizes activated carbon filters on the single vent line to achieve zero emissions of triethylamine.

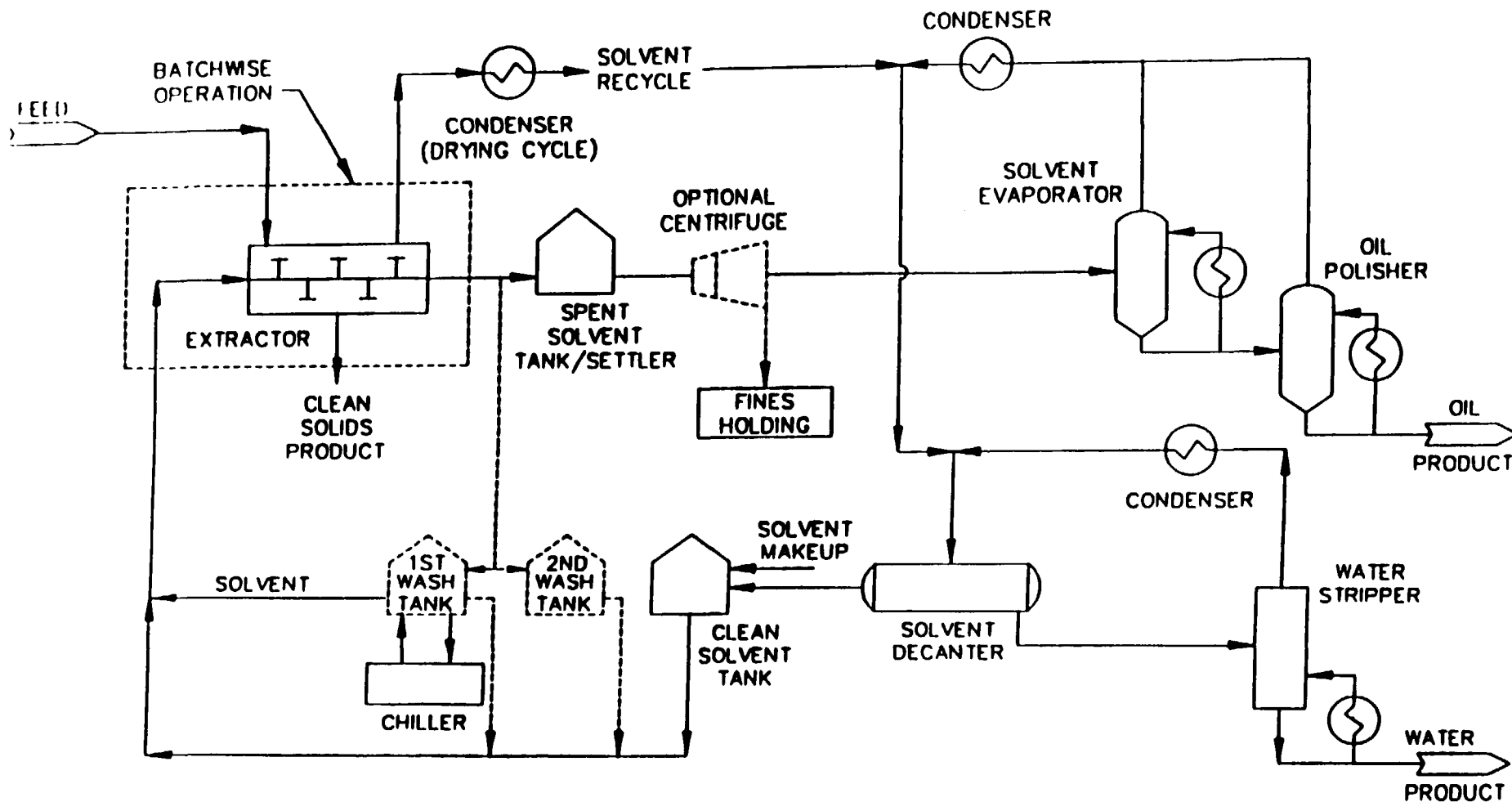


Figure 2

**RCC** Resources  
Conservation  
Company

|                     |
|---------------------|
| ENG RECORD          |
| DRAWN J. STANDIFORD |
| CHECKED             |
| CHECKED             |
| PROJ ENGR           |
| APPROVED            |

PROCESS FLOW SCHEMATIC

B.E.S.T.<sup>®</sup> MODEL 315/615

SOILS TREATMENT UNIT

DWG NO.

B-221

SHEET NO.

1 OF 1

REV

# B.E.S.T.<sup>®</sup> PROCESS STEPS BATTERY LIMITS OPERATION

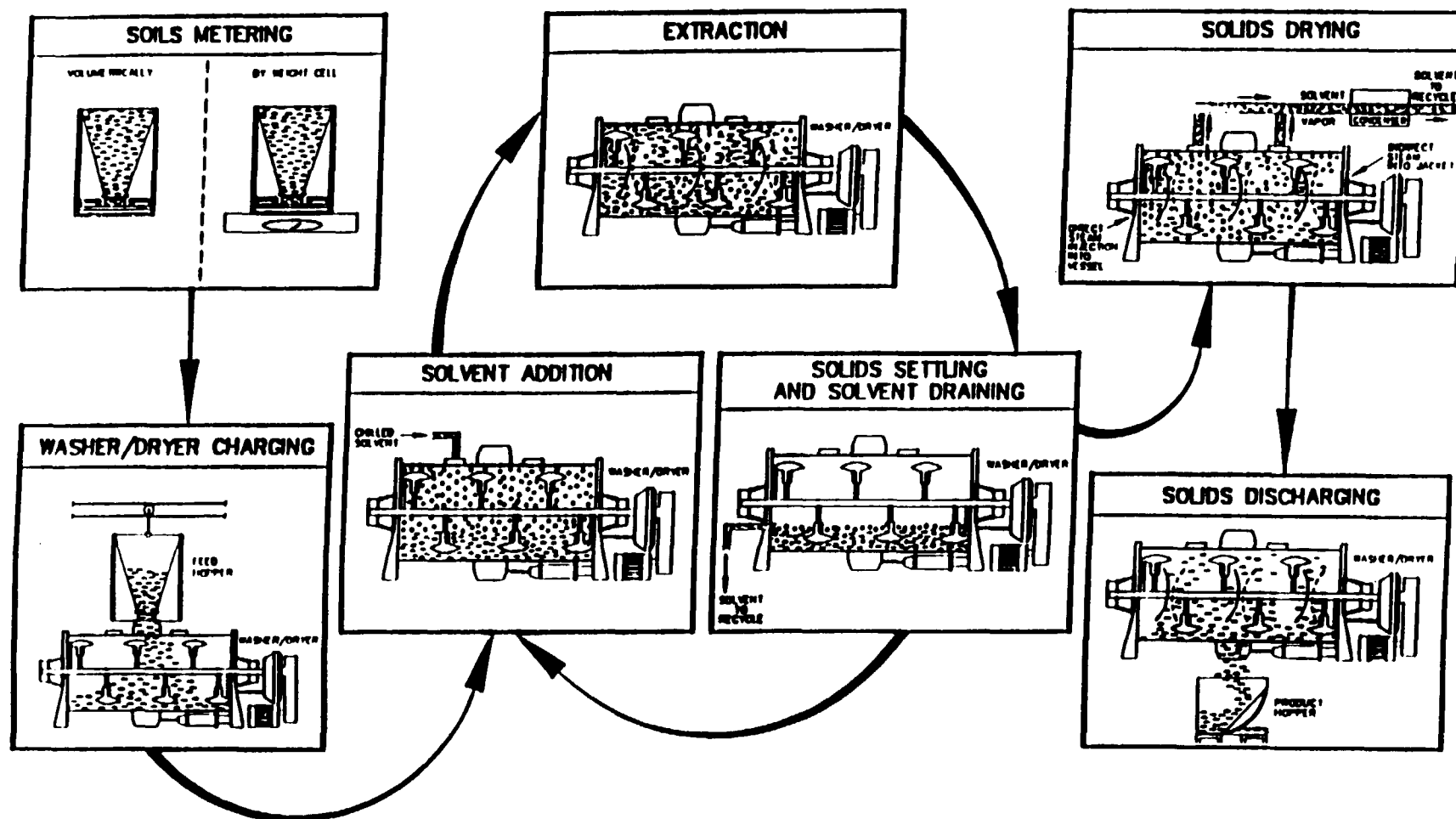


Figure 3

Storage Tanks      Processing Equipment      Six Extractor/Dryers

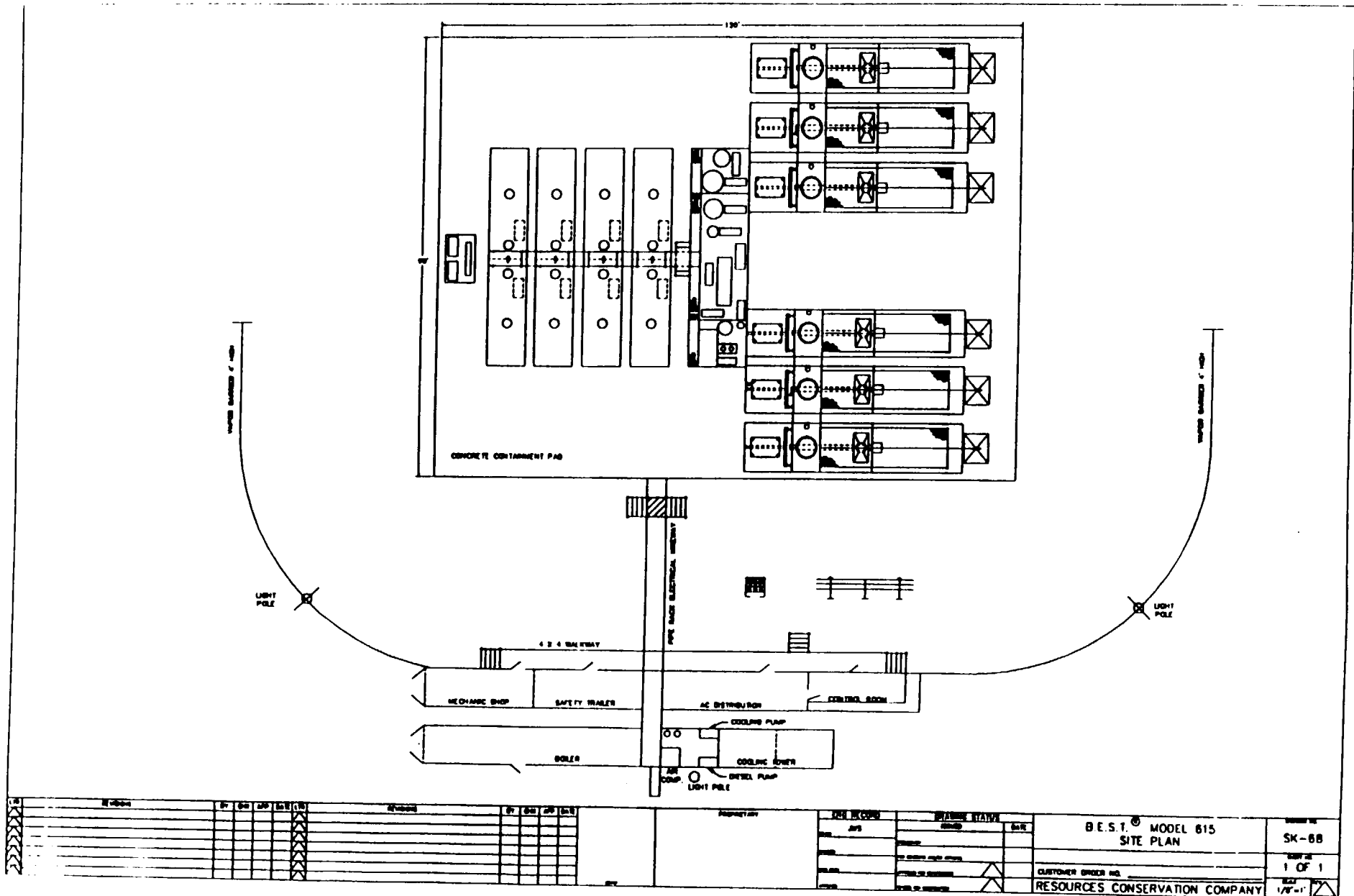


Figure 4

## **BENCH-SCALE TREATABILITY TEST DATA CORRELATION TO FULL-SCALE PERFORMANCE**

In order to evaluate each potential application for the B.E.S.T. process, RCC has developed a low cost bench-scale treatability test protocol that provides data that closely simulates full-scale system performance. The bench-scale treatability test data allows RCC to evaluate the feasibility of the process on a particular sample and to estimate treatment costs.

The reliability of the bench-scale treatability tests to predict full-scale performance has been verified by the US EPA report Evaluation of the B.E.S.T. Solvent Extraction Sludge Treatment Technology - Twenty-Four Hour Test, by Enviroresponse, Inc., under EPA Contract 68-03-3255. A quote from this report evaluating the B.E.S.T. process states:

"Resources Conservation Company has conducted many laboratory tests and developed correlations to which data from full-scale operations, such as the General Refining site, can be compared."

Figures 5 and 6 present data from two separate bench-scale treatability tests and full-scale operating performance data at the General Refining, Inc., Superfund site, as collected by an EPA contractor. This data demonstrates a close correlation between bench-scale treatability test data and full-scale operating data.

Bench-scale treatability testing provides valuable information about the use of the B.E.S.T. process at full-scale including:

- The PCB removal efficiency from the sample.
- Solids separation requirements for full-scale operation.
- The separation efficiency of water from the water/solvent/oil solution by decantation.
- General information on the partitioning of metals and organic compounds in the oil, water, and solids products.
- Full-scale operating parameters to develop treatment costs.

GENERAL REFINING SITE  
PCB CONCENTRATIONS IN RAW SLUDGE & PRODUCT FRACTIONS  
(ppm)

|                              | LAB SCALE TESTING (1986) |          | FULL SCALE PROCESSING |
|------------------------------|--------------------------|----------|-----------------------|
|                              | TEST "A"                 | TEST "B" | FEB. 26-27, 1987      |
| RAW SLUDGE (DRY BASIS) mg/kg | 14.                      | 12.      | 13.5                  |
| PRODUCT SOLIDS mg/kg *       | 0.02                     | 0.14     | <0.13                 |
| PRODUCT WATER mg/L           | <0.01                    | <0.01    | <0.005                |
| %EXTRACTION EFFICIENCY       | 99.9                     | 98.8     | >99.0                 |

\* Dry Basis

**COMPARISON OF BENCH SCALE TO FULL SCALE  
PHASE SEPARATION PERFORMANCE  
FOR  
GENERAL REFINING SITE SLUDGE**

|          | Raw Sludge | Bench Scale      |                        |               | Raw Sludge | Full Scale       |                        |               |
|----------|------------|------------------|------------------------|---------------|------------|------------------|------------------------|---------------|
|          |            | <u>Separated</u> | <u>Phase Fractions</u> |               |            | <u>Separated</u> | <u>Phase Fractions</u> |               |
|          |            | <u>Oil</u>       | <u>Water</u>           | <u>Solids</u> |            | <u>Oil</u>       | <u>Water</u>           | <u>Solids</u> |
| Oil %    | 36         | >97.             | .017                   | 5.7           | 27         | 99.              | 0.0033                 | 0.81          |
| Water %  | 56         | *                | N/A                    | <1.0          | 66         | 0.88             | >99.                   | <0.5          |
| Solids % | 8          | *                | N/A                    | >94.          | 7          | *                | 0.81                   | >98.          |

N/A Not Available  
\* BS&W = 2.8%

## **II. BENCH-SCALE TREATABILITY TESTING**

### **OBJECTIVES**

Resources Conservation Company (RCC) has conducted a bench-scale treatability test on the Sheboygan River PCB-containing sediment sample. The primary objective of this test was to determine the feasibility and cost effectiveness of the B.E.S.T. solvent extraction process for treating the raw sediment, specifically:

- Determine effectiveness of the B.E.S.T. process for treating PCB-containing sediments from the site, including the PCB removal efficiency.
- Determine materials handling and other equipment needs for each sediment tested.
- Develop data to project process operating conditions for full-scale treatment, as well as estimate full-scale treatment costs.

### **BENCH-SCALE TREATABILITY TEST DOCUMENTATION**

The documentation of the testing can be separated into three distinct categories. The following summarizes the procedures used for each step of the treatability process:

1. When the sample was received in the laboratory, the shipment was checked for correctness of accompanying paper work, including Chain of Custody. The information was recorded both in a hardbound sample logbook and on a computer system that has been specifically designed by RCC for use in tracking samples. The sample was issued a discrete laboratory sample number, and a test request form was completed. The sample was kept in a refrigerator under controlled and documented temperature prior to any lab analysis or the treatability study. Chain of Custody records and other information received with the sample are kept as part of the project file.
2. All records and observations taken during the bench-scale treatability testing were recorded in laboratory notebooks. The laboratory notebooks are the property of RCC, and each analyst and engineer has been issued a notebook. The notebooks are retained by RCC as permanent record of raw data collection.
3. Samples that were collected during the bench-scale test, including samples internal to the process, were submitted to the RCC analytical chemistry laboratory for further analysis. Each sample collected was issued a discrete laboratory number. An analysis request form was completed. The samples were analyzed in accordance with RCC's Laboratory Quality Management Plan and reviewed for correctness prior to issuance. A file is maintained to permanently store the accumulated test results from completion of the analytical testing.

## SAMPLE PREPARATION

The PCB-containing sample from the Sheboygan River and Harbor Site arrived at RCC's laboratory in December, 1991. The sample was labeled BS-2. The sample was a wet, gray-colored mud with very little debris present, and had a strong sulfur odor.

The feed was screened using standard Tyler sieves to remove debris and to homogenize the sample. Very little debris was removed. Results of the screen analysis were as follows:

### Sample Screening

| <u>&lt; 1/4 inch</u> | <u>&gt; 1 inch</u> |
|----------------------|--------------------|
| > 97 %               | none               |

Bench-scale testing requires material greater than 1/4 inch be removed. Full-scale processing requires that the feeds be screened to remove only material greater than 1 inch in diameter.

## FEED COMPOSITIONAL ANALYSIS

The feed was analyzed for percent oil, water, solids, PCBs, and metals per the following methods:

- The oil & grease content was determined as per Standard Methods for the Examination of Water and Wastewater, 16th Edition, Method 503D, with two exceptions: the extraction time was extended from 4 to 16 hours, and methylene chloride ( $\text{MeCl}_2$ ) was substituted for Freon based on RCC experience that  $\text{MeCl}_2$  is a better solvent for oils and greases.
- The water content was determined by weight loss at 105 degrees C.
- The PCB concentration was determined per EPA Publication SW846 Test Methods for Evaluating Solid Waste, Method 8080. The sample extraction method was by Soxhlet extraction with 1:1 acetone:hexane for 16 hours. The PCBs were quantitated as Aroclor 1242.
- The metals composition (except for Mercury) was determined by nitric acid digestion after ashing at 550 degrees C, followed by ICP analysis (EPA SW846, Method 6010).
- Mercury concentration was determined by the Cold Vapor Technique, Method 303F, of Standard Methods for the Examination of Water and Wastewater.
- Loss-on-ignition was determined by heating a sample from 105 to 550 degrees C which is a measure of the total organic content.
- Bulk density was determined by weighing a specific volume of sample.

The results of these analyses on a wet basis were as follows:

**Feed Compositional Analysis**

(wet basis unless noted)

| <b><u>Analyte</u></b>                 | <b><u>Result</u></b> |
|---------------------------------------|----------------------|
| Oil & Grease (by $\text{MeCl}_2$ ), % | 0.55                 |
| Water, %                              | 40.                  |
| Solids, %                             | 59.                  |
| Loss-on-ignition, % (dry basis)       | 6.6                  |
| PCBs, mg/kg, dry basis                | 170.                 |

The heavy metals composition of each feed was as follows:

**Feed Metals Composition, mg/kg**

(As received basis)

| <b><u>Analyte</u></b> | <b><u>Result</u></b> |
|-----------------------|----------------------|
| Arsenic               | < 50.                |
| Barium                | 47.                  |
| Cadmium               | < 5.                 |
| Chromium              | 25.                  |
| Copper                | 14.                  |
| Lead                  | 32.                  |
| Mercury               | 0.38                 |
| Nickel                | 9.                   |
| Selenium              | < 50.                |
| Silver                | < 5.                 |
| Zinc                  | 85.                  |

## TRIETHYLAMINE COMPATIBILITY TEST

Triethylamine is a compound with a unique chemical structure. The geometry of the structure is tetrahedral, meaning that the nitrogen atom is at the center of a three-sided pyramid. The four points of the pyramid structure are occupied by three ethyl functional groups and one electron cloud. This structure gives triethylamine dual polarity characteristics. The ethyl groups are essentially nonpolar; the electron cloud is polar. Although triethylamine is a very stable solvent, there is a remote possibility that the electron pair can react with certain types of materials. In order to determine if this will occur with a sample, a compatibility test is performed. This involves mixing of the sample with triethylamine and making observations as to the heat of solution and any other visual signs of reaction.

When each feed sample was mixed with cold triethylamine, there were no visible signs of adverse reactions and the heat of solution was in a normal range. The triethylamine was observed to darken upon mixing, indicating that extraction of the organic compounds was occurring.

Based on the favorable results of this preliminary test, it was decided that the B.E.S.T. bench-scale treatability test should proceed.

## FEED pH ADJUSTMENT

Triethylamine can be ionized at low pH to triethylammonium salts that cannot be removed from the products. The alkaline nature of triethylamine will buffer the pH of the sample to a pH of around 9. The solvent spent in the pH buffering will be lost. In order to efficiently recover the triethylamine from the separated phase fraction products, the pH of the sample is adjusted to about 11 with caustic soda.

A 5-gram portion of each feed sample was slurried with deionized water. The pH of this mixture indicated that caustic would need to be added to each sample. Incremental portions of caustic soda (NaOH) were added to bring the pH to 11. The amount of caustic that was required to perform this pH adjustment and the original sample pH is summarized below:

### Sample pH and Caustic Dose

| <u>pH</u> | <u>Caustic Dose</u><br><u>(mls 50% NaOH per kg)</u> |
|-----------|-----------------------------------------------------|
| 8.0       | 5.1                                                 |

## SAMPLE EXTRACTION/PRODUCT SOLIDS

A portion of sediment was prechilled by placing it in a 4-liter resin kettle, immersed in a temperature controlled water bath set at 0.5 degrees C. The sediment pH was adjusted by adding caustic soda at the same time that chilled triethylamine was added. Mixing was performed by an air-driven propeller mixer. As expected, the solvent became colored, indicating extraction of organic compounds was occurring. The mixing was stopped and settling characteristics were observed. The liquid in the mixture was decanted off and then separated from any remaining solids by centrifuging at 2100 rpm for 10 minutes. The solvent/oil/water mixture was temporarily set aside after centrifugation for testing as discussed later under solvent evaporation/oil stripping.

No additional caustic was added for the additional extraction stages. The decanted TEA/Oil from the subsequent extraction stages was not centrifuged. The improved settling characteristics observed during the subsequent extractions resulted in a TEA/Oil mixture which was free of suspended solids. A total of six extraction stages were conducted on the material. Solids samples were collected from each extraction stage. The final extraction solids are hereafter referred to as Product Solids.

Product Solids were analyzed per the following methods. Additionally, 4th, 5th and 6th extraction stage solids were analyzed for PCBs to allow a determination of when the point of diminishing returns with respect to PCB reduction is achieved.

- The oil & grease content was determined as per Standard Methods for the Examination of Water and Wastewater, 16th Edition, Method 503D, with two exceptions: the extraction time was extended from 4 to 16 hours, and methylene chloride ( $\text{MeCl}_2$ ) was substituted for Freon based on RCC experience that  $\text{MeCl}_2$  is a better solvent for oils and greases. The O & G content was also determined using the Freon protocol.
- Loss-on-ignition was determined by heating a sample to 550 degrees C for 3 hours.
- The PCB concentration was determined per EPA Publication SW846 Test Methods for Evaluating Solid Waste, Method 8080. The sample extraction method was by Soxhlet extraction with 1:1 Acetone:Hexane for 16 hours. The PCBs were quantitated as Aroclor 1242.
- The metals composition was determined by aqua regia digestion, followed by ICP analysis (EPA SW846, Method 6010).

- Mercury concentration was determined by the Cold Vapor Technique, Method 303F, of Standard Methods for the Examination of Waste and Wastewater.
- The triethylamine content was determined by shaker bath water extraction and packed column gas chromatography with a flame ionization detector.
- The pH was determined by measuring the pH of a slurry of 5 grams of sample and 50 mls of deionized water. The slurry was tested by pH probe after mixing.

PCB analytical results of all of the solids samples were as follows:

**PCB Analysis Summary, mg/kg**  
(all data dry basis)

| <b><u>Sample Point</u></b>        | <b><u>Result</u></b> |
|-----------------------------------|----------------------|
| Feed                              | 170.                 |
| 4th Stage Solids                  | 1.9                  |
| 5th Stage Solids                  | 1.1                  |
| Product Solids (6th Stage Solids) | 0.73                 |

Additional product solids analyses, all on a dry basis since the product solids were dried in-process, follows:

**Product Solids Analysis**  
(six extraction stages)

| <b><u>Analyte</u></b>                 | <b><u>Result</u></b> |
|---------------------------------------|----------------------|
| Oil & Grease (by $\text{MeCl}_2$ ), % | < 0.2                |
| Triethylamine, mg/kg                  | < 15.                |
| Loss-on-ignition, %                   | 6.3                  |

PCB removal efficiency is determined by comparing the amount of PCBs in the feed to the amount remaining in the sediment after treatment. The fraction of PCBs remaining in the sediment is calculated by dividing the PCB content of the product solids by the PCB content of the feed, on a dry basis. The calculation of the Sheboygan River sample follows:

### PCB Removal Efficiency Calculation

$$\begin{aligned} \text{Fraction of PCBs remaining in sediment} &= \frac{\text{Product solids PCB Content (dry basis)}}{\text{Feed PCB Content (dry basis)}} \\ &= \frac{0.73 \text{ mg/kg}}{170 \text{ mg/kg}} = 0.00429 \end{aligned}$$

$$\begin{aligned} \% \text{ Removal from sediment} &= 100 \cdot (1 - \text{fraction of PCBs remaining in sediment}) \\ &= 100 \cdot (1 - 0.00429) \\ &= 99.6 \% \end{aligned}$$

The reduction in the PCB content and the corresponding removal efficiency of PCBs from the sediment is summarized below.

### Total PCB Removal Summary

| <u>PCBs in Feed, mg/kg</u><br>(dry basis) | <u>PCBs in Product Solids, mg/kg</u><br>(dry basis) | <u>Removal Efficiency, %</u> |
|-------------------------------------------|-----------------------------------------------------|------------------------------|
| 170.                                      | 0.73                                                | 99.6                         |

Total heavy metal analysis of the product solids was as follows:

**Product Solids**  
**Total Metals Analysis, (mg/kg)**  
(Dry Basis)

| <b><u>Analyte</u></b> | <b><u>Result</u></b> |
|-----------------------|----------------------|
| Arsenic               | < 50.                |
| Barium                | 77.                  |
| Cadmium               | < 5.                 |
| Chromium              | 44.                  |
| Copper                | 31.                  |
| Lead                  | 50.                  |
| Mercury               | 0.29                 |
| Nickel                | 12.                  |
| Selenium              | < 50.                |
| Silver                | < 5.                 |
| Zinc                  | 130.                 |

**TOXICITY CHARACTERISTIC LEACHING PROCEDURE ANALYSIS ON PRODUCT SOLIDS**

The product solids from each sample were extracted using the Toxicity Characteristic Leaching Procedure (TCLP) in accordance with Federal Register, March 29, 1990. Each TCLP leachate was analyzed for metals content. The results from this analysis were as follows:

**Product Solids**  
**TCLP Leachate Analysis, mg/l**

| <b><u>Analyte</u></b> | <b><u>Result</u></b> | <b><u>Regulatory Level, mg/l</u></b> |
|-----------------------|----------------------|--------------------------------------|
| Arsenic               | < 0.5                | 5                                    |
| Barium                | 0.64                 | 100                                  |
| Cadmium               | < 0.05               | 1                                    |
| Chromium              | < 0.05               | 5                                    |
| Lead                  | < 0.3                | 5                                    |
| Mercury               | 0.002                | 0.2                                  |
| Selenium              | < 0.5                | 1                                    |
| Silver                | < 0.05               | 5                                    |

As can be seen from the above data, all Product solids readily passed the TCLP test for metals.

## SOLVENT EVAPORATION/OIL STRIPPING

Recovery of product oil (the organic compound in the feed) was accomplished by distilling off the triethylamine. This was done by boiling the triethylamine/oil/water extract in a Buchi Rotovapor<sup>®</sup> apparatus. The oil remained in the boiling flask of the Rotovapor while the triethylamine was condensed as it evaporated and was collected separately. A small amount of triethylamine was deliberately left in the oil because of the extremely low oil content in the feed samples. In this fashion, the oil could be transferred from the Rotovapor flask and the oil would still be homogenous which is very important for the integrity of the PCB mass balance. (The PCB mass balance is discussed on page 25.) Normally the oil is further treated to remove residual solvent.

The analysis of each product oil was performed as follows:

- The solids content is calculated by ashing at 550 degrees C. The fraction of ash to "oil" is considered the "solids" content.
- The PCB concentration was determined by dilution of the oil in hexane, followed by EPA SW846 (Test Methods for Evaluating Solid Waste), Method 3620, Florisil column cleanup and/or sulfuric acid digest. Then the prepared sample was analyzed by EPA SW846, Method 8080.
- The metals composition was determined by nitric acid digestion after ashing at 550 degrees C, followed by ICP analysis (EPA SW846, Method 6010).

The product analysis results reported after the triethylamine remaining in the oil is factored out were as follows:

### Product Oil Analysis

| <u>Analyte</u> | <u>Result, Oil Basis</u><br>(triethylamine-free) |
|----------------|--------------------------------------------------|
| PCBs, mg/kg    | 40,000.                                          |
| Solids, %      | 0.2                                              |
| Metals, mg/kg  |                                                  |
| Arsenic        | < 210                                            |
| Barium         | 16.                                              |
| Cadmium        | < 21.                                            |
| Chromium       | < 21.                                            |
| Copper         | 110.                                             |
| Lead           | 145.                                             |
| Nickel         | 35.                                              |
| Selenium       | < 210                                            |
| Silver         | < 21.                                            |
| Zinc           | 19.                                              |

The Product Oil was not analyzed for triethylamine and water since the Product Oil was left in solution with triethylamine due to the low oil content of the feed. This makes an analysis of "triethylamine residual" meaningless. Analysis of "water residual" is also meaningless since water is normally removed with the solvent.

The distilled and condensed solvent also carries water in the form of an azeotrope. The solvent/water mixture was further processed as per the next section, DECANTATION OF SOLVENT FROM WATER.

## **DECANTATION OF SOLVENT FROM WATER**

The solvent recovered from each extraction stage was separated into its aqueous (water), oil and solvent components. Only the extract from the first extraction stage had a significant amount of water in solution, so only the water in the first stage extract is recovered.

The water was separated from the extract by evaporation. When the triethylamine/oil/water first stage extract was evaporated, as described in section SOLVENT EVAPORATION/OIL STRIPPING, the water formed an azeotrope with the distilled triethylamine, leaving the oil behind. The water was then separated from the triethylamine of the condensed triethylamine/water azeotrope by decantation. The triethylamine/water recovered from the Solvent Evaporation/Oil Stripping step was heated to 140 degrees F, then poured into a 4-liter separatory funnel. Separation occurred immediately, therefore, a temperature control system was not required. As expected, this separation was highly effective because virtually no oil or solids in the condensed triethylamine/water could hinder the separation of triethylamine from water by decantation.

## **PRODUCT WATER**

Removal of residual triethylamine from each decant water was accomplished by heating the water on a hot plate while maintaining an elevated pH. The elevated pH is necessary to ensure that the majority of the triethylamine remains in the volatile molecular form. Triethylamine/water azeotrope boils at about 170 degrees F. When the triethylamine is removed, the water temperature increases to 212 degrees F. Analysis of each stripped water, labeled Product Water, was conducted as follows:

- The total solids content was per EPA Methods for Chemical Analysis of Water and Wastes, Method 160.3
- The triethylamine content was determined by packed column gas chromatography with a flame ionization detector.
- The metals content was determined by nitric acid digestion followed by ICP analysis (EPA SW846, Method 6010).
- There was insufficient sample for Oil & Grease or PCB analyses.

Results of these analyses were as follows:

**Product Water Analysis, mg/l**

| <b><u>Analyte</u></b> | <b><u>Result</u></b> |
|-----------------------|----------------------|
| Total Solids          | 1000.                |
| Triethylamine         | 7.                   |
| pH                    | 10.7                 |

The bulk of the total solids content is attributed to sodium due to the addition of sodium hydroxide.

**Product Water  
Total Metals Analysis, mg/l**

| <b><u>Analyte</u></b> | <b><u>Result</u></b> |
|-----------------------|----------------------|
| Arsenic               | < 0.5                |
| Barium                | 0.06                 |
| Cadmium               | <0.05                |
| Chromium              | < 0.05               |
| Copper                | < 0.05               |
| Lead                  | < 0.3                |
| Nickel                | < 0.05               |
| Selenium              | < 0.5                |
| Silver                | < 0.05               |
| Zinc                  | 0.13                 |

### III. MASS BALANCES

The data gathered during the bench-scale treatability test provides the data required to calculate mass balances. The mass balances have been segregated into four groups: solids, oil, water, and PCBs.

#### SOLIDS MASS BALANCE

The mass balance for solids is a comparison of the solids input during the test to the solids recovered after the test. The mass of solids input during the test includes the solids portion of the feed extracted and the solids portion of caustic soda added. The solids portion of the feed extracted was calculated by multiplying the weight of feed extracted by the solids content as determined by analysis. The solids portion of the caustic soda added was calculated by multiplying the weight of the 50 percent NaOH solution added by 0.50.

The mass of the solids recovered from the test is equivalent to the sum of the product solids and samples taken for stage-by-stage assays. A summary of this data follows:

#### Solids Mass Balance

|                                 |         |
|---------------------------------|---------|
| Total Feed Extracted, Wet Basis | 1500 g  |
| Solids Portion of Feed          | 870 g   |
| Solids Portion of Caustic       | + 5.4 g |
|                                 | <hr/>   |
| Total Calculated Solids Input   | = 875 g |

|                                       |         |
|---------------------------------------|---------|
| Weight of Product<br>Solids Recovered | 759 g   |
| Weight of Solids<br>Samples Recovered | + 123 g |
|                                       | <hr/>   |
| Total Solids Recovered                | = 882 g |

|             |     |
|-------------|-----|
| Recovery, % | 101 |
|-------------|-----|

## OIL MASS BALANCE

The oil mass balance was computed by the same method used in calculating the solids mass balance. The oil & grease content of each feed was determined by extracting a sample of the feed with methylene chloride. This oil & grease content (by  $\text{MeCl}_2$ ) was multiplied by the weight of the feed input to determine the amount of oil input. The mass of oil recovered from the test was equivalent to the product oil recovered. The residual oil in the product solids and product water was negligible when calculating an oil mass balance.

The oil mass balances (based on methylene chloride) were as follows:

### Oil Mass Balance

| <u>Calculated<br/>Oil Input</u> | <u>Equivalent Product<br/>Oil Recovered</u> | <u>% Recovery</u> |
|---------------------------------|---------------------------------------------|-------------------|
| 8.3 g                           | 5.2 g                                       | 63 %              |

Removal of the oil was good as evidenced by the low ( $< 0.2\%$ ) oil content of the Product Solids. However, the mass balance is lower than usual. This is attributed to analytical error in the determination of the oil content of the feed and/or the oil in triethylamine. The amount of oil recovered was low due to the low feed oil content and, therefore, the recovered oil was left in a triethylamine solution. As the feed oil content decreases, analytical error becomes more pronounced.

Virtually all of the PCBs from the sample now reside in the product oil. The weight of PCB-containing material was reduced from 1500 grams to 5.2 grams corresponding to a 300-fold reduction in mass.

## WATER MASS BALANCE

The water mass balance was computed similarly to the method used for solids. The mass of water input came from the water in the feed, plus the water introduced with the caustic. The water portion of each feed was calculated by multiplying the weight of the feed by the water content as determined by analysis. The water portion of the caustic input was calculated by multiplying the weight of the 50 percent NaOH solution by half.

The mass of water recovered was equivalent to the sum of the decant water, residual water in the decant triethylamine/oil, and residual water in the subsequent extraction extracts. A summary of this data follows:

### Water Mass Balance

|                       |       |
|-----------------------|-------|
| Water Portion of Feed | 615 g |
|-----------------------|-------|

|                          |         |
|--------------------------|---------|
| Water Portion of Caustic | + 5.5 g |
|--------------------------|---------|

|                              |         |
|------------------------------|---------|
| Total calculated water input | = 620 g |
|------------------------------|---------|

.....

|                                      |       |
|--------------------------------------|-------|
| Water recovered from<br>decant water | 430 g |
|--------------------------------------|-------|

|                       |         |
|-----------------------|---------|
| Total water recovered | = 430 g |
|-----------------------|---------|

.....

|            |    |
|------------|----|
| % Recovery | 69 |
|------------|----|

The recovery of water was low. The temperature tends to increase above the triethylamine/water miscibility limit when the treated solids are centrifuged. At these conditions, some water may have exited the centrifuge with the solids. This water was lost when the solids were dried and cannot be quantified. In addition, a portion of the water in the feed was left behind in the resin kettle after decantation of the first extraction since it is not possible to decant all the solvent from the solids. This water was lost when the solids were dried. This portion of the water lost in the dryer is not accounted for in the water mass balance. (In RCC's Pilot Unit, and Full-Scale Unit, all such water is recovered from the dryer.)

## PCB MASS BALANCE

The PCB mass balance was computed similarly to the method used for oil. The mass of PCBs input was calculated by multiplying the weight of each feed by the PCB concentration as determined by analysis. The PCBs recovered from the test reside in the product oil. The PCBs in the product solids were negligible when calculating the mass balance. Experience has shown that the PCBs in the product water and recovered triethylamine are also negligible when calculating a PCB mass balance. The mass of PCBs recovered in the oil was calculated by multiplying the weight of oil recovered by the PCB concentration as determined by analysis. The PCB mass balance was as follows:

### PCB Balance

| <u>Calculated<br/>PCBs Input</u> | <u>Calculated<br/>PCBs Recovered</u> | <u>Total PCB<br/>% Recovery</u> |
|----------------------------------|--------------------------------------|---------------------------------|
| 150    mg                        | 162    mg                            | 108    %                        |

## SUMMARY OF MASS BALANCE CALCULATIONS

The following table summarizes the mass balance calculations for each of the constituents considered. The mass balances were based on the amount of the fraction recovered from the simulation divided by the calculated input amount to the simulation.

### Mass Balance Summary, %

| <u>Solids</u> | <u>Oil</u> | <u>Water</u> | <u>PCBs</u> |
|---------------|------------|--------------|-------------|
| 101           | 63         | 69           | 108         |

#### **IV. CONCLUSIONS**

The PCB-containing sediment sample from the Sheboygan River is suitable for treatment with the B.E.S.T. solvent extraction process. No problems were observed during testing of the sample.

1. The sample was chemically compatible with triethylamine.
2. The total PCB concentrations in the sample was 170 mg/kg.
3. After treatment, the PCB residual concentration was 0.73 mg/kg, which yields a PCB removal efficiency of 99.6%.
4. The treated solids readily passed the TCLP Toxicity Test for leaching of metals.
5. Virtually all of the PCBs from the sample have been concentrated into the product oil. For each sample, the weight of PCB-containing material was reduced 300 times.

\* \* \* \* \*

## APPENDIX F-9

### X TRAX THERMAL EXTRACTION BENCH-SCALE STUDY (CWM)



RESEARCH

Technical Report 92-102  
March 5, 1992

**CLIENT CONFIDENTIAL**

**X\*TRAX™**  
**LABORATORY TREATABILITY STUDY**  
**OF**  
**SEDIMENT CONTAINING PCBs**  
**FROM THE**  
**SHEBOYGAN RIVER AND HARBOR SITE**  
**IN**  
**SHEBOYGAN, WISCONSIN**

**Prepared for**  
**Blasland & Bouck Engineers, P.C.**

**Chemical Waste Management, Inc.**  
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**X•TRAX™ LABORATORY TREATABILITY STUDY OF SEDIMENT CONTAINING  
PCBs FROM THE SHEBOYGAN RIVER AND HARBOR SITE  
IN SHEBOYGAN, WISCONSIN  
March 5, 1992**

**Chemical Waste Management, Inc.  
Engineering & Technology Division  
Geneva, Illinois 60134**

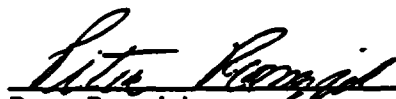
**Executive Summary**

Chemical Waste Management, Inc. (CWM) conducted a laboratory X•TRAX treatability study on sediment containing PCBs from the Sheboygan River and Harbor Site in Sheboygan, Wisconsin. This treatability study was conducted under a service agreement dated September, 1991 between Blasland & Bouck Engineers, P.C. and CWM.

The CWM X•TRAX patented process is an innovative thermal desorption technology which volatilizes organic compounds by indirectly heating the feed material in an inert atmosphere rotary dryer and condenses the organics separate from the remaining solids. CWM has laboratory, pilot and full-scale systems of the process. This treatability study was conducted with the laboratory scale system at CWM's Research Facility in Geneva, Illinois.

At the time of this study, the volume of sediments to be treated and the cleanup goal were not established. The residual PCB level in the treated sediment was less than 6 ppm at both test conditions. Cost estimates for processing the soil in the full-scale X•TRAX Model 200 system at several moisture content levels is presented in this report.

The laboratory treatability study was conducted by Peter Romzick and Sam Bailey and supervised by Carl Swanstrom. This report was written by Peter Romzick.

  
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**1. INTRODUCTION**

This X\*TRAX laboratory treatability study was performed under a contract between Blasland & Bouck Engineers, P.C. (B&B), 6723 Towpath Road, Box 66, Syracuse, New York, 13214, (315) 446-9120, and Chemical Waste Management, Inc., 1950 South Batavia Avenue, Geneva, Illinois, 60134, (708) 513-4309, dated September, 1991. The client's contact is Mr. J.P. (Paul) Doody; Mr. Peter Romzick, Project Manager, is the CWM contact.

The contract consisted of a treatability study on one sediment sample from the Sheboygan River and Harbor Site, Sheboygan, Wisconsin. The contaminant of concern is PCBs. The first sample received at the CWM Geneva Research Center (GRC) was submitted for analysis. The total PCB concentration of 13 ppm was much lower than the expected concentration of 200 ppm. B&B elected to submit an alternate sample for the study and not process the first sample. After receipt, the second sample was submitted for analysis at CWM's contracted laboratory and a split sample was sent to B&B's contracted laboratory. This second sample had a PCB concentration of 191 ppm and was approved by B&B for processing through the laboratory X\*TRAX unit. This report summarizes the results-of the study.

The primary objective of the laboratory X\*TRAX treatability study was to determine the minimum residual PCB level for the sample treated.

The X\*TRAX treatability run was completed by Peter Romzick and Sam Bailey, and the report prepared by Peter Romzick, under the supervision of Carl Swanstrom. The results of the run are presented in this report.

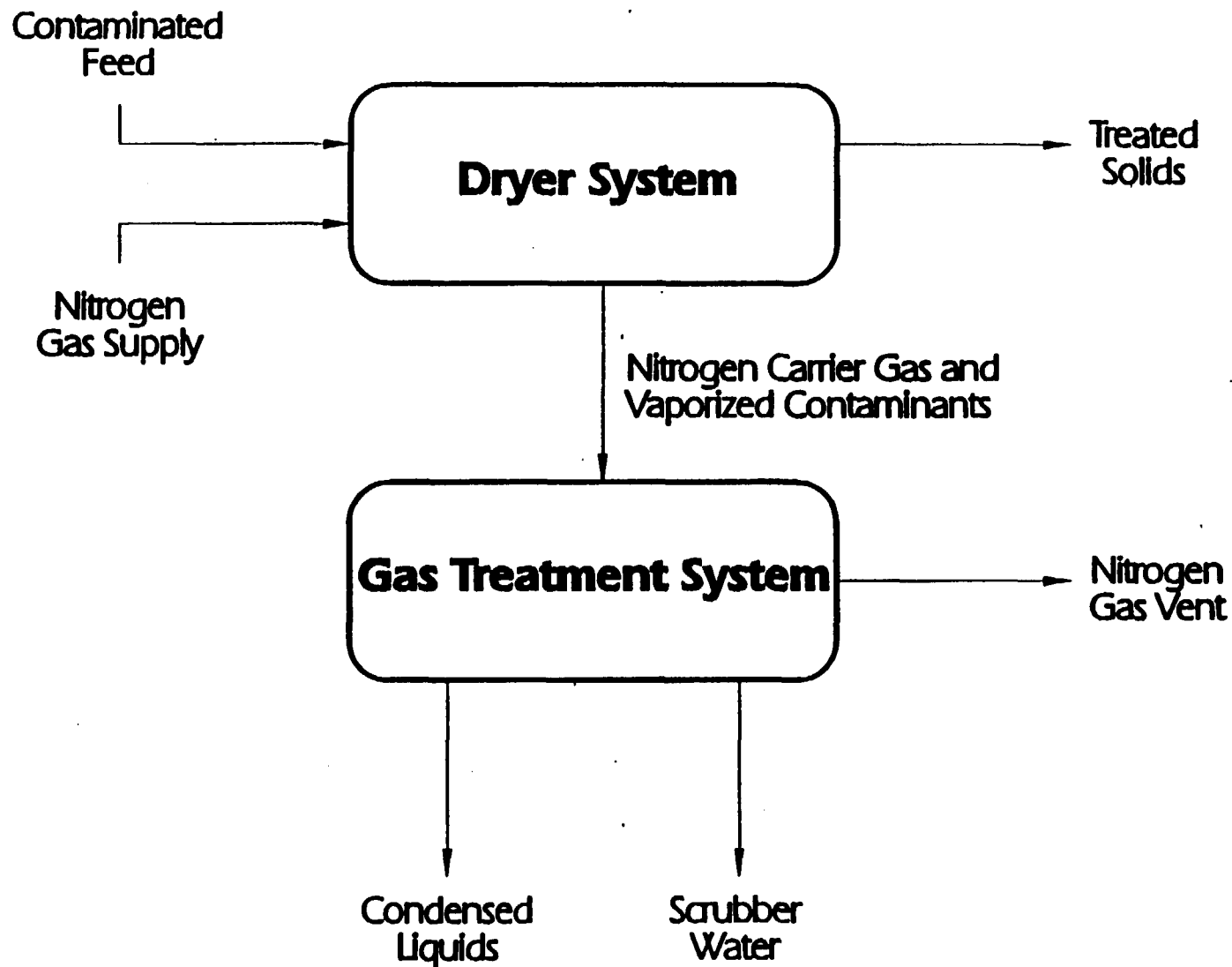
## **2. DESCRIPTION OF THE LABORATORY SCALE X\*TRAX UNIT**

X\*TRAX treatment is a low temperature separation process that evaporates or volatilizes organic contaminants from soils, sludges, and other types of solid substances or wastes. It operates by heating the contaminated material as high as 850°F in a nitrogen atmosphere with an externally heated rotary dryer. The nitrogen serves as an inert carrier for the volatilized organics, transporting them to the gas-treatment system, which consists of scrubbing and condensing train followed by activated carbon adsorption beds.

### **2.1 The Rotary Dryer System**

The function of the laboratory unit is to provide a preliminary assessment of X\*TRAX capability for treating contaminated wastes. The laboratory rotary dryer is a 12 kilowatt, electrically heated furnace with a maximum temperature capability of 1470°F. The steel dryer cylinder has a 48 inch heated section and an inner diameter of 4.0 inches. This configuration is designed to simulate the performance of the Pilot and Full Scale X\*TRAX dryers. Data from the pilot scale system confirms the similarity in performance. Data from the full scale system will be available in mid-1992. The laboratory unit can process up to four pounds of feed per hour (30 grams/minute) depending on the moisture content of the feed and the residence time desired.

A block flow diagram illustrating the process is shown in Figure 2-1 and a process flow diagram in Figure 2-2. The contaminated material is fed into the dryer with a screw feeder. The cylinder outer shell is heated as high as 900°F depending on the type of material being treated. The nitrogen carrier gas is preheated up to 600°F and introduced cocurrently to the solid feed. Treated material exits the dryer cylinder and collects in a product hopper which is routinely emptied. Volatilized contaminants and water vapor are transported with the carrier gas to the gas treatment system. Depending on the particle size distribution of the feed, 0.5-4% solids (wet feed basis) are entrained in the gas stream and swept into the gas treatment system in the laboratory unit. Entrainment in the Pilot and Full scale units is about the same.



**Figure 2-1. Block Flow Diagram of the Laboratory X\*TRAX Unit**



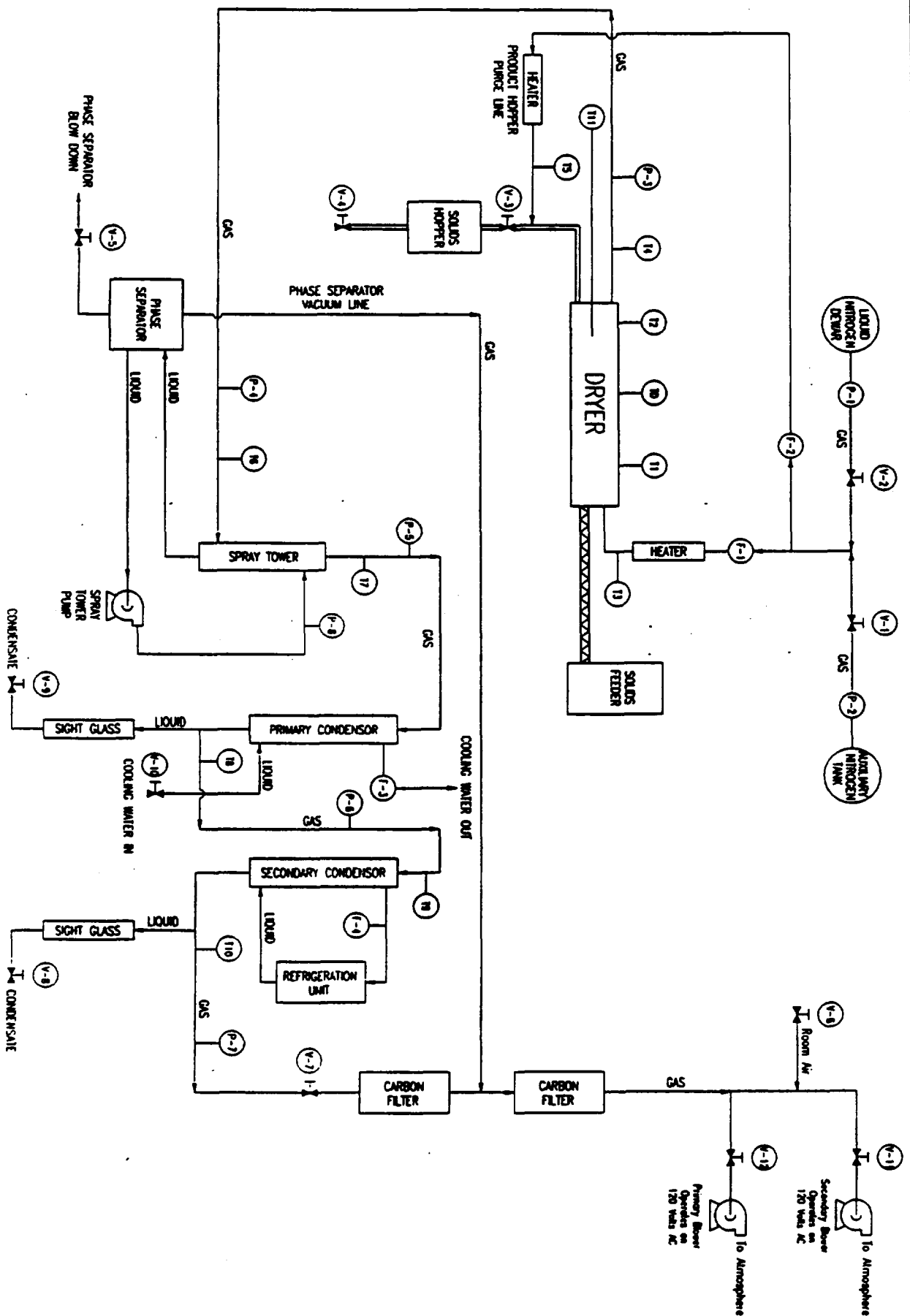


Figure 2-2. Process Flow Diagram of the Laboratory X\*TRAX Unit



### Key to Figure 2-2

- T1 thermocouple in zone 1 of dryer
- TD thermocouple in zone 2 of dryer, sensing element for controller
- T2 thermocouple in zone 3 of dryer
- T3 thermocouple at exit position of nitrogen gas heater
- T4 thermocouple at exit position of nitrogen gas from dryer
- T5 thermocouple at exit position of nitrogen gas heater for product hopper purge
- T6 thermocouple at entrance of gas to spray tower
- T7 thermocouple at exit of gas to spray tower
- T8 thermocouple at exit of primary condenser
- T9 thermocouple at entrance of secondary condenser
- T10 thermocouple at exit of secondary condenser
- T11 thermocouple immersed in product solids bed within dryer cylinder
  
- P-1 pressure regulator for liquid nitrogen dewar
- P-2 pressure regulator for auxiliary nitrogen tank
- P-3 pressure gauge at gas exit from dryer
- P-4 pressure gauge at gas entrance to spray tower
- P-5 pressure gauge at gas exit from spray tower
- P-6 pressure gauge at gas entrance to secondary condenser
- P-7 pressure gauge at gas exit from secondary condenser
- P-8 pressure gauge at liquid entrance to spray nozzle in spray tower
  
- F-1 flow meter for main nitrogen flow into dryer
- F-2 flow meter for nitrogen purge line into product hopper
- F-3 flow meter for cooling water in primary condenser
- F-4 flow meter for water-ethylene glycol mixture in secondary condenser
  
- V-1 ball valve for positive shutoff of auxiliary nitrogen tank
- V-2 ball valve for positive shutoff of liquid nitrogen dewar
- V-3 butterfly valve for isolating system from atmosphere during product sample collection
- V-4 butterfly valve for discharging product solids
- V-5 ball valve for emptying phase separator drum during sample collection
- V-6 ball valve for bleeding air into exhaust line to reduce vacuum level
- V-7 butterfly valve for throttling nitrogen gas flow
- V-8 ball valve for emptying condensate trap
- V-9 ball valve for emptying condensate trap
- V-10 globe valve for metering flow rate of cooling water for primary condenser
- V-11 ball valve for positive shutoff of backup blower
- V-12 ball valve for positive shutoff of primary blower

## **2.2 The Gas Treatment System**

The contaminated carrier gas exits the dryer and enters a spray scrubber that removes virtually all of the particulate material and some of the less volatile organic compounds. The gas stream exits the scrubber at approximately 120°F and is essentially saturated with water vapor. Next the gas enters a water-cooled shell-and-tube heat exchanger and is cooled to about 10°F above ambient temperature. Tap water is the cooling side fluid. A significant fraction of the water vapor is condensed out as well as organic compounds of intermediate volatility. The third and final stage of the condensing train is a shell-and-tube heat exchanger cooled with a refrigerated 50/50 glycol/water mixture at 32°F. Here the carrier gas is cooled to approximately 40°F and most of the remaining condensable components are removed. The gas stream then passes through two activated carbon adsorption drums in series and is vented to the atmosphere. The vented gas stream is approximately 95-97% nitrogen, 0-4% oxygen with water, and a trace of volatile organic compounds making up the balance. Unlike the laboratory unit, the Pilot and Full Scale (Model 200) X•TRAX units reheat and recycle the cooled nitrogen.

## **2.3 The Fate of Treatment Residuals**

The liquid from the spray scrubber drains to a phase separation tank where water, immiscible organics, and solids are gravity-separated. The water is recycled back to the spray tower continuously. Condensates from the primary and secondary condensers are collected in traps which are drained at regular intervals. When the run is complete, the contents of the phase separation tank is filtered and any solids are collected. Samples of the treated solids, phase separator water, phase separator oil, phase separator filtered solids (filter cake), condensed water, and condensed oil are retained for chemical analyses when available. Phase separator oil and condensate oil are typically not recoverable unless the feed material has a significant oil content. The remaining products and residuals are properly packaged for disposal or returned to the client depending on the clients requirements. All solids and liquids are weighed for material balance purposes.

### **3. STANDARD PROCEDURE FOR TREATABILITY STUDIES**

There is a standard procedure for conducting X•TRAX treatability studies. The procedure begins with the issuance of an R&D Sample Authorization Number which facilitates tracking. A R&D sample authorization number must be assigned before sample shipment to CWM R&D. Any sample shipped to CWM R&D without a sample authorization number will not be accepted. The received sample is weighed and logged in at the sample receiving area. Feed preparation, process operation, sampling of feed and product streams, system decontamination, and disposal of residuals are discussed below.

#### **3.1 Feed Preparation**

The treatability sample size requested is usually 10 gallons (two five-gallon pails). Sample quantities in excess of that requested is immediately returned to the client. Chain-of-custody documents must accompany all samples. Upon receipt the sample is sieved through a ¼ inch screen to remove oversize solids that might damage the screw feeder of the laboratory unit. The weights of the screened and oversize fractions are recorded as well as visual observations of the treatability sample. The screened portion is sealed in five-gallon polypropylene pails with gasketed lids. The required amount of feed material (usually one five-gallon pail) is stored at 4°C, any excess feed is stored at room temperature. The oversize pieces are similarly sealed and stored at room temperature.

After the feed is screened, the screened portion is homogenized by hand mixing. Wet cohesive type soils (clays) are more difficult to homogenize than drier, non-cohesive type soils and may affect the resulting homogeneity. After mixing, a sample is withdrawn for physical and chemical analyses. If the material is difficult to homogenize, the smaller analytical sample is also homogenized to provide a sample of consistent quality to the laboratory. The sample is identified as the preliminary feed and is assigned a sample ID suffix of -01 (Example: CWM-01).

The analyses requested depends on the specific nature of the sample, prior analytical information for the waste, source site history, particular client requests, and the principle contaminants of concern.

The screened sample is not run through the laboratory X\*TRAX unit until sufficient analytical information is available. This assures that the sample contains the contaminants of concern, allows the identification of extraordinary health and safety requirements, and assures the appropriate operating conditions are selected.

### **3.2 Process Operation**

The feed material is removed from refrigerated storage 24 hours before a treatability study to allow the feed to reach room temperature. The rotary dryer is heated to 400°F 12 hours prior to the start of the run. Process startup begins by charging the phase separator with an initial charge of weighed water, ramping the furnace temperature setpoint up from 400°F to the first temperature setting for the treatability study, starting cooling side flow to the condensers, and starting the spray scrubber. Next, the gas stream exhaust blowers are turned on and the nitrogen gas is heated and sent into the rotary dryer. A weighed quantity of feed is added to the feed hopper and the screw feeder is adjusted to provide a preselected feed rate. Once the furnace shell temperature reaches the setpoint, the feeder is turned on.

Once feed is introduced into the dryer, final product (treated solid) and condensate collection begins after approximately 1.5 residence times. This allows the entire system to reach a steady state condition. The condensates collected from the primary and secondary condensers are individually weighed then combined. Any solid product or condensate collected before the steady state condition is held separately and considered scrap. All solid product and condensate collected, including scrap, is weighed for material balance purposes.

After an adequate amount of product and condensate is collected, the dryer temperature setpoint is changed to evaluate the next temperature condition if more than one temperature condition is being evaluated. When the new temperature

setpoint is reached, another 1.5 residence times are allowed to elapse to assure the solid product is representative of the new steady state condition.

For the time period between the temperature setpoint change and the end of the 1.5 residence times, all solid product collected is set aside as scrap but the condensates are collected and combined with the previously saved condensates. The condensates collected during both the steady and non-steady-state periods between temperature setpoint changes are combined in order to provide a sufficient quantity for analysis.

After an adequate amount of solid product and condensate is collected for the last temperature condition, the feeder is shut off and any further solid product is considered scrap and any additional condensate is recycled into the phase separator. The remaining system operations are continued until the dryer is emptied. Then the furnace heat, nitrogen feed, blower, heat exchangers, and spray tower are shut down. The dryer cylinder is allowed to rotate for several hours until it cools to 200°F.

During the steady state portions of the run, system pressures and gas flow rates are noted. Temperatures are monitored throughout the run in half hour intervals. Solid product and condensates are collected and weighed every fifteen minutes. A careful accounting of all solids and liquids added to and collected from the unit is recorded for mass balance calculations.

### **3.3 Sampling of Feed and Product Streams**

Feed samples are usually withdrawn in equal increments from the feed hopper at least once per hour starting at the beginning of the first steady state condition and continuing to the end of the last steady state condition. The quantity removed each time is weighed and recorded. The feed sample is identified as the run feed and given the sample ID suffix -02 (i.e. CWM-02).

The solid products generated from each steady state test condition are stored in separate clean containers. The containers are kept closed between material additions to minimize exposure to the room air and minimize adsorption of moisture and

organics from the air. The contents of each jar are mixed well, typically by tumbling and mixing with a spatula or scoop, prior to withdrawing samples for analytical purposes. Solid product samples are identified as product and given the sample ID suffices -03,-04 and -05 depending on the number of steady state conditions evaluated (i.e. CWM-03, CWM-04 and CWM-05).

The composited condensates are filtered through Whatman 54 filter paper (nominal 25-micron retention), mixed well, then poured into a separatory funnel from which samples are drawn for chemical analyses. This liquid is identified as condensed water and given the sample ID suffix -06 (i.e. CWM-06).

The liquid from the phase separator is weighed, filtered through Whatman 54 filter paper, mixed well, and drawn from a separatory funnel into sample bottles for chemical analyses. This sample is identified as phase separator water and given the sample ID suffix -07 (i.e. CWM-07). The solids (filter cake) are weighed and if enough filter cake is retained by the filter paper, it is also analyzed. This sample is identified as phase separator filter cake and given the sample ID suffix -08 (i.e. CWM-08). The filtering procedure is intended to simulate full scale field operations. Both the pilot and full scale systems use a filter press to dewater the phase separator solids. Previous testing on the pilot and full scale systems has shown the laboratory filtering procedure results to be similar to the pilot and full scale system filter press systems.

In the event an oil layer is present in the phase separator liquid or condensate it is removed prior to filtration if possible. Any oil recovered is weighed, recorded and sent for analysis if a sufficient quantity is recovered. Oil removed from the phase separator is identified as phase separator oil and given the sample ID suffix -11 (i.e. CWM-11). Oil recovered from the condensate is identified as condensed oil and given the sample ID suffix -10 (i.e. CWM-10).

Solid material may collect in the carryover pipe between the dryer outlet and the gas handling system. If recovered, this material is weighed and sent for analysis if enough

is recovered. This material is identified as carryover holdup and given the sample ID suffix -09 (i.e. CWM-09).

### **3.4 System Decontamination and Disposal of Residuals**

The product hopper is cleaned by dry brushing after the system has cooled. The residual product collected from the product hopper is weighed and placed with the other scrap product material.

The gas handling system is disassembled, and each component is washed with a laboratory detergent and scrub brush. The washed components are then rinsed with tap water twice. The wash water and water from the first rinse are combined and labeled as waste water that is disposed as a hazardous waste.

All solid product, feed, and scrap is packaged, labeled, and weighed for inventory and mass balance purposes. The fate of the solid material depends on the needs of the client. It is either returned to the client or disposed of as hazardous waste. All remaining liquids are packaged properly and disposed of as a hazardous waste. All decontamination and disposal activities are conducted in a manner consistent with all relevant federal, state, and local regulations governing hazardous waste at the Geneva Research Center (GRC) facility.

## **4. DESCRIPTION OF THE SHEBOYGAN RIVER AND HARBOR SITE TREATABILITY STUDY**

A description of the treatability study is given below. The description includes a discussion of sample preparation, deviation from the standard treatability study procedure, a chronology of significant events during the test, sample collection, and sample analysis.

### **4.1 Feed Preparation and Description**

The two soil samples, each contained in two 5-gallon plastic buckets, were received at the GRC on September 24, 1991 and October 29, 1991 under sample Authorization Number 714. Upon receipt, each sample was logged in. The second

sample was sent to CWM because the PCB concentration in the first sample was much lower than expected. The individual samples were screened through a 1/4" screen to remove oversize material which might damage the laboratory unit screw feeder. During the screening process a representative sample of each material was collected and submitted for physical and chemical analyses. A split sample of the second sample received (B&B ID: CTF-4) was submitted to Blasland & Bouck's laboratory, Hazleton Lab, 3301 Kinsman Boulevard, P.O. Box 7545, Madison, Wisconsin, 53707, attention Tod Noltemeyer, the sample was identified as XTRAX1. Table 4-1 shows the sample receipt dates, screening dates and run dates. Table 4-2 summarizes the feed sample preparation information.

**Table 4-1. Treatability Study Screening and Run Dates**

| <b>B&amp;B<br/>Sample ID</b> | <b>CWM ID<br/>Prefix</b> | <b>Receipt<br/>Date</b> | <b>Screening<br/>Date</b> | <b>Run Date</b> | <b>R&amp;D Sample<br/>No.</b> |
|------------------------------|--------------------------|-------------------------|---------------------------|-----------------|-------------------------------|
| <b>BS-2</b>                  | <b>BB</b>                | <b>9/24/91</b>          | <b>9/30/91</b>            | <b>Not Run</b>  | <b>91-0282</b>                |
| <b>CTF-4</b>                 | <b>BB2</b>               | <b>10/29/91</b>         | <b>10/29/91</b>           | <b>11/22/91</b> | <b>91-0310</b>                |

**Table 4-2. Summary of Feed Preparation and Material Descriptions**

| <b>As-Received Sample No.</b> | <b>CWM Assigned Sample ID</b> | <b>As-Received Gross Wt. (kg)</b> | <b>As-Received Net Wt. (kg)</b> | <b>Date Sample Screened (1)</b> | <b>Oversize &gt; 1/4" Net Wt. (kg)</b> | <b>Percent Oversize (%)</b> | <b>Feed Physical Description</b>                                                                                                                        | <b>Oversize Description</b>                                                                                                                    |
|-------------------------------|-------------------------------|-----------------------------------|---------------------------------|---------------------------------|----------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| BS-2                          | BB-01                         | 38.65                             | 34.137                          | 9/30/91                         | 0.821                                  | 2.4                         | Gray/brown colored sediments with a odor of decaying material. Approx. 1 inch of standing water on top of each bucket was mixed into sample.            | Primarily small twigs 1/8" in diameter and approx. 2 inches long. Some small rocks approx. 3/8 inch in diameter.                               |
| CTF-4                         | BB2-01                        | 69.70                             | 66.65                           | 10/29/91                        | 8.651                                  | 13.0                        | Brown sludge/sediments with odor of decaying materials. Contained white mushrooms approximately 1 inch in diameter, these were broken up on the screen. | Mostly sticks up to 2 inches in length. Some small rocks and a few over 2 inches in diameter. One rock was approximately 4 inches in diameter. |

**Notes:**

(1) Samples received at Geneva Research Center on 9/24/91 and 10/29/91.

#### 4.2 Test Execution

The treatability study was completed on the second sample, CWM prefix ID BB2, on November 22, 1991. A treatability study was not conducted on the first sample, CWM prefix ID BB, because of the low PCB concentration. The run was conducted at two steady state temperature conditions defined by the dryer shell Zone 2 temperature setpoints 900F and 750F and a solids residence time of 85 minutes. Table 4-3 summarizes the treatability study feed quantity used and the average feed rate.

Table 4-3. Treatability Study Feed Operations Summary

| As-Received Sample No. | CWM Run Feed Sample ID | Run Date | Total Run Feed to System (kg) | Total Feed Time (hr) | Average Feed Rate (g/min) |
|------------------------|------------------------|----------|-------------------------------|----------------------|---------------------------|
| CTF-4                  | BB2-02                 | 11/22/91 | 5.983                         | 10.27                | 9.7                       |

Table 4-4 summarizes the chronology of the treatability study run.

**Table 4-4. Chronology of Sheboygan River and Harbor Site Treatability Study**  
Run Date: November 22, 1991

| Time       | Treatability Study Activity                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 05:45      | Arrive at lab. Furnace was at 900F all night and product breech strip heaters were also up to temperature. This varied from the non-standard procedure of heating the furnace to only 400°F 12 hours before the run and not turning on the breech heating until the end of the run. Both of these non-standard procedures were conducted in an effort to help bring the dryer system to an equilibrium temperature condition more quickly on the day of the run. |
| 06:00      | Add run water to the phase separator/spray tower system after flushing and draining the phase separator/spray tower system two times.                                                                                                                                                                                                                                                                                                                            |
| 06:01-6:03 | Turned on spray tower pump, coolant flows to HX01 and HX02, blower, charger, and nitrogen flow and heaters.                                                                                                                                                                                                                                                                                                                                                      |
| 06:57      | Started feeder at setting of 200 using the medium size screw.                                                                                                                                                                                                                                                                                                                                                                                                    |
| 09:30      | HX02 condensate has a blue tint, HX01 condensate has a yellow tint. The yellow tint was present from the start of the run, the blue tint just became noticeable.                                                                                                                                                                                                                                                                                                 |
| 09:45      | pH of HX02 condensate = 10, pH of HX01 condensate = 9.                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10:00      | Began collecting solid product for first steady state condition (Product 1, sample ID BB2-03), began collecting product condensate.                                                                                                                                                                                                                                                                                                                              |
| 10:01      | Observations: Noticed dark ring forming on the inside of HX01 sample cup. Spray tower sight glass looks clean. Phase separator has no foam, fluid is dark.                                                                                                                                                                                                                                                                                                       |
| 11:30      | Noticed one streak on the inside of each sight glass for the HX01 and HX02 traps.                                                                                                                                                                                                                                                                                                                                                                                |
| 12:00      | Ended Product 1 collection with a 5 minute snap shot (sample ID BB2-03A) representing the period 11:55 to 12:00, continued collecting product condensate.                                                                                                                                                                                                                                                                                                        |
| 12:01      | Reduced furnace Zone 2 setpoint to 750°F.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13:01      | Furnace Zone 2 reaches 750°F.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 15:30      | Began collecting solid product for second steady state condition (Product 2, sample ID BB2-04), continued collecting product condensate.                                                                                                                                                                                                                                                                                                                         |
| 15:50      | Noticed that the entire HX01 trap sight glass is tinted. The HX01 sight glass has only the streak observed earlier.                                                                                                                                                                                                                                                                                                                                              |
| 17:13      | Turned off feeder, continued collecting Product 2 and product condensate.                                                                                                                                                                                                                                                                                                                                                                                        |
| 17:15      | Ended Product 2 collection, ended condensate product collection.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 17:42      | Set furnace Zone 2 setpoint to 0°F.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 17:44      | Turned off product breech strip heaters and N2 gas heaters.                                                                                                                                                                                                                                                                                                                                                                                                      |
| 17:56      | Shut off N2 flow, charger, blower, coolant flows to HX01 and HX02, and spray tower pump. Continued to rotate furnace for several hours until cooled to less than 200°F.                                                                                                                                                                                                                                                                                          |
| 18:06      | Drain phase separator/spray tower system.                                                                                                                                                                                                                                                                                                                                                                                                                        |

#### **4.3 Sample Collection and Analysis**

Feed, solid product and liquid samples were collected using the standard procedures described in Section 3.

There was no oil layer noticeable in the phase separator water or the condensate for the run. A small oil film was noticed on the inside of the HX01 condensate collection cup.

The physical and chemical analyses requested for this treatability study are shown in Table 4-5.

Split samples of the treated products were sent to B&B's contracted laboratory. The samples sent were identified as XTRAX3 and XTRAX4 for Product 1 (BB2-03) and Product 2 (BB2-04), respectively.

**Table 4-5. Sampling and Analytical Requirements for the  
Sheboygan River and Harbor Treatability Study**

| Sample | Description                                               | VOC | SVOC | pH | Moist | Ash | O&G | TPH | PCB | PCB(CLP)         | TDS | TSS | TCLP | TM |
|--------|-----------------------------------------------------------|-----|------|----|-------|-----|-----|-----|-----|------------------|-----|-----|------|----|
| BS-01  | Preliminary sample of BS-2 taken during feed preparation  | Y   | Y    | Y  | Y     | Y   | Y   | Y   | Y   |                  | -   | -   | Y    | Y  |
| BS2-01 | Preliminary sample of CTF-4 taken during feed preparation | Y   | Y    | Y  | Y     | Y   | Y   | Y   | -   | Y                | -   | -   | Y    | Y  |
| BS2-02 | Run Feed                                                  | Y   | Y    | Y  | Y     | Y   | Y   | Y   | -   | Y                | -   | -   | Y    | Y  |
| BS2-03 | Solid Product from Condition 1                            | Y   | Y    | Y  | Y     | Y   | Y   | Y   | -   | Y <sup>(1)</sup> | -   | -   | Y    | Y  |
| BS2-04 | Solid Product from Condition 2                            | Y   | Y    | Y  | Y     | Y   | Y   | Y   | -   | Y <sup>(1)</sup> | -   | -   | Y    | Y  |
| BS2-06 | Combined condensed water from Conditions 1 and 2          | Y   | Y    | Y  | -     | -   | Y   | Y   | -   | Y                | Y   | Y   | -    | -  |
| BS2-07 | Phase separator water                                     | Y   | Y    | Y  | -     | -   | Y   | Y   | -   | Y                | Y   | Y   | -    | -  |
| BS2-08 | Phase separator filter cake                               | Y   | Y    | Y  | Y     | Y   | Y   | Y   | -   | Y                | -   | -   | -    | -  |
| BS2-09 | Carryover holdup                                          | -   | -    | Y  | Y     | Y   | Y   | Y   | -   | -                | -   | -   | -    | -  |

**Legend:**

- Y = test requested
- = test not requested
- VOC = volatile organic compounds: Method SW846
- SVOC = semi-volatile organic compounds: Method SW846-8270
- pH = solution pH: Method SW846-9045 (solid) or EPA 150.1 (water)
- Moist = moisture = % sample weight loss @ 105°C
- Ash = ash content: Method ASTM D-482
- O&G (IR) = oil and grease: Method EPA 413.2 equivalent (IR)
- TPH (IR) = total petroleum hydrocarbons: Method 503E with infrared spectroscopy
- PCB = PCB scan: Method SW846-8080
- PCB(CLP) = PCB scan: CLP technology
- TDS = total dissolved solids: Method EPA 160.1
- TSS = total suspended solids: Method EPA 160.2
- TS = total solids: Method EPA 160.3
- O&G = oil & grease: Method EPA 413.2
- TPH = total petroleum hydrocarbons: Method EPA 418.1
- TM = total metals

**Notes:**

- <sup>(1)</sup> A complete CLP data package for these PCB analyses were requested.

## **5. DISCUSSION OF TREATABILITY STUDY RESULTS**

The laboratory X-TRAX treatability study on the Sheboygan River and Harbor Site sample was completed as planned without any major problems occurring. The treatability results are presented in this section.

### **5.1 Operating Data Summary**

The laboratory unit was operated at two steady state conditions defined by the dryer Zone 2 outside shell temperature and solids residence time:

Condition 1 = 900°F/85 min.

Condition 2 = 750°F/85 min.

A summary of the operating conditions is shown in Table 5-1.

**Table 5-1. Operating Conditions Summary for the Sheboygan River and Harbor Site Treatability Study**

| Sample ID | Cond. No. | Avg. Prod. Rate (g/min) | Avg. Prod. Loose Density (g/cc) | Dryer Fill Volume (1) (%) | Residence Time (min) | Temperatures (°F) <sup>(2)</sup> |        |        |               |                       |                        | Sample Collection Length (min) |
|-----------|-----------|-------------------------|---------------------------------|---------------------------|----------------------|----------------------------------|--------|--------|---------------|-----------------------|------------------------|--------------------------------|
|           |           |                         |                                 |                           |                      | Zone 1                           | Zone 2 | Zone 3 | Solid Product | N <sub>2</sub> Gas In | N <sub>2</sub> Gas Out |                                |
| BB2       | 1         | 7.2                     | 1.26                            | 2.9                       | 85                   | 850                              | 900    | 930    | 843           | 607                   | 540                    | 135                            |
|           | 2         | 6.4                     | 1.26                            | 2.6                       | 85                   | 710                              | 750    | 773    | 694           | 597                   | 514                    | 135                            |

**Notes:**

- (1) Fill Volume = percentage of dryer cylinder cross section filled with solids.
- (2) Zones 1, 2 and 3 are progressive zones through the heated section of the dryer cylinder between the feed and product discharge ends of the dryer.

The solids residence time and fill volume are calculated from the following equations presented in Chapter 20 of the Chemical Engineer's Handbook (Perry, 1973):

$$\tau = \frac{0.23L}{DN^{0.9}\tan\theta}$$

$$f = \frac{m_p \tau 100}{\rho_p V_D}$$

Where:

$\tau$  = Solids residence time in dryer, minutes

$L$  = Dryer cylinder length, feet

$D$  = Dryer inside diameter, feet

$N$  = Cylinder rotational speed, revolution per minute

$\theta$  = Cylinder slope, degrees

$f$  = Fill volume, percent

$m_p$  = Product mass flow rate, grams per min

$\rho_p$  = Product bulk density, grams per cubic centimeter

$V_D$  = Dryer cylinder volume, cubic centimeters

## 5.2 Process Component and Overall Mass Balances

The component mass balances for solids, water, PCBs, oil and grease, and nitrogen are shown in Figure 5-1. The overall mass balance is shown in Figure 5-2.

For the mass balances, the following component definitions apply:

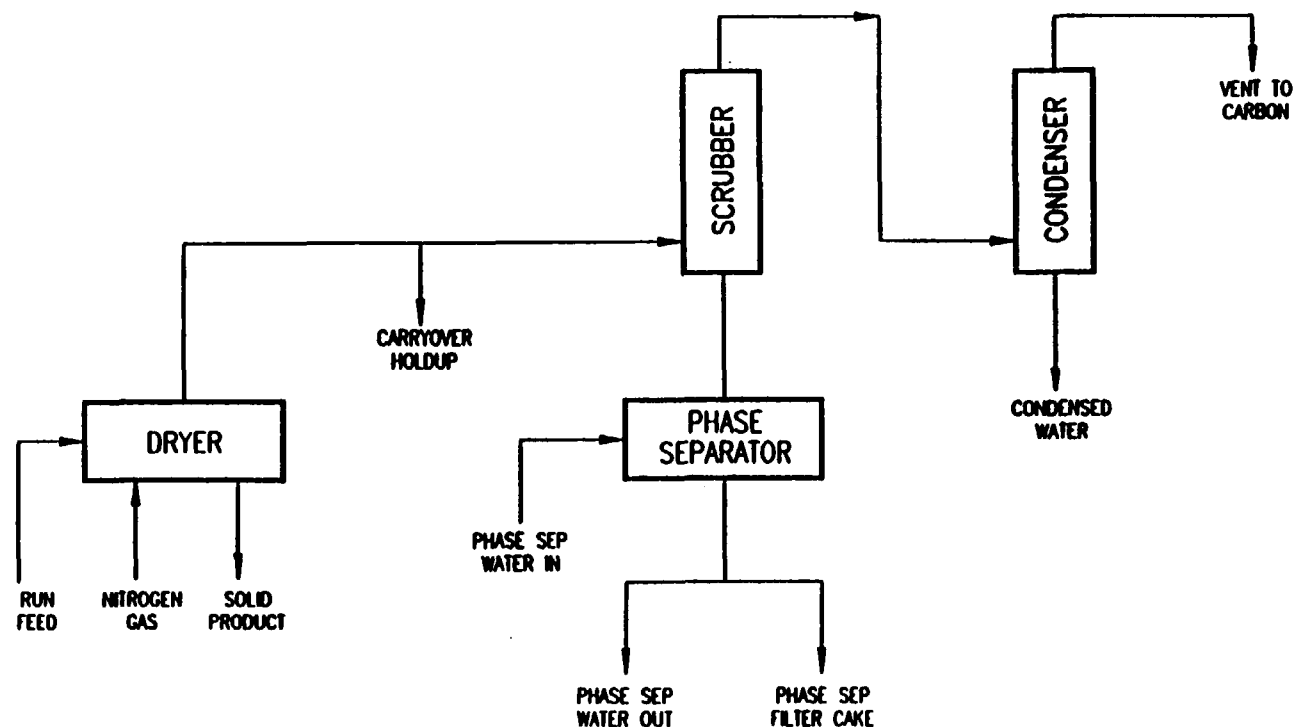
|                        |                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Solids:</b>         | The fraction of the material remaining after heating at 105°C.                                                        |
| <b>Water:</b>          | Sample weight loss at 105°C; may include organics of higher volatility. Moisture and water are considered synonymous. |
| <b>Oil and Grease:</b> | Oil and grease analyses, or actual liquid oil recovered.                                                              |
| <b>Nitrogen:</b>       | Nitrogen gas, assumed to be inert.                                                                                    |

The mass balance is based on the total time that solids are fed to and discharged from the system. Thus the unsteady portions of operation - start-up, shutdown, and transitions to new steady state conditions - are included in the mass balance. All solid product recovered is assumed to be the average of the product samples analyzed for the particular run. Contaminant concentrations are measured in the solid and liquid streams only. Analysis of the contaminants in the gas stream was not within the scope of this project. Sampling and analysis of the vent gas stream does not provide data that can be correlated to the pilot or full scale systems. Unlike the laboratory unit, the pilot and full scale X-TRAX units reheat and recycle the cooled nitrogen and a small amount of the nitrogen is vented to the atmosphere after being analyzed to assure compliance with permit conditions. Permit conditions will vary from site to site. The quantity of water in the laboratory scale vent gas is calculated assuming the vent stream is saturated with water at 40°F.

The component recovery calculations are based on the mass of the component measured in the untreated run feed material.

The component recoveries for the treatability study runs are summarized in Table 5-2. The overall mass recovery for each run is tabulated in Table 5-3.

Figure 5-1: Sheboygan River and Harbor Site X\*TRAX Treatability Study  
Component Mass Balances



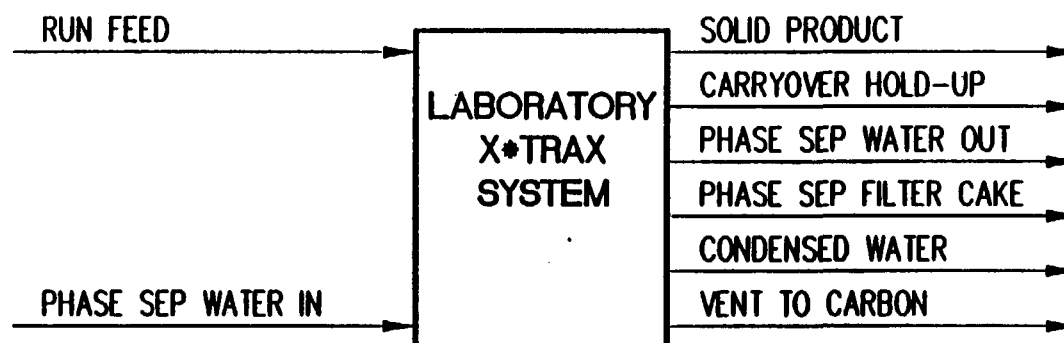
| COMPONENT DESCRIPTION |     | RUN FEED | NITROGEN GAS | SOLID PRODUCT  | CARRYOVER HOLDUP | PHASE SEP WATER IN | PHASE SEP WATER OUT | PHASE SEP FILTER CAKE | CONDENSED WATER | CALCULATED VENT LOSS <sup>(1)</sup> | QUANTITY NOT RECOVERED <sup>(3)</sup> | % RECOVERY <sup>(2)</sup> |
|-----------------------|-----|----------|--------------|----------------|------------------|--------------------|---------------------|-----------------------|-----------------|-------------------------------------|---------------------------------------|---------------------------|
| SAMPLE ID             |     | BB2-02   | N/A          | BB2-03 AND -04 | BB2-09           | N/A                | BB2-07              | BB2-08                | BB2-06          | N/A                                 | N/A                                   | N/A                       |
| Solids                | (g) | 4,667    | 0            | 3,987          | 71               | 0                  | 0                   | 109                   | 0               | 0                                   | 499                                   | 89.3                      |
| Water                 | (g) | 1,316    | 0            | 0              | 9                | 16,545             | 11,568              | 85                    | 5,799           | 280                                 | 121                                   | 90.8                      |
| PCB                   | (g) | 0.60     | 0            | 0.022          | 0.002            | 0                  | 0                   | 0.007                 | 0               | 0                                   | 0.57                                  | 5.2                       |
| O&G                   | (g) | 1.9      | 0            | 0.82           | 0.019            | 0                  | 0.012               | 0.058                 | 0.016           | 0                                   | 0.99                                  | 48.9                      |
| Nitrogen              | (g) | 0        | 56,000       | 0              | 0                | 0                  | 0                   | 0                     | 0               | 56,000                              | -                                     | -                         |

(1) Vent loss water based on air absolute humidity at 40F = 0.005 g water per gram nitrogen (air assumed equal to nitrogen).  
Nitrogen quantity based on entire period of nitrogen flow to the system = 11.9 hours.

(2) The water recovery is based on the water entering the system with the run feed, it excludes the phase separator water.

(3) This column shows the quantity of material not recycled for in the mass balance.

Figure 5-2: Sheboygan River and Harbor Site X\*TRAX  
Treatability Study Overall Mass Balance



| TOTAL MASS IN<br>(g) | TOTAL MASS OUT<br>(g) | RECOVERY<br>% |
|----------------------|-----------------------|---------------|
| 22,528               | 21,908                | 97.2          |

NOTE: THE OVERALL MASS BALANCE EXCLUDES THE NITROGEN ADDED TO THE SYSTEM

**Table 5-2: Component Recoveries for the Sheboygan River and Harbor Site Treatability Study**

| Study Prefix | Component      | Total Mass In (g) | Total Mass Out (g) | Recovery (%) |
|--------------|----------------|-------------------|--------------------|--------------|
| BB2          | Solids         | 4,667             | 4,167              | 89.3         |
|              | Water*         | 1,316             | 1,195              | 90.8         |
|              | PCB            | 0.60              | 0.031              | 5.2          |
|              | Oil and Grease | 1.9               | 0.93               | 48.9         |

\*The water recovery is based on the water entering the system with the run feed only, it does not include the water charged to the phase separator during the run. The phase separator water added to the system was subtracted from the mass in and out.

\*\*The Oil and Grease component is a subset of the solids and/or water components based on the definition of oil and grease given in this section. Therefore, summing the individual components will not give the total mass of the stream. The total mass of any stream is calculated by summing the solids and water components only.

**Table 5-3. Overall Mass Recoveries (Excluding Nitrogen) for the Sheboygan River and Harbor Site Treatability Study**

| Study Prefix | Total Mass In (g) | Total Mass Out (g) | % Recovery |
|--------------|-------------------|--------------------|------------|
| BB2          | 22,528            | 21,908             | 97.2       |

The solids and water recovery is excellent.

The recovery of organic based components such as oil and grease, and individual organic compounds, is usually low relative to the solid and water recoveries. This is particularly true for treatability studies with low concentration, high boiling point compounds. The organic components tend to condense and plate out on the cooler gas piping internal surfaces. Also, non-water-miscible organics coat the container walls in the collection vessels. Each treatability study only uses a small amount of feed material and the organics that plate out represent a significant fraction of the total component mass for the treatability study. The visual observations of streaks

on the site glasses shown in Table 4-4 substantiate that material was collecting on the inside of the gas system piping.

If a treatability study were to process a significantly larger quantity of feed material, the organic constituent recoveries would increase. There is a fixed amount of organic material which adheres to the piping surfaces and as more material is processed and the plating out limit is reached, the fixed quantity of the internal surfaces becomes less mathematically significant. Even if the plated organics serve as sites for more organics to plate out it is likely an equilibrium condition exists where the rate of organics plating onto the plated organics equals the rate at which the accumulated organics are released from the organic film surface. This theory is supported by the pilot scale operations data where organic component recoveries, including PCBs, are typically greater than 75 percent. The laboratory system piping must be washed after each treatability study to prevent cross contamination with the next study. In addition, it is important to remind the reader that the primary focus of the laboratory scale treatability study is on the resulting concentrations of the contaminants in the treated solid product.

### **5.3 Particulate Carryover**

Particulate carryover is the material entrained in the gas stream which reaches the scrubber. It is the total solid material recovered from the phase separator (BB2-08). The percent carryover is determined according to the following equation:

$$\% \text{ Carryover} = (\text{Mass BB2-08 solids}) / (\text{Total Mass BB2-02 feed})$$

For this study the carryover ranged was 1.8% as shown in Table 5-4. This is within the typical range of 0.5-4% for previous laboratory X-TRAX runs. Typical carryover rates for the pilot scale are less, and the full scale system is estimated to be less than the pilot scale system. The pilot and full scale systems are designed to handle particulate carryover by filter pressing the particulates from the gas scrubbing system. In the pilot and full scale systems, the filter pressed solids are typically reprocessed through the dryer.

**Table 5-4. Particulate Carryover for the Sheboygan River and Harbor Site Treatability Study**

| Run Prefix | Phase Separator Solids (BB2-08) (g) | Run Feed (BB2-02) (g) | Carryover (%) |
|------------|-------------------------------------|-----------------------|---------------|
| BB2        | 109                                 | 5,983                 | 1.8           |

#### **5.4 Analytical Results**

The complete analytical results for the Blasland & Bouck treatability study are summarized in Tables 5-5 and 5-6. The analytical results for the first treatability study sample, BB-01, are shown in Appendix B.

All PCB analyses reported in Table 5-5 were completed using CLP protocols. PCB CLP data packages for Product 1 (BB2-03) and Product 2 (BB2-04) are found in Appendix A.

**Table 5-5. Analytical Data Summary for the Sheboygan River and Harbor Site Treatability Study**

| Sample ID                   | Prelim Feed<br>BB2-01 | Run Feed<br>BB2-02 | Run Feed<br>Re-Analysis<br>BB2-02R | Prod 1<br>BB2-03 | Prod 2<br>BB2-04 | Cond<br>Water<br>BB2-06 | Phase Sep<br>Water<br>BB2-07 | Phase Sep<br>Filter Cake<br>BB2-08 | Carry-Over<br>Holdup<br>BB2-09 |
|-----------------------------|-----------------------|--------------------|------------------------------------|------------------|------------------|-------------------------|------------------------------|------------------------------------|--------------------------------|
| EMS Lab No.                 | C134250               | C134905            | C135707                            | C134906          | C134907          | C134910<br>C135634      | C134929                      | C134928                            | C134908                        |
| Moisture %                  | 36.3                  | 22.0               | x                                  | 0.0              | 0.0              | x                       | x                            | 43.7                               | 11.0                           |
| LOI (100-ash) %             | 47.3                  | 36.3               | x                                  | 14.0             | 14.7             | x                       | x                            | 54.0                               | 26.0                           |
| Susp Solids ppm             | x                     | x                  | x                                  | x                | x                | BDL(5)                  | 9                            | x                                  | x                              |
| Dis Solids ppm              | x                     | x                  | x                                  | x                | x                | 37                      | 870                          | x                                  | x                              |
| pH                          | 6.9                   | 7.9                | x                                  | 8.6              | 7.9              | 8.6                     | 8.2                          | 8.3                                | 7.7                            |
| O&G (IR) ppm                | 170                   | 320                | x                                  | 200              | 210              | 2.8                     | 0.98                         | 300                                | 240                            |
| TPH (IR) ppm                | 200                   | 330                | x                                  | 210              | 220              | 2.7                     | 1.2                          | 310                                | 300                            |
| PCB 1242 ppm                | 143                   | 43                 | 100                                | 4.8              | 3.9              | 0.0414                  | BDL(0.0005)                  | 18                                 | 12                             |
| PCB 1248 ppm                | BDL(1.0)              | BDL(1.0)           | BDL(0.4)                           | BDL(1.0)         | BDL(1.0)         | BDL(0.006)              | BDL(0.0005)                  | BDL(1.0)                           | BDL(1.0)                       |
| PCB 1254 ppm                | 42                    | 13                 | 26                                 | 1.0              | 1.4              | 0.0094                  | BDL(0.0005)                  | 37                                 | 11                             |
| PCB 1260 ppm                | 5.8                   | 2.1                | 3.6                                | BDL(1.0)         | BDL(1.0)         | BDL(0.0006)             | BDL(0.0005)                  | 9.8                                | 2.7                            |
| Total PCBs ppm              | 190.8                 | 58.1               | 129.6                              | 5.8              | 5.3              | 0.0508                  | BDL                          | 64.8                               | 25.7                           |
| <b>Volatiles (ppm)</b>      |                       |                    |                                    |                  |                  |                         |                              |                                    |                                |
| Acetone                     | 0.73                  | BDL(0.02)          | x                                  | 0.21             | 0.28             | 2.1                     | 0.11                         | est 0.38                           | x                              |
| Benzene                     | est 0.004             | BDL(0.005)         | x                                  | 0.024            | 0.046            | BDL(0.05)               | BDL(0.005)                   | BDL(0.005)                         | x                              |
| Ethylbenzene                | est 0.004             | BDL(0.005)         | x                                  | est 0.005        | 0.012            | BDL(0.05)               | BDL(0.005)                   | BDL(0.005)                         | x                              |
| Fluorotrichloromethane      | BDL(0.005)            | BDL(0.005)         | x                                  | 0.048            | 0.14             | BDL(0.05)               | BDL(0.005)                   | BDL(0.005)                         | x                              |
| Methylene Chloride          | BDL(0.005)            | BDL(0.005)         | x                                  | BDL(0.01)        | est 0.007        | BDL(0.05)               | BDL(0.005)                   | 0.066                              | x                              |
| Methyl Ethyl Ketone         | BDL(0.01)             | BDL(0.01)          | x                                  | BDL(0.02)        | BDL(0.02)        | 0.3                     | BDL(0.01)                    | 0.045                              | x                              |
| Toluene                     | BDL(0.005)            | BDL(0.005)         | x                                  | 0.014            | 0.034            | BDL(0.05)               | BDL(0.005)                   | BDL(0.005)                         | x                              |
| 1,1,1-Trichloroethane       | BDL(0.005)            | BDL(0.005)         | x                                  | BDL(0.01)        | est 0.009        | est 0.024               | BDL(0.005)                   | BDL(0.005)                         | x                              |
| Xylene                      | BDL(0.005)            | BDL(0.005)         | x                                  | 0.016            | 0.046            | BDL(0.05)               | BDL(0.005)                   | BDL(0.005)                         | x                              |
| <b>Semi-Volatiles (ppm)</b> |                       |                    |                                    |                  |                  |                         |                              |                                    |                                |
| Anthracene                  | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | 1.6                                | x                              |
| Benz(a)anthracene           | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | est 0.6                            | x                              |
| Benzyl Alcohol              | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | est 0.061               | 0.05                         | BDL(1)                             | x                              |
| Bis(2-ethylhexyl)phthalate  | 0.37                  | est 0.31           | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | est 0.6                            | x                              |
| Carbazole                   | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | 1.1                                | x                              |
| Chrysene                    | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | 1.2                                | x                              |
| Di-N-Butylphthalate         | 0.35                  | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | est 0.8                            | x                              |
| Fluoranthene                | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | 6.3                                | x                              |
| Phenanthrene                | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | 9.3                                | x                              |
| Pyrene                      | BDL(0.33)             | est 0.19           | x                                  | BDL(0.33)        | BDL(0.33)        | BDL(0.11)               | BDL(0.01)                    | 5.2                                | x                              |
| Pyridine                    | BDL(1.6)              | BDL(1.7)           | x                                  | est 0.43         | est 0.21         | 1.7                     | est 0.22                     | BDL(5)                             | x                              |
| Benzoic Acid                | BDL(1.6)              | BDL(1.7)           | x                                  | BDL(1.7)         | BDL(1.7)         | BDL(0.55)               | 0.076                        | BDL(5)                             | x                              |
| 2-Methylphenol              | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | est 0.057               | 0.023                        | BDL(1)                             | x                              |
| 4-Methylphenol              | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | 0.41                    | est 0.42                     | est 0.97                           | x                              |
| Phenol                      | BDL(0.33)             | BDL(0.33)          | x                                  | BDL(0.33)        | BDL(0.33)        | 0.89                    | est 0.34                     | 1.3                                | x                              |

## Key to Table 5-5

### Notes:

- est = the value is below the calculated practical quantitation limit but the compound was identified as being present during the analysis
- x = analysis not requested
- BDL(A) = below detection limit, A = detection limit
- LOI = loss on ignition = 100% - % ash

Preliminary Feed = Feed sample taken during feed preparation

Run Feed = Feed sample taken from feed hopper during treatability study

Prod 1 = solid product sample taken during Condition 1

Prod 2 = solid product sample taken during Condition 2

Condensed Water = combined condensate from Conditions 1 and 2 less condensed oil

Phase Sep Water = filtered water from phase separator drum for Conditions 1 and 2

Phase Sep Filter Cake = residue filtered from phase separator liquid

Carryover Holdup = material removed from piping between dryer exit and spray tower

- Differences in detection levels between samples are due to use of different dilutions used by analytical laboratory or matrix interference.
- All results are reported on "as-received" basis except PCBs which are reported on a dry weight basis.
- CLP data packages for Prod 1 (BB2-02) and Prod 2 (BB2-04) are found in Appendix A.

**Table 5-6. Wet Basis Total Metals Data Summary  
for the Sheboygan River and Harbor Site Treatability Study**

| <b>Metal</b>    | <b>Preliminary<br/>Feed<br/>BB2-01<br/>(ppm)</b> | <b>Run Feed<br/>BB2-02<br/>(ppm)</b> | <b>Product 1<br/>BB2-03<br/>(ppm)</b> | <b>Product 2<br/>BB2-04<br/>(ppm)</b> |
|-----------------|--------------------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|
| <b>Arsenic</b>  | 5.8                                              | BDL(1.0)                             | BDL(1.0)                              | BDL(1.0)                              |
| <b>Barium</b>   | 1.4                                              | 42                                   | 53                                    | 63                                    |
| <b>Cadmium</b>  | BDL(0.40)                                        | BDL(0.40)                            | 0.70                                  | BDL(0.40)                             |
| <b>Chromium</b> | 11                                               | 16                                   | 21                                    | 25                                    |
| <b>Lead</b>     | 11                                               | 16                                   | 19                                    | 22                                    |
| <b>Mercury</b>  | BDL(0.11)                                        | 0.12                                 | 0.14                                  | BDL(0.11)                             |
| <b>Nickel</b>   | x                                                | 5.8                                  | 12                                    | 13                                    |
| <b>Selenium</b> | BDL(1.0)                                         | BDL(1.0)                             | BDL(1.0)                              | BDL(1.0)                              |
| <b>Silver</b>   | BDL(1.0)                                         | BDL(1.0)                             | BDL(1.0)                              | BDL(1.0)                              |

Notes:           x       = analysis not requested  
                   BDL(A)   = below detection limit, A = detection limit  
 Preliminary Feed   = feed sample taken during initial feed homogenization  
           Run Feed     = feed sample taken from feed hopper during treatability study  
           Product 1    = solid product sample taken during Condition 1  
           Product 2    = solid product sample taken during Condition 2

Total metals reported on "as-received" basis.

**Table 5-7. Dry Weight Basis Total Metals Data Summary  
for the Sheboygan River and Harbor Site Treatability Study**

| <b>Metal</b>    | <b>Preliminary<br/>Feed<br/>BB2-01<br/>(ppm, DWB)</b> | <b>Run Feed<br/>BB2-02<br/>(ppm, DWB)</b> | <b>Product 1<br/>BB2-03<br/>(ppm, DWB)</b> | <b>Product 2<br/>BB2-04<br/>(ppm, DWB)</b> |
|-----------------|-------------------------------------------------------|-------------------------------------------|--------------------------------------------|--------------------------------------------|
| <b>Arsenic</b>  | 9.1                                                   | BDL(1.3)                                  | BDL(1.0)                                   | BDL(1.0)                                   |
| <b>Barium</b>   | 2.2                                                   | 54                                        | 53                                         | 63                                         |
| <b>Cadmium</b>  | BDL(0.63)                                             | BDL(0.51)                                 | 0.70                                       | BDL(0.40)                                  |
| <b>Chromium</b> | 17                                                    | 21                                        | 21                                         | 25                                         |
| <b>Lead</b>     | 17                                                    | 21                                        | 19                                         | 22                                         |
| <b>Mercury</b>  | BDL(0.17)                                             | 0.15                                      | 0.14                                       | BDL(0.11)                                  |
| <b>Nickel</b>   | x                                                     | 7.4                                       | 12                                         | 13                                         |
| <b>Selenium</b> | BDL(1.6)                                              | BDL(1.3)                                  | BDL(1.0)                                   | BDL(1.0)                                   |
| <b>Silver</b>   | BDL(1.6)                                              | BDL(1.3)                                  | BDL(1.0)                                   | BDL(1.0)                                   |

Notes:           x       = analysis not requested  
                   BDL(A)   = below detection limit, A = detection limit  
 Preliminary Feed   = feed sample taken during initial feed homogenization  
           Run Feed     = feed sample taken from feed hopper during treatability study  
           Product 1    = solid product sample taken during Condition 1  
           Product 2    = solid product sample taken during Condition 2

**Table 5-8. TCLP Metals Data Summary for the Sheboygan River and Harbor Site Treatability Study**

| TCLP Metal | Preliminary Feed<br>BB2-01<br>(mg/l) | Run Feed<br>BB2-02<br>(mg/l) | Product 1<br>BB2-03<br>(mg/l) | Product 2<br>BB2-04<br>(mg/l) |
|------------|--------------------------------------|------------------------------|-------------------------------|-------------------------------|
| Arsenic    | BDL(0.01)                            | BDL(0.010)                   | BDL(0.010)                    | BDL(0.010)                    |
| Barium     | 1.2                                  | 4.6                          | 2.6                           | 3.0                           |
| Cadmium    | BDL(0.020)                           | BDL(0.020)                   | BDL(0.020)                    | BDL(0.020)                    |
| Chromium   | BDL(0.050)                           | BDL(0.050)                   | BDL(0.050)                    | BDL(0.050)                    |
| Lead       | BDL(0.20)                            | BDL(0.20)                    | BDL(0.20)                     | BDL(0.20)                     |
| Mercury    | BDL(0.005)                           | BDL(0.005)                   | BDL(0.005)                    | BDL(0.005)                    |
| Selenium   | BDL(0.050)                           | BDL(0.010)                   | BDL(0.010)                    | BDL(0.010)                    |
| Silver     | BDL(0.040)                           | BDL(0.05)                    | BDL(0.05)                     | BDL(0.05)                     |

Notes:

- x = analysis not requested
- BDL(A) = below detection limit, A = detection limit
- Preliminary Feed = feed sample taken during initial feed homogenization
- Run Feed = feed sample taken from feed hopper during treatability study
- Product 1 = solid product sample taken during Condition 1
- Product 2 = solid product sample taken during Condition 2

**Table 5-9. Removal Efficiency of Selected Components for the Sheboygan River and Harbor Site Treatability Study**

| Component | Run Feed<br>DMTS2-02<br>(ppm) | Product 1 (900°F)<br>BB2-03 |             | Product 2 (750°F)<br>BB2-04 |             |
|-----------|-------------------------------|-----------------------------|-------------|-----------------------------|-------------|
|           |                               | Conc (ppm)                  | Removal (%) | Conc (ppm)                  | Removal (%) |
| PCB       | 129.6                         | 5.8                         | 96          | 5.3                         | 96          |
| O&G       | 410                           | 200                         | 51          | 210                         | 49          |

Notes:

Values are reported on a dry weight basis.

PCB removal efficiencies were between 90 and 91 percent. Oil and grease removal efficiencies were 51 and 49 percent. The metals concentrations remained essentially the same. Barium was the only TCLP metal detected. The barium TCLP level was well below the 100 mg/l limit. All of the other TCLP metal concentrations were below their respective limits also.

There is variability between the preliminary feed sample (BB2-01) analytical results and the run feed sample (BB2-02) analytical results, particularly for the PCBs and some metals. Because of the large variability between the preliminary feed (BB2-01) and the run feed (BB2-02) PCB results, the run feed (BB2-02) was reanalyzed for PCBs. The results of the run feed reanalysis (BB2-02R) was a PCB concentration more similar to the preliminary feed (BB2-01) PCB concentration. Therefore, the run feed PCB reanalysis (BB2-02R) result is used for all mass balance and removal efficiency calculations.

The variability between the preliminary feed and run feed may be due to the non-homogeneity of the sample, sampling technique, laboratory technique, or a combination of these. Non-homogeneity of the sample is the most likely source of the variability. As described in Section 3, the preliminary feed is collected when the material is screened and mixed, the run feed sample is collected from the hopper at regular intervals during the treatability study and composited. The feed in the hopper is continually mixed by rotating mixers. Therefore, the run feed sample is more representative of the feed material and is used as the basis for calculating removal efficiencies and material balances for the treatability study. It should be noted that even a well mixed sample can exhibit variability because of the small aliquotes used to conduct the individual analytical procedures. The initial mixing of the sample after sample screening is intended to minimize this variability.

All PCB analyses for the BB2 run were completed using US EPA Contract Laboratory Program (CLP) methodology. At the request of Blasland & Bouck, CLP data packages for Product 1 (BB2-03) and Product 2 (BB2-04) were provided. The data packages are found in Appendix A.

Semi-volatile organic compounds were detected in the phase separator filter cake that were not detected in the feed material. Semi-volatile organics frequently appear in the filter cake at levels higher than the feed material. The detection of these compounds in the cake that were not found in the feed analysis may be due to any or all of three factors:

- 1) Difference in detection levels for feed and cake samples.
- 2) Concentration effect.
- 3) Material carryover from previous tests.

The previous X\*TRAX study was conducted on a sample with more than 3,400 ppm polynuclear aromatic hydrocarbons (PAHs). Although the entire gas system was cleaned between runs, the dryer itself may have contained some residual solids from the previous test.

Both Product 1 (BB2-03) and Product 2 (BB2-04) appear to contain volatile organics not detected in the feed samples. The reason for this phenomenon is not known. A possible explanation includes adsorption of the chemicals onto the sediments from being exposed to the open air after being discharged from the system. It is likely that these compounds are not on the soil when discharged from the dryer because most of the same compounds are not detected in any of the other product streams from the system. The previous X\*TRAX study that contained the PAHs did not contain most of these volatile compounds.

## **5.5 Vent Emissions**

Vent gas emissions sampling and analyses for PCBs was not within the scope of work for this treatability study. However, vent gas emissions testing for PCBs on the pilot scale system indicated that the quantity of PCBs entering the final stage of the APC equipment (the carbon and particulate filters) was insignificant to the overall PCB mass balance and the carbon and particulate filters removed virtually all traces of PCBs from the vent stream before discharge to the air. Therefore, PCB emissions should not be a concern when using the X\*TRAX system.

## **6. CONCLUSIONS**

### **6.1 Test Results**

The X\*TRAX treatability run significantly reduced the PCB level in the soil. The residual PCB level in Product 1 (BB2-03) and Product 2 (BB2-04) was approximately

the same, 5.8 ppm and 5.3 ppm, respectively. There is currently no PCB cleanup goal established for the Sheboygan River and Harbor Site. Based on the results of this study, CWM would be able to consistently reduce the PCB level to less than 10 ppm total PCB using the patented X•TRAX process.

## **6.2 Full Scale Remediation Cost Estimate**

The final volume of sediments to be treated from the Sheboygan River and Harbor Site will depend on the cleanup goal, which is not yet established. Projected full scale remediation costs are presented in Table 6-1. Full scale X•TRAX cost estimates versus moisture content of the feed material are also presented.

These cost estimates are for the battery limits operation of the X•TRAX process. Battery limits operation assumes that a stockpile of minus two-inch feed material is provided by others near the feed hopper of the X•TRAX processing area. The X•TRAX system will treat the sediments to less than 10 ppm PCBs and discharge the sediments into a stockpile for others to remove from the X•TRAX processing area. It is important to note that the costs include disposal of process residuals with the recovered oil being destroyed in an off site TSCA approved incinerator. It is also important to note that the residuals management costs are estimates based on the samples tested in the treatability study.

Based on the sample received, the oversize material greater than two inches in diameter consisted of rocks. Some of the options for handling the oversize rocks include crushing them to less than two inches in diameter and processing them through the X•TRAX system or washing them with water or steam and disposing of them at an off-site facility. The costs for screening the feed material to remove the oversize material and handling the oversize material is not included in the X•TRAX processing cost estimate.

**Table 6-1. Projected Model 200 X•TRAX Treatment Costs  
Sheboygan River and Harbor Site**

| <b>Costs Included in Total Prices Below</b><br><b>X•TRAX Processing:</b><br>Operating Labor<br>Capital and Maintenance<br>Consumables:<br>Nitrogen, Carbon, Electricity, Propane, Miscellaneous<br>Residual Management:<br>Condensed Water, Condensed Organics, Filter Cake<br>Recycle |                                                    |                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|
| <b>Feed Material<br/>Moisture Content<br/>(%)</b>                                                                                                                                                                                                                                      | <b>X•TRAX Process<br/>Feed Rate<br/>(tons/day)</b> | <b>X•TRAX Treatment<br/>Cost<br/>(\$/ton feed)</b> |
| 36.3                                                                                                                                                                                                                                                                                   | 105                                                | 180                                                |
| 30.0                                                                                                                                                                                                                                                                                   | 110                                                | 165                                                |
| 25.0                                                                                                                                                                                                                                                                                   | 115                                                | 155                                                |
| 20.0                                                                                                                                                                                                                                                                                   | 120                                                | 145                                                |

**Notes for Table 6-1:**

- 1) Mob/Demobilization cost will typically range from \$300,000 to \$500,000 and is not included in the price above.
- 2) Carbon is reactivated off site, PCB guard beds installed upstream of main adsorbers.
- 3) Condensed organics are incinerated in a TSCA approved incinerator and the cost is included in the prices given above.
- 4) Cost assume that water not used for product cooling can be discharged on site after filtration and carbon treatment.

Cost items that are not included in the estimate include permit equivalency development, analytical testing, air monitoring, personnel monitoring and other expenses that will be associated with this remediation and that are not yet defined. It is impossible to estimate these costs prior to the issuance of an RFP defining the scope of work and the division of responsibility between CWM and the owner/engineer.

The mobilization and demobilization charges are broken out as a separate lump sum line item; this removes the price dependency on the volume of soil treated.

The operating conditions and unit cost assumptions for preparing Table 6-1 are presented in Table 6-2.

**Table 6-2. X•TRAX Model 200  
Cost Estimate Assumptions  
Sheboygan River and Harbor Site**

| Item                                                            | Amount       |
|-----------------------------------------------------------------|--------------|
| Organic in Feed                                                 | 0.1%         |
| Residence Time                                                  | 90 min       |
| Separation Temperature                                          | 785°F        |
| Average Labor Rate                                              | \$30/hour    |
| Propane                                                         | \$0.65/therm |
| Electricity                                                     | \$0.10/kW-hr |
| Activated Carbon <sup>1</sup>                                   | \$1.75/pound |
| Nitrogen                                                        | \$0.01/cf    |
| Notes: <sup>1</sup> Assumes carbon will be reactivated off-site |              |

Table 6-3 presents the estimates of raw material consumption and condensed organic production for each condition.

**Table 6-3. X•TRAX Model 200 Estimated Daily Consumption  
Residual Rates, Sheboygan River and Harbor Site**

| Item              | Units      | Amount Per Day @ Feed Moisture Indicated |        |        |        |
|-------------------|------------|------------------------------------------|--------|--------|--------|
|                   |            | @ 36.3%                                  | @ 30%  | @ 25%  | @ 20%  |
| Propane           | gallons    | 3,428                                    | 3,166  | 2,957  | 2,717  |
| Electricity       | kW-hr      | 13,672                                   | 12,240 | 11,050 | 9,720  |
| Carbon            | pounds     | 250                                      | 250    | 250    | 250    |
| Nitrogen          | cubic feet | 72,000                                   | 72,000 | 72,000 | 72,000 |
| Condensed Organic | pounds     | 210                                      | 220    | 230    | 240    |
| Condensed Water   | gallons    | 5,617                                    | 3,857  | 2,350  | 697    |

## **Appendix A**

**PCB CLP Data Packages  
for Product 1 (BB2-03)  
and Product 2 (BB2-04)**

EMS HERITAGE LABORATORIES, INC.



7901 West Morris Street  
Indianapolis, IN 46231  
Phone: 317-243-8304  
FAX: 317-243-0360

CASE NARRATIVE  
GC GROUP

SAMPLE # C134905 - C134909 and C134928.

These samples were analyzed using the normal procedures with no modifications.

LAT 12-11-91

Elizabeth Wering (aut. group leader)  
LISA JULIAN  
GC GROUPLADER

2F  
SOIL PESTICIDE SURROGATE RECOVERY

EMS LABORATORIES, INC.

Name: INDIANAPOLIS, IN 46231

Contract: CWM

Lab Code: 3071 Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: \_\_\_\_\_

Level: (low/med) \_\_\_\_\_

|    | EPA<br>SAMPLE NO. | S1<br>(DGB) # | OTHER<br>TCX |                              |
|----|-------------------|---------------|--------------|------------------------------|
| 01 | A1A683            | 87            | 97           |                              |
| 02 | STD 695           | 89            | 100          |                              |
| 03 | C134905           | 87            | 105          | 882-02 Run Feed              |
| 04 | C134905 SP102     | 88            | 103          |                              |
| 05 | C134905 DB002     | 105           | 124          |                              |
| 06 | C134906           | 79            | 94           | 882-03 Product 1             |
| 07 | C134907           | 82            | 99           | 882-04 Product 2             |
| 08 | C134908           | 92            | 103          | 882-09 Carryover hold up     |
| 09 | C134909           | 101           | 114          | 882-03A Project 1 End snap   |
| 10 | C134928           | 82            | 88           | 882-08 Phase Sep. Filter Can |
| 11 |                   |               |              |                              |
| 12 |                   |               |              |                              |
| 13 |                   |               |              |                              |
| 14 |                   |               |              |                              |
| 15 |                   |               |              |                              |
| 16 |                   |               |              |                              |
| 17 |                   |               |              |                              |
| 18 |                   |               |              |                              |
| 19 |                   |               |              |                              |
| 20 |                   |               |              |                              |
| 21 |                   |               |              |                              |
| 22 |                   |               |              |                              |
| 23 |                   |               |              |                              |
| 24 |                   |               |              |                              |
| 25 |                   |               |              |                              |
| 26 |                   |               |              |                              |
| 27 |                   |               |              |                              |
| 28 |                   |               |              |                              |
| 29 |                   |               |              |                              |
| 30 |                   |               |              |                              |

ADVISORY  
QC LIMITS  
(20-150)

S1 (DGB) = Decachlorobiphenyl

# Column to be used to flag recovery values

\* Values outside of QC limits

D Surrogates diluted out

ADB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: **EMS LABORATORIES, INC.**  
**INDIANAPOLIS, IN 46231**

Contract: CWM

Matrix Spike Sample Number: C134905

| AROCHLOR | SPIKE<br>ADDED | SAMPLE<br>CONCENTRATION | MATRIX SPIKE<br>CONCENTRATION | MS<br>%<br>RECOVERY | QC<br>LIMITS<br>RECOVERY |
|----------|----------------|-------------------------|-------------------------------|---------------------|--------------------------|
| 1260     | 9.1<br>mg/kg   | 2.1<br>mg/kg            | 10.3<br>mg/kg                 | 90%                 | 75-115                   |
|          |                |                         |                               |                     |                          |

| AROCHLOR | SPIKE<br>ADDED | MATRIX SPIKE<br>DUPLICATE<br>CONCENTRATION | MSD<br>%<br>RECOVERY | %<br>RPD | QC LIMITS |        |
|----------|----------------|--------------------------------------------|----------------------|----------|-----------|--------|
|          |                |                                            |                      |          | RPD       | REC    |
| 1260     | 8.9<br>mg/kg   | 9.7<br>mg/kg                               | 85%                  | 5.7%     | 20        | 75-115 |
|          |                |                                            |                      |          |           |        |

EMS LABORATORIES, INC.  
INDIANAPOLIS, IN 46231

# PESTICIDE METHOD BLANK SUMMARY

EMS LABORATORIES, INC.  
INDIANAPOLIS, IN 46231

Name: \_\_\_\_\_ Contract: CWM

Lab Code: 3071 Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: \_\_\_\_\_

Lab Sample ID: ALA 683 Lab File ID: \_\_\_\_\_

Matrix: (soil/water) soil Level: (low/med) \_\_\_\_\_

Date Extracted: 12-5-91 Extraction: (SepF/Cont/Sonc) Scn

Date Analyzed (1): 12-6-91 Date Analyzed (2): 12-7-91

Time Analyzed (1): 23:52:15 Time Analyzed (2): 0:35:57

Instrument ID (1): 6C ELO8 Instrument ID (2): 6C ELL

GC Column ID (1): 08-5 GC Column ID (2): 08-608

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSC

|    | EPA<br>SAMPLE NO. | LAB<br>SAMPLE ID | DATE<br>ANALYZED 1 | DATE<br>ANALYZED 2 |
|----|-------------------|------------------|--------------------|--------------------|
| 01 |                   | ALA 683          | 12-6-91            | 12-7-91            |
| 02 |                   | STD 695          | 12-7-91            |                    |
| 03 | 662-02 Run Feed   | C134905          |                    |                    |
| 04 |                   | C134905 SP102    |                    |                    |
| 05 |                   | C134905 MS02     |                    |                    |
| 06 | 662-03 Product 1  | C134906          |                    |                    |
| 07 | 662-04 Product 2  | C134907          |                    |                    |
| 08 | 662-05 Carryover  | C134908          |                    |                    |
| 09 | 662-03A Run Feed  | C134909          |                    |                    |
| 10 | 662-08 Filter Bag | C134928          | ✓                  | ✓                  |
| 11 |                   |                  |                    |                    |
| 12 |                   |                  |                    |                    |
| 13 |                   |                  |                    |                    |
| 14 |                   |                  |                    |                    |
| 15 |                   |                  |                    |                    |
| 16 |                   |                  |                    |                    |
| 17 |                   |                  |                    |                    |
| 18 |                   |                  |                    |                    |
| 19 |                   |                  |                    |                    |
| 20 |                   |                  |                    |                    |
| 21 |                   |                  |                    |                    |
| 22 |                   |                  |                    |                    |
| 23 |                   |                  |                    |                    |
| 24 |                   |                  |                    |                    |
| 25 |                   |                  |                    |                    |
| 26 |                   |                  |                    |                    |

COMMENTS: \_\_\_\_\_

62  
PCB INITIAL CALIBRATION

Lab Name: EHS HERITAGE Indianapolis, IN 46231 Contract: CWM  
 Lab Code: 3071 Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: \_\_\_\_\_  
 Instrument ID: GCRCD 8 Level (x low): low \_\_\_\_\_ INIT 1 \_\_\_\_\_ MED \_\_\_\_\_ INIT 2 \_\_\_\_\_ HIGH \_\_\_\_\_

| COMPOUND | CAL. FACTOR           |                       |                       |                       | MEAN                  | RSD   |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------|
|          | V.LOW                 | LOW                   | MED                   | HIGH                  |                       |       |
| 1248     | $4.70 \times 10^{-5}$ | $3.90 \times 10^{-5}$ | $5.32 \times 10^{-5}$ | $5.49 \times 10^{-5}$ | $4.95 \times 10^{-5}$ | 14.8% |
| 1260     | $2.48 \times 10^{-5}$ | $2.86 \times 10^{-5}$ | $2.98 \times 10^{-5}$ | $3.01 \times 10^{-5}$ | $2.88 \times 10^{-5}$ | 5.2%  |
|          |                       |                       |                       |                       |                       |       |
|          |                       |                       |                       |                       |                       |       |

"RSD must be less than or equal to 20.0% for all compounds except the surrogates, where RSD must be less than or equal to 30.0%. Up to two target compounds, but not surrogates, may have RSD greater than 20.0% but less than or equal to 30.0%." (CLP Revision 01/01)

**92**  
**PESTICIDE EVALUATION STANDARDS SUMMARY**  
 Evaluation of Retention Time Shift for Dibutylchlorodantate

ENS LABORATORIES, INC.  
 INDIANAPOLIS, IN 46231

Contract: C-620

Name: INDIANAPOLIS, IN 46231 Case No.:            SAS No.:            SDG No.:           

Lab Code: 3071 GC Column ID: 06-5

Instrument ID: GC-EC08

Dates of Analyses: 12-6-91 to 12-7-91

| EPA<br>SAMPLE NO. | LAB SAMPLE<br>ID | DATE<br>ANALYZED | TIME<br>ANALYZED | D    |
|-------------------|------------------|------------------|------------------|------|
| 01                | 0709 147L        | 12-6-91          | 15:51:58         | 0    |
| 02                | 0710 147L        |                  | 16:55:33         | 0    |
| 03                | 0711 147L        |                  | 17:19:17         | 0    |
| 04                | 0712 147L        |                  | 18:03:02         | 0    |
| 05                | 0707 1247        |                  | 18:46:33         | 0    |
| 06                | 0703 1221        |                  | 19:30:23         | 0    |
| 07                | 0704 1232        |                  | 20:14:01         | 0.04 |
| 08                | 0707 1242        |                  | 20:57:41         | 0    |
| 09                | 0706 1248        |                  | 21:41:19         | 0    |
| 10                | 0707 1254        |                  | 22:24:57         | 0    |
| 11                | 0708 1260        |                  | 23:08:39         | 0    |
| 12                | 0708 1260        |                  | 23:52:15         | 0    |
| 13                | 0708 1260        | 12-7-91          | 0:55:53          | 0.04 |
| 14                | 0708 1260        |                  | 1:14:33          | 0    |
| 15                | 0708 1260        |                  | 2:03:11          | 0    |
| 16                | 0708 1260        |                  | 2:46:57          | 0    |
| 17                | 0714 1260        |                  | 3:30:37          | 0.04 |
| 18                | 0714 1260        |                  | 4:14:05          | 0.04 |
| 19                | 0714 1260        |                  | 4:57:41          | 0.04 |
| 20                | 0714 1260        |                  | 5:41:21          | 0.04 |
| 21                | 0714 1260        |                  | 6:25:03          | 0.04 |
| 22                | 0714 1260        |                  | 7:08:37          | 0.04 |
| 23                | 0714 1260        |                  | 7:52:17          | 0.04 |
| 24                | 0714 1260        |                  | 8:35:47          | 0.04 |
| 25                | 0714 1260        |                  | 9:19:21          | 0    |
| 26                | 0714 1260        |                  | 10:03:58         | 0.04 |
| 27                | 0714 1260        |                  | 10:46:30         | 0.04 |
| 28                | 0714 1260        |                  | 11:30:06         | 0.04 |
| 29                | 0714 1260        |                  | 12:13:40         | 0.04 |
| 30                |                  |                  |                  |      |
| 31                |                  |                  |                  |      |
| 32                |                  |                  |                  |      |
| 33                |                  |                  |                  |      |
| 34                |                  |                  |                  |      |
| 35                |                  |                  |                  |      |
| 36                |                  |                  |                  |      |
| 37                |                  |                  |                  |      |
| 38                |                  |                  |                  |      |

\* Values outside of QC limits (2.0σ for packed columns,

# PESTICIDE/PCB STANDARDS SUMMARY

EMS LABORATORIES, INC.

Name: INDIANAPOLIS 231

Contract: CWM

Lab Code: 3071 Case No.:        SAS No.:        SDG No.:       

Instrument ID: 66 EC08

GC Column ID: 06-5

DATE(S) OF FROM: 12-6-91  
ANALYSIS TO: 12-7-91  
TIME(S) OF FROM: 15:51:58  
ANALYSIS TO: 12:13:40

DATE OF ANALYSIS         
TIME OF ANALYSIS         
EPA SAMPLE NO.         
(STANDARD)       

| COMPOUND     | RT    | RT WINDOW |       | CALIBRATION FACTOR    | RT    | CALIBRATION FACTOR    | QNT Y/N | %D  |
|--------------|-------|-----------|-------|-----------------------|-------|-----------------------|---------|-----|
|              |       | FROM      | TO    |                       |       |                       |         |     |
| Aroclor-1016 | 10.57 | 10.50     | 10.64 | $5.26 \times 10^{-5}$ | 10.58 | $5.00 \times 10^{-5}$ |         | 4.9 |
| Aroclor-1221 | 7.27  | 7.20      | 7.34  | $1.92 \times 10^{-4}$ | 7.30  | $1.82 \times 10^{-4}$ |         | 5.2 |
| Aroclor-1232 | 10.58 | 10.51     | 10.65 | $1.05 \times 10^{-4}$ | 10.58 | $1.03 \times 10^{-4}$ |         | 1.9 |
| Aroclor-1242 | 10.57 | 10.50     | 10.64 | $5.94 \times 10^{-5}$ | 10.59 | $5.80 \times 10^{-5}$ |         | 2.4 |
| Aroclor-1248 | 10.57 | 10.50     | 10.64 | $5.24 \times 10^{-5}$ | 10.58 | $5.26 \times 10^{-5}$ |         | 0.4 |
| Aroclor-1254 | 19.24 | 19.17     | 19.31 | $3.57 \times 10^{-5}$ | 19.25 | $3.56 \times 10^{-5}$ |         | 0.3 |
| Aroclor-1260 | 20.74 | 20.67     | 20.91 | $3.04 \times 10^{-5}$ | 20.75 | $3.00 \times 10^{-5}$ |         | 1.3 |

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.  
%D must be less than or equal to 15.0% for quantitation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15.0% criterion.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D.

Identification of such analytes is based primarily on pattern recognition

Page     of    

FORM IX PEST

1/87 Rev



#90

EMS LABORATORIES, INC  
PCB ANALYSIS-SOIL METHOD BLANK  
ANALYSIS METHOD: SW846-8080

ANALYSIS DATE: 12-7-91

ANALYST: LAJ # 1022

TEST CODE: C301.2

QC# 0370516

PREP DATE: 12-5-91

PREP METHOD: SW846-3550

| PAR# | COMPOUND      | RESULT | UNITS | DET. LIMIT |
|------|---------------|--------|-------|------------|
| 558  | Arochlor 1016 | <0.4   | MG/KG | 1.0        |
| 559  | Arochlor 1221 | <2.0   | MG/KG | 5.0        |
| 560  | Arochlor 1232 | <0.4   | MG/KG | 1.0        |
| 561  | Arochlor 1242 | <0.4   | MG/KG | 1.0        |
| 562  | Arochlor 1248 | <0.4   | MG/KG | 1.0        |
| 563  | Arochlor 1254 | <0.4   | MG/KG | 1.0        |
| 564  | Arochlor 1260 | <0.4   | MG/KG | 1.0        |

## CIP, GAS CHROMATOGRAPHY

DATE OF RUN 12-7-91

REVIEWER: Enin' / 1023 RECORDED: \_\_\_\_\_

DATE: 12/12/71

Instr. # 25 cl 9

[illegible]

REFERENCE NO. 0501.2 3071

or WT. 9.96g  
EFFECTIVE  
FINAL VOL. 500 ml

Test Code: 0301.2

**Tw88115**

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAT /1022DATE OF RUN 12-7-91REVIEWER: Emw/1023

RECORDER: \_\_\_\_\_

INSTRUMENT 6C FCD 9DATE: 12 / 12 / 91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 8

| VAL |            | ANALYTE      | EXTR.<br>CONC. | RESULTS | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|-----|------------|--------------|----------------|---------|------------------------|---------------|---------------|-------------|-------|-------------------|
| —   | SAMPLE     | C134905      | 60L            | 60L     | mg/kg                  | 1.0           |               |             |       |                   |
|     | QA/QC      | Aroclor-1221 | ↓              | ↓       |                        | 5.0           |               |             |       |                   |
|     | TYPE       | Aroclor-1232 | ↓              | ↓       |                        | 1.0           |               |             |       |                   |
|     | PREP       | Aroclor-1242 | 0.851          | 43 *    |                        | 1.0           |               |             |       |                   |
|     | DATE       | Aroclor-1248 | 60L            | 60L     |                        | 1.0           |               |             |       |                   |
|     |            | Aroclor-1254 | 0.260          | 13      |                        | 1.0           |               |             |       |                   |
|     | ANALYST    | Aroclor-1260 | 0.0426         | 2.1     |                        | 1.0           |               |             |       |                   |
|     | PREP       | Aroclor-1262 | 60L            | 60L     |                        | 1.0           |               |             |       |                   |
|     | PAGE #     | 5 230        |                | 0.0436  | ↓                      | 0.01          | 0.050         | 87%         |       |                   |
|     | IN. VOL.   |              |                |         |                        |               |               |             |       |                   |
|     | GR. WT.    | 9.96g        |                |         |                        |               |               |             |       |                   |
|     | EFFECTIVE  |              |                |         |                        |               |               |             |       |                   |
|     | FINAL VOL. | 500 mL       |                |         |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

\* Comment: 1242 is degraded

11

Test Code: 0301.2

CLP, GAS CHROMATOGRAPHY

HMS LABORATORIES, INC  
INDIANAPOLIS, IN 46221

CALCULATOR LAJ / 1022

DATE OF RUN 12-7-91

INSTRUMENT 6C FCO 1

Inst. # 25 49

REVIEWER: kmw / 1023

DATE: 12 / 12 / 91

REORDER:           

DATE:       /      /      

VAL Q367247 ANALYTE

SAMPLE C134905 ANALYTE  
QA/QC

TYPE 5P102 ANALYTE

PREP 12-2-91 ANALYTE

DATE 12-2-91 ANALYTE

ANALYST 08F / 1622 ANALYTE

PREP 5 230 ANALYTE

PAGE 1 ANALYTE

IN. VOL. 5 230 ANALYTE

OF WT. 9.94g ANALYTE

EFFECTIVE 9 ANALYTE

FINAL VOL. 500 ml ANALYTE

| EXTR. CONC. | RESULTS | mg/kg<br>µg/l<br>UNITS | DET. LIMIT | TRUE VALUE | % RECOV. | REPL. | REPLIC. 1 CONC |
|-------------|---------|------------------------|------------|------------|----------|-------|----------------|
|             |         | 0.9149                 | 1.0        |            |          |       | sample         |
|             |         | 5.0                    | 5.0        |            |          |       |                |
|             |         | 1.0                    | 1.0        |            |          |       | 43             |
|             |         | 1.0                    | 1.0        |            |          |       |                |
|             |         | 1.0                    | 1.0        |            |          |       | 13             |
|             |         | 1.0                    | 1.0        |            |          |       | 2.1            |
|             |         | 0.205                  | 10.3       | 9.1        | 90%      |       |                |
|             |         | 0.9139                 | 0.91       | 0.050      | 11%      |       |                |

REFERENCE NO. 0301.2 3071

Test code: 0301.2

TW88115

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## CLP, GAS CHROMATOGRAPHY

MIS LABORATORY INC  
INDIANAPOLIS, IN 46231CALCULATOR LAT / 1022DATE OF RUN 12-7-91REVIEWER: Emu / 1023

RECORDED: \_\_\_\_\_

INSTRUMENT 66 E603DATE: 12 / 12 / 91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Inst. # 25 cl 9

|            |            |              |         |
|------------|------------|--------------|---------|
| VAL        | SAMPLE     | Q367248      | ANALYTE |
| QA/QC      | C134905    | Atoclor-1016 |         |
| TYPE       | OPS 07     | Atoclor-1221 |         |
| PREP       |            | Atoclor-1232 |         |
| DATE       | 12-2-91    | Atoclor-1242 |         |
|            |            | Atoclor-1248 |         |
|            |            | Atoclor-1254 |         |
| ANALYST    | DAE / 3623 | Atoclor-1260 |         |
| PREP       |            | Atoclor-1262 |         |
| PAGE #     | 5 230      | b c e        |         |
| IN. VOL.   |            |              |         |
| GR. WT.    | 10.11g     |              |         |
| EFFECTIVE  |            |              |         |
| FINAL VOL. | 500 ml     |              |         |

mg/kg

μg/l

UNITS

DEF. LIMIT

RESULTS

EXTR. CONC.

TRUE VALUE

RECON.

REPL.

REPLIC.

1 CONC

REFERENCE NO. 0301.2 3071

Test Code: 0301.2

TW88115

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAT /1022DATE OF RUN 12-7-91REVIEWER: Emu /1023

RECORDER: \_\_\_\_\_

INSTRUMENT 66 EGD 8DATE: 12 / 12 / 91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 8

| VAL |            | ANALYTE          | EXTR.<br>CONC. | RESULTS       | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|-----|------------|------------------|----------------|---------------|------------------------|---------------|---------------|-------------|-------|-------------------|
| —   | SAMPLE     | <u>C134906</u>   | <u>60L</u>     | <u>60L</u>    | <u>mg/kg</u>           | <u>1.0</u>    |               |             |       |                   |
|     | QA/QC      | Aroclor-1221     | <u>↓</u>       | <u>↓</u>      |                        | <u>5.0</u>    |               |             |       |                   |
|     | TYPE       | Aroclor-1232     | <u>↓</u>       | <u>↓</u>      |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1242     | <u>0.0965</u>  | <u>4.8 *</u>  |                        | <u>1.0</u>    |               |             |       |                   |
|     | DATE       | <u>12-2-91</u>   | <u>60L</u>     | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1248     | <u>0.0208</u>  | <u>1.0</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | ANALYST    | <u>DAF /2622</u> | <u>60L</u>     | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1260     | <u>↓</u>       | <u>↓</u>      |                        | <u>1.0</u>    |               |             |       |                   |
|     | PAGE #     | <u>5 230</u>     |                | <u>0.0393</u> | <u>↓</u>               | <u>0.01</u>   | <u>0.050</u>  |             |       |                   |
|     | IN. VOL.   |                  |                |               |                        |               |               |             |       |                   |
|     | OR WT.     | <u>10.01g</u>    |                |               |                        |               |               |             |       |                   |
|     | EFFECTIVE  |                  |                |               |                        |               |               |             |       |                   |
|     | FINAL VOL. | <u>500 mL</u>    |                |               |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

\* Comment: 1242 is degraded

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Test code: 0301.2

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAT / 1022DATE OF RUN 12-7-91REVIEWER: EMU / 1023

RECORDER: \_\_\_\_\_

INSTRUMENT GC ECD 9DATE: 12 / 12 / 91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 8

| VAL |            | ANALYTE        | EXTR.<br>CONC. | RESULTS       | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|-----|------------|----------------|----------------|---------------|------------------------|---------------|---------------|-------------|-------|-------------------|
| —   | SAMPLE     | <u>C134907</u> | <u>60L</u>     | <u>60L</u>    | <u>mg/kg</u>           | <u>1.0</u>    |               |             |       |                   |
|     | QA/QC      | Aroclor-1016   | <u>↓</u>       | <u>↓</u>      |                        | <u>5.0</u>    |               |             |       |                   |
|     | TYPE       | Aroclor-1221   | <u>↓</u>       | <u>↓</u>      |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1232   | <u>0.0767</u>  | <u>3.9</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | DATE       | Aroclor-1242   | <u>60L</u>     | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1248   | <u>0.0283</u>  | <u>1.4</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | ANALYST    | Aroclor-1254   | <u>60L</u>     | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1260   | <u>↓</u>       | <u>↓</u>      |                        | <u>1.0</u>    |               |             |       |                   |
|     | PAGE #     | Aroclor-1262   |                | <u>0.0409</u> | <u>↓</u>               | <u>0.01</u>   | <u>0.050</u>  | <u>12%</u>  |       |                   |
|     | IN. VOL.   | b c e          |                |               |                        |               |               |             |       |                   |
|     | OR WT.     |                |                |               |                        |               |               |             |       |                   |
|     | EFFECTIVE  |                |                |               |                        |               |               |             |       |                   |
|     | FINAL VOL. |                |                |               |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

\*Comment: 1242 is degraded

15

Test code: 0301.2

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAJ /1022DATE OF RUN 12-7-91REVIEWER: Ymml /1023

RECORDER: \_\_\_\_\_

INSTRUMENT 6C ECO 9DATE: 12/12/91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 9

| VAL |            | ANALYTE        | EXTIR.<br>CONC. | RESULTS       | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|-----|------------|----------------|-----------------|---------------|------------------------|---------------|---------------|-------------|-------|-------------------|
| —   | SAMPLE     | <u>C134908</u> | <u>60L</u>      | <u>60L</u>    | <u>mg/kg</u>           | <u>1.0</u>    |               |             |       |                   |
|     | QA/QC      | Aroclor-1016   |                 |               |                        | <u>5.0</u>    |               |             |       |                   |
|     | TYPE       | Aroclor-1221   | <u>↓</u>        | <u>↓</u>      |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1232   |                 |               |                        | <u>1.0</u>    |               |             |       |                   |
|     | DATE       | Aroclor-1242   | <u>0.247</u>    | <u>12 *</u>   |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1248   | <u>60L</u>      | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1254   | <u>0.231</u>    | <u>11</u>     |                        | <u>1.0</u>    |               |             |       |                   |
|     | ANALYST    | Aroclor-1260   | <u>0.0353</u>   | <u>2.7</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1262   | <u>60L</u>      | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
|     | PAGE #     | <u>5 230</u>   |                 | <u>0.0459</u> | <u>↓</u>               | <u>0.01</u>   | <u>0.050</u>  | <u>92%</u>  |       |                   |
|     | IN. VOL.   |                |                 |               |                        |               |               |             |       |                   |
|     | OR WT.     |                |                 |               |                        |               |               |             |       |                   |
|     | EFFECTIVE  |                |                 |               |                        |               |               |             |       |                   |
|     | FINAL VOL. | <u>500 ml</u>  |                 |               |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

\* Comment: 1242 is degraded

16

Test code: 0301.2

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAT /1022DATE OF RUN 12-7-91REVIEWER: Emu /1022

RECORDER: \_\_\_\_\_

INSTRUMENT 6C ECD 8DATE: 12 / 12 / 91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 8

| VAL |            | ANALYTE   | EXTR.<br>CONC. | RESULTS | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|-----|------------|-----------|----------------|---------|------------------------|---------------|---------------|-------------|-------|-------------------|
| —   | SAMPLE     | C134909   | Aroclor-1016   | 60L     | 60L                    | mg/kg         | 1.0           |             |       |                   |
|     | QA/QC      |           | Aroclor-1221   | ↓       | ↓                      |               | 5.0           |             |       |                   |
|     | TYPE       |           | Aroclor-1232   | ↓       | ↓                      |               | 1.0           |             |       |                   |
|     | PREP       |           | Aroclor-1242   | 0.0476  | 2.3 *                  |               | 1.0           |             |       |                   |
|     | DATE       | 12-2-91   | Aroclor-1248   | 60L     | 60L                    |               | 1.0           |             |       |                   |
|     |            |           | Aroclor-1254   | 0.0173  | 60L                    |               | 1.0           |             |       |                   |
|     | ANALYST    | ORF /3622 | Aroclor-1260   | 60L     | ↓                      |               | 1.0           |             |       |                   |
|     | PREP       |           | Aroclor-1262   | ↓       | ↓                      |               | 1.0           |             |       |                   |
|     | PAGE #     | 5 230     | b a b          |         | 0.0509                 | ↓             | 0.01          | 0.030       | 101%  |                   |
|     | IN. VOL.   |           |                |         |                        |               |               |             |       |                   |
|     | OR WT.     | 10.15g    |                |         |                        |               |               |             |       |                   |
|     | EFFECTIVE  |           |                |         |                        |               |               |             |       |                   |
|     | FINAL VOL. | 500 mL    |                |         |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

\* Comment: 1242 is degraded

Test code: 0301.2

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAT /1022DATE OF RUN 12-7-91REVIEWER: Enu /1023

RECORDER: \_\_\_\_\_

INSTRUMENT GC ECD 8DATE: 12/12/91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 8

| VAL        |                  | ANALYTE      | EXTR.<br>CONC. | RESULTS       | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|------------|------------------|--------------|----------------|---------------|------------------------|---------------|---------------|-------------|-------|-------------------|
| SAMPLE     | <u>C134928</u>   | Aroclor-1016 | <u>60L</u>     | <u>60L</u>    | <u>mg/kg</u>           | <u>1.0</u>    |               |             |       |                   |
| QA/QC      |                  | Aroclor-1221 | <u>↓</u>       | <u>↓</u>      |                        | <u>5.0</u>    |               |             |       |                   |
| TYPE       |                  | Aroclor-1232 | <u>↓</u>       | <u>↓</u>      |                        | <u>1.0</u>    |               |             |       |                   |
| PREP       |                  | Aroclor-1242 | <u>0.352</u>   | <u>18 *</u>   |                        | <u>1.0</u>    |               |             |       |                   |
| DATE       | <u>12-2-91</u>   | Aroclor-1248 | <u>60L</u>     | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
| ANALYST    | <u>DAE /3623</u> | Aroclor-1254 | <u>0.734</u>   | <u>37</u>     |                        | <u>1.0</u>    |               |             |       |                   |
| PREP       |                  | Aroclor-1260 | <u>0.197</u>   | <u>9.8</u>    |                        | <u>1.0</u>    |               |             |       |                   |
| PAGE #     | <u>5 230</u>     | Aroclor-1262 | <u>60L</u>     | <u>60L</u>    |                        | <u>1.0</u>    |               |             |       |                   |
| IN. VOL.   |                  | <u>DCB</u>   |                | <u>0.0408</u> | <u>↓</u>               | <u>0.01</u>   | <u>0.050</u>  | <u>122</u>  |       |                   |
| OR WT.     | <u>10.02g</u>    |              |                |               |                        |               |               |             |       |                   |
| EFFECTIVE  |                  |              |                |               |                        |               |               |             |       |                   |
| FINAL VOL. | <u>500 mL</u>    |              |                |               |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

\* Comment: 1242 is degraded

15

Test code: 0301.2

## CLP, GAS CHROMATOGRAPHY

CALCULATOR LAT /1022DATE OF RUN 12-7-91REVIEWER: Ym /1023

RECORDER: \_\_\_\_\_

INSTRUMENT GC ECD 9DATE: 12 / 12 / 91

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

Instr # 25 cl 9

| VAL |            | ANALYTE          | EXTR.<br>CONC. | RESULTS      | mg/kg<br>µg/l<br>UNITS | DET.<br>LIMIT | TRUE<br>VALUE | %<br>RECOV. | REPL. | REPLIC.<br>1 CONC |
|-----|------------|------------------|----------------|--------------|------------------------|---------------|---------------|-------------|-------|-------------------|
| —   | SAMPLE     | <u>RCS</u>       |                |              | <u>mg/kg</u>           | <u>1.0</u>    |               |             |       |                   |
|     | QA/QC      | Aroclor-1016     |                |              |                        | <u>5.0</u>    |               |             |       |                   |
|     | TYPE       | <u>ICV01</u>     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     | PREP       | Aroclor-1221     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     | DATE       | <u>12- -91</u>   |                | <u>0.449</u> |                        | <u>1.0</u>    | <u>0.450</u>  | <u>100%</u> |       |                   |
|     |            | Aroclor-1232     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1242     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1248     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     |            | Aroclor-1254     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     | ANALYST    | <u>DAF /3622</u> |                | <u>0.469</u> |                        | <u>1.0</u>    | <u>0.450</u>  | <u>104%</u> |       |                   |
|     | PREP       | Aroclor-1260     |                |              |                        | <u>1.0</u>    |               |             |       |                   |
|     | PAGE #     | <u>5 230</u>     |                |              |                        | <u>0.01</u>   | <u>0.050</u>  |             |       |                   |
|     | IN. VOL.   |                  |                |              |                        |               |               |             |       |                   |
|     | OR WT.     |                  |                |              |                        |               |               |             |       |                   |
|     | EFFECTIVE  |                  |                |              |                        |               |               |             |       |                   |
|     | FINAL VOL. | <u>500 mL</u>    |                |              |                        |               |               |             |       |                   |

REFERENCE NO. 0301.2 3071

Test code: 0301.2

2.634  
3.450

5.767 TCA 4000

6.833  
7.258  
7.972

8.836

9.219  
9.766  
10.237  
9.520

10.922 555 1245 1.00

11.080  
11.383  
11.196

12.460

13.93854

15.384

14.525

15.019.759

15.041

15.948

16.366

17.231

16.877

17.051 17.722

18.020

19.236

19.838

20.593

21.603 21.544

22.012

22.470

22.810

23.762

11:080

12:080

13:080

14:080

15:080

16:080

17:080

18:080

19:080

20:080

21:080

22:080

23:080

24:080

25:080

26:080

27:080

28:080

29:080

30:080

31:080

32:080

33:080

34:080

35:080

36:080

37:080

38:080

39:080

40:080

41:080

42:080

43:080

44:080

45:080

46:080

47:080

48:080

49:080

50:080

51:080

52:080

53:080

54:080

55:080

56:080

57:080

58:080

59:080

60:080

61:080

62:080

63:080

26.229

24.672 0.0500

Sample Name : D709 HIGH

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D709 HIGH

Result File : /DATA/LOOP/RESULT/PCB\_3071\_001.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 3:51:58

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area    | Amount     | Name |
|---------|---------|------------|------|
| 5.77    | 390237  | .120       | TCX  |
| 9.52 A  | 1820219 | 3.595      | 1248 |
| 18.99 B | 3324017 | 164255.400 | 1260 |
| 24.67   | 389496  | 389496.200 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .61     | 211814 | BV   | .3145  |      |
| 2.63    | 1830   | BV   | .0003  |      |
| 3.45    | 5708   | BV   | .0011  |      |
| 5.77    | 390237 | PV   | .1202  | TCX  |
| 6.83    | 9410   | BV   | .0018  |      |
| 7.26    | 11243  | PV   | .0021  |      |
| 7.97    | 5522   | BB   | .0010  |      |
| 8.84    | 158724 | BV   | .0295  |      |
| 9.22    | 6422   | VV   | .0012  |      |
| 9.52 A  | 93392  | VV   | .0433  | 1248 |
| 9.77    | 1858   | VV   | .0003  |      |
| 10.24   | 18009  | VV   | .0033  |      |
| 10.56 A | 403898 | VV   | .1777  | 1248 |
| 10.92 A | 138876 | VV   | .0548  | 1248 |
| 11.20 A | 85912  | VV   | .0399  | 1248 |
| 11.38 A | 53032  | VV   | .0136  | 1248 |
| 11.68   | 24616  | VV   | .0046  |      |
| 11.92 A | 220777 | VV   | .0869  | 1248 |
| 12.07 A | 180318 | VV   | .0398  | 1248 |
| 12.17 A | 186706 | VV   | 3.0114 | 1248 |
| 12.46   | 5563   | VV   | .0010  |      |
| 12.65   | 255116 | VV   | .0475  |      |
| 12.76   | 142209 | VV   | .0265  |      |
| 13.09   | 340331 | VV   | .0633  |      |
| 13.38   | 71900  | VV   | .0134  |      |
| 13.65   | 7980   | VV   | .0015  |      |
| 13.85   | 13269  | VV   | .0025  |      |
| 13.99 A | 174814 | VV   | .0383  | 1248 |
| 14.14 A | 282494 | VV   | .0889  | 1248 |
| 14.27   | 517851 | VV   | .0963  |      |
| 14.53   | 44048  | VV   | .0082  |      |
| 14.86   | 274849 | VV   | .0511  |      |
| 15.04   | 113506 | VV   | .0211  |      |
| 15.19   | 278473 | VV   | .0518  |      |
| 15.37   | 87165  | VV   | .0162  |      |
| 15.60   | 7092   | VV   | .0013  |      |

Sample Name : D709 HIGH

Result File : /DATA/LOOP/RESULT/PCB\_3071\_001.RES

| RT      | Area   | Code | Amount      | Name   |
|---------|--------|------|-------------|--------|
| 15.76   | 13852  | VV   | .0026       |        |
| 15.95   | 69682  | VV   | .0130       |        |
| 16.14   | 130994 | VV   | .0244       |        |
| 16.28   | 55728  | VV   | .0104       |        |
| 16.37   | 90312  | VV   | .0168       |        |
| 16.50   | 276816 | VV   | .0515       |        |
| 16.88   | 36044  | VV   | .0067       |        |
| 16.97   | 202872 | VV   | .0377       |        |
| 17.13   | 140759 | VV   | .0262       |        |
| 17.29   | 9905   | VV   | .0018       |        |
| 17.40   | 593721 | VV   | .1104       |        |
| 17.72   | 39945  | VV   | .0074       |        |
| 17.85   | 23409  | VV   | .0044       |        |
| 18.04   | 86965  | VV   | .0162       |        |
| 18.23   | 774143 | VV   | .1440       |        |
| 18.59   | 319635 | VV   | .0595       |        |
| 18.83   | 79276  | VV   | .0147       |        |
| 18.99 B | 724766 | VV   | .2684       | 1260   |
| 19.26   | 91000  | VV   | .0169       |        |
| 19.40   | 15515  | VV   | .0029       |        |
| 19.47 B | 311558 | VV   | .1133       | 1260   |
| 19.60 B | 179634 | VV   | .1054       | 1260   |
| 19.70   | 61259  | VV   | .0114       |        |
| 19.77   | 17664  | VV   | .0033       |        |
| 19.86   | 56618  | VV   | .0105       |        |
| 20.05 B | 316013 | VV   | .0926       | 1260   |
| 20.18 B | 179415 | VV   | .0580       | 1260   |
| 20.29 B | 164229 | VV   | 164229.0000 | 1260   |
| 20.47   | 40331  | VV   | .0075       |        |
| 20.59   | 66480  | VV   | .0124       |        |
| 20.74 B | 707311 | VV   | .3925       | 1260   |
| 20.89   | 24071  | VV   | .0045       |        |
| 20.99   | 31665  | VV   | .0059       |        |
| 21.27   | 2742   | VV   | .0005       |        |
| 21.38 B | 380074 | VV   | .0803       | 1260 - |
| 21.51   | 15327  | VV   | .0029       |        |
| 21.59 B | 154238 | VV   | 25.1862     | 1260   |
| 21.70 B | 206778 | VV   | .0814       | 1260   |
| 22.01   | 14241  | VV   | .0026       |        |
| 22.32   | 78009  | VV   | .0145       |        |
| 22.48   | 7500   | VV   | .0014       |        |
| 22.80   | 157608 | PV   | .0293       |        |
| 22.92   | 14931  | VV   | .0028       |        |
| 23.76   | 41860  | BV   | .0078       |        |
| 24.67   | 389496 | BB   | 389496.2000 | DCB    |
| 26.23   | 2279   | BV   | .0004       |        |

Total Area : 12221636 Total mg/L : 553756.700

Report Time : Mon Dec 9, 1991 11:32:03 am  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

.618

1.313

3.468

5.784 TCM 0.050

6.858  
7.275  
7.988

8.852

9.233  
9.535  
10.252

10.570 1245 0.500

11.397 11.210 940  
11.692

12.000 12.181 11.931

12.776 12.668 13.104

13.394  
13.864

14.001 14.155

14.535  
14.950  
15.000

14.872  
15.136

15.957  
16.145

16.506

16.884 17.138

16.977  
17.405

17.838 18.049

18.233

18.638 19.268

18.596  
19.000

19.001

19.488 1260 0.500

20.000 20.398

20.059

20.992

20.741

21.511 21.703

21.382

22.015 22.321

22.801

23.764

24.674 0.48 0.050

26.229

Sample Name : D710 MED

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D710 MED

Result File : /DATA/LOOP/RESULT/PCB\_3071\_002.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 4:35:38

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area    | Amount     | Name |
|-------|---|---------|------------|------|
| 5.78  |   | 391836  | .121       | TCX  |
| 9.53  | A | 940767  | 1.898      | 1248 |
| 19.00 | B | 1680509 | 82016.310  | 1260 |
| 24.67 |   | 370273  | 370273.500 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .62     | 171223 | BV   | .2543  |      |
| 1.31    | 2434   | PB   | .0005  |      |
| 3.47    | 10766  | BV   | .0020  |      |
| 5.78    | 391836 | BV   | .1207  | TCX  |
| 6.86    | 4186   | VV   | .0008  |      |
| 7.27    | 6108   | VV   | .0011  |      |
| 7.99    | 3018   | BB   | .0006  |      |
| 8.85    | 86967  | BV   | .0162  |      |
| 9.23    | 3331   | VV   | .0006  |      |
| 9.53 A  | 49194  | PV   | .0228  | 1248 |
| 9.78    | 1857   | VV   | .0003  |      |
| 10.25   | 9088   | VV   | .0017  |      |
| 10.57 A | 203565 | VV   | .0896  | 1248 |
| 10.94 A | 73045  | VV   | .0288  | 1248 |
| 11.21 A | 43408  | VV   | .0202  | 1248 |
| 11.40 A | 28187  | VV   | .0072  | 1248 |
| 11.69   | 12439  | VV   | .0023  |      |
| 11.93 A | 120519 | VV   | .0475  | 1248 |
| 12.08 A | 96671  | VV   | .0213  | 1248 |
| 12.18 A | 99037  | VV   | 1.5974 | 1248 |
| 12.67   | 133387 | VV   | .0248  |      |
| 12.78   | 73871  | VV   | .0137  |      |
| 13.10   | 173170 | VV   | .0322  |      |
| 13.39   | 36914  | VV   | .0069  |      |
| 13.66   | 4168   | VV   | .0008  |      |
| 13.86   | 6532   | VV   | .0012  |      |
| 14.00 A | 85741  | VV   | .0188  | 1248 |
| 14.15 A | 141402 | VV   | .0445  | 1248 |
| 14.29   | 266896 | VV   | .0496  |      |
| 14.53   | 25558  | VV   | .0048  |      |
| 14.87   | 127136 | VV   | .0236  |      |
| 15.05   | 60729  | VV   | .0113  |      |
| 15.20   | 149372 | VV   | .0278  |      |
| 15.38   | 47056  | VV   | .0088  |      |
| 15.61   | 4384   | VV   | .0008  |      |
| 15.77   | 7516   | VV   | .0014  |      |

Sample Name : D710 MED

Result File : /DATA/LOOP/RESULT/PCB\_3071\_002.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 15.96   | 35612  | VV   | .0066       |      |
| 16.15   | 64561  | VV   | .0120       |      |
| 16.29   | 27304  | VV   | .0051       |      |
| 16.37   | 48825  | VV   | .0091       |      |
| 16.51   | 138804 | VV   | .0258       |      |
| 16.88   | 17504  | VV   | .0033       |      |
| 16.98   | 106429 | VV   | .0198       |      |
| 17.14   | 73553  | VV   | .0137       |      |
| 17.30   | 4904   | VV   | .0009       |      |
| 17.40   | 313406 | VV   | .0583       |      |
| 17.73   | 21259  | VV   | .0040       |      |
| 17.86   | 12611  | VV   | .0023       |      |
| 18.05   | 44668  | VV   | .0083       |      |
| 18.23   | 409261 | VV   | .0761       |      |
| 18.60   | 163075 | VV   | .0303       |      |
| 18.83   | 41996  | VV   | .0078       |      |
| 19.00 B | 366934 | VV   | .1359       | 1260 |
| 19.26   | 50200  | VV   | .0093       |      |
| 19.40   | 8533   | VV   | .0016       |      |
| 19.48 B | 164441 | VV   | .0598       | 1260 |
| 19.61 B | 92794  | VV   | .0545       | 1260 |
| 19.71   | 30959  | VV   | .0058       |      |
| 19.77   | 8667   | VV   | .0016       |      |
| 19.86   | 29701  | VV   | .0055       |      |
| 20.06 B | 161027 | VV   | .0472       | 1260 |
| 20.19 B | 93044  | VV   | .0301       | 1260 |
| 20.30 B | 82003  | VV   | 82002.8400  | 1260 |
| 20.47   | 21906  | VV   | .0041       |      |
| 20.60   | 33404  | VV   | .0062       |      |
| 20.74 B | 355735 | VV   | .1974       | 1260 |
| 20.89   | 14437  | VV   | .0027       |      |
| 20.99   | 18967  | VV   | .0035       |      |
| 21.39 B | 181046 | VV   | .0382       | 1260 |
| 21.51   | 8453   | VV   | .0016       |      |
| 21.59 B | 78716  | VV   | 12.8538     | 1260 |
| 21.70 B | 104770 | VV   | .0413       | 1260 |
| 22.02   | 7509   | VV   | .0014       |      |
| 22.32   | 38124  | VV   | .0071       |      |
| 22.48   | 4127   | VV   | .0008       |      |
| 22.80   | 74979  | PV   | .0139       |      |
| 22.92   | 8232   | VV   | .0015       |      |
| 23.76   | 21037  | BV   | .0039       |      |
| 24.67   | 370273 | BB   | 370273.5000 | DCB  |
| 26.23   | 2143   | BV   | .0004       |      |

Total Area : 6716644 Total mg/L : 452292.600

Report Time : Mon Dec 9, 1991 11:46:52 am

ethod : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

.617

1.323

2.638

3.460

5.778 TCA 0.05

6.852  
7.265

8.849

9.773  
10.245

10.566 124% 0.100

11.110  
11.687

12.201  
12.716

13.101

13.390  
13.860

13.998

14.154 14.283

15.047  
15.197

15.762  
16.180  
16.504

16.880  
17.619

17.403

18.044

18.231

18.823  
18.999

1360 0.100

19.192  
19.605  
19.477

20.056  
20.564

20.739

21.502  
21.788  
21.385

22.010  
22.316  
22.923

23.759

24.669 0.05

26.223

Sample Name : D711 LOW

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D711 LOW

Result File : /DATA/LOOP/RESULT/PCB\_3071\_003.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 5:19:17

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area   | Amount     | Name |
|-------|---|--------|------------|------|
| 5.78  |   | 391169 | .120       | TCX  |
| 9.53  | A | 256449 | .515       | 1248 |
| 19.00 | B | 350306 | 17521.130  | 1260 |
| 24.67 |   | 366975 | 366974.700 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .62     | 124275 | BV   | .1845  |      |
| 1.32    | 2190   | PB   | .0004  |      |
| 2.64    | 1953   | BV   | .0004  |      |
| 3.46    | 15422  | BV   | .0029  |      |
| 5.78    | 391169 | BV   | .1205  | TCX  |
| 6.85    | 3938   | VV   | .0007  |      |
| 7.27    | 1864   | BV   | .0003  |      |
| 8.85    | 24439  | BV   | .0045  |      |
| 9.53 A  | 14032  | BV   | .0065  | 1248 |
| 9.77    | 1815   | VV   | .0003  |      |
| 10.25   | 3512   | BV   | .0007  |      |
| 10.57 A | 54178  | VV   | .0238  | 1248 |
| 10.93 A | 20860  | VV   | .0082  | 1248 |
| 11.20 A | 13352  | VV   | .0062  | 1248 |
| 11.39 A | 7522   | VV   | .0019  | 1248 |
| 11.69   | 3387   | VV   | .0006  |      |
| 11.93 A | 33460  | VV   | .0132  | 1248 |
| 12.08 A | 26586  | VV   | .0059  | 1248 |
| 12.18 A | 26810  | VV   | .4324  | 1248 |
| 12.67   | 36311  | VV   | .0068  |      |
| 12.77   | 21565  | VV   | .0040  |      |
| 13.10   | 46095  | VV   | .0086  |      |
| 13.39   | 10268  | VV   | .0019  |      |
| 13.86   | 1744   | VV   | .0003  |      |
| 14.00 A | 22063  | VV   | .0048  | 1248 |
| 14.15 A | 37586  | VV   | .0118  | 1248 |
| 14.28   | 68420  | VV   | .0127  |      |
| 14.53   | 7578   | VV   | .0014  |      |
| 14.87   | 32497  | VV   | .0060  |      |
| 15.05   | 15532  | VV   | .0029  |      |
| 15.20   | 36680  | VV   | .0068  |      |
| 15.38   | 12327  | VV   | .0023  |      |
| 15.76   | 1858   | VV   | .0003  |      |
| 15.95   | 8980   | VV   | .0017  |      |
| 16.14   | 15574  | VV   | .0029  |      |
| 16.28   | 6826   | VV   | .0013  |      |

Sample Name : D711 LOW

Result File : /DATA/LOOP/RESULT/PCB\_3071\_003.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 16.37   | 10853  | VV   | .0020       |      |
| 16.50   | 32007  | VV   | .0060       |      |
| 16.88   | 4255   | PV   | .0008       |      |
| 16.97   | 23121  | VV   | .0043       |      |
| 17.14   | 15671  | VV   | .0029       |      |
| 17.40   | 73047  | VV   | .0136       |      |
| 17.72   | 4591   | VV   | .0009       |      |
| 17.85   | 2501   | VV   | .0005       |      |
| 18.04   | 8988   | VV   | .0017       |      |
| 18.23   | 93157  | VV   | .0173       |      |
| 18.60   | 34857  | VV   | .0065       |      |
| 18.83   | 9105   | VV   | .0017       |      |
| 19.00 B | 75292  | VV   | .0279       | 1260 |
| 19.26   | 11560  | VV   | .0022       |      |
| 19.40   | 1905   | VV   | .0004       |      |
| 19.48 B | 36940  | VV   | .0134       | 1260 |
| 19.61 B | 19964  | VV   | .0117       | 1260 |
| 19.70   | 8617   | VV   | .0016       |      |
| 19.86   | 6477   | VV   | .0012       |      |
| 20.06 B | 34023  | VV   | .0100       | 1260 |
| 20.18 B | 19871  | VV   | .0064       | 1260 |
| 20.29 B | 17518  | VV   | 17518.2600  | 1260 |
| 20.46   | 4874   | VV   | .0009       |      |
| 20.59   | 7006   | VV   | .0013       |      |
| 20.74 B | 72862  | VV   | .0404       | 1260 |
| 20.88   | 3327   | VV   | .0006       |      |
| 20.99   | 4451   | VV   | .0008       |      |
| 21.39 B | 34983  | VV * | .0074       | 1260 |
| 21.50   | 1823   | VV   | .0003       |      |
| 21.59 B | 16798  | VV * | 2.7431      | 1260 |
| 21.70 B | 22055  | VV * | .0087       | 1260 |
| 22.01   | 1465   | VV   | .0003       |      |
| 22.32   | 7552   | PV * | .0014       |      |
| 22.80   | 15732  | BV * | .0029       |      |
| 22.91   | 2594   | VB   | .0005       |      |
| 23.76   | 6740   | BV * | .0013       |      |
| 24.67   | 366975 | BB   | 366974.7000 | DCB  |
| 26.22   | 2138   | BV   | .0004       |      |

\* used for 1254/1260 mixed  
103562

Total Area : 2268366 Total mg/L : 384496.700

Report Time : Mon Dec 9, 1991 12:50:30 pm  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

.623

2.637

3.459

5.778 Tc x 0.05

6.852

8.851

9.776

10.568 1248 0.050

11.100

11.328

11.687

12.070

12.276

12.766

13.103

13.390

14.000

14.155

14.290

15.000

15.197

15.352

15.503

15.653

15.803

16.193

17.404

18.044

18.232

18.597

19.000

19.478

19.657

20.591

20.740

21.387

22.317

22.799

23.760

24.669 0.05 0.050

26.224

Sample Name : D712 VERY LOW

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D712 VERY LOW

Result File : /DATA/LOOP/RESULT/PCB\_3071\_004.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 6:03:02

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 5.78    | 394424 | .121       | TCX  |
| 9.53 A  | 106452 | .219       | 1248 |
| 19.00 B | 186164 | 9270.697   | 1260 |
| 24.67   | 370763 | 370763.100 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .62     | 115398 | BV   | .1714  |      |
| 2.64    | 1856   | BV   | .0003  |      |
| 3.46    | 5418   | BV   | .0010  |      |
| 5.78    | 394424 | BV   | .1215  | TCX  |
| 6.85    | 4293   | BV   | .0008  |      |
| 8.85    | 10504  | BV   | .0020  |      |
| 9.53 A  | 5761   | BV   | .0027  | 1248 |
| 9.78    | 1839   | VV   | .0003  |      |
| 10.57 A | 22152  | PV   | .0097  | 1248 |
| 10.94 A | 8399   | VV   | .0033  | 1248 |
| 11.21 A | 4899   | VV   | .0023  | 1248 |
| 11.39 A | 3234   | VV   | .0008  | 1248 |
| 11.69   | 1406   | VV   | .0003  |      |
| 11.93 A | 15025  | VV   | .0059  | 1248 |
| 12.08 A | 11377  | VV   | .0025  | 1248 |
| 12.18 A | 11490  | VV   | .1853  | 1248 |
| 12.67   | 15545  | VV   | .0029  |      |
| 12.77   | 8388   | VV   | .0016  |      |
| 13.10   | 18883  | VV   | .0035  |      |
| 13.39   | 3932   | VV   | .0007  |      |
| 14.00 A | 8963   | VV   | .0020  | 1248 |
| 14.16 A | 15151  | VV   | .0048  | 1248 |
| 14.29   | 30133  | VV   | .0056  |      |
| 14.53   | 2784   | VV   | .0005  |      |
| 14.87   | 12403  | VV   | .0023  |      |
| 15.05   | 6691   | VV   | .0012  |      |
| 15.20   | 17296  | VV   | .0032  |      |
| 15.37   | 4834   | VV   | .0009  |      |
| 15.95   | 3722   | PV   | .0007  |      |
| 16.14   | 6707   | VV   | .0012  |      |
| 16.28   | 2817   | VV   | .0005  |      |
| 16.37   | 5645   | VV   | .0011  |      |
| 16.50   | 14353  | VV   | .0027  |      |
| 16.88   | 1647   | PV   | .0003  |      |
| 16.97   | 11966  | VV   | .0022  |      |
| 17.14   | 8030   | VV   | .0015  |      |

Sample Name : D712 VERY LOW  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_004.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 17.40   | 37310  | VV   | .0069       |      |
| 17.72   | 2508   | VV   | .0005       |      |
| 18.04   | 4593   | PV   | .0009       |      |
| 18.23   | 47873  | VV   | .0089       |      |
| 18.60   | 18488  | VV   | .0034       |      |
| 18.83   | 4934   | VV   | .0009       |      |
| 19.00 B | 38512  | VV   | .0143       | 1260 |
| 19.25   | 6429   | VV   | .0012       |      |
| 19.48 B | 20705  | VV   | .0075       | 1260 |
| 19.61 B | 10615  | VV   | .0062       | 1260 |
| 19.70   | 4571   | VV   | .0009       |      |
| 19.86   | 3677   | VV   | .0007       |      |
| 20.06 B | 17866  | VV   | .0052       | 1260 |
| 20.18 B | 10512  | VV   | .0034       | 1260 |
| 20.29 B | 9269   | VV   | 9269.1890   | 1260 |
| 20.59   | 3754   | VV   | .0007       |      |
| 20.74 B | 39517  | VV   | .0219       | 1260 |
| 20.99   | 2442   | VV   | .0005       |      |
| 21.39 B | 18955  | VV   | .0040       | 1260 |
| 21.59 B | 8828   | VV   | 1.4416      | 1260 |
| 21.70 B | 11384  | VV   | .0045       | 1260 |
| 22.32   | 4017   | BV   | .0007       |      |
| 22.80   | 7110   | BV   | .0013       |      |
| 23.76   | 4327   | BV   | .0008       |      |
| 24.67   | 370763 | BB   | 370763.1000 | DCB  |
| 26.22   | 2114   | BV   | .0004       |      |

Total Area : 1528442 Total mg/L : 380034.300

Report Time : Mon Dec 9, 1991 1:02:43 pm  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

.596

2.637

3.461

5.779 7.4x 0.050

~~6.850~~ 6.88  
~~7.064~~

7.267

7.984

8.699

9.227

8.850

9.527

~~10.032~~

10.249

10.16 0.500

10.931<sup>10</sup> 566

~~11.890~~ 11.891

11.207

~~12.482~~

~~12.207~~ 11.930

12.17666

13.101

~~13.882~~

13.392

14.001

14.156

~~14.882~~

23.762

24.672 0.05 0.050

26.226

Sample Name : D702 1016

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCB\_3071\_005.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 6:46:43

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT     | Area   | Amount     | Name |
|--------|--------|------------|------|
| 5.78   | 393835 | .121       | TCX  |
| 9.53 A | 949572 | 1.559      | 1248 |
| 24.67  | 350460 | 350459.600 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                 |
|---------|--------|------|--------|----------------------|
| .60     | 976068 | BV   | 1.4494 |                      |
| 2.64    | 1828   | BV   | .0003  |                      |
| 3.46    | 4878   | BV   | .0009  |                      |
| 5.78    | 393835 | PV   | .1213  | TCX                  |
| 6.69    | 13595  | BV   | .0025  |                      |
| 6.85    | 4472   | VV   | .0008  |                      |
| 7.06    | 17986  | VV   | .0033  |                      |
| 7.27    | 88957  | VV   | .0165  |                      |
| 7.98    | 12658  | BV   | .0024  |                      |
| 8.70    | 1296   | BV   | .0002  |                      |
| 8.85    | 197477 | VV   | .0367  |                      |
| 9.23    | 17570  | VV   | .0033  |                      |
| 9.53 A  | 118681 | VV   | .0550  | 1248                 |
| 9.78    | 1953   | VV   | .0004  |                      |
| 10.03   | 3110   | VV   | .0006  |                      |
| 10.25   | 41280  | VV   | .0077  |                      |
| 10.57 A | 294739 | VV   | .1297  | <del>1248</del> 1016 |
| 10.93 A | 137424 | VV   | .0542  | 1248                 |
| 11.21 A | 78348  | VV   | .0364  | 1248                 |
| 11.39 A | 31284  | VV   | .0080  | 1248                 |
| 11.69   | 13130  | VV   | .0024  |                      |
| 11.93 A | 84693  | VV   | .0333  | 1248                 |
| 12.08 A | 77870  | VV   | .0172  | 1248                 |
| 12.18 A | 75086  | VV   | 1.2111 | 1248                 |
| 12.48   | 7107   | VV   | .0013  |                      |
| 12.67   | 101459 | VV   | .0189  |                      |
| 12.77   | 74510  | VV   | .0139  |                      |
| 13.10   | 130419 | VV   | .0243  |                      |
| 13.39   | 30967  | VV   | .0058  |                      |
| 13.66   | 4946   | VV   | .0009  |                      |
| 13.86   | 3472   | VV   | .0006  |                      |
| 14.00 A | 19895  | VV   | .0044  | 1248                 |
| 14.16 A | 31552  | VV   | .0099  | 1248                 |
| 14.29   | 42422  | VV   | .0079  |                      |
| 14.53   | 7760   | VV   | .0014  |                      |
| 14.87   | 4422   | VV   | .0008  |                      |
| 15.05   | 5513   | VV   | .0010  |                      |

Sample Name : D702 1016  
Result File : /DATA/LOOP/RESULT/PCB\_3071\_005.RES

| RT    | Area   | Code | Amount      | Name |
|-------|--------|------|-------------|------|
| 15.20 | 2476   | VV   | .0005       |      |
| 23.76 | 1275   | BB   | .0002       |      |
| 24.67 | 350460 | BB   | 350459.6000 | DCB  |
| 26.23 | 2017   | BV   | .0004       |      |

Total Area : 3508888 Total mg/L : 350462.900

Report Time : Mon Dec 9, 1991 1:09:57 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

2.643  
2.981  
3.463

3.903

5.112

5.780 TCX 0.050

6.846  
7.064 6.689

7.269 1221 0.500

8.694 8.896

9.625 9.777 29

10.250 10.572

11.210 4

11.934

12.477

13.104

14.305

15.202

16.508

16.980

17.410

18.240

18.605

19.005

19.482

20.062

20.745

21.273

23.764

24.674 PCB 0.050

26.228

Sample Name : D703 1221

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D703 1221

Result File : /DATA/LOOP/RESULT/PCB\_3071\_006.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 7:30:23

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 5.78    | 401768 | .124       | TCX  |
| 9.53 A  | 30964  | .013       | 1248 |
| 19.00 B | 7735   | .003       | 1260 |
| 24.67   | 371730 | 371730.300 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name        |
|---------|--------|------|--------|-------------|
| .61     | 189331 | BV   | .2811  |             |
| 2.64    | 6854   | BV   | .0013  |             |
| 2.98    | 3546   | VV   | .0007  |             |
| 3.46    | 8803   | VV   | .0016  |             |
| 3.90 /  | 48409  | VV   | .0090  |             |
| 5.11 /  | 12152  | BV   | .0023  |             |
| 5.78    | 401768 | PV   | .1237  | TCX         |
| 6.69 /  | 44412  | BV   | .0083  |             |
| 6.85    | 4965   | VV   | .0009  |             |
| 7.06 /  | 34152  | VV   | .0064  |             |
| 7.27 /  | 120691 | VV   | .0225  | 1221 259816 |
| 8.69    | 7782   | BV   | .0014  |             |
| 8.90    | 25321  | VV   | .0047  |             |
| 9.22    | 1665   | VV   | .0003  |             |
| 9.53 A  | 7038   | PV   | .0033  | 1248        |
| 9.78    | 1784   | VV   | .0003  |             |
| 10.25   | 1383   | PV   | .0003  |             |
| 10.32   | 1820   | VV   | .0003  |             |
| 10.57 A | 12473  | PV   | .0055  | 1248        |
| 10.93 A | 6708   | VV   | .0026  | 1248        |
| 11.21 A | 3161   | PV   | .0015  | 1248        |
| 11.93 A | 1583   | BV   | .0006  | 1248        |
| 12.48   | 31497  | BV   | .0059  |             |
| 12.66   | 3492   | VV   | .0006  |             |
| 12.77   | 3969   | VV   | .0007  |             |
| 13.10   | 2169   | VV   | .0004  |             |
| 14.31   | 4025   | VV   | .0007  |             |
| 15.20   | 2790   | VV   | .0005  |             |
| 16.51   | 1990   | VV   | .0004  |             |
| 16.98   | 1548   | BV   | .0003  |             |
| 17.41   | 4756   | BV   | .0009  |             |
| 18.24   | 5116   | VV   | .0010  |             |
| 18.60   | 1971   | VV   | .0004  |             |
| 19.00 B | 3581   | VV   | .0013  | 1260        |
| 19.48 B | 1327   | PV   | .0005  | 1260        |
| 20.06 B | 1071   | BV   | .0003  | 1260        |

Sample Name : D703 1221

Result File : /DATA/LOOP/RESULT/PCB\_3071\_006.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 20.75 B | 1756   | BV   | .0010 1260  |      |
| 21.27   | 1263   | BV   | .0002       |      |
| 23.76   | 1830   | BV   | .0003       |      |
| 24.67   | 371730 | BB   | 371730.3000 | DCB  |
| 26.23   | 2179   | BV   | .0004       |      |

Total Area : 1393863 Total mg/L : 371730.800

Report Time : Mon Dec 9, 1991 1:17:12 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

.646

2.701

3.517

3.952

5.149

5.814 Tcx 0.050

6.870 6.716

7.292

8.004

8.711

8.879

9.243

9.544

1282 0.500

10.263

10.580

11.220

10.945

11.701

12.143

12.143

12.781

12.678

13.112

13.669

13.871

14.010

14.165

14.348

14.879

14.886

15.862

16.189

16.889

17.470

18.281

18.806

19.010

19.486

20.065

20.749

21.394

23.767

24.678 ocb 0.050

26.234

Sample Name : D704 1232

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D704 1232

Result File : /DATA/LOOP/RESULT/PCB\_3071\_007.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 8:14:01

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 9.54 A  | 477722 | .685       | 1248 |
| 19.01 B | 11272  | .004       | 1260 |
| 24.68   | 365280 | 365279.700 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                 |
|---------|--------|------|--------|----------------------|
| .65     | 588788 | BV   | .8743  |                      |
| 2.70    | 2728   | BV   | .0005  |                      |
| 3.52    | 8028   | BV   | .0015  |                      |
| 3.95    | 28071  | VV   | .0052  |                      |
| 5.15    | 7958   | BV   | .0015  |                      |
| 5.81    | 406441 | PV   | .0756  | Tc*                  |
| 6.72    | 28409  | BV   | .0053  |                      |
| 6.87    | 4604   | VV   | .0009  |                      |
| 7.09    | 24597  | VV   | .0046  |                      |
| 7.29    | 102873 | VV   | .0191  |                      |
| 8.00    | 5911   | BV   | .0011  |                      |
| 8.71    | 4518   | BV   | .0008  |                      |
| 8.88    | 105744 | VV   | .0197  |                      |
| 9.24    | 8402   | VV   | .0016  |                      |
| 9.54 A  | 59048  | PV   | .0274  | 1248                 |
| 9.79    | 1898   | VV   | .0004  |                      |
| 10.26   | 19838  | VV   | .0037  |                      |
| 10.58 A | 136581 | VV   | .0601  | <del>1248</del> 1232 |
| 10.95 A | 65972  | VV   | .0260  | 1248                 |
| 11.22 A | 36652  | VV   | .0170  | 1248                 |
| 11.41 A | 13353  | VV   | .0034  | 1248                 |
| 11.70   | 5792   | VV   | .0011  |                      |
| 11.94 A | 39345  | VV   | .0155  | 1248                 |
| 12.09 A | 34568  | VV   | .0076  | 1248                 |
| 12.20 A | 31682  | VV   | .5110  | 1248                 |
| 12.68   | 46577  | VV   | .0087  |                      |
| 12.78   | 35458  | VV   | .0066  |                      |
| 13.11   | 56385  | VV   | .0105  |                      |
| 13.40   | 14612  | VV   | .0027  |                      |
| 13.67   | 2762   | VV   | .0005  |                      |
| 13.87   | 2326   | VV   | .0004  |                      |
| 14.01 A | 20978  | VV   | .0046  | 1248                 |
| 14.16 A | 39544  | VV   | .0124  | 1248                 |
| 14.28   | 49898  | VV   | .0093  |                      |
| 14.55   | 7555   | VV   | .0014  |                      |
| 14.88   | 34807  | VV   | .0065  |                      |
| 15.06   | 9477   | VV   | .0018  |                      |

Sample Name : D704 1232  
Result File : /DATA/LOOP/RESULT/PCB\_3071\_007.RES

| RT           | Area          | Code      | Amount             | Name       |
|--------------|---------------|-----------|--------------------|------------|
| 15.21        | 11876         | VV        | .0022              |            |
| 15.39        | 7586          | VV        | .0014              |            |
| 15.96        | 5790          | VV        | .0011              |            |
| 16.15        | 8048          | VV        | .0015              |            |
| 16.29        | 5284          | VV        | .0010              |            |
| 16.51        | 13795         | VV        | .0026              |            |
| 16.89        | 3434          | PV        | .0006              |            |
| 17.47        | 8604          | VV        | .0016              |            |
| 18.28        | 8738          | PV        | .0016              |            |
| 18.61        | 1698          | VV        | .0003              |            |
| 19.01 B      | 3614          | VV        | .0013              | 1260       |
| 19.49 B      | 1476          | PV        | .0005              | 1260       |
| 20.07 B      | 1304          | BV        | .0004              | 1260       |
| 20.75 B      | 3217          | PV        | .0018              | 1260       |
| 21.39 B      | 1661          | VV        | .0004              | 1260       |
| 23.77        | 2089          | BV        | .0004              |            |
| <u>24.68</u> | <u>365280</u> | <u>BB</u> | <u>365279.7000</u> | <u>DCB</u> |
| 26.23        | 2093          | BV        | .0004              |            |

Total Area : 2547770 Total mg/L : 365281.500

Report Time : Mon Dec 9, 1991 1:21:48 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

.669

3.519

5.811 TCX 0.050

6.67213  
6.72085

7.288

8.000

8.866

9.238

9.537

10.041 10.257

10.574 1242 0.500

11.695

11.214

10.938

12.489 12.980 11.935

12.078

13.105

13.883

13.393

14.003

14.274

14.157

14.541

14.872

15.766 15.388 1

16.287 16.506

17.388 17.463

18.605 18.278

19.003

19.180 19.481

20.000 20.59

20.743

21.388 21.702 0

22.801

23.762

24.672 1242 0.050

26.227

Sample Name : D907 1242

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCB\_3071\_008.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 8:57:41

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 9.54 A  | 841839 | 1.235      | 1248 |
| 19.00 B | 27580  | 1329.942   | 1260 |
| 24.67   | 357512 | 357512.400 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                        |
|---------|--------|------|--------|-----------------------------|
| .67     | 151821 | BV   | .2254  |                             |
| 3.52    | 10533  | BV   | .0020  |                             |
| 5.81    | 406240 | BV   | .0756  | <i>TCF</i>                  |
| 6.71    | 11101  | BV   | .0021  |                             |
| 6.87    | 4658   | VV   | .0009  |                             |
| 7.08    | 14998  | VV   | .0028  |                             |
| 7.29    | 75330  | VV * | .0140  |                             |
| 8.00    | 10555  | BV   | .0020  |                             |
| 8.87    | 166096 | VV * | .0309  |                             |
| 9.24    | 14461  | VV   | .0027  |                             |
| 9.54 A  | 99885  | VV * | .0463  | 1248                        |
| 9.79    | 2047   | VV   | .0004  |                             |
| 10.04   | 2447   | VV   | .0005  |                             |
| 10.26   | 34315  | VV   | .0064  |                             |
| 10.57 A | 240710 | VV * | .1059  | <del>1248</del> <i>1242</i> |
| 10.94 A | 113515 | VV * | .0448  | 1248                        |
| 11.21 A | 64766  | VV * | .0301  | 1248                        |
| 11.40 A | 24416  | VV   | .0063  | 1248                        |
| 11.70   | 10469  | VV   | .0019  |                             |
| 11.94 A | 68085  | VV * | .0268  | 1248                        |
| 12.08 A | 61692  | VV * | .0136  | 1248                        |
| 12.19 A | 57680  | VV * | .9303  | 1248 -                      |
| 12.49   | 3535   | VV   | .0007  |                             |
| 12.67   | 81534  | VV   | .0152  |                             |
| 12.77   | 62919  | VV   | .0117  |                             |
| 13.11   | 102582 | VV   | .0191  |                             |
| 13.40   | 25871  | VV   | .0048  |                             |
| 13.66   | 5161   | VV   | .0010  |                             |
| 13.86   | 4474   | VV   | .0008  |                             |
| 14.00 A | 39307  | VV   | .0086  | 1248                        |
| 14.16 A | 71784  | VV   | .0226  | 1248                        |
| 14.27   | 90984  | VV   | .0169  |                             |
| 14.54   | 13762  | VV   | .0026  |                             |
| 14.87   | 64880  | VV   | .0121  |                             |
| 15.05   | 17812  | VV   | .0033  |                             |
| 15.20   | 22294  | VV   | .0041  |                             |
| 15.38   | 14911  | VV   | .0028  |                             |

*+ used for 1242/1254 mix:**947759*

Sample Name : D907 1242  
Result File : /DATA/LOOP/RESULT/PCB\_3071\_008.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 15.77   | 3207   | VV   | .0006       |      |
| 15.96   | 11769  | VV   | .0022       |      |
| 16.15   | 16448  | VV   | .0031       |      |
| 16.29   | 10506  | VV   | .0020       |      |
| 16.51   | 27629  | VV   | .0051       |      |
| 16.88   | 7437   | VV   | .0014       |      |
| 16.97   | 2166   | VV   | .0004       |      |
| 17.15   | 1814   | VV   | .0003       |      |
| 17.30   | 1265   | VV   | .0002       |      |
| 17.46   | 19218  | VV   | .0036       |      |
| 18.28   | 16312  | PV   | .0030       |      |
| 18.61   | 3387   | VV   | .0006       |      |
| 19.00 B | 5219   | VV   | .0019       | 1260 |
| 19.48 B | 3732   | PV   | .0014       | 1260 |
| 19.61 B | 1020   | VV   | .0006       | 1260 |
| 20.06 B | 2978   | BV   | .0009       | 1260 |
| 20.19 B | 1483   | VV   | .0005       | 1260 |
| 20.29 B | 1330   | VV   | 1329.5740   | 1260 |
| 20.74 B | 5323   | PV   | .0030       | 1260 |
| 21.39 B | 1930   | VV   | .0004       | 1260 |
| 21.59 B | 2199   | VV   | .3591       | 1260 |
| 21.70 B | 2367   | VV   | .0009       | 1260 |
| 22.80   | 1393   | BV   | .0003       |      |
| 23.76   | 1941   | BV   | .0004       |      |
| 24.67   | 357512 | BB   | 357512.4000 | DCB  |
| 26.23   | 2027   | BV   | .0004       |      |

Total Area : 2779238 Total mg/L : 358844.100

Report Time : Mon Dec 9, 1991 1:31:51 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

.636

3.515

5.805 Tex 0.050

6.872  
7.287  
7.997

8.862

9.255  
9.540  
10.256

10.573

11.694  
11.212  
10.944

12.002  
12.182  
11.933  
12.668  
13.106

13.864  
13.995

14.001  
14.195  
14.870

14.535  
15.252  
15.378

15.765  
15.955  
16.144  
16.504

16.882  
17.362  
17.462

18.045  
18.278

18.535  
18.003

19.121  
19.080

20.000  
20.593  
20.743

22.211  
22.388

22.318  
22.800

23.761

24.671 0.05 0.050

26.225

Sample Name : D706 1248  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D706 1248

Result File : /DATA/LOOP/RESULT/PCB\_3071\_009.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 9:41:19

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 9.54 A  | 953616 | 1.931      | 1248 |
| 19.00 B | 68364  | 3375.745   | 1260 |
| 24.67   | 352021 | 352021.200 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .64     | 303789 | BV   | .4511  |      |
| 3.52    | 4733   | BV   | .0009  |      |
| 5.80    | 397442 | BV   | .0739  | Tet  |
| 6.87    | 4605   | BV   | .0009  |      |
| 7.29    | 5590   | VV   | .0010  |      |
| 8.00    | 3108   | BB   | .0006  |      |
| 8.86    | 88483  | BV   | .0165  |      |
| 9.24    | 3386   | VV   | .0006  |      |
| 9.54 A  | 50203  | PV   | .0233  | 1248 |
| 9.78    | 2274   | VV   | .0004  |      |
| 10.26   | 9239   | VV   | .0017  |      |
| 10.57 A | 206454 | VV   | .0908  | 1248 |
| 10.94 A | 74408  | VV   | .0293  | 1248 |
| 11.21 A | 44052  | VV   | .0205  | 1248 |
| 11.40 A | 29223  | VV   | .0075  | 1248 |
| 11.69   | 13013  | VV   | .0024  |      |
| 11.93 A | 116700 | VV   | .0460  | 1248 |
| 12.08 A | 98977  | VV   | .0218  | 1248 |
| 12.18 A | 100856 | VV   | 1.6267 | 1248 |
| 12.48   | 41164  | VV   | .0077  |      |
| 12.67   | 140328 | VV   | .0261  |      |
| 12.78   | 78435  | VV   | .0146  |      |
| 13.11   | 179379 | VV   | .0334  |      |
| 13.40   | 39264  | VV   | .0073  |      |
| 13.66   | 5035   | VV   | .0009  |      |
| 13.86   | 7264   | VV   | .0014  |      |
| 14.00 A | 88330  | VV   | .0194  | 1248 |
| 14.15 A | 144413 | VV   | .0454  | 1248 |
| 14.27   | 198817 | VV   | .0370  |      |
| 14.53   | 25807  | VV   | .0048  |      |
| 14.87   | 132426 | VV   | .0246  |      |
| 15.05   | 40809  | VV   | .0076  |      |
| 15.20   | 54997  | VV   | .0102  |      |
| 15.38   | 44132  | VV   | .0082  |      |
| 15.61   | 4071   | VV   | .0008  |      |
| 15.77   | 6795   | VV   | .0013  |      |
| 15.95   | 30720  | VV   | .0057  |      |

Sample Name : D706 1248

Result File : /DATA/LOOP/RESULT/PCB\_3071\_009.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 16.14   | 43323  | VV   | .0081       |      |
| 16.28   | 32450  | VV   | .0060       |      |
| 16.50   | 79092  | VV   | .0147       |      |
| 16.88   | 23713  | VV   | .0044       |      |
| 17.16   | 4312   | VV   | .0008       |      |
| 17.30   | 3696   | VV   | .0007       |      |
| 17.46   | 59485  | VV   | .0111       |      |
| 17.80   | 5598   | VV   | .0010       |      |
| 18.05   | 1751   | VV   | .0003       |      |
| 18.28   | 52353  | PV   | .0097       |      |
| 18.60   | 6080   | VV   | .0011       |      |
| 19.00 B | 18398  | VV   | .0068       | 1260 |
| 19.25   | 2541   | VV   | .0005       |      |
| 19.48 B | 5211   | VV   | .0019       | 1260 |
| 19.61 B | 2741   | VV   | .0016       | 1260 |
| 19.71   | 3565   | VV   | .0007       |      |
| 20.06 B | 4757   | PV   | .0014       | 1260 |
| 20.19 B | 2907   | VV   | .0009       | 1260 |
| 20.30 B | 3375   | VV   | 3375.1980   | 1260 |
| 20.59   | 892    | PV   | .0002       |      |
| 20.74 B | 14388  | PV   | .0080       | 1260 |
| 21.39 B | 8718   | VV   | .0018       | 1260 |
| 21.59 B | 3200   | VV   | .5226       | 1260 |
| 21.70 B | 4670   | VV   | .0018       | 1260 |
| 22.32   | 2013   | BV   | .0004       |      |
| 22.80   | 4606   | BV   | .0009       |      |
| 23.76   | 2524   | BB   | .0005       |      |
| 24.67   | 352021 | BB   | 352021.2000 | DCB  |
| 26.22   | 2019   | BV   | .0004       |      |

Total Area : 3569122 Total mg/L : 355399.700

Report Time : Mon Dec 9, 1991 1:52:44 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT -

3.537

5.823 TCX 0.050

6.885

8.876

9.794

10.571

10.989

11.406

11.938

12.484 12.675

13.119

13.871 14.006

14.160

14.308

14.876

15.052

15.380

15.769

15.956

16.146

16.508

16.997

17.859

17.458

1254 0.500

18.050

18.244

18.876

18.992

19.002

19.802

19.708

20.188

20.061

20.318

21.270

21.388

22.318

22.801

23.762

24.674 0.050

26.228

Sample Name : D707 1254

EMS LABORATORIES, INC. INDIANAPOLIS IN  
 1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCB\_3071\_010.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Fri Dec 6, 1991 10:24:57

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area   | Amount     | Name |
|-------|---|--------|------------|------|
| 10.57 | A | 252090 | .082       | 1248 |
| 19.00 | B | 431967 | 34554.160  | 1260 |
| 24.67 |   | 269112 | 269111.900 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT    |   | Area   | Code | Amount | Name |
|-------|---|--------|------|--------|------|
| .67   |   | 304382 | BV   | .4520  |      |
| 3.54  |   | 4843   | BV   | .0009  |      |
| 5.82  |   | 382317 | BV   | .0711  | Tcf  |
| 6.89  |   | 4705   | VV   | .0009  |      |
| 8.88  |   | 2773   | BV   | .0005  |      |
| 9.79  |   | 1968   | VV   | .0004  |      |
| 10.57 | A | 5984   | BV   | .0026  | 1248 |
| 10.99 |   | 4254   | PV   | .0008  |      |
| 11.41 | A | 1289   | VV   | .0003  | 1248 |
| 11.94 | A | 104638 | BV   | .0412  | 1248 |
| 12.09 | A | 40790  | VV   | .0090  | 1248 |
| 12.48 |   | 27895  | VV   | .0052  |      |
| 12.67 |   | 73295  | VV   | .0136  |      |
| 13.12 |   | 29460  | VV   | .0055  |      |
| 13.40 |   | 7759   | VV   | .0014  |      |
| 13.87 |   | 1614   | PV   | .0003  |      |
| 14.01 | A | 21728  | VV   | .0048  | 1248 |
| 14.16 | A | 77661  | VV   | .0244  | 1248 |
| 14.31 |   | 195794 | VV   | .0364  |      |
| 14.54 |   | 37302  | VV   | .0069  |      |
| 14.88 |   | 15675  | VV   | .0029  |      |
| 15.05 |   | 116900 | VV   | .0217  |      |
| 15.20 |   | 213625 | VV   | .0397  |      |
| 15.38 |   | 96778  | VV   | .0180  |      |
| 15.61 |   | 6978   | VV   | .0013  |      |
| 15.77 |   | 17484  | VV   | .0033  |      |
| 15.96 | ✓ | 80869  | VV   | .0150  |      |
| 16.15 | ✓ | 151893 | VV   | .0283  |      |
| 16.29 |   | 47990  | VV   | .0089  |      |
| 16.37 |   | 26475  | VV   | .0049  |      |
| 16.51 | ✓ | 291263 | VV   | .0542  |      |
| 16.88 |   | 35195  | VV   | .0065  |      |
| 16.98 |   | 32974  | VV   | .0061  |      |
| 17.14 |   | 45632  | VV   | .0085  |      |
| 17.30 |   | 18380  | VV   | .0034  |      |
| 17.46 | ✓ | 298348 | VV   | .0555  |      |
| 17.73 |   | 23849  | VV   | .0044  |      |

Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCB\_3071\_010.RES

| RT        | Area   | Code | Amount      | Name         |
|-----------|--------|------|-------------|--------------|
| 17.86     | 21477  | VV   | .0040       |              |
| 18.05     | 29631  | VV   | .0055       |              |
| 18.24 ✓   | 302532 | VV   | .0563       | 1254 1399131 |
| 18.59     | 52069  | VV   | .0097       |              |
| 18.78     | 19163  | VV   | .0036       |              |
| 18.85     | 22676  | VV   | .0042       |              |
| 19.00 B ✓ | 274226 | VV   | .1016       | 1260         |
| 19.21     | 29050  | VV   | .0054       |              |
| 19.37     | 5226   | VV   | .0010       |              |
| 19.48 B   | 15616  | VV   | .0057       | 1260         |
| 19.61 B   | 11009  | VV   | .0065       | 1260         |
| 19.71     | 71751  | VV   | .0133       |              |
| 20.06 B   | 18485  | VV   | .0054       | 1260         |
| 20.19 B   | 11624  | VV   | .0038       | 1260         |
| 20.32 B   | 34554  | VV   | 34553.6300  | 1260         |
| 20.45     | 10041  | VV   | .0019       |              |
| 20.59     | 5736   | VV   | .0011       |              |
| 20.74 B   | 34220  | VV   | .0190       | 1260         |
| 20.88     | 2391   | VV   | .0004       |              |
| 21.27     | 2050   | VV   | .0004       |              |
| 21.39 B   | 26759  | VV   | .0057       | 1260         |
| 21.59 B   | 2332   | VV   | .3809       | 1260         |
| 21.70 B   | 3142   | VV   | .0012       | 1260         |
| 22.01     | 1356   | VV   | .0003       |              |
| 22.32     | 1007   | PV   | .0002       |              |
| 22.80     | 1949   | BB   | .0004       |              |
| 23.76     | 1837   | BV   | .0003       |              |
| 24.67     | 269112 | BB   | 269111.9000 | DCB          |
| 26.23     | 1535   | BV   | .0003       |              |

Total Area : 4133312 Total mg/L : 303667.100

Report Time : Mon Dec 9, 1991 2:22:38 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT -

.661

3.539

5.826 TCV 0.050

6.887

9.792

10.579

11.941

12.676

14.162

14.310

15.000

15.201

15.957

16.148

16.375

16.508

17.139

17.855

18.047

18.828

19.257

19.858

20.593

21.508

22.012

22.477

22.817

22.318

22.798

21.700

16.977

17.403

18.230

18.335

18.998

19.477

20.185

20.737

21.388

1260 0.500

23.761

24.672 0.050

26.227

Sample Name : D708 1260

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D708 1260  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_011.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)  
 Make Up Gas P-5 Argon Methane Mix (30 uL/min)  
 Carrier Gas - Hydrogen (3.5 mL/min)  
 Injected on Fri Dec 6, 1991 11:08:39

\*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area    | Amount     | Name |
|-------|---|---------|------------|------|
| 10.58 | A | 12665   | .005       | 1248 |
| 19.00 | B | 1642846 | 80626.220  | 1260 |
| 24.67 |   | 325416  | 325416.200 | DCB  |

\*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT    |   | Area   | Code | Amount     | Name |
|-------|---|--------|------|------------|------|
| .66   |   | 284233 | BV   | .4221      |      |
| 3.54  |   | 3180   | BV   | .0006      |      |
| 5.83  |   | 397009 | BV   | .0738      | Tcy  |
| 6.89  |   | 4717   | VV   | .0009      |      |
| 9.79  |   | 1925   | VV   | .0004      |      |
| 10.58 | A | 1670   | BV   | .0007      | 1248 |
| 11.94 | A | 9743   | BV   | .0038      | 1248 |
| 12.68 |   | 2018   | VV   | .0004      |      |
| 14.16 | A | 1252   | PV   | .0004      | 1248 |
| 14.31 |   | 84828  | VV   | .0158      |      |
| 15.00 |   | 22200  | VV   | .0041      |      |
| 15.20 |   | 105932 | VV   | .0197      |      |
| 15.38 |   | 5171   | VV   | .0010      |      |
| 15.96 |   | 6049   | PV   | .0011      |      |
| 16.15 |   | 23646  | VV   | .0044      |      |
| 16.37 |   | 46422  | VV   | .0086      |      |
| 16.51 |   | 64252  | VV   | .0120      |      |
| 16.98 |   | 103937 | VV   | .0193      |      |
| 17.14 |   | 73262  | VV   | .0136      |      |
| 17.40 |   | 266675 | VV   | .0496      |      |
| 17.73 |   | 18657  | VV   | .0035      |      |
| 17.85 |   | 8427   | VV   | .0016      |      |
| 18.05 |   | 43905  | VV   | .0082      |      |
| 18.23 |   | 369990 | VV   | .0688      |      |
| 18.59 |   | 162842 | VV   | .0303      |      |
| 18.83 |   | 40581  | VV   | .0075      |      |
| 19.00 | B | 359631 | VV   | .1332      | 1260 |
| 19.26 |   | 49774  | VV   | .0093      |      |
| 19.40 |   | 8444   | VV   | .0016      |      |
| 19.48 | B | 165789 | VV   | .0603      | 1260 |
| 19.61 | B | 92991  | VV   | .0546      | 1260 |
| 19.71 |   | 37096  | VV   | .0069      |      |
| 19.86 |   | 29701  | VV   | .0055      |      |
| 20.06 | B | 161085 | VV   | .0472      | 1260 |
| 20.18 | B | 92596  | VV   | .0299      | 1260 |
| 20.29 | B | 80613  | VV   | 80613.3700 | 1260 |
| 20.47 |   | 21489  | VV   | .0040      |      |

Sample Name : D708 1260

Result File : /DATA/LOOP/RESULT/PCB\_3071\_011.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 20.59   | 32904  | VV   | .0061       |      |
| 20.74 B | 345696 | VV   | .1919       | 1260 |
| 20.88   | 13610  | VV   | .0025       |      |
| 20.99   | 18148  | VV   | .0034       |      |
| 21.38 B | 171050 | VV   | .0361       | 1260 |
| 21.51   | 7903   | VV   | .0015       |      |
| 21.59 B | 75136  | VV   | 12.2692     | 1260 |
| 21.70 B | 98259  | VV   | .0387       | 1260 |
| 22.01   | 6619   | VV   | .0012       |      |
| 22.32   | 34533  | VV   | .0064       |      |
| 22.48   | 3635   | VV   | .0007       |      |
| 22.80   | 64852  | PV   | .0121       |      |
| 22.92   | 6892   | VV   | .0013       |      |
| 23.76   | 17663  | BB   | .0033       |      |
| 24.67   | 325416 | BB   | 325416.2000 | DCB  |
| 26.23   | 1842   | BV   | .0003       |      |

Total Area : 4475893 Total mg/L : 406043.200

Report Time : Mon Dec 9, 1991 2:33:44 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

.660

1.315

5.819

6.884

9.793

10.582

12.488

23.764

24.674

26.228

Sample Name : BLA 683 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : BLA 683 S230  
Result File : /DATA/LOOP/RESULT/PCB\_3071\_012.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)  
Make Up Gas P-5 Argon Methane Mix (30 uL/min)  
Carrier Gas - Hydrogen (3.5 mL/min)  
Injected on Fri Dec 6, 1991 11:52:15

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 10.58 A | 1849   | .001       | 1248 |
| 24.67   | 325063 | 325062.900 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| .66     | 329068 | BV   | .4886       |      |
| 1.32    | 4099   | PV   | .0008       |      |
| 5.82    | 380544 | PV   | .0708       | Tcx  |
| 6.88    | 4273   | BV   | .0008       |      |
| 9.79    | 1825   | BV   | .0003       |      |
| 10.58 A | 1849   | BV   | .0008       | 1248 |
| 12.49   | 3366   | BV   | .0006       |      |
| 23.76   | 1107   | BB   | .0002       |      |
| 24.67   | 325063 | BB   | 325062.9000 | DCB  |
| 26.23   | 1839   | BV   | .0003       |      |

Total Area : 1053034 Total mg/L : 325063.400

Report Time : Sat Dec 7, 1991 12:36:08 am  
Method : /DATA/LOOP/METHOD/PCB8.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

.668

5.831

6.891

9.797

10.586

11.947

12.882

14.318

15.005

15.209

15.186

15.555

16.988

17.146

16.985

17.412

17.862

18.055

18.239

18.832

18.607

19.007

19.402

19.203

19.615

19.486

19.883

20.000

20.193

20.064

20.000

20.000

20.746

21.226

21.526

21.708

21.394

22.019

22.324

22.484

22.923

22.806

23.769

24.679

26.234

Sample Name : STD 695 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : STD 695 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_013.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 12:35:53

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 10.59 A | 5759   | .002       | 1248 |
| 19.01 B | 594386 | 28358.550  | 1260 |
| 24.68   | 332506 | 332505.700 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount     | Name |
|---------|--------|------|------------|------|
| .67     | 337143 | BV   | .5006      |      |
| 5.83    | 390531 | BV   | .0726      | Tet  |
| 6.89    | 4918   | VV   | .0009      |      |
| 9.80    | 1949   | VV   | .0004      |      |
| 10.59 A | 2958   | BV   | .0013      | 1248 |
| 11.95 A | 2800   | BV   | .0011      | 1248 |
| 12.49   | 1158   | BV   | .0002      |      |
| 12.68   | 726    | PV   | .0001      |      |
| 14.32   | 29013  | VV   | .0054      |      |
| 15.01   | 5322   | VV   | .0010      |      |
| 15.21   | 33134  | VV   | .0062      |      |
| 15.96   | 1355   | BV   | .0003      |      |
| 16.16   | 6050   | VV   | .0011      |      |
| 16.38   | 17323  | VV   | .0032      |      |
| 16.52   | 17876  | VV   | .0033      |      |
| 16.99   | 39451  | PV   | .0073      |      |
| 17.15   | 26010  | VV   | .0048      |      |
| 17.41   | 98580  | VV   | .0183      |      |
| 17.73   | 6237   | VV   | .0012      |      |
| 17.86   | 2750   | VV   | .0005      |      |
| 18.06   | 15094  | VV   | .0028      |      |
| 18.24   | 135089 | VV   | .0251      |      |
| 18.61   | 60051  | VV   | .0112      |      |
| 18.83   | 14067  | VV   | .0026      |      |
| 19.01 B | 117482 | VV   | .0435      | 1260 |
| 19.26   | 18666  | VV   | .0035      |      |
| 19.41   | 3176   | VV   | .0006      |      |
| 19.49 B | 65243  | VV   | .0237      | 1260 |
| 19.61 B | 34142  | VV   | .0200      | 1260 |
| 19.71   | 10946  | VV   | .0020      |      |
| 19.87   | 11225  | VV   | .0021      |      |
| 20.06 B | 61073  | VV   | .0179      | 1260 |
| 20.19 B | 35586  | VV   | .0115      | 1260 |
| 20.30 B | 28353  | VV   | 28353.4900 | 1260 |
| 20.47   | 7850   | VV   | .0015      |      |
| 20.60   | 12205  | VV   | .0023      |      |
| 20.75 B | 127286 | VV   | .0706      | 1260 |

Sample Name : STD 695 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_013.RES

| RT             | Area          | Code      | Amount             | Name        |
|----------------|---------------|-----------|--------------------|-------------|
| 20.89          | 5280          | VV        | .0010              |             |
| 21.00          | 7205          | VV        | .0013              |             |
| 21.28          | 2127          | VV        | .0004              |             |
| <u>21.39 B</u> | <u>58955</u>  | <u>VV</u> | <u>.0124</u>       | <u>1260</u> |
| 21.51          | 2997          | VV        | .0006              |             |
| <u>21.60 B</u> | <u>29660</u>  | <u>VV</u> | <u>4.8433</u>      | <u>1260</u> |
| <u>21.71 B</u> | <u>36605</u>  | <u>VV</u> | <u>.0144</u>       | <u>1260</u> |
| 22.02          | 2344          | VV        | .0004              |             |
| 22.32          | 14253         | VV        | .0027              |             |
| 22.48          | 1501          | VV        | .0003              |             |
| 22.81          | 25658         | PV        | .0048              |             |
| 22.92          | 3428          | VB        | .0006              |             |
| 23.77          | 10296         | BV        | .0019              |             |
| <u>24.68</u>   | <u>332506</u> | <u>BB</u> | <u>332505.7000</u> | <u>DCB</u>  |
| 26.23          | 1889          | BV        | .0004              |             |

Total Area : 2317520 Total mg/L : 360864.900

Report Time : Mon Dec 9, 1991 4:15:38 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

.661

3.534

5.825

6.7833  
6.7833

7.298

8.005

9.245 8.921  
9.554

10.265

10.265

10.332

10.583

11.638

11.403

11.782

11.826

12.466

12.673

12.772

13.062

13.867

14.003

14.159

14.301

14.875

14.533

15.164

15.399

15.768

15.956

16.145

16.506

16.885

17.198

17.452

17.855

18.048

18.239

18.595

18.595

19.000

18.881

19.210

19.891

20.743

21.270

21.388

22.316

22.799

23.761

24.672

26.227

Sample Name : C134905 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134905 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_014.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 1:19:33

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area    | Amount     | Name |
|-------|---|---------|------------|------|
| 9.55  | A | 1251606 | 4.807      | 1248 |
| 19.00 | B | 250624  | 16365.320  | 1260 |
| 24.67 |   | 325574  | 325573.600 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT    |     | Area   | Code | Amount | Name                  |
|-------|-----|--------|------|--------|-----------------------|
| .66   |     | 510419 | BV   | .7579  |                       |
| 3.53  |     | 7148   | BV   | .0013  |                       |
| 5.82  |     | 409589 | PV   | .0762  | TCT                   |
| 6.72  |     | 5115   | VV   | .0010  |                       |
| 6.88  |     | 4851   | VV   | .0009  |                       |
| 7.09  |     | 8836   | VV   | .0016  |                       |
| 7.30  | /   | 34384  | VV   | .0064  |                       |
| 8.00  |     | 103040 | BV   | .0192  |                       |
| 8.92  | ✓   | 356795 | VV   | .0664  |                       |
| 9.24  |     | 126612 | VV   | .0236  |                       |
| 9.55  | A ✓ | 213288 | VV   | .0988  | 1248                  |
| 9.79  |     | 2036   | VV   | .0004  |                       |
| 9.92  |     | 5403   | VV   | .0010  |                       |
| 10.03 |     | 5374   | VV   | .0010  |                       |
| 10.26 |     | 48815  | VV   | .0091  |                       |
| 10.33 |     | 93932  | VV   | .0175  |                       |
| 10.58 | A ✓ | 305955 | VV   | .1346  | 1248 degraded 1612328 |
| 10.99 | ✓   | 70408  | VV   | .0131  |                       |
| 11.16 | ✓   | 74272  | VV   | .0138  |                       |
| 11.40 | A   | 36590  | VV   | .0094  | 1248                  |
| 11.70 |     | 7467   | VV   | .0014  |                       |
| 11.94 | A ✓ | 144765 | VV   | .0570  | 1248 -                |
| 12.08 | A ✓ | 137192 | VV   | .0303  | 1248                  |
| 12.17 | A ✓ | 275269 | VV   | 4.4399 | 1248                  |
| 12.49 |     | 3645   | VV   | .0007  |                       |
| 12.67 |     | 76732  | VV   | .0143  |                       |
| 12.77 |     | 70932  | VV   | .0132  |                       |
| 13.06 |     | 221692 | VV   | .0412  |                       |
| 13.40 |     | 9849   | VV   | .0018  |                       |
| 13.49 |     | 15763  | VV   | .0029  |                       |
| 13.66 |     | 14017  | VV   | .0026  |                       |
| 13.87 |     | 22534  | VV   | .0042  |                       |
| 14.00 | A   | 64190  | VV   | .0141  | 1248                  |
| 14.16 | A   | 74357  | VV   | .0234  | 1248                  |
| 14.30 |     | 221296 | VV   | .0412  |                       |
| 14.53 |     | 62894  | VV   | .0117  |                       |
| 14.87 |     | 29204  | VV   | .0054  |                       |

Sample Name : C134905 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_014.RES

| RT        | Area   | Code | Amount      | Name        |
|-----------|--------|------|-------------|-------------|
| 15.00     | 64030  | VV   | .0119       |             |
| 15.04     | 58178  | VV   | .0108       |             |
| 15.20     | 161496 | VV   | .0300       |             |
| 15.38     | 105900 | VV   | .0197       |             |
| 15.61     | 16093  | VV   | .0030       |             |
| 15.77     | 20810  | VV   | .0039       |             |
| 15.96 .   | 53919  | VV   | .0100       |             |
| 16.14 .   | 60316  | VV   | .0112       |             |
| 16.29     | 22495  | VV   | .0042       |             |
| 16.37     | 19469  | VV   | .0036       |             |
| 16.51 .   | 210445 | VV   | .0391       |             |
| 16.88     | 11373  | VV   | .0021       |             |
| 16.98     | 29057  | VV   | .0054       |             |
| 17.14     | 35042  | VV   | .0065       |             |
| 17.30     | 17512  | VV   | .0033       |             |
| 17.41     | 90669  | VV   | .0169       |             |
| 17.46 .   | 110391 | VV   | .0205       |             |
| 17.73     | 15624  | VV   | .0029       |             |
| 17.85     | 12235  | VV   | .0023       |             |
| 18.05     | 30521  | VV   | .0057       |             |
| 18.24 .   | 166105 | VV   | .0309       | 1254 729269 |
| 18.59     | 25816  | VV   | .0048       |             |
| 18.78     | 8538   | VV   | .0016       |             |
| 18.85     | 11924  | VV   | .0022       |             |
| 19.00 B . | 128093 | VV   | .0474       | 1260        |
| 19.21     | 8020   | VV   | .0015       |             |
| 19.25     | 7120   | VV   | .0013       |             |
| 19.48 B   | 19497  | VV   | .0071       | 1260        |
| 19.61 B   | 7428   | VV   | .0044       | 1260        |
| 19.71     | 22508  | VV   | .0042       |             |
| 20.06 B   | 11991  | PV   | .0035       | 1260        |
| 20.19 B   | 10538  | VV   | .0034       | 1260        |
| 20.31 B   | 16364  | VV   | 16364.1800  | 1260        |
| 20.46     | 4140   | VV   | .0008       |             |
| 20.59     | 3272   | VV   | .0006       |             |
| 20.74 B   | 25598  | PV   | .0142       | 1260* 44260 |
| 21.27     | 1160   | BV   | .0002       |             |
| 21.39 B * | 17464  | VV   | .0037       | 1260        |
| 21.59 B * | 6423   | VV   | 1.0489      | 1260        |
| 21.70 B * | 7227   | VV   | .0028       | 1260        |
| 22.01     | 1002   | VV   | .0002       |             |
| 22.32 *   | 2778   | PV   | .0005       |             |
| 22.80 *   | 6263   | BV   | .0012       |             |
| 23.76 *   | 4105   | BB   | .0008       |             |
| 24.67     | 325574 | BB   | 325573.6000 | DCB         |
| 26.23     | 1860   | BV   | .0003       |             |

Total Area : 5871045 Total mg/L : 341945.200

Report Time : Mon Dec 9, 1991 4:21:38 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

3.536

5.825

6.7824  
6.8857.299

8.007

8.923

9.247

9.554

10.020

10.265

10.333

10.586

11.16810.990

11.700 11.404

11.838

12.407

12.720.673

13.883.400  
13.868

13.104

14.536

14.2883

15.050

14.874

15.769

15.399

15.956

16.145

16.884.7.139

16.978

16.507

17.859

18.049

17.489

18.846

18.598

18.237

19.401.257

19.600

19.481

19.000

20.000

20.302

20.188

20.060

20.742

21.000

21.220

21.703

21.591

21.388

22.013

22.318

22.801

23.763

24.674

26.228

Sample Name : C134905 SPI02 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134905 SPI02 S230  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_015.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)  
 Make Up Gas P-5 Argon Methane Mix (30 uL/min)  
 Carrier Gas - Hydrogen (3.5 mL/min)  
 Injected on Sat Dec 7, 1991 2:03:11

\*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area    | Amount     | Name |
|---------|---------|------------|------|
| 9.55 A  | 1488082 | 5.005      | 1248 |
| 19.00 B | 702459  | 37622.160  | 1260 |
| 24.67   | 327462  | 327462.400 | DCB  |

\*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT        | Area   | Code | Amount | Name                      |
|-----------|--------|------|--------|---------------------------|
| .67       | 539477 | BV   | .8011  |                           |
| 3.54      | 7448   | BV   | .0014  |                           |
| 5.83      | 403998 | PV   | .0751  | <i>tex</i>                |
| 6.72      | 4163   | VV   | .0008  |                           |
| 6.89      | 4933   | VV   | .0009  |                           |
| 7.10      | 7594   | VV   | .0014  |                           |
| 7.30      | 25182  | VV   | .0047  |                           |
| 8.01      | 76236  | BV   | .0142  |                           |
| 8.92      | 286692 | VV   | .0533  |                           |
| 9.25      | 96534  | VV   | .0180  |                           |
| 9.55 A /  | 177414 | VV   | .0822  | 1248                      |
| 9.79      | 2053   | VV   | .0004  |                           |
| 9.92      | 4297   | VV   | .0008  |                           |
| 10.03     | 4500   | VV   | .0008  |                           |
| 10.27     | 40916  | VV   | .0076  |                           |
| 10.33     | 69535  | VV   | .0129  |                           |
| 10.59 A / | 285624 | VV   | .1257  | 1248 <i>1242 degraded</i> |
| 10.99     | 77713  | VV   | .0145  |                           |
| 11.17     | 76168  | VV   | .0142  |                           |
| 11.40 A   | 47311  | VV   | .0121  | 1248                      |
| 11.70     | 14511  | VV   | .0027  |                           |
| 11.94 A / | 214569 | VV   | .0845  | 1248 -                    |
| 12.09 A / | 187201 | VV   | .0413  | 1248                      |
| 12.18 A / | 283907 | VV   | 4.5792 | 1248                      |
| 12.49     | 8145   | VV   | .0015  |                           |
| 12.67     | 178930 | VV   | .0333  |                           |
| 12.78     | 110806 | VV   | .0206  |                           |
| 13.10     | 335715 | VV   | .0624  |                           |
| 13.40     | 25246  | VV   | .0047  |                           |
| 13.49     | 11743  | VV   | .0022  |                           |
| 13.66     | 14980  | VV   | .0028  |                           |
| 13.87     | 24053  | VV   | .0045  |                           |
| 14.00 A   | 126887 | VV   | .0278  | 1248                      |
| 14.16 A   | 165169 | VV   | .0520  | 1248                      |
| 14.29     | 374409 | VV   | .0696  |                           |
| 14.54     | 74803  | VV   | .0139  |                           |
| 14.87     | 124313 | VV   | .0231  |                           |

Sample Name : C134905 SPI02 S230  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_015.RES

| RT      | Area   | Code | Amount      | Name           |
|---------|--------|------|-------------|----------------|
| 15.05   | 144247 | VV   | .0268       |                |
| 15.20   | 215532 | VV   | .0401       |                |
| 15.38   | 131292 | VV   | .0244       |                |
| 15.61   | 16914  | VV   | .0031       |                |
| 15.77   | 25777  | VV   | .0048       |                |
| 15.96   | 85983  | VV   | .0160       |                |
| 16.15   | 114635 | VV   | .0213       |                |
| 16.29   | 54659  | VV   | .0102       |                |
| 16.37   | 29881  | VV   | .0056       |                |
| 16.51   | 268494 | VV   | .0499       |                |
| 16.88   | 30426  | VV   | .0057       |                |
| 16.98   | 57027  | VV   | .0106       |                |
| 17.14   | 52592  | VV   | .0098       |                |
| 17.30   | 19603  | VV   | .0036       |                |
| 17.41   | 142467 | VV   | .0265       |                |
| 17.46   | 153979 | VV   | .0286       |                |
| 17.73   | 18583  | VV   | .0035       |                |
| 17.86   | 20548  | VV   | .0038       |                |
| 18.05   | 37833  | VV   | .0070       |                |
| 18.24   | 285688 | VV   | .0531       | 1254           |
| 18.60   | 72234  | VV   | .0134       |                |
| 18.85   | 31033  | VV   | .0058       |                |
| 19.00 B | 210511 | VV   | .0780       | 1260           |
| 19.26   | 28423  | VV   | .0053       |                |
| 19.40   | 3946   | VV   | .0007       |                |
| 19.48 B | 68363  | VV   | .0249       | 1260           |
| 19.61 B | 33898  | VV   | .0199       | 1260           |
| 19.71   | 29975  | VV   | .0056       |                |
| 19.86   | 11291  | VV   | .0021       |                |
| 20.06 B | 59869  | VV   | .0176       | 1260           |
| 20.19 B | 36532  | VV   | .0118       | 1260           |
| 20.30 B | 37617  | VV   | 37617.1500  | 1260           |
| 20.46   | 10367  | VV   | .0019       |                |
| 20.60   | 13330  | VV   | .0025       |                |
| 20.74 B | 128844 | VV   | .0715       | 1260* - 178703 |
| 20.89   | 4811   | VV   | .0009       |                |
| 20.99   | 6043   | VV   | .0011       |                |
| 21.27   | 2488   | VV   | .0005       |                |
| 21.39 B | 62244  | VV   | .0131       | 1260           |
| 21.51   | 2735   | VV   | .0005       |                |
| 21.59 B | 29195  | VV   | 4.7674      | 1260           |
| 21.70 B | 35387  | VV   | .0139       | 1260           |
| 22.01   | 2661   | VV   | .0005       |                |
| 22.32   | 13752  | VV   | .0026       |                |
| 22.48   | 1469   | VV   | .0003       |                |
| 22.80   | 26987  | PV   | .0050       |                |
| 22.92   | 3239   | VB   | .0006       |                |
| 23.76   | 11138  | BV   | .0021       |                |
| 24.67   | 327462 | BB   | 327462.4000 | DCB            |
| 26.23   | 1889   | BV   | .0004       |                |

internal standard Adjustment used  
 because of low injection. Adjustment factor:  
 $8900/3275 = 1.191$  (Adj. to DPS PCB)

Total Area : 7727072 Total mg/L : 365091.200

Sample Name : C134905 SPI02 S230  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_015.RES

Report Time : Mon Dec 9, 1991 4:31:20 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

2.715

3.532

5.824

6.7885 7.299

8.006

8.923

9.248

9.554

10.7829

10.266

10.333

10.585

11.16889

11.700 11.405

11.9286

12.774

12.675

13.062

13.888

13.868

14.005

14.162

14.304

14.876

14.936

15.002

15.381 15.200

15.769

15.957

16.146

16.508

16.886

17.139

16.979

17.408

17.85628

18.049

18.235

18.842

18.598

18.999

19.4089 19.258

19.609

19.480

19.855 19.700

20.299

20.187

20.059

20.688594

20.741

21.508

21.702

21.598

21.387

22.012 22.317

22.800

22.478

22.818

23.762

24.673

26.229

Sample Name : C134905 DPS02 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134905 DPS02 S230  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_016.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)  
 Make Up Gas P-5 Argon Methane Mix (30 uL/min)  
 Carrier Gas - Hydrogen (3.5 mL/min)  
 Injected on Sat Dec 7, 1991 2:46:51

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area    | Amount     | Name |
|---------|---------|------------|------|
| 9.55 A  | 1048549 | 3.997      | 1248 |
| 19.00 B | 783327  | 40801.800  | 1260 |
| 24.67   | 389959  | 389959.400 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                          |
|---------|--------|------|--------|-------------------------------|
| .66     | 531080 | BV   | .7886  |                               |
| 2.71    | 2560   | BV   | .0005  |                               |
| 3.53    | 13241  | BV   | .0025  |                               |
| 5.82    | 484023 | PV   | .0900  | TCL                           |
| 6.72    | 4352   | BV   | .0008  |                               |
| 6.89    | 5140   | VV   | .0010  |                               |
| 7.10    | 7060   | VV   | .0013  |                               |
| 7.30    | 30079  | VV   | .0056  |                               |
| 8.01    | 82573  | VV   | .0154  |                               |
| 8.92    | 292689 | VV   | .0544  |                               |
| 9.25    | 101136 | VV   | .0188  |                               |
| 9.55 A  | 167485 | VV   | .0776  | 1248                          |
| 9.79    | 2649   | VV   | .0005  |                               |
| 9.92    | 5041   | VV   | .0009  |                               |
| 10.03   | 5567   | VV   | .0010  |                               |
| 10.27   | 40382  | PV   | .0075  |                               |
| 10.33   | 75933  | VV   | .0141  |                               |
| 10.58 A | 243428 | VV   | .1071  | <del>1248</del> 1247 degraded |
| 10.99   | 62939  | VV   | .0117  |                               |
| 11.17   | 62393  | VV   | .0116  |                               |
| 11.41 A | 32525  | VV   | .0084  | 1248                          |
| 11.70   | 8468   | VV   | .0016  |                               |
| 11.94 A | 132025 | VV   | .0520  | 1248                          |
| 12.09 A | 121945 | VV   | .0269  | 1248                          |
| 12.18 A | 228862 | VV   | 3.6914 | 1248                          |
| 12.68   | 71825  | VV   | .0134  |                               |
| 12.77   | 64545  | VV   | .0120  |                               |
| 13.06   | 200186 | VV   | .0372  |                               |
| 13.40   | 10786  | VV   | .0020  |                               |
| 13.50   | 14559  | VV   | .0027  |                               |
| 13.67   | 14221  | VV   | .0026  |                               |
| 13.87   | 19971  | VV   | .0037  |                               |
| 14.01 A | 54518  | VV   | .0120  | 1248                          |
| 14.16 A | 67761  | VV   | .0213  | 1248                          |
| 14.30   | 211350 | VV   | .0393  |                               |
| 14.54   | 57288  | VV   | .0107  |                               |
| 14.88   | 28461  | VV   | .0053  |                               |

Sample Name : C134905 DPS02 S230  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_016.RES

| RT        | Area   | Code | Amount      | Name         |
|-----------|--------|------|-------------|--------------|
| 15.00     | 109265 | VV   | .0203       |              |
| 15.20     | 165113 | VV   | .0307       |              |
| 15.38     | 91520  | VV   | .0170       |              |
| 15.61     | 15532  | VV   | .0029       |              |
| 15.77     | 19982  | VV   | .0037       |              |
| 15.96     | 48642  | VV   | .0090       |              |
| 16.15     | 57354  | VV   | .0107       |              |
| 16.29     | 18895  | VV   | .0035       |              |
| 16.38     | 33560  | VV   | .0062       |              |
| 16.51     | 190281 | VV   | .0354       |              |
| 16.89     | 10379  | VV   | .0019       |              |
| 16.98     | 62801  | VV   | .0117       |              |
| 17.14     | 53644  | VV   | .0100       |              |
| 17.30     | 15316  | VV   | .0028       |              |
| 17.41     | 249604 | VV   | .0464       |              |
| 17.73     | 19966  | VV   | .0037       |              |
| 17.86     | 14351  | VV   | .0027       |              |
| 18.05     | 41223  | VV   | .0077       |              |
| 18.23     | 257822 | VV   | .0480       | 1254         |
| 18.60     | 79468  | VV   | .0148       |              |
| 18.84     | 31878  | VV   | .0059       |              |
| 19.00 B   | 217515 | VV   | .0806       | 1260         |
| 19.26     | 31087  | VV   | .0058       |              |
| 19.40     | 4727   | VV   | .0009       |              |
| 19.48 B   | 78702  | VV   | .0286       | 1260         |
| 19.61 B   | 39577  | VV   | .0232       | 1260         |
| 19.71     | 28930  | VV   | .0054       |              |
| 19.86     | 13773  | VV   | .0026       |              |
| 20.06 B   | 69809  | VV   | .0205       | 1260         |
| 20.19 B   | 42759  | VV   | .0138       | 1260         |
| 20.30 B   | 40796  | VV   | .0200       | 1260         |
| 20.46     | 11715  | VV   | .0022       |              |
| 20.59     | 15786  | VV   | .0029       |              |
| 20.74 B   | 148081 | VV   | .0822       | 1260* 204969 |
| 20.88     | 5856   | VV   | .0011       |              |
| 20.99     | 7865   | VV   | .0015       |              |
| 21.39 B * | 71512  | VV   | .0151       | 1260         |
| 21.51     | 3246   | VV   | .0006       |              |
| 21.59 B * | 33659  | VV   | 5.4964      | 1260         |
| 21.70 B * | 40917  | VV   | .0161       | 1260         |
| 22.01     | 3378   | VV   | .0006       |              |
| 22.32 *   | 15918  | VV   | .0030       |              |
| 22.48     | 1824   | VV   | .0003       |              |
| 22.80 *   | 30050  | VV   | .0056       |              |
| 22.92     | 3179   | VV   | .0006       |              |
| 23.76 *   | 12912  | BB   | .0024       |              |
| 24.67     | 389959 | BB   | 389959.4000 | DCB          |
| 26.23     | 2258   | BV   | .0004       |              |

Total Area : 6511433 Total mg/L : 430766.700

Report Time : Mon Dec 9, 1991 4:39:26 pm  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

EMS LABORATORIES, INC. INDIANAPOLIS IN

Sample Name : C134905 DPS02 S230  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_016.RES



.677

3.539

5.829 Tex 0.05

6.892

7.304

8.014

8.877

9.253

9.554

9.758

10.268

10.585 1248 0.45

10.955

11.706 11.411

12.191 11.925 0.93

12.787

12.680  
13.116

13.480

13.875

14.011

14.292  
14.880

14.511

15.059

15.388

15.207

15.774

15.965

16.154

16.514

16.892

17.145

16.984  
17.411

17.862

18.055

18.239  
18.603  
19.005

18.091

19.265

19.323 484  
20.069 1

19.800

20.000

20.744

1260 0.45

20.000

21.515

21.335 392

22.019

22.325

22.805

22.481

22.824

23.769

24.679 0.05

26.235

69

Sample Name : D714 RCS

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D714 RCS

Result File : /DATA/LOOP/RESULT/PCB\_3071\_017.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 3:30:29

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area    | Amount     | Name |
|---------|---------|------------|------|
| 9.55 A  | 843270  | 1.691      | 1248 |
| 19.01 B | 1572391 | 74679.200  | 1260 |
| 24.68   | 353447  | 353447.300 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .68     | 150706 | BV   | .2238  |      |
| 3.54    | 9156   | BV   | .0017  |      |
| 5.83    | 405793 | PV   | .0755  | Tot  |
| 6.89    | 4328   | VV   | .0008  |      |
| 7.30    | 5692   | VV   | .0011  |      |
| 8.01    | 2697   | BB   | .0005  |      |
| 8.88    | 79011  | BV   | .0147  |      |
| 9.25    | 3029   | VV   | .0006  |      |
| 9.55 A  | 44797  | PV   | .0208  | 1248 |
| 9.80    | 2278   | VV   | .0004  |      |
| 10.27   | 8323   | VV   | .0015  |      |
| 10.59 A | 181860 | VV   | .0800  | 1248 |
| 10.96 A | 66053  | VV   | .0260  | 1248 |
| 11.22 A | 38819  | VV   | .0180  | 1248 |
| 11.41 A | 25319  | VV   | .0065  | 1248 |
| 11.71   | 11088  | VV   | .0021  |      |
| 11.94 A | 106852 | VV   | .0421  | 1248 |
| 12.09 A | 87680  | VV   | .0193  | 1248 |
| 12.19 A | 88115  | VV   | 1.4212 | 1248 |
| 12.68   | 120432 | VV   | .0224  |      |
| 12.79   | 65912  | VV   | .0123  |      |
| 13.12   | 154924 | VV   | .0288  |      |
| 13.41   | 32875  | VV   | .0061  |      |
| 13.67   | 3457   | VV   | .0006  |      |
| 13.87   | 5596   | VV   | .0010  |      |
| 14.01 A | 76958  | VV   | .0169  | 1248 |
| 14.16 A | 126819 | VV   | .0399  | 1248 |
| 14.29   | 229588 | VV   | .0427  |      |
| 14.54   | 21577  | VV   | .0040  |      |
| 14.88   | 113656 | VV   | .0211  |      |
| 15.06   | 48902  | VV   | .0091  |      |
| 15.21   | 123764 | VV   | .0230  |      |
| 15.39   | 39781  | VV   | .0074  |      |
| 15.62   | 3181   | VV   | .0006  |      |
| 15.77   | 5678   | VV   | .0011  |      |
| 15.97   | 29127  | VV   | .0054  |      |
| 16.15   | 51026  | VV   | .0095  |      |

Sample Name : D714 RCS  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_017.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 16.29   | 23836  | VV   | .0044       |      |
| 16.38   | 44333  | VV   | .0082       |      |
| 16.51   | 111004 | VV   | .0206       |      |
| 16.89   | 14846  | VV   | .0028       |      |
| 16.98   | 100258 | VV   | .0186       |      |
| 17.15   | 65501  | VV   | .0122       |      |
| 17.31   | 3576   | VV   | .0007       |      |
| 17.41   | 279841 | VV   | .0521       |      |
| 17.73   | 17441  | VV   | .0032       |      |
| 17.86   | 9819   | VV   | .0018       |      |
| 18.05   | 39212  | VV   | .0073       |      |
| 18.24   | 369280 | VV   | .0687       |      |
| 18.60   | 152953 | VV   | .0285       |      |
| 18.83   | 36072  | VV   | .0067       |      |
| 19.01 B | 322000 | VV   | .1192       | 1260 |
| 19.26   | 44738  | VV   | .0083       |      |
| 19.41   | 7533   | VV   | .0014       |      |
| 19.48 B | 159742 | VV   | .0581       | 1260 |
| 19.61 B | 88788  | VV   | .0521       | 1260 |
| 19.71   | 30091  | VV   | .0056       |      |
| 19.87   | 27835  | VV   | .0052       |      |
| 20.06 B | 156641 | VV   | .0459       | 1260 |
| 20.19 B | 90545  | VV   | .0293       | 1260 |
| 20.30 B | 74667  | VV   | 74666.8000  | 1260 |
| 20.47   | 19339  | VV   | .0036       |      |
| 20.60   | 31574  | VV   | .0059       |      |
| 20.74 B | 342108 | VV   | .1899       | 1260 |
| 20.89   | 12791  | VV   | .0024       |      |
| 21.00   | 16667  | VV   | .0031       |      |
| 21.39 B | 170214 | VV   | .0359       | 1260 |
| 21.52   | 7462   | VV   | .0014       |      |
| 21.60 B | 72662  | VV   | 11.8654     | 1260 |
| 21.71 B | 95025  | VV   | .0374       | 1260 |
| 22.02   | 6369   | VV   | .0012       |      |
| 22.32   | 34827  | VV   | .0065       |      |
| 22.48   | 3367   | VV   | .0006       |      |
| 22.81   | 67646  | PV   | .0126       |      |
| 22.92   | 7082   | VV   | .0013       |      |
| 23.77   | 17655  | BV   | .0033       |      |
| 24.68   | 353447 | BB   | 353447.3000 | DCB  |
| 26.23   | 2045   | BV   | .0004       |      |

Total Area : 6105682 Total mg/L : 428129.000

Report Time : Mon Dec 9, 1991 2:49:38 pm  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

.677

3.537

5.830

0.893

7.306

8.016

8.930

9.254

9.563

10.271

10.592

11.100

11.415

11.728

12.041

12.354

12.667

12.980

13.293

13.606

13.919

14.232

14.545

14.858

15.171

15.484

15.797

16.110

16.423

16.736

17.049

17.362

17.675

17.988

18.301

18.614

18.927

19.240

19.553

19.866

20.179

20.492

20.805

21.118

21.431

21.744

22.057

22.370

22.683

22.996

23.309

23.622

23.935

24.248

24.561

24.874

25.187

25.500

25.813

26.126

26.439

26.752

27.065

27.378

27.691

28.004

28.317

28.630

28.943

29.256

29.569

29.882

30.195

30.508

30.821

31.134

31.447

31.760

32.073

32.386

32.699

33.012

33.325

33.638

33.951

34.264

34.577

34.890

35.203

23.767

24.678

26.233

Sample Name : C134906 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134906 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_018.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 4:14:05

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 10.59 A | 153039 | .468       | 1248 |
| 19.01 B | 16548  | 1329.801   | 1260 |
| 24.68   | 293134 | 293134.400 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT        | Area   | Code | Amount                | Name                 |
|-----------|--------|------|-----------------------|----------------------|
| .68       | 575091 | BV   | .8540                 |                      |
| 3.54      | 7214   | BV   | .0013                 |                      |
| 5.83      | 367377 | PV   | .0683                 | TCX                  |
| 6.89      | 3998   | VV   | .0007                 |                      |
| 7.31 ✓    | 12455  | VV   | .0023                 |                      |
| 8.02      | 4045   | BB   | .0008                 |                      |
| 8.93 ✓    | 29707  | BV   | .0055                 |                      |
| 9.25      | 6789   | VV   | .0013                 |                      |
| 9.56 /    | 17893  | VV   | .0033                 |                      |
| 9.80      | 1905   | VV   | .0004                 |                      |
| 10.27     | 4648   | PV   | .0009                 |                      |
| 10.34     | 8474   | VV   | .0016                 |                      |
| 10.59 A / | 42200  | VV   | .0186 <del>4240</del> | 1047 degraded 182649 |
| 10.96 A / | 12267  | VV   | .0048                 | 1248                 |
| 11.22 A / | 9284   | VV   | .0043                 | 1248                 |
| 11.41 A   | 4163   | VV   | .0011                 | 1248                 |
| 11.95 A / | 17277  | VV   | .0068                 | 1248                 |
| 12.10 A / | 15438  | VV   | .0034                 | 1248                 |
| 12.19 A / | 26148  | VV   | .4218                 | 1248                 |
| 12.49     | 7252   | VV   | .0013                 |                      |
| 12.68     | 14898  | VV   | .0028                 |                      |
| 12.78     | 11830  | VV   | .0022                 |                      |
| 13.12     | 24016  | VV   | .0045                 |                      |
| 13.41     | 3300   | VV   | .0006                 |                      |
| 13.67     | 2509   | VV   | .0005                 |                      |
| 13.87     | 2718   | VV   | .0005                 |                      |
| 14.01 A   | 10572  | VV   | .0023                 | 1248                 |
| 14.17 A   | 15689  | VV   | .0049                 | 1248                 |
| 14.30     | 28066  | VV   | .0052                 |                      |
| 14.54     | 7302   | VV   | .0014                 |                      |
| 14.88     | 9873   | VV   | .0018                 |                      |
| 15.06     | 10748  | VV   | .0020                 |                      |
| 15.21     | 14125  | VV   | .0026                 |                      |
| 15.39     | 10289  | VV   | .0019                 |                      |
| 15.77     | 2140   | VV   | .0004                 |                      |
| 15.97 .   | 5855   | VV   | .0011                 |                      |
| 16.15 .   | 7392   | VV   | .0014                 |                      |

Sample Name : C134906 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_018.RES

| RT        | Area   | Code | Amount      | Name       |
|-----------|--------|------|-------------|------------|
| 16.29     | 3552   | VV   | .0007       |            |
| 16.52     | 19795  | VV   | .0037       |            |
| 16.89     | 1865   | PV   | .0003       |            |
| 16.98     | 1749   | VV   | .0003       |            |
| 17.15     | 2147   | VV   | .0004       |            |
| 17.31     | 1525   | VV   | .0003       |            |
| 17.47     | 18710  | VV   | .0035       |            |
| 18.05     | 1850   | VV   | .0003       |            |
| 18.25     | 15326  | PV   | .0029       | 1254 57334 |
| 18.60     | 1820   | VV   | .0003       |            |
| 19.01 B   | 11051  | PV   | .0041       | 1260       |
| 19.71     | 2768   | VV   | .0005       |            |
| 20.32 B   | 1330   | VV   | 1329.7950   | 1260       |
| 20.75 B   | 2251   | PV   | .0012       | 1260* 3908 |
| 21.27     | 2337   | BV   | .0004       |            |
| 21.39 B * | 1916   | VV   | .0004       | 1260       |
| 23.77 *   | 1492   | BV   | .0003       |            |
| 24.68     | 293134 | BB   | 293134.4000 | DCB        |
| 26.23     | 1660   | BV   | .0003       |            |

Total Area : 1741223 Total mg/L : 294465.700

Report Time : Mon Dec 9, 1991 4:47:01 pm  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

.677

3.545

5.835

6.896  
7.309

8.018

8.936

9.257  
9.566

10.326  
10.594

11.412

11.948  
12.186

12.478  
13.086

13.483  
14.0312

14.180  
15.08210

15.082  
16.517

16.388  
17.484

18.054  
18.249

18.880  
19.009

19.262

20.192

20.747

22.138

23.765

24.678

26.235

Sample Name : C13A907 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134907 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_019.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 4:57:41

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area   | Amount     | Name |
|-------|---|--------|------------|------|
| 11.41 | A | 65977  | .420       | 1248 |
| 19.01 | B | 27958  | 1846.945   | 1260 |
| 24.68 |   | 305270 | 305270.200 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT    |          | Area   | Code | Amount | Name                        |
|-------|----------|--------|------|--------|-----------------------------|
| .68   |          | 418553 | BV   | .6215  |                             |
| 3.54  |          | 6870   | BV   | .0013  |                             |
| 5.84  |          | 386121 | PV   | .0718  | <i>Tch</i>                  |
| 6.90  |          | 4590   | VV   | .0009  |                             |
| 7.31  | ✓        | 13161  | VV   | .0024  |                             |
| 8.02  |          | 5597   | BB   | .0010  |                             |
| 8.94  | ✓        | 28578  | BV   | .0053  |                             |
| 9.26  |          | 8237   | VV   | .0015  |                             |
| 9.57  | ✓        | 15933  | PV   | .0030  |                             |
| 9.80  | <i>x</i> | 1400   | PV   | .0003  |                             |
| 10.28 |          | 3889   | BV   | .0007  |                             |
| 10.34 |          | 8514   | VV   | .0016  |                             |
| 10.59 | ✓        | 26126  | VV   | .0049  | <i>1242 degraded 145296</i> |
| 11.00 | ✓        | 5704   | VV   | .0011  |                             |
| 11.18 | ✓        | 5908   | VV   | .0011  |                             |
| 11.41 | A        | 3004   | VV   | .0008  | 1248                        |
| 11.95 | A ✓      | 12806  | VV   | .0050  | 1248                        |
| 12.10 | A ✓      | 11756  | VV   | .0026  | 1248                        |
| 12.19 | A ✓      | 25324  | VV   | .4085  | 1248                        |
| 12.49 |          | 6010   | VV   | .0011  |                             |
| 12.68 |          | 7520   | VV   | .0014  |                             |
| 12.78 |          | 7201   | VV   | .0013  |                             |
| 13.09 |          | 24796  | VV   | .0046  |                             |
| 13.87 |          | 1609   | PV   | .0003  |                             |
| 14.01 | A        | 5811   | VV   | .0013  | 1248                        |
| 14.17 | A        | 7277   | VV   | .0023  | 1248                        |
| 14.31 |          | 21695  | VV   | .0040  |                             |
| 14.54 |          | 6427   | VV   | .0012  |                             |
| 14.88 |          | 3299   | VV   | .0006  |                             |
| 15.06 |          | 11738  | VV   | .0022  |                             |
| 15.21 |          | 16128  | VV   | .0030  |                             |
| 15.39 |          | 10888  | VV   | .0020  |                             |
| 15.62 |          | 1744   | VV   | .0003  |                             |
| 15.78 |          | 2221   | VV   | .0004  |                             |
| 15.96 | .        | 5544   | VV   | .0010  |                             |
| 16.15 | .        | 6540   | VV   | .0012  |                             |
| 16.30 |          | 2515   | VV   | .0005  |                             |

Sample Name : C134907 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_019.RES

| RT      | Area   | Code | Amount      | Name       |
|---------|--------|------|-------------|------------|
| 16.38   | 2062   | VV   | .0004       |            |
| 16.52   | 21345  | VV   | .0040       |            |
| 16.99   | 1994   | BV   | .0004       |            |
| 17.14   | 2879   | PV   | .0005       |            |
| 17.30   | 1479   | VV   | .0003       |            |
| 17.42   | 9129   | VV   | .0017       |            |
| 17.46   | 11860  | VV   | .0022       |            |
| 17.74   | 1433   | VV   | .0003       |            |
| 18.05   | 2757   | PV   | .0005       |            |
| 18.25   | 18818  | PV   | .0035       | 1254 79295 |
| 18.60   | 2959   | VV   | .0006       |            |
| 18.79   | 988    | VV   | .0002       |            |
| 18.86   | 1375   | VV   | .0003       |            |
| 19.01 B | 15188  | VV   | .0056       | 1260       |
| 19.26   | 2161   | VV   | .0004       |            |
| 19.49 B | 2689   | VV   | .0010       | 1260       |
| 19.71   | 2848   | VV   | .0005       |            |
| 20.19 B | 1212   | BV   | .0004       | 1260       |
| 20.32 B | 1847   | VV   | 1846.9350   | 1260       |
| 20.75 B | 3777   | PV   | .0021       | 1260* 7937 |
| 21.27   | 7867   | BV   | .0015       |            |
| 21.39 B | 3245   | VV   | .0007       | 1260       |
| 23.76   | 4692   | BV   | .0009       |            |
| 24.68   | 305270 | PV   | 305270.2000 | DCB        |
| 26.23   | 1728   | BV   | .0003       |            |

Total Area : 1572635 Total mg/L : 307118.400

Report Time : Mon Dec 9, 1991 4:53:32 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

3.538

5.827

~~5.672~~  
~~5.688~~

7.302

8.010

8.929

~~9.251~~

9.560

10.337

10.590

~~11.704~~

11.942

12.092

12.180

~~12.432~~

12.728

680

13.050

~~13.188~~

13.872

14.002

166

14.307

14.880

15.009

15.091

15.305

~~15.773~~

15.861

15.914

16.511

~~16.889~~

16.889

16.128

16.128

17.477

~~17.899~~

18.052

18.243

~~18.188~~

18.559

19.005

~~18.213~~

18.213

18.748

18.748

~~18.468~~

18.468

18.517

20.746

21.276

21.392

~~22.012~~

22.012

22.321

22.804

23.766

24.678

26.233

Sample Name : C134908 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134908 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_020.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 5:41:21

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 10.59 A | 363990 | 1.762      | 1248 |
| 19.00 B | 288156 | 19573.080  | 1260 |
| 24.68   | 342543 | 342542.600 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                        |
|---------|--------|------|--------|-----------------------------|
| .66     | 332941 | BV   | .4944  |                             |
| 3.54    | 7728   | BV   | .0014  |                             |
| 5.83    | 400452 | PV   | .0745  | Tcx                         |
| 6.73    | 1786   | BV   | .0003  |                             |
| 6.89    | 4412   | VV   | .0008  |                             |
| 7.10    | 2809   | VV   | .0005  |                             |
| 7.30    | 25032  | VV   | .0047  |                             |
| 8.01    | 17594  | BV   | .0033  |                             |
| 8.93    | 71818  | VV   | .0134  |                             |
| 9.25    | 23787  | VV   | .0044  |                             |
| 9.56    | 45184  | VV   | .0084  |                             |
| 9.80    | 1869   | VV   | .0003  |                             |
| 10.34   | 39918  | PV   | .0074  |                             |
| 10.59 A | 86261  | VV   | .0380  | 1248 <i>degraded</i> 467563 |
| 10.99   | 19054  | VV   | .0035  |                             |
| 11.17   | 21141  | VV   | .0039  |                             |
| 11.41 A | 11041  | VV   | .0028  | 1248                        |
| 11.70   | 3281   | VV   | .0006  |                             |
| 11.94 A | 49644  | VV   | .0195  | 1248                        |
| 12.09 A | 45705  | VV   | .0101  | 1248                        |
| 12.18 A | 103744 | VV   | 1.6733 | 1248                        |
| 12.49   | 2883   | VV   | .0005  |                             |
| 12.68   | 28540  | VV   | .0053  |                             |
| 12.78   | 28222  | VV   | .0052  |                             |
| 13.05   | 361959 | VV   | .0673  |                             |
| 13.40   | 5549   | VV   | .0010  |                             |
| 13.50   | 6759   | VV   | .0013  |                             |
| 13.67   | 6651   | VV   | .0012  |                             |
| 13.87   | 11276  | VV   | .0021  |                             |
| 14.01 A | 30593  | VV   | .0067  | 1248                        |
| 14.17 A | 37001  | VV   | .0116  | 1248                        |
| 14.31   | 113175 | VV   | .0211  |                             |
| 14.54   | 34008  | VV   | .0063  |                             |
| 14.88   | 15345  | VV   | .0029  |                             |
| 15.01   | 30113  | VV   | .0056  |                             |
| 15.05   | 40256  | VV   | .0075  |                             |
| 15.21   | 95613  | VV   | .0178  |                             |

Sample Name : C134908 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_020.RES

| RT      | Area   | Code | Amount      | Name        |
|---------|--------|------|-------------|-------------|
| 15.38   | 68109  | VV   | .0127       |             |
| 15.62   | 10282  | VV   | .0019       |             |
| 15.77   | 12925  | VV   | .0024       |             |
| 15.96   | 35501  | VV   | .0066       |             |
| 16.15   | 41844  | VV   | .0078       |             |
| 16.29   | 16345  | VV   | .0030       |             |
| 16.38   | 12959  | VV   | .0024       |             |
| 16.51   | 160722 | VV   | .0299       |             |
| 16.89   | 9069   | VV   | .0017       |             |
| 16.98   | 21257  | VV   | .0040       |             |
| 17.14   | 26548  | VV   | .0049       |             |
| 17.30   | 14843  | VV   | .0028       |             |
| 17.42   | 69939  | VV   | .0130       |             |
| 17.46   | 103929 | VV   | .0193       |             |
| 17.73   | 13814  | VV   | .0026       |             |
| 17.86   | 10466  | VV   | .0019       |             |
| 18.05   | 26532  | VV   | .0049       |             |
| 18.24   | 163222 | VV   | .0304       | 1254 646392 |
| 18.60   | 23840  | VV   | .0044       |             |
| 18.78   | 8921   | VV   | .0017       |             |
| 18.86   | 12233  | VV   | .0023       |             |
| 19.00 B | 141174 | VV   | .0523       | 1260        |
| 19.21   | 16270  | VV   | .0030       |             |
| 19.48 B | 20716  | VV   | .0075       | 1260        |
| 19.61 B | 8137   | VV   | .0048       | 1260        |
| 19.71   | 30500  | VV   | .0057       |             |
| 20.06 B | 13611  | PV   | .0040       | 1260        |
| 20.19 B | 13362  | VV   | .0043       | 1260        |
| 20.32 B | 19572  | VV   | 19571.6500  | 1260        |
| 20.46   | 5014   | VV   | .0009       |             |
| 20.60   | 3958   | VV   | .0007       |             |
| 20.75 B | 31022  | PV   | .0172       | 1260 57524  |
| 21.28   | 1091   | BV   | .0002       |             |
| 21.39 B | 23314  | VV   | .0049       | 1260        |
| 21.59 B | 8140   | VV   | 1.3292      | 1260 -      |
| 21.71 B | 9109   | VV   | .0036       | 1260        |
| 22.02   | 1217   | VV   | .0002       |             |
| 22.32   | 3648   | PV   | .0007       |             |
| 22.80   | 7928   | BV   | .0015       |             |
| 23.77   | 5385   | BV   | .0010       |             |
| 24.68   | 342543 | BB   | 342542.6000 | DCB         |
| 26.23   | 2011   | BV   | .0004       |             |

Total Area : 3734166 Total mg/L : 362118.400

Report Time : Mon Dec 9, 1991 5:02:43 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

.675

1.355

3.540

5.831

6.894  
7.307

8.016

9.258.934

9.800.565

10.342.594

11.414

11.297.788

12.278.84

13.120

14.407.5309

15.000.000

16.519

17.148

18.058.253

18.603

19.012

19.715

20.750

21.332

23.769

24.680

26.235

Sample Name : C134909 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134909 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_021.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 6:25:02

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 11.21 A | 43936  | .238       | 1248 |
| 19.01 B | 10438  | .004       | 1260 |
| 24.68   | 376367 | 376366.700 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                |
|---------|--------|------|--------|---------------------|
| .68     | 385239 | BV   | .5721  |                     |
| 1.36    | 1935   | PB   | .0004  |                     |
| 3.54    | 13551  | BV   | .0025  |                     |
| 5.83    | 445600 | PV   | .0829  | Tex                 |
| 6.89    | 4864   | VV   | .0009  |                     |
| 7.31    | 8255   | VV   | .0015  |                     |
| 8.02    | 2761   | BB   | .0005  |                     |
| 8.93    | 16363  | BV   | .0030  |                     |
| 9.25    | 4264   | VV   | .0008  |                     |
| 9.56    | 10028  | PV   | .0019  |                     |
| 9.80    | 2118   | VV   | .0004  |                     |
| 10.34   | 7814   | BV   | .0015  |                     |
| 10.59   | 19264  | VV   | .0036  | 1242 degraded 90215 |
| 10.98   | 3955   | VV   | .0007  |                     |
| 11.21 A | 4660   | VV   | .0022  | 1248                |
| 11.41 A | 1505   | VV   | .0004  | 1248                |
| 11.95 A | 6873   | BV   | .0027  | 1248                |
| 12.10 A | 6648   | VV   | .0015  | 1248                |
| 12.19 A | 14169  | VV   | .2285  | 1248                |
| 12.68   | 5175   | VV   | .0010  |                     |
| 12.78   | 4340   | VV   | .0008  |                     |
| 13.12   | 9323   | VV   | .0017  |                     |
| 13.88   | 1299   | VV   | .0002  |                     |
| 14.01 A | 4300   | VV   | .0009  | 1248                |
| 14.17 A | 5780   | VV   | .0018  | 1248                |
| 14.31   | 13168  | VV   | .0024  |                     |
| 14.55   | 3835   | VV   | .0007  |                     |
| 14.89   | 3405   | VV   | .0006  |                     |
| 15.06   | 6313   | VV   | .0012  |                     |
| 15.21   | 8348   | VV   | .0016  |                     |
| 15.39   | 6139   | VV   | .0011  |                     |
| 15.97   | 3251   | VV   | .0006  |                     |
| 16.15   | 3991   | VV   | .0007  |                     |
| 16.30   | 1737   | VV   | .0003  |                     |
| 16.52   | 12025  | VV   | .0022  |                     |
| 17.15   | 1381   | PV   | .0003  |                     |
| 17.47   | 11567  | VV   | .0022  |                     |

Sample Name : C134909 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_021.RES

| RT      | Area   | Code | Amount      | Name       |
|---------|--------|------|-------------|------------|
| 18.06   | 1271   | PV   | .0002       |            |
| 18.25   | 9817   | PV   | .0018       | 1254 48094 |
| 18.60   | 1264   | VV   | .0002       |            |
| 19.01 B | 7443   | PV   | .0028       | 1260       |
| 19.72   | 1464   | VV   | .0003       |            |
| 20.75 B | 1577   | BV   | .0009       | 1260       |
| 21.28   | 2030   | PV   | .0004       |            |
| 21.39 B | 1418   | VV   | .0003       | 1260       |
| 23.77   | 1645   | BV   | .0003       |            |
| 24.68   | 376367 | BB   | 376366.7000 | DCB        |
| 26.24   | 2254   | BV   | .0004       |            |

Total Area : 1471794 Total mg/L : 376367.600

Report Time : Tue Dec 10, 1991 8:03:29 am

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

Sample Name : C134928 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_022.RES

| RT      | Area   | Code | Amount      | Name         |
|---------|--------|------|-------------|--------------|
| 15.78   | 36856  | VV   | .0069       |              |
| 15.96   | 98474  | VV   | .0183       |              |
| 16.15   | 112501 | VV   | .0209       |              |
| 16.30   | 42398  | VV   | .0079       |              |
| 16.38   | 37123  | VV   | .0069       |              |
| 16.51   | 385956 | VV   | .0718       |              |
| 16.89   | 19275  | VV   | .0036       |              |
| 16.99   | 76240  | VV   | .0142       |              |
| 17.14   | 94451  | VV   | .0176       |              |
| 17.30   | 46468  | VV   | .0086       |              |
| 17.42   | 496570 | VV   | .0924       |              |
| 17.73   | 39211  | VV   | .0073       |              |
| 17.86   | 36737  | VV   | .0068       |              |
| 18.05   | 111734 | VV   | .0208       |              |
| 18.24   | 502636 | VV   | .0935       | 1254 2656503 |
| 18.60   | 95035  | VV   | .0177       |              |
| 18.79   | 33438  | VV   | .0062       |              |
| 18.86   | 44337  | VV   | .0082       |              |
| 19.01 B | 460266 | VV   | .1705       | 1260         |
| 19.22   | 23895  | VV   | .0044       |              |
| 19.26   | 33041  | VV   | .0061       |              |
| 19.41   | 6471   | VV   | .0012       |              |
| 19.49 B | 89780  | VV   | .0327       | 1260         |
| 19.62 B | 37501  | VV   | .0220       | 1260         |
| 19.71   | 54704  | VV   | .0102       |              |
| 19.78   | 19560  | VV   | .0036       |              |
| 19.86   | 8414   | VV   | .0016       |              |
| 20.07 B | 58173  | VV   | .0171       | 1260         |
| 20.19 B | 47473  | VV   | .0153       | 1260         |
| 20.32 B | 62700  | VV   | .4800       | 1260         |
| 20.47   | 17894  | VV   | .0033       |              |
| 20.60   | 20650  | VV   | .0038       |              |
| 20.75 B | 141856 | VV   | .0787       | 1260 264988  |
| 20.89   | 5685   | VV   | .0011       |              |
| 21.00   | 4892   | VV   | .0009       |              |
| 21.28   | 3164   | VV   | .0006       |              |
| 21.39 B | 72223  | VV   | .0153       | 1260         |
| 21.52   | 2600   | VV   | .0005       |              |
| 21.60 B | 34309  | VV   | 5.6025      | 1260         |
| 21.71 B | 37553  | VV   | .0148       | 1260         |
| 22.02   | 4074   | VV   | .0008       |              |
| 22.32   | 12742  | VV   | .0024       |              |
| 22.49   | 1912   | VV   | .0004       |              |
| 22.81   | 32789  | PV   | .0061       |              |
| 22.93   | 2752   | VV   | .0005       |              |
| 23.77   | 15372  | BV   | .0029       |              |
| 24.68   | 304189 | BB   | 304188.8000 | DCB          |
| 26.24   | 1733   | BV   | .0003       |              |

Total Area : 6853766 Total mg/L : 366899.500

Report Time : Tue Dec 10, 1991 8:16:54 am

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

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EMS LABORATORIES, INC. INDIANAPOLIS IN

Sample Name : C134928 S230

Page 4

3.545

5.832

6.893  
7.306  
8.016

8.932

9.255 9.564

9.926

10.02379

10.591

11.1101987  
11.707

11.946

12.129484

12.783

12.683

13.113

13.876

14.011

14.168

14.311

14.853

14.943

15.3886

15.61515.776

15.963

16.152

16.892

17.146.987

16.513

17.882

17.415

18.706 18.833

18.253

18.600

19.005

19.487

20.289420.067

20.748

21.2277

21.220709

21.393

22.020  
22.4862.324

22.808

23.027

23.770

24.683

26.239

Sample Name : C134928 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : C134928 S230

Result File : /DATA/LOOP/RESULT/PCB\_3071\_022.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 7:08:37

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area    | Amount     | Name |
|-------|---|---------|------------|------|
| 10.59 | A | 631679  | 2.888      | 1248 |
| 19.01 | B | 1041834 | 62706.450  | 1260 |
| 24.68 |   | 304189  | 304188.800 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                                 |
|---------|--------|------|--------|--------------------------------------|
| .67     | 328109 | BV   | .4872  |                                      |
| 3.55    | 10076  | BV   | .0019  |                                      |
| 5.83    | 342492 | PV   | .0637  | <del>TCX</del>                       |
| 6.89    | 3927   | VV   | .0007  |                                      |
| 7.31    | 15396  | VV   | .0029  |                                      |
| 8.02    | 10625  | VV   | .0020  |                                      |
| 8.93    | 70599  | BV   | .0131  |                                      |
| 9.25    | 22686  | VV   | .0042  |                                      |
| 9.56    | 41502  | VV   | .0077  |                                      |
| 9.80    | 1525   | VV   | .0003  |                                      |
| 9.93    | 1825   | VV   | .0003  |                                      |
| 10.28   | 17345  | PV   | .0032  |                                      |
| 10.34   | 31308  | VV   | .0058  |                                      |
| 10.59 A | 96797  | VV   | .0426  | <del>1248</del> 1242 degraded 666102 |
| 11.00   | 31851  | VV   | .0059  |                                      |
| 11.17   | 32209  | VV   | .0060  |                                      |
| 11.41 A | 17623  | VV   | .0045  | 1248                                 |
| 11.71   | 5618   | VV   | .0010  |                                      |
| 11.95 A | 112537 | VV   | .0443  | 1248                                 |
| 12.09 A | 95512  | VV   | .0211  | 1248                                 |
| 12.18 A | 169699 | VV   | 2.7371 | 1248                                 |
| 12.68   | 75135  | VV   | .0140  |                                      |
| 12.78   | 47118  | VV   | .0088  |                                      |
| 13.11   | 119618 | VV   | .0223  |                                      |
| 13.41   | 9773   | VV   | .0018  |                                      |
| 13.50   | 15955  | VV   | .0030  |                                      |
| 13.67   | 15112  | VV   | .0028  |                                      |
| 13.88   | 19864  | VV   | .0037  |                                      |
| 14.01 A | 54027  | VV   | .0118  | 1248                                 |
| 14.17 A | 85484  | VV   | .0269  | 1248                                 |
| 14.31   | 244443 | VV   | .0455  |                                      |
| 14.54   | 73872  | VV   | .0137  |                                      |
| 14.88   | 29727  | VV   | .0055  |                                      |
| 15.01   | 176938 | VV   | .0329  |                                      |
| 15.21   | 279432 | VV   | .0520  |                                      |
| 15.39   | 190845 | VV   | .0355  |                                      |
| 15.62   | 29253  | VV   | .0054  |                                      |

.668

3.544

5.831 Tex 0.05

5.896 7.731  
7.102

7.304

8.015

8.725

8.880

9.231

9.550

10.053

10.268

10.584 1016 0.000  
10.949

11.704

11.110

11.224

12.434

12.198 12.944 12.091

12.781

12.678  
13.114

13.872 13.404

14.011

14.166

15.288

23.764

24.676 ACS 0.05

26.232

Sample Name : D702 1016

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCB\_3071\_023.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 7:52:12

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT     | Area   | Amount     | Name |
|--------|--------|------------|------|
| 9.55 A | 999270 | 1.619      | 1248 |
| 24.68  | 328478 | 328478.400 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name      |
|---------|--------|------|--------|-----------|
| .67     | 192208 | BV   | .2854  |           |
| 3.54    | 4588   | BV   | .0009  |           |
| 5.83    | 407119 | BV   | .0757  | Tet       |
| 6.73    | 14341  | BV   | .0027  |           |
| 6.89    | 4465   | VV   | .0008  |           |
| 7.10    | 18739  | VV   | .0035  |           |
| 7.30    | 93407  | VV   | .0174  |           |
| 8.01    | 13264  | BV   | .0025  |           |
| 8.73    | 1295   | BV   | .0002  |           |
| 8.88    | 205909 | VV   | .0383  |           |
| 9.25    | 18354  | VV   | .0034  |           |
| 9.55 A  | 124215 | VV   | .0576  | 1248      |
| 9.80    | 2057   | VV   | .0004  |           |
| 10.05   | 3156   | VV   | .0006  |           |
| 10.27   | 43401  | VV   | .0081  |           |
| 10.58 A | 310926 | VV   | .1368  | 1248 1016 |
| 10.95 A | 144901 | VV   | .0571  | 1248      |
| 11.22 A | 82702  | VV   | .0384  | 1248      |
| 11.41 A | 32132  | VV   | .0083  | 1248      |
| 11.70   | 13124  | VV   | .0024  |           |
| 11.94 A | 88522  | VV   | .0349  | 1248      |
| 12.09 A | 82063  | VV   | .0181  | 1248      |
| 12.20 A | 77657  | VV   | 1.2526 | 1248 -    |
| 12.49   | 7336   | VV   | .0014  |           |
| 12.68   | 107375 | VV   | .0200  |           |
| 12.78   | 78641  | VV   | .0146  |           |
| 13.11   | 137415 | VV   | .0256  |           |
| 13.40   | 31916  | VV   | .0059  |           |
| 13.67   | 4613   | VV   | .0009  |           |
| 13.87   | 3437   | VV   | .0006  |           |
| 14.01 A | 21623  | VV   | .0047  | 1248      |
| 14.17 A | 34530  | VV   | .0109  | 1248      |
| 14.30   | 45676  | VV   | .0085  |           |
| 14.54   | 7604   | VV   | .0014  |           |
| 14.88   | 4689   | VV   | .0009  |           |
| 15.06   | 5723   | VV   | .0011  |           |
| 15.21   | 2725   | VV   | .0005  |           |
| 23.76   | 1253   | BB   | .0002  |           |

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCB\_3071\_023.RES

| RT    | Area   | Code | Amount      | Name |
|-------|--------|------|-------------|------|
| 24.68 | 328478 | BB   | 328478.4000 | DCB  |
| 26.23 | 1863   | BV   | .0003       |      |

Total Area : 2803439 Total mg/L : 328480.600

Report Time : Mon Dec 9, 1991 3:20:33 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

.675

2.732

3.545

3.978

5.171

5.833 70% 0.05

7.103<sup>6</sup>731

7.305 1221 0.500

8.719 8.920

9.248 52

9.800 52

10.278 589

11.104 51

11.226 51

11.947

12.489

14.315

15.209

16.514

16.984

17.414

18.242

18.608

19.007

19.484

20.061

20.746

23.765

24.677 PCB 0.05

26.230

Sample Name : D703 1221

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D703 1221

Result File : /DATA/LOOP/RESULT/PCB\_3071\_024.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 8:35:47

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 9.55 A  | 31876  | .014       | 1248 |
| 19.01 B | 7605   | .003       | 1260 |
| 24.68   | 316586 | 316586.400 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount      | Name        |
|---------|--------|------|-------------|-------------|
| .68     | 189337 | BV   | .2812       |             |
| 2.73    | 2987   | BV   | .0006       |             |
| 3.55    | 2453   | BV   | .0005       |             |
| 3.98    | 48605  | PV   | .0090       |             |
| 5.17    | 11319  | BV   | .0021       |             |
| 5.83    | 411292 | BV   | .0765       | Tc4         |
| 6.73    | 51509  | BV   | .0096       |             |
| 7.10    | 35431  | VV   | .0066       |             |
| 7.31    | 127191 | VV   | .0237       | 1221 274055 |
| 8.72    | 8138   | BV   | .0015       |             |
| 8.92    | 26379  | VV   | .0049       |             |
| 9.25    | 1732   | VV   | .0003       |             |
| 9.55 A  | 7312   | PV   | .0034       | 1248        |
| 9.80    | 1941   | VV   | .0004       |             |
| 10.27   | 1457   | VV   | .0003       |             |
| 10.34   | 1894   | VV   | .0004       |             |
| 10.59 A | 12816  | VV   | .0056       | 1248        |
| 10.95 A | 6973   | PV   | .0027       | 1248        |
| 11.23 A | 3188   | VV   | .0015       | 1248        |
| 11.95 A | 1587   | BV   | .0006       | 1248        |
| 12.49   | 28731  | BV   | .0053       |             |
| 12.67   | 3045   | VV   | .0006       |             |
| 12.78   | 2842   | VV   | .0005       |             |
| 14.32   | 4012   | VV   | .0007       |             |
| 15.21   | 2873   | VV   | .0005       |             |
| 16.51   | 2113   | VV   | .0004       |             |
| 16.98   | 1637   | BV   | .0003       |             |
| 17.41   | 4990   | BV   | .0009       |             |
| 18.24   | 5245   | VV   | .0010       |             |
| 18.61   | 1981   | VV   | .0004       |             |
| 19.01 B | 3316   | PV   | .0012       | 1260        |
| 19.48 B | 1346   | BV   | .0005       | 1260        |
| 20.06 B | 1118   | BV   | .0003       | 1260        |
| 20.75 B | 1825   | BV   | .0010       | 1260        |
| 23.77   | 2077   | BV   | .0004       |             |
| 24.68   | 316586 | BV   | 316586.4000 | DCB         |
| 26.23   | 1787   | BV   | .0003       |             |

Total Area : 1339065 Total mg/L : 316586.900

Sample Name : D703 1221

Report Time : Mon Dec 9, 1991 3:30:56 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

668

2.732

3.546

3.979

5.171

5.832 TCK 0.05

6.730  
7.100

7.303

8.014

8.717

8.886

9.248

9.549

9.790

10.267

10.583 1232 0.500

11.108

11.225

10.949

11.702

12.118

12.198

12.489

12.678

13.112

13.898

14.009

14.168

14.540

14.878

15.050

15.984

16.960

16.887

17.467

18.032

18.278

19.005

19.482

20.061

20.744

21.389

23.763

24.674 PCB 0.05

26.230

Sample Name : D704 1232

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D704 1232

Result File : /DATA/LOOP/RESULT/PCB\_3071\_025.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 9:19:21

```

*****AREA SUM*****
      RT      Area      Amount      Name
    9.55  A      483646      .686    1248
   19.01  B      11094      .004    1260
   24.67      328231     328230.600    DCB
  
```

```

*****PEAK AREAS*****
      RT      Area      Code      Amount      Name
    .67      270544 BV      .4017
    2.73      2400 BV      .0004
    3.55      2798 BV      .0005
    3.98      28545 PV      .0053
    5.17      7590 BV      .0014
    5.83      405289 VV      .0754  TCM
    6.73      33945 VV      .0063
    7.10      24805 VV      .0046
    7.30      104337 VV      .0194
    8.01      5989 BV      .0011
    8.72      4449 BV      .0008
    8.89      106745 VV      .0199
    9.25      8522 VV      .0016
    9.55 A      60071 VV      .0278  1248
    9.80      2052 VV      .0004
   10.27      20248 VV      .0038
   10.58 A      137649 VV      .0606  1248  1232
   10.95 A      66744 VV      .0263  1248
   11.22 A      36990 VV      .0172  1248
   11.41 A      13726 VV      .0035  1248
   11.70      5968 VV      .0011
   11.94 A      39721 VV      .0156  1248  -
   12.09 A      35050 VV      .0077  1248
   12.20 A      31615 VV      .5099  1248
   12.49      39222 VV      .0073
   12.68      50863 VV      .0095
   12.78      38316 VV      .0071
   13.11      58660 VV      .0109
   13.40      15675 VV      .0029
   13.67      3252 VV      .0006
   13.87      2674 VV      .0005
   14.01 A      21649 VV      .0047  1248
   14.16 A      40430 VV      .0127  1248
   14.28      50915 VV      .0095
   14.55      7716 VV      .0014
   14.88      35824 VV      .0067
   15.06      9457 VV      .0018
  
```

Sample Name : D704 1232

Result File : /DATA/LOOP/RESULT/PCB\_3071\_025.RES

| RT           | Area          | Code      | Amount             | Name       |
|--------------|---------------|-----------|--------------------|------------|
| 15.20        | 12082         | VV        | .0022              |            |
| 15.38        | 7717          | VV        | .0014              |            |
| 15.96        | 6041          | VV        | .0011              |            |
| 16.15        | 8372          | VV        | .0016              |            |
| 16.29        | 5539          | VV        | .0010              |            |
| 16.51        | 14365         | VV        | .0027              |            |
| 16.89        | 3710          | PV        | .0007              |            |
| 17.47        | 8894          | VV        | .0017              |            |
| 18.28        | 8787          | PV        | .0016              |            |
| 18.60        | 1680          | VV        | .0003              |            |
| 19.01 B      | 3493          | PV        | .0013              | 1260       |
| 19.48 B      | 1481          | PV        | .0005              | 1260       |
| 20.06 B      | 1294          | BV        | .0004              | 1260       |
| 20.74 B      | 3206          | PV        | .0018              | 1260       |
| 21.39 B      | 1619          | VV        | .0003              | 1260       |
| 23.76        | 1906          | BV        | .0004              |            |
| <u>24.67</u> | <u>328231</u> | <u>BB</u> | <u>328230.6000</u> | <u>DCB</u> |
| 26.23        | 1868          | BV        | .0003              |            |

Total Area : 2250731 Total mg/L : 328231.900

Report Time : Mon Dec 9, 1991 3:35:29 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

.674

3.542

5.831 Tcx 0.05

6.897<sup>31</sup>  
7.103

7.306

8.016

8.882

9.552

10.855

10.271

10.588  
10.953

1242 0.500

11.709

11.228

11.949 12.097

12.433

12.786

12.684  
13.119

13.089

13.403

14.016

14.170 288

14.551

14.885

15.066

15.778

15.392 213

16.267 198

16.518

16.198 195

17.311 17.474

18.616 18.288

19.013

19.648 0

20.198

20.751

21.388

21.710

22.809

23.772

24.683 0.05

26.240

97

Sample Name : D907 1242

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCB\_3071\_026.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 10:02:58

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 9.55 A  | 862502 | 1.262      | 1248 |
| 19.01 B | 30565  | 1393.169   | 1260 |
| 24.68   | 355484 | 355483.700 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name                 |
|---------|--------|------|--------|----------------------|
| .67     | 147800 | BV   | .2195  |                      |
| 3.54    | 6913   | BV   | .0013  |                      |
| 5.83    | 416676 | PV   | .0775  | <del>TCX</del>       |
| 6.73    | 11466  | BV   | .0021  |                      |
| 6.89    | 4670   | VV   | .0009  |                      |
| 7.10    | 15357  | VV   | .0029  |                      |
| 7.31    | 76813  | VV   | .0143  |                      |
| 8.02    | 10735  | BV   | .0020  |                      |
| 8.88    | 169128 | VV   | .0315  |                      |
| 9.25    | 14687  | VV   | .0027  |                      |
| 9.55 A  | 102066 | VV   | .0473  | 1248                 |
| 9.80    | 2138   | VV   | .0004  |                      |
| 10.06   | 2503   | VV   | .0005  |                      |
| 10.27   | 35202  | VV   | .0065  |                      |
| 10.59 A | 246340 | VV   | .1084  | <del>1248</del> 1242 |
| 10.95 A | 116312 | VV   | .0459  | 1248                 |
| 11.23 A | 66122  | VV   | .0307  | 1248                 |
| 11.41 A | 24890  | VV   | .0064  | 1248                 |
| 11.71   | 10749  | VV   | .0020  |                      |
| 11.95 A | 69557  | VV   | .0274  | 1248                 |
| 12.10 A | 63198  | VV   | .0139  | 1248                 |
| 12.20 A | 58852  | VV   | .9492  | 1248 -               |
| 12.50   | 6746   | VV   | .0013  |                      |
| 12.68   | 84016  | VV   | .0156  |                      |
| 12.79   | 64879  | VV   | .0121  |                      |
| 13.12   | 105555 | VV   | .0196  |                      |
| 13.41   | 26674  | VV   | .0050  |                      |
| 13.68   | 5268   | VV   | .0010  |                      |
| 13.88   | 4701   | VV   | .0009  |                      |
| 14.02 A | 40768  | VV   | .0089  | 1248                 |
| 14.17 A | 74396  | VV   | .0234  | 1248                 |
| 14.29   | 93973  | VV   | .0175  |                      |
| 14.55   | 14102  | VV   | .0026  |                      |
| 14.89   | 67529  | VV   | .0126  |                      |
| 15.07   | 18251  | VV   | .0034  |                      |
| 15.21   | 22848  | VV   | .0043  |                      |
| 15.39   | 15277  | VV   | .0028  |                      |

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCB\_3071\_026.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 15.78   | 3318   | VV   | .0006       |      |
| 15.97   | 12192  | VV   | .0023       |      |
| 16.16   | 17087  | VV   | .0032       |      |
| 16.30   | 10915  | VV   | .0020       |      |
| 16.52   | 28597  | VV   | .0053       |      |
| 16.89   | 7772   | VV   | .0014       |      |
| 16.98   | 2243   | VV   | .0004       |      |
| 17.16   | 1849   | VV   | .0003       |      |
| 17.31   | 1326   | VV   | .0002       |      |
| 17.47   | 20044  | VV   | .0037       |      |
| 18.29   | 17094  | PV   | .0032       |      |
| 18.62   | 3620   | VV   | .0007       |      |
| 19.01 B | 5937   | VV   | .0022       | 1260 |
| 19.49 B | 4597   | VV   | .0017       | 1260 |
| 19.62 B | 1478   | VV   | .0009       | 1260 |
| 20.07 B | 3144   | VV   | .0009       | 1260 |
| 20.20 B | 1552   | VV   | .0005       | 1260 |
| 20.30 B | 1393   | VV   | 1392.7590   | 1260 |
| 20.75 B | 5553   | PV   | .0031       | 1260 |
| 21.28   | 1259   | BV   | .0002       |      |
| 21.40 B | 2084   | VV   | .0004       | 1260 |
| 21.60 B | 2443   | VV   | .3989       | 1260 |
| 21.71 B | 2383   | VV   | .0009       | 1260 |
| 22.81   | 1909   | BB   | .0004       |      |
| 23.77   | 2336   | BV   | .0004       |      |
| 24.68   | 355484 | BB   | 355483.7000 | DCB  |
| 26.24   | 2053   | BV   | .0004       |      |

Total Area : 2836819 Total mg/L : 356878.600

Report Time : Mon Dec 9, 1991 3:46:50 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

.660

3.539

5.830 Tcx 0.05

6.893  
7.306  
8.014

8.878

9.253  
9.798  
10.269

9.555

10.585 1248 0.000

10.956  
11.706 11.411\*

12.191 11.945 12.093

12.495 12.787 12.680  
13.116

13.485 13.874 14.011

14.265  
14.880

15.063 15.388 15.209

15.965 16.154 16.514  
16.892

17.378 17.471

18.034 18.287

18.802 19.011

19.568

19.887

20.006

20.599

20.749

21.218 21.294

22.324

22.806

23.769

24.679 248 0.05

26.235

Sample Name : D706 1248  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D706 1248

Result File : /DATA/LOOP/RESULT/PCB\_3071\_027.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 10:46:30

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT      | Area   | Amount     | Name |
|---------|--------|------------|------|
| 9.55 A  | 951080 | 1.926      | 1248 |
| 19.01 B | 68355  | 3377.010   | 1260 |
| 24.68   | 329641 | 329640.900 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT      | Area   | Code | Amount | Name |
|---------|--------|------|--------|------|
| .66     | 286633 | BV   | .4256  |      |
| 3.54    | 6475   | BV   | .0012  |      |
| 5.83    | 396196 | PV   | .0737  | TCX  |
| 6.89    | 4320   | BV   | .0008  |      |
| 7.31    | 5522   | VV   | .0010  |      |
| 8.01    | 3044   | BB   | .0006  |      |
| 8.88    | 88181  | BV   | .0164  |      |
| 9.25    | 3358   | VV   | .0006  |      |
| 9.55 A  | 50218  | PV   | .0233  | 1248 |
| 9.80    | 2300   | VV   | .0004  |      |
| 10.27   | 9232   | VV   | .0017  |      |
| 10.58 A | 205803 | VV   | .0906  | 1248 |
| 10.96 A | 74268  | VV   | .0293  | 1248 |
| 11.22 A | 43947  | VV   | .0204  | 1248 |
| 11.41 A | 28900  | VV   | .0074  | 1248 |
| 11.71   | 12919  | VV   | .0024  |      |
| 11.94 A | 116153 | VV   | .0457  | 1248 |
| 12.09 A | 98767  | VV   | .0218  | 1248 |
| 12.19 A | 100589 | VV   | 1.6224 | 1248 |
| 12.49   | 5379   | VV   | .0010  |      |
| 12.68   | 136704 | VV   | .0254  |      |
| 12.79   | 75501  | VV   | .0140  |      |
| 13.12   | 177174 | VV   | .0330  |      |
| 13.41   | 38131  | VV   | .0071  |      |
| 13.67   | 4370   | VV   | .0008  |      |
| 13.87   | 6819   | VV   | .0013  |      |
| 14.01 A | 88137  | VV   | .0193  | 1248 |
| 14.16 A | 144298 | VV   | .0454  | 1248 |
| 14.28   | 198975 | VV   | .0370  |      |
| 14.54   | 25103  | VV   | .0047  |      |
| 14.88   | 132557 | VV   | .0247  |      |
| 15.06   | 40393  | VV   | .0075  |      |
| 15.21   | 54724  | VV   | .0102  |      |
| 15.39   | 43636  | VV   | .0081  |      |
| 15.62   | 3737   | VV   | .0007  |      |
| 15.78   | 6457   | VV   | .0012  |      |
| 15.97   | 30514  | VV   | .0057  |      |

Sample Name : D706 1248  
 Result File : /DATA/LOOP/RESULT/PCB\_3071\_027.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 16.15   | 43197  | VV   | .0080       |      |
| 16.29   | 32231  | VV   | .0060       |      |
| 16.51   | 78973  | VV   | .0147       |      |
| 16.89   | 23608  | VV   | .0044       |      |
| 17.17   | 4258   | VV   | .0008       |      |
| 17.31   | 3714   | VV   | .0007       |      |
| 17.47   | 59929  | VV   | .0111       |      |
| 17.81   | 4078   | VV   | .0008       |      |
| 18.05   | 1740   | VV   | .0003       |      |
| 18.29   | 52720  | PV   | .0098       |      |
| 18.60   | 6068   | VV   | .0011       |      |
| 19.01 B | 18433  | VV   | .0068       | 1260 |
| 19.26   | 2457   | VV   | .0005       |      |
| 19.49 B | 5281   | VV   | .0019       | 1260 |
| 19.61 B | 2650   | VV   | .0016       | 1260 |
| 19.71   | 3547   | VV   | .0007       |      |
| 20.07 B | 4751   | PV   | .0014       | 1260 |
| 20.19 B | 2878   | VV   | .0009       | 1260 |
| 20.31 B | 3376   | VV   | 3376.4570   | 1260 |
| 20.60   | 865    | PV   | .0002       |      |
| 20.75 B | 14331  | PV   | .0080       | 1260 |
| 21.39 B | 8717   | VV   | .0018       | 1260 |
| 21.60 B | 3234   | VV   | .5281       | 1260 |
| 21.71 B | 4703   | VV   | .0019       | 1260 |
| 22.32   | 1938   | BV   | .0004       |      |
| 22.81   | 4461   | BV   | .0008       |      |
| 23.77   | 2352   | BB   | .0004       |      |
| 24.68   | 329641 | BB   | 329640.9000 | DCB  |
| 26.24   | 1874   | BV   | .0003       |      |

Total Area : 3475443 Total mg/L : 333020.600

Report Time : Mon Dec 9, 1991 4:02:31 pm  
 Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT -

3.542

5.833 TCX 0.05

6.895

8.885

9.802

10.579

10.999

11.415

12.000

11.948

12.493

12.684

13.109 13.129

13.880 14.016

14.170

14.886

15.063

14.318

15.621 15.780

15.391 15.210

15.967

16.156

16.516

16.702

16.989

17.132

17.469

17.887

18.058

1254 0.500

18.252

18.700

18.601

19.010

19.191 19.490

19.716

20.199

20.069

20.326

20.751

21.279

21.396

22.021

22.325

22.809

23.771

24.684 PCB 0.05

26.238

Sample Name : D707 1254

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCB\_3071\_028.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 11:30:06

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area   | Amount     | Name |
|-------|---|--------|------------|------|
| 10.58 | A | 253336 | .083       | 1248 |
| 19.01 | B | 431749 | 34627.350  | 1260 |
| 24.68 |   | 265819 | 265819.200 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT    |   | Area   | Code | Amount | Name |
|-------|---|--------|------|--------|------|
| .68   |   | 301738 | BV   | .4481  |      |
| 3.54  |   | 4176   | BV   | .0008  |      |
| 5.83  |   | 381052 | BV   | .0709  | Te*  |
| 6.89  |   | 4038   | BV   | .0008  |      |
| 8.89  |   | 2770   | BV   | .0005  |      |
| 9.80  |   | 2033   | VV   | .0004  |      |
| 10.58 | A | 5955   | BV   | .0026  | 1248 |
| 11.00 |   | 4261   | PV   | .0008  |      |
| 11.41 | A | 1255   | VV   | .0003  | 1248 |
| 11.95 | A | 104909 | BV   | .0413  | 1248 |
| 12.10 | A | 40743  | VV   | .0090  | 1248 |
| 12.49 |   | 40551  | VV   | .0075  |      |
| 12.68 |   | 75103  | VV   | .0140  |      |
| 13.13 |   | 29927  | VV   | .0056  |      |
| 13.41 |   | 7932   | VV   | .0015  |      |
| 13.88 |   | 1651   | PV   | .0003  |      |
| 14.02 | A | 21998  | VV   | .0048  | 1248 |
| 14.17 | A | 78476  | VV   | .0247  | 1248 |
| 14.32 |   | 196050 | VV   | .0365  |      |
| 14.55 |   | 37227  | VV   | .0069  |      |
| 14.89 |   | 15822  | VV   | .0029  |      |
| 15.06 |   | 117213 | VV   | .0218  |      |
| 15.21 |   | 214045 | VV   | .0398  |      |
| 15.39 |   | 96791  | VV   | .0180  |      |
| 15.62 |   | 6909   | VV   | .0013  |      |
| 15.78 |   | 17570  | VV   | .0033  |      |
| 15.97 | / | 81249  | VV   | .0151  |      |
| 16.16 | / | 152749 | VV   | .0284  |      |
| 16.30 |   | 48135  | VV   | .0090  |      |
| 16.38 |   | 26367  | VV   | .0049  |      |
| 16.52 | / | 292107 | VV   | .0543  |      |
| 16.89 |   | 35221  | VV   | .0066  |      |
| 16.99 |   | 32893  | VV   | .0061  |      |
| 17.15 |   | 45644  | VV   | .0085  |      |
| 17.31 |   | 18463  | VV   | .0034  |      |
| 17.47 | / | 299300 | VV   | .0557  |      |
| 17.74 |   | 23512  | VV   | .0044  |      |

Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCB\_3071\_028.RES

| RT        | Area   | Code | Amount      | Name         |
|-----------|--------|------|-------------|--------------|
| 17.87     | 21265  | VV   | .0040       |              |
| 18.06     | 29434  | VV   | .0055       |              |
| 18.25 ✓   | 303236 | VV   | .0564       | 1254 1463744 |
| 18.60     | 51700  | VV   | .0096       |              |
| 18.79     | 19005  | VV   | .0035       |              |
| 18.86     | 22580  | VV   | .0042       |              |
| 19.01 B ✓ | 275103 | VV   | .1019       | 1260         |
| 19.22     | 28542  | VV   | .0053       |              |
| 19.38     | 4912   | VV   | .0009       |              |
| 19.49 B   | 15341  | VV   | .0056       | 1260         |
| 19.62 B   | 10861  | VV   | .0064       | 1260         |
| 19.72     | 71622  | VV   | .0133       |              |
| 20.07 B   | 18280  | VV   | .0054       | 1260         |
| 20.20 B   | 11472  | VV   | .0037       | 1260         |
| 20.33 B   | 34627  | VV   | 34626.8400  | 1260         |
| 20.46     | 9865   | VV   | .0018       |              |
| 20.60     | 5516   | VV   | .0010       |              |
| 20.75 B   | 34099  | VV   | .0189       | 1260         |
| 20.89     | 2268   | VV   | .0004       |              |
| 21.28     | 1966   | VV   | .0004       |              |
| 21.40 B   | 26824  | VV   | .0057       | 1260         |
| 21.60 B   | 2249   | VV   | .3673       | 1260         |
| 21.71 B   | 2893   | VV   | .0011       | 1260         |
| 22.02     | 1280   | VV   | .0002       |              |
| 22.33     | 993    | PV   | .0002       |              |
| 22.81     | 1905   | BB   | .0004       |              |
| 23.77     | 1916   | BV   | .0004       |              |
| 24.68     | 265819 | BB   | 265819.2000 | DCB          |
| 26.24     | 1509   | BV   | .0003       |              |

Total Area : 4142915 Total mg/L : 300447.700

Report Time : Mon Dec 9, 1991 4:07:25 pm

Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT -

.670

3.546

5.835 70x 0.05

6.898

9.804

10.589

11.951

12.883

14.173

14.321

15.010

15.211

15.967 16.158

16.385 16.518

17.118

16.987  
17.413

18.056

18.239  
18.604

18.837

19.007

19.266

19.624 19.85

19.887

20.064

20.420 20.601

20.745

1260 0.500

21.516

21.5382

22.013

22.325

22.806

22.485

22.925

23.770

24.682 005 0.05

26.238

Sample Name : D708 1260

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Sample Name : D708 1260

Result File : /DATA/LOOP/RESULT/PCB\_3071\_029.RES

1 uL injection on INST 9004 #6 DB-5 (fused silica/capillary)

Make Up Gas P-5 Argon Methane Mix (30 uL/min)

Carrier Gas - Hydrogen (3.5 mL/min)

Injected on Sat Dec 7, 1991 12:13:40

## \*\*\*\*\*AREA SUM\*\*\*\*\*

| RT    |   | Area    | Amount     | Name |
|-------|---|---------|------------|------|
| 10.59 | A | 13070   | .005       | 1248 |
| 19.01 | B | 1666865 | 81725.860  | 1260 |
| 24.68 |   | 331665  | 331665.400 | DCB  |

## \*\*\*\*\*PEAK AREAS\*\*\*\*\*

| RT    |   | Area   | Code | Amount     | Name |
|-------|---|--------|------|------------|------|
| .67   |   | 276672 | BV   | .4108      |      |
| 3.55  |   | 5753   | BV   | .0011      |      |
| 5.84  |   | 403220 | BV   | .0750      | Tcx  |
| 6.90  |   | 5197   | VV   | .0010      |      |
| 9.80  |   | 1992   | VV   | .0004      |      |
| 10.59 | A | 1843   | BV   | .0008      | 1248 |
| 11.95 | A | 9841   | BV   | .0039      | 1248 |
| 12.50 |   | 1266   | BV   | .0002      |      |
| 12.69 |   | 1033   | PV   | .0002      |      |
| 14.17 | A | 1386   | PV   | .0004      | 1248 |
| 14.32 |   | 85737  | VV   | .0159      |      |
| 15.01 |   | 22598  | VV   | .0042      |      |
| 15.21 |   | 107070 | VV   | .0199      |      |
| 15.39 |   | 5273   | VV   | .0010      |      |
| 15.97 |   | 6181   | PV   | .0011      |      |
| 16.16 |   | 24097  | VV   | .0045      |      |
| 16.39 |   | 46892  | VV   | .0087      |      |
| 16.52 |   | 65329  | VV   | .0122      |      |
| 16.99 |   | 105216 | VV   | .0196      |      |
| 17.15 |   | 74008  | VV   | .0138      |      |
| 17.41 |   | 269381 | VV   | .0501      |      |
| 17.74 |   | 18868  | VV   | .0035      |      |
| 17.86 |   | 8555   | VV   | .0016      |      |
| 18.06 |   | 44532  | VV   | .0083      |      |
| 18.24 |   | 374075 | VV   | .0696      |      |
| 18.60 |   | 164426 | VV   | .0306      |      |
| 18.84 |   | 40768  | VV   | .0076      |      |
| 19.01 | B | 364799 | VV   | .1351      | 1260 |
| 19.27 |   | 49872  | VV   | .0093      |      |
| 19.41 |   | 8458   | VV   | .0016      |      |
| 19.49 | B | 167519 | VV   | .0609      | 1260 |
| 19.61 | B | 93455  | VV   | .0548      | 1260 |
| 19.71 |   | 37483  | VV   | .0070      |      |
| 19.87 |   | 29887  | VV   | .0056      |      |
| 20.06 | B | 162968 | VV   | .0478      | 1260 |
| 20.19 | B | 93609  | VV   | .0303      | 1260 |
| 20.30 | B | 81713  | VV   | 81712.8300 | 1260 |

Sample Name : D708 1260

Result File : /DATA/LOOP/RESULT/PCB\_3071\_029.RES

| RT      | Area   | Code | Amount      | Name |
|---------|--------|------|-------------|------|
| 20.47   | 21476  | VV   | .0040       |      |
| 20.60   | 33357  | VV   | .0062       |      |
| 20.75 B | 352225 | VV   | .1955       | 1260 |
| 20.89   | 13285  | VV   | .0025       |      |
| 21.00   | 17609  | VV   | .0033       |      |
| 21.39 B | 175224 | VV   | .0370       | 1260 |
| 21.52   | 7901   | VV   | .0015       |      |
| 21.60 B | 76167  | VV   | 12.4376     | 1260 |
| 21.71 B | 99175  | VV   | .0391       | 1260 |
| 22.02   | 6810   | VV   | .0013       |      |
| 22.33   | 35321  | VV   | .0066       |      |
| 22.48   | 3730   | VV   | .0007       |      |
| 22.81   | 66799  | PV   | .0124       |      |
| 22.93   | 6980   | VV   | .0013       |      |
| 23.77   | 18596  | BV   | .0035       |      |
| 24.68   | 331665 | BV   | 331665.4000 | DCB  |
| 26.24   | 1873   | BV   | .0003       |      |

Total Area : 4529182 Total mg/L : 413392.100

Report Time : Mon Dec 9, 1991 4:11:42 pm  
Method : /DATA/LOOP/METHOD/PCB8LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

68  
PCB INITIAL CALIBRATION

Lab Name: EKS HERITAGE Indianapolis, IN 46231 Contract: CWM  
 Lab Code: 3071 Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: \_\_\_\_\_  
 Instrument ID: GCECD 7 Level (x low): low \_\_\_\_\_ INIT 1 \_\_\_\_\_ MED \_\_\_\_\_ INIT 2 \_\_\_\_\_ HIGH \_\_\_\_\_

| COMPOUND | CAL. FACTOR           |                       |                       |                       | MEAN                  | RSD   |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------|
|          | V. LOW                | LOW                   | MED                   | HIGH                  |                       |       |
| 1248     | $1.32 \times 10^{-5}$ | $1.28 \times 10^{-5}$ | $1.44 \times 10^{-5}$ | $1.46 \times 10^{-5}$ | $1.38 \times 10^{-5}$ | 6.42  |
| 1260     | $1.20 \times 10^{-5}$ | $1.16 \times 10^{-5}$ | $1.46 \times 10^{-5}$ | $1.43 \times 10^{-5}$ | $1.31 \times 10^{-5}$ | 11.82 |
|          |                       |                       |                       |                       |                       |       |
|          |                       |                       |                       |                       |                       |       |

"RSD must be less than or equal to 20.0% for all compounds except the surrogates, where RSD must be less than or equal to 30.0%. Up to two target compounds, but not surrogates, may have RSD greater than 20.0% but less than or equal to 30.0%." (CLP Revision 04/01)

# **PESTICIDE EVALUATION STANDARDS SUMMARY** **Evaluation of Retention Time Shift for Dibutylchlorodate**

**ENSLABORATORIES, INC.**  
**BIRMINGHAM, AL 35201**

Contract: C1221

Name: BBB/VAPOUS IN ACRYL

SAS No.: \_\_\_\_\_

SDC No.: \_\_\_\_\_

Lab Code: 3071 Case No.: \_\_\_\_\_

GC Column ID: 06-608

Instrument ID: GC ECD 87  
MS 12-1-51

Dates of Analysis: 12-6-91 to 12-7-91

| EPA<br>SAMPLE NO. | LAB SAMPLE<br>ID              | DATE<br>ANALYZED | TIME<br>ANALYZED | D           | *        |
|-------------------|-------------------------------|------------------|------------------|-------------|----------|
| 01                | <u>Hexane</u>                 | <u>12-6-91</u>   | <u>15:51:58</u>  | <u>-</u>    | <u>-</u> |
| 02                | <u>0709 H<sub>2</sub>O</u>    |                  | <u>16:35:38</u>  | <u>R</u>    | <u>-</u> |
| 03                | <u>0710 Me<sub>2</sub></u>    |                  | <u>17:19:17</u>  | <u>0.03</u> | <u>-</u> |
| 04                | <u>0711 L<sub>2</sub></u>     |                  | <u>18:03:02</u>  | <u>0.03</u> | <u>-</u> |
| 05                | <u>0712 V-L<sub>2</sub></u>   |                  | <u>18:46:43</u>  | <u>0.03</u> | <u>-</u> |
| 06                | <u>0702 L<sub>2</sub></u>     |                  | <u>19:30:23</u>  | <u>0.03</u> | <u>-</u> |
| 07                | <u>0703 L<sub>2</sub></u>     |                  | <u>20:14:01</u>  | <u>0.03</u> | <u>-</u> |
| 08                | <u>0704 L<sub>2</sub></u>     |                  | <u>20:57:41</u>  | <u>0.03</u> | <u>-</u> |
| 09                | <u>0907 L<sub>2</sub></u>     |                  | <u>21:41:19</u>  | <u>0.03</u> | <u>-</u> |
| 10                | <u>0706 L<sub>2</sub></u>     |                  | <u>22:24:57</u>  | <u>0.06</u> | <u>-</u> |
| 11                | <u>0707 L<sub>2</sub></u>     | <u>✓</u>         | <u>23:08:57</u>  | <u>0.03</u> | <u>-</u> |
| 12                | <u>0708 L<sub>2</sub></u>     | <u>✓</u>         | <u>23:57:15</u>  | <u>0.03</u> | <u>-</u> |
| 13                | <u>AA L<sub>2</sub></u>       | <u>12-7-91</u>   | <u>01:51:53</u>  | <u>0.03</u> | <u>-</u> |
| 14                | <u>STO L<sub>2</sub></u>      | <u>"</u>         | <u>1:19:33</u>   | <u>0.06</u> | <u>-</u> |
| 15                | <u>C134905 ST<sub>2</sub></u> |                  | <u>2:03:11</u>   | <u>0.06</u> | <u>-</u> |
| 16                | <u>C134905 ST<sub>2</sub></u> |                  | <u>2:46:57</u>   | <u>0.06</u> | <u>-</u> |
| 17                | <u>C134905 ST<sub>2</sub></u> |                  | <u>3:30:39</u>   | <u>0.06</u> | <u>-</u> |
| 18                | <u>0714 R<sub>2</sub></u>     |                  | <u>4:14:05</u>   | <u>0.06</u> | <u>-</u> |
| 19                | <u>C134906</u>                |                  | <u>4:57:41</u>   | <u>0.06</u> | <u>-</u> |
| 20                | <u>C134907</u>                |                  | <u>5:41:21</u>   | <u>0.06</u> | <u>-</u> |
| 21                | <u>C134908</u>                |                  | <u>6:25:02</u>   | <u>0.06</u> | <u>-</u> |
| 22                | <u>C134909</u>                |                  | <u>7:08:57</u>   | <u>0.03</u> | <u>-</u> |
| 23                | <u>C134928</u>                |                  | <u>7:52:12</u>   | <u>0.03</u> | <u>-</u> |
| 24                | <u>0702 L<sub>2</sub></u>     |                  | <u>8:35:47</u>   | <u>0.06</u> | <u>-</u> |
| 25                | <u>0703 L<sub>2</sub></u>     |                  | <u>9:19:21</u>   | <u>0.06</u> | <u>-</u> |
| 26                | <u>0704 L<sub>2</sub></u>     |                  | <u>10:02:58</u>  | <u>0.03</u> | <u>-</u> |
| 27                | <u>0907 L<sub>2</sub></u>     |                  | <u>10:46:30</u>  | <u>0.06</u> | <u>-</u> |
| 28                | <u>0706 L<sub>2</sub></u>     |                  | <u>11:30:06</u>  | <u>0.06</u> | <u>-</u> |
| 29                | <u>0707 L<sub>2</sub></u>     | <u>✓</u>         | <u>12:13:40</u>  | <u>0.06</u> | <u>-</u> |
| 30                | <u>0708 L<sub>2</sub></u>     |                  | <u>12:56:57</u>  | <u>0.06</u> | <u>-</u> |
| 31                |                               |                  |                  |             |          |
| 32                |                               |                  |                  |             |          |
| 33                |                               |                  |                  |             |          |
| 34                |                               |                  |                  |             |          |
| 35                |                               |                  |                  |             |          |
| 36                |                               |                  |                  |             |          |
| 37                |                               |                  |                  |             |          |
| 38                |                               |                  |                  |             |          |

\* Values outside of GC limits (2.0% for packed columns,

# PESTICIDE/PCB STANDARDS SUMMARY

EMS LABORATORIES, INC.

Name: INDIANAPOLIS, IN 46231

Contract: 6107

Lab Code: 3071 Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: \_\_\_\_\_

Instrument ID: GC 607

GC Column ID: 20609

DATE(S) OF FROM: 12-6-91  
ANALYSIS TO: 12-7-91  
TIME(S) OF FROM: 3:51:59  
ANALYSIS TO: 12:56:59

DATE OF ANALYSIS \_\_\_\_\_  
TIME OF ANALYSIS \_\_\_\_\_  
EPA SAMPLE NO. \_\_\_\_\_  
(STANDARD) \_\_\_\_\_

| COMPOUND     | RT    | RT WINDOW |       | CALIBRATION FACTOR    | RT    | CALIBRATION FACTOR     | QNT Y/N | %D   |
|--------------|-------|-----------|-------|-----------------------|-------|------------------------|---------|------|
|              |       | FROM      | TO    |                       |       |                        |         |      |
| Aroclor-1016 | 16.45 | 16.39     | 16.52 | $1.85 \times 10^{-5}$ | 16.43 | $1.45 \times 10^{-5}$  |         | 20.0 |
| Aroclor-1221 | 13.18 | 13.11     | 13.25 | $4.11 \times 10^{-5}$ | 13.16 | $4.06 \times 10^{-5}$  |         | 1.2  |
| Aroclor-1232 | 16.45 | 16.38     | 16.52 | $3.45 \times 10^{-5}$ | 16.45 | $2.82 \times 10^{-5}$  |         | 18.3 |
| Aroclor-1242 | 16.44 | 16.37     | 16.51 | $1.64 \times 10^{-5}$ | 16.44 | $1.47 \times 10^{-5}$  |         | 10.4 |
| Aroclor-1248 | 16.45 | 16.38     | 16.52 | $1.32 \times 10^{-5}$ | 16.45 | $1.26 \times 10^{-5}$  |         | 4.5  |
| Aroclor-1254 | 20.09 | 20.03     | 20.16 | $1.66 \times 10^{-5}$ | 20.09 | $1.50 \times 10^{-5}$  |         | 9.6  |
| Aroclor-1260 | 21.97 | 21.90     | 22.04 | $1.46 \times 10^{-5}$ | 21.97 | $7.144 \times 10^{-5}$ |         | 1.4  |

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.  
%D must be less than or equal to 15.0% for quantitation, and less than or equal to 20.0% for confirmation.

Note: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15.0% criterion.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D.

Identification of such analytes is based primarily on pattern recognition.

Page    of   

FORM IX PEST

1/87 Rev





114

2.242  
1.31  
2.20

TCX 0.05

11.372  
11.372  
11.372  
11.372  
11.372

14.000

14.401

15.332

15.332

17.336 192

18.330

19.332

20.332 21.110

23.349

25.644

26.376

27.665

28.298

28.640

31.188

16.450

1248

1.00  
0.500  
0.500

17.699

18.705

19.120

20.541

21.432

22.333

23.333

24.148

24.612

1260 1.00  
0.500  
0.500

26.265 26.080

26.432

28.884

33.046 0.05





191  
192

10. 7. 7cX 0.05

10. 7. 7cX  
10. 7. 7cX  
10. 7. 7cX

14.502 14.110

1245 0.500

17.123 14.843

18.002 18.862 19.113 18.738

19.036 19.036 19.036 19.036

20.428 20.428 20.428 20.428

20.943 20.943 20.943 20.943

21.032 21.032 21.032 21.032

22.418 22.418 22.418 22.418

23.044 23.044 23.044 23.044

24.413 24.413 24.413 24.413

25.259 25.259 25.259 25.259

26.068 26.068 26.068 26.068

27.053 27.053 27.053 27.053

28.292 28.292 28.292 28.292

28.628 28.628 28.628 28.628

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23.039 0.05 0.05

Sample Name: 07-09 MWI  
CMS LABORATORIES, INC. INDIANAPOLIS IN  
Injection on INST 9904 #5 (DE-608 megadose column)

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[illegible]

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Report Time      : Tue Dec 10, 1991  9:40:10 am
Method          : /DATA/LOOP/METHOD/EPA/LAJ.MTH
Report File     : /DATA/LOOP/FORMAT/EMS.FMT
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86

11.291

10.072 TCX 0.05

11.1046  
11.1051  
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23.040 0.03 0.050

Sample name : 07:1 COW

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

120



Report Name : 11-11-91  
 Date : 11/11/91  
 Time : 14:10:00

| Peak # | Area | Height | Amount | Name            |
|--------|------|--------|--------|-----------------|
| 1      | 1044 | 1044   | 1044   | ENDRIN          |
| 2      | 1216 | 1216   | 1216   | ENDRIN          |
| 3      | 1276 | 1276   | 1276   | ENDRIN          |
| 4      | 1294 | 1294   | 1294   | ENDRIN          |
| 5      | 1484 | 1484   | 1484   | 4,4'-DDT        |
| 6      | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 7      | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 8      | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 9      | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 10     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 11     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 12     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 13     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 14     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 15     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 16     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 17     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 18     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 19     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 20     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 21     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 22     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 23     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 24     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 25     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 26     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 27     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 28     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 29     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 30     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 31     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 32     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 33     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 34     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 35     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 36     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 37     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 38     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 39     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 40     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 41     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 42     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 43     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 44     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 45     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 46     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 47     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 48     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 49     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 50     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 51     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 52     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 53     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 54     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 55     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 56     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 57     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 58     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 59     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 60     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 61     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 62     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 63     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 64     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 65     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 66     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 67     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 68     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 69     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 70     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 71     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 72     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 73     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 74     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 75     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 76     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 77     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 78     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 79     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 80     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 81     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 82     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 83     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 84     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 85     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 86     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 87     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 88     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 89     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 90     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 91     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 92     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 93     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 94     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 95     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 96     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 97     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 98     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 99     | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |
| 100    | 1737 | 1737   | 1737   | ENDRIN ALDEHYDE |

Total Area : 10426/20 Total mg/L : 3.339

Report Time : Tue Dec 10, 1991 9:50:00 am  
 Method : /DATA/LOOP/METHOD/EPA/LAB.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

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10.075 Tcx 0.05

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25.044  
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26.041

26.053  
27.023  
27.030

28.001  
28.001

31.192

33.042 0.05 0.05

Sample Name : D712 VERY LOW  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 ul injection on INST 9004 #5 (DB-608 megabore column)

DATE: 10/10/1991 10:10:10  
TIME: 10:10:10  
DATA: 10/10/1991 10:10:10 10/10/1991 10:10:10

INJECTION IN 10/10/1991 10:10:10 10/10/1991 10:10:10  
INJECTOR: 10/10/1991 10:10:10 10/10/1991 10:10:10  
INJECTOR: 10/10/1991 10:10:10 10/10/1991 10:10:10  
INJECTOR: 10/10/1991 10:10:10 10/10/1991 10:10:10

| RT    | Area   | Code | Amount | Name            |
|-------|--------|------|--------|-----------------|
| 11.12 | 46974  | AV   | .0025  |                 |
| 11.12 | 3063   | VV   | .0015  |                 |
| 11.12 | 475026 | VV   | .00429 |                 |
| 11.12 | 16344  | PV   | .0001  |                 |
| 11.12 | 39844  | VV   | .0012  |                 |
| 11.12 | 19124  | VV   | .0005  |                 |
| 11.12 | 12121  | VV   | .0003  |                 |
| 11.12 | 16411  | VV   | .0001  |                 |
| 11.12 | 15117  | VV   | .0005  |                 |
| 11.12 | 32844  | VV   | .0001  |                 |
| 11.12 | 11282  | VV   | .0001  |                 |
| 11.12 | 30630  | VV   | .0001  |                 |
| 11.12 | 10914  | VV   | .0001  |                 |
| 11.12 | 16355  | VV   | .0001  |                 |
| 11.12 | 187034 | VV   | .0001  |                 |
| 11.12 | 44520  | VV   | .0013  |                 |
| 11.12 | 28650  | VV   | .0008  |                 |
| 11.12 | 22753  | VV   | .0001  |                 |
| 11.12 | 14639  | VV   | .0004  |                 |
| 11.12 | 38065  | VV   | .0011  |                 |
| 11.12 | 96197  | PV   | .0024  |                 |
| 11.12 | 27588  | VV   | .0008  |                 |
| 11.12 | 28198  | VV   | .0008  |                 |
| 11.12 | 66257  | VV   | .0019  |                 |
| 11.12 | 123253 | VV   | .0146  | DELTA-EHC       |
| 11.12 | 76757  | VV   | .0022  |                 |
| 11.12 | 82500  | VV   | .0023  |                 |
| 11.12 | 16333  | VV   | .0005  |                 |
| 11.12 | 42183  | VV   | .0012  |                 |
| 11.12 | 78774  | VV   | .0022  |                 |
| 11.12 | 92484  | VV   | .0026  |                 |
| 11.12 | 78213  | VV   | .0022  |                 |
| 11.12 | 23174  | VV   | .0007  |                 |
| 11.12 | 50890  | VV   | .0014  |                 |
| 11.12 | 19027  | VV   | .0018  | GAMMA-CHLORDANE |
| 11.12 | 12661  | VV   | .0013  | ALPHA-CHLORDANE |
| 11.12 | 79427  | PV   | .0023  |                 |
| 11.12 | 65876  | VV   | .0019  |                 |
| 11.12 | 117069 | VV   | .0033  |                 |
| 11.12 | 124769 | VV   | .0141  | DELTA-EHC       |
| 11.12 | 30204  | PV   | .0009  |                 |
| 11.12 | 71950  | VV   | .0020  |                 |
| 11.12 | 35592  | VV   | .0056  | ENDRIN          |
| 11.12 | 285470 | VV   | .0053  |                 |

378609

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417345

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5.990

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7.988  
8.373

10.075 TCX 0.05

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1016 0.500

17.327  
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18.072  
17.888

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18.072

17.888

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18.868

19.120

18.765

19.944

19.255

19.684

20.231

19.684

20.752

24.995  
25.435  
25.928  
26.413  
26.809  
27.335  
27.821

31.199

33.042 046 0.05

Sample Name : D702 1816

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

126

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_006.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Fri Dec 6, 1991 7:30:23

| RT    | Area    | Code | Amount  | Name            |
|-------|---------|------|---------|-----------------|
| .12   | 25243   | BV   | .0007   |                 |
| .66   | 2086228 | HS   | 13.0517 |                 |
| .92   | 20387   | PT   | .0006   |                 |
| .98   | 38741   | VT   | .0011   |                 |
| 1.14  | 14327   | VT   | .0004   |                 |
| 1.29  | 10807   | VT   | .0003   |                 |
| 5.29  | 11021   | VV   | .0003   |                 |
| 5.99  | 46930   | PV   | .0013   |                 |
| 7.54  | 22199   | VV   | .0006   |                 |
| 7.99  | 10049   | VV   | .0003   |                 |
| 8.37  | 32426   | PV   | .0009   |                 |
| 10.08 | 1840897 | BV   | .0522   | TCT             |
| 11.87 | 82797   | BV   | .0023   |                 |
| 12.26 | 89753   | VV   | .0025   |                 |
| 12.64 | 17648   | VV   | .0005   |                 |
| 12.91 | 72715   | VV   | .0021   |                 |
| 13.18 | 423949  | VV   | .0120   |                 |
| 14.60 | 48714   | PV   | .0014   |                 |
| 14.95 | 717516  | PV   | .0203   |                 |
| 15.40 | 76741   | VB   | .0022   |                 |
| 15.81 | 189135  | BV   | .0054   |                 |
| 16.12 | 401529  | VV   | .0114   |                 |
| 16.45 | 1193073 | VV   | .0338   | 1016 2701837    |
| 17.09 | 478535  | VV   | .0136   |                 |
| 17.33 | 172532  | VV   | .0049   |                 |
| 17.59 | 254241  | VV   | .0072   |                 |
| 17.72 | 381145  | VV   | .0108   |                 |
| 17.89 | 593736  | VV   | .0168   |                 |
| 18.07 | 229094  | VV   | .0065   |                 |
| 18.39 | 63786   | VB   | .0018   |                 |
| 18.76 | 383775  | BV   | .0109   |                 |
| 18.87 | 196409  | VV   | .0056   |                 |
| 19.12 | 411845  | VV   | .0117   |                 |
| 19.26 | 171764  | VV   | .0049   |                 |
| 19.37 | 70423   | VV   | .0020   |                 |
| 19.55 | 101896  | VV   | .0029   |                 |
| 19.68 | 248141  | VV   | .0070   |                 |
| 19.91 | 137814  | VV   | .0039   |                 |
| 20.12 | 71022   | VV   | .0020   |                 |
| 20.43 | 29366   | VV   | .0008   |                 |
| 20.75 | 21311   | VV   | .0020   | GAMMA-CHLORDANE |
| 24.99 | 20088   | VV   | .0006   |                 |
| 25.43 | 31644   | VV   | .0009   |                 |
| 25.69 | 16132   | VV   | .0005   |                 |

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_006.RES

| RT    | Area    | Code | Amount | Name         |
|-------|---------|------|--------|--------------|
| 25.93 | 19834   | VV   | .0025  | DBC          |
| 26.41 | 34852   | VV   | .0010  |              |
| 26.81 | 31156   | VV   | .0009  |              |
| 27.33 | 21411   | VV   | .0006  |              |
| 27.82 | 14036   | VB   | .0032  | METHOXYCHLOR |
| 31.20 | 13321   | BV   | .0004  |              |
| 33.04 | 1764673 | BV   | .0500  | <u>OCB</u>   |

Total Area : 13456802 Total mg/L : 13.380

Report Time : Tue Dec 10, 1991 10:49:14 am

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

1.25  
502  
1.741

.660

5.293  
5.992

7.542  
7.978  
8.378

9.023

10.426

10.075 74% 0.05

11.174  
11.747  
12.248

12.908

13.178 1221 0.500

14.609  
14.952

16.121  
16.464

17.110  
17.977

20.1838

21.865  
21.982

23.106

23.811

24.455

24.800

25.859

26.437

26.830

27.373

33.043 0.05 0.05

Sample Name : D703 1221

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D703 1221

sult File : /DATA/LOOP/RESULT/PCBCON\_3071\_007.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Fri Dec 6, 1991 8:14:01

| RT    | Area    | Code | Amount | Name                |
|-------|---------|------|--------|---------------------|
| .12   | 104104  | BV   | .0030  |                     |
| .50   | 33592   | VV   | .0010  |                     |
| .66   | 713438  | VV   | 4.4634 |                     |
| .92   | 15061   | PV   | .0004  |                     |
| .98   | 58616   | VV   | .0017  |                     |
| 1.19  | 54941   | VV   | .0016  |                     |
| 1.29  | 24575   | VV   | .0007  |                     |
| 1.40  | 31033   | VV   | .0009  |                     |
| 1.74  | 62049   | VV   | .0018  |                     |
| 5.29  | 17801   | VV   | .0005  |                     |
| 5.99  | 49911   | VV   | .0014  |                     |
| 7.54  | 29978   | VV   | .0008  |                     |
| 7.98  | 20998   | VV   | .0006  |                     |
| 8.38  | 43931   | PV   | .0012  |                     |
| 9.02  | 164245  | VB   | .0047  |                     |
| 10.08 | 1849018 | PV   | .0524  | <del>1221</del> Tct |
| 10.43 | 116758  | VV   | .0033  | 1221                |
| 11.74 | 34649   | BV   | .0010  |                     |
| 11.87 | 87649   | VV   | .0025  |                     |
| 12.25 | 264864  | VV   | .0075  |                     |
| 12.91 | 144752  | VV   | .0041  |                     |
| 13.18 | 419065  | VV   | .0119  | 1221                |
| 13.41 | 223939  | VV   | .0063  | 1216865             |
| 14.61 | 10712   | PV   | .0003  |                     |
| 14.95 | 65492   | VV   | .0019  |                     |
| 16.12 | 20369   | PV   | .0021  | GAMMA-BHC           |
| 16.46 | 53323   | PV   | .0015  |                     |
| 17.11 | 34179   | VV   | .0010  |                     |
| 17.60 | 10441   | VV   | .0003  |                     |
| 17.72 | 13683   | VV   | .0004  |                     |
| 17.98 | 90440   | VB   | .0107  | DELTA-BHC           |
| 19.92 | 17974   | VV   | .0005  |                     |
| 20.11 | 12954   | VV   | .0004  |                     |
| 21.37 | 12258   | PV   | .0003  |                     |
| 21.56 | 13449   | VV   | .0004  |                     |
| 21.77 | 20312   | VV   | .0006  |                     |
| 21.98 | 11228   | VV   | .0013  | DIELDRIN            |
| 23.11 | 20716   | VV   | .0006  |                     |
| 23.81 | 11855   | VB   | .0003  |                     |
| 24.46 | 17813   | BV   | .0023  | ENDRIN ALDEHYDE     |
| 24.65 | 14224   | VV   | .0004  |                     |
| 24.99 | 17243   | VV   | .0005  |                     |
| 25.46 | 32505   | VV   | .0009  |                     |
| 25.66 | 15239   | VV   | .0004  |                     |

Sample Name : D703 1221  
Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_007.RES

| RT    | Area    | Code | Amount | Name |
|-------|---------|------|--------|------|
| 26.44 | 55593   | VV   | .0016  |      |
| 26.83 | 23771   | VV   | .0007  |      |
| 27.37 | 16918   | VV   | .0005  |      |
| 33.04 | 1900375 | BV   | .0539  | AcA  |

Total Area : 7078034 Total mg/L : 4.656

Report Time : Tue Dec 10, 1991 2:45:32 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

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.658

1.735  
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9.016

10.069 Tcx 0.05

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12.525  
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12.902  
12.902  
13.174

14.597

14.942

15.397

15.804

16.114

16.454

1232 0.500

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17.091

17.888

18.377

18.761

19.166

19.550

20.035

20.419

20.803

21.187

21.571

21.955

22.339

22.723

23.107

23.491

22.745

23.105

24.428

24.978

26.412

26.859

27.302

27.805

31.205

33.040 0.03 0.05

Sample Name : D704 1232

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

132

Sample Name : D704 1232

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_008.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Fri Dec 6, 1991 8:57:41

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 24083   | BV   | .0007  |                 |
| .66   | 1118014 | HS   | 6.9944 |                 |
| .92   | 18423   | PT   | .0005  |                 |
| .98   | 41161   | VT   | .0012  |                 |
| 1.14  | 13929   | VT   | .0004  |                 |
| 1.28  | 11702   | VT   | .0003  |                 |
| 1.40  | 15780   | VT   | .0004  |                 |
| 1.73  | 26139   | VT   | .0007  |                 |
| 5.28  | 13277   | VV   | .0004  |                 |
| 5.98  | 72908   | VV   | .0021  |                 |
| 7.54  | 29149   | VV   | .0008  |                 |
| 7.76  | 13847   | VV   | .0004  |                 |
| 7.98  | 19124   | VV   | .0005  |                 |
| 8.37  | 44771   | PV   | .0013  |                 |
| 9.02  | 59787   | PB   | .0017  |                 |
| 10.07 | 1784626 | BV   | .0506  | Tot             |
| 11.86 | 91782   | BV   | .0026  |                 |
| 12.24 | 150973  | VV   | .0043  |                 |
| 12.64 | 16959   | VV   | .0005  |                 |
| 12.90 | 90384   | VV   | .0026  |                 |
| 13.17 | 314831  | VV   | .0089  |                 |
| 13.40 | 149057  | VV   | .0042  |                 |
| 14.60 | 22934   | PV   | .0007  |                 |
| 14.94 | 339837  | PV   | .0096  |                 |
| 15.40 | 32950   | VV   | .0009  |                 |
| 15.80 | 79657   | BV   | .0023  |                 |
| 16.11 | 169943  | VV   | .0048  |                 |
| 16.45 | 514307  | VV   | .0146  | 1232 1448321    |
| 17.09 | 207742  | VV   | .0059  |                 |
| 17.32 | 83813   | VV   | .0024  |                 |
| 17.71 | 265450  | VV   | .0075  |                 |
| 17.89 | 341755  | VV   | .0097  |                 |
| 18.38 | 27460   | VB   | .0008  |                 |
| 18.76 | 233958  | BV   | .0066  |                 |
| 19.12 | 164364  | VV   | .0047  |                 |
| 19.25 | 60909   | VV   | .0017  |                 |
| 19.38 | 48167   | VV   | .0014  |                 |
| 19.55 | 96913   | VV   | .0027  |                 |
| 19.69 | 204665  | VV   | .0058  |                 |
| 19.91 | 100589  | VV   | .0029  |                 |
| 20.10 | 72011   | VV   | .0020  |                 |
| 20.27 | 26793   | VV   | .0008  |                 |
| 20.45 | 128235  | VV   | .0036  |                 |
| 20.75 | 39464   | VV   | .0037  | GAMMA-CHLORDANE |

Sample Name : D704 1232

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_008.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 20.96 | 18223   | VV   | .0005  |                 |
| 21.11 | 16653   | VV   | .0017  | ALPHA-CHLORDANE |
| 21.37 | 51290   | VV   | .0015  |                 |
| 21.76 | 22685   | VV   | .0006  |                 |
| 21.90 | 24223   | VV   | .0027  | DIELDRIN        |
| 22.74 | 17340   | PV   | .0005  |                 |
| 23.11 | 21993   | VV   | .0006  |                 |
| 24.43 | 25521   | BV   | .0033  | ENDRIN ALDEHYDE |
| 24.64 | 21866   | VV   | .0006  |                 |
| 24.98 | 18451   | VV   | .0005  |                 |
| 26.41 | 123485  | VV   | .0035  |                 |
| 26.86 | 26335   | VV   | .0007  |                 |
| 27.30 | 25435   | VV   | .0007  |                 |
| 27.81 | 11926   | VB   | .0003  |                 |
| 31.20 | 12417   | BV   | .0004  |                 |
| 33.04 | 1651891 | BV   | .0468  | <u>0.08</u>     |

Total Area : 9472356 Total mg/L : 7.240

Report Time : Tue Dec 10, 1991 11:04:14 am

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

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10.068 TCX 0.05

11.858

12.256

12.654

12.902

13.174

13.776

14.593

14.938

15.393

15.799

16.109

16.441 1342 0.500

17.318

17.082

17.588

17.879

18.379

18.063

18.861

18.757

19.858

19.113

19.549

19.689

20.270

20.432

20.750

21.208

21.362

21.783

22.733

23.085

24.146

24.420

24.984

25.634

26.080

26.626

26.886

27.288

28.884

31.185

33.036 PCB 0.05

Sample Name : D907 1242

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_009.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Fri Dec 6, 1991 9:41:19

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 88799   | BV   | .0025  |                 |
| .49   | 33781   | VV   | .0010  |                 |
| .65   | 268582  | VV   | .0076  |                 |
| .72   | 346722  | VV   | 2.1691 |                 |
| .84   | 42698   | VV   | .0012  |                 |
| 5.28  | 11504   | PV   | .0003  |                 |
| 5.98  | 97636   | PV   | .0028  |                 |
| 7.54  | 18723   | PV   | .0005  |                 |
| 8.37  | 15226   | VV   | .0004  |                 |
| 10.07 | 1951380 | PV   | .0553  | Tot             |
| 11.86 | 76438   | BV   | .0022  |                 |
| 12.26 | 81768   | VV   | .0023  |                 |
| 12.64 | 16581   | VV   | .0005  |                 |
| 12.90 | 62865   | VV   | .0018  |                 |
| 13.17 | 341454  | VV   | .0097  |                 |
| 13.78 | 30446   | VV   | .0009  |                 |
| 14.59 | 41317   | PV   | .0012  |                 |
| 14.94 | 622786  | PV   | .0177  |                 |
| 15.39 | 64669   | VV   | .0018  |                 |
| 15.80 | 165157  | BV   | .0047  |                 |
| 16.11 | 361535  | VV   | .0103  |                 |
| 16.44 | 1083413 | VV   | .0307  | 1242 3052737    |
| 17.08 | 437192  | VV   | .0124  |                 |
| 17.32 | 140115  | VV   | .0040  |                 |
| 17.58 | 237584  | VV   | .0067  |                 |
| 17.71 | 327451  | VV   | .0093  |                 |
| 17.88 | 493428  | VV   | .0140  |                 |
| 18.06 | 164465  | VV   | .0195  | DELTA-BHC       |
| 18.38 | 49026   | VB   | .0014  | -               |
| 18.76 | 339257  | BV   | .0096  |                 |
| 18.86 | 168824  | VV   | .0048  |                 |
| 19.11 | 353442  | VV   | .0100  |                 |
| 19.25 | 124444  | VV   | .0035  |                 |
| 19.38 | 135137  | VV   | .0038  |                 |
| 19.54 | 248759  | VV   | .0071  |                 |
| 19.69 | 444528  | VV   | .0126  |                 |
| 19.90 | 180841  | VV   | .0051  |                 |
| 20.10 | 148380  | VV   | .0042  |                 |
| 20.27 | 65764   | VV   | .0019  |                 |
| 20.43 | 299809  | VV   | .0085  |                 |
| 20.75 | 83303   | VV   | .0078  | GAMMA-CHLORDANE |
| 20.96 | 53244   | VV   | .0015  |                 |
| 21.10 | 54736   | VV   | .0016  |                 |
| 21.26 | 27466   | VV   | .0008  |                 |

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_009.RES

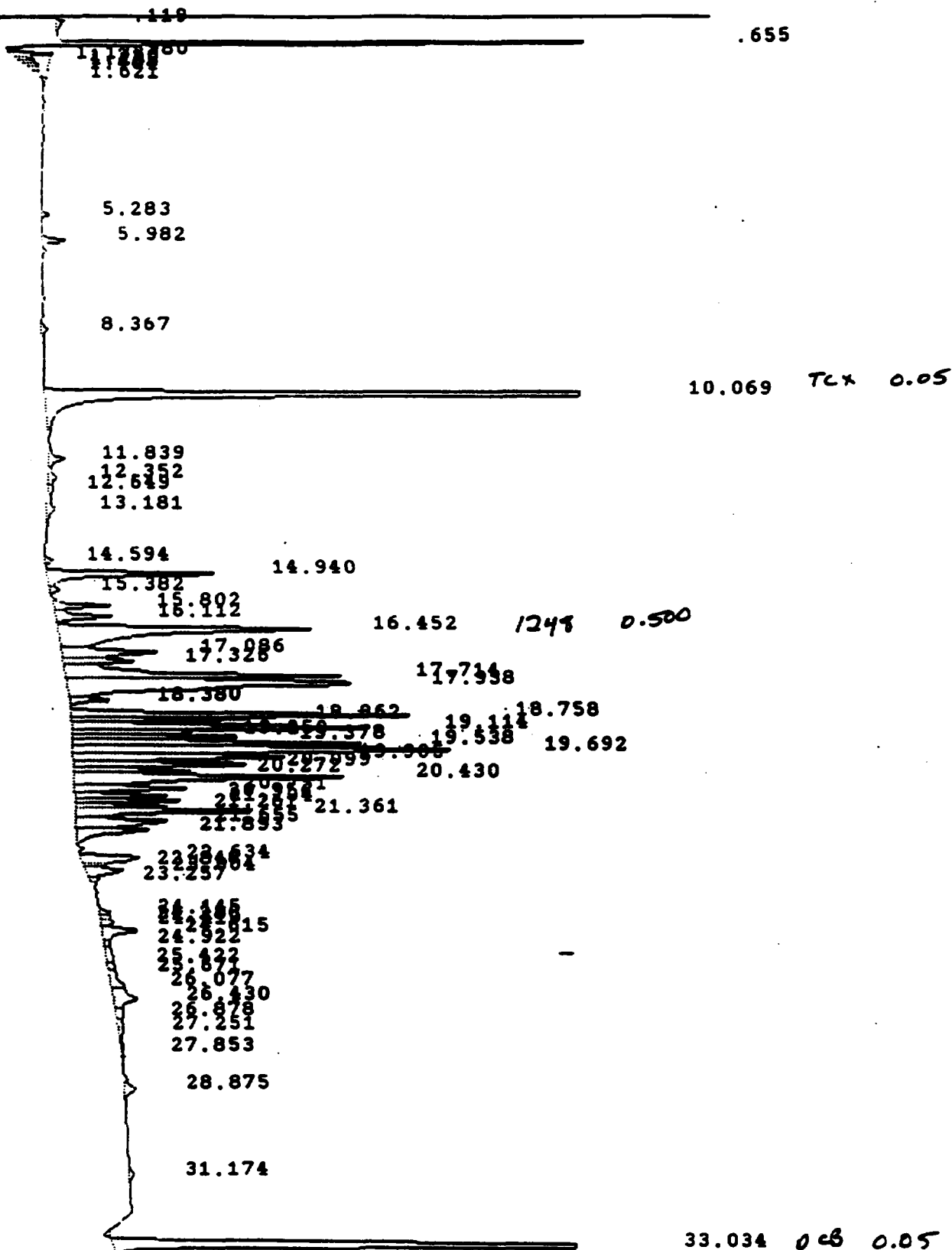
| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 21.36 | 113586  | VV   | .0032  |                 |
| 21.62 | 92795   | VV   | .0026  |                 |
| 21.75 | 31783   | VV   | .0009  |                 |
| 21.89 | 59727   | VV   | .0017  |                 |
| 22.73 | 54482   | PV   | .0015  |                 |
| 23.09 | 41388   | VV   | .0012  |                 |
| 24.15 | 14084   | BV   | .0024  | 4,4'-DDT        |
| 24.42 | 21984   | VV   | .0028  | ENDRIN ALDEHYDE |
| 24.62 | 39979   | VV   | .0011  |                 |
| 24.98 | 13237   | VV   | .0004  |                 |
| 25.43 | 36676   | VV   | .0010  |                 |
| 25.64 | 15724   | VV   | .0004  |                 |
| 26.08 | 47650   | VV   | .0061  | DBC             |
| 26.29 | 16479   | VV   | .0005  |                 |
| 26.44 | 29505   | VV   | .0008  |                 |
| 26.73 | 15977   | VV   | .0005  |                 |
| 26.84 | 16322   | VV   | .0005  |                 |
| 27.29 | 24301   | VV   | .0007  |                 |
| 28.88 | 10415   | VV   | .0003  |                 |
| 31.18 | 15338   | BV   | .0004  |                 |
| 33.04 | 1892416 | BV   | .0537  | pcb             |

Total Area : 13004526 Total mg/L : 2.557

Report Time : Tue Dec 10, 1991 11:15:23 am

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT



Sample Name : D706 1248

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D706 1248

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_010.RES

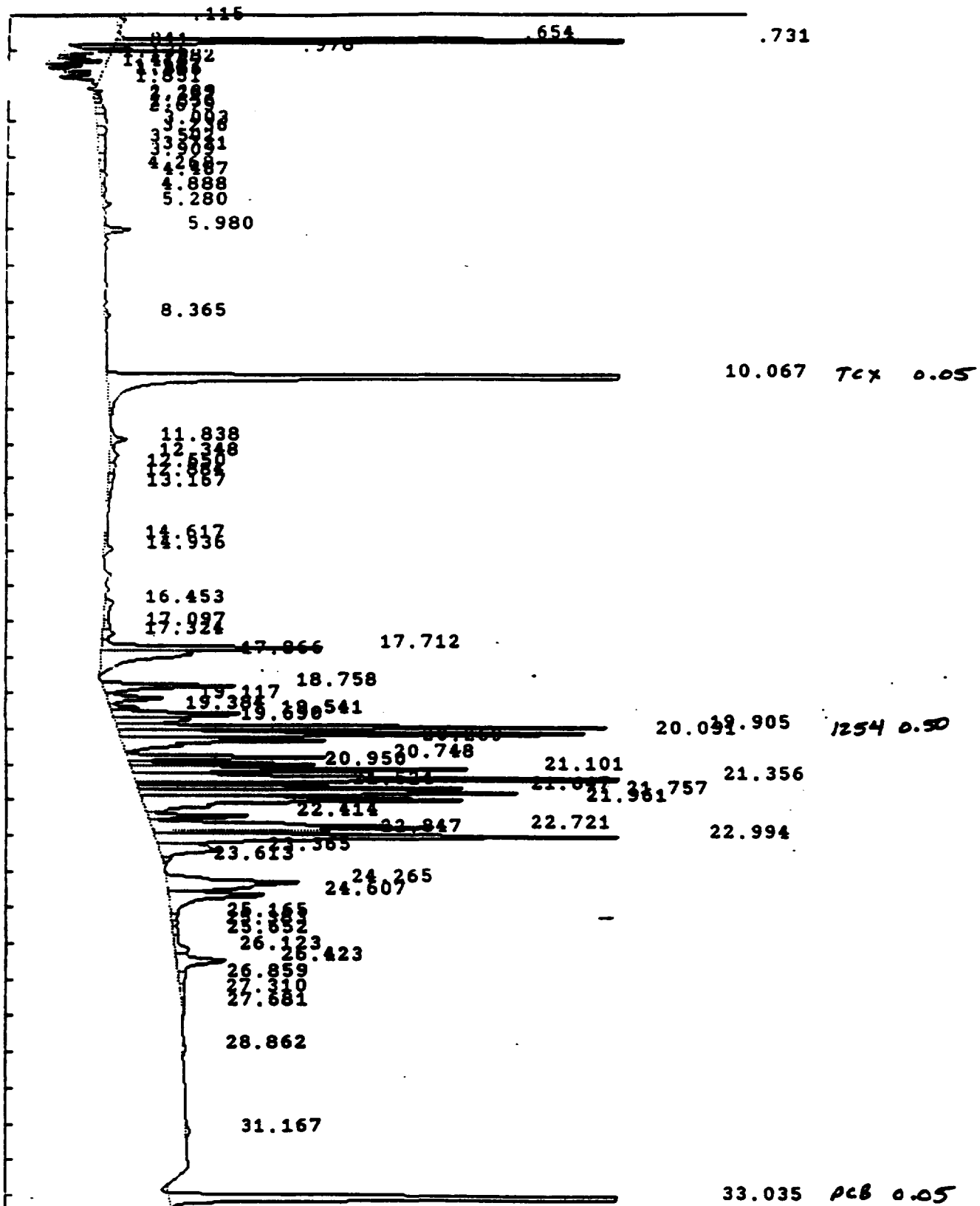
| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 21.89 | 181344  | VV   | .0051  |                 |
| 22.63 | 159331  | PV   | .0045  |                 |
| 22.84 | 29372   | VV   | .0046  | ENDRIN          |
| 23.00 | 96133   | VV   | .0027  |                 |
| 23.26 | 18011   | VV   | .0005  |                 |
| 24.15 | 21075   | BV   | .0036  | 4,4'-DDT        |
| 24.28 | 16120   | VV   | .0005  |                 |
| 24.41 | 26311   | VV   | .0034  | ENDRIN ALDEHYDE |
| 24.62 | 102702  | VV   | .0029  |                 |
| 24.92 | 13557   | VV   | .0004  |                 |
| 25.42 | 39163   | VV   | .0011  |                 |
| 25.67 | 24105   | VV   | .0007  |                 |
| 26.08 | 60738   | VV   | .0077  | DBC             |
| 26.43 | 118201  | VV   | .0034  |                 |
| 26.88 | 31184   | VV   | .0009  |                 |
| 27.25 | 25045   | VV   | .0007  |                 |
| 27.85 | 12720   | VB   | .0029  | METHOXYCHLOR    |
| 28.87 | 40831   | VV   | .0012  |                 |
| 31.17 | 19914   | BV   | .0006  |                 |
| 33.03 | 1898953 | BV   | .0538  | <u>0.06</u>     |

Total Area : 15199186 Total mg/L : 3.550

Report Time : Tue Dec 10, 1991 11:25:41 am

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT



Sample Name : D707 1354

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_011.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Fri Dec 6, 1991 11:08:39

| RT    | Area    | Code | Amount | Name |
|-------|---------|------|--------|------|
| .11   | 25136   | BV   | .0007  |      |
| .65   | 285409  | VV   | .0081  |      |
| .73   | 787767  | HS   | 4.9284 |      |
| .84   | 11911   | BT   | .0003  |      |
| .98   | 132459  | VT   | .0038  |      |
| 1.14  | 32856   | PT   | .0009  |      |
| 1.28  | 67928   | PT   | .0019  |      |
| 1.42  | 39109   | PT   | .0011  |      |
| 1.59  | 38926   | PT   | .0011  |      |
| 1.66  | 28705   | VT   | .0008  |      |
| 1.85  | 34334   | PT   | .0010  |      |
| 2.29  | 11921   | VV   | .0003  |      |
| 2.39  | 12538   | VV   | .0004  |      |
| 2.56  | 18010   | VV   | .0005  |      |
| 2.67  | 28350   | VV   | .0008  |      |
| 3.00  | 48140   | VV   | .0014  |      |
| 3.24  | 35230   | VV   | .0010  |      |
| 3.50  | 25003   | VV   | .0007  |      |
| 3.72  | 28283   | VV   | .0008  |      |
| 3.91  | 19440   | VV   | .0006  |      |
| 4.27  | 21867   | VV   | .0006  |      |
| 4.47  | 23222   | VV   | .0007  |      |
| 4.89  | 19244   | VV   | .0005  |      |
| 5.28  | 25888   | VV   | .0007  |      |
| 5.98  | 47378   | VV   | .0013  |      |
| 8.36  | 17625   | VV   | .0005  |      |
| 10.07 | 1852266 | PV   | .0525  | Tot  |
| 11.84 | 42938   | BV   | .0012  |      |
| 12.35 | 30383   | VV   | .0009  |      |
| 12.65 | 26797   | VV   | .0008  |      |
| 12.88 | 16889   | VV   | .0005  |      |
| 13.17 | 35012   | VV   | .0010  |      |
| 14.62 | 11846   | VV   | .0003  |      |
| 14.94 | 30576   | VV   | .0009  |      |
| 16.45 | 48844   | VV   | .0014  |      |
| 17.10 | 22770   | VV   | .0006  |      |
| 17.32 | 34869   | VV   | .0010  |      |
| 17.71 | 406909  | VV   | .0115  |      |
| 17.87 | 343231  | VB   | .0097  |      |
| 18.76 | 243717  | BV   | .0069  |      |
| 19.12 | 110096  | VV   | .0031  |      |
| 19.38 | 45546   | VV   | .0013  |      |
| 19.54 | 247439  | VV   | .0070  |      |
| 19.69 | 166234  | VV   | .0047  |      |

Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_011.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 19.91 | 704771  | VV   | .0200  |                 |
| 20.09 | 798272  | VV   | .0226  | 1254 3019633    |
| 20.27 | 480357  | VV   | .0136  |                 |
| 20.75 | 273241  | VV   | .0257  | GAMMA-CHLORDANE |
| 20.95 | 281989  | VV   | .0080  |                 |
| 21.10 | 481203  | VV   | .0136  |                 |
| 21.36 | 1180124 | VV   | .0335  |                 |
| 21.52 | 242051  | VV   | .0069  |                 |
| 21.65 | 460157  | VV   | .0130  |                 |
| 21.76 | 624148  | VV   | .0177  |                 |
| 21.96 | 777072  | VV   | .0877  | DIELDRIN        |
| 22.41 | 145924  | VV   | .0041  |                 |
| 22.72 | 632407  | VV   | .0179  |                 |
| 22.85 | 261390  | VV   | .0413  | ENDRIN          |
| 22.99 | 910921  | VV   | .0258  |                 |
| 23.37 | 213476  | VV   | .0234  | ENDOSULFAN II   |
| 23.61 | 23137   | VB   | .0007  |                 |
| 24.26 | 447393  | BV   | .0127  |                 |
| 24.61 | 305387  | VV   | .0087  |                 |
| 25.16 | 17097   | VV   | .0005  |                 |
| 25.38 | 16819   | VV   | .0005  |                 |
| 25.65 | 19671   | VV   | .0006  |                 |
| 26.12 | 62413   | VV   | .0079  | DBC             |
| 26.42 | 159858  | VV   | .0045  |                 |
| 26.86 | 35919   | VV   | .0010  |                 |
| 27.31 | 17289   | VV   | .0005  |                 |
| 27.68 | 16104   | VB   | .0005  |                 |
| 28.86 | 10403   | VV   | .0003  |                 |
| 31.17 | 19611   | BV   | .0006  |                 |
| 33.03 | 1495988 | BV   | .0424  | acc             |

Total Area : 16697632 Total mg/L : 5.520

Report Time : Tue Dec 10, 1991 11:38:23 am  
 Method : /DATA/LOOP/METHOD/EPA7LAJ-MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT

118

.656

1.118  
1.184  
1.394

5.283  
5.982

8.367

10.069 *TEX 0.05*

11.839  
12.351  
12.652

16.465  
17.157  
17.719

20.195  
20.3909

20.748  
20.911  
21.109

21.535 21.350

21.385 *1260 0.500*

22.419 22.857 22.736 23.003

23.643

24.411 24.142

24.610

25.633

26.254  
26.067

26.425

26.863

27.651

28.282

28.622

28.869

31.167

33.036 *0.05*

Sample Name : D708 1260

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D708 1260

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_012.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Fri Dec 6, 1991 11:52:15

| RT    | Area             | Code | Amount | Name                  |
|-------|------------------|------|--------|-----------------------|
| .12   | 23667            | BV   | .0007  |                       |
| .66   | 398775           | HS   | 2.4948 |                       |
| .98   | 45628            | VT   | .0013  |                       |
| 1.13  | 16611            | VT   | .0005  |                       |
| 1.28  | 12583            | VT   | .0004  |                       |
| 1.40  | 18880            | VT   | .0005  |                       |
| 1.59  | 10927            | VT   | .0003  |                       |
| 5.28  | 11659            | PV   | .0003  |                       |
| 5.98  | 31191            | VV   | .0009  |                       |
| 8.37  | 12133            | VV   | .0003  |                       |
| 10.07 | 1972322          | PV   | .0559  | <i>Tex</i>            |
| 11.84 | 42166            | BV   | .0012  |                       |
| 12.35 | 24848            | VV   | .0007  |                       |
| 12.65 | 32998            | VV   | .0009  |                       |
| 16.46 | 10351            | VV   | .0003  |                       |
| 17.16 | 16128            | VV   | .0005  |                       |
| 17.72 | 71293            | VB   | .0020  |                       |
| 19.91 | 354426           | VV   | .0100  |                       |
| 20.10 | 480015           | VV   | .0136  |                       |
| 20.75 | 28699            | VV   | .0027  | GAMMA-CHLORDANE       |
| 20.96 | 14865            | PV   | .0004  |                       |
| 21.11 | 74794            | VV   | .0021  |                       |
| 21.35 | <i>x</i> 532495  | VV   | .0151  |                       |
| 21.54 | <i>x</i> 480953  | VV   | .0136  |                       |
| 21.76 | <i>x</i> 937700  | VV   | .0266  |                       |
| 21.97 | <i>x</i> 1079899 | VV   | .1218  | DIELDRIN 1260 3427424 |
| 22.42 | <i>x</i> 396377  | VV   | .0112  |                       |
| 22.74 | 604985           | VV   | .0172  |                       |
| 22.86 | 388256           | VV   | .0614  | ENDRIN -              |
| 23.00 | 1648641          | VV   | .0467  |                       |
| 23.26 | 542700           | VV   | .0154  |                       |
| 23.64 | 141204           | VB   | .0040  |                       |
| 24.14 | 669835           | BV   | .1136  | 4,4'-DDT              |
| 24.41 | 663589           | VV   | .0853  | ENDRIN ALDEHYDE       |
| 24.61 | 2117121          | VV   | .0600  |                       |
| 25.63 | 114827           | VV   | .0033  |                       |
| 26.07 | 525765           | VV   | .0669  | DBC                   |
| 26.25 | 299413           | VV   | .0085  |                       |
| 26.42 | 1128364          | VV   | .0320  |                       |
| 26.86 | 126451           | VV   | .0036  |                       |
| 27.65 | 40570            | VB   | .0012  |                       |
| 28.28 | 13738            | BV   | .0014  | ENDRIN KETONE         |
| 28.62 | 179003           | VV   | .0051  |                       |
| 28.87 | 618573           | VV   | .0175  |                       |

Sample Name : D708 1260  
Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_012.RES

| RT    | Area    | Code | Amount | Name |
|-------|---------|------|--------|------|
| 31.17 | 153163  | BV   | .0043  |      |
| 33.04 | 1963864 | BV   | .0557  | 466  |

Total Area : 19072444 Total mg/L : 3.382

Report Time : Tue Dec 10, 1991 12:48:49 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

124

.661

1.0320  
1.320  
1.665

3.196

5.287

8.365

10.068

11.839  
12.351  
12.651

16.450  
17.179  
17.328

19.064  
19.332

21.616

26.447  
26.888  
27.351  
27.883

33.038

Sample Name : BLA 688 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

147

Sample Name : BLA 683 S230  
Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_013.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)  
Carrier Gas - Helium (7.4 mL/min)  
Aux Gas - P-5 mix (28.6 mL/min)  
Injected on Sat Dec 7, 1991 12:35:53

| RT           | Area           | Code      | Amount       | Name         |
|--------------|----------------|-----------|--------------|--------------|
| .12          | 25006          | BV        | .0007        |              |
| .66          | 464754         | HS        | 2.9076       |              |
| 1.01         | 12786          | PT        | .0004        |              |
| 1.17         | 16702          | VT        | .0005        |              |
| 1.32         | 14968          | VT        | .0004        |              |
| 1.66         | 13368          | VT        | .0004        |              |
| 3.20         | 13701          | VV        | .0004        |              |
| 5.29         | 11724          | VV        | .0003        |              |
| 8.37         | 14114          | VV        | .0004        |              |
| <u>10.07</u> | <u>1840532</u> | <u>PV</u> | <u>.0522</u> | <u>Tex</u>   |
| 11.84        | 40325          | BV        | .0011        |              |
| 12.35        | 27744          | VV        | .0008        |              |
| 12.65        | 48478          | VV        | .0014        |              |
| 16.45        | 10157          | PV        | .0003        |              |
| 17.18        | 25229          | VV        | .0007        |              |
| 17.72        | 14011          | VV        | .0004        |              |
| 17.97        | 20725          | VB        | .0025        | DELTA-BHC    |
| 19.06        | 13044          | VV        | .0004        |              |
| 19.72        | 12019          | VV        | .0003        |              |
| 19.93        | 20238          | VV        | .0006        |              |
| 21.62        | 64452          | PV        | .0018        |              |
| 26.45        | 144698         | BV        | .0041        |              |
| 26.89        | 32162          | VV        | .0009        |              |
| 27.35        | 25637          | VV        | .0007        |              |
| 27.88        | 15718          | VB        | .0035        | METHOXYCHLOR |
| <u>33.04</u> | <u>1788539</u> | <u>BV</u> | <u>.0507</u> | <u>neb</u>   |

Total Area : 4730832 Total mg/L : 3.033

Report Time : Tue Dec 10, 1991 3:19:30 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

1.848  
1.848  
1.848

2.848  
3.214

5.280

8.364

10.063

11.831  
12.341  
12.642

16.460  
17.157  
17.735

18.762

20.996

21.106

21.532.346

22.9762

22.417

22.882.733

23.070

23.638

24.407.137

24.606

25.415

25.827

26.2959

26.421

27.343  
27.651

28.622.869

31.168

33.030

Sample Name : STD 695 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_014.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 1:19:33

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 25002   | BV   | .0007  |                 |
| .65   | 475947  | HS   | 2.9776 |                 |
| 1.00  | 18821   | PT   | .0005  |                 |
| 1.16  | 17815   | VT   | .0005  |                 |
| 1.31  | 20739   | VT   | .0006  |                 |
| 1.41  | 11345   | VT   | .0003  |                 |
| 1.64  | 19513   | VT   | .0006  |                 |
| 2.85  | 13446   | VV   | .0004  |                 |
| 3.21  | 17180   | VV   | .0005  |                 |
| 5.28  | 13452   | VV   | .0004  |                 |
| 8.36  | 20357   | PV   | .0006  |                 |
| 10.06 | 1913543 | PV   | .0543  | TCL             |
| 11.83 | 42246   | BV   | .0012  |                 |
| 12.34 | 34207   | VV   | .0010  |                 |
| 12.64 | 38899   | VV   | .0011  |                 |
| 16.46 | 13552   | PV   | .0004  |                 |
| 17.16 | 20462   | VV   | .0006  |                 |
| 17.73 | 45136   | VV   | .0013  |                 |
| 18.76 | 13358   | BV   | .0004  |                 |
| 19.08 | 14748   | VV   | .0004  |                 |
| 19.91 | 123840  | VV   | .0035  |                 |
| 20.09 | 165121  | VV   | .0047  |                 |
| 21.11 | 15872   | VV   | .0005  |                 |
| 21.35 | 183755  | PV   | .0052  |                 |
| 21.53 | 159046  | VV   | .0045  |                 |
| 21.76 | 346444  | VV   | .0098  |                 |
| 21.97 | 383785  | VV   | .0433  | DIBENDRIN 1240  |
| 22.42 | 123204  | PV   | .0035  |                 |
| 22.73 | 215942  | PV   | .0061  |                 |
| 22.86 | 124387  | VV   | .0197  | ENDRIN          |
| 23.07 | 595734  | VV   | .0169  |                 |
| 23.25 | 195446  | VV   | .0055  |                 |
| 23.64 | 52603   | VB   | .0015  |                 |
| 24.14 | 252277  | BV   | .0428  | 4,4'-DDT        |
| 24.41 | 235268  | VV   | .0302  | ENDRIN ALDEHYDE |
| 24.61 | 813519  | VV   | .0231  |                 |
| 25.41 | 26201   | VV   | .0007  |                 |
| 25.63 | 61826   | VV   | .0018  |                 |
| 26.06 | 209472  | VV   | .0267  | DBC             |
| 26.25 | 114101  | VV   | .0032  |                 |
| 26.42 | 482215  | VV   | .0137  |                 |
| 27.34 | 23775   | VV   | .0007  |                 |
| 27.65 | 33707   | VB   | .0010  |                 |
| 28.62 | 57251   | PV   | .0016  |                 |

Sample Name : STD 695 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_014.RES

| RT    | Area    | Code | Amount | Name       |
|-------|---------|------|--------|------------|
| 28.87 | 205773  | VV   | .0058  |            |
| 31.17 | 81411   | BV   | .0023  |            |
| 33.03 | 1854735 | BV   | .0526  | <u>pcb</u> |

Total Area : 9926482 Total mg/L : 3.374

Report Time : Tue Dec 10, 1991 3:36:40 pm

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

11.722  
11.861

2.848  
3.505

5.276  
5.977

7.535  
7.963  
8.363

10.063

11.722  
11.861  
12.895  
13.169

14.587

14.934

15.376

15.791

16.096  
16.096

16.442

17.1844

17.422

17.705

17.930

18.385

18.85418.750

19.106

19.5894

20.09819.903

20.749

21.758

21.6035

22.413

21.962

22.850 22.72496

23.63389

24.214069

24.607

25.336

25.846

26.062

26.419

26.885

27.333

27.639

28.662

31.165

33.031

Sample Name : C134905 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_015.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 2:03:11

| RT    | Area    | Code | Amount | Name       |
|-------|---------|------|--------|------------|
| .12   | 24694   | BV   | .0007  |            |
| .65   | 845126  | HS   | 5.2872 |            |
| 1.01  | 27477   | PT   | .0008  |            |
| 1.05  | 23564   | VT   | .0007  |            |
| 1.16  | 26872   | VT   | .0008  |            |
| 1.30  | 36666   | VT   | .0010  |            |
| 1.41  | 21185   | VT   | .0006  |            |
| 1.59  | 11573   | VT   | .0003  |            |
| 2.85  | 10666   | VV   | .0003  |            |
| 3.51  | 10695   | VV   | .0003  |            |
| 5.28  | 12454   | VV   | .0004  |            |
| 5.98  | 69757   | PV   | .0020  |            |
| 7.53  | 16958   | VV   | .0005  |            |
| 7.96  | 17601   | VV   | .0005  |            |
| 8.36  | 36713   | VV   | .0010  |            |
| 10.06 | 1985253 | PV   | .0563  | TCX        |
| 11.73 | 22772   | BV   | .0006  |            |
| 11.86 | 143262  | VV   | .0041  |            |
| 12.22 | 13503   | PV   | .0004  |            |
| 12.33 | 13875   | VV   | .0004  |            |
| 12.89 | 29973   | VV   | .0008  |            |
| 13.17 | 149387  | VV   | .0042  |            |
| 14.59 | 429609  | PV   | .0122  |            |
| 14.93 | 1456529 | PV   | .0413  |            |
| 15.38 | 572873  | VB   | .0162  |            |
| 15.79 | 834336  | BV   | .0237  |            |
| 15.98 | 206970  | VV   | .0059  |            |
| 16.10 | 444034  | VV   | .0126  |            |
| 16.44 | 1507780 | VV   | .0427  | 1242       |
| 17.04 | 102203  | VV   | .0029  |            |
| 17.18 | 36677   | VV   | .0010  |            |
| 17.32 | 260921  | VV   | .0074  |            |
| 17.46 | 310500  | VV   | .0264  | HEPTACHLOR |
| 17.70 | 540681  | VV   | .0153  |            |
| 17.93 | 1925217 | VV   | .2282  | DELTA-BHC  |
| 18.38 | 71736   | VB   | .0020  |            |
| 18.75 | 415597  | BV   | .0118  |            |
| 18.85 | 228277  | VV   | .0065  |            |
| 19.11 | 582361  | VV   | .0165  |            |
| 19.26 | 106562  | VV   | .0030  |            |
| 19.37 | 222995  | VV   | .0063  |            |
| 19.53 | 320023  | VV   | .0091  |            |
| 19.69 | 434702  | VV   | .0123  |            |
| 19.90 | 816442  | VV   | .0231  |            |

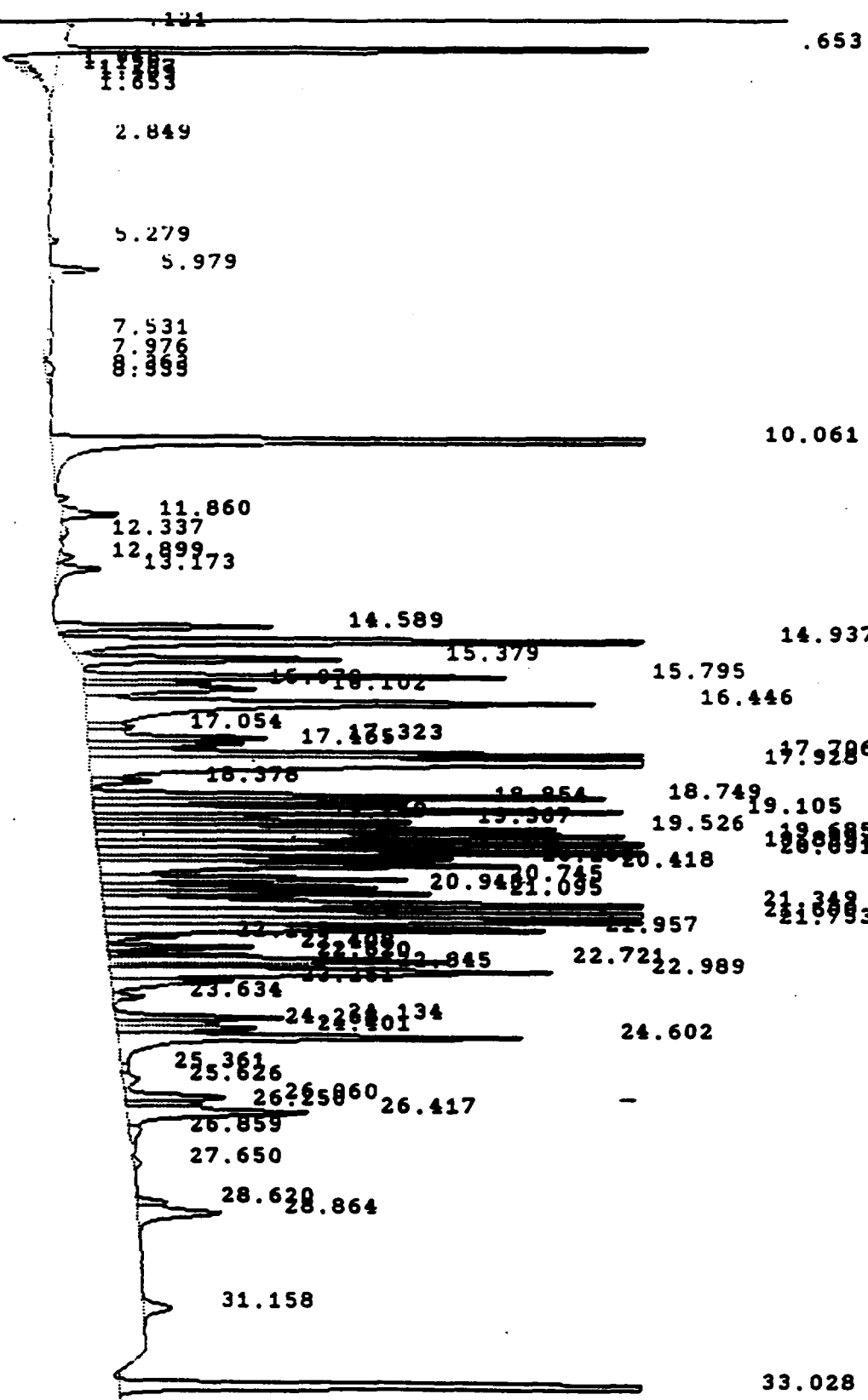
Sample Name : C134905 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_015.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 20.10 | 825042  | VV   | .0234  | 1254            |
| 20.27 | 426689  | VV   | .0121  |                 |
| 20.42 | 275914  | VV   | .0078  |                 |
| 20.75 | 302040  | VV   | .0284  | GAMMA-CHLORDANE |
| 20.95 | 281312  | VV   | .0080  |                 |
| 21.10 | 188529  | VV   | .0053  |                 |
| 21.36 | 915212  | VV   | .0259  |                 |
| 21.60 | 2092903 | VV   | .0593  |                 |
| 21.76 | 645852  | VV   | .0183  |                 |
| 21.96 | 407188  | VV   | .0459  | DIELDRIN 1260   |
| 22.13 | 80429   | VV   | .0023  |                 |
| 22.41 | 65027   | VV   | .0018  |                 |
| 22.72 | 351170  | PV   | .0100  |                 |
| 22.85 | 204090  | VV   | .0323  | ENDRIN          |
| 23.00 | 488355  | VV   | .0138  |                 |
| 23.26 | 53065   | VV   | .0015  |                 |
| 23.36 | 58908   | VV   | .0064  | ENDOSULFAN II   |
| 23.63 | 12165   | VV   | .0003  |                 |
| 24.14 | 49396   | BV   | .0084  | 4,4'-DDT        |
| 24.27 | 105775  | VV   | .0030  |                 |
| 24.40 | 109066  | VV   | .0140  | ENDRIN ALDEHYDE |
| 24.61 | 250661  | VV   | .0071  |                 |
| 25.22 | 14766   | VV   | .0004  |                 |
| 25.40 | 19718   | VV   | .0006  |                 |
| 25.65 | 24688   | VV   | .0007  |                 |
| 26.06 | 73059   | VV   | .0093  | DBC             |
| 26.42 | 170397  | VV   | .0048  |                 |
| 26.88 | 33798   | VV   | .0010  |                 |
| 27.33 | 23673   | VV   | .0007  |                 |
| 27.64 | 22574   | VB   | .0006  |                 |
| 28.64 | 11397   | VV   | .0003  |                 |
| 28.86 | 64522   | VV   | .0018  |                 |
| 31.16 | 37412   | BV   | .0011  |                 |
| 33.03 | 1977446 | BV   | .0561  | 0.6             |

Total Area : 26039292 Total mg/L : 6.303

Report Time : Tue Dec 10, 1991 3:55:15 pm  
 Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
 Report File : /DATA/LOOP/FORMAT/EMS.FMT



Sample Name : C134906 SPI02 S230  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : C134905 SPI02 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_016.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 2:46:51

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 25483   | BV   | .0007  |                 |
| .65   | 964983  | HS   | 6.0371 |                 |
| 1.05  | 40463   | VT   | .0011  |                 |
| 1.16  | 21454   | VT   | .0006  |                 |
| 1.30  | 29301   | VT   | .0008  |                 |
| 1.41  | 15392   | VT   | .0004  |                 |
| 1.65  | 13392   | VT   | .0004  |                 |
| 2.85  | 10157   | VV   | .0003  |                 |
| 5.28  | 13063   | VV   | .0004  |                 |
| 5.98  | 71816   | PV   | .0020  |                 |
| 7.53  | 18043   | VV   | .0005  |                 |
| 7.98  | 10381   | VV   | .0003  |                 |
| 8.36  | 30358   | PV   | .0009  |                 |
| 8.53  | 10869   | VV   | .0003  |                 |
| 10.06 | 1984159 | PV   | .0563  | Tot             |
| 11.86 | 95191   | VV   | .0027  |                 |
| 12.34 | 15891   | VV   | .0005  |                 |
| 12.90 | 27637   | VV   | .0008  |                 |
| 13.17 | 108792  | VV   | .0031  |                 |
| 14.59 | 313017  | PV   | .0089  |                 |
| 14.94 | 1156468 | PV   | .0328  |                 |
| 15.38 | 432318  | VB   | .0123  |                 |
| 15.80 | 681239  | BV   | .0193  |                 |
| 15.98 | 162597  | VV   | .0046  |                 |
| 16.10 | 347186  | VV   | .0098  |                 |
| 16.45 | 1383401 | VV   | .0392  | 1242            |
| 17.05 | 97430   | VV   | .0028  |                 |
| 17.32 | 315098  | VV   | .0089  |                 |
| 17.46 | 292306  | VV   | .0248  | HEPTACHLOR      |
| 17.71 | 822282  | VV   | .0233  |                 |
| 17.93 | 2191773 | VV   | .0621  |                 |
| 18.38 | 99566   | VB   | .0028  |                 |
| 18.75 | 798239  | BV   | .0226  |                 |
| 18.85 | 375541  | VV   | .0106  |                 |
| 19.10 | 988260  | VV   | .0280  |                 |
| 19.25 | 199315  | VV   | .0057  |                 |
| 19.37 | 458557  | VV   | .0130  |                 |
| 19.53 | 661303  | VV   | .0187  |                 |
| 19.68 | 986909  | VV   | .0280  |                 |
| 19.90 | 1037767 | VV   | .0294  |                 |
| 20.09 | 1047271 | VV   | .0297  | 1254            |
| 20.26 | 522170  | VV   | .0148  |                 |
| 20.42 | 732400  | VV   | .0208  |                 |
| 20.74 | 420309  | VV   | .0395  | GAMMA-CHLORDANE |

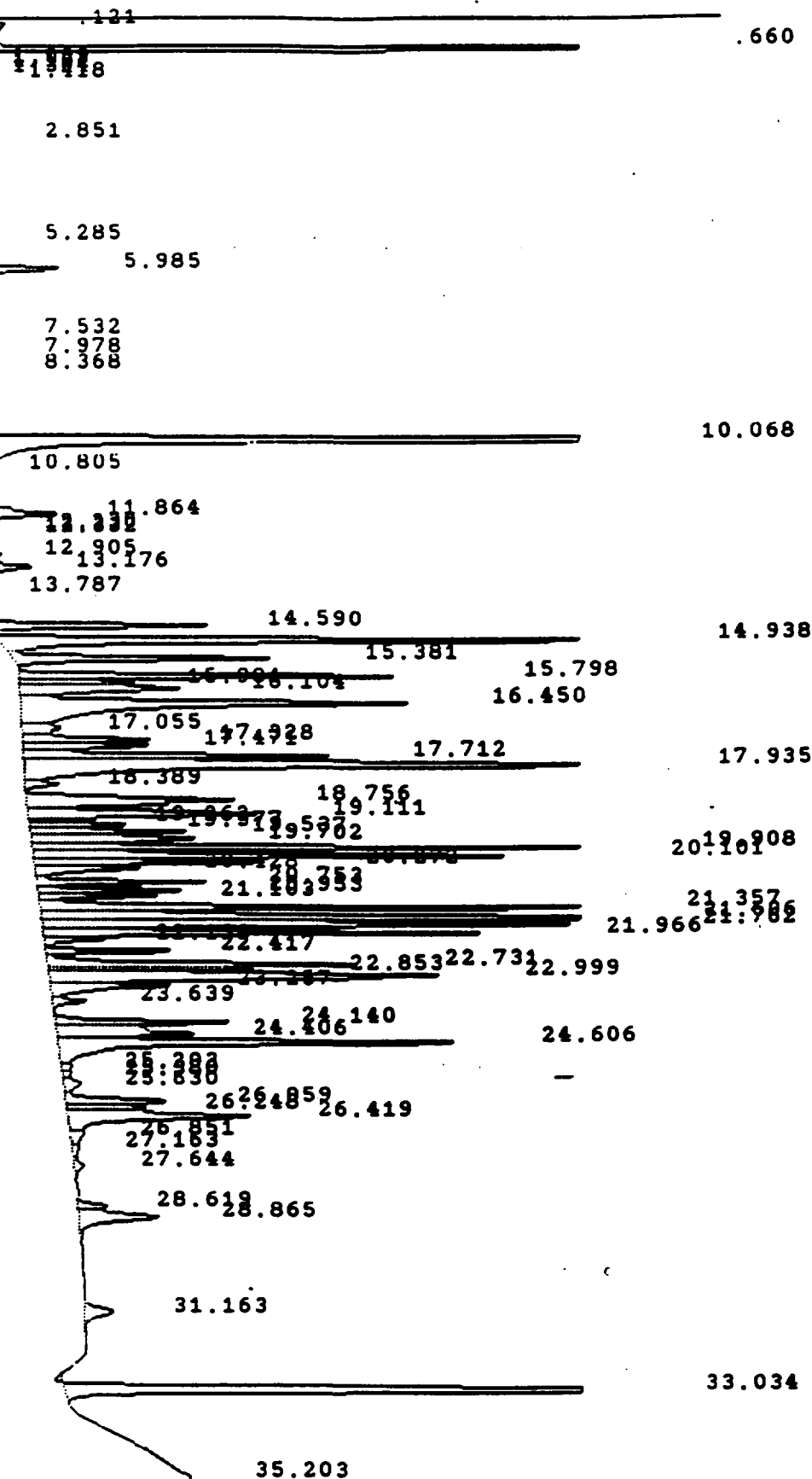
Sample Name : C134905 SPI02 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_016.RES

| RT    | Area    | Code | Amount | Name                     |
|-------|---------|------|--------|--------------------------|
| 20.94 | 410846  | VV   | .0116  |                          |
| 21.09 | 388672  | VV   | .0110  |                          |
| 21.35 | 1317040 | VV   | .0373  |                          |
| 21.60 | 1963009 | VV   | .0557  |                          |
| 21.75 | 798516  | VV   | .0226  |                          |
| 21.96 | 759519  | VV   | .0857  | <del>DIELDRIN</del> 1260 |
| 22.13 | 102555  | VV   | .0029  |                          |
| 22.41 | 167856  | VV   | .0048  |                          |
| 22.62 | 128025  | VV   | .0036  |                          |
| 22.72 | 495658  | VV   | .0141  |                          |
| 22.84 | 292514  | VV   | .0463  | ENDRIN                   |
| 22.99 | 913834  | VV   | .0259  |                          |
| 23.25 | 242670  | VV   | .0069  |                          |
| 23.63 | 51929   | VB   | .0015  |                          |
| 24.13 | 260795  | BV   | .0442  | 4,4'-DDT                 |
| 24.27 | 132806  | VV   | .0038  |                          |
| 24.40 | 246612  | VV   | .0317  | ENDRIN ALDEHYDE          |
| 24.60 | 862845  | VV   | .0245  |                          |
| 25.36 | 18332   | VV   | .0005  |                          |
| 25.63 | 50006   | VV   | .0014  |                          |
| 26.06 | 222356  | VV   | .0283  | DBC                      |
| 26.25 | 116932  | VV   | .0033  |                          |
| 26.42 | 447109  | VV   | .0127  |                          |
| 26.86 | 44615   | VV   | .0013  |                          |
| 27.65 | 23489   | VV   | .0007  |                          |
| 28.62 | 65076   | VV   | .0018  |                          |
| 28.86 | 256971  | VV   | .0073  |                          |
| 31.16 | 96427   | BV   | .0027  |                          |
| 33.03 | 1967052 | BV   | .0558  | 060                      |

Total Area : 32873624 Total mg/L : 7.172

Report Time : Tue Dec 10, 1991 4:41:50 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT\_



Sample Name : C134905 DPS02 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : C134905 DPS02 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_017.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 3:30:29

| RT    | Area    | Code | Amount | Name       |
|-------|---------|------|--------|------------|
| .12   | 24291   | BV   | .0007  |            |
| .66   | 840346  | HS   | 5.2573 |            |
| 1.01  | 30201   | PT   | .0009  |            |
| 1.06  | 15977   | VT   | .0005  |            |
| 1.16  | 21221   | VT   | .0006  |            |
| 1.30  | 29067   | VT   | .0008  |            |
| 1.42  | 14738   | VT   | .0004  |            |
| 2.85  | 11434   | VV   | .0003  |            |
| 5.28  | 13767   | VV   | .0004  |            |
| 5.99  | 120297  | VV   | .0034  |            |
| 7.53  | 27756   | VV   | .0008  |            |
| 7.98  | 15961   | VV   | .0005  |            |
| 8.37  | 38790   | PV   | .0011  |            |
| 10.07 | 2147765 | PV   | .0609  | Tcx        |
| 10.81 | 26089   | VV   | .0007  |            |
| 11.86 | 129017  | BV   | .0037  |            |
| 12.23 | 12061   | VV   | .0003  |            |
| 12.33 | 23620   | VV   | .0007  |            |
| 12.90 | 33525   | PV   | .0010  |            |
| 13.18 | 138301  | VV   | .0039  |            |
| 13.79 | 34244   | VV   | .0010  |            |
| 14.59 | 318670  | VV   | .0090  |            |
| 14.94 | 1091359 | PV   | .0309  |            |
| 15.38 | 412493  | VB   | .0117  |            |
| 15.80 | 591577  | BV   | .0168  |            |
| 15.98 | 139108  | VV   | .0039  |            |
| 16.10 | 329780  | VV   | .0093  |            |
| 16.45 | 1080154 | VV   | .0306  | 1242       |
| 17.06 | 107601  | VV   | .0031  |            |
| 17.33 | 192536  | VV   | .0055  |            |
| 17.47 | 221481  | VV   | .0188  | HEPTACHLOR |
| 17.71 | 439789  | VV   | .0125  |            |
| 17.94 | 1467385 | VV   | .1740  | DELTA-BHC  |
| 18.39 | 52916   | VB   | .0015  |            |
| 18.76 | 506214  | BV   | .0144  |            |
| 19.11 | 439684  | VV   | .0125  |            |
| 19.26 | 71059   | VV   | .0020  |            |
| 19.38 | 150144  | VV   | .0043  |            |
| 19.54 | 238170  | VV   | .0068  |            |
| 19.70 | 320444  | VV   | .0091  |            |
| 19.91 | 688385  | VV   | .0195  |            |
| 20.10 | 702405  | VV   | .0199  | 1254       |
| 20.27 | 317700  | VV   | .0090  |            |
| 20.43 | 182113  | VV   | .0052  |            |

Sample Name : C134905 DPS02 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_017.RES

| RT    | Area    | Code | Amount | Name                            |
|-------|---------|------|--------|---------------------------------|
| 20.75 | 211772  | VV   | .0199  | GAMMA-CHLORDANE                 |
| 20.95 | 189725  | VV   | .0054  |                                 |
| 21.10 | 141784  | VV   | .0040  |                                 |
| 21.36 | 782232  | VV   | .0222  |                                 |
| 21.61 | 1585355 | VV   | .0449  |                                 |
| 21.76 | 740894  | VV   | .0210  |                                 |
| 21.97 | 585934  | VV   | .0661  | <del>DIELDRIN</del> <i>1760</i> |
| 22.13 | 82842   | VV   | .0023  |                                 |
| 22.42 | 158351  | PV   | .0045  |                                 |
| 22.73 | 418550  | VV   | .0119  |                                 |
| 22.85 | 251858  | VV   | .0398  | ENDRIN                          |
| 23.00 | 846785  | VV   | .0240  |                                 |
| 23.26 | 238311  | VV   | .0068  |                                 |
| 23.64 | 55442   | VB   | .0016  |                                 |
| 24.14 | 268956  | BV   | .0456  | 4,4'-DDT                        |
| 24.41 | 345882  | VV   | .0445  | ENDRIN ALDEHYDE                 |
| 24.61 | 862907  | VV   | .0245  |                                 |
| 25.20 | 17872   | VV   | .0005  |                                 |
| 25.38 | 20706   | VV   | .0006  |                                 |
| 25.63 | 57605   | VV   | .0016  |                                 |
| 26.06 | 224472  | VV   | .0286  | DBC                             |
| 26.25 | 113879  | VV   | .0032  |                                 |
| 26.42 | 463847  | VV   | .0132  |                                 |
| 26.85 | 46163   | VV   | .0013  |                                 |
| 27.16 | 23953   | VV   | .0007  |                                 |
| 27.64 | 33733   | VB   | .0010  |                                 |
| 28.62 | 62677   | VV   | .0018  |                                 |
| 28.87 | 240803  | VV   | .0068  |                                 |
| 31.16 | 98539   | BV   | .0028  |                                 |
| 33.03 | 2094694 | BV   | .0594  | <i>026</i>                      |
| 35.20 | 14394   | BV   | .0012  | <del>DEC</del>                  |

Total Area : 25090556 Total mg/L : 6.282

Report Time : Tue Dec 10, 1991 4:53:54 pm

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

116

719 .655

11.834  
11.935

5.278  
5.978

7.532  
7.965  
8.926

10.064 TCR 0.05

11.834  
12.345  
12.844  
13.175

14.589  
14.935

15.380  
15.706

16.443 1248 0.45

17.319

17.878

18.375

18.855

19.108 18.751

19.373

19.533

20.089 19.902

20.424

20.911

21.054 21.502

21.349

21.989

1260 0.45

22.415

22.732

22.853

23.893

23.640

24.207

24.407

24.137

24.604

25.627

26.268 26.063

26.418

26.865

27.642

28.279

28.615

28.861

31.157

33.030 0.05

35.203

Sample Name : D714 RCS

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D714 RCS

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_018.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 4:14:05

| RT    | Area    | Code | Amount | Name         |
|-------|---------|------|--------|--------------|
| .12   | 100993  | BV   | .0029  |              |
| .66   | 453400  | VV   | 2.8365 |              |
| .72   | 234632  | VV   | .0067  |              |
| .92   | 10724   | PV   | .0003  |              |
| .98   | 72339   | VV   | .0021  |              |
| 1.13  | 62623   | VV   | .0018  |              |
| 1.29  | 31087   | VV   | .0009  |              |
| 1.38  | 17675   | VV   | .0005  |              |
| 1.59  | 27963   | VV   | .0008  |              |
| 1.73  | 30138   | VV   | .0009  |              |
| 5.28  | 12640   | VV   | .0004  |              |
| 5.98  | 83351   | VV   | .0024  |              |
| 7.53  | 23000   | VV   | .0007  |              |
| 7.97  | 11762   | VV   | .0003  |              |
| 8.36  | 26043   | PV   | .0007  |              |
| 8.53  | 13040   | VV   | .0004  |              |
| 10.06 | 2033529 | PV   | .0577  | Tct          |
| 11.83 | 40684   | BV   | .0012  |              |
| 12.35 | 30346   | VV   | .0009  |              |
| 12.64 | 19962   | VV   | .0006  |              |
| 12.88 | 11061   | VV   | .0003  |              |
| 13.17 | 30240   | VV   | .0009  |              |
| 14.59 | 11332   | PV   | .0003  |              |
| 14.94 | 317489  | PV   | .0090  |              |
| 15.38 | 16497   | VV   | .0005  |              |
| 15.80 | 90457   | VV   | .0026  |              |
| 16.11 | 108751  | VV   | .0031  |              |
| 16.44 | 847125  | VV   | .0240  | 1204 3489662 |
| 17.08 | 235072  | VV   | .0067  |              |
| 17.32 | 132928  | VV   | .0038  |              |
| 17.71 | 595059  | VV   | .0169  |              |
| 17.87 | 704236  | VV   | .0200  |              |
| 18.06 | 223089  | VV   | .0264  | DELTA-BHC    |
| 18.37 | 60827   | VB   | .0017  |              |
| 18.75 | 495247  | BV   | .0140  |              |
| 18.86 | 224969  | VV   | .0064  |              |
| 19.11 | 563614  | VV   | .0160  |              |
| 19.24 | 144574  | VV   | .0041  |              |
| 19.37 | 268017  | VV   | .0076  |              |
| 19.53 | 468116  | VV   | .0133  |              |
| 19.69 | 737555  | VV   | .0209  |              |
| 19.90 | 579665  | VV   | .0164  |              |
| 20.09 | 564028  | VV   | .0160  |              |
| 20.27 | 178950  | VV   | .0051  |              |

Sample Name : D714 RCS

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_018.RES

| RT      | Area    | Code | Amount | Name                             |
|---------|---------|------|--------|----------------------------------|
| 20.42 / | 555763  | VV   | .0158  |                                  |
| 20.75   | 161080  | VV   | .0152  | GAMMA-CHLORDANE                  |
| 20.95   | 120540  | VV   | .0034  |                                  |
| 21.10   | 173653  | VV   | .0049  |                                  |
| 21.35 x | 769116  | VV   | .0218  |                                  |
| 21.53 x | 401843  | VV   | .0114  |                                  |
| 21.64   | 133325  | VV   | .0038  |                                  |
| 21.76 x | 922362  | VV   | .0262  |                                  |
| 21.96 K | 954300  | VV   | .1077  | <del>DIELDRIN</del> 1260 3394417 |
| 22.13   | 95485   | VV   | .0027  |                                  |
| 22.41 x | 346796  | PV   | .0098  |                                  |
| 22.73   | 671585  | VV   | .0190  |                                  |
| 22.85   | 386455  | VV   | .0611  | ENDRIN                           |
| 23.00   | 860072  | VV   | .0244  |                                  |
| 23.07   | 694340  | VV   | .0197  |                                  |
| 23.26   | 487741  | VV   | .0138  |                                  |
| 23.64   | 130470  | VB   | .0037  |                                  |
| 24.14   | 666276  | BV   | .1129  | 4,4'-DDT                         |
| 24.29   | 140109  | VV   | .0040  |                                  |
| 24.41   | 507844  | VV   | .0653  | ENDRIN ALDEHYDE                  |
| 24.60   | 2049899 | VV   | .0581  |                                  |
| 25.63   | 95738   | VV   | .0027  |                                  |
| 26.06   | 513400  | VV   | .0654  | DBC                              |
| 26.25   | 271050  | VV   | .0077  |                                  |
| 26.42   | 1098909 | VV   | .0312  |                                  |
| 26.86   | 99629   | VV   | .0028  |                                  |
| 27.64   | 31671   | VB   | .0009  |                                  |
| 28.28   | 13489   | BV   | .0014  | ENDRIN KETONE                    |
| 28.61   | 183625  | VV   | .0052  |                                  |
| 28.86   | 629093  | VV   | .0178  |                                  |
| 31.16   | 139867  | BV   | .0040  |                                  |
| 33.03   | 2038090 | BV   | .0578  | AC6                              |
| 35.20   | 15329   | BV   | .0013  | DCB                              |

Total Area : 27303776 Total mg/L : 3.957

Report Time : Tue Dec 10, 1991 12:53:50 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

.656

2.851

3.508

5.283

5.981

7.090

7.524

7.966

8.370

10.062

11.838

12.341

12.888

13.174

13.745

14.589

15.382

15.798

16.452

17.082

17.1936

18.754

19.13

20.359

21.960

21.603

21.960

22.889

23.520

24.448

25.080

25.712

26.344

26.976

27.608

27.731

31.172

33.030

35.210

Sample Name : C134906 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : C134906 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_019.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 4:57:41

| RT    | Area     | Code | Amount | Name      |
|-------|----------|------|--------|-----------|
| .12   | 26362    | BV   | .0007  |           |
| .66   | 943193   | HS   | 5.9007 |           |
| .84   | 11202    | BT   | .0003  |           |
| 1.04  | 62396    | PT   | .0018  |           |
| 1.16  | 34649    | VT   | .0010  |           |
| 1.30  | 36463    | VT   | .0010  |           |
| 1.41  | 27935    | VT   | .0008  |           |
| 1.58  | 11639    | VT   | .0003  |           |
| 1.74  | 16547    | VT   | .0005  |           |
| 1.80  | 14711    | VT   | .0004  |           |
| 2.85  | 13025    | VV   | .0004  |           |
| 3.51  | 10426    | VV   | .0003  |           |
| 5.28  | 12947    | VV   | .0004  |           |
| 5.98  | 64535    | VV   | .0018  |           |
| 7.09  | 10031    | VV   | .0003  |           |
| 7.52  | 21838    | VV   | .0006  |           |
| 7.83  | 16029    | VV   | .0005  |           |
| 7.96  | 12077    | VV   | .0003  |           |
| 8.37  | 48847    | PV   | .0014  |           |
| 10.06 | 1820259  | PV   | .0516  | TCT       |
| 11.84 | 29008    | BV   | .0008  |           |
| 12.34 | 26229    | VV   | .0007  |           |
| 12.65 | 10812    | VV   | .0003  |           |
| 12.90 | 12954    | VV   | .0004  |           |
| 13.17 | 57053    | VV   | .0016  |           |
| 13.75 | 11239    | VV   | .0003  |           |
| 14.59 | 19418    | VV   | .0006  |           |
| 14.94 | ✓ 108294 | VV   | .0031  |           |
| 15.38 | 25134    | VV   | .0007  |           |
| 15.80 | 53375    | BV   | .0015  |           |
| 16.10 | 55374    | VV   | .0016  |           |
| 16.45 | ✓ 222682 | VV   | .0063  | 1247      |
| 17.08 | 46012    | VV   | .0013  |           |
| 17.32 | 28711    | VV   | .0008  |           |
| 17.71 | 107254   | VV   | .0030  |           |
| 17.94 | 226909   | VV   | .0269  | DELTA-BHC |
| 18.75 | 89994    | BV   | .0026  |           |
| 19.11 | ✓ 77138  | VV   | .0022  |           |
| 19.25 | 18159    | VV   | .0005  |           |
| 19.38 | 30503    | VV   | .0009  |           |
| 19.54 | ✓ 59213  | VV   | .0017  |           |
| 19.70 | ✓ 86084  | VV   | .0024  |           |
| 19.90 | . 76345  | VV   | .0022  |           |
| 20.10 | . 72669  | VV   | .0021  | 1254      |

Sample Name : C134906 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_019.RES

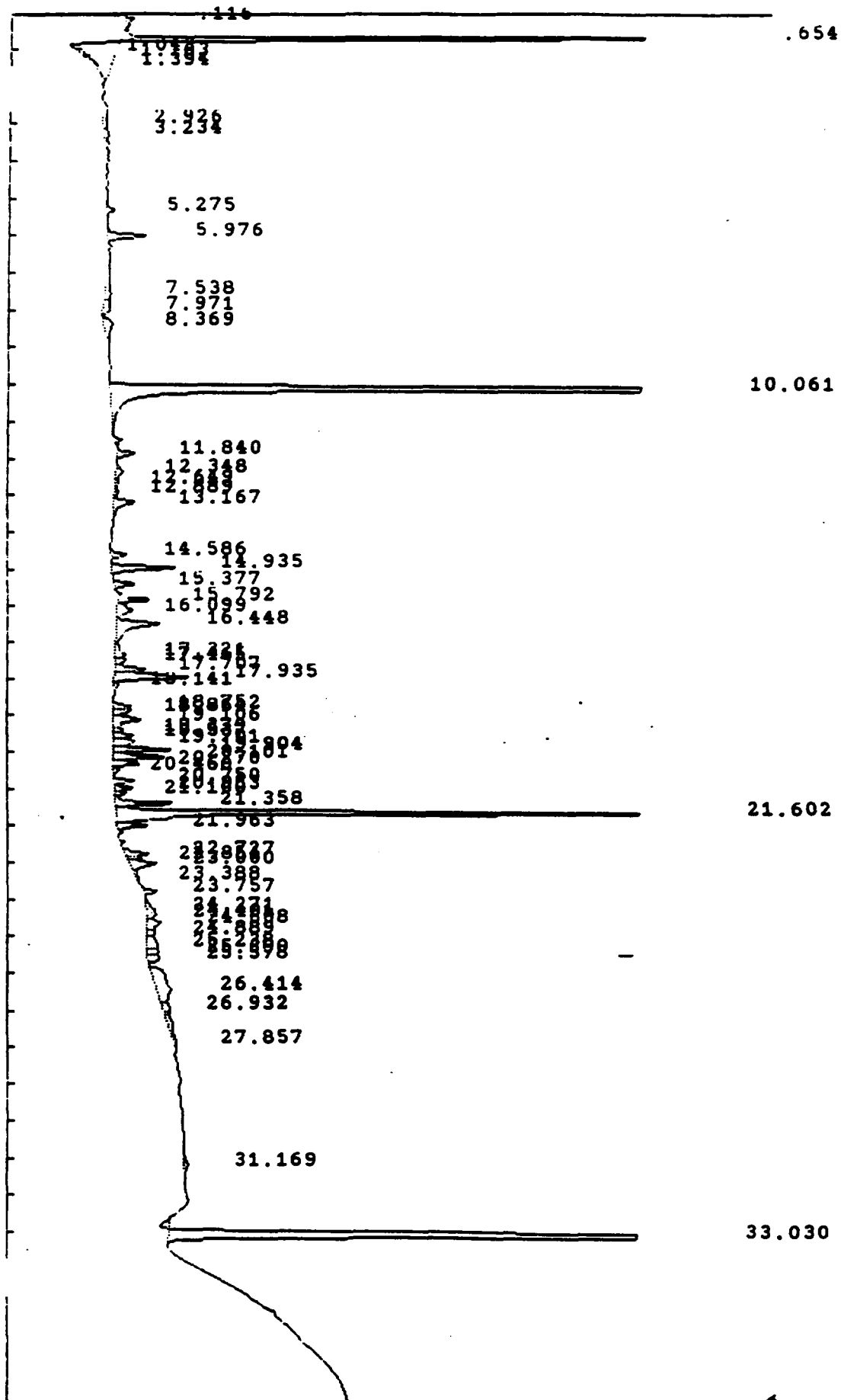
| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 20.27 | 37933   | VV   | .0011  |                 |
| 20.43 | 46214   | VV   | .0013  |                 |
| 20.75 | 25551   | VV   | .0024  | GAMMA-CHLORDANE |
| 20.95 | 23095   | PV   | .0007  |                 |
| 21.10 | 15820   | VV   | .0004  |                 |
| 21.36 | 81871   | PV   | .0023  |                 |
| 21.60 | 468148  | VV   | .0133  |                 |
| 21.96 | 33922   | VV   | .0038  | DIELDRIN        |
| 22.72 | 39877   | PV   | .0011  |                 |
| 22.85 | 18026   | VV   | .0029  | ENDRIN          |
| 23.00 | 48338   | VV   | .0014  |                 |
| 23.37 | 14002   | VV   | .0015  | ENDOSULFAN II   |
| 23.75 | 15755   | VB   | .0004  |                 |
| 24.27 | 27227   | BV   | .0008  |                 |
| 24.40 | 20942   | VV   | .0027  | ENDRIN ALDEHYDE |
| 24.61 | 27303   | VV   | .0008  |                 |
| 24.96 | 26321   | VV   | .0007  |                 |
| 25.41 | 43336   | VV   | .0012  |                 |
| 25.63 | 26753   | VV   | .0008  |                 |
| 26.40 | 91432   | VV   | .0026  |                 |
| 26.87 | 26660   | VV   | .0008  |                 |
| 27.31 | 27647   | VV   | .0008  |                 |
| 27.73 | 18311   | VB   | .0005  |                 |
| 31.17 | 14969   | BV   | .0004  |                 |
| 33.03 | 1742168 | BV   | .0494  | pcb             |
| 35.21 | 14993   | BV   | .0013  | pcb             |

Total Area : 7742290 Total mg/L : 6.125

Report Time : Tue Dec 10, 1991 5:01:52 pm

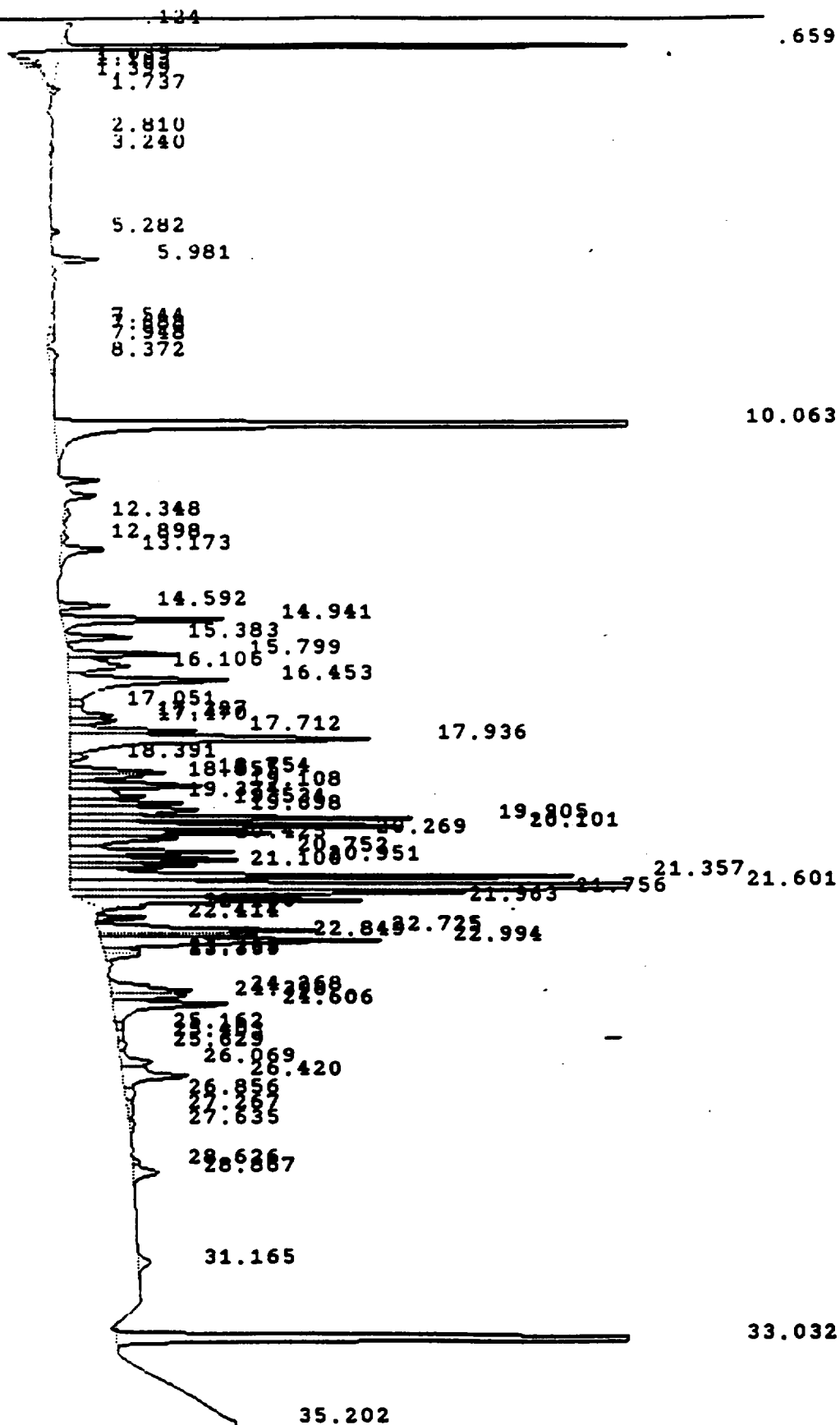
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT



Sample Name : C134907 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)



Sample Name : C134908 S230  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : C134908 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_021.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 6:25:02

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 22215   | BV   | .0006  |                 |
| .66   | 483279  | HS   | 3.0235 |                 |
| 1.04  | 40859   | PT   | .0012  |                 |
| 1.16  | 26545   | VT   | .0008  |                 |
| 1.40  | 41250   | VT   | .0012  |                 |
| 1.74  | 21502   | VT   | .0006  |                 |
| 2.81  | 10206   | VV   | .0003  |                 |
| 3.24  | 14736   | VV   | .0004  |                 |
| 5.28  | 14571   | VV   | .0004  |                 |
| 5.98  | 73631   | VV   | .0021  |                 |
| 7.54  | 19849   | VV   | .0006  |                 |
| 7.69  | 10879   | VV   | .0003  |                 |
| 7.95  | 15805   | VV   | .0004  |                 |
| 8.37  | 49191   | PV   | .0014  |                 |
| 10.06 | 2050855 | PV   | .0581  | <u>Tot</u>      |
| 12.35 | 19994   | PV   | .0006  |                 |
| 12.90 | 11952   | VV   | .0003  |                 |
| 13.17 | 109566  | VV   | .0031  |                 |
| 14.59 | 74028   | PV   | .0021  |                 |
| 14.94 | 291339  | PV   | .0083  |                 |
| 15.38 | 104374  | VV   | .0030  |                 |
| 15.80 | 178917  | BV   | .0051  |                 |
| 16.11 | 178501  | VV   | .0051  |                 |
| 16.45 | 479256  | VV   | .0136  | <u>1242</u>     |
| 17.05 | 30831   | VV   | .0009  |                 |
| 17.33 | 84426   | VV   | .0024  |                 |
| 17.47 | 88531   | VV   | .0075  | HEPTACHLOR      |
| 17.71 | 189915  | VV   | .0054  |                 |
| 17.94 | 747945  | VV   | .0887  | DELTA-BHC       |
| 18.39 | 28864   | VB   | .0008  |                 |
| 18.75 | 158710  | BV   | .0045  |                 |
| 18.86 | 94177   | VV   | .0027  |                 |
| 19.11 | 263964  | VV   | .0075  |                 |
| 19.37 | 176282  | VV   | .0050  |                 |
| 19.53 | 178757  | VV   | .0051  |                 |
| 19.70 | 253936  | VV   | .0072  |                 |
| 19.91 | 462559  | VV   | .0131  |                 |
| 20.10 | 524190  | VV   | .0149  | <u>1254</u>     |
| 20.27 | 315163  | VV   | .0089  |                 |
| 20.42 | 228810  | VV   | .0065  |                 |
| 20.75 | 256560  | VV   | .0241  | GAMMA-CHLORDANE |
| 20.95 | 272135  | VV   | .0077  |                 |
| 21.10 | 175724  | VV   | .0050  |                 |
| 21.36 | 805203  | VV   | .0228  |                 |

Sample Name : C134908 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_021.RES

| RT      | Area    | Code | Amount | Name                     |
|---------|---------|------|--------|--------------------------|
| 21.60 x | 4139909 | HS   | .1174  |                          |
| 21.76 x | 711268  | HS   | .0202  |                          |
| 21.96 x | 516385  | HS   | .0583  | <del>DIELDRIN</del> 1260 |
| 22.13   | 20330   | BT   | .0006  |                          |
| 22.41 x | 45476   | BB   | .0013  |                          |
| 22.72   | 350764  | BV   | .0099  |                          |
| 22.85   | 217989  | VV   | .0345  | ENDRIN                   |
| 22.99   | 522578  | VV   | .0148  |                          |
| 23.26   | 56959   | VV   | .0016  |                          |
| 23.36   | 58759   | VV   | .0064  | ENDOSULFAN II            |
| 24.27   | 187912  | BV   | .0053  |                          |
| 24.40   | 129837  | VV   | .0167  | ENDRIN ALDEHYDE          |
| 24.61   | 292862  | VV   | .0083  |                          |
| 25.16   | 18827   | VV   | .0005  |                          |
| 25.40   | 21125   | VV   | .0006  |                          |
| 25.63   | 23107   | VV   | .0007  |                          |
| 26.07   | 87809   | VV   | .0112  | DBC                      |
| 26.42   | 215510  | VV   | .0061  |                          |
| 26.86   | 34298   | VV   | .0010  |                          |
| 27.27   | 24903   | VV   | .0007  |                          |
| 27.64   | 22308   | VB   | .0006  |                          |
| 28.63   | 15311   | VV   | .0004  |                          |
| 28.87   | 75818   | VV   | .0021  |                          |
| 31.17   | 47423   | BV   | .0013  |                          |
| 33.03   | 2035523 | BV   | .0577  |                          |
| 35.20   | 10469   | BV   | .0009  | DCB                      |

Total Area : 19563444 Total mg/L : 3.753

Report Time : Wed Dec 11, 1991 10:38:04 am  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

1.711

5.282

5.982

7.539  
7.975  
8.365

10.066

11.840  
12.341  
12.604  
13.176

14.591  
14.941  
15.383  
15.799  
16.085  
16.464

17.072  
17.721  
17.942

18.762  
19.117  
19.554  
19.881  
20.001  
20.117  
20.337  
21.372  
21.393

23.741

23.788

24.426  
24.477  
24.877  
25.398

26.426  
26.864  
27.337  
27.799

31.176

33.035

Sample Name : C134909 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

173

Sample Name : C134909 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_022.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 7:08:37

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 25820   | BV   | .0007  |                 |
| .66   | 824732  | HS   | 5.1596 |                 |
| .84   | 16195   | BT   | .0005  |                 |
| 1.71  | 15665   | VV   | .0004  |                 |
| 5.28  | 13922   | BV   | .0004  |                 |
| 5.98  | 119988  | PV   | .0034  |                 |
| 7.54  | 25133   | VV   | .0007  |                 |
| 7.98  | 15179   | VV   | .0004  |                 |
| 8.36  | 39228   | PV   | .0011  |                 |
| 10.07 | 2126170 | PV   | .0603  | TCT             |
| 11.84 | 48834   | BV   | .0014  |                 |
| 12.34 | 32274   | VV   | .0009  |                 |
| 12.65 | 15374   | VV   | .0004  |                 |
| 12.90 | 13181   | VV   | .0004  |                 |
| 13.18 | 39704   | VV   | .0011  |                 |
| 14.59 | 11209   | PV   | .0003  |                 |
| 14.94 | 58823   | PV   | .0017  |                 |
| 15.38 | 15465   | VV   | .0004  |                 |
| 15.80 | 24610   | BV   | .0007  |                 |
| 16.08 | 25203   | VV   | .0007  |                 |
| 16.46 | 68959   | PV   | .0020  | 1247            |
| 17.07 | 10127   | VV   | .0003  |                 |
| 17.72 | 24698   | VV   | .0007  |                 |
| 17.94 | 91838   | VV   | .0109  | DELTA-BHC       |
| 18.76 | 35912   | BV   | .0010  |                 |
| 19.12 | 41876   | VV   | .0012  |                 |
| 19.55 | 20265   | VV   | .0006  |                 |
| 19.71 | 29888   | VV   | .0008  |                 |
| 19.91 | 45276   | VV   | .0013  |                 |
| 20.11 | 41077   | VV   | .0012  | 1254            |
| 20.28 | 21568   | VV   | .0006  |                 |
| 20.43 | 17658   | VV   | .0005  |                 |
| 20.76 | 14596   | VV   | .0014  | GAMMA-CHLORDANE |
| 20.97 | 10234   | PV   | .0003  |                 |
| 21.37 | 43024   | PV   | .0012  |                 |
| 21.77 | 59155   | VV   | .0017  |                 |
| 21.97 | 17645   | VV   | .0020  | DIELDIN         |
| 22.74 | 20633   | PV   | .0006  |                 |
| 23.02 | 45608   | VV   | .0013  |                 |
| 23.79 | 20772   | VB   | .0006  |                 |
| 24.43 | 29438   | BV   | .0038  | ENDRIN ALDEHYDE |
| 24.63 | 16883   | VV   | .0005  |                 |
| 24.98 | 22944   | VV   | .0007  |                 |
| 25.40 | 44744   | VV   | .0013  |                 |

Sample Name : C134909 S230  
Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_022.RES

| RT    | Area    | Code | Amount | Name       |
|-------|---------|------|--------|------------|
| 26.43 | 98455   | VV   | .0028  |            |
| 26.86 | 37477   | VV   | .0011  |            |
| 27.34 | 27698   | VV   | .0008  |            |
| 27.80 | 16840   | VB   | .0005  |            |
| 31.18 | 17027   | BV   | .0005  |            |
| 33.04 | 2056888 | BV   | .0583  | <i>006</i> |

Total Area : 6555912 Total mg/L : 5.336

Report Time : Wed Dec 11, 1991 9:52:43 am  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

11.839  
11.924  
1.853

3.232

5.281

5.979

7.526

7.976

8.369

10.060

11.839  
12.341  
12.892  
13.169  
13.781

14.588

14.937

15.380

16.15795

16.101

16.446

17.062

17.424

17.706

17.927

18.388

18.751  
19.098  
19.257368  
19.6928

20.26328.892

20.750  
20.89821.349  
21.958

22.118 22.407

22.8422.9878

23.826

24.122.868

24.594

25.374  
25.627

26.050

26.409

26.862

27.639

28.282

28.6128.855

31.153

33.026

Sample Name : C134928 S230

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : C134928 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_023.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 7:52:12

| RT    | Area      | Code | Amount | Name            |
|-------|-----------|------|--------|-----------------|
| .12   | 23771     | BV   | .0007  |                 |
| .65   | 352053    | HS   | 2.2025 |                 |
| 1.00  | 25116     | PT   | .0007  |                 |
| 1.17  | 26776     | VT   | .0008  |                 |
| 1.31  | 23888     | VT   | .0007  |                 |
| 1.65  | 11240     | VT   | .0003  |                 |
| 3.23  | 12728     | VV   | .0004  |                 |
| 5.28  | 12247     | VV   | .0003  |                 |
| 5.98  | 94777     | PV   | .0027  |                 |
| 7.53  | 21971     | VV   | .0006  |                 |
| 7.98  | 11671     | VV   | .0003  |                 |
| 8.37  | 34678     | PV   | .0010  |                 |
| 10.06 | 1785328   | PV   | .0506  | <u>TCX</u>      |
| 11.84 | 25751     | BV   | .0007  |                 |
| 12.34 | 28359     | VV   | .0008  |                 |
| 12.65 | 10510     | VV   | .0003  |                 |
| 12.89 | 14932     | VV   | .0004  |                 |
| 13.17 | 72525     | VV   | .0021  |                 |
| 13.78 | 10011     | VV   | .0003  |                 |
| 14.59 | 44374     | PV   | .0013  |                 |
| 14.94 | ✓ 282965  | PV   | .0080  |                 |
| 15.38 | 94796     | PB   | .0027  |                 |
| 15.79 | 147926    | BV   | .0042  |                 |
| 16.10 | 209199    | VV   | .0059  |                 |
| 16.45 | ✓ 500591  | VV   | .0142  | <u>1242</u>     |
| 17.06 | 27947     | VV   | .0008  |                 |
| 17.32 | 116823    | VV   | .0033  |                 |
| 17.47 | 120182    | VV   | .0102  | HEPTACHLOR      |
| 17.71 | 421674    | VV   | .0120  |                 |
| 17.93 | 1237834   | VV   | .0351  |                 |
| 18.39 | 58816     | VB   | .0017  |                 |
| 18.75 | 549113    | BV   | .0156  |                 |
| 19.10 | ✓ 447751  | VV   | .0127  |                 |
| 19.26 | 97599     | VV   | .0028  |                 |
| 19.37 | 179870    | VV   | .0051  |                 |
| 19.53 | ✓ 351634  | VV   | .0100  |                 |
| 19.69 | / 437795  | VV   | .0124  |                 |
| 19.90 | . 1021096 | VV   | .0290  |                 |
| 20.09 | . 1245835 | VV   | .0353  | <u>1254</u>     |
| 20.26 | . 709527  | VV   | .0201  |                 |
| 20.42 | / 316950  | VV   | .0090  |                 |
| 20.75 | . 377531  | VV   | .0355  | GAMMA-CHLORDANE |
| 20.94 | . 474359  | VV   | .0134  |                 |
| 21.09 | . 341252  | VV   | .0097  |                 |

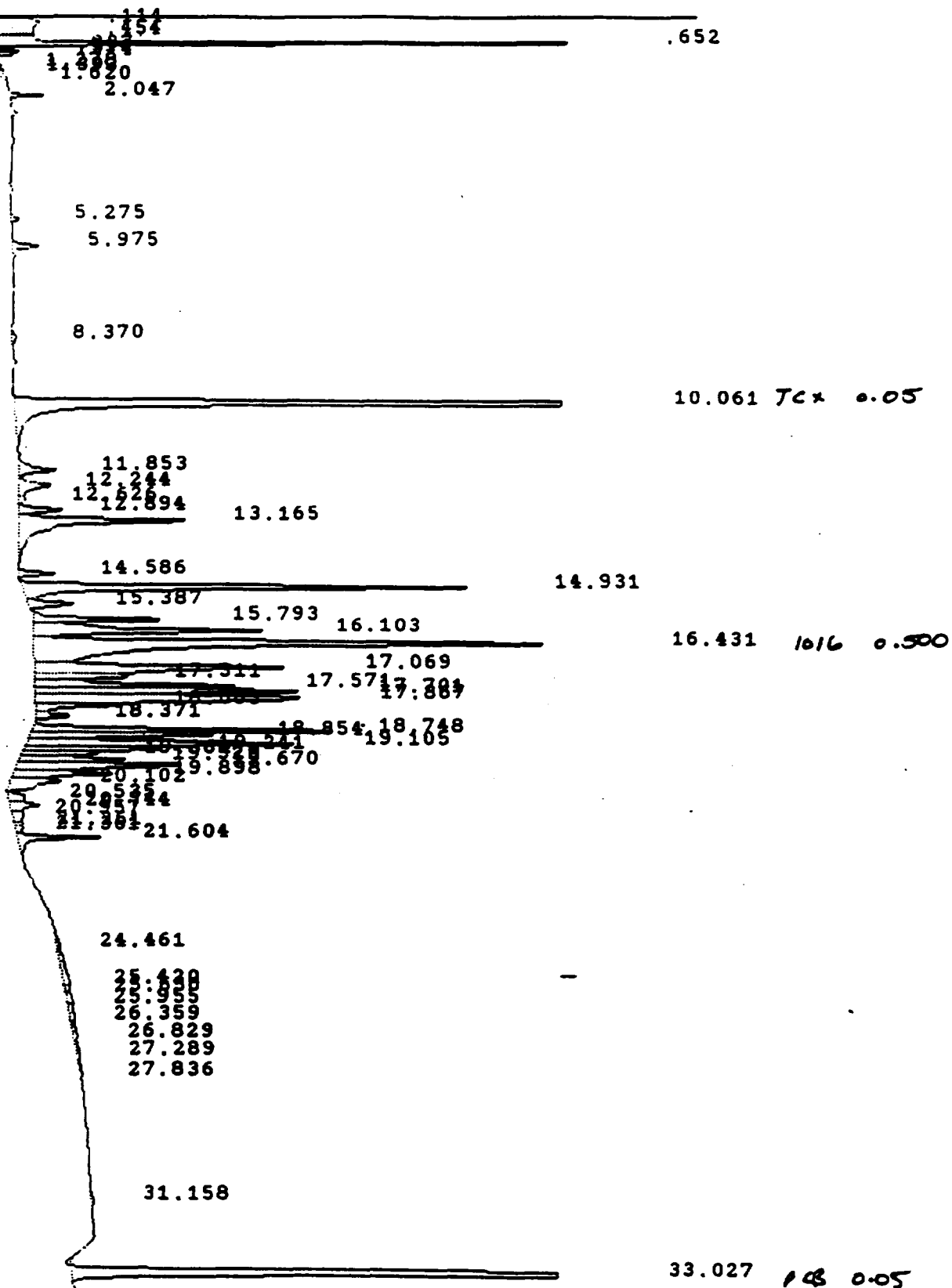
Sample Name : C134928 S230

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_023.RES

| RT      | Area    | Code | Amount | Name                     |
|---------|---------|------|--------|--------------------------|
| 21.35 x | 1618265 | VV   | .0459  |                          |
| 21.61 x | 1840945 | VV   | .0522  |                          |
| 21.76 x | 1472783 | VV   | .0418  |                          |
| 21.96 x | 1226617 | VV   | .1384  | <del>DIELDRIN</del> 1760 |
| 22.13   | 203097  | VV   | .0058  |                          |
| 22.41 x | 280751  | VV   | .0080  |                          |
| 22.72   | 937418  | VV   | .0266  |                          |
| 22.84   | 682530  | VV   | .1080  | ENDRIN                   |
| 22.99   | 1632842 | VV   | .0463  |                          |
| 23.26   | 416948  | VV   | .0118  |                          |
| 23.63   | 53851   | VB   | .0015  |                          |
| 24.13   | 245343  | BV   | .0416  | 4,4'-DDT                 |
| 24.26   | 337268  | VV   | .0096  |                          |
| 24.39   | 383121  | VV   | .0492  | ENDRIN ALDEHYDE          |
| 24.59   | 1022381 | VV   | .0290  |                          |
| 25.37   | 23804   | VV   | .0007  |                          |
| 25.63   | 53870   | VV   | .0015  |                          |
| 26.05   | 266299  | VV   | .0339  | DBC                      |
| 26.41   | 627640  | VV   | .0178  |                          |
| 26.86   | 63298   | VV   | .0018  |                          |
| 27.25   | 16536   | VV   | .0005  |                          |
| 27.64   | 36429   | VB   | .0010  |                          |
| 28.28   | 10609   | BV   | .0011  | ENDRIN KETONE            |
| 28.61   | 53091   | VV   | .0015  |                          |
| 28.86   | 300865  | VV   | .0085  |                          |
| 31.15   | 130362  | BV   | .0037  |                          |
| 33.03   | 1784634 | BV   | .0506  | o.c.b                    |

Total Area : 28133372 Total mg/L : 3.314

Report Time : Wed Dec 11, 1991 10:15:52 am  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT



Sample Name : D702 1016 37.728  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_024.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 8:35:47

| RT    | Area    | Code | Amount | Name               |
|-------|---------|------|--------|--------------------|
| .11   | 98330   | BV   | .0028  |                    |
| .45   | 14020   | VV   | .0004  |                    |
| .65   | 715173  | VV   | 4.4742 |                    |
| .84   | 25004   | PV   | .0007  |                    |
| .91   | 27050   | PV   | .0008  |                    |
| .97   | 32688   | VV   | .0009  |                    |
| 1.28  | 12640   | VV   | .0004  |                    |
| 1.39  | 11188   | VV   | .0003  |                    |
| 1.62  | 20064   | VV   | .0006  |                    |
| 2.05  | 25783   | BV   | .0007  |                    |
| 5.27  | 12314   | VV   | .0003  |                    |
| 5.97  | 43578   | VV   | .0012  |                    |
| 8.37  | 20296   | PV   | .0006  |                    |
| 10.06 | 2013746 | PV   | .0571  | TCX                |
| 11.85 | 79917   | BV   | .0023  |                    |
| 12.24 | 93117   | VV   | .0026  |                    |
| 12.63 | 12362   | VV   | .0004  |                    |
| 12.89 | 79986   | VV   | .0023  |                    |
| 13.16 | 484092  | VV   | .0137  |                    |
| 14.59 | 56231   | VV   | .0016  |                    |
| 14.93 | 809371  | PV   | .0229  |                    |
| 15.39 | 87057   | VV   | .0025  |                    |
| 15.79 | 227225  | BV   | .0064  |                    |
| 16.10 | 489292  | VV   | .0139  |                    |
| 16.43 | 1528323 | VV   | .0433  | 1016 3368113       |
| 17.07 | 614696  | VV   | .0174  |                    |
| 17.31 | 175609  | VV   | .0050  |                    |
| 17.57 | 356295  | VV   | .0101  |                    |
| 17.70 | 441115  | VV   | .0125  |                    |
| 17.87 | 690733  | VV   | .0196  |                    |
| 18.06 | 133496  | VV   | .0158  | DELTA-BHC          |
| 18.37 | 59103   | VB   | .0017  |                    |
| 18.75 | 500211  | BV   | .0142  |                    |
| 18.85 | 241026  | VV   | .0068  |                    |
| 19.10 | 527444  | VV   | .0150  |                    |
| 19.24 | 195586  | VV   | .0055  |                    |
| 19.36 | 114288  | VV   | .0032  |                    |
| 19.53 | 165922  | VV   | .0047  |                    |
| 19.67 | 337053  | VV   | .0096  |                    |
| 19.90 | 180585  | VV   | .0051  |                    |
| 20.10 | 152788  | VV   | .0043  |                    |
| 20.53 | 45779   | PV   | .0044  | HEPTACHLOR EPOXIDE |
| 20.74 | 68615   | VV   | .0065  | GAMMA-CHLORDANE    |
| 20.96 | 41807   | VV   | .0012  |                    |

Sample Name : D702 1016

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_024.RES

| RT    | Area    | Code | Amount | Name         |
|-------|---------|------|--------|--------------|
| 21.26 | 12250   | VV   | .0003  |              |
| 21.36 | 17936   | VV   | .0005  |              |
| 21.60 | 136674  | VV   | .0039  |              |
| 24.46 | 16440   | VV   | .0005  |              |
| 25.42 | 65643   | VV   | .0019  |              |
| 25.65 | 13185   | VV   | .0004  |              |
| 25.95 | 21710   | VV   | .0028  | DBC          |
| 26.36 | 31042   | VV   | .0009  |              |
| 26.83 | 28870   | VV   | .0008  |              |
| 27.29 | 20006   | VV   | .0006  |              |
| 27.84 | 13102   | VB   | .0030  | METHOXYCHLOR |
| 31.16 | 13182   | BV   | .0004  |              |
| 33.03 | 1975901 | BV   | .1708  | DCB          |
| 37.73 | 644642  | BV   | .0183  |              |

Total Area : 15071584 Total mg/L : 5.020

Report Time : Tue Dec 10, 1991 1:04:39 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

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5.278  
5.9787.534  
8.368

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10.059 TOL 0.05

11.172653  
12.22912.621  
12.888

13.159 1221 0.500

14.588  
14.93016.103  
16.44517.087  
17.583  
17.95618.756  
19.103  
19.536  
20.089420.738  
21.349  
21.902 9603

23.069

24.628

25.692

26.402  
26.840  
27.303

31.172

33.027 OCB 0.05

35.203

Sample Name : D7031221

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D703 1221  
 Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_025.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)  
 Carrier Gas - Helium (7.4 mL/min)  
 Aux Gas - P-5 mix (28.6 mL/min)  
 Injected on Sat Dec 7, 1991 9:19:21

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .11   | 96086   | BV   | .0027  |                 |
| .65   | 764584  | VV   | 4.7833 |                 |
| .97   | 51195   | VV   | .0015  |                 |
| 1.13  | 16443   | VV   | .0005  |                 |
| 1.18  | 29046   | VV   | .0008  |                 |
| 1.28  | 19828   | VV   | .0006  |                 |
| 1.39  | 27268   | VV   | .0008  |                 |
| 1.59  | 32258   | VV   | .0009  |                 |
| 1.73  | 23631   | VV   | .0007  |                 |
| 5.28  | 16990   | VV   | .0005  |                 |
| 5.98  | 31049   | VV   | .0009  |                 |
| 7.53  | 12857   | VV   | .0004  |                 |
| 8.37  | 18848   | PV   | .0005  |                 |
| 9.01  | 165792  | PB   | .0047  |                 |
| 10.06 | 1870706 | BV   | .0530  | Tct             |
| 10.41 | 117746  | VV   | .0033  |                 |
| 11.73 | 33132   | BV   | .0009  |                 |
| 11.85 | 86306   | VV   | .0024  |                 |
| 12.23 | 250354  | VV   | .0071  |                 |
| 12.62 | 15567   | VV   | .0004  |                 |
| 12.89 | 151029  | VV   | .0043  |                 |
| 13.16 | 447155  | VV   | .0127  | 1221 1231270    |
| 13.40 | 216940  | VV   | .0062  |                 |
| 14.59 | 14004   | PV   | .0004  |                 |
| 14.93 | 73613   | VV   | .0021  |                 |
| 16.10 | 24922   | PV   | .0007  |                 |
| 16.45 | 78555   | VV   | .0022  |                 |
| 17.09 | 62736   | VV   | .0018  |                 |
| 17.58 | 23903   | VV   | .0007  |                 |
| 17.70 | 24675   | VV   | .0007  |                 |
| 17.96 | 73527   | VV   | .0087  | DELTA-BHC       |
| 18.76 | 10247   | BV   | .0003  |                 |
| 18.87 | 10452   | VV   | .0003  |                 |
| 19.10 | 36854   | VV   | .0010  |                 |
| 19.54 | 26931   | VV   | .0008  |                 |
| 19.69 | 30478   | VV   | .0009  |                 |
| 19.90 | 39654   | VV   | .0011  |                 |
| 20.09 | 62701   | VV   | .0018  |                 |
| 20.74 | 33439   | PV   | .0031  | GAMMA-CHLORDANE |
| 21.35 | 19490   | VV   | .0006  |                 |
| 21.60 | 80697   | VV   | .0023  |                 |
| 21.75 | 28498   | VV   | .0008  |                 |
| 21.96 | 15325   | VV   | .0017  | DIELDRIN        |
| 23.07 | 18728   | VV   | .0005  |                 |

Sample Name : D703 1221  
Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_025.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 24.43 | 18743   | BV   | .0024  | ENDRIN ALDEHYDE |
| 24.62 | 19390   | VV   | .0005  |                 |
| 25.40 | 40151   | VV   | .0011  |                 |
| 25.61 | 15162   | VV   | .0004  |                 |
| 26.40 | 52159   | VV   | .0015  |                 |
| 26.84 | 28105   | VV   | .0008  |                 |
| 27.30 | 24106   | VV   | .0007  |                 |
| 31.17 | 11847   | BV   | .0003  |                 |
| 33.03 | 1905240 | BV   | .0540  | ACB             |
| 35.20 | 13486   | BV   | .0012  | DCB             |

Total Area : 7412631 Total mg/L : 4.985

Report Time : Tue Dec 10, 1991 3:04:40 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

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1.135985

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5.284  
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10.068 TCK 0.05

11.74863  
12.244  
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13.173

14.597  
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15.396  
15.803  
16.114  
16.448 1232 0.500

17.3370.088  
17.585714  
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18.8628759  
19.2380113  
19.484690

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25.410  
25.810  
26.210  
26.610  
27.010  
27.410  
27.836

31.174

33.036 0.05 0.05

Sample Name : D704 1232  
EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D704 1232  
 Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_026.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)  
 Carrier Gas - Helium (7.4 mL/min)  
 Aux Gas - P-5 mix (28.6 mL/min)  
 Injected on Sat Dec 7, 1991 10:02:58

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .13   | 23112   | BV   | .0007  |                 |
| .66   | 423909  | HS   | 2.6520 |                 |
| .98   | 39037   | VT   | .0011  |                 |
| 1.14  | 10258   | VT   | .0003  |                 |
| 5.28  | 11690   | PV   | .0003  |                 |
| 5.98  | 26538   | VV   | .0008  |                 |
| 8.37  | 16577   | PV   | .0005  |                 |
| 9.02  | 67639   | PB   | .0019  |                 |
| 10.07 | 1946295 | PV   | .0552  | TEL             |
| 11.74 | 18105   | BV   | .0005  |                 |
| 11.86 | 73145   | VV   | .0021  |                 |
| 12.24 | 155148  | VV   | .0044  |                 |
| 12.64 | 17282   | VV   | .0005  |                 |
| 12.90 | 101372  | VV   | .0029  |                 |
| 13.17 | 364414  | VV   | .0103  |                 |
| 13.40 | 154230  | VV   | .0044  |                 |
| 14.60 | 27322   | PV   | .0008  |                 |
| 14.94 | 388252  | PV   | .0110  |                 |
| 15.40 | 37894   | VV   | .0011  |                 |
| 15.80 | 96123   | BV   | .0027  |                 |
| 16.11 | 204408  | VV   | .0058  |                 |
| 16.45 | 646880  | VV   | .0183  | 1232 1775254    |
| 17.09 | 258929  | VV   | .0073  |                 |
| 17.32 | 83206   | VV   | .0024  |                 |
| 17.59 | 135024  | VV   | .0038  |                 |
| 17.71 | 193980  | VV   | .0055  |                 |
| 17.95 | 448935  | VV   | .0532  | DELTA-BHC       |
| 18.38 | 30414   | VB   | .0009  |                 |
| 18.76 | 195169  | BV   | .0055  |                 |
| 18.86 | 95325   | VV   | .0027  |                 |
| 19.11 | 200314  | VV   | .0057  |                 |
| 19.25 | 68350   | VV   | .0019  |                 |
| 19.38 | 69391   | VV   | .0020  |                 |
| 19.54 | 133989  | VV   | .0038  |                 |
| 19.69 | 252728  | VV   | .0072  |                 |
| 19.90 | 107190  | VV   | .0030  |                 |
| 20.10 | 79964   | VV   | .0023  |                 |
| 20.27 | 32200   | VV   | .0009  |                 |
| 20.44 | 153091  | VV   | .0043  |                 |
| 20.75 | 40531   | VV   | .0038  | GAMMA-CHLORDANE |
| 20.96 | 21935   | VV   | .0006  |                 |
| 21.11 | 22371   | VV   | .0006  |                 |
| 21.27 | 10510   | VV   | .0003  |                 |
| 21.36 | 51557   | VV   | .0015  |                 |

Sample Name : D704 1232  
sult File : /DATA/LOOP/RESULT/PCBCON\_3071\_026.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 21.61 | 72883   | VV   | .0021  |                 |
| 21.75 | 19365   | VV   | .0005  |                 |
| 21.90 | 28694   | VV   | .0008  |                 |
| 22.73 | 22409   | PV   | .0006  |                 |
| 23.09 | 27340   | VV   | .0008  |                 |
| 24.43 | 20061   | VV   | .0026  | ENDRIN ALDEHYDE |
| 24.62 | 30484   | VV   | .0009  |                 |
| 24.98 | 16795   | VV   | .0005  |                 |
| 25.42 | 42960   | VV   | .0012  |                 |
| 25.64 | 26080   | VV   | .0007  |                 |
| 25.88 | 16024   | VV   | .0005  |                 |
| 26.07 | 19011   | VV   | .0024  | DBC             |
| 26.44 | 30256   | VV   | .0009  |                 |
| 26.83 | 19428   | VV   | .0006  |                 |
| 27.31 | 18972   | VV   | .0005  |                 |
| 27.84 | 10640   | VB   | .0024  | METHOXYCHLOR    |
| 31.17 | 14365   | VV   | .0004  |                 |
| 33.04 | 1865446 | BV   | .0529  | 146             |

Total Area : 9835946 Total mg/L : 2.968

Report Time : Tue Dec 10, 1991 1:48:00 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

1.240  
1.486  
1.587  
1.657  
1.718

5.279  
5.980

7.540  
7.973  
8.377

10.064 TCX 0.05

11.853  
12.248  
12.538  
12.896  
13.167

14.588

14.932

15.388

15.795

16.106

16.437

1242 0.50

17.312

17.077

17.578  
17.896

18.376

18.755

19.109

19.536  
19.687

20.269  
20.429

20.749  
21.058

21.893

22.725  
23.080

24.142  
24.814

25.627

26.060

26.414

26.839

27.302

27.840

28.862

31.160

33.031 OCS 0.05

35.196

Sample Name : D907 1242

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_027.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 10:46:30

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 93795   | BV   | .0027  |                 |
| .49   | 40636   | VV   | .0012  |                 |
| .66   | 269064  | VV   | .0076  |                 |
| .72   | 357310  | VV   | 2.2354 |                 |
| .84   | 45811   | VV   | .0013  |                 |
| .99   | 11446   | PV   | .0003  |                 |
| 5.28  | 12718   | VV   | .0004  |                 |
| 5.98  | 57009   | VV   | .0016  |                 |
| 7.54  | 11928   | VV   | .0003  |                 |
| 7.97  | 16221   | VV   | .0005  |                 |
| 8.38  | 26716   | PV   | .0008  |                 |
| 10.06 | 2047386 | PV   | .0580  | TCT             |
| 11.85 | 70946   | BV   | .0020  |                 |
| 12.25 | 78075   | VV   | .0022  |                 |
| 12.64 | 12620   | VV   | .0004  |                 |
| 12.90 | 67618   | VV   | .0019  |                 |
| 13.17 | 399502  | VV   | .0113  |                 |
| 14.59 | 44995   | PV   | .0013  |                 |
| 14.93 | 667508  | PV   | .0189  |                 |
| 15.39 | 70665   | VV   | .0020  |                 |
| 15.79 | 181375  | BV   | .0051  |                 |
| 16.11 | 393869  | VV   | .0112  |                 |
| 16.44 | 1224061 | VV   | .0347  | 1242 2410659    |
| 17.08 | 495096  | VV   | .0140  |                 |
| 17.31 | 146650  | VV   | .0042  |                 |
| 17.58 | 275503  | VV   | .0078  |                 |
| 17.71 | 354584  | VV   | .0101  |                 |
| 17.87 | 696500  | VV   | .0197  |                 |
| 18.38 | 52149   | VB   | .0015  |                 |
| 18.75 | 567328  | BV   | .0161  |                 |
| 19.11 | 395489  | VV   | .0112  |                 |
| 19.25 | 130980  | VV   | .0037  |                 |
| 19.37 | 159693  | VV   | .0045  |                 |
| 19.54 | 293582  | VV   | .0083  |                 |
| 19.69 | 502535  | VV   | .0142  |                 |
| 19.90 | 185962  | VV   | .0053  |                 |
| 20.10 | 156297  | VV   | .0044  |                 |
| 20.27 | 68402   | VV   | .0019  |                 |
| 20.43 | 327484  | VV   | .0093  |                 |
| 20.75 | 85103   | VV   | .0080  | GAMMA-CHLORDANE |
| 20.95 | 57575   | VV   | .0016  |                 |
| 21.10 | 61230   | VV   | .0017  |                 |
| 21.36 | 156256  | VV   | .0044  |                 |
| 21.62 | 160099  | VV   | .0045  |                 |

Sample Name : D907 1242

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_027.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 21.89 | 67808   | VV   | .0019  |                 |
| 22.73 | 65286   | PV   | .0019  |                 |
| 23.08 | 43233   | VV   | .0012  |                 |
| 24.14 | 14626   | BV   | .0025  | 4,4'-DDT        |
| 24.41 | 21330   | VV   | .0027  | ENDRIN ALDEHYDE |
| 24.61 | 38876   | VV   | .0011  |                 |
| 25.63 | 59191   | VV   | .0017  |                 |
| 26.06 | 36343   | VV   | .0046  | DBC             |
| 26.41 | 47785   | VV   | .0014  |                 |
| 26.84 | 24901   | VV   | .0007  |                 |
| 27.30 | 25086   | VV   | .0007  |                 |
| 27.84 | 18367   | VB   | .0041  | METHOXYCHLOR    |
| 28.86 | 10365   | VV   | .0003  |                 |
| 31.16 | 17025   | BV   | .0005  |                 |
| 33.03 | 2055344 | BV   | .0583  | <del>046</del>  |
| 35.20 | 15143   | BV   | .0013  | <del>DGB</del>  |

Total Area : 14090484 Total mg/L : 2.643

Report Time : Tue Dec 10, 1991 1:55:55 pm

Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH

Report File : /DATA/LOOP/FORMAT/EMS.FMT

1.134982

5.284  
5.983

8.369

10.066 TcK 0.05

11.839  
12.352  
12.849  
13.182

14.596

14.941

15.384  
15.802  
16.112

16.448 1248 0.50

17.132084

17.843

18.378

18.860

19.114 18.757

19.378 19.536 19.691

20.291089.909

20.428

21.362

21.8945

22.322640  
23.26460

24.148620

24.539620

24.830620

25.121620

25.412620

25.703620

26.094620

26.385620

26.676620

26.967620

27.258620

27.549620

27.840620

28.131620

28.422620

28.713620

29.004620

29.295620

29.586620

29.877620

30.168620

30.459620

30.750620

31.041620

31.332620

31.623620

31.914620

32.205620

32.496620

32.787620

33.078620

31.164

33.033 048 0.05

35.203

Sample Name : D706 1248

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D706 1248

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_028.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 11:30:06

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| .12   | 25539   | BV   | .0007  |                 |
| .66   | 507977  | HS   | 3.1780 |                 |
| .98   | 52048   | PT   | .0015  |                 |
| 1.13  | 10123   | VT   | .0003  |                 |
| 5.28  | 11695   | PV   | .0003  |                 |
| 5.98  | 54728   | BV   | .0016  |                 |
| 8.37  | 24961   | PV   | .0007  |                 |
| 10.07 | 1982836 | PV   | .0562  | TCT             |
| 11.84 | 41653   | BV   | .0012  |                 |
| 12.35 | 22954   | VV   | .0007  |                 |
| 12.65 | 18899   | VV   | .0005  |                 |
| 12.86 | 10049   | VV   | .0003  |                 |
| 13.18 | 31818   | VV   | .0009  |                 |
| 14.60 | 12304   | PV   | .0003  |                 |
| 14.94 | 352179  | PV   | .0100  |                 |
| 15.38 | 18500   | VV   | .0005  |                 |
| 15.80 | 102234  | VV   | .0029  |                 |
| 16.11 | 119847  | VV   | .0034  |                 |
| 16.45 | 932622  | VV   | .0264  | 1249 3969789    |
| 17.08 | 256263  | VV   | .0073  |                 |
| 17.32 | 149755  | VV   | .0042  |                 |
| 17.71 | 636007  | VV   | .0180  |                 |
| 17.88 | 778046  | VV   | .0221  |                 |
| 18.06 | 255711  | VV   | .0303  | DELTA-BHC       |
| 18.38 | 69399   | VB   | .0020  |                 |
| 18.76 | 539977  | BV   | .0153  |                 |
| 18.86 | 256486  | VV   | .0073  |                 |
| 19.11 | 632196  | VV   | .0179  |                 |
| 19.25 | 170381  | VV   | .0048  |                 |
| 19.38 | 297184  | VV   | .0084  |                 |
| 19.54 | 517790  | VV   | .0147  |                 |
| 19.69 | 869076  | VV   | .0246  |                 |
| 19.90 | 402792  | VV   | .0114  |                 |
| 20.10 | 345663  | VV   | .0098  |                 |
| 20.27 | 200251  | VV   | .0057  |                 |
| 20.43 | 665926  | VV   | .0189  |                 |
| 20.75 | 210619  | VV   | .0198  | GAMMA-CHLORDANE |
| 20.95 | 158564  | VV   | .0045  |                 |
| 21.10 | 167435  | VV   | .0047  |                 |
| 21.26 | 107673  | VV   | .0031  |                 |
| 21.36 | 370653  | VV   | .0105  |                 |
| 21.65 | 256323  | VV   | .0073  |                 |
| 21.89 | 196406  | VV   | .0056  |                 |
| 22.64 | 164184  | PV   | .0047  |                 |

Sample Name : D706 1248  
sult File : /DATA/LOOP/RESULT/PCBCON\_3071\_028.RES

| RT    | Area    | Code | Amount | Name            |
|-------|---------|------|--------|-----------------|
| 22.85 | 28972   | VV   | .0046  | ENDRIN          |
| 23.01 | 97489   | VV   | .0028  |                 |
| 23.26 | 24504   | VV   | .0007  |                 |
| 24.15 | 19214   | BV   | .0033  | 4,4'-DDT        |
| 24.28 | 17748   | VV   | .0005  |                 |
| 24.42 | 25856   | VV   | .0033  | ENDRIN ALDEHYDE |
| 24.62 | 90268   | VV   | .0026  |                 |
| 24.94 | 17563   | VV   | .0005  |                 |
| 25.21 | 14693   | VV   | .0004  |                 |
| 25.42 | 15988   | VV   | .0005  |                 |
| 25.66 | 13641   | VV   | .0004  |                 |
| 26.08 | 42876   | VV   | .0055  | DBC             |
| 26.28 | 19252   | VV   | .0005  |                 |
| 26.43 | 64926   | VV   | .0018  |                 |
| 26.87 | 16278   | VV   | .0005  |                 |
| 27.36 | 20719   | VV   | .0006  |                 |
| 27.77 | 11556   | VB   | .0003  |                 |
| 28.65 | 10642   | VV   | .0003  |                 |
| 28.88 | 42022   | VV   | .0012  |                 |
| 31.16 | 21238   | BV   | .0006  |                 |
| 33.03 | 1960921 | BV   | .0556  | <del>0.04</del> |
| 35.20 | 10803   | BV   | .0009  | <del>0.09</del> |

Total Area : 15594900 Total mg/L : 3.657

Report Time : Tue Dec 10, 1991 2:04:29 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT



Sample Name : D707 1254

Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_029.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 12:13:40

| RT    | Area     | Code | Amount | Name         |
|-------|----------|------|--------|--------------|
| .12   | 25245    | BV   | .0007  |              |
| .66   | 273924   | VV   | .0078  |              |
| .73   | 851310   | HS   | 5.3259 |              |
| .84   | 11033    | BT   | .0003  |              |
| .98   | 139879   | VT   | .0040  |              |
| 1.14  | 30678    | PT   | .0009  |              |
| 1.28  | 60107    | PT   | .0017  |              |
| 1.42  | 34715    | PT   | .0010  |              |
| 1.58  | 33990    | PT   | .0010  |              |
| 1.66  | 21579    | VT   | .0006  |              |
| 1.85  | 29679    | PT   | .0008  |              |
| 2.39  | 10145    | VV   | .0003  |              |
| 2.57  | 15753    | VV   | .0004  |              |
| 2.70  | 25135    | VV   | .0007  |              |
| 3.01  | 41587    | VV   | .0012  |              |
| 3.24  | 33393    | VV   | .0009  |              |
| 3.50  | 14799    | VV   | .0004  |              |
| 3.74  | 30868    | VV   | .0009  |              |
| 3.98  | 10726    | VV   | .0003  |              |
| 4.30  | 19244    | VV   | .0005  |              |
| 4.47  | 19455    | VV   | .0006  |              |
| 4.89  | 17359    | VV   | .0005  |              |
| 5.28  | 23698    | VV   | .0007  |              |
| 5.98  | 41168    | VV   | .0012  |              |
| 8.37  | 17988    | PV   | .0005  |              |
| 10.06 | 1953107  | PV   | .0554  | Tek          |
| 11.83 | 39607    | BV   | .0011  |              |
| 12.35 | 26921    | VV   | .0008  |              |
| 12.64 | 22856    | VV   | .0006  |              |
| 12.86 | 14328    | VV   | .0004  |              |
| 13.17 | 22419    | VV   | .0006  |              |
| 14.63 | 10249    | VV   | .0003  |              |
| 14.94 | 23608    | VV   | .0007  |              |
| 16.45 | 32696    | PV   | .0009  |              |
| 17.32 | 15084    | VV   | .0004  |              |
| 17.71 | 411176   | VV   | .0117  |              |
| 17.87 | 337209   | VB   | .0096  |              |
| 18.76 | 281212   | BV   | .0080  |              |
| 19.12 | 125000   | VV   | .0035  |              |
| 19.38 | 50003    | VV   | .0014  |              |
| 19.54 | 272397   | VV   | .0077  |              |
| 19.69 | 181554   | VV   | .0051  |              |
| 19.90 | ✓ 785547 | VV   | .0223  |              |
| 20.09 | ✓ 881755 | VV   | .0250  | 1254 3334060 |

Sample Name : D707 1254  
Result File : /DATA/LOOP/RESULT/PCBCON\_3071\_029.RES

| RT      | Area    | Code | Amount | Name            |
|---------|---------|------|--------|-----------------|
| 20.27 / | 517308  | VV   | .0147  |                 |
| 20.75 / | 300664  | VV   | .0283  | GAMMA-CHLORDANE |
| 20.95 / | 314015  | VV   | .0089  |                 |
| 21.10 / | 534771  | VV   | .0152  |                 |
| 21.36   | 1307904 | VV   | .0371  |                 |
| 21.52   | 267136  | VV   | .0076  |                 |
| 21.65   | 507615  | VV   | .0144  |                 |
| 21.76   | 697252  | VV   | .0198  |                 |
| 21.96   | 855261  | VV   | .0965  | DIELDRIN        |
| 22.41   | 161261  | VV   | .0046  |                 |
| 22.72   | 695785  | VV   | .0197  |                 |
| 22.85   | 298640  | VV   | .0472  | ENDRIN          |
| 22.99   | 1009627 | VV   | .0286  |                 |
| 23.36   | 228340  | VV   | .0250  | ENDOSULFAN II   |
| 23.62   | 21008   | VB   | .0006  |                 |
| 24.26   | 504873  | BV   | .0143  |                 |
| 24.60   | 348984  | VV   | .0099  |                 |
| 25.39   | 11355   | VV   | .0003  |                 |
| 25.62   | 12003   | VV   | .0003  |                 |
| 26.12   | 52362   | VV   | .0067  | DBC             |
| 26.42   | 163337  | VV   | .0046  |                 |
| 26.86   | 23718   | VV   | .0007  |                 |
| 27.32   | 16645   | VV   | .0005  |                 |
| 27.77   | 13244   | VB   | .0004  |                 |
| 28.87   | 19765   | VV   | .0006  |                 |
| 31.17   | 21261   | BV   | .0006  |                 |
| 33.03   | 1648523 | BV   | .0467  | 465             |

Total Area : 17872844 Total mg/L : 5.963

Report Time : Tue Dec 10, 1991 2:18:33 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

120

.658

5.278  
5.977

8.366

10.063 TCX 0.05

11.834  
12.347  
12.580  
13.153

16.472  
16.793  
17.166  
17.712  
18.385  
19.108  
19.552

20.191906

20.347  
21.105

21.533

21.348

21.368 1260 0.50

22.416

22.854

22.734

22.999

23.640

24.406

24.139

24.604

25.380  
25.828

26.228.063

26.416

26.862

27.640

28.271

28.616

28.858

31.155

33.030 0.05 0.05

Sample Name : D708 1260

EMS LABORATORIES, INC. INDIANAPOLIS IN  
1 uL injection on INST 9004 #5 (DB-608 megabore column)

Sample Name : D708 1260

sult File : /DATA/LOOP/RESULT/PCBCON\_3071\_030.RES

1 uL injection on INST 9004 #5 (DB-608 megabore column)

Carrier Gas - Helium (7.4 mL/min)

Aux Gas - P-5 mix (28.6 mL/min)

Injected on Sat Dec 7, 1991 12:56:59

| RT    | Area    | Code | Amount | Name                  |
|-------|---------|------|--------|-----------------------|
| .12   | 25105   | BV   | .0007  |                       |
| .66   | 410377  | HS   | 2.5674 |                       |
| .98   | 41147   | VT   | .0012  |                       |
| 5.28  | 11768   | PV   | .0003  |                       |
| 5.98  | 52042   | PV   | .0015  |                       |
| 8.37  | 13377   | PV   | .0004  |                       |
| 10.06 | 1972413 | PV   | .0559  | TCX                   |
| 11.83 | 36772   | BV   | .0010  |                       |
| 12.35 | 29212   | VV   | .0008  |                       |
| 12.65 | 17208   | VV   | .0005  |                       |
| 12.85 | 13346   | VV   | .0004  |                       |
| 13.15 | 12671   | VV   | .0004  |                       |
| 16.47 | 29609   | VV   | .0008  |                       |
| 16.79 | 14609   | VV   | .0004  |                       |
| 17.17 | 53496   | VV   | .0015  |                       |
| 17.71 | 134032  | VV   | .0038  |                       |
| 18.39 | 11994   | PV   | .0003  |                       |
| 19.11 | 14785   | VV   | .0004  |                       |
| 19.55 | 12876   | VV   | .0004  |                       |
| 19.91 | 366209  | VV   | .0104  |                       |
| 20.09 | 473536  | VV   | .0134  |                       |
| 20.75 | 28574   | VV   | .0027  | GAMMA-CHLORDANE       |
| 20.95 | 16185   | PV   | .0005  |                       |
| 21.11 | 81621   | VV   | .0023  |                       |
| 21.35 | 548705  | VV   | .0156  |                       |
| 21.53 | 492293  | VV   | .0140  |                       |
| 21.76 | 950247  | VV   | .0269  |                       |
| 21.97 | 1080789 | VV   | .1219  | DIELDRIN 1762 3471396 |
| 22.42 | 399362  | VV   | .0113  |                       |
| 22.73 | 612490  | VV   | .0174  |                       |
| 22.85 | 410335  | VV   | .0649  | ENDRIN                |
| 23.00 | 1671233 | VV   | .0474  |                       |
| 23.26 | 527493  | VV   | .0150  |                       |
| 23.64 | 142677  | VB   | .0040  |                       |
| 24.14 | 691602  | BV   | .1172  | 4,4'-DDT              |
| 24.41 | 682254  | VV   | .0877  | ENDRIN ALDEHYDE       |
| 24.60 | 2105007 | VV   | .0597  |                       |
| 25.38 | 21191   | VV   | .0006  |                       |
| 25.63 | 122349  | VV   | .0035  |                       |
| 26.06 | 556121  | VV   | .0708  | DBC                   |
| 26.25 | 299898  | VV   | .0085  |                       |
| 26.42 | 1139240 | VV   | .0323  |                       |
| 26.86 | 148181  | VV   | .0042  |                       |
| 27.64 | 52034   | VB   | .0015  |                       |

Sample Name : D708 1260  
sult File : /DATA/LOOP/RESULT/PCBCON\_3071\_030.RES

| RT    | Area    | Code | Amount | Name          |
|-------|---------|------|--------|---------------|
| 28.27 | 13024   | BV   | .0013  | ENDRIN KETONE |
| 28.62 | 187591  | VV   | .0053  |               |
| 28.86 | 622648  | VV   | .0177  |               |
| 31.16 | 156076  | BV   | .0044  |               |
| 33.03 | 1957249 | BV   | .0555  | <u>0.05</u>   |

Total Area : 19463056 Total mg/L : 3.476

Report Time : Tue Dec 10, 1991 2:34:18 pm  
Method : /DATA/LOOP/METHOD/EPA7LAJ.MTH  
Report File : /DATA/LOOP/FORMAT/EMS.FMT

## **Appendix B**

### **Analytical Data Summary for the First Preliminary Feed Sample (BB-01)**

**Table B-1**  
**Analytical Data Summary for the First Sheboygan River**  
**and Harbor Sample**

| Sample ID                   |     | Prelim Feed<br>BB-01 |
|-----------------------------|-----|----------------------|
| EMS Lab No.                 |     | C133733              |
| Moisture                    | %   | 40.0                 |
| LOI (100-ash)               | %   | 45.0                 |
| Susp Solids                 | ppm | x                    |
| Dis Solids                  | ppm | x                    |
| pH                          |     | 7.0                  |
| O&G (IR)                    | ppm | 170                  |
| TPH (IR)                    | ppm | 120                  |
| PCB 1242                    | ppm | BDL(1.0)             |
| PCB 1248                    | ppm | BDL(1.0)             |
| PCB 1254                    | ppm | 9.6                  |
| PCB 1260                    | ppm | 3.4                  |
| Total PCBs                  | ppm | 13.0                 |
| <u>Volatiles (ppm)</u>      |     |                      |
| Acetone                     |     | 0.18                 |
| Benzene                     |     | BDL(0.005)           |
| Ethylbenzene                |     | BDL(0.005)           |
| Fluorotrichloromethane      |     | BDL(0.005)           |
| Methylene Chloride          |     | est 0.004            |
| Methyl Ethyl Ketone         |     | 0.081                |
| Toluene                     |     | BDL(0.005)           |
| 1,1,1-Trichloroethane       |     | BDL(0.005)           |
| Xylene                      |     | BDL(0.005)           |
| <u>Semi-Volatiles (ppm)</u> |     |                      |
| Anthracene                  |     | BDL(0.33)            |
| Benz(a)anthracene           |     | BDL(0.33)            |
| Bis(2-ethylhexyl)phthalate  |     | 0.67                 |
| Carbazole                   |     | BDL(0.33)            |
| Chrysene                    |     | BDL(0.33)            |
| Di-N-Butylphthalate         |     | BDL(0.33)            |
| Fluoranthene                |     | BDL(0.33)            |
| Phenanthrene                |     | BDL(0.33)            |
| Pyrene                      |     | BDL(0.33)            |
| Pyridine                    |     | BDL(1.7)             |
| Benzoic Acid                |     | BDL(1.7)             |
| 2-Methylphenol              |     | BDL(0.33)            |
| 4-Methylphenol              |     | BDL(0.33)            |
| Phenol                      |     | BDL(0.33)            |

### Key to Table B-1

#### **Notes:**

- est** = the value is below the calculated practical quantitation limit but the compound was identified as being present during the analysis
- x** = analysis not requested
- BDL(A)** = below detection limit, A = detection limit
- LOI** = loss on ignition = 100% - % ash

**Preliminary Feed** = Feed sample taken during feed preparation

- Differences in detection levels between samples are due to use of different dilutions used by analytical laboratory or matrix interference.
- All results are reported on "as-received" basis except PCBs which are reported on a dry weight basis.

**Table B-2**  
**Metals Data for First Sheboygan River and Harbor Site**  
**Preliminary Feed Sample, ID BB-01**

| <b>Metal</b> | <b>Total Metals<br/>As-Received<br/>Basis<br/>(ppm)</b> | <b>Total Metals<br/>Dry Weight<br/>Basis<br/>(ppm)</b> | <b>TCLP Metals<br/>(mg/l)</b> |
|--------------|---------------------------------------------------------|--------------------------------------------------------|-------------------------------|
| Arsenic      | 1.0                                                     | 1.7                                                    | BDL(0.010)                    |
| Barium       | 35                                                      | 58                                                     | 1.0                           |
| Cadmium      | BDL(0.40)                                               | BDL(0.67)                                              | 0.03                          |
| Chromium     | 17                                                      | 28                                                     | BDL(0.05)                     |
| Lead         | 25                                                      | 42                                                     | BDL(0.20)                     |
| Mercury      | 0.21                                                    | 0.35                                                   | BDL(0.0005)                   |
| Nickel       | x                                                       | x                                                      | x                             |
| Selenium     | BDL(1.0)                                                | BDL(1.7)                                               | BDL(0.010)                    |
| Silver       | BDL(1.0)                                                | BDL(1.7)                                               | BDL(0.05)                     |

**Notes:**        x        = analysis not requested  
                   BDL(A)    = below detection limit, A = detection limit

**APPENDIX F-10**

**APEG CHEMICAL DECHLORINATION BENCH-SCALE-STUDY (GRC)**



January 30, 1992

R00020

**GRC ENVIRONMENTAL, INC.**  
**Final Report**  
**Treatability Study for the**  
**Sheboygan River and Harbor**  
**Superfund Site**

**Presented to:**

**Blasland & Bouck Engineers, P.C.**  
**Syracuse, NY**



January 30, 1992

Mr. Paul Doody  
Blasland & Bouck Engineers, P. C.  
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Syracuse, NY 13214-0066

6627 Joy Road  
East Syracuse  
New York  
13057

Tel: 315/463/5160

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1/800/722/7123

Dear Paul:

I've attached the final report for treatability studies done on sediment from Sheboygan River and Harbor.

The report breaks the treatability study work into phases and provides a discussion of activity and results within each phase. Average starting PCB concentrations of 280 ppm were brought to below the 2 ppm treatability study objective.

Cost estimates have been included in Appendix IV. Costs were estimated for two scenarios, 10,000 and 100,000 tons. These estimates are, by necessity, preliminary, and project a range of costs from \$200 to \$550 per ton for these volumes. Pilot scale studies will refine cost accuracy.

Enclosed please also find a copy of summary for GRC's responses related to Blasland & Bouck Engineers' comments. We believe these respond to comments regarding the draft final report. We have enjoyed working with Blasland & Bouck on this bench scale investigation and look forward to pilot scale studies which will generate data critical to full-scale processing.

Sincerely,

*Steve New*

Steve New  
Client Services Manager

Enc.: Summary of Responses on Blasland & Bouck Engineers, P.C.'s  
Comments on GRC's Draft Final Report on Treatability Study for  
the Sheboygan River and Harbor Superfund Site

Final Report, Treatability Study for the Sheboygan River and  
Harbor Superfund Site

Summary of Responses on Blasland & Bouck Engineers, P.C.'s  
Comments on GRC's Draft Final Report on Treatability Study for  
the Sheboygan River and Harbor Superfund Site

GRC has made appropriate modifications in the final report in accordance to the comments Blasland & Bouck Engineers have regarding to the draft final report. The responses related to Blasland & Bouck Engineers' comments are illustrated as follows:

Report Cover

- (1) The change has been made in the final report.

Executive Summary

- (2 & 3) The change has been made in the final report.
- (4) Revised discussion has been made in the final report, see page 1.

Introduction

- (5) References are provided as footnote 1 and 2, page 2.

Preliminary Analysis

- (6) Data listed in page 4.
- (7) "Dewatered untreated sediment" is replaced with "prepared" sediment, see page 3.
- (8) The change has been made in the final report.
- (9) The PCB concentration for "hour six" sample was 2.5 ppm in the draft final report. Reaction 2 has PCB level below 2 ppm after 7 hours.
- (10) The data is listed in page 5, footnote 7.
- (11, 12, & 13) The discussion about data variability has been enhanced in the final report.
- (14) See page 7 for explanation and data.

Evaluation of Results

- (15) More descriptive statement has been made on page 8.

#### Post Reaction Contaminant Analysis

- (16) Treated sediment from Reaction 2 was sent to Hazleton Laboratories for analysis.
- (17) The change has been made in the final report.
- (18, 19 & 20) An additional section has been added to the final report to address the PCBs found in the condensate and wash water. Management of this stream is discussed on page 12 & page 13.
- (21) Refer to page 12 for discussion.
- (22) A typographical error in the draft final report and listed spike recovery as 59%. It is now correctly stated as 79%. However, "very good" is deleted from the final report, refer to page 10.
- (23 & 24) The change has been made in the final report.
- (25) It was a mis-statement in the case narrative from Galson laboratory; the untreated sediment was determined on a wet weight basis.
- (26) The change has been made in the final report.
- (27, 28 & 29) More complete discussion has been made in the final report, see page 9 and 10.

#### Mass Balance and Reagent Recovery

- (30) Please refer to section "Scale Up and Limitations of Lab-Scale Testing" for background information and page 14 & 15 for discussion.
- (31) Please refer to page 15 for calculation.
- (32) Please refer to section "Scale Up and Limitations of Lab-Scale Testing" for discussion.
- (33) As noted in discussions between GRC and B&B, the final report provides the best available preliminary cost estimation for Sheboygan site, see page 14 & page 15.
- (34, 35 & 36) The correction has been made in the final report.

#### Cost Estimate

Cost estimate from laboratory data have limited precision. If more detailed information is required, a pilot-scale test is recommended.

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## APPENDICES

- Appendix 1 - Method Used
- Appendix 2 - PCB Mass Balance and Mass Balance
- Appendix 3 - Outside Laboratory Analysis - PCB Result
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- Appendix 5 - Quality Assurance Report

## Executive Summary

GRC Environmental, Inc. (GRC) successfully treated a sediment sample containing PCB from the Sheboygan River & Harbor Superfund site in Wisconsin using the APEG-PLUS™ dechlorination treatment. The treatability study objective of 2 ppm for the treated sediment matrix was reached after seven hours of treatment. PCBs found in the exit fractions were below 2 ppm with the exception of the condensate and vent trap A.

Two batches of sediment were treated with GRC's patented APEG-PLUS™ treatment system in laboratory equipment. Reaction 1 reduced the PCB concentration to below 2 ppm in nine hours. Reaction 2 reduced the PCB concentration in seven hours, using a different reagent formulation. Both reactions showed high variability in analytical data for PCB results. This variability is not unusual for laboratory scale testing, largely due to mixing limitations.

Based on the laboratory data currently available, GRC estimates APEG-PLUS™ treatment costs for this site at \$200 - \$550 per ton, assuming a total sediment volume of 10,000 - 100,000 tons. This includes costs for treating PCB contaminated condensates produced during the process.

Extrapolation of processing costs from laboratory data has poor precision due to physical factors. The scale up factor from laboratory to full scale operations is approximately 50,000:1. Of the major components of cost estimation; cycle time, reagent consumption, energy/fuel cost and capital cost, only cycle time and capital cost can be reasonably estimated from laboratory data. Reagent and energy/fuel costs which comprise 30-60% of overall costs, can only be estimated from pilot plant or full scale demonstration data.

## **Introduction**

The Sheboygan River & Harbor Superfund Site is located in Sheboygan County, Wisconsin. Riverbed sediment at the site contains PCBs and metals. The primary goal of GRC's treatability study was to reduce the concentration of PCBs to less than 2 ppm, as requested by Blasland & Bouck Engineers, P.C., the consultant for the site.

During the APEG-PLUS™ chemical dechlorination treatment process, a patented mixture of chemical reagents is used: dimethyl sulfoxide (DMSO), polyethylene glycol (PEG 400), triethylene glycol methyl ether and higher homologs (TMH), and potassium hydroxide (KOH). The contaminated sediment is mixed with reagent and heated. The glycol reacts with KOH in the presence of the sulfoxide to form an alkoxide. The alkoxide replaces one or more of the chlorine atoms in the contaminant to produce a glycol ether and potassium chloride. The glycol ether may further degrade to a totally dechlorinated species. The sulfoxide acts as a cosolvent and catalyst to increase the overall rate of the reaction.

APEG-PLUS™ treatment has been proven effective in destroying PCBs, dioxins, dibenzofurans, and other halogenated aromatic compounds. Previous research with APEG has shown that the reaction products from treatment of PCBs and dioxins are not toxic<sup>1,2</sup>. Both dioxin reaction products and treated PCB soil have been administered orally to guinea pigs with no observable ill effects. Ames testing of both treated soil and reaction products has shown that the products are not mutagenic. Since the reaction products are more water soluble than the original contaminants, they are less likely to bioaccumulate. Testing with fathead minnows has confirmed that PCB reaction products do not bioaccumulate<sup>2</sup>.

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<sup>1</sup> D. J. Brunelle and D. A. Singleton, "Destruction/Removal of Polychlorinated Biphenyls from Non-Polar Media. Reaction of PCB with Poly(Ethylene Glycol)/KOH"; Chemosphere, Vol. 12, p 183-196, 1983.

<sup>2</sup> D. M. DeMarini and J. E. Simmons, "Toxicological Evaluation of By-Products From Chemically Dechlorinated 2,3,7,8-TCDD," Health Effects Research Laboratory, U.S.EPA, Chemosphere, Vol. 18, Nos. 11/12, p 2293-2301, 1989.

The first step in investigating the feasibility of using the APEG-PLUS™ treatment system for the Sheboygan River & Harbor Superfund Site was to conduct a laboratory study to demonstrate the effectiveness of APEG-PLUS™ treatment for this sediment. At the same time a preliminary cost estimate was prepared. The various phases of the treatability study will be discussed in detail in the remainder of this report.

#### Preparation of the Sample

Blasland & Bouck Engineers, P.C. delivered approximately 9 pounds of sediment containing PCBs on August 26, 1991, to the GRC laboratory located in East Syracuse, New York. It is considered by Blasland & Bouck to be representative of sediment at the site. Free liquids were first decanted off the sample. Then, GRC personnel passed the sediment through a screen with 0.25-inch openings to remove debris and collected the sediment in a pan. The sediment then was air-dried in a fume hood overnight to remove excess moisture and mimic the effect of pre-process storage. The moisture content was reduced from 39% to 35% at this time. All work with this material was conducted in a fume hood by personnel wearing appropriate protective equipment, including nitrile gloves with latex gloves underneath.

#### Preliminary Analysis

After the sediment sample had been dewatered and homogenized, the initial PCB concentration and the KOH absorption capacity (KAC) were determined. The "prepared" sediment was analyzed for percentage of oversized sediment (material larger than 1/4 inch) and moisture content. The data generated in this portion of the lab study are summarized in Table 1 (See Appendix 1 for methods used).

**Table 1. Preliminary Analysis of Sheboygan Harbor Sediment**

|                                                         |      |
|---------------------------------------------------------|------|
| PCB Concentration, ppm ( $\mu\text{g/g}$ ) <sup>3</sup> | 280  |
| Oversized Sediment, (% by weight) <sup>4</sup>          | 3.3  |
| Free Liquids Decanted Off, (% by weight)                | 0.80 |
| Moisture Content, before drying, %                      | 39   |
| Moisture Content, after drying, %                       | 35   |
| KOH Absorption Capacity, mg/g <sup>5</sup>              | 190  |

Initial PCB concentrations for untreated sediment were 150 ppm, 180 ppm, and 520 ppm<sup>6</sup>. This variation showed that the PCB concentration for the untreated sediment was unevenly distributed. Table 1 data also indicates the sediment contains a relatively high moisture content. Thus, the APEG-PLUS<sup>TM</sup> treatment of the sediment requires additional heatup time compared to drier soils. The additional water must be distilled off in order to reach the APEG-PLUS<sup>TM</sup> reaction temperature of 150°C.

The KAC was performed to determine the quantity of KOH needed for the reaction. Based on the data obtained for the KAC, 200% reagent loading at 1:1:2:2 reagent formulation (PEG:TMH:DMSO:45% KOH) was selected as the initial reaction loading for this sediment sample.

### **Treatment Reactions**

Two reactions were performed on the representative Sheboygan River and Harbor sediment following GRC's standard methods (see Appendix 1). Each

---

<sup>3</sup> Average value of triplicate determinations, and were reported on a dry weight basis.

<sup>4</sup> Particles of Sediment over 1/4" are considered oversized.

<sup>5</sup> Average value of duplicate determinations.

<sup>6</sup> This data was analyzed with 64% of DCB surrogate recovery which was within the QA acceptable limit and was considered valid.

reaction was run for 10 hours. Samples were collected hourly and analyzed for PCBs to monitor the progress of the reaction.

For the first reaction, 600 grams of reagents at the standard reagent formulation of 1:1:2:2 (PEG:TMH:DMSO:45% KOH) was mixed with 300 grams of "prepared" untreated sediment. The total reagent weight was 200% of the sediment weight, which is twice the amount of reagent GRC typically would use for a soil treatment. The materials loaded into the reactor are listed in Table 2.

Table 2. Reactions Input Quantities

| Reaction                    | # 1    | # 2    |
|-----------------------------|--------|--------|
| Grams of sediment treated   | 302.20 | 300.35 |
| Moisture content of feed. % | 35     | 35     |
| Dry grams treated           | 200    | 200    |
| Grams of PEG used           | 99.68  | 75.00  |
| Grams of TMH used           | 99.95  | 74.97  |
| Grams of DMSO used          | 200.10 | 150.10 |
| Grams of 45% KOH used       | 200.00 | 299.93 |

Reaction 1 reduced the PCB concentration to less than 2 ppm in 9 hours. Due to low KOH recovery for Reaction 1<sup>7</sup>, additional KOH was added to Reaction 2. For the second reaction, the reagent formulation was changed to 1:1:2:4 (PEG:TMH:DMSO:45% KOH). The amount of the organic reagents was reduced and the KOH loading was increased. The total reagent weight for this reaction was also 200% of the sediment weight. Reaction 2 reduced the PCB concentration to below 2 ppm in 7 hours. This additional 45% KOH caused a longer heatup time and increased generation of condensate for Reaction 2 compared to Reaction 1, even though the overall reaction time was shorter (7 hours versus 9 hours). Analytical results from the hourly samples for both reactions are listed in Table 3. Complete reaction curves for Reaction 1 and 2 are graphed in Figure 1.

---

<sup>7</sup> Upon completion of Reaction 1, KOH titration was performed on the treated sediment and reagent: 7.6 mg/g and 6.1 mg/g of KOH were recovered separately.

**Table 3. Reaction 1&2 Monitoring Data**

| Hour              | Reaction 1           |                     | Reaction 2          |        |
|-------------------|----------------------|---------------------|---------------------|--------|
|                   | ppm PCB <sup>8</sup> | DCB %R <sup>9</sup> | ppm PCB             | DCB %R |
| 0                 | 150                  | 85                  | 240                 | 89     |
| 1                 | 400 <sup>10</sup>    | 51                  | 220                 | 87     |
| 2                 | 460                  | 100                 | 45                  | 74     |
| 3                 | 400                  | 99                  | 24                  | 74     |
| 4                 | 120                  | 67                  | 37                  | 94     |
| 5                 | 17                   | 52                  | 83                  | 90     |
| 6                 | 4.9                  | 90                  | 2.5                 | 110    |
| 7                 | 5.3                  | 130                 | 0.47                | 110    |
| 8                 | 4.0                  | 110                 | <0.43 <sup>11</sup> | 120    |
| 9                 | <0.22 <sup>11</sup>  | 130                 | <0.34 <sup>11</sup> | 120    |
| 10                | <0.65 <sup>11</sup>  | 100                 | <0.14 <sup>11</sup> | 120    |
| Treated Sample    | <0.71 <sup>11</sup>  | 89                  | 0.27                | 60     |
| Trd. Sample. Dupe | NA <sup>12</sup>     | NA                  | <0.71 <sup>11</sup> | 100    |

<sup>8</sup> All PCB concentrations are determined on a dry sediment weight basis in ppm.

<sup>9</sup> DCB%R = per cent recovery of decachlorobiphenyl (the recovery surrogate), included for QA purposes.

<sup>10</sup> Extended mixing of soil and reagent frequently extracts PCBs that are not found during the beginning of mixing. This does not indicate production of new PCBs.

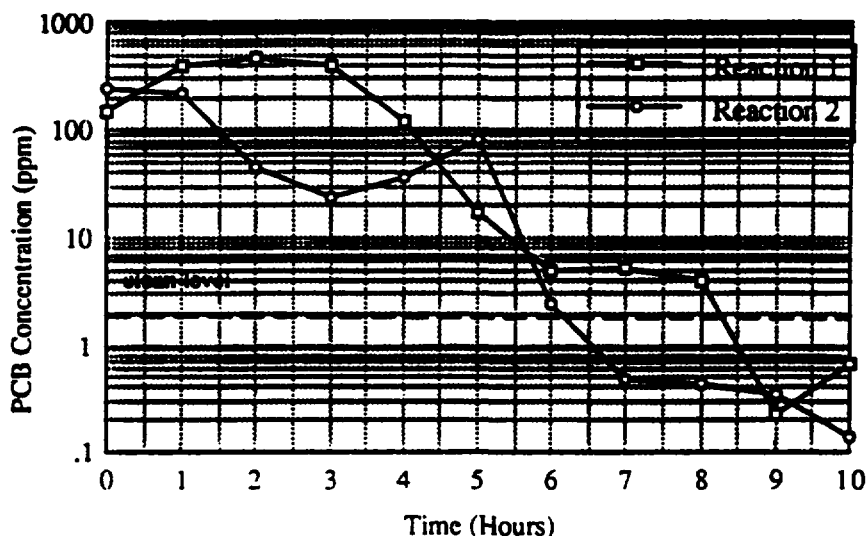
<sup>11</sup> The data represented that the PCB concentration in the sample was non-detectable. The detection limit was calculated by the following formula:

$$D.L. = \frac{\text{lowest PCB conc. detected by GC-ECD (ppm)} * \text{final Vol (mL)}}{\text{Amount of sample extracted (g)}}$$

The data reported in the preliminary report were the quantitation limit for our analytical method instead of the detection limit. The listed data were recalculated.

<sup>12</sup> NA = the sample was not analyzed.

**Figure 1. PCB Concentration Versus Time: Reaction 1 and 2**



As the graphs show, both Reaction 1 and Reaction 2 had high variability in analytical results. This variability indicates poor mixing, possibly related to high sample viscosity as well as the usual surface adsorption effects. For example, the most troublesome unmixed area of the lab reactor is the upper portion, above the level of the slurry, where splashes and lumps of less treated material bond to the wall. Capturing small lumps of the less treated material during sampling leads to random variation in the PCB results. This problem is significant at laboratory scale, but as the size of reactor increases, the surface to volume ratio improves dramatically. Data from previous lab and pilot studies clearly show that reaction curves become much smoother as the reactor size increases.

After reaction 2, treated sediment was washed four times with an amount of water equal to the initial sediment weight (see Appendix 1 for method). The sediment was neutralized with 20% sulfuric acid in conjunction with the fourth wash<sup>13</sup>. The purpose of this process was to remove excess reagents from the sediment to restore the sediment to its initial pH and to remove

<sup>13</sup> The pH prior neutralization was not taken, but the total amount of KOH neutralized was 12 g.

environmental hazards associated with the residual high alkalinity in the treated sediment.

### Evaluation of Results

Because the PCB contamination was reduced to below 2 ppm quicker in Reaction 2 than in Reaction 1, Reaction 2 was chosen as the most successful reaction. A subsample of treated sediment from Reaction 2 was sent to Hazleton Laboratories for analysis. The key to the increased dechlorination speed for Reaction 2 was the addition of extra KOH. A further increase in dechlorination speed would be expected if the moisture content of the sediment was significantly reduced (generate less condensate and speed up the heatup time) and/or the KOH was added as flake instead of as a solution. Use of flake KOH in place of a portion of the liquid KOH would reduce the amount of water (from the liquid KOH) to be boiled out of the reactor and would reduce the treatment cycle time. This effect would potentially reduce the overall remediation costs.

A handling problem was observed during the heatup of Reaction 1 but not observed during Reaction 2. The contents of the reactor boiled vigorously causing some foam to fill up the reactor. This foaming may be due to the particular reagent formulation used in this reaction or to a reacting substance in the matrix. During full scale, an anti-foam agent can be introduced to control this phenomenon. Research for choosing an appropriate antifoam agent should be conducted during the pilot-scale testing.

### Post Reaction Contaminant Analyses

#### PCB Analysis - By GRC's Laboratory

All of the exit streams from the most successful reaction, Reaction 2, were analyzed for PCBs by GRC's laboratory. The purpose of these analyses was to prove that the PCBs were destroyed, not simply removed from the matrix. The results are presented in Table 4. All the exit fractions, with the exception of the condensate and the vent trap A (florisil tube), contained PCBs below 2 ppm.

**Table 4. PCB Analysis of Exit Fractions for Reaction 2**

| Fraction                           | GRC              |                  | Galson Lab.          |
|------------------------------------|------------------|------------------|----------------------|
|                                    | PCB (ppm)        | DCB Recovery(%)  | PCB (ppm)            |
| Condensate                         | 49 <sup>14</sup> | 110              | 67                   |
| Reagent                            | 0.19             | 86               | < 0.70               |
| Wash 1                             | 0.14             | 97               | NA                   |
| Wash 2                             | 0.12             | 100              | NA                   |
| Wash 3                             | 0.12             | 71               | NA                   |
| Wash 4                             | 0.10             | 99               | NA                   |
| Wash Water Composite <sup>15</sup> | NA               | NA               | 0.0086               |
| Vent trap A. part 1                | 13               | NR <sup>16</sup> | NA                   |
| Vent trap A. part 2                | 9.8              | NR               | NA                   |
| Vent Trap B                        | NA               | NA               | <0.15                |
| Treated sediment                   | 0.27             | 60               | <0.080 <sup>17</sup> |
| Treated sediment. dupe             | 0.26             | 101              | NA                   |
| Treated sediment Avg.              | 0.27             |                  |                      |
| % Relative Stand. Dev.             | 2.7              |                  |                      |
| Treated soil spike                 | 3.2              |                  |                      |
| Spike added (ppm)                  | 3.7              |                  |                      |
| % Spike Recovery                   | 79               |                  |                      |

A detectable amount of PCB was present in the condensate, but that is not unusual (see Scale Up and Limitations of Lab-Scale Testing section). PCBs

<sup>14</sup> The condensate obtained from Reaction 1 was analyzed and has an average PCB concentration of 19 ppm.

<sup>15</sup> After each portion of wash water was tested for PCB concentration, GRC combined all the wash water portions as a wash water composite and delivered it to Galson Corporation Laboratories for PCB analysis.

<sup>16</sup> NR = No recovery surrogate was added to this sample.

<sup>17</sup> The data reported was on a wet weight basis.

found in vent trap A<sup>18</sup>, 0.032% of total input PCBs, are not significant: vent trap B contained no PCBs. During the full-scale remediation, similar florasil tubes will be used to monitor the condition of drum size vent traps. When remediation is complete, the spent vent traps will be analyzed and disposed or incinerated.

The precision of PCB analysis is indicated by the per cent relative standard deviation (which equals the standard deviation expressed as a percentage of the mean) calculated from duplicate or replicate samples. The precision shown in Table 4 for duplicate analysis on the treated sediment was excellent. Please note that the values shown in the table are significantly below the detection limit for the treated sediment at value of 0.71 ppm (Table 3). However, the actual values obtained are included here to demonstrate the precision of GRC's PCB analytical method.

Accuracy is evaluated by examining the per cent recovery of spiked samples and the per cent recovery of the DCB recovery surrogate. The spike recovery of 79% indicates that the accuracy of GRC's rapid analytical method for PCBs is well within our QA goals (100%  $\pm$  50%) of QAPP plan. The DCB recoveries for the exit fractions were also within the QA criteria.

A mass balance for PCBs indicates that approximately 82% of the PCBs were destroyed by the dechlorination process (refer to appendix 2). The PCBs found in the condensate account for about 18% of the total.

PCB Analysis - By Galson Corporation Laboratories  
- Use SW-846 Method 8080, NYS-DEC ASP Category B

A sample of the untreated sediment and various exit fractions were submitted to Galson Corporation Laboratories in East Syracuse and analyzed for PCBs. The data are summarized in Table 4 with the complete reports attached as Appendix 3.

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<sup>18</sup> Vent trap A is the florasil tube and is analyzed as two parts. Vent trap B is an active carbon trap and installed after vent trap A.

The untreated sediment sample was analyzed by Galson Corporation with PCB levels at 47 ppm<sup>19</sup>. The level of PCB concentration was below GRC detected range of 150-520 ppm. GRC reanalyzed five extra samples and obtained a range of 98-150 ppm for the untreated sediment, data are listed in Table 5. Including preliminary data an average of 190 ppm with 68% of RSD<sup>20</sup> was obtained. The discrepancy between Galson Corporation's and GRC's data for untreated sediment is probably due to the non-uniformity of the untreated sample in spite of extensive homogenization efforts. For calculation purposes, GRC is using the "zero" hour concentration of 240 ppm from Reaction 2 as the initial PCB concentration for calculating the PCB mass balance. The "zero" hour sample is collected after slurring the soil with PEG, TMH, DMSO and 45% KOH, but before heat is applied. The liquid reagents are more effective in spreading the PCB concentration evenly than physical homogenization of the soil.

**Table 5. Replicate PCB Analysis on Sheboygan Harbor and River  
Untreated Sediment and Condensate by GRC Laboratory**

| Date                      | PCB conc (ppm) | DCB % Recovery | Average | % RSD |
|---------------------------|----------------|----------------|---------|-------|
| <b>Untreated Sediment</b> |                |                | 190     | 68    |
| 8-8-91                    | 180            | NA             |         |       |
| 8-29-91                   | 520            | 64             |         |       |
| 8-29-92                   | 150            | 85             |         |       |
| 12-10-91                  | 150            | 95             |         |       |
| 12-10-91                  | 120            | 110            |         |       |
| 12-12-91                  | 140            | 116            |         |       |
| 12-12-91                  | 98             | 110            |         |       |
| 12-12-91                  | 150            | 111            |         |       |
| <b>Condensate</b>         |                |                | 49      | 20    |
| 9-30-91                   | 35             | 112            |         |       |
| 12-13-91                  | 56             | 118            |         |       |
| 12-13-91                  | 56             | 112            |         |       |

<sup>19</sup> The PCB concentration for untreated sediment was determined on a dry weight basis, whereas the treated sediment was reported on a wet weight basis.

<sup>20</sup> RSD refers to relative standard deviation and is equal to the standard deviation divided by the mean and expressed as a percentage.

The PCB concentration for condensate was reported as 67 ppm, which was higher than GRC's analytical data (first analyzed as 38 ppm). This inconsistent analytical data between GRC's laboratory and Galson Corporation's laboratory may be due to the fact that the APEG-PLUS™ process uses chemicals which interfere with analysis by regular EPA methods. However, the condensate was well mixed and reanalyzed by GRC's laboratory in duplicate; analytical data are listed in Table 5. The average value obtained for condensate was higher than GRC first analyzed and still lower than Galson Corporation's data.

The persistent data discrepancy between two laboratories may be explained by the following. The method that GRC used is more specific and rigorous than EPA's standard method. GRC developed it's own analytical method, and uses the EPA sponsored Webb McCall calculation. From GRC's experience, the APEG-PLUS™ process often disrupts aroclor peak patterns and makes EPA's standard method inapplicable to APEG reaction products. If third party verification is required to comply with regulations, a laboratory conducting the analysis using GRC's analytical method or another congener specific method analysis is more appropriate.

The presence of reagent in the condensate, wash water composite and reagent fraction caused interference in identifying PCB peaks pattern during analysis. Galson Corporation did not meet the QC acceptable limits for matrix spike/matrix spike duplicate for water matrix sample. The data for the wash water composite therefore should not be considered as valid. A smaller than usual quantity of sample was taken for analysis in order to avoid the interference of reagent in the wash water, therefore, Galson Corporation Laboratory must report a higher than usual detection limit.

#### Scale Up and Limitations of Lab-Scale Testing

Laboratory test reactions use approximately one pound of slurry, as compared to 35,000-50,000 pounds in a full-scale batch reactor. This large scale up factor limits the types of information that may be obtained from a small scale laboratory reaction. Inherent limits of a small reaction include:

- limited sample size
- unrealistic surface/volume ratio
- limited production of treated fractions

Limited sample size magnifies the effects of non-homogeneous matrices. Differences in a 1 pound slurry sample tend to even out in a 20 ton batch.

The electrically heated lab reactor has a very high surface/volume ratio compared to field equipment. During the course of laboratory scale reactions, it is not unusual to char some of the reagents when materials solidify on the reactor walls. The solidified material prevents efficient heat transfer from the metal reactor wall to the bulk of the reaction slurry. As the temperature controller attempts to maintain a constant 150°C temperature, the heating mantle raises the wall temperature much higher than would happen if the heat were efficiently conducted into the bulk slurry. This "hot wall" effect can break down reagents. Based on prior experience, it is probable that the oil-jacketed reactors used in pilot and full scale work will prevent the reagents from breaking down as much as it did in the laboratory reactor.

When large quantities of condensate are generated (on pilot- or full-scale work), it is possible to separate the PCB-containing organic phase from the water phase by simple physical means. Laboratory reactions do not produce enough sample to test such procedures. In full scale operations recovered water is tested for PCBs and passed through a carbon filter if it contains PCBs, then cycled back into the system to be used as wash water. Any condensable materials or volatiles are removed from the condenser system and are disposed off site or in an on-site bioreactor system. The separation of condensate and requirement of carbon filter installed will be verified during the pilot study. Contaminated carbon can be treated by APEG-PLUS™ or incinerated depending on the economics of the situation. This is not expected to be a major cost element. For example, during full-scale remediation carbon adsorption may be chosen as the method to remove PCB in the condensate. 10,000 tons of untreated sediment will require about 3 tons of activated carbon to adsorb the PCB in the condensate. Incineration, the most expensive disposal method, would cost about \$3,000 or less than 0.2% of the overall estimated disposal cost.

### Mass Balance and Reagent Recovery

The first part of a reagent recovery analysis is to verify the overall mass balance of the reaction. A mass balance at the lab level involves simply adding up all the masses that went into the reactor and comparing them to all the masses that came out. The mass balance data for Reaction 2 is presented in Table 6 and the mass balance and reagent analysis calculations can be found in Appendix 2.

Table 6. Mass Balance Data for Reaction 2

| Inputs             | Mass (g) | Outputs                      | Mass (g) |
|--------------------|----------|------------------------------|----------|
| Untreated Sediment | 300.35   | Treated Sediment             | 250.34   |
| PEG                | 75.00    | Reagent                      | 405.43   |
| TMH                | 74.97    |                              |          |
| DMSO               | 150.10   | Hourly Samples <sup>21</sup> | 60.51    |
| 45% KOH            | 299.93   |                              |          |
| Water for Wash 1   | 307.02   | Wash 1                       | 251.89   |
| Water for Wash 2   | 300.05   | Wash 2                       | 278.75   |
| Water for Wash 3   | 306.97   | Wash 3                       | 281.49   |
| Water for Wash 4   | 221.00   | Wash 4                       | 371.36   |
| Acid added         | 151.25   |                              |          |
| replace condensate | 258.74   | condensate                   | 259.36   |
| Total Inputs       | 2445.38  | Total Outputs                | 2159.13  |
| Mass Lost (grams)  |          | 286.25                       |          |
| Mass Recovery (%)  |          | 88                           |          |

The mass recovery for this reaction was lower than expected. The major mass losses was due to a change in sampling procedures (dual sample were taken instead of single sample and the former caused more sampling losses) and longer heatup time (causes more water vapor to escape from the ground glass

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<sup>21</sup> Sampling losses estimated at less than 60 g.

joints during sampling) compared to previous reactions GRC had conducted. Minor mass losses can also occur for any one or more of the following reasons:

- liquids may leak from the lab reactor seal
- water vapor may leak from condenser system
- gases may leave the lab reactor
- residuals left on centrifuge bottles, funnels, spatulas, and any items that come in contact with the reactor contents

It is also possible that some of the reagents or soil carbonates were converted to carbon dioxide during the course of this reaction. During scale up to pilot or full scale testing, slurry samples are taken directly from the sampling port on the reactor vessel. Mass losses due to laboratory sampling procedure and vapor leakage during sampling are eliminated.

The second aspect of mass balance is the question of whether the sediment is adequately separated from the reagents and wash waters at the end of the treatment. The mass recovery and related data for the Reaction 2 sediment is shown in Table 7.

Table 7. Mass Recovery for Sediment

| Sediment                     | Input  | Output |
|------------------------------|--------|--------|
| Wet Mass (grams)             | 300.35 | 250.34 |
| Moisture Content (%)         | 35     | 54     |
| Dry mass (grams)             | 200    | 120    |
| Dry mass for hourly sample   |        | 41     |
| Total dry mass recovered     |        | 160    |
| Mass Recovery, dry Basis (%) |        | 80     |
| Overall Mass Recovery (%)    |        | 88     |

The mass recovery for the sediment was much lower than expected and slightly lower than the overall mass recovery. The low sediment recovery indicates that the fine particles within the sediment did not separate from the

above 150°C. The loss of DMSO may be associated with the "hot wall" effect that is encountered with a lab reactor. Nevertheless, the concentration of DMSO in the treated sediment solid (0.54 mg/g) is well below the 7 mg/g "safe" level for earthworms, a species quite sensitive to DMSO. Performance evaluation samples for the reagent analysis were within acceptable recovery ranges.

Very little reagent was recovered in washes 3 and 4. If soil washing is as efficient in full scale as it was in the lab, adequate reagent removal from the sediment could be achieved in three washes. Sediment reagent residuals will be checked after the pilot-scale reactions to verify that the concentrations are acceptable.

Based on all of the lab data, GRC has prepared a cost estimate for full-scale cleanup. The cost estimate document is provided as Appendix 4.

#### Waste Disposal

After the final report has been accepted by Blasland & Bouck Engineers, P.C., GRC will ship the untreated sediment samples to Blasland & Bouck Engineers, P.C. GRC will properly dispose of the remaining waste, including treated sediment, reagent, wash water, and debris.

#### Summary & Conclusion

The treatability study conducted on the sediment from the Sheboygan River & Harbor site was successful in reducing the PCB concentration in the sediment to 2 ppm.

The CLP analysis using EPA's method was completed, and part of the data did not agree with GRC's analytical data. The inconsistency has been discussed in detail in this final report.

PCBs found in the exit fractions were below 2 ppm with the exception of the condensate and a vent trap. Discussion of the condensate and vent trap have been made in detail in the report. Mass balance data indicated slightly lower than normal mass recoveries. Although these low recoveries are probably the

result of materials handling conditions at lab scale, scale-up to pilot and full scale are expected to improve recoveries to allow cost effective remediation of this site. Reagent recoveries were within acceptable ranges.

January 30, 1992

R00020

**GRC ENVIRONMENTAL, INC.**  
**Appendix 1: Method Used**

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### ***1.1 Method for Percent Moisture***

Percent moisture data are important for calculating soil recoveries and for setting all analytical data to a fixed base.

A CSC Scientific moisture balance is used to measure the percent moisture of the untreated and treated samples.

## ***1.2 Method for Checking KOH Absorption Capacity***

The objective of this test is to determine whether a soil will absorb Potassium Hydroxide (KOH) from the APEG-PLUS™ reagent and to quantify the amount absorbed. If KOH is absorbed by the soil, additional KOH will be needed to drive the dechlorination reaction.

Accurately weigh about 10 g of dry, untreated soil into a 24 mL vial. (Weigh the vial with its cap, record the weight, add soil, re-weigh, record, subtract and record the soil weight.) Add 10 mL of 45 % KOH to the vial using a measuring pipette. Shake vigorously to mix and place the vial in GRC's ultrasonic bath. Prepare a blank by pipetting 10 mL of 45 % KOH into an empty vial. Because reactions between soil and KOH are very slow, it is necessary to agitate the soil samples overnight.

The next morning, shake the samples one more time and centrifuge the vials at about 1500 rpm for 3 minutes to settle the soil particles. Pipette 0.5 mL of the liquid into a beaker or conical flask containing about 100 mL of deionized water. Use a calibrated pH meter to monitor the pH changes. Titrate to a pH of 8.2. The KOH absorption capacity (KAC) is calculated as follows:

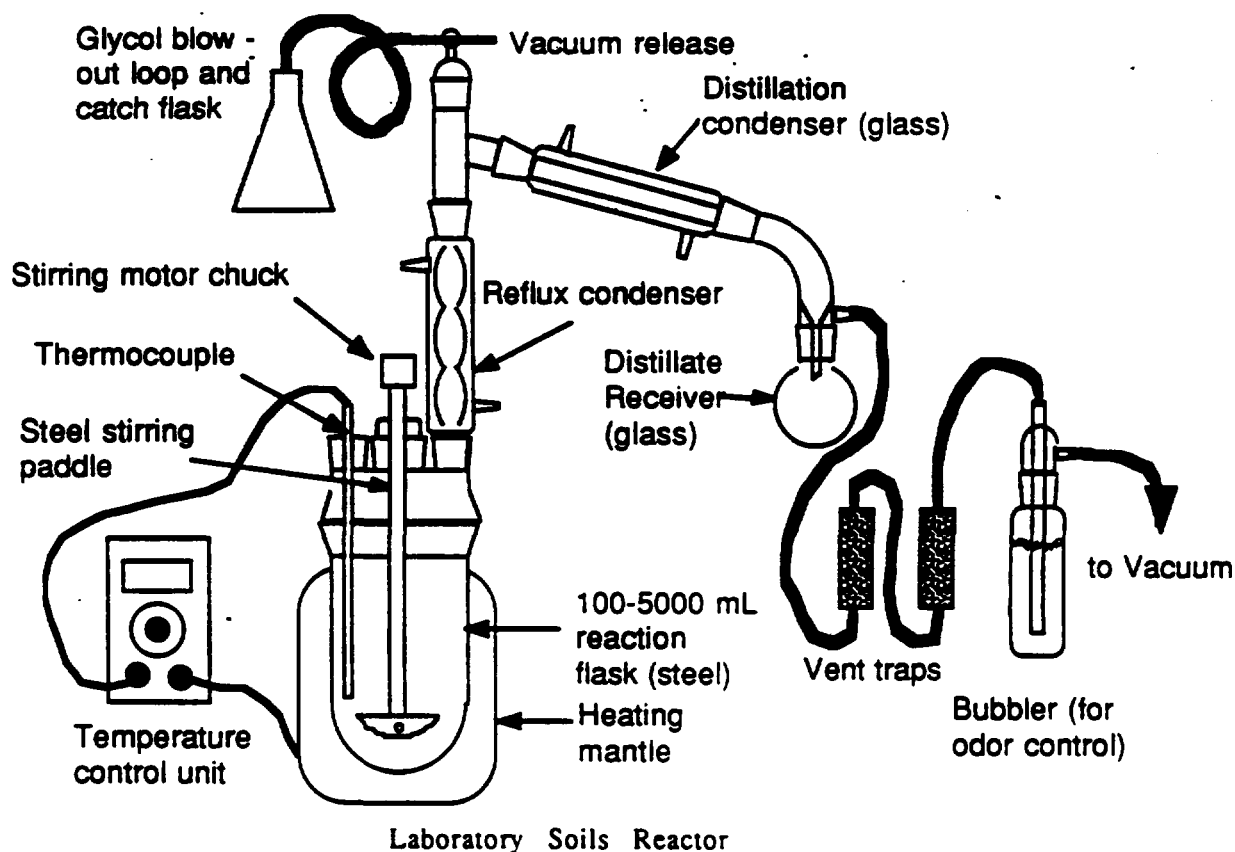
$$\text{KAC (mg/g)} = \frac{0.1 \times (\text{blank mL} - \text{sample mL}) \times 56 \times 10 \text{ mL equilibrated}}{\text{g sample} \times 0.5 \text{ mL titrated}}$$

Record the soil weight, the volume and concentration of KOH solution, the volume taken for titration, the volume and concentration of the acid used, and the result of the KAC calculation in the lab notebook or use the KAC spreadsheet.

### 1.3 Protocol for Laboratory Soil Reactions

Galson Remediation's APEG-PLUS™ treatment system can be used to treat soil contaminated with aromatic halides, for example: PCBs, dioxins and hexachlorobenzene. Before full scale treatment is begun, it is prudent to verify that the treatment system can indeed decontaminate the soil. The purpose of lab reactions is to imitate full scale soil treatment so that critical reaction parameters, such as reagent composition, can be established and tested at minimum cost. Laboratory data can also be used to estimate full scale reagent consumption and reaction time, which affect treatment costs.

Before any reactions are done, soil samples are analyzed for the contaminant(s) of interest, percent moisture, and KOH absorption capacity. These analyses help the lab personnel decide on the reagent formulation and loading for the initial reaction, and set up a schedule for the reaction time that will be required. The GRC laboratory soil reactor is illustrated below.



The reactor bottom, distillate receiver, and jars for reagent, soil, and washes are tared before starting the reaction. Soil is weighed into the reactor bottom. The reactor is clamped together and set up in a fume hood. The thermocouple, condenser system, and condensate receiver are attached and a thermostatically controlled heating mantle is positioned on the bottom of the reactor as shown. Reagents are weighed and added through the neck that usually holds the thermocouple. The soil and reagents are mixed into a slurry.

Reactions are timed from the start of heating. During heating, slight vacuum ( $<1$ " Hg) is applied at the exit from the vent trap. The vacuum imitates the negative pressure maintained on the full scale reactor. The vent trap assures that no vapors escape from the system. Water distills between 110 and 130°C (due to boiling point elevation). Samples are taken throughout the reaction, usually about one per hour, and analyzed according to GRC's analytical method for the contaminant(s) in soil.

After the contaminant concentration in the soil has reached the desired "clean" level the reactor is cooled to about 100°C and water is added to liquify the KOH and restore the reagent to its original water content. The reactor is then cooled to room temperature.

Reagent recovery and soil washing are carried out using centrifugation as the separation method. The reactor is emptied into one or more centrifuge bottles. The bottles are centrifuged at a known RPM, usually 1500, for a known time, usually one to five minutes. The centrifuge speed and time are selected to imitate the G force and dwell time of the centrifuges to be used in full scale soil treatment. The reagent is poured or pipetted off the soil into its tared jar. The soil is returned to the reactor and the reactor is re-assembled so that the stirrer can be used. Wash water is weighed into the reactor and mixed with the soil. The reactor contents are heated to 90°C and held at that temperature for 20 minutes with constant agitation. The reactor is cooled to a comfortable working temperature and the contents are emptied into the same centrifuge bottles as before. The washing procedure is repeated for the desired number of washes, usually 3-5.

When all the liquids are in their tared jars, the jars (and the distillate receiver) are re-weighed and mass recoveries are calculated. The reagent, washes, and distillate are analyzed and for the various reagent components. Mass balances for each reagent component are calculated. The reagent mass balance data are used to generate an estimate of reagent consumption and cost for full scale treatment.

The contaminant data from the monitoring samples are used to generate a concentration vs. time graph for the soil. This graph can be used to estimate the difference in reaction time for various "clean" levels that may be requested. Reaction time affects treatment cost. The reagent, washes, distillate, and vent traps are also analyzed for the contaminant(s) to verify that the contaminant(s) are destroyed and not just removed.

#### ***1.4 Analytical Method for PCB in Soil and Sludge***

Soil or sludge samples generated during APEG treatment require unusual treatment because the APEG-PLUS™ reagent is somewhat destructive to standard gas chromatography (GC) equipment. Care must be taken so that reagent is not included in the extract that is injected into the GC. This method has been developed to provide accurate results in the shortest time possible.

##### **A) Soil Wash Step (not required for final treated soil or untreated soil)**

A sample of the reaction slurry is collected directly in (or transferred from a large sample jar into) a tared 8 mL vial. The usual sample size is 2-3 mL of slurry. The vials are re-weighed to obtain the weight of slurry used. Water is added to the vials to fill them up to the "shoulders" and the vials are capped with solid, teflon lined caps and shaken vigorously using a vortex mixer to suspend the soil. The vial is then centrifuged at 1500 rpm for two minutes. The supernatant is transferred into a 24 mL collection vial. Two additional aliquots of deionized water (4-5 mL each) are used to wash the soil by the same method. The vial containing the wet soil is re-weighed to obtain a wet soil weight.

##### **B) Extraction Step**

After the final water wash is carefully decanted, a recovery surrogate (usually decachlorobiphenyl) is added to the sample and mixed in well. Then 1 mL of methanol and 3 mL of hexane are added to the 8 mL vial containing the soil sample. (Dry, untreated soil is weighed in a tared vial and 1 mL water, 1 mL methanol, and sometimes 100 µl of reagent mixture is added to aid in mixing. Hexane is then added as for a treated sample.) The vial is shaken vigorously on the vortex mixer to suspend the soil from the bottom of the vial. Shaking is continued for an additional minute. The vial is then centrifuged for two minutes as described above. The hexane layer is carefully transferred into a 10 mL volumetric flask using a disposable Pasteur pipette. Two additional aliquots of hexane, 3 mL each, are used to extract the soil/water/methanol slurry by the same method. Each hexane layer is transferred into the volumetric flask. After the third extraction, the volume in the volumetric

flask is adjusted to 10 mL with fresh hexane. The volumetric flask is mixed gently by inverting 20 times. 2-3 mL of the extract are transferred to a 4 mL vial containing 0.5 mL copper dust (measured with a powder measure) and 1 mL concentrated sulfuric acid. The 4 mL vial sealed is with a teflon lined screw cap and is shaken for about 30 seconds on the vortex mixer. The vial is then centrifuged to separate the phases. This procedure usually produces a colorless, dry extract above the acid/copper layer. The sulfuric acid wash may be repeated if necessary. The clean extract is transferred to a 1.5 mL vial used for GC analysis. The remainder of the unwashed extract is transferred into an 12 mL storage vial and retained until a satisfactory analytical result is obtained for that sample. The level of extract in the 12 mL vial is marked as a precaution against solvent evaporation.

The vial containing the extracted soil is left uncapped in a block heater to dry. The vial and soil are then re-weighed to obtain the dry soil weight.

#### C) Chromatography

The acid/copper washed sample extracts are diluted as required and used for GC analysis. PCB standards and blanks are injected on the same day as samples to provide instrument response data for calculations and adequate quality control for the analysis. Samples, standards and blanks are injected into the following chromatographic systems:

##### Hewlett Packard 5890A

- Injector temp.: 250°C, Manual injections with solvent flush
- Column: 30 m x 0.543 mm ID fused silica coated with 1.5 µm DB-1
- Carrier gas: nitrogen at 25 mL/min through column, makeup to 60 ml/min.
- Temperature Program: 170°C, 25°C/min. to 270°C, hold 6 min.
- Detector: Ni-63 ECD, base: 300°C
- Integrator: Hewlett Packard 59970C Chemstation with GC software.
- Threshold: 0, atten 2<sup>6</sup> (adjust as needed), Report mode: Area%

#### D) Data Reduction

The APEG-PLUS™ process causes unique problems in the area of data reduction because in many cases some PCB congeners react more rapidly than others. The differences in reaction rate result in a disruption of the usual aroclor peak pattern. Since the samples do not have the usual peak pattern, the normal methods of quantitation by comparison to standard aroclors are not appropriate.

The concentration of PCB in samples is calculated according to the procedure of Webb and McCall as described in the EPA method for PCB analysis (EPA 600/4-81-045). Each PCB peak is treated as a separate compound and is quantified individually. The total PCB concentration in a sample is the sum of the concentrations represented by the various peaks. This method provides a much more accurate estimate of the PCB concentrations in treated samples. It also provides accurate results for aroclors and mixtures of aroclors.

Chromatograms of samples and standards are studied and peak names, based on the relative retention times (RRT's) given in the EPA method, are assigned. Peaks 11 and 14 represent monochlorobiphenyls, peaks 16 and 21 represent dichlorobiphenyls and so on.

The standards used for calculations are hexane solutions of a 1:1 mixture of aroclors 1242 and 1260 at various concentrations. The nanograms of PCB represented by a given peak (ng<sub>ix</sub>) within a standard is calculated as follows.

$$ng_{ix} = C_x * VI * (M_{ia} + M_{ib})/200$$

where  $C_x$  = the total PCB concentration of standard x in ng/μL,

$VI$  = the injection volume of the standard in μL, and

$M_{ia}$  = the mean weight percent of peak i in Aroclor 1242, taken from Table 3 of the EPA method.

$M_{ib}$  = the mean weight percent of peak i in Aroclor 1260, taken from Table 6 of the EPA method

The nanograms of PCB represented by each peak in a sample is calculated by linear interpolation between two standards having the same peak at higher and lower concentrations. The equation for this calculation is:

$$ng_{is} = ng_{ih} - [(A_{ih} - A_{il})(ng_{ih} - ng_{il}) / (A_{ih} - A_{il})]$$

where i refers to a peak name,  
s refers to the sample,  
h refers to the higher standard,  
l refers to the lower standard, and  
A is a peak area.

The total nanograms of PCB in a sample injection, ( $ng_t$ ) is the sum of the nanograms of the individual PCBs ( $ng_{is}$ ).

$$ng_t = \sum ng_{is}$$

The PCB concentration in the soil is calculated from the nanograms in the sample injection as follows:

$$C = ng_t * V * D / (VJ * W)$$

where C = the concentration of PCB in soil in mg/kg (ppm)  
V = the total sample extract volume  
W = the weight of soil, in grams and  
D = any additional dilution factor required, e.g. if a 1/100 dilution of the extract is injected, D=100

In order to speed up calculations without requiring a large computer, a spreadsheet program was developed for doing the Webb McCall calculations on a Macintosh microcomputer using a spreadsheet. After peak identities are assigned by trained personnel, peak areas and concentrations of standards and dilution information for each sample are typed into the spreadsheet. The spreadsheet is programmed to calculate nanograms injected for each PCB peak by linear interpolation, to add up the total nanograms of PCB injected, to

correct for the injection volume, sample dilution, extract volume and sample weight, and to report concentrations in ppm by weight in the soil.

When rapid sample turn around is critical, as in process monitoring, it is not possible to obtain dry soil weights for the individual samples in the required time. In order to supply useful data as quickly as possible, half of the wet soil weight (after washing) is used to approximate the dry soil weight, and the data are reported verbally as approximate. GRC's experience has shown that half of the wet soil weight is a good approximation of the dry soil weight in this analysis. The soil samples are dried after extraction and re-weighed to obtain the dry soil weight before final data are reported.

### ***1.5 Analytical Method for PCB in Reagent and Water Solutions***

GRC's method for analyzing reagent for PCB is similar to the method used for soil and sludges. A 1-2 gram sample of reagent or water solution is weighed accurately, diluted with 1 mL of methanol. The reagent solution is extracted three times with a 3 ml volume of hexane. After each extraction, the hexane layer is transferred to a volumetric flask. After the third extraction, the hexane extract is brought up to 10 mL. The sample is cleaned up by shaking 2 mL of the hexane extract briefly with 0.5 mL of copper dust and 1 mL of concentrated sulfuric acid as described for soil extracts. The extract is then injected into a GC with ECD.

The chromatographic technique for the hexane solution was the same as for the hexane extract from a soil sample. PCB concentration is calculated as described for soil samples.

### ***1.6 Analytical Method for PCB in Florisil (Vent Trap)***

GRC's method for analyzing florisil (Vent Trap) for PCB is similar to the method used for soil and sludges.

The florisil tube is broken into two sections, A and B. These sections are transferred in two 1.5 mL amber vials. Part A includes two plugs of glass wool and the florisil closest to where the vapors entered the tube. Part B consists of one glass wool plug and the rest of the florisil closest to the vapor outlet. 1 mL of hexane is added to each vial and they are shaken with a shaker, or sonicated in an ultrasonic bath for 30 minutes. The samples are analyzed using the same chromatographic and data reduction techniques as soil and sludge samples.

### ***1.7 Analytical Method for KOH Titrations***

Between 0.5 - 5 grams of sample is weighed into an erlenmeyer flask. If the sample is opaque, it may be diluted with distilled or deionized water. A calibrated pH meter is used to monitor the pH of the sample during the titration. The sample is titrated with acid solution (usually 0.1N Hydrochloric) until the pH is 8.2. For a soil sample, 10 grams of soil is allowed to sonicate with 10 grams of water over night. About 1 gram of the aqueous solution is titrated (as detailed above). The concentration of KOH in the sample is calculated as follows.

$\text{mg KOH/g sample} = \text{mL titrant} \times \text{titrant normality} \times 56 / \text{sample weight (g)}.$

### ***1.8 Analytical Method for PEG, TMH, and DMSO***

#### **A) Sample Preparation for Liquid Samples**

Mix the samples well. Weigh 1-2 g of reagent or 5-6 g of wash water into a 15 mL graduated centrifuge tube with a teflon lined screw cap. Record the sample weight in the notebook. Add deionized water to the reagent samples so that the volume is 5-6 mL and mix on the vortex mixer. Bring the pH to  $< 8$  by dropwise addition of 25% sulfuric acid, using Hydrion paper to check the pH. Bring the sample volume up to 10 mL with deionized water. Mix on the vortex mixer. Record the solution volume in the notebook. The pH adjustment may produce copious quantities of precipitate. Use the centrifuge to settle the precipitate and filter about 1.5 mL of the liquid using a filter syringe (Lid-X/AQOR .45 or equivalent).

#### **B) Sample Preparation for Soil or Other Solid Samples**

Mix the samples well. Weigh 2-3 g of sample into an 8 mL vial with a teflon lined screw cap. Record the sample weight in your notebook. Add 2 mL of deionized water to the sample and mix on the vortex mixer. Bring the pH to  $< 7$  by dropwise addition of concentrated sulfuric acid, using Hydrion paper to check the pH. Cap and vortex for 5-10 seconds and loosen cap with caution in case of pressure buildup or effervescence. Let stand for 10-15 minutes to allow solids to react with the acid and re-check the pH. Extract the sample three times with methanol. For each extraction, add 3 mL of methanol to the 8 mL vial from a Repipet®, mix on the vortex mixer for two minutes (make sure all sediment is stirred up from the bottom of the vial), centrifuge for two minutes or until the liquid layer is clear, and transfer the liquid layer to a 15 mL centrifuge tube.

After the third portion of methanol has been added to the centrifuge tube, reduce the volume to less than 2 mL under a gentle stream of air or nitrogen. The volume reduction can be speeded up by placing the centrifuge tube in a block heater. Cap and vortex the centrifuge tube occasionally during volume reduction to assure that all the methanol is exposed to evaporation. It is very important that all of the methanol be removed during the volume reduction.

Verify that the pH is still <7 and adjust the final volume to 3-5 mL with deionized water. Record the solution volume in your notebook. Vortex for 5-10 seconds and centrifuge for 1-2 minutes to remove any sediment. Filter about 1.5 mL of the liquid using a filter syringe (Lid-X/AQOR .45 or equivalent).

### C) Chromatography

Any HPLC system equivalent to the following may be used, provided that its performance is checked.

Mainframe: Hewlett Packard 1090  
Mobil Phase : 10% Methanol in HPLC grade H<sub>2</sub>O (isocratic).  
Flow rate: 2 mL/min. Max pressure set at 400 bar.  
Guard Column: 7 cm x 2 mm ID stainless steel packed with 37-53 µm silica gel (Whatman 4390-411 or equivalent) frits and packing changed when pressure exceeds 300 bar.  
Analytical column: 250 x 4.6 mm ID stainless steel packed with 10 µm silica gel (Whatman 4216-001 or equivalent)  
Detector: Hewlett Packard 1047A refractive index detector, set at 30°C  
Integrator: Hewlett Packard 3393  
Zero = 10% of full scale  
Att 2<sup>Λ</sup>= 6  
CHT SP =1 cm/min  
AR REJ =10000  
THRSH=3  
PK WD= 0.25  
Mode = peak height  
Events: baseline hold 0.5 min, baseline next valley after PEG A peak, baseline all valleys after PEG B peak.  
STOP at 20 min

#### D) Data Reduction

DMSO produces only one peak. TMH produces 2 peaks, but only the largest one is used for quantitation. PEG produces a series of peaks. The heights of the four largest peaks are summed and used for quantitation.

The number of micrograms of analyte "i" in an injection is calculated from the concentration of that analyte in the standard and the injection volume as follows. (Remember that mg/mL = ug/uL)

$$ug_{is} = C_{is} * V_{js}$$

where  $ug_{is}$  = the micrograms of analyte "i" in standard injection

$C_{is}$  = the concentration of "i" in the standard (in mg/mL)

$V_{js}$  = the injection volume for the standard.

The micrograms of analyte "i" in a sample injection is calculated by linear interpolation between standards of higher and lower concentration. The equation for this calculation

$$ug_{ix} = ug_{ih} - [(H_{ih} - H_{il})(ug_{ih} - ug_{il}) / (H_{ih} - H_{ix})]$$

where i refers to a peak name.

x refers to the sample.

h refers to the higher standard.

l refers to the lower standard, and

H is a peak height.

The peaks generated in this method are broad and the integrator baseline correction is not consistent. Therefore integrated peak areas vary randomly and produce inconsistent results. Peak height was found to produce more reliable results. Therefore peak height is used instead of peak area for this analysis. Since peak height is a function of the voltage difference between the "zero" voltage and the voltage at the tip of the peak, it is very important that the detector "zero" be checked frequently throughout the day and adjusted as required.

The concentration of analyte "i" in the reagent is calculated from the micrograms in the injection, the sample injection volume, the sample solution volume (usually 10 mL), and the sample weight. It is most useful to report concentrations in milligrams of analyte per gram of reagent or wash water. The equation for that is given below.

$$i \text{ (mg/g)} = (ug_{ix} * V)/(V_{jx} * W)$$

where V is the sample solution volume in mL (usually 10 mL)

V<sub>jx</sub> is the sample injection volume and

W is the sample weight in grams.

A spreadsheet program which does these calculations automatically has been developed using Microsoft Excel. The program is quite similar to the Webb McCall spreadsheet used to calculate PCB concentrations in soil samples.

### ***1.9 Method for Reagent Removal and Neutralization***

The reactor is cooled to below 100°C, and enough water is added to replace what was distilled out of the 45% KOH. The reactor is cooled further to a comfortable handling temperature (below 70°C, but above 40°C).

The reactor contents are emptied into one or more tared teflon centrifuge bottles. The bottles are balanced and placed opposite of each other in the centrifuge. They are spun at 1500 RPM for 3-5 min. The liquid layer is transferred from centrifuge bottles into a tared jar labeled "reagents".

The soil is returned to the reactor. A mass of water equal to the original soil mass is weighed into a jar or beaker. This water is used to rinse the centrifuge bottles and the spatula. The rinsings and the remaining water is added to the reactor.

The reactor is re-assembled. The stirrer is started and the reactor contents are heated to 90°C. The temperature is held constant for 20 minutes with constant stirring. Vacuum is not applied during this time. The reactor is cooled to a comfortable working temperature (below 70°C, but above 40°C). The reactor contents are centrifuged as before. The liquid layer is transferred from centrifuge bottles into a tared jar labeled "wash 1".

The soil is once again returned to the reactor with an equal weight of water for additional washes. The same centrifuge bottles are used as before. The additional washes follow the same procedure as related above except for neutralization in the third or fourth wash, and the soil transfer in the last wash. Ordinarily, 5 washes are performed. The amount of washes depends on how the matrix holds onto the reagents.

Neutralization often occurs after the second wash. After liquid from the second wash is transferred into a tared jar, the soil is weighed in the centrifuge bottles and returned to the reactor. The soil is mixed briefly to make it homogeneous. A small sample is titrated for KOH content ( to pH of 8.2). Using the result from that analysis, the amount of acid needed can be calculated using the equations below.

a. for 20% Sulfuric acid:

$$\frac{\text{g soil} * \text{mg KOH/g soil} * 49 \text{ g H}_2\text{SO}_4/\text{eq}}{1000 \text{ mg/g} * 56 \text{ g KOH/eq} * 0.2} = \text{g 20\% H}_2\text{SO}_4 \text{ needed}$$

b. for 1:1 Hydrochloric acid (18%):

$$\frac{\text{g soil} * \text{mg KOH/g soil} * 36.5 \text{ g HCl/eq}}{1000 \text{ mg/g} * 56 \text{ g KOH/eq} * 0.18} = \text{g 18\% HCL needed}$$

The acid is added to the water for the third wash so that together, they are equal to the original soil mass. Small volumes of the acidified water are used to rinse the centrifuge bottles. The rinsings and the remaining acidified water is transferred very slowly to the reactor containing the soil. The soil is mixed into a slurry with a spatula. Gas evolution often occurs. The pH of the slurry is checked several times during the addition of acid. Addition of more acid may be necessary. When the pH reaches the desired level, the reactor is reassembled, and the mechanical stirrer is started.. The third wash is continued with the application of heat. The reactor contents are heated to 90°C as before and are maintained at that temperature for 20 minutes. The wash is continued like the first wash.

The last step of the last wash is placing the soil into a tared jar labeled "treated soil". The soil is placed in the refrigerator pending analysis.

January 30, 1992

R00020

GRC ENVIRONMENTAL, INC.  
Appendix 2: Mass Balance Sheet for  
Reaction 2

2-1 PCB Mass Balance for Reaction 2

2-2 Mass Balance for Reaction 2

Appendix 2-1: PCB Mass Balance for Reaction 2

| PCB MASS BALANCE : Laboratory Dechlorination Reaction For Sheboygan Harbor |           |                            |         |                 |
|----------------------------------------------------------------------------|-----------|----------------------------|---------|-----------------|
| Reaction                                                                   | 2         |                            |         |                 |
| Matrix                                                                     | Sediment  |                            |         |                 |
| Contaminants                                                               | PCBs      |                            |         |                 |
| Date                                                                       | 23-Sep-91 |                            |         |                 |
| Inputs                                                                     | grams     | Outputs                    | grams   |                 |
| Untreated Soil                                                             | 300.35    | Treated Soil               | 250.34  |                 |
| PEG                                                                        | 75.00     | Reagent                    | 405.43  |                 |
| TMH                                                                        | 74.97     |                            |         |                 |
| DMSO                                                                       | 150.10    | Slurry sampls              | 60.51   |                 |
| 45% KOH                                                                    | 299.93    |                            |         |                 |
| Wash 1                                                                     | 307.02    | Wash 1                     | 251.89  |                 |
| Wash 2                                                                     | 300.05    | Wash 2                     | 278.75  |                 |
| Wash 3                                                                     | 306.97    | Wash 3                     | 281.49  |                 |
| Wash 4                                                                     | 221.00    | Wash 4                     | 371.36  |                 |
| *Acid added                                                                | 151.25    |                            |         |                 |
| replace cond.                                                              | 258.74    | condensate                 | 259.36  |                 |
| Total Inputs                                                               | 2445.38   | Total Outputs              | 2159.13 |                 |
|                                                                            |           |                            |         | % recovery = 88 |
| SOIL                                                                       | INPUT     | FINAL                      |         |                 |
| total mass                                                                 | 300       | 250                        |         |                 |
| % moisture                                                                 | 35        | 54                         |         |                 |
| dry mass                                                                   | 200       | 120                        |         |                 |
| Dry mass for hourly sample                                                 |           | 41                         |         |                 |
| % Recovery, dry basis                                                      |           | 80                         |         |                 |
| Results are accurate to 2 significant digits.                              |           |                            |         |                 |
| *The PCB concentration for Hour "0" was "240 ppm"                          |           |                            |         |                 |
| *240 ppm was used as the initial concentration of untreated sediment       |           |                            |         |                 |
| PCB INPUT FOR REACTION 2                                                   |           |                            |         |                 |
| Total Input Mass                                                           | 300.35    |                            |         |                 |
| PCB conc (µg/g)                                                            | 240       | Hour "0" PCB concentration |         |                 |
| Total PCB (mg)                                                             | 72        |                            |         |                 |
| CONDENSATE OUTPUT SAMPLE #9109230850023                                    |           |                            |         |                 |
| total mass                                                                 | 259.36    |                            |         |                 |
| µg/g                                                                       | 49        |                            |         |                 |
| mass found (mg)                                                            | 13        |                            |         |                 |
| % recovery                                                                 | 18        |                            |         |                 |
| REAGENT OUTPUT SAMPLE # 9109241310116                                      |           |                            |         |                 |
| total mass                                                                 | 405.43    |                            |         |                 |
| µg/g                                                                       | 0.19      |                            |         |                 |
| mass found (mg)                                                            | 0.077     |                            |         |                 |
| % recovery                                                                 | 0.11      |                            |         |                 |
| WASH 1 OUTPUT SAMPLE #9109241300023                                        |           |                            |         |                 |
| total mass                                                                 | 251.89    |                            |         |                 |
| µg/g                                                                       | 0.14      |                            |         |                 |
| mass found (mg)                                                            | 0.035     |                            |         |                 |
| % recovery                                                                 | 0.049     |                            |         |                 |
| WASH 2 OUTPUT SAMPLE #9109241305023                                        |           |                            |         |                 |
| total mass                                                                 | 278.75    |                            |         |                 |
| µg/g                                                                       | 0.12      |                            |         |                 |
| mass found (mg)                                                            | 0.033     |                            |         |                 |
| % recovery                                                                 | 0.046     |                            |         |                 |
| WASH 3 OUTPUT SAMPLE #9109231310023                                        |           |                            |         |                 |
| total mass                                                                 | 281.49    |                            |         |                 |
| µg/g                                                                       | 0.12      |                            |         |                 |
| mass found (mg)                                                            | 0.034     |                            |         |                 |
| % recovery                                                                 | 0.047     |                            |         |                 |
| WASH 4 OUTPUT SAMPLE # 9109241315023                                       |           |                            |         |                 |
| total mass                                                                 | 371.36    |                            |         |                 |
| µg/g                                                                       | 0.10      |                            |         |                 |
| mass found (mg)                                                            | 0.037     |                            |         |                 |
| % recovery                                                                 | 0.051     |                            |         |                 |

Appendix 2-1: PCB Mass Balance for Reaction 2

|                          |            |                              |  |  |
|--------------------------|------------|------------------------------|--|--|
| <b>VENT TRAP A</b>       |            | <b>SAMPLE #9109251210116</b> |  |  |
| total mass               | 1.0        |                              |  |  |
| µg/g                     | 13         |                              |  |  |
| mass found (mg)          | 0.013      |                              |  |  |
| % recovery               | 0.018      |                              |  |  |
| <b>VENT TRAP B</b>       |            |                              |  |  |
| µg/g                     | 9.8        |                              |  |  |
| mass found (mg)          | 0.010      |                              |  |  |
| % recovery               | 0.014      |                              |  |  |
| <b>FINAL SOIL OUTPUT</b> |            | <b>SAMPLE #9109251210116</b> |  |  |
| total mass               | 250.34     |                              |  |  |
| µg/g                     | 0.27       |                              |  |  |
| mass found (mg)          | 0.068      |                              |  |  |
| % recovery               | 0.094      |                              |  |  |
| <b>Total %R</b>          | <b>1.8</b> |                              |  |  |
| <b>% Destruction=</b>    | <b>8.2</b> |                              |  |  |

## Appendix 2-2: Mass Balance for Reaction 2

| MASS BALANCE: Laboratory Dechlorination Reaction For Sheboygan Harbor |           |                        |         |              |                           |
|-----------------------------------------------------------------------|-----------|------------------------|---------|--------------|---------------------------|
| Reaction                                                              | 2         |                        |         |              |                           |
| Matrix                                                                | Sediment  |                        |         |              |                           |
| Contaminants                                                          | PCBs      |                        |         |              |                           |
| Date                                                                  | 23-Sep-91 |                        |         |              |                           |
| Inputs                                                                | Grams     | Outputs                | Grams   |              |                           |
| Untreated Soil                                                        | 300.35    | Treated Soil           | 250.34  |              |                           |
| PEG                                                                   | 75.00     | Reagent                | 405.43  |              |                           |
| TMH                                                                   | 74.97     |                        |         |              |                           |
| DMSO                                                                  | 150.10    | Slurry samp.           | 60.51   |              |                           |
| 45% KOH                                                               | 299.93    |                        |         |              |                           |
| Wash 1                                                                | 307.02    | Wash 1                 | 251.89  |              |                           |
| Wash 2                                                                | 300.05    | Wash 2                 | 278.75  |              |                           |
| Wash 3                                                                | 306.97    | Wash 3                 | 281.49  |              |                           |
| Wash 4                                                                | 221.00    | Wash 4                 | 371.36  |              |                           |
| *Acid added                                                           | 151.25    |                        |         |              |                           |
| replace cond.                                                         | 258.74    | condensate             | 259.36  |              |                           |
| Total Inputs                                                          | 2445.38   | Total Outputs          | 2159.13 |              |                           |
|                                                                       |           |                        |         | % recovery = | 88                        |
| SOIL                                                                  | INPUT     | FINAL                  |         |              |                           |
| total mass                                                            | 300.35    | 250.34                 |         |              |                           |
| % moisture                                                            | 35        | 53.8                   |         |              |                           |
| dry mass                                                              | 200       | 120                    |         |              |                           |
| Dry mass for hourly sample                                            |           | 41                     |         |              |                           |
| % Recovery, dry basis                                                 |           | 88                     |         |              |                           |
| REAGENT INPUT                                                         |           |                        |         |              |                           |
| component                                                             | PEG       | TMH                    | DMSO    | KOH          | TOTAL                     |
| Dry mass used                                                         | 75.00     | 74.97                  | 150.10  | 119.97       | 420.04                    |
| CONDENSATE OUTPUT                                                     |           | SAMPLE #9109230830023  |         |              |                           |
| total mass                                                            | 259.36    |                        |         |              |                           |
| mg/g                                                                  | 0.00      | 0.00                   | 2.3     | 0.00         |                           |
| mass found                                                            | 0.00      | 0.00                   | 6.0     | 0.00         | 6.0                       |
| % recovery                                                            | 0.00      | 0.00                   | 4.0     | 0.00         |                           |
| REAGENT OUTPUT                                                        |           | SAMPLE # 9109241310116 |         |              |                           |
| total mass                                                            | 405.43    |                        |         |              |                           |
| mg/g                                                                  | 130       | 210                    | 210     | 46.00        |                           |
| mass found                                                            | 53        | 85                     | 85      | 19           | 240                       |
| % recovery                                                            | 70        | 114                    | 57      | 16           |                           |
| WASH 1 OUTPUT                                                         |           | SAMPLE #9109241300023  |         |              |                           |
| total mass                                                            | 251.89    |                        |         |              |                           |
| mg/g                                                                  | 5.8       | 5.1                    | 2.2     | 7.1          |                           |
| mass found                                                            | 1.5       | 1.3                    | 5.5     | 18           | 26                        |
| % recovery                                                            | 1.9       | 1.7                    | 3.7     | 15           |                           |
| WASH 2 OUTPUT                                                         |           | SAMPLE #9109241305023  |         |              |                           |
| total mass                                                            | 278.75    |                        |         |              |                           |
| mg/g                                                                  | 10        | 10                     | 9.9     | 33           |                           |
| mass found                                                            | 2.8       | 2.8                    | 2.8     | 9.2          | 18                        |
| % recovery                                                            | 3.7       | 3.7                    | 1.8     | 7.6          |                           |
| WASH 3 OUTPUT                                                         |           | SAMPLE #9109231310023  |         |              |                           |
| total mass                                                            | 281.49    |                        |         |              |                           |
| mg/g                                                                  | 2.4       | 1.7                    | 3.4     | 16           |                           |
| mass found                                                            | 0.68      | 0.48                   | 0.96    | 4.4          | 6.5                       |
| % recovery                                                            | 0.90      | 0.64                   | 0.64    | 3.7          |                           |
| WASH 4 OUTPUT                                                         |           | SAMPLE # 9109241315023 |         |              |                           |
| total mass                                                            | 371.36    |                        |         |              |                           |
| mg/g                                                                  | 1.3       | 0.98                   | 1.5     |              |                           |
| mass found                                                            | 0.48      | 0.36                   | 0.56    | 0.00         | 1.4                       |
| % recovery                                                            | 0.64      | 0.49                   | 0.37    | 0.00         |                           |
| FINAL SOIL OUTPUT                                                     |           | SAMPLE #9109251210116  |         |              |                           |
| total mass                                                            | 250.34    |                        |         |              |                           |
| mg/g                                                                  | 0.47      | 0.38                   | 0.54    | 47           | (prior to neutralization) |
| mass found                                                            | 0.12      | 0.10                   | 0.14    | 12           |                           |
| % recovery                                                            | 0.16      | 0.13                   | 0.090   | 9.8          |                           |
| g for hourly sample                                                   |           |                        |         |              | 19                        |
| Total %R                                                              | 78        | 120                    | 67      | 53           | 78                        |

January 30, 1991

R00020

GRC ENVIRONMENTAL, INC.

Appendix 3: Outside Laboratory Analysis

**Galson Remediation Corporation**

**Task#: 5177**

**Polychlorinated Biphenyl Compounds Data Package**



**Galson  
Laboratories**



3601 Kirkville Road  
E. Syracuse, NY 13057  
Tel: (315) 432-0506  
1-800-950-0506

November 19, 1991

Ms. Edwina Milicic  
GRC  
6627 Joy Rd.  
E. Syracuse, NY 13057

RE: Analytical Services  
Project R00020

TASK: 5177  
PCBs

Dear Ms. Milicic:

Polychlorinated Biphenyls

Samples were analyzed following SW846 Method 8080. Quality control and report format followed DEC ASP 89-3. Surrogate recoveries were within acceptable control limits, except for sample 9110151520023 and the matrix spike/matrix spike duplicate of this sample.

Aroclor 1242 was detected in the water sample selected for the MS/MSD. The matrix spike consisted of Aroclor 1248. Due to the influence of Aroclor 1242 in the sample, the sample peaks of Aroclor 1242 were also quantitated as Aroclor 1248. This value was then used to calculate MS/MSD recoveries. Recoveries of the water MS/MSD were poor; however, matrix blank spike and QC check recoveries were all within acceptable control limits.

Matrix spike, matrix spike duplicate, and QC check recoveries for the soil samples were within acceptable control limits. The blank spike recovery for soils was outside the 75%-125% limit, however, the recovery was within the matrix spike control limits.

Dry weights were not obtained for all soils due to an insufficient amount of sample. The peaks of the patterns in the samples where Aroclor 1242 was identified were not in the same ratio as those in the standards.

Please do not hesitate to call if you require any additional information regarding this report.

Sincerely,

Gale G. Sutton  
Associate Laboratory Director



6601 K... Road  
Syracuse, NY 12057  
Tel: 315-432-0506  
1-800-950-0506

## Table of Contents - Polychlorinated Biphenyl Compounds Data Package

GRC

Task #:5177

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|                                                                                                                                                                         |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| Company Name<br><b>GRC</b>                                                                                                                                              |  | Project Manager/Contact<br><b>Legna Katz TSAT</b> |  |  <b>Galson</b><br>Laboratories<br>6601 Kirkville Road East<br>E. Syracuse, New York 13057<br>315-432-0506 or 800-950-0506 |  | Special QA/QC Protocol (Circle)<br>EPA CLP   EPA SW 846<br>NYS DEC   NYS DOH<br>NJ TIER I   CALIFORNIA<br>NJ TIER II   OTHER (Specify) |  | PARAMETERS FOR ANALYSIS                                          |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Project No.<br><b>10020</b>                                                                                                                                             |  | Project Name                                      |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| SAMPLE LOCATION / SAMPLE ID                                                                                                                                             |  |                                                   |  | Date   Time                                                                                                                                                                                                |  | Type<br>Com.   Grab   Aqueous   Soil   Other                                                                                           |  | Laboratory ID Number                                             |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                         |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  | A   B   C   D   E   F   G   H   I   J   K                        |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| 9/10/15 1520023                                                                                                                                                         |  |                                                   |  | 10/9/15 20                                                                                                                                                                                                 |  | ✓                                                                                                                                      |  | 5177-001   5177-002   5177-003<br>520023   1520023MS   1520023MS |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Ground Water Composite                                                                                                                                                  |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| 9/10/15 230950023                                                                                                                                                       |  |                                                   |  | 2/7/10 32                                                                                                                                                                                                  |  | ✓                                                                                                                                      |  | GRC   5177-001<br>Oct 15 1991 Water   1102310050021              |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Groundwater                                                                                                                                                             |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| 9/10/15 270940023                                                                                                                                                       |  |                                                   |  | 2/7/10 94                                                                                                                                                                                                  |  | ✓                                                                                                                                      |  | GRC   5177-001<br>Oct 15 1991 Soil   1102310050021               |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Groundwater Soil                                                                                                                                                        |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| 9/10/15 25120116                                                                                                                                                        |  |                                                   |  | 2/7/10 12                                                                                                                                                                                                  |  | ✓                                                                                                                                      |  | 5177-001   5177-002   5177-003<br>110116   1210116MS   1210116MS |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Tested soil                                                                                                                                                             |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| 9/10/15 241130116                                                                                                                                                       |  |                                                   |  | 2/7/10 13                                                                                                                                                                                                  |  | ✓                                                                                                                                      |  | GRC   5177-001<br>Oct 15 1991 Water   1102310050021              |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Groundwater                                                                                                                                                             |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| 9/10/15 270840023 - 1st                                                                                                                                                 |  |                                                   |  | 2/7/10 84                                                                                                                                                                                                  |  | ✓                                                                                                                                      |  | GRC   5177-001<br>Oct 15 1991 Soil   1102310050021               |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Groundwater                                                                                                                                                             |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| REMARKS: <b>At Port 510-846 510-846 McNeil 20150</b>                                                                                                                    |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| Task No.                                                                                                                                                                |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                         |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  |                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |
| SAMPLES<br>NAME: <b>Victoria K. Gross</b><br>SIGNATURE: <i>Victoria K. Gross</i>                                                                                        |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  | SIGNATURE: _____<br>_____<br>_____                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  |
| SAMPLES RELINQUISHED BY:<br>NAME: <b>Victoria K. Gross</b><br>SIGNATURE: <i>Victoria K. Gross</i><br>NAME: _____<br>SIGNATURE: _____<br>NAME: _____<br>SIGNATURE: _____ |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  | SAMPLES RECEIVED BY:<br>NAME: _____<br>SIGNATURE: _____<br>NAME: _____<br>SIGNATURE: _____<br>NAME: _____<br>SIGNATURE: _____                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  |
| DATE: <b>10/9/15</b><br>TIME: <b>1</b>                                                                                                                                  |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  | DATE: _____<br>TIME: _____<br>DATE: _____<br>TIME: _____                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |  |
| DATE: _____<br>TIME: _____<br>DATE: _____<br>TIME: _____                                                                                                                |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  | Received For Laboratory By<br>(Signature) <i>Bryan Bell</i><br>DATE: <b>10/9/15</b><br>TIME: <b>16:00</b><br>Custody Seal Intact? Sample <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA<br>Shipment Complete? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Lab Stor. Location (Ref. #) |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                         |  |                                                   |  |                                                                                                                                                                                                            |  |                                                                                                                                        |  |                                                                  |  |  |  | A   B   C   D   E   F   G   H   I   J   K   L<br>12/9/15                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |  |

[illegible]

000004

# Internal Chain of Custody Receipt and Termination Form

Client : GRC  
 Job # : 10057  
 Task : 5177  
 VTSR : 307/11/150 (Date/Time)\*

Cover Page 1 of 1 -- 0:50:R  
 Final Report Date : \_\_\_\_\_  
 Disposal Holding Interval : \_\_\_\_\_  
 Request #: 01

| Sample # | Client Id | Matrix # | Cont. Code | # Contr's Received | Storage Area | Analytes Circle-Requests | Hazard Level | Containers Taken / Retn |
|----------|-----------|----------|------------|--------------------|--------------|--------------------------|--------------|-------------------------|
| 001      | 191101515 | 20013    | 1          | 1                  | 126/1004     | PCB's                    |              | 1 / NR                  |
| 004      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 005      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 009      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 010      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 011      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 012      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 013      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 014      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 015      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 016      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 017      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 018      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 019      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 020      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 021      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 022      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 023      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 024      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 025      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 026      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 027      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 028      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 029      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 030      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 031      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 032      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 033      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 034      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 035      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 036      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 037      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 038      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 039      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 040      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 041      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 042      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 043      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 044      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 045      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 046      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 047      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 048      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 049      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |
| 050      | 191022075 | 0023     | 1          | 1                  |              |                          |              | 1 / NR                  |

Total # of Containers For Task: 06  
 Sample Receipt/Breakdown By: 307/11/150 (Sig) 307/11/150 (Date/Time)  
 Sample Storage By: 307/11/150 (Sig) 307/11/150 (Date/Time)  
 Sample Disposal By: 307/11/150 (Sig) 307/11/150 (Date/Time)

Disposal Comments:

- \* - VTSR = Validated Time of Sample Receipt
  - \*\* - Page number assigned in the series of pages to list all samples for a given task.
  - \*\*\* - The period of time after final report for which the contract requires the lab to maintain custody of the samples in question.
- NR = Sample not to be returned.

Total #  
 Cntrs Taken:  
06

Total #  
 Cntrs Retn:  
04

Released To: 307/11/150 (Sig) Released By: 307/11/150 (Sig) 307/11/150 (Date/Time)  
 Returned By: 307/11/150 (Sig) Returned To: 307/11/150 (Sig) 307/11/150 (Date/Time)

### Internal Chain of Custody Receipt and Termination Form

Client : GRC  
Job # : 2053  
Task : 5177  
VTSR : 4 OCT 1 14:50 (Date/Time)\*

Cover Page 1 of 1 -- Q: 5D: A  
Final Report Date : \_\_\_\_\_  
Disposal Holding Interval : \_\_\_\_\_  
Request #: 62

[illegible]

Total # of Containers For Task: 26

Sample Receipt Breakdown By:                      (Sig):                      (Date/Time)

**Sample Storage** By: [Signature] (Sig) 10/10/2023 (Date/Time)

Sample Disposal By: \_\_\_\_\_ (Sig) \_\_\_\_\_ (Date/Time)

Disposal Comments:

Total #  
Cntrs Taken

ok

• VTSA = validated Time of Sample Receipt

\*\* - Page number assigned in the series of pages to list all samples for a given task.

... - The period of time after final report for which the contract requires the lab to maintain custody of the samples in question.

NR = Sample not to be returned.

|     | Total # | Cntr's Ret. |
|-----|---------|-------------|
| 1   | 1       | 1           |
| 2   | 1       | 1           |
| 3   | 1       | 1           |
| 4   | 1       | 1           |
| 5   | 1       | 1           |
| 6   | 1       | 1           |
| 7   | 1       | 1           |
| 8   | 1       | 1           |
| 9   | 1       | 1           |
| 10  | 1       | 1           |
| 11  | 1       | 1           |
| 12  | 1       | 1           |
| 13  | 1       | 1           |
| 14  | 1       | 1           |
| 15  | 1       | 1           |
| 16  | 1       | 1           |
| 17  | 1       | 1           |
| 18  | 1       | 1           |
| 19  | 1       | 1           |
| 20  | 1       | 1           |
| 21  | 1       | 1           |
| 22  | 1       | 1           |
| 23  | 1       | 1           |
| 24  | 1       | 1           |
| 25  | 1       | 1           |
| 26  | 1       | 1           |
| 27  | 1       | 1           |
| 28  | 1       | 1           |
| 29  | 1       | 1           |
| 30  | 1       | 1           |
| 31  | 1       | 1           |
| 32  | 1       | 1           |
| 33  | 1       | 1           |
| 34  | 1       | 1           |
| 35  | 1       | 1           |
| 36  | 1       | 1           |
| 37  | 1       | 1           |
| 38  | 1       | 1           |
| 39  | 1       | 1           |
| 40  | 1       | 1           |
| 41  | 1       | 1           |
| 42  | 1       | 1           |
| 43  | 1       | 1           |
| 44  | 1       | 1           |
| 45  | 1       | 1           |
| 46  | 1       | 1           |
| 47  | 1       | 1           |
| 48  | 1       | 1           |
| 49  | 1       | 1           |
| 50  | 1       | 1           |
| 51  | 1       | 1           |
| 52  | 1       | 1           |
| 53  | 1       | 1           |
| 54  | 1       | 1           |
| 55  | 1       | 1           |
| 56  | 1       | 1           |
| 57  | 1       | 1           |
| 58  | 1       | 1           |
| 59  | 1       | 1           |
| 60  | 1       | 1           |
| 61  | 1       | 1           |
| 62  | 1       | 1           |
| 63  | 1       | 1           |
| 64  | 1       | 1           |
| 65  | 1       | 1           |
| 66  | 1       | 1           |
| 67  | 1       | 1           |
| 68  | 1       | 1           |
| 69  | 1       | 1           |
| 70  | 1       | 1           |
| 71  | 1       | 1           |
| 72  | 1       | 1           |
| 73  | 1       | 1           |
| 74  | 1       | 1           |
| 75  | 1       | 1           |
| 76  | 1       | 1           |
| 77  | 1       | 1           |
| 78  | 1       | 1           |
| 79  | 1       | 1           |
| 80  | 1       | 1           |
| 81  | 1       | 1           |
| 82  | 1       | 1           |
| 83  | 1       | 1           |
| 84  | 1       | 1           |
| 85  | 1       | 1           |
| 86  | 1       | 1           |
| 87  | 1       | 1           |
| 88  | 1       | 1           |
| 89  | 1       | 1           |
| 90  | 1       | 1           |
| 91  | 1       | 1           |
| 92  | 1       | 1           |
| 93  | 1       | 1           |
| 94  | 1       | 1           |
| 95  | 1       | 1           |
| 96  | 1       | 1           |
| 97  | 1       | 1           |
| 98  | 1       | 1           |
| 99  | 1       | 1           |
| 100 | 1       | 1           |

06

Released To: Mr. [illegible] (Sig) Released By: [illegible] (Sig) 0-224/11.2 (Date/Time)

Returned By: [Signature] (Sig) Returned To: [Signature] (Sig) 1/20/02 (Date/Time)

000006

## EXTRACTABLE CHAIN OF CUSTODY

Client: CRCTask #: 5177

Sample Analysis Requested:

Protocol: ELAP CLP HCRA SPDES Other:Relinquished by: P. G. L.Received by: R. ChapinPage # 1 of 2Date/Time 10/21/11 15:15Date/Time 10/21/11 3:15

PCB's 604/8040 610/8310 310-13

TCLP Air Other: 8080Stored In Refrigerator # 6QC Batch # 05-0320

| Gallon<br>Sample<br>ID | B<br>P<br># | Sample Removal & Return Tracking |               |     |                 |                  |               |     |                 |                  |               |     |                 | Comments &<br>Date of Disposal |  |              |
|------------------------|-------------|----------------------------------|---------------|-----|-----------------|------------------|---------------|-----|-----------------|------------------|---------------|-----|-----------------|--------------------------------|--|--------------|
|                        |             | Date/Time<br>Out                 | Removed<br>By | For | Date/Time<br>In | Date/Time<br>Out | Removed<br>By | For | Date/Time<br>In | Date/Time<br>Out | Removed<br>By | For | Date/Time<br>In |                                |  |              |
| 5177-001               | 4E1         | 1                                | 10/21/11      | 12  | 9               |                  |               |     |                 |                  |               |     |                 |                                |  | LC 10-3      |
| 5177-002               |             | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  | que.         |
| 5177-003               |             | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  | lvf.         |
| 5177-004               |             | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  | to           |
| 5177-005               |             | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| Blank                  |             | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| BS                     |             | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| HK 31D                 | 4E8         | 1                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| 5177-001               | 15B0        | 2                                | 10/31/11      | 12  | 10              |                  |               |     |                 |                  |               |     |                 |                                |  | New chain    |
| 5177-002               | "           | 2                                | 11/1/11       |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  | Must only be |
| 5177-003               | 15B3        | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  | for clear    |
| 5177-004               | "           | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  | sample.      |
| 5177-005               | 15B4        | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| 5177-006               | "           | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| Blank                  | "           | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| BS                     | 15B5        | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |
| HK 31D                 | "           | 2                                |               |     |                 |                  |               |     |                 |                  |               |     |                 |                                |  |              |

Reasons for Removal-- A:Analysis IS: Standardizing C:Combining D:Debulking &amp; Reorganizing O:Other (Specify in Comments) 900606.0932

3- 10/21/11  
 (10/21/11)

10/21/11

9/1  
 to  
 11/5.

17-  
 11/5.

## )

Task #: 5177

**Sample Analysis Requested:**

Protocol: ELAP-CLP-RCRA-SPDES-Other: GPC CU

Received by:

Page # 2 of 2

Date/Time 11/13/17 11:17

Date/Time 11/1/91 11:17

~~TELE~~ Air Other:

Stored in Refrigerator # 6

QC Batch #05-032128

65

### Sample Removal & Return Tracking

Reasons For Removal- A:Analysis IS: Standardizing C:Combining D:Debulking &amp; Reorganizing O:Other (Specify in Comments) 900608.0932

1

## EXTRACTABLE CHAIN OF CUSTODY

Page # 1 of 1Client: CRRelinquished by: [Signature] Date/Time: 10/27/10Task #: 5177Received by: [Signature] Date/Time: 10/27/10 10:30

Sample Analysis Requested:

Pes/PCB's 804/8040 610/8310 310-13

TCLP All Other: CRProtocol: ELAP CLP RCRA SPDES Other:                     Stored In Refrigerator # 6QC Batch # Q5 034766

| Galson<br>Sample<br>ID |       | B<br>n<br># | Sample Removal & Return Tracking |               |     |                  |                  |               |     |                 |                  |               |     |                 | Comments &<br>Date of Disposal |
|------------------------|-------|-------------|----------------------------------|---------------|-----|------------------|------------------|---------------|-----|-----------------|------------------|---------------|-----|-----------------|--------------------------------|
|                        |       |             | Date/Time<br>Out                 | Removed<br>By | For | Date/Time<br>Out | Date/Time<br>Out | Removed<br>By | For | Date/Time<br>In | Date/Time<br>Out | Removed<br>By | For | Date/Time<br>In |                                |
| 5177-005               | 7C 1  | 1           | 10/29/10                         | LE            | S   | 10/29/10         | 11/11/10         | LE            | A   | 10/29/10        |                  |               |     |                 | Bag                            |
| 5177-006               | 2     | 1           | 10/15                            |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-007               | 3     | 1           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-008               | 4     | 1           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-009               | 5     | 1           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| BS                     | 6     | 1           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| Blank                  | 7D 1  | 1           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| CHK STD                | 2     | 1           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-005               | 15C 1 | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-006               | 2     | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-007               | 3     | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-008               | 42    | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-009               | 53    | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| BS                     | 63    | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| Blank                  | 84    | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| CHK STD                | 84    | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-010               | 5     | 2           |                                  |               |     |                  |                  |               |     |                 |                  |               |     |                 |                                |
| 5177-011               | 7D:3  | 1           | 10/29/10                         | LE            | S   |                  |                  |               |     |                 |                  |               |     |                 |                                |

Reasons For Removal: A: Analysis IS: Standardizing C: Combining D: Debulking &amp; Reorganizing O: Other (Specify In Comments) 900606.0932

3 = Green

500000

Task Number: 5177

**Matrix:** Soil    Sediment    Water    Leachate

900010

**Dissolved**

## Wel 1 ist 1 - Harmonia

Chicago 11/13

Original: 1 of 6

050011

Matrix: (Soil) Sediment Water Leachate

050011

Vol List 1 - Ammonia

Original 1 of 6

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Task Number: 5177

[illegible]

Bulk

[illegible]

**Metals list 1 - Al, Sb, As, Ba, Bi, Cd, Co, Cr, Cu, Fe, Pb, Mn, Ni, K, Sn, Ag, Na, H, V, Zn**

# Dissolved

Metals Incl - Al, Si, As, Ba, Bi, Cd, Co, Cr, Cu, Fe, Pb,  
Mg, Mn, Hg, Ni, K, Sn, Ag, Na, H, V, Zn

Wel Hat 1 - Annmerkin

Page 1 of 1

Page: 1 of 2

11/9/13

[illegible]

Conquinta lista 5

Original List 6

2017

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
SAMPLE PREPARATION AND ANALYSIS SUMMARY - PCB/PESTICIDE

| Sample ID                     | Matrix | Date Collected | Date Rec at Lab | Date Extracted | Date Analyzed |
|-------------------------------|--------|----------------|-----------------|----------------|---------------|
| 9108270940023<br>5177-005 DL  | SOIL   | 27-AUG-91      | 15-OCT-91       | 18-OCT-91      | 06-NOV-91     |
| 9108270940023<br>5177-005     | SOIL   | 27-AUG-91      | 15-OCT-91       | 18-OCT-91      | 06-NOV-91     |
| 9109230840023<br>5177-010     | SOIL   | 23-SEP-91      | 15-OCT-91       | 18-OCT-91      | 06-NOV-91     |
| 9109230850023<br>5177-004     | WATER  | 23-SEP-91      | 15-OCT-91       | 21-OCT-91      | 06-NOV-91     |
| 9109241310116<br>5177-009 DL  | WATER  | 24-SEP-91      | 15-OCT-91       | 21-OCT-91      | 06-NOV-91     |
| 9109241310116<br>5177-009     | WATER  | 24-SEP-91      | 15-OCT-91       | 21-OCT-91      | 06-NOV-91     |
| 9109251210116<br>5177-006     | SOIL   | 25-SEP-91      | 15-OCT-91       | 18-OCT-91      | 06-NOV-91     |
| 9109251210116<br>5177-007 MS  | SOIL   | 25-SEP-91      | 15-OCT-91       | 18-OCT-91      | 06-NOV-91     |
| 9109251210116<br>5177-008 MSD | SOIL   | 25-SEP-91      | 15-OCT-91       | 18-OCT-91      | 06-NOV-91     |
| 9110151520023<br>5177-001     | WATER  | 15-OCT-91      | 15-OCT-91       | 21-OCT-91      | 06-NOV-91     |
| 9110151520023<br>5177-002 mg  | WATER  | 15-OCT-91      | 15-OCT-91       | 21-OCT-91      | 06-NOV-91     |
| 9110151520023<br>5177-003 MSD | WATER  | 15-OCT-91      | 15-OCT-91       | 21-OCT-91      | 06-NOV-91     |
|                               |        |                |                 |                |               |
|                               |        |                |                 |                |               |
|                               |        |                |                 |                |               |
|                               |        |                |                 |                |               |
|                               |        |                |                 |                |               |

000013

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
SAMPLE PREPARATION AND ANALYSIS SUMMARY - ORGANIC ANALYSIS

| Sample ID                    | Matrix | Analytical Protocol | Extraction Method | Auxiliary Clean up   | Dil/Conc Factor |
|------------------------------|--------|---------------------|-------------------|----------------------|-----------------|
| 9108270940023<br>5177-005 DL | SOIL   | SW846<br>8080       | SW846<br>3550     | SW846<br>3650 & 3640 | 10              |
| 9108270940023<br>5177-005    | SOIL   |                     | 3550              |                      | 100             |
| 9109230840023<br>5177-010    | SOIL   |                     | 3550              |                      | 1               |
| 9109230850023<br>5177-004    | WATER  |                     | 3520              |                      | 1000            |
| 9109241310116<br>5177-009 DL | WATER  |                     | 3520              | SW846<br>3620        | 5               |
| 9109241310116<br>5177-009    | WATER  |                     | 3520              | ↓                    | 25              |
| 9109251210116<br>5177-006    | SOIL   |                     | 3550              |                      | 1               |
| 9109251210116<br>5177-007 ms | SOIL   |                     | 3550              |                      | 1               |
| 9109251210116<br>5177-008 ms | SOIL   |                     | 3550              |                      | 1               |
| 9110151520023<br>5177-001    | WATER  |                     | 3520              |                      | 1               |
| 9110151520023<br>5177-002 ms | WATER  |                     | 3520              |                      | 1               |
| 9110151520023<br>5177-003 ms | WATER  | ✓                   | 3520              | ✓                    | 1               |
|                              |        |                     |                   |                      |                 |
|                              |        |                     |                   |                      |                 |
|                              |        |                     |                   |                      |                 |
|                              |        |                     |                   |                      |                 |

### ORGANIC DATA REPORTING QUALIFIERS

The Organic data qualifiers used in this report are as follows:

Value - If the result is a value greater than or equal to the detection limit, the value is reported.

- U - Indicates the compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.
- E - Indicates an estimated value. This flag is used to estimate a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicate identification criteria, but the result is less than the specified detection limit.
- C - Applies to pesticide parameters when the identification has been confirmed by GC/MS.
- B - Used when the analyte is found in the blank, as well as a sample. It indicates possible/pretable blank contamination and warns data user to take appropriate action.
- I - Identifies compounds whose concentrations exceed the calibration range of the instruments for specific analysis.
- N - Compound not analyzed.
- D - Identifies all compounds analyzed at a secondary dilution.
- A - Indicates that a TIC is a suspected aldol-condensation product.
- X - Any other specific flags and footnotes that may be required to properly define the results.
- RE - Analysis performed on a re-extracted sample.

GC/ECD

PCB

QUALITY CONTROL SUMMARY

000016

# PCB/PESTICIDE SURROGATE RECOVERY

Lab Name: Galson Laboratories

Lab Task Number: 5177

Level: (low/med) LOW

Instrument ID : HP9A

Matrix: WATER

| SAMPLE NO.          | S1  | # | OTHER |
|---------------------|-----|---|-------|
| 1 METHOD BLANK      | 77  |   |       |
| 2 BLANK SPIKE       | 85  |   |       |
| 3 CHECK SAMPLE      | 114 |   |       |
| 4 METHOD BLANK      | 94  |   |       |
| 5 BLANK SPIKE       | 103 |   |       |
| 6 CHECK SAMPLE      | 77  |   |       |
| 7 9110151520023     | 12  | * |       |
| 8 9110151520023MS   | 9   | * |       |
| 9 9109251210116     | 81  |   |       |
| 10 9109251210116MS  | 84  |   |       |
| 11 9109251210116MSD | 81  |   |       |
| 12 9109230840023    | 91  |   |       |
| 13 9110151520023MSD | 14  | * |       |
| 14 9108270940023    | 104 |   |       |
| 15 9108270940023 CL | D   |   |       |
| 16 9109230850023    | D   |   |       |
| 17 9109241310116    | D   |   |       |
| 18 9109241310116CL  | D   |   |       |
| 19                  |     |   |       |
| 20                  |     |   |       |
| 21                  |     |   |       |
| 22                  |     |   |       |
| 23                  |     |   |       |
| 24                  |     |   |       |
| 25                  |     |   |       |
| 26                  |     |   |       |
| 27                  |     |   |       |
| 28                  |     |   |       |
| 29                  |     |   |       |
| 30                  |     |   |       |

ADVISORY  
QC LIMITS  
(24-154)

S1 = Dibutylchloride

# Column used to flag recovery values

\* Values outside of QC limits

D Surrogates diluted out

# PCB/PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Galson Laboratories

Date Extracted: Oct 21, 1991

Lab Task Number: 5177

Date Analyzed : Nov 06, 1991 00:59

Sample: 9110151520023

Lab Sample ID: 5177-001

Matrix: WATER

QC Batch: Q5-0320

| COMPOUND     | SPIKE<br>ADDED<br>(ug/L ) | SAMPLE<br>CONCENTRATION<br>(ug/L ) | MS<br>CONCENTRATION<br>(ug/L ) | MS<br>%<br>REC # |
|--------------|---------------------------|------------------------------------|--------------------------------|------------------|
| Aroclor-1248 | 25.                       | 11 **                              | 15.                            | 16 *             |

| COMPOUND     | SPIKE<br>ADDED<br>(ug/L ) | MSD<br>CONC.<br>(ug/L ) | MSD<br>%<br>REC # | %<br>RPD # | QC LIMITS<br>RPD REC |
|--------------|---------------------------|-------------------------|-------------------|------------|----------------------|
| Aroclor-1248 | 25.                       | 16.                     | 30 *              | 32         | 50 46-161            |

# Column to be used to flag recovery and RPD values with an asterisk.

\* Values outside of QC limits.

RPD: 0 out of 1 outside limits

Spike Recovery: 2 out of 2 outside limits

COMMENTS: \*\* The Aroclor 1248 was calculated as 11 ug/L to allow for the necessary calculation.

PCB/PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Galson Laboratories

Date Extracted: Oct 18, 1991

Lab Task Number: 5177

Date Analyzed : Nov 06, 1991 11:31

Sample: 9109251210116

Lab Sample ID: 5177-006

Matrix: SOIL

QC Batch: Q5-0319

| COMPOUND     | SPIKE<br>ADDED<br>(ug/Kg) | SAMPLE<br>CONCENTRATION<br>(ug/Kg) | MS<br>CONCENTRATION<br>(ug/Kg) | MS<br>%<br>REC # |
|--------------|---------------------------|------------------------------------|--------------------------------|------------------|
| Aroclor-1248 | 170                       | 0.                                 | 190                            | 112.             |

| COMPOUND     | SPIKE<br>ADDED<br>(ug/Kg) | MSD<br>CONC.<br>(ug/Kg) | MSD<br>%<br>REC # | %<br>RPD # | QC LIMITS<br>RPD REC |
|--------------|---------------------------|-------------------------|-------------------|------------|----------------------|
| Aroclor-1248 | 170                       | 180                     | 106.              | 5.4        | 45 40-146            |

# Column to be used to flag recovery and RPD values with an asterisk.

\* Values outside of QC limits.

RPD: 0 out of 1 outside limits

Spike Recovery: 0 out of 2 outside limits

COMMENTS:

FORM III

1/87 Rev.

000019

# PCB/PESTICIDE BLANK SPIKE RECOVERY

Lab Name: Galson Laboratories

Date Extracted: Oct 21, 1991

Lab Task Number: 5177

Date Analyzed : Nov 05, 1991 20:33

Sample: METHOD BLANK

Lab Sample ID: Q5-0320

Matrix: WATER

QC Batch: Q5-0320

| COMPOUND     | SPIKE<br>ADDED<br>(ug/L ) | BLANK<br>CONCENTRATION<br>(ug/L ) | BS<br>CONCENTRATION<br>(ug/L ) | BS<br>%<br>REC # |
|--------------|---------------------------|-----------------------------------|--------------------------------|------------------|
| Aroclor-1248 | 2.5                       | 0.                                | 2.0                            | 80.              |

| COMPOUND     | QC<br>LIMITS |
|--------------|--------------|
| Aroclor-1248 | 75-125%      |

# Column to be used to flag recovery values with an asterisk.

\* Values outside of QC limits.

Spike Recovery: 0 out of 1 outside limits

COMMENTS:

FORM III

1/87 Rev.

000020

# PCB/PESTICIDE BLANK SPIKE RECOVERY

Lab Name: Galson Laboratories

Date Extracted: Oct 18, 1991

Lab Task Number: 5177

Date Analyzed : Nov 05, 1991 22:13

Sample: METHOD BLANK

Lab Sample ID: Q5-0319

Matrix: SOIL

QC Batch: Q5-0319

| COMPOUND     | SPIKE<br>ADDED<br>(ug/Kg) | BLANK<br>CONCENTRATION<br>(ug/Kg) | BS<br>CONCENTRATION<br>(ug/Kg) | BS<br>%<br>REC # |
|--------------|---------------------------|-----------------------------------|--------------------------------|------------------|
| Aroclor-1248 | 170                       | 0.                                | 120                            | 71. *            |

| COMPOUND     | QC<br>LIMITS |
|--------------|--------------|
| Aroclor-1248 | 75-125%      |

# Column to be used to flag recovery values with an asterisk.

\* Values outside of QC limits.

Spike Recovery: 1 out of 1 outside limits

COMMENTS:

FORM III

1/87 Rev.

000021

# PCB/PESTICIDE CHECK SAMPLE RECOVERY

Lab Name: Galson Laboratories

Date Extracted: Oct 21, 1991

Lab Task Number: 5177

Date Analyzed : Nov 05, 1991 20:23

Sample: METHOD BLANK

Lab Sample ID: Q5-0320

Matrix: WATER

QC Batch: Q5-0320

| COMPOUND     | SPIKE<br>ADDED<br>(ug/L ) | BLANK<br>CONCENTRATION<br>(ug/L ) | CS<br>CONCENTRATION<br>(ug/L ) | CS<br>%<br>REC # |
|--------------|---------------------------|-----------------------------------|--------------------------------|------------------|
| Aroclor-1260 | 6.5                       | 0.                                | 1.8                            | 172%             |

| COMPOUND     | QC<br>LIMITS |
|--------------|--------------|
| Aroclor-1260 | 46-161 %     |

# Column to be used to flag recovery values with an asterisk.

\* Values outside of QC limits.

Spike Recovery: out of 1 outside limits

COMMENTS:

FORM III

1/87 Rev.

000022

# PCB/PESTICIDE CHECK SAMPLE RECOVERY

Lab Name: Galson Laboratories

Date Extracted: Oct 18, 1991

Lab Task Number: 5177

Date Analyzed : Nov 05, 1991 22:13

Sample: METHOD BLANK

Lab Sample ID: Q5-0319

Matrix: SOIL

QC Batch: Q5-0319

| COMPOUND     | SPIKE<br>ADDED<br>(ug/Kg) | BLANK<br>CONCENTRATION<br>(ug/Kg) | CS<br>CONCENTRATION<br>(ug/Kg) | CS<br>%<br>REC # |
|--------------|---------------------------|-----------------------------------|--------------------------------|------------------|
| Aroclor-1260 | 170                       | 0.                                | 140                            | 82%              |

| COMPOUND     | QC<br>LIMITS |
|--------------|--------------|
| Aroclor-1260 | 40-140 %     |

# Column to be used to flag recovery values with an asterisk.

\* Values outside of QC limits.

Spike Recovery: out of 1 outside limits

COMMENTS:

FORM 111

1/87 Rev.

060023

# PCB/PESTICIDE METHOD BLANK SUMMARY

Lab Name: GALSON LABORATORIES

Lab Task #: 5177

Lab Sample ID : Q5-0320

Lab File ID: HP9A\_110591GR012

Matrix : WATER

Level: LOW

Date Extracted : 21-OCT-91

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed (1): 05-NOV-91

Date Analyzed (2): \_\_\_\_\_

Time Analyzed (1): 20:33

Time Analyzed (2): \_\_\_\_\_

Instrument ID (1): HP9A

Instrument ID (2): \_\_\_\_\_

GC Column ID (1): DB-1701 MEGABORE

GC Column ID (2): \_\_\_\_\_

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

|    | SAMPLE NO.       | SAMPLE ID  | DATE ANALYZED 1 | DATE ANALYZED 2 |
|----|------------------|------------|-----------------|-----------------|
| 1  | BLANK SPIKE      | Q5-0320BS  | 05-NOV-91       |                 |
| 2  | CHECK SAMPLE     | Q5-0320CS  | 05-NOV-91       |                 |
| 3  | 9110151520023    | 5177-301   | 06-NOV-91       |                 |
| 4  | 9110151520023MS  | 5177-302   | 06-NOV-91       |                 |
| 5  | 9110151520023MSD | 5177-303   | 06-NOV-91       |                 |
| 6  | 9109230850023    | 5177-304   | 06-NOV-91       |                 |
| 7  | 9109241310116    | 5177-309   | 06-NOV-91       |                 |
| 8  | 9109241310116 DL | 5177-309DL | 06-NOV-91       |                 |
| 9  |                  |            |                 |                 |
| 10 |                  |            |                 |                 |
| 11 |                  |            |                 |                 |
| 12 |                  |            |                 |                 |
| 13 |                  |            |                 |                 |
| 14 |                  |            |                 |                 |
| 15 |                  |            |                 |                 |
| 16 |                  |            |                 |                 |
| 17 |                  |            |                 |                 |
| 18 |                  |            |                 |                 |
| 19 |                  |            |                 |                 |
| 20 |                  |            |                 |                 |
| 21 |                  |            |                 |                 |
| 22 |                  |            |                 |                 |
| 23 |                  |            |                 |                 |
| 24 |                  |            |                 |                 |
| 25 |                  |            |                 |                 |
| 26 |                  |            |                 |                 |

COMMENTS: \_\_\_\_\_

# PCB/PESTICIDE METHOD BLANK SUMMARY

Lab Name: GALSON LABORATORIES

Lab Task #: 5177

Lab Sample ID : Q5-0319

Lab File ID: HP9A\_110591GR015

Matrix : SOIL

Level: LOW

Date Extracted : 18-OCT-91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed (1): 05-NOV-91

Date Analyzed (2): \_\_\_\_\_

Time Analyzed (1): 22:13

Time Analyzed (2): \_\_\_\_\_

Instrument ID (1): HP9A

Instrument ID (2): \_\_\_\_\_

GC Column ID (1): DB-1701 MEGABORE

GC Column ID (2): \_\_\_\_\_

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

|    | SAMPLE NO.       | LAB<br>SAMPLE ID | DATE<br>ANALYZED 1 | DATE<br>ANALYZED 2 |
|----|------------------|------------------|--------------------|--------------------|
| 1  | BLANK SPIKE      | Q5-0319BS        | 05-NOV-91          |                    |
| 2  | CHECK SAMPLE     | Q5-0319CS        | 06-NOV-91          |                    |
| 3  | 9109251210116    | 5177-006         | 06-NOV-91          |                    |
| 4  | 9109251210116MS  | 5177-007         | 06-NOV-91          |                    |
| 5  | 9109251210116MSD | 5177-008         | 06-NOV-91          |                    |
| 6  | 9109230840023    | 5177-010         | 06-NOV-91          |                    |
| 7  | 9108270940023    | 5177-005         | 06-NOV-91          |                    |
| 8  | 9108270940023 DL | 5177-005 DL      | 06-NOV-91          |                    |
| 9  |                  |                  |                    |                    |
| 10 |                  |                  |                    |                    |
| 11 |                  |                  |                    |                    |
| 12 |                  |                  |                    |                    |
| 13 |                  |                  |                    |                    |
| 14 |                  |                  |                    |                    |
| 15 |                  |                  |                    |                    |
| 16 |                  |                  |                    |                    |
| 17 |                  |                  |                    |                    |
| 18 |                  |                  |                    |                    |
| 19 |                  |                  |                    |                    |
| 20 |                  |                  |                    |                    |
| 21 |                  |                  |                    |                    |
| 22 |                  |                  |                    |                    |
| 23 |                  |                  |                    |                    |
| 24 |                  |                  |                    |                    |
| 25 |                  |                  |                    |                    |
| 26 |                  |                  |                    |                    |

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_

GC/ECD

PCB

SAMPLE DATA

000026

## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

PQL

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID:

Sample wt/vol: 1000 mL

Lab File ID:

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted:

Extraction: (SepF/Cont/Sonc) CCNT

Date Analyzed:

GPC Cleanup: (Y/N) Y pH: 7.5

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 0.50                 | U |
| 11104-28-2 | Aroclor-1221 | 0.50                 | U |
| 11141-16-5 | Aroclor-1232 | 0.50                 | U |
| 53469-21-9 | Aroclor-1242 | 0.50                 | U |
| 12672-29-6 | Aroclor-1248 | 0.50                 | U |
| 11097-69-1 | Aroclor-1254 | 0.50                 | U |
| 11096-82-5 | Aroclor-1260 | 0.50                 | U |

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

PQL

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID:

Sample wt/vol: 30 g

Lab File ID:

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted:

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed:

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 80.                  | U |
| 11104-28-2 | Aroclor-1221 | 80.                  | U |
| 11141-16-5 | Aroclor-1232 | 80.                  | U |
| 53469-21-9 | Aroclor-1242 | 80.                  | U |
| 12672-29-6 | Aroclor-1248 | 80.                  | U |
| 11097-69-1 | Aroclor-1254 | 160                  | U |
| 11096-82-5 | Aroclor-1260 | 160                  | U |

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9108270940023

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: 5177-005

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR042

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 36

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 06, 1991 18:37

GPC Cleanup: (Y/N) Y pH: 7

Dilution Factor: 10

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |    |
|------------|--------------|----------------------|----|
|            |              | ug/Kg                | Q  |
| 12674-11-2 | Aroclor-1016 | 1200                 | UD |
| 11104-28-2 | Aroclor-1221 | 1200                 | UD |
| 11141-16-5 | Aroclor-1232 | 1200                 | UD |
| 53469-21-9 | Aroclor-1242 | 31000                | UD |
| 12672-29-6 | Aroclor-1248 | 1200                 | UD |
| 11097-69-1 | Aroclor-1254 | 2500                 | UD |
| 11096-82-5 | Aroclor-1260 | 3100                 | D  |

Sample Name : E177-005.1.10.GPC ACID

081701:150-0-20-190-0-3-250-8: 2uL INJ:\*\*\*\*PRIMARY RUN\*\*\*\*

Peak Processor : Gent

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreaUnits

Dilution : 100

Run Time : 30.00 Minutes

Injection time : Wed Nov 6, 1991 6:37:28 pm

AR1242 Run Status

RunStatusOK

5.433

EndOffBaseline

AR1242 #2

AR1242 #1

AR1242 #5

AR1242 #6

AR1242 #7

9.258

AR1242 #8

9.383

10.508

11.025

11.242

11.567

12.058

12.267

12.567

12.567

12.567

12.567

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Area Group UG/ML Name

180656 95388

91736 48437

34564 44651

29000 15312

3609 04546

3903 04701

12039 06357

5883 03106

5801 00063

6034 00186

1949 02613

3252 0.00000

4444 0.00000

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|----|-------|--------|---------|------------|
| 14 | 16.32 | 469437 | 0.00000 | AR1260 #4  |
| 15 | 17.85 | 12343  | 0.00000 |            |
| 46 | 18.12 | 57681  | 0.00000 |            |
| 47 | 18.35 | 71897  | 0.00000 |            |
| 48 | 19.21 | 23940  | 0.00000 |            |
| 49 | 19.53 | 99078  | 0.00000 | AR1260 #5  |
| 50 | 20.38 | 2931   | 0.00000 |            |
| 51 | 20.92 | 126753 | 0.00000 | DBC (SURR) |
| 52 | 21.31 | 91829  | 0.00000 |            |
| 53 | 22.04 | 10674  | 0.00000 |            |
| 54 | 22.62 | 22364  | 0.00000 |            |
| 55 | 23.13 | 20712  | 0.00000 |            |
| 56 | 24.75 | 37246  | 0.00000 |            |
| 57 | 26.53 | 12313  | 0.00000 |            |

|         |  |   |         |       |
|---------|--|---|---------|-------|
| Totals: |  | 0 | 0.00000 | UG/ML |
|---------|--|---|---------|-------|

Report Time: Fri Nov 15 1991 1:55:22 PM  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000031

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9108270940023 DL

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: 5177-005

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR043

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 36

Date Extracted: Oct 18, 1991

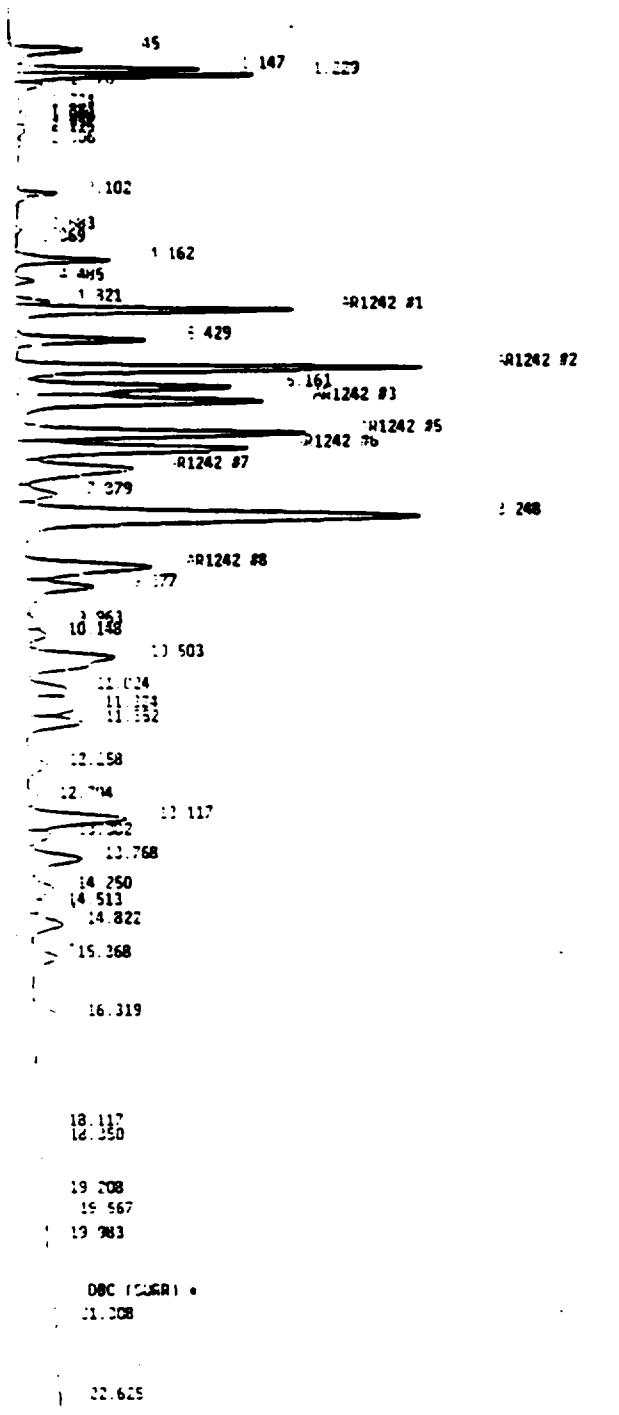
Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 06, 1991 19:10

GPC Cleanup: (Y/N) Y pH: 7

Dilution Factor: 100

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |    |
|------------|--------------|----------------------|----|
|            |              | ug/Kg                | Q  |
| 12674-11-2 | Aroclor-1016 | 12000                | UD |
| 11104-28-2 | Aroclor-1221 | 12000                | UD |
| 11141-16-5 | Aroclor-1232 | 12000                | UD |
| 53469-21-9 | Aroclor-1242 | 47000                | D  |
| 12672-29-6 | Aroclor-1248 | 12000                | UD |
| 11097-69-1 | Aroclor-1254 | 25000                | UD |
| 11096-82-5 | Aroclor-1260 | 25000                | UD |



Result File HP9A/HP9A\_110591GR043.RES Page 1  
Sample Name E177-005.1.100.GPC ACID  
DB1701:150-0-20-190-0-3-250-M: 2uL INJ:\*\*\*\*PRIMARY RUN\*\*\*\*  
Peak Processor Gentle Multilevel : False  
Instrument HP9A  
Calculation Zero Quantitation: AreaUnits  
Dilution 100  
Run Time 30.02 Minutes  
Injection time Wed Nov 6, 1991 10:42 pm  
Run Status RunStatusOK  
EndOffBaseline

| PK # | RT    | Area   | Group | UG/ML    | Name      |
|------|-------|--------|-------|----------|-----------|
| 1    | 1.34  | 28764  |       | 1.28715  |           |
| 2    | 1.15  | 55349  |       | 1.83783  |           |
| 3    | 1.23  | 75233  |       | 2.49806  |           |
| 4    | 1.38  | 19704  |       | 65427    |           |
| 5    | 1.73  | 5948   |       | 13749    |           |
| 6    | 1.88  | 1620   |       | 12022    |           |
| 7    | 1.95  | 3391   |       | 11260    |           |
| 8    | 2.05  | 3557   |       | 11812    |           |
| 9    | 2.12  | 3494   |       | 11502    |           |
| 10   | 2.21  | 2390   |       | 07934    |           |
| 11   | 2.10  | 15300  |       | 50803    |           |
| 12   | 2.68  | 2660   |       | 88834    |           |
| 13   | 2.87  | 1400   |       | 14648    |           |
| 14   | 4.16  | 42211  |       | 1.40160  |           |
| 15   | 4.48  | 7543   |       | 25046    |           |
| 16   | 4.82  | 13309  |       | 14192    |           |
| 17   | 4.96  | 131471 |       | 4.26541  | AR1242 #1 |
| 18   | 5.43  | 60934  |       | 2.02329  |           |
| 19   | 5.37  | 202042 |       | 5.70868  | AR1242 #2 |
| 20   | 5.16  | 132864 |       | 4.41166  |           |
| 21   | 6.38  | 153524 |       | 5.09769  | AR1242 #3 |
| 22   | 6.89  | 179656 |       | 5.96537  | AR1242 #5 |
| 23   | 7.14  | 149850 |       | 4.97569  | AR1242 #6 |
| 24   | 7.46  | 106671 |       | 1.54196  | AR1242 #7 |
| 25   | 7.38  | 29929  |       | 99377    |           |
| 26   | 8.25  | 386549 |       | 12.83517 |           |
| 27   | 9.06  | 120393 |       | 1.99757  | AR1242 #8 |
| 28   | 9.38  | 69861  |       | 2.21969  |           |
| 29   | 9.96  | 16844  |       | 55930    |           |
| 30   | 10.15 | 19281  |       | 64022    |           |
| 31   | 10.50 | 112408 |       | 3.73246  |           |
| 32   | 11.02 | 29360  |       | 1.20693  |           |
| 33   | 11.32 | 55195  |       | 2.15477  |           |
| 34   | 11.55 | 49820  |       | 1.65424  |           |
| 35   | 12.26 | 30561  |       | 1.01476  |           |
| 36   | 12.79 | 10817  |       | 25916    |           |
| 37   | 13.12 | 37287  |       | 1.89832  |           |
| 38   | 13.38 | 19337  |       | 64206    |           |
| 39   | 13.77 | 52231  |       | 1.73431  |           |
| 40   | 14.25 | 26409  |       | 37690    |           |
| 41   | 14.51 | 11681  |       | 45429    |           |
| 42   | 14.82 | 12333  |       | 1.07360  |           |

|    |       |       |         |              |
|----|-------|-------|---------|--------------|
| 44 | 16.12 | 51899 | 1.72327 |              |
| 45 | 18.12 | 5711  | 0.00000 |              |
| 46 | 18.35 | 7283  | 0.00000 |              |
| 47 | 19.21 | 2398  | 0.00000 |              |
| 48 | 19.57 | 9066  | 0.00000 |              |
| 49 | 19.98 | 1712  | 0.00000 |              |
| 50 | 20.92 | 11841 | 0.00000 | DBC (SURR) * |
| 51 | 21.31 | 6657  | 0.00000 |              |
| 52 | 22.63 | 2357  | 0.00000 |              |

Totals: 0 0.00000 UC/PL

Report Time: Tue Nov 12, 1991 10:35:43 am  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000034

## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109230840023

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: 5177-010

Sample wt/vol: 16 g

Lab File ID: HP9A\_110591GR033

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 06, 1991 13:11

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 150                  | U |
| 11104-28-2 | Aroclor-1221 | 150                  | U |
| 11141-16-5 | Aroclor-1232 | 150                  | U |
| 53469-21-9 | Aroclor-1242 | 150                  | U |
| 12672-29-6 | Aroclor-1248 | 150                  | U |
| 11097-69-1 | Aroclor-1254 | 300                  | U |
| 11096-82-5 | Aroclor-1260 | 300                  | U |

Sample Name : 5177-010.1.1.GPC ACID

DB1781:150-0-20-190-0-1-250-8: 2uL [INJ:=====PRIMARY RUN=====

Peak Processor : Cente

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreauNITS

Dilution : 100

Run Time : 30.00 Minutes

Injection time : Wed Nov 6, 1991 1:11:20 pm

Run Status : EndOffBaseline

SignalOverload

1.099  
 1.374  
 4.156  
 4.435  
 4.817  
 AR1242 #1  
 5.150  
 5.425  
 AR1242 #2  
 5.151  
 AR1242 #3  
 AR1242 #5  
 AR1242 #6  
 AR1242 #7  
 7.362  
 8.237  
 AR1242 #8  
 7.362  
 7.959  
 10.418  
 10.968  
 11.530

| Pk #    | RT    | Area     | Group | UG/ML    | Name          |
|---------|-------|----------|-------|----------|---------------|
| 1       | 1.03  | 10612960 |       | 92.29224 |               |
| 2       | 1.76  | 69534    |       | .11133   |               |
| 3       | 1.95  | 16028    |       | .07176   |               |
| 4       | 2.02  | 32680    |       | .14632   |               |
| 5       | 2.23  | 10884    |       | .04873   |               |
| 6       | 2.40  | 1193     |       | .00534   |               |
| 7       | 2.47  | 1869     |       | .00837   |               |
| 8       | 3.10  | 5250     |       | .02351   |               |
| 9       | 3.57  | 2239     |       | .01003   |               |
| 10      | 4.16  | 3015     |       | .01350   |               |
| 11      | 4.43  | 1713     |       | .00767   |               |
| 12      | 4.82  | 883      |       | 0.00000  |               |
| 13      | 4.96  | 2988     |       | 0.00000  | AR1242 #1     |
| 14      | 5.15  | 619      |       | 0.00000  |               |
| 15      | 5.43  | 3677     |       | 0.00000  |               |
| 16      | 5.86  | 11429    |       | .05117   | AR1242 #2     |
| 17      | 6.15  | 6201     |       | .02777   |               |
| 18      | 6.37  | 7334     |       | .03284   | AR1242 #3     |
| 19      | 6.88  | 7646     |       | .03423   | AR1242 #5     |
| 20      | 7.13  | 6417     |       | .02873   | AR1242 #6     |
| 21      | 7.44  | 13810    |       | .06183   | AR1242 #7     |
| 22      | 7.86  | 1000     |       | .00448   |               |
| 23      | 8.24  | 15481    |       | .06931   |               |
| 24      | 9.08  | 11646    |       | .05214   | AR1242 #8     |
| 25      | 9.36  | 2128     |       | .00953   |               |
| 26      | 9.96  | 2432     |       | .01089   |               |
| 27      | 10.42 | 37135    |       | .16627   |               |
| 28      | 10.97 | 1559     |       | .00698   |               |
| 29      | 11.53 | 2886     |       | .01292   |               |
| 30      | 20.38 | 38243    |       | 0.00000  |               |
| 31      | 20.89 | 1110252  |       | 0.00000  | DBC (SURR)    |
| Totals: |       |          |       | 0        | 0.00000 UG/ML |

20.375

DBC (SURR)

Report Time: Tue Nov 12, 1991 2:41:10 pm

Method: /DATA/LOOP/METHOD/HP9A.PCB.MTH

Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000036

## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109230850023

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: 5177-004

Sample wt/vol: 100 mL

Lab File ID: HP9A\_110591GR044

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 06, 1991 19:44

GPC Cleanup: (Y/N) Y pH: 12

Dilution Factor: 1000

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |    |
|------------|--------------|----------------------|----|
|            |              | ug/L                 | Q  |
| 12674-11-2 | Aroclor-1016 | 5000                 | UD |
| 11104-28-2 | Aroclor-1221 | 5000                 | UD |
| 11141-16-5 | Aroclor-1232 | 5000                 | UD |
| 53469-21-9 | Aroclor-1242 | 67000                | D  |
| 12672-29-6 | Aroclor-1248 | 5000                 | UD |
| 11097-69-1 | Aroclor-1254 | 5000                 | UD |
| 11096-32-5 | Aroclor-1260 | 5000                 | UD |

*Order 3 and*

Sample Name : 5177-004.1.1000.GPC ACID

DB1701:150-0-20-190-0-3-250-8: 2uL INJ:====PRIMARY RUN=====

Peak Processor : Genie

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreaUnits

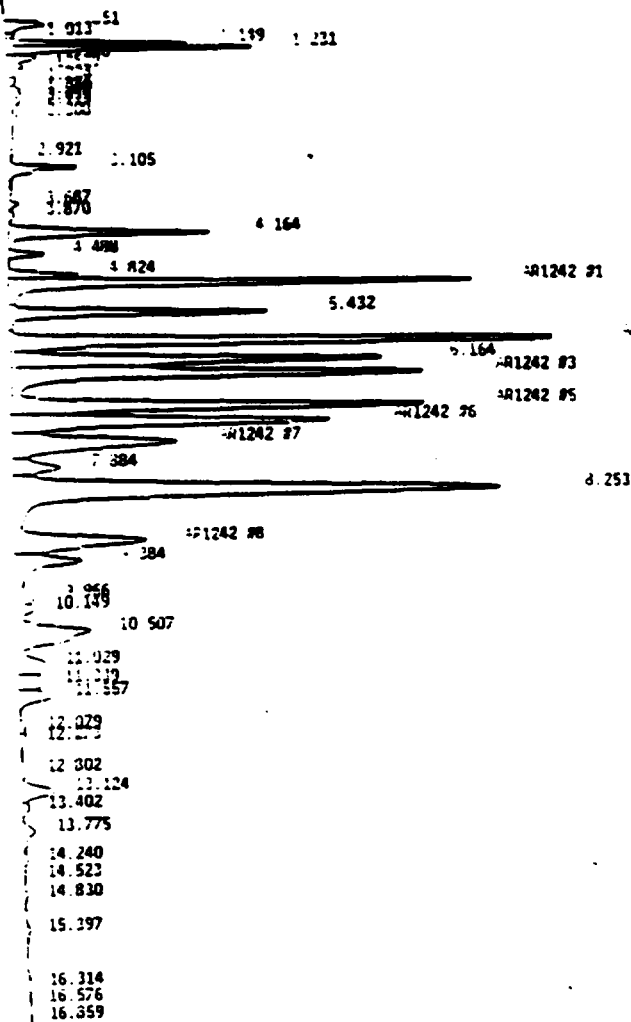
Dilution : 100

Run Time : 30.00 Minutes

Injection time : Wed Nov 6, 1991 7:44:00 pm

Run Status : RunStatusOK

EndOffBaseline



| PK # | RT    | Area   | Group | UG/ML    | Name      |
|------|-------|--------|-------|----------|-----------|
| 1    | 0.85  | 18550  |       | 53022    |           |
| 2    | 1.01  | 3313   |       | 39468    |           |
| 3    | 1.15  | 50973  |       | 1.45695  |           |
| 4    | 1.23  | 72836  |       | 2.08189  |           |
| 5    | 1.38  | 15212  |       | 43480    |           |
| 6    | 1.53  | 8369   |       | 23921    |           |
| 7    | 1.73  | 1659   |       | 10458    |           |
| 8    | 1.88  | 3775   |       | 10789    |           |
| 9    | 1.95  | 3404   |       | 39731    |           |
| 10   | 2.06  | 3382   |       | 99667    |           |
| 11   | 2.12  | 3230   |       | 99233    |           |
| 12   | 2.31  | 2393   |       | 96839    |           |
| 13   | 2.92  | 1045   |       | 92987    |           |
| 14   | 3.11  | 28573  |       | 81670    |           |
| 15   | 3.69  | 4379   |       | 12518    |           |
| 16   | 3.37  | 2965   |       | 38476    |           |
| 17   | 4.16  | 93341  |       | 2.66797  |           |
| 18   | 4.49  | 13738  |       | 39269    |           |
| 19   | 4.82  | 25566  |       | 73076    |           |
| 20   | 4.96  | 214155 |       | 6.12120  | AR1242 #1 |
| 21   | 5.43  | 122160 |       | 3.49171  |           |
| 22   | 5.87  | 350433 |       | 10.01646 | AR1242 #2 |
| 23   | 6.16  | 223658 |       | 6.39284  |           |
| 24   | 6.39  | 252407 |       | 7.21457  | AR1242 #3 |
| 25   | 6.89  | 257751 |       | 7.36731  | AR1242 #5 |
| 26   | 7.15  | 206687 |       | 0.00000  | AR1242 #6 |
| 27   | 7.47  | 152111 |       | 4.34781  | AR1242 #7 |
| 28   | 7.88  | 38244  |       | 1.09312  |           |
| 29   | 8.25  | 480250 |       | 13.72704 |           |
| 30   | 9.07  | 123450 |       | 3.52858  | AR1242 #8 |
| 31   | 9.38  | 56229  |       | 1.89304  |           |
| 32   | 9.97  | 16112  |       | 46054    |           |
| 33   | 10.15 | 14383  |       | 41111    |           |
| 34   | 10.51 | 93143  |       | 2.66232  |           |
| 35   | 11.03 | 31378  |       | 99688    |           |
| 36   | 11.34 | 25472  |       | 72805    |           |
| 37   | 11.56 | 28414  |       | 81215    |           |
| 38   | 12.08 | 4322   |       | 12352    |           |
| 39   | 12.27 | 5428   |       | 15516    |           |
| 40   | 12.80 | 7958   |       | 22747    |           |
| 41   | 13.12 | 38452  |       | 91326    |           |
| 42   | 13.40 | 4806   |       | 13736    |           |

000038

000000

Report Date: Tue Nov 12, 1991 1:31:26 PM  
 Method: DATA/LOOP/METHOD/HP9A\_PCB.MTH  
 Format File: DATA/LOOP/FORMAT/SIDE.FMT

| Totals: |       | 0    | 0.00000 UC/ML |
|---------|-------|------|---------------|
| 50      | 15.66 | 2912 | 08323         |
| 49      | 15.58 | 1170 | 01343         |
| 48      | 15.21 | 1058 | 21599         |
| 47      | 15.40 | 4297 | 12282         |
| 46      | 14.33 | 2118 | 36626         |
| 45      | 14.52 | 1341 | 33833         |
| 44      | 14.24 | 1361 | 39607         |
| 43      | 14.11 | 1400 | 44740         |

## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109241310116

Lab Task Number : 5177

Final Volume 145.0L

Matrix: (soil/water) WATER

Lab Sample ID: 5177-009

Sample wt/vol: 100 mL

Lab File ID: HP9A\_110591GR045

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 06, 1991 20:17

GPC Cleanup: (Y/N) Y pH: 14

Dilution Factor: 5

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |    |
|------------|--------------|----------------------|----|
|            |              | ug/L                 | Q  |
| 12674-11-2 | Aroclor-1016 | 720                  | UD |
| 11104-28-2 | Aroclor-1221 |                      | UD |
| 11141-16-5 | Aroclor-1232 | 720                  | UD |
| 53469-21-9 | Aroclor-1242 | 720                  | UD |
| 12672-29-6 | Aroclor-1248 | 720                  | UD |
| 11097-69-1 | Aroclor-1254 | 720                  | UD |
| 11096-82-5 | Aroclor-1260 | 720                  | UD |

Result File HP9A/HP9A 110591GR045 RES Page 1  
 221 Sample Name 5177-009.0.5.10.GPC FLORISIL ACID  
 222 0081701.150-0-20-190-0-3-250-8: 2uL INJ:####PRIMARY RUN####  
 223 Break Processor Gentle Multilevel False  
 224 Instrument HP9A  
 225 Calculation Zero Quantitation: AreaUnits  
 4.11 Dilution 100  
 4.12 Run Time 30.00 Minutes  
 5.11 Injection time: Wed Nov 6, 1991 8:17:16 am  
 5.12 Run Status EndOffBaseline  
 5.930 SignalOverload

624  
 115  
 151  
 308  
 372  
 3.464  
 3.463  
 3.149  
 3.607

10.346  
 10.361  
 11.190  
 11.531  
 12.477  
 12.635  
 13.091  
 13.910  
 14.260  
 14.531  
 14.930  
 15.126  
 16.269

| PK # | RT    | Area    | Group | UG/ML    | Name |
|------|-------|---------|-------|----------|------|
| 1    | 0.5   | 1377    |       | 00361    |      |
| 2    | 1.22  | 5427660 |       | 14.21748 |      |
| 3    | 1.63  | 218047  |       | 57116    |      |
| 4    | 1.75  | 662886  |       | 1.73640  |      |
| 5    | 1.90  | 4562677 |       | 11.95170 |      |
| 6    | 2.14  | 1199000 |       | 3.14072  |      |
| 7    | 2.55  | 170407  |       | 44637    |      |
| 8    | 2.58  | 1120213 |       | 2.93434  |      |
| 9    | 2.80  | 1399365 |       | 3.90446  |      |
| 10   | 2.93  | 20603   |       | 05397    |      |
| 11   | 3.00  | 1381323 |       | 7.54748  |      |
| 12   | 3.31  | 375426  |       | 72146    |      |
| 13   | 3.40  | 33990   |       | 14620    |      |
| 14   | 3.49  | 393676  |       | 2.60288  |      |
| 15   | 3.53  | 37807   |       | 12000    |      |
| 16   | 3.76  | 148964  |       | 19020    |      |
| 17   | 4.12  | 370503  |       | 37051    |      |
| 18   | 4.24  | 152979  |       | 40072    |      |
| 19   | 4.41  | 210017  |       | 55013    |      |
| 20   | 4.65  | 45341   |       | 11877    |      |
| 21   | 4.80  | 32473   |       | 21603    |      |
| 22   | 4.98  | 63069   |       | 16521    |      |
| 23   | 5.12  | 2937690 |       | 7.59513  |      |
| 24   | 5.22  | 1861563 |       | 12.73462 |      |
| 25   | 5.56  | 57442   |       | 17666    |      |
| 26   | 5.67  | 40522   |       | 10615    |      |
| 27   | 5.93  | 4584449 |       | 17.24763 |      |
| 28   | 6.33  | 36155   |       | 09471    |      |
| 29   | 6.82  | 11180   |       | 02929    |      |
| 30   | 7.12  | 19429   |       | 05089    |      |
| 31   | 7.45  | 5574    |       | 01486    |      |
| 32   | 7.51  | 10422   |       | 02730    |      |
| 33   | 7.97  | 5974    |       | 01827    |      |
| 34   | 8.08  | 21359   |       | 05595    |      |
| 35   | 8.46  | 15758   |       | 04128    |      |
| 36   | 8.75  | 124550  |       | 35014    |      |
| 37   | 9.15  | 15820   |       | 06763    |      |
| 38   | 9.51  | 37591   |       | 22944    |      |
| 39   | 9.98  | 530816  |       | 1.19045  |      |
| 40   | 10.25 | 14064   |       | 03684    |      |
| 41   | 10.45 | 7448    |       | 01951    |      |
| 42   | 10.36 | 1645    |       | 00431    |      |

|    |       |       |       |
|----|-------|-------|-------|
| 44 | 11.53 | 17768 | 04654 |
| 45 | 12.29 | 5153  | 01350 |
| 46 | 12.68 | 4177  | 01094 |
| 47 | 12.39 | 4644  | 01216 |
| 48 | 12.91 | 1477  | 00387 |
| 49 | 14.26 | 2786  | 00730 |
| 50 | 14.59 | 2570  | 00673 |
| 51 | 14.93 | 1348  | 00353 |
| 52 | 15.33 | 9482  | 02484 |
| 53 | 16.27 | 4194  | 01098 |

-----

|         |   |         |       |
|---------|---|---------|-------|
| Totals: | 0 | 0.00008 | UG/PH |
|---------|---|---------|-------|

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## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109241310116 DL

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: 5177-009

Sample wt/vol: 100 mL

Lab File ID: HP9A\_110591GR046

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 06, 1991 20:50

GPC Cleanup: (Y/N) Y pH: 14

Dilution Factor: 25

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |    |
|------------|--------------|----------------------|----|
|            |              | ug/L                 | Q  |
| 12674-11-2 | Aroclor-1016 | 3600                 | UD |
| 11104-28-2 | Aroclor-1221 | 3600                 | UD |
| 11141-16-5 | Aroclor-1232 | 3600                 | UD |
| 53469-21-9 | Aroclor-1242 | 3600                 | UD |
| 12672-29-6 | Aroclor-1248 | 3600                 | UD |
| 11097-69-1 | Aroclor-1254 | 3600                 | UD |
| 11096-82-5 | Aroclor-1260 | 3600                 | UD |

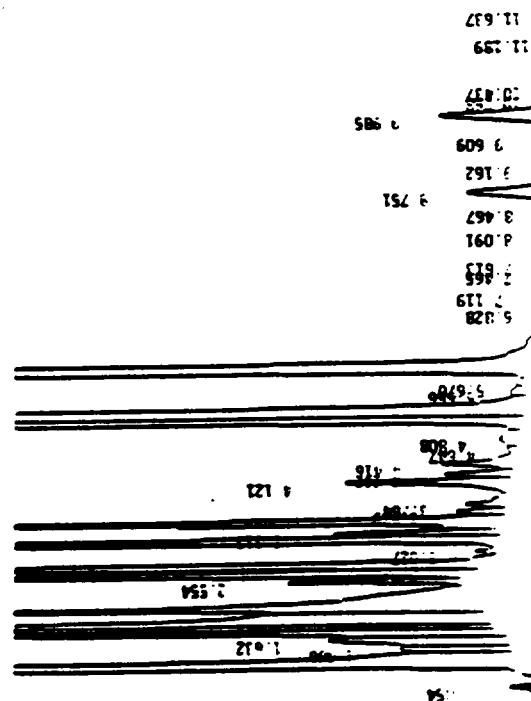
000044

Report Time: Tue Nov 12, 1991 9:22:41 PM  
Method: DATA/LOOP/METHOD/HP9A\_PCH.MTH  
Format File: DATA/LOOP/FORMAT/SIDE.FMT

0.00000 UC/ML

| RT | Area  | Group   | UC/ML    | Name |
|----|-------|---------|----------|------|
| 1  | 35    | 2182    | 0.02533  |      |
| 2  | 1.22  | 1409187 | 16.36056 |      |
| 3  | 1.49  | 45756   | 53122    |      |
| 4  | 1.63  | 110641  | 1.28453  |      |
| 5  | 1.75  | 173488  | 2.24638  |      |
| 6  | 1.84  | 185303  | 2.15135  |      |
| 7  | 1.90  | 410898  | 5.00270  |      |
| 8  | 2.14  | 177557  | 4.38341  |      |
| 9  | 2.55  | 47536   | 55189    |      |
| 10 | 2.58  | 253988  | 2.94079  |      |
| 11 | 2.70  | 774593  | 8.99297  |      |
| 12 | 3.03  | 4662    | 05413    |      |
| 13 | 3.20  | 557134  | 7.62928  |      |
| 14 | 3.31  | 49057   | 56955    |      |
| 15 | 3.49  | 235460  | 2.73368  |      |
| 16 | 3.54  | 17477   | 20291    |      |
| 17 | 3.76  | 19464   | 22598    |      |
| 18 | 4.12  | 71036   | 82473    |      |
| 19 | 4.24  | 24781   | 28771    |      |
| 20 | 4.42  | 13335   | 18702    |      |
| 21 | 4.65  | 1656    | 04245    |      |
| 22 | 4.81  | 17901   | 20783    |      |
| 23 | 5.12  | 558632  | 6.48567  |      |
| 24 | 5.23  | 1018424 | 11.82383 |      |
| 25 | 5.56  | 9363    | 10870    |      |
| 26 | 5.67  | 5999    | 06965    |      |
| 27 | 5.93  | 1548119 | 17.97355 |      |
| 28 | 5.83  | 1823    | 02117    |      |
| 29 | 7.12  | 1992    | 04634    |      |
| 30 | 7.47  | 4105    | 04765    |      |
| 31 | 7.61  | 2826    | 03281    |      |
| 32 | 8.09  | 2203    | 02558    |      |
| 33 | 8.47  | 1803    | 02093    |      |
| 34 | 8.75  | 57249   | 66466    |      |
| 35 | 9.16  | 6645    | 07714    |      |
| 36 | 9.61  | 12813   | 14875    |      |
| 37 | 9.98  | 71801   | 83360    |      |
| 38 | 10.27 | 2278    | 02645    |      |
| 39 | 10.44 | 7372    | 08559    |      |
| 40 | 11.19 | 2554    | 02965    |      |
| 41 | 11.54 | 1449    | 04004    |      |

Result File: HP9A/HP9A\_110591GR046.NCS  
Sample Name: 5177-009.0.5.50.CPC ACID FLORISIL  
081701:150-0-20-190-0-3-250-8: 2UL INJ: SECONDARY RUNS  
1.253 Peak Processor: Genie  
1.159 Instrument: HP9A  
1.157 Allocation: Zero  
1.492 Injection: 100  
Run Time: 30.00 Minutes  
Injection Time: Wed Nov 6, 1991 8:58:35 PM  
Run Status: RunStatusOK  
EndOfBaseline



## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109251210116

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: 5177-006

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR030

Level : (low/med) LCW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 06, 1991 11:31

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 80.                  | U |
| 11104-28-2 | Aroclor-1221 | 80.                  | U |
| 11141-16-5 | Aroclor-1232 | 80.                  | U |
| 53469-21-9 | Aroclor-1242 | 80.                  | U |
| 12672-29-6 | Aroclor-1248 | 80.                  | U |
| 11097-69-1 | Aroclor-1254 | 160                  | U |
| 11096-82-5 | Aroclor-1260 | 160                  | U |

Sample Name: 5177-006.1.1. GPC ACID

081701:150-0-20-190-0-3-250-0: 2uL IMJ:ccccPRIMARY RUNcccc

Peak Processor: Gentle

Multilevel: False

Instrument: HP9A

Calculation: Zero

Quantitation: AreaUnits

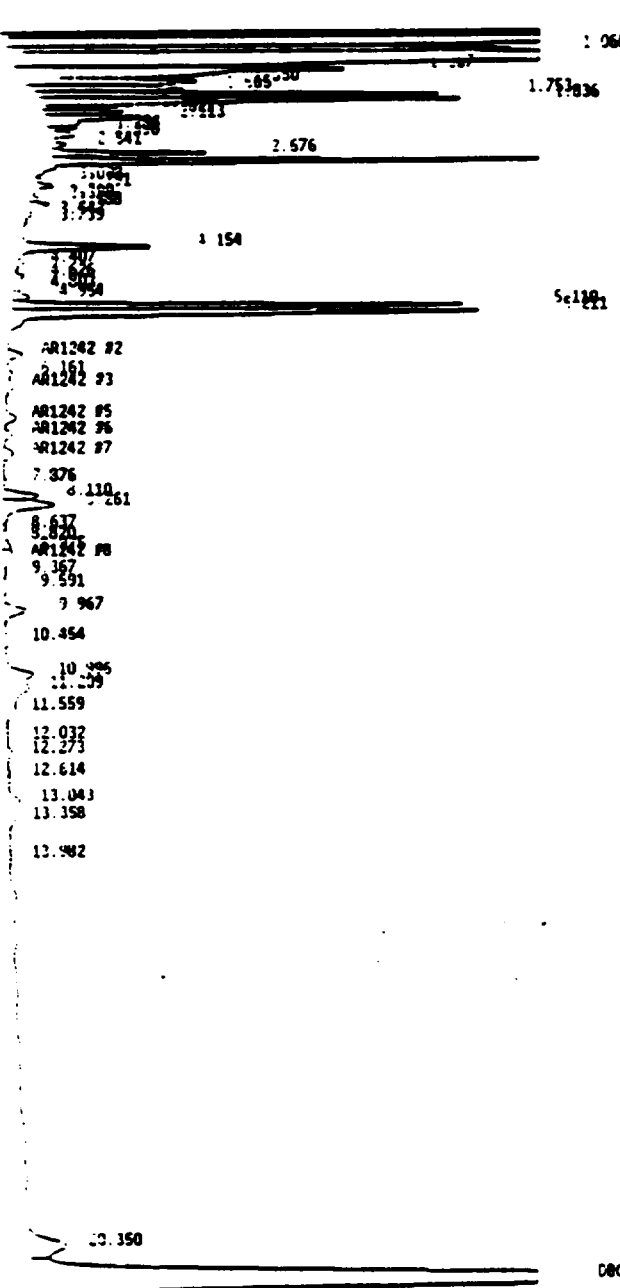
Dilution: 100

Run Time: 30.00 Minutes

Injection time: Wed Nov 6, 1991 11:31:26 am

Run Status: RunStatusOK

EndOffBaseline:



| PK # | RT   | Area    | Group | UG/ML    | Name      |
|------|------|---------|-------|----------|-----------|
| 1    | 0.1  | 1553169 |       | 19.85323 |           |
| 2    | 0.38 | 2102986 |       | 26.88120 |           |
| 3    | 1.07 | 201162  |       | 2.57133  |           |
| 4    | 1.15 | 970183  |       | 12.40127 |           |
| 5    | 1.27 | 175138  |       | 2.23869  |           |
| 6    | 1.55 | 69082   |       | .89327   |           |
| 7    | 1.66 | 55268   |       | .83428   |           |
| 8    | 1.75 | 132212  |       | 1.68999  |           |
| 9    | 1.84 | 137610  |       | 1.75899  |           |
| 10   | 1.95 | 21048   |       | .26905   |           |
| 11   | 2.03 | 29053   |       | .37137   |           |
| 12   | 2.11 | 49198   |       | .62887   |           |
| 13   | 2.29 | 8227    |       | .10516   |           |
| 14   | 2.40 | 7382    |       | .09437   |           |
| 15   | 2.54 | 4142    |       | .05294   |           |
| 16   | 2.68 | 40547   |       | .51829   |           |
| 17   | 2.80 | 129773  |       | 1.65881  |           |
| 18   | 3.10 | 1572    |       | .02010   |           |
| 19   | 3.19 | 5106    |       | .06526   |           |
| 20   | 3.40 | 2778    |       | .03551   |           |
| 21   | 3.49 | 7695    |       | .09837   |           |
| 22   | 3.64 | 1804    |       | .02306   |           |
| 23   | 3.74 | 1023    |       | .01307   |           |
| 24   | 3.15 | 53781   |       | .68745   |           |
| 25   | 4.41 | 2259    |       | .02888   |           |
| 26   | 4.63 | 3540    |       | .04525   |           |
| 27   | 4.80 | 3468    |       | .04432   |           |
| 28   | 4.95 | 7890    |       | .10086   |           |
| 29   | 5.11 | 155519  |       | 1.98790  |           |
| 30   | 5.21 | 181826  |       | 2.32417  |           |
| 31   | 5.86 | 7696    |       | .09837   | AR1242 #2 |
| 32   | 6.16 | 3290    |       | .04206   |           |
| 33   | 6.37 | 5130    |       | .06558   | AR1242 #3 |
| 34   | 6.87 | 7075    |       | .09043   | AR1242 #5 |
| 35   | 7.14 | 4140    |       | .05291   | AR1242 #6 |
| 36   | 7.44 | 7229    |       | .09240   | AR1242 #7 |
| 37   | 7.88 | 1470    |       | .01879   |           |
| 38   | 8.11 | 19753   |       | .25249   |           |
| 39   | 8.26 | 39540   |       | .50542   |           |
| 40   | 8.64 | 1220    |       | .01559   |           |
| 41   | 8.82 | 2113    |       | .02701   |           |
| 42   | 8.98 | 3942    |       | 0.00000  |           |

DOC / SURR

|         |       |        |         |            |
|---------|-------|--------|---------|------------|
| 44      | 9.17  | 1272   | 01626   |            |
| 45      | 9.59  | 4820   | 06161   |            |
| 46      | 9.97  | 15484  | 19792   |            |
| 47      | 10.45 | 4173   | 05590   |            |
| 48      | 11.00 | 25015  | 11254   |            |
| 49      | 11.21 | 10141  | 18528   |            |
| 50      | 11.56 | 7464   | 09541   |            |
| 51      | 12.03 | 1939   | 02479   |            |
| 52      | 12.27 | 4346   | 05555   |            |
| 53      | 12.61 | 2070   | 02646   |            |
| 54      | 13.04 | 11296  | 14440   |            |
| 55      | 13.16 | 7448   | 09520   |            |
| 56      | 13.98 | 2158   | 02759   |            |
| 57      | 20.35 | 43152  | 0.00000 |            |
| 58      | 20.89 | 279980 | 0.00000 | DEC (CURR) |
| -----   |       |        |         |            |
| Totals: |       | 0      | 0.00000 | UC/ML      |

Report Time: Tue Nov 12, 1991 2:26:47 PM  
Method: DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: DATA/LOOP/FORMAT/SIDE.FMT

000047

## PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9110151520023

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: 5177-001

Sample wt/vol: 100 mL

Lab File ID: HP9A\_110591GR020

Level : (low/med) LOW

Date Received: Oct 15, 1991

‡ Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

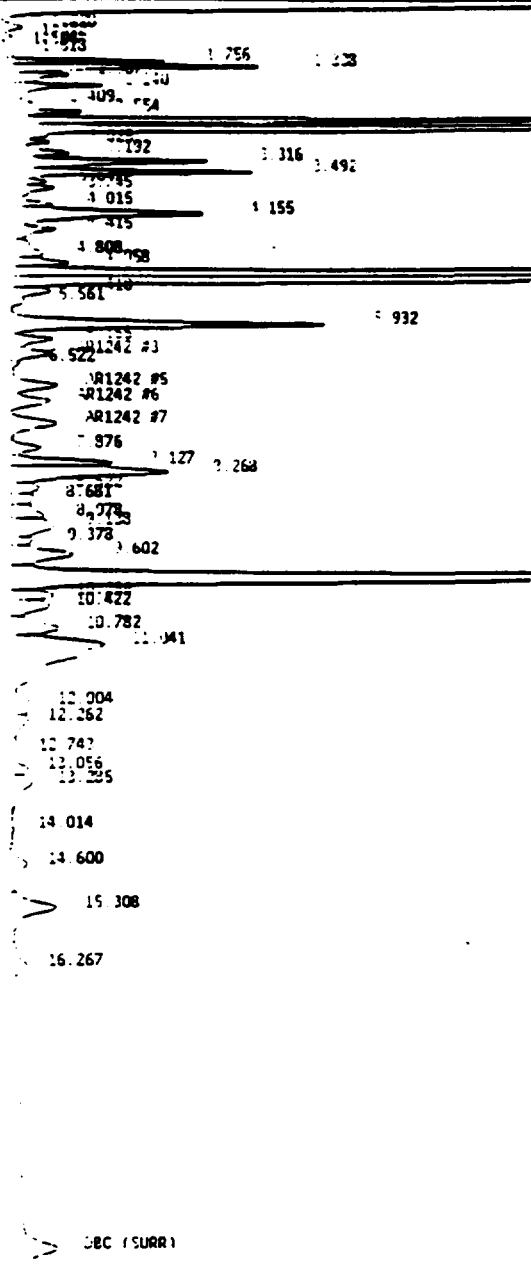
Date Analyzed: Nov 06, 1991 00:59

GPC Cleanup: (Y/N) Y pH: 14

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 5.0                  | U |
| 11104-28-2 | Aroclor-1221 | 5.0                  | U |
| 11141-16-5 | Aroclor-1232 | 5.0                  | U |
| 53469-21-9 | Aroclor-1242 | 8.6                  |   |
| 12672-29-6 | Aroclor-1248 | 5.0                  | U |
| 11097-69-1 | Aroclor-1254 | 5.0                  | U |
| 11096-82-5 | Aroclor-1260 | 5.0                  | U |

*no water*



Result File: HP9A/HP9A.110591GR020.RES Page 1  
 Sample Name: 5177-001.1.1.GPC ACID  
 DB1701:150-0-20-190-0-3-250-8: ZUL INJ:=====PRIMARY RUN=====

Peak Processor: Gentle Multilevel False  
 Instrument: HP9A  
 Calculation: Zero Quantitation: AreasUnits  
 Dilution: 100  
 Run Time: 30.00 Minutes  
 Injection time: Wed Nov 6 1991 12:59:19 am  
 Run Status: RunStatusOK  
 EndOffBaseline

| PK # | RT   | Area    | Group | UG/ML    | Name      |
|------|------|---------|-------|----------|-----------|
| 1    | 1.23 | 1059126 |       | 18.37864 |           |
| 2    | 1.23 | 13269   |       | 23025    |           |
| 3    | 1.27 | 4145    |       | 07192    |           |
| 4    | 1.50 | 1326    |       | 02301    |           |
| 5    | 1.52 | 5977    |       | 10371    |           |
| 6    | 1.76 | 37470   |       | 65020    |           |
| 7    | 1.34 | 78282   |       | 1.35839  |           |
| 8    | 1.37 | 24278   |       | 42129    |           |
| 9    | 1.14 | 11626   |       | 58351    |           |
| 10   | 1.41 | 2141    |       | 03715    |           |
| 11   | 2.55 | 12143   |       | 22807    |           |
| 12   | 2.67 | 238750  |       | 4.14294  |           |
| 13   | 2.80 | 786404  |       | 13.64613 |           |
| 14   | 2.03 | 6078    |       | 10546    |           |
| 15   | 2.19 | 15087   |       | 27915    |           |
| 16   | 2.32 | 75090   |       | 1.30300  |           |
| 17   | 2.49 | 74148   |       | 1.28667  |           |
| 18   | 2.64 | 8900    |       | 15444    |           |
| 19   | 2.75 | 14815   |       | 25707    |           |
| 20   | 4.02 | 10644   |       | 13470    |           |
| 21   | 4.15 | 107327  |       | 1.86241  |           |
| 22   | 4.42 | 19095   |       | 33135    |           |
| 23   | 4.81 | 22665   |       | 39330    |           |
| 24   | 4.96 | 27584   |       | 47865    |           |
| 25   | 5.12 | 513718  |       | 8.91437  |           |
| 26   | 5.22 | 429568  |       | 7.45414  |           |
| 27   | 5.41 | 21079   |       | 16578    |           |
| 28   | 5.56 | 5534    |       | 09603    |           |
| 29   | 5.93 | 152977  |       | 2.65456  |           |
| 30   | 6.17 | 24041   |       | 41718    |           |
| 31   | 6.39 | 21752   |       | 37745    | AR1242 #3 |
| 32   | 6.52 | 1235    |       | 05613    |           |
| 33   | 6.39 | 31287   |       | 54291    | AR1242 #5 |
| 34   | 7.14 | 24272   |       | 42119    | AR1242 #6 |
| 35   | 7.49 | 35804   |       | 62130    | AR1242 #7 |
| 36   | 7.38 | 17838   |       | 30953    |           |
| 37   | 8.13 | 54394   |       | 94389    |           |
| 38   | 8.27 | 118336  |       | 2.05345  |           |
| 39   | 8.52 | 10290   |       | 15209    |           |
| 40   | 8.68 | 15736   |       | 27305    |           |
| 41   | 8.98 | 27514   |       | 47744    |           |
| 42   | 9.14 | 46906   |       | 91394    |           |

|         |       |        |                 |
|---------|-------|--------|-----------------|
| 44      | 9.50  | 52918  | 31826           |
| 45      | 9.98  | 613278 | 10.64208        |
| 46      | 10.26 | 28828  | 50024           |
| 47      | 10.42 | 30950  | 53706           |
| 48      | 10.78 | 42145  | 73133           |
| 49      | 11.04 | 180203 | 3.12701         |
| 50      | 12.00 | 24901  | 43210           |
| 51      | 12.26 | 19126  | 33189           |
| 52      | 12.74 | 10131  | 17588           |
| 53      | 13.06 | 13748  | 23856           |
| 54      | 13.29 | 28890  | 50131           |
| 55      | 14.01 | 2466   | 34280           |
| 56      | 14.60 | 24759  | 0.00000         |
| 57      | 15.31 | 53493  | 0.00000         |
| 58      | 16.27 | 15149  | 0.00000         |
| 59      | 20.91 | 35279  | 0.00000         |
|         |       |        | DBC (SURR)      |
| Totals: |       |        | 0 0.00000 UG/ML |

Report Time: Tue Nov 12, 1991 9:09:04 am  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000050

GC-1 LUG

Analyst/Date: JC / 3/1/79

Temperature: 210°C

Solvent Flow Rate: 5.0 ml/min

Pressure w/ Detector: 20.0 psi

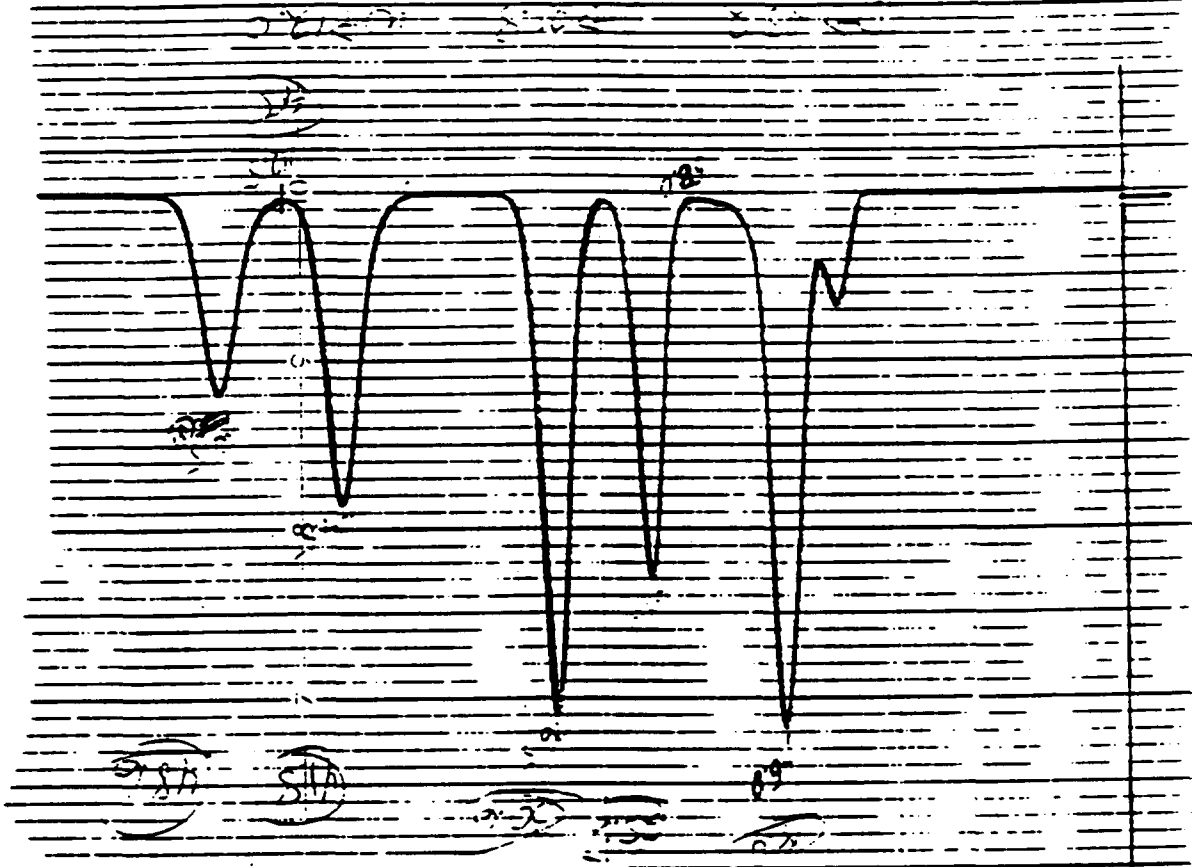
Detector Range: 2.0 AUFs

Chart Speed: 2.0 cm/min

3.5 Calibration Stock 005

1.00 Tint 0.5 cm

| Port # | Sample # | Analysis | Comments                      | Port # | Sample # | Analysis | Comments |
|--------|----------|----------|-------------------------------|--------|----------|----------|----------|
| 1      |          |          |                               |        |          |          |          |
| 1      |          |          | 17.18.10.20                   |        |          |          |          |
| 1      |          |          | RINSED & USED FOR 17.18.10.20 |        |          |          |          |
| 2      |          |          | 17.18.10.20                   |        |          |          |          |
| 3      |          |          | 2.5                           |        |          |          |          |
| 4      |          |          | THAX                          |        |          |          |          |
| 5      |          |          | 2.5-2.0.20.20                 |        |          |          |          |
| 6      |          |          | 17.18.10.20                   |        |          |          |          |
| 7      |          |          | 17.18.10.20                   |        |          |          |          |
| 8      |          |          | 17.18.10.20                   |        |          |          |          |
| 9      |          |          | 17.18.10.20                   |        |          |          |          |



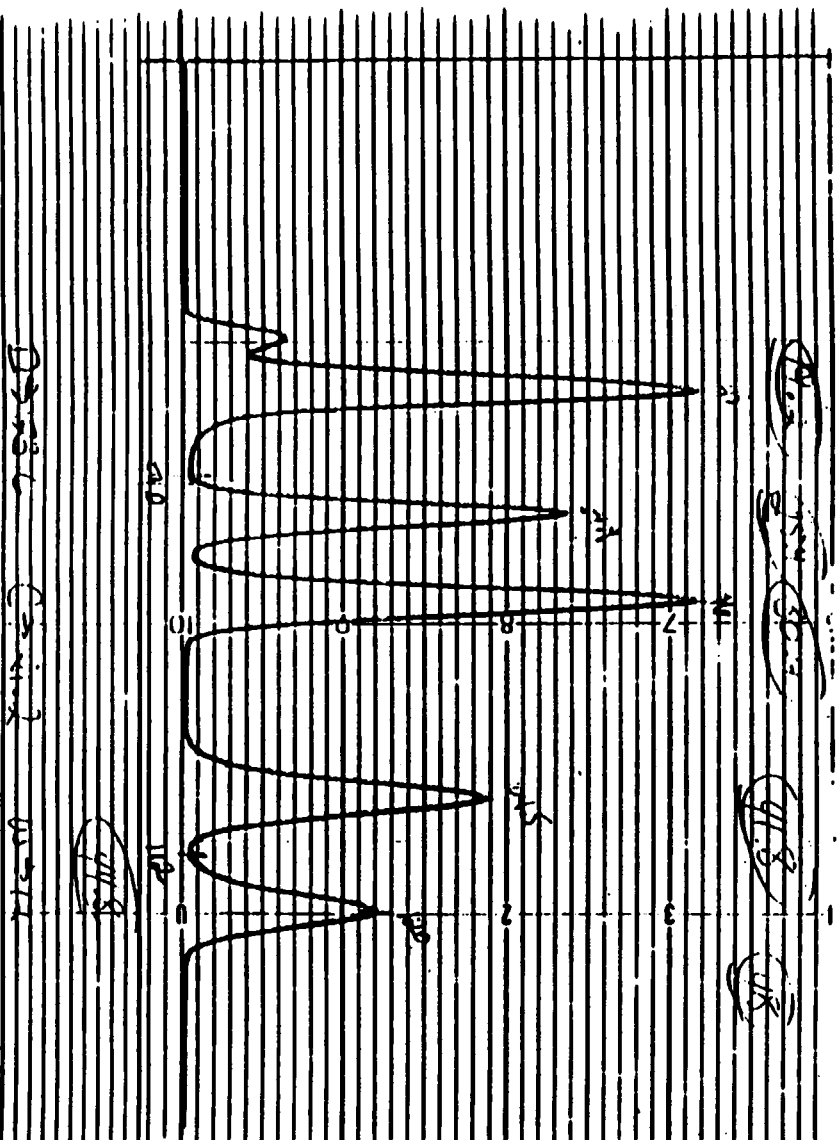
000051

Analysis/Date 10/1/2009  
 Temperature 1 220C  
 Chart Speed 25cm/min

Solvent Flow Rate 5.0 ml/min  
 Pressure w/ Detector 8.0 PSI  
 Detector Range 220mV

Calibration Stock DE

| Bot # | Sample #             | Analysis  | Comments | Run # | Sample # | Analysis | Comments |
|-------|----------------------|-----------|----------|-------|----------|----------|----------|
| 1     | NA1/1647261          |           |          |       |          |          |          |
| 7     | 15-034-02<br>177-010 | 200 S/L/S |          |       |          |          |          |
| 8     | RS                   | 200 S/L/S |          |       |          |          |          |
| 9     | 177-006              | 1         |          |       |          |          |          |
| 10    | 177-005              | 1         |          |       |          |          |          |
| 11    | 177-005              | 1         |          |       |          |          |          |
| 12    | 13/1A/1K             |           |          |       |          |          |          |
| 13    | 15-034-02            |           |          |       |          |          |          |
| 14    | 177-008              | 1         |          |       |          |          |          |
| 15    | 177-008              | 1         |          |       |          |          |          |



GC/ECD

PCB

STANDARD DATA

000053

8D  
PCB EVALUATION STANDARDS SUMMARY

Lab Name: GALSON LABORATORIES

Dates of Analyses: 05-NOV-91-06-NOV-91

Lab Task Number: 5177

Lab QC Batch ID: Q5-0319, Q5-0320

Instrument ID: HP9A

GC Column ID: DB1701

Evaluation Check for Linearity

| COMPOUND | CALIBRATION<br>FACTOR<br>EVAL MIX A | CALIBRATION<br>FACTOR<br>EVAL MIX B | CALIBRATION<br>FACTOR<br>EVAL MIX C | %RSD<br>( $\leq$ 10.0%) |
|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------|
| AR1248   | 2.277,212                           | 2.014,425                           | 1.927,102                           | 8.87                    |
| DBC      | 2.612870                            | 2.840944                            | 3.037,270                           | 7.52                    |

Concentrations of Evaluation Standards:

| (in ug/ml) | EVAL A | EVAL B | EVAL C |
|------------|--------|--------|--------|
| AR1248     | 0.20   | 0.50   | 1.00   |
| DBC        | 0.05   | 0.125  | 0.25   |

(1) If  $> 10.0\%$  RSD, plot a standard curve and determine the ng for each sample in that set from the curve.

(2) Since column breakdown does not occur in PCB analysis, it is not necessary to calculate the percent breakdown for Endrin nor 4,4'-DDT.

**PCB/PESTICIDE EVALUATION STANDARDS SUMMARY**  
**Evaluation of Retention Time Shift for Dibutylchlorodate**

Lab Name: GALSON LABORATORIES

SDG No. : 5177

Instrument ID : HP9A

GC Column ID: DB-1701 MEGABORE

Dates of Analyses: 11/05/91 to 11/06/91

|    | SAMPLE NO.       | LAB SAMPLE ID | DATE ANALYZED | TIME ANALYZED | % D  | *   |
|----|------------------|---------------|---------------|---------------|------|-----|
| 1  | EVAL A           | EVAL A        | 11/05/91      | 15:01         | 0.0  |     |
| 2  | EVAL B           | EVAL B        | 11/05/91      | 15:34         | 0.04 |     |
| 3  | EVAL C           | EVAL C        | 11/05/91      | 16:07         | 0.0  |     |
| 4  | AR1016           | AR1016        | 11/05/91      | 16:40         | 0.0  |     |
| 5  | AR1221           | AR1221        | 11/05/91      | 17:14         | 0.04 |     |
| 6  | AR1232           | AR1232        | 11/05/91      | 17:47         | 0.04 |     |
| 7  | AR1242           | AR1242        | 11/05/91      | 18:20         | 0.0  |     |
| 8  | AR1248           | AR1248        | 11/05/91      | 18:54         | 0.0  |     |
| 9  | AR1254           | AR1254        | 11/05/91      | 19:27         | 0.0  |     |
| 10 | AR1260           | AR1260        | 11/05/91      | 20:00         | 0.04 |     |
| 11 | METHOD BLANK     | Q5-0320       | 11/05/91      | 20:33         | 0.0  |     |
| 12 | BLANK SPIKE      | Q5-0320BS     | 11/05/91      | 21:06         | 0.0  |     |
| 13 | CHECK SAMPLE     | Q5-0320CS     | 11/05/91      | 21:40         | 0.04 |     |
| 14 | METHOD BLANK     | Q5-0319       | 11/05/91      | 22:13         | 0.04 |     |
| 15 | HEXANE           | HEXANE        | 11/05/91      | 22:46         | 0.04 |     |
| 16 | AR1248           | AR1248        | 11/05/91      | 23:19         | 0.0  |     |
| 17 | BLANK SPIKE      | Q5-0319BS     | 11/05/91      | 23:52         | 0.0  |     |
| 18 | CHECK SAMPLE     | Q5-0319CS     | 11/06/91      | 00:26         | 0.04 |     |
| 19 | 9110151520023    | 5177-001      | 11/06/91      | 00:59         | 0.04 |     |
| 20 | 9110151520023MS  | 5177-002      | 11/06/91      | 01:32         | 0.04 |     |
| 21 | HEXANE           | HEXANE        | 11/06/91      | 02:05         | 0.0  |     |
| 22 | AR1260           | AR1260        | 11/06/91      | 02:38         | 0.0  |     |
| 23 | AR1248           | AR1248        | 11/06/91      | 10:58         | 0.04 |     |
| 24 | 9109251210116    | 5177-006      | 11/06/91      | 11:31         | 0.04 |     |
| 25 | 9109251210116MS  | 5177-007      | 11/06/91      | 12:04         | 0.09 |     |
| 26 | 9109251210116MSb | 5177-008      | 11/06/91      | 12:38         | 0.09 |     |
| 27 | 9109230840023    | 5177-010      | 11/06/91      | 13:11         | 0.04 |     |
| 28 | HEXANE           | HEXANE        | 11/06/91      | 13:44         | 0.09 |     |
| 29 | AR1260           | AR1260        | 11/06/91      | 14:17         | 0.04 |     |
| 30 | 9110151520023MSb | 5177-003      | 11/06/91      | 15:07         | 0.04 |     |
| 31 | z z z z z        | z z z z z     | 11/06/91      | 15:40         | —    | AAA |
| 32 | z z z z z        | z z z z z     | 11/06/91      | 16:13         | —    |     |
| 33 | z z z z z        | z z z z z     | 11/06/91      | 16:47         | —    |     |
| 34 | HEXANE           | HEXANE        | 11/06/91      | 17:20         | 0.04 |     |
| 35 | AR1248           | AR1248        | 11/06/91      | 18:04         | 0.14 |     |
| 36 | 9108270940023    | 5177-005      | 11/06/91      | 18:37         | 0.09 |     |
| 37 | 9108270940023 DL | 5177-005 DL   | 11/06/91      | 19:10         | 0.09 |     |
| 38 | 9109230850023    | 5177-004      | 11/06/91      | 19:44         |      |     |

\* Values outside of QC limits (2.0 % for packed columns,  
0.3 % for capillary columns, 1.5 % for megabore columns)

D = diluted out

000055

**PCB/PESTICIDE EVALUATION STANDARDS SUMMARY**  
**Evaluation of Retention Time Shift for Dibutylchlorodate**

Lab Name: GALSON LABORATORIES

SDG No. : 5177

Instrument ID : HP9A

GC Column ID: DB-1701 MEGABORE

Dates of Analyses: 11/05/91 to 11/06/91

|    | SAMPLE NO.       | LAB SAMPLE ID | DATE ANALYZED | TIME ANALYZED | % D  | * |
|----|------------------|---------------|---------------|---------------|------|---|
| 1  | 9109241310116    | 5177-009      | 11/06/91      | 20:17         | —    | D |
| 2  | 9109241310116 DL | 5177-009 DL   | 11/06/91      | 20:50         | —    | D |
| 3  | AR1248           | AR1248        | 11/06/91      | 21:23         | 0.04 |   |
| 4  | AR1260           | AR1260        | 11/06/91      | 21:57         | 0.09 |   |
| 5  |                  |               |               |               |      |   |
| 6  |                  |               |               |               |      |   |
| 7  |                  |               |               |               |      |   |
| 8  |                  |               |               |               |      |   |
| 9  |                  |               |               |               |      |   |
| 10 |                  |               |               |               |      |   |
| 11 |                  |               |               |               |      |   |
| 12 |                  |               |               |               |      |   |
| 13 |                  |               |               |               |      |   |
| 14 |                  |               |               |               |      |   |
| 15 |                  |               |               |               |      |   |
| 16 |                  |               |               |               |      |   |
| 17 |                  |               |               |               |      |   |
| 18 |                  |               |               |               |      |   |
| 19 |                  |               |               |               |      |   |
| 20 |                  |               |               |               |      |   |
| 21 |                  |               |               |               |      |   |
| 22 |                  |               |               |               |      |   |
| 23 |                  |               |               |               |      |   |
| 24 |                  |               |               |               |      |   |
| 25 |                  |               |               |               |      |   |
| 26 |                  |               |               |               |      |   |
| 27 |                  |               |               |               |      |   |
| 28 |                  |               |               |               |      |   |
| 29 |                  |               |               |               |      |   |
| 30 |                  |               |               |               |      |   |
| 31 |                  |               |               |               |      |   |
| 32 |                  |               |               |               |      |   |
| 33 |                  |               |               |               |      |   |
| 34 |                  |               |               |               |      |   |
| 35 |                  |               |               |               |      |   |
| 36 |                  |               |               |               |      |   |
| 37 |                  |               |               |               |      |   |
| 38 |                  |               |               |               |      |   |

\* Values outside of QC limits (2.0 % for packed columns,  
0.3 % for capillary columns. 1.5 % for megabore columns)

> = diluted out

000056

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177INSTRUMENT ID: HPGACOLUMN ID: DB1701

| DATES OF ANALYSIS: |        | FROM: 05 NOV 91<br>TO: 06 NOV 91 |                       | DATE OF ANALYSIS: 05 NOV 91<br>TIME OF ANALYSIS: 23:19 |                       |            |        |
|--------------------|--------|----------------------------------|-----------------------|--------------------------------------------------------|-----------------------|------------|--------|
| TIME OF ANALYSIS:  |        | FROM: 15:01<br>TO: 21:57         |                       | AR <u>1248</u> PCB# <u>618</u>                         |                       |            |        |
| COMPOUND           | R<br>T | RT<br>WINDOW<br>FROM TO          | CALIBRATION<br>FACTOR | R<br>T                                                 | CALIBRATION<br>FACTOR | QNT<br>Y/N | %<br>D |
| Aroclor 1016       | 7.14   | 7.04   7.24                      | 1.132.902             |                                                        |                       |            |        |
| Aroclor 1221       | 4.96   | 4.86   5.06                      | 319.892               |                                                        |                       |            |        |
| Aroclor 1232       | 7.15   | 7.05   7.25                      | 755.112               |                                                        |                       |            |        |
| Aroclor 1242       | 7.15   | 7.05   7.25                      | 1.244.661             |                                                        |                       |            |        |
| Aroclor 1248       | 10.55  | 10.45   10.65                    | 2.181.803             | 10.55                                                  | 2.139.951             | Y          | 19     |
| Aroclor 1254       | 13.12  | 13.02   13.22                    | 1.407.292             |                                                        |                       |            |        |
| Aroclor 1260       | 19.56  | 19.46   19.66                    | 2.334.695             |                                                        |                       |            |        |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177

INSTRUMENT ID: HPA

COLUMN ID: DB1701

| DATES OF ANALYSIS: |        | FROM: 05 NOV 91         |                       | DATE OF ANALYSIS: 06 NOV 91 |                       | TIME OF ANALYSIS: 02:38 |        |
|--------------------|--------|-------------------------|-----------------------|-----------------------------|-----------------------|-------------------------|--------|
| TIME OF ANALYSIS:  |        | FROM: 15:01             |                       | AR 1248                     |                       | PCB# 614                |        |
| TO: 06 NOV 91      |        | TO: 21:57               |                       |                             |                       |                         |        |
| COMPOUND           | R<br>T | RT<br>WINDOW<br>FROM TO | CALIBRATION<br>FACTOR | R<br>T                      | CALIBRATION<br>FACTOR | QNT<br>Y/N              | %<br>D |
| Aroclor 1016       | 7.14   | 7.04   7.24             | 1.132.902             |                             |                       |                         |        |
| Aroclor 1221       | 4.96   | 4.86   5.06             | 319.892               |                             |                       |                         |        |
| Aroclor 1232       | 7.15   | 7.05   7.25             | 755.112               |                             |                       |                         |        |
| Aroclor 1242       | 7.15   | 7.05   7.25             | 1.244.661             |                             |                       |                         |        |
| Aroclor 1248       | 10.55  | 10.45   10.65           | 2.181.803             |                             |                       |                         |        |
| Aroclor 1254       | 13.12  | 13.02   13.22           | 1.407.292             |                             |                       |                         |        |
| Aroclor 1260       | 19.56  | 19.46   19.66           | 2.334.695             | 19.59                       | 2,253.334             | Y                       | 35     |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177

INSTRUMENT ID: HP9A

COLUMN ID: DB1701

|              |        | DATES OF ANALYSIS: FROM: 05 NOV 91 TO: 06 NOV 91 |                       | DATE OF ANALYSIS: 06 NOV 91 |                       | TIME OF ANALYSIS: 10:58 |        |
|--------------|--------|--------------------------------------------------|-----------------------|-----------------------------|-----------------------|-------------------------|--------|
|              |        | TIME OF ANALYSIS: FROM: 15:01 TO: 21:57          |                       | AR 1248                     |                       | PCB# 618                |        |
| COMPOUND     | R<br>T | RT<br>WINDOW<br>FROM TO                          | CALIBRATION<br>FACTOR | R<br>T                      | CALIBRATION<br>FACTOR | QNT<br>Y/N              | %<br>D |
| Aroclor 1016 | 7.14   | 7.04   7.24                                      | 1,132,902             |                             |                       |                         |        |
| Aroclor 1221 | 4.96   | 4.86   5.06                                      | 319,892               |                             |                       |                         |        |
| Aroclor 1232 | 7.15   | 7.05   7.25                                      | 755,112               |                             |                       |                         |        |
| Aroclor 1242 | 7.15   | 7.05   7.25                                      | 1,244,661             |                             |                       |                         |        |
| Aroclor 1248 | 10.55  | 10.45   10.65                                    | 2,181,803             | 10.54                       | 2,261,377             | Y                       | 3.6    |
| Aroclor 1254 | 13.12  | 13.02   13.22                                    | 1,407,292             |                             |                       |                         |        |
| Aroclor 1260 | 19.56  | 19.46   19.66                                    | 2,334,695             |                             |                       |                         |        |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition

FORM IX PCB

600059

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177INSTRUMENT ID: HPGACOLUMN ID: DB1701

| DATES OF ANALYSIS: FROM: 05 NOV 91 TO: 06 NOV 91 |        | DATE OF ANALYSIS: TIME OF ANALYSIS: |                       |        |                       |            |        |
|--------------------------------------------------|--------|-------------------------------------|-----------------------|--------|-----------------------|------------|--------|
| TIME OF ANALYSIS: FROM: 15:01 TO: 21:57          |        | AR <u>1260</u> PCB# <u>614</u>      |                       |        |                       |            |        |
| COMPOUND                                         | R<br>T | RT<br>WINDOW<br>FROM TO             | CALIBRATION<br>FACTOR | R<br>T | CALIBRATION<br>FACTOR | QNT<br>Y/N | %<br>D |
| Aroclor 1016                                     | 7.14   | 7.04   7.24                         | 1.132.902             |        |                       |            |        |
| Aroclor 1221                                     | 4.96   | 4.86   5.06                         | 319.892               |        |                       |            |        |
| Aroclor 1232                                     | 7.15   | 7.05   7.25                         | 755.112               |        |                       |            |        |
| Aroclor 1242                                     | 7.15   | 7.05   7.25                         | 1.244.661             |        |                       |            |        |
| Aroclor 1248                                     | 10.55  | 10.45   10.65                       | 2.181.803             |        |                       |            |        |
| Aroclor 1254                                     | 13.12  | 13.02   13.22                       | 1.407.292             |        |                       |            |        |
| Aroclor 1260                                     | 19.56  | 19.46   19.66                       | 2.334.695             | 19.54  | 2.349.550             | Y          | 0.6    |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition.

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177

INSTRUMENT ID: HP9A

COLUMN ID: DB1701

| DATES OF ANALYSIS: |        | FROM: 05 NOV 91         |                       | DATE OF ANALYSIS: 6 NOV 91 |                       | TIME OF ANALYSIS: 18:04 |        |
|--------------------|--------|-------------------------|-----------------------|----------------------------|-----------------------|-------------------------|--------|
| TIME OF ANALYSIS:  |        | FROM: 15:01             |                       | AR 1248                    |                       | PCB# 1618               |        |
| TO: 06 NOV 91      |        | TO: 21:57               |                       |                            |                       |                         |        |
| COMPOUND           | R<br>T | RT<br>WINDOW<br>FROM TO | CALIBRATION<br>FACTOR | R<br>T                     | CALIBRATION<br>FACTOR | QNT<br>Y/N              | %<br>D |
| Aroclor 1016       | 7.14   | 7.04   7.24             | 1.132.902             |                            |                       |                         |        |
| Aroclor 1221       | 4.96   | 4.86   5.06             | 319.892               |                            |                       |                         |        |
| Aroclor 1232       | 7.15   | 7.05   7.25             | 755.112               |                            |                       |                         |        |
| Aroclor 1242       | 7.15   | 7.05   7.25             | 1.244.661             |                            |                       |                         |        |
| Aroclor 1248       | 10.55  | 10.45   10.65           | 2.181.803             | 10.58                      | 2.188.482             | Y                       | 03     |
| Aroclor 1254       | 13.12  | 13.02   13.22           | 1.407.292             |                            |                       |                         |        |
| Aroclor 1260       | 19.56  | 19.46   19.66           | 2.334.695             |                            |                       |                         |        |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177

INSTRUMENT ID: HP9A

COLUMN ID: DB1701

| DATES OF ANALYSIS: |        | FROM: 05 NOV 91<br>TO: 06 NOV 91 |                       | DATE OF ANALYSIS: 6 NOV 91<br>TIME OF ANALYSIS: 21:23 |                       |            |        |
|--------------------|--------|----------------------------------|-----------------------|-------------------------------------------------------|-----------------------|------------|--------|
| TIME OF ANALYSIS:  |        | FROM: 15:01<br>TO: 21:57         |                       | AR 1248 PCB# 618                                      |                       |            |        |
| COMPOUND           | R<br>T | RT<br>WINDOW<br>FROM TO          | CALIBRATION<br>FACTOR | R<br>T                                                | CALIBRATION<br>FACTOR | QNT<br>Y/N | %<br>D |
| Aroclor 1016       | 7.14   | 7.04   7.24                      | 1.132.902             |                                                       |                       |            |        |
| Aroclor 1221       | 4.96   | 4.86   5.06                      | 319.892               |                                                       |                       |            |        |
| Aroclor 1232       | 7.15   | 7.05   7.25                      | 755.112               |                                                       |                       |            |        |
| Aroclor 1242       | 7.15   | 7.05   7.25                      | 1.244.661             |                                                       |                       |            |        |
| Aroclor 1248       | 10.55  | 10.45   10.65                    | 2.181.803             | 10.65                                                 | 2.206021              | Y          | 1.1    |
| Aroclor 1254       | 13.12  | 13.02   13.22                    | 1.407.292             |                                                       |                       |            |        |
| Aroclor 1260       | 19.56  | 19.46   19.66                    | 2.334.695             |                                                       |                       |            |        |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition.

FORM IX PCB

000082

## PCB STANDARDS SUMMARY

LAB NAME: GALSON LABORATORIES

SDG#: 5177

INSTRUMENT ID: HP9A

COLUMN ID: DB1701

| DATES OF ANALYSIS: |        | FROM: 05 NOV 91<br>TO: 26 NOV 91 |                       | DATE OF ANALYSIS: 6 NOV 91<br>TIME OF ANALYSIS: 21:57 |                       | AR 1260 PCB# 614 |        |
|--------------------|--------|----------------------------------|-----------------------|-------------------------------------------------------|-----------------------|------------------|--------|
| TIME OF ANALYSIS:  |        | FROM: 15:01<br>TO: 21:57         |                       |                                                       |                       |                  |        |
| COMPOUND           | R<br>T | RT<br>WINDOW<br>FROM TO          | CALIBRATION<br>FACTOR | R<br>T                                                | CALIBRATION<br>FACTOR | QNT<br>Y/N       | %<br>D |
| Aroclor 1016       | 7.14   | 7.04   7.24                      | 1.32.902              |                                                       |                       |                  |        |
| Aroclor 1221       | 4.96   | 4.86   5.06                      | 319.892               |                                                       |                       |                  |        |
| Aroclor 1232       | 7.15   | 7.05   7.25                      | 755.112               |                                                       |                       |                  |        |
| Aroclor 1242       | 7.15   | 7.05   7.25                      | 1.244.661             |                                                       |                       |                  |        |
| Aroclor 1248       | 10.55  | 10.45   10.65                    | 2.181.803             |                                                       |                       |                  |        |
| Aroclor 1254       | 13.12  | 13.02   13.22                    | 1.407.292             |                                                       |                       |                  |        |
| Aroclor 1260       | 19.54  | 19.46   19.66                    | 2.334.695             | 19.57                                                 | 2.367.234             | Y                | 14     |

Under QNT Y/N enter Y if quantitation was performed, N if not performed.

% D must be less than or equal to 15% for quantitation, and less than or equal to 20.0 % for confirmation.

NOTE: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification on such analytes is based primarily on pattern recognition

FORM IX PCB

000063

GAS CHROMATOGRAPH PARAMETERS

ANALYSIS: 808C - PAB 7/11

GC ID: HP9A - HP589C - II

COLUMN PACKING: 2B1701

COLUMN DIMENSIONS: 30m x 0.5mm

OVEN TEMPERATURE: 150-200-190-0.5-250-3

INJECTION TEMPERATURE: 220°C

DETECTOR: FID

DETECTOR TEMPERATURE: 300°C

CARRIER GAS: N<sub>2</sub>

FLOW (COLUMN/MAKE-UP): column = 1.1 cc/min, total = 60 cc/min

INSTRUMENT ATTENUATION: 270 = 5^0, range = 271

INJECTION VOLUME: 2.0

OPERATOR: LC

Page 1

081701:150-0-20-190-0-3-250-8: 2UL INJ:\*\*\*\*\*PRIMARY RUN\*\*\*\*\*

Instrument HP9A

multilevel : false

INSTRUMENT HP9A

Calculation      Zero

**Quantitation: Arcsunits**

|          |     |
|----------|-----|
| Dilution | 100 |
|----------|-----|

Run Time : 30.00 Minutes

Injection time: Tue Nov 5, 1991 3:01:16 pm

Run Status RunStatusUK

EndOfBaseline

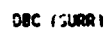
| Ok # | RT      | Area   | Group | UG/ML   | Name |
|------|---------|--------|-------|---------|------|
| 1    | 36      | 79254  |       | 3.27804 |      |
| 2    | 1.15    | 44380  |       | 1.33560 |      |
| 3    | 1.23    | 61537  |       | 2.54525 |      |
| 4    | 1.37    | 19460  |       | 80489   |      |
| 5    | 1.53    | 1073   |       | 04440   |      |
| 6    | 1.72    | 2676   |       | 15204   |      |
| 7    | 1.88    | 3479   |       | 14391   |      |
| 8    | 1.95    | 2463   |       | 10187   |      |
| 9    | 2.11    | 7302   |       | 30201   |      |
| 10   | 2.20    | 2816   |       | 11647   |      |
| 11   | 2.10    | 11295  |       | 46346   |      |
| 12   | 3.58    | 3955   |       | 16560   |      |
| 13   | 4.12    | 1159   |       | 04793   |      |
| 14   | 4.51    | 1191   |       | 04925   |      |
| 15   | 4.95    | 5395   |       | 22315   |      |
| 16   | 5.42    | 1648   |       | 26816   |      |
| 17   | 5.55    | 2142   |       | 08859   |      |
| 18   | 5.86 1  | 38669  |       | 1.59938 |      |
| 19   | 5.15    | 2089   |       | 28639   |      |
| 20   | 5.38    | 10975  |       | 45394   |      |
| 21   | 5.52    | 12749  |       | 52732   |      |
| 22   | 5.38    | 5937   |       | 24556   |      |
| 23   | 7.10 2  | 70235  |       | 3.73222 |      |
| 24   | 7.52    | 52653  |       | 2.17780 |      |
| 25   | 7.37    | 35164  |       | 1.45441 |      |
| 26   | 8.21 3  | 154772 |       | 6.40154 |      |
| 27   | 9.06 4  | 123349 |       | 0.00000 |      |
| 28   | 9.15    | 46129  |       | 0.00000 |      |
| 29   | 10.11 6 | 70980  |       | 0.00000 |      |
| 30   | 10.55 7 | 188196 |       | 0.00000 |      |
| 31   | 11.01   | 14616  |       | 0.00000 |      |
| 32   | 11.50 8 | 153555 |       | 0.00000 |      |
| 33   | 12.28   | 32198  |       | 0.00000 |      |
| 34   | 12.69   | 43128  |       | 0.00000 |      |
| 35   | 13.11   | 48918  |       | 0.00000 |      |
| 36   | 13.78   | 22824  |       | 0.00000 |      |
| 37   | 14.23   | 30745  |       | 0.00000 |      |
| 38   | 14.42   | 4199   |       | 0.00000 |      |
| 39   | 14.81   | 6085   |       | 0.00000 |      |
| 40   | 15.17   | 2475   |       | 0.00000 |      |
| 41   | 15.78   | 22437  |       | 0.00000 |      |
| 42   | 16.42   | 12209  |       | 0.00000 |      |

Σ-910885  
R4-2271212

000065

```
Report Time: Wed Nov 9 1991 9:15:20 AM
Method: DATA/LOOP/METHOD/MP9A_PCB.MTH
Format File: DATA/LOOP/FORMAT/SIDE.FMT
```

| DATE    | DESCRIPTION | AMOUNT | BALANCE |
|---------|-------------|--------|---------|
| 10/1/57 | 0000000     |        | 1810000 |
|         | -----       |        | -----   |
| 10/1/57 | 0000000     | 20127  | 1830127 |
|         | 0000000     | 10000  | 1930127 |
|         | 0000000     | 10000  | 2030127 |



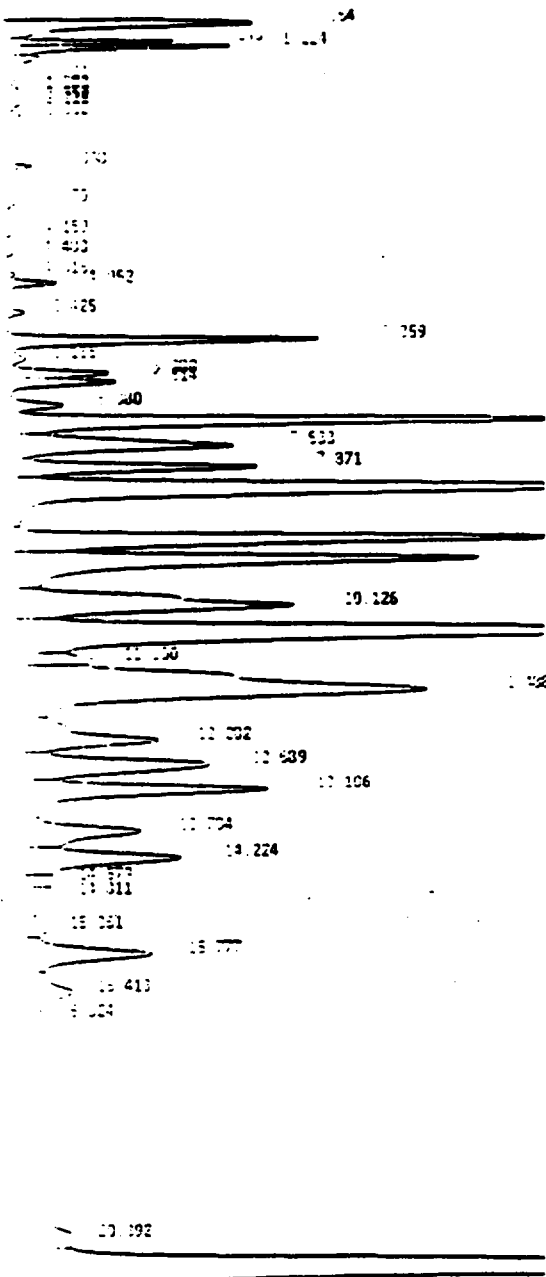
| PK # | RT    | Area   | Group | UG/ML   | Name |
|------|-------|--------|-------|---------|------|
| 1    | 16    | 109649 |       | 2.28327 |      |
| 2    | 1.15  | 47331  |       | .08559  |      |
| 3    | 1.23  | 66500  |       | 1.28476 |      |
| 4    | 1.38  | 20673  |       | 43047   |      |
| 5    | 1.73  | 4507   |       | .09384  |      |
| 6    | 1.38  | 1429   |       | .07141  |      |
| 7    | 1.35  | 2270   |       | .4726   |      |
| 8    | 1.11  | 5817   |       | .4196   |      |
| 9    | 1.20  | 1490   |       | .5185   |      |
| 10   | 5.43  | 4013   |       | 0.00000 |      |
| 11   | 5.55  | 2502   |       | 0.00000 |      |
| 12   | 5.27  | 15744  |       | 0.00000 |      |
| 13   | 5.11  | 5541   |       | 0.00000 |      |
| 14   | 5.13  | 16099  |       | 0.00000 |      |
| 15   | 6.52  | 28379  |       | 0.00000 |      |
| 16   | 5.68  | 15264  |       | 0.00000 |      |
| 17   | 5.2   | 102973 |       | 0.00000 |      |
| 18   | 5.54  | 105944 |       | 0.00000 |      |
| 19   | 7.38  | 31153  |       | 0.00000 |      |
| 20   | 5.23  | 132780 |       | 0.00000 |      |
| 21   | 5.03  | 122507 |       | 0.00000 |      |
| 22   | 5.15  | 114942 |       | 0.00000 |      |
| 23   | 5.15  | 103945 |       | 0.00000 |      |
| 24   | 5.54  | 108435 |       | 0.00000 |      |
| 25   | 10.39 | 14054  |       | 0.00000 |      |
| 26   | 11.14 | 53099  |       | 0.00000 |      |
| 27   | 12.27 | 76734  |       | 0.00000 |      |
| 28   | 12.58 | 103013 |       | 0.00000 |      |
| 29   | 13.10 | 114028 |       | 0.00000 |      |
| 30   | 13.77 | 55011  |       | 0.00000 |      |
| 31   | 14.22 | 75816  |       | 0.00000 |      |
| 32   | 14.41 | 9725   |       | 0.00000 |      |
| 33   | 14.31 | 14424  |       | 0.00000 |      |
| 34   | 15.15 | 5835   |       | 0.00000 |      |
| 35   | 15.77 | 59650  |       | 0.00000 |      |
| 36   | 15.41 | 25708  |       | 0.00000 |      |
| 37   | 16.31 | 1382   |       | 0.00000 |      |
| 38   | 10.39 | 15851  |       | 0.00000 |      |
| 39   | 20.39 | 101236 |       | 0.00000 |      |

|       |   |       |       |
|-------|---|-------|-------|
| Years | 3 | 30000 | UG/ML |
|-------|---|-------|-------|

Report Time: Wed Nov 6, 1991 6:17:23 pm  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format file: /DATA/LOOP/FORMAT/SIDE.FMT

000067

Result File HP9A/HP9A\_110591GR004 RES Page 1  
 Sample Name FVAL CSTD 3.1.PCB 513 1.0 UG/ML  
 DB1701:150-0-20-190-0-1-250-8: 2ul INJ:=====PRIMARY RUN=====  
 Peak Processor Genie Multilevel False  
 Instrument HP9A  
 Calculation Zero Quantitation: AreasUnits  
 Dilution 100  
 Run Time 30.00 Minutes  
 Injection time Tue Nov 5, 1991 4 07:37 pm  
 Run Status RunStatusOK  
 EndOfBaseline



|         |       |         |         |         |         |
|---------|-------|---------|---------|---------|---------|
| 1       | 20.90 | 1518635 | 0.00000 | 0.00000 | 0.00000 |
| 2       |       |         |         |         |         |
| 3       |       |         |         |         |         |
| 4       | 20.90 | 1518635 | 0.00000 | 0.00000 | 0.00000 |
| -----   |       |         |         |         |         |
| Totals: |       | 0       | 0.00000 | 0.00000 | 0.00000 |

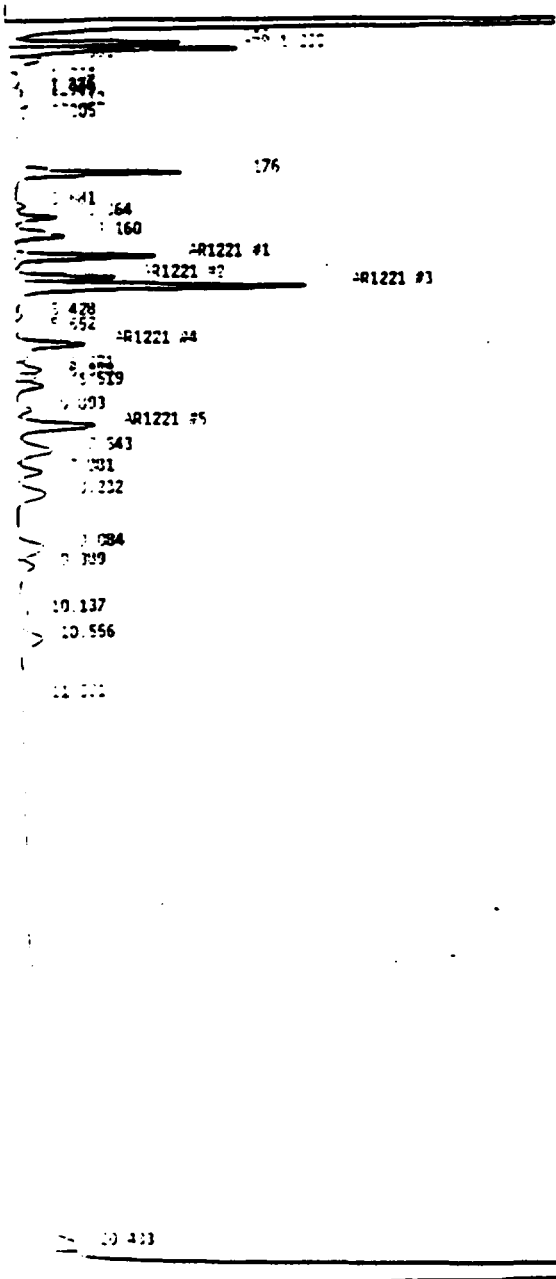
0.00000 0.00000 0.00000

0.00000 0.00000 0.00000

Report Time: Wed Nov 6, 1991 6:11:29 am  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000069

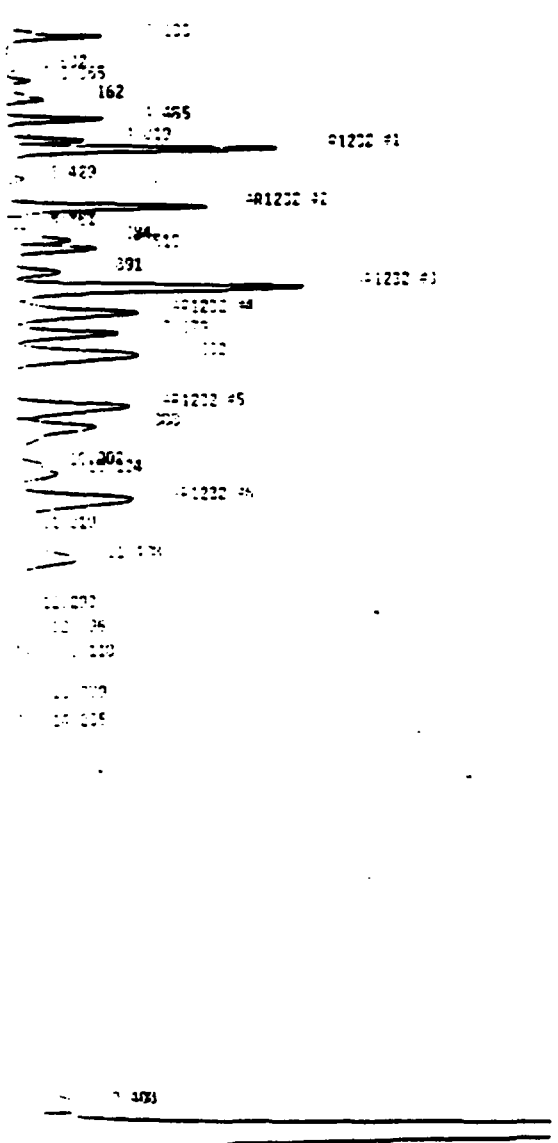




Result File -P9A/HP9A\_110591GR006.RES Page 1  
 Sample Name AR1221 STD 1.1.PCB 587 0.5 UG/ML  
 DB1701.150-U-20-199-0-1-250-8: 2uL INJ:=====PRIMARY RUN=====  
 Peak Processor Genie Multilevel False  
 Instrument HP9A  
 Calculation Zero Quantitation: AreaUnits  
 Dilution 100  
 Run Time 10.00 Minutes  
 Injection time Tue Nov 5, 1991 5:14:08 pm  
 Run Status RunStatusOK  
 EndOffBaseline

| pk #    | RT    | Area    | Group | UG/ML    |              |
|---------|-------|---------|-------|----------|--------------|
| 1       | 1.20  | 409165  |       | 12.91070 |              |
| 2       | 1.15  | 51543   |       | 1.75235  |              |
| 3       | 1.23  | 71558   |       | 2.43282  |              |
| 4       | 1.38  | 21451   |       | 72929    |              |
| 5       | 1.73  | 5954    |       | 20241    |              |
| 6       | 1.29  | 3918    |       | 13321    |              |
| 7       | 1.35  | 1773    |       | 59429    |              |
| 8       | 1.11  | 1722    |       | 29652    |              |
| 9       | 1.11  | 4396    |       | 14947    |              |
| 10      | 1.13  | 53735   |       | 1.09686  |              |
| 11      | 1.58  | 1412    |       | 11599    |              |
| 12      | 1.26  | 15397   |       | 12348    |              |
| 13      | 1.16  | 15089   |       | 18696    |              |
| 14      | 1.48  | 54281   |       | 1.84542  | AR1221 #1    |
| 15      | 1.82  | 7893    |       | 1.28828  | AR1221 #2    |
| 16      | 1.96  | 115546  |       | 1.64227  | AR1221 #3    |
| 17      | 1.43  | 1157    |       | 10732    |              |
| 18      | 1.55  | 1643    |       | 95585    |              |
| 19      | 1.37  | 42836   |       | 1.45634  | AR1221 #4    |
| 20      | 1.27  | 14066   |       | 47823    |              |
| 21      | 1.38  | 3086    |       | 10889    |              |
| 22      | 1.52  | 15027   |       | 51038    |              |
| 23      | 1.39  | 1451    |       | 23731    |              |
| 24      | 1.15  | 48336   |       | 1.64333  | AR1221 #5    |
| 25      | 1.54  | 10503   |       | 1.03703  |              |
| 26      | 1.28  | 15881   |       | 53990    |              |
| 27      | 1.23  | 17395   |       | 13117    |              |
| 28      | 1.08  | 15482   |       | 36635    |              |
| 29      | 1.39  | 15717   |       | 53435    |              |
| 30      | 10.14 | 3291    |       | 28188    |              |
| 31      | 10.56 | 11733   |       | 30647    |              |
| 32      | 11.50 | 16440   |       | 55893    |              |
| 33      | 10.43 | 19175   |       | 0.00000  |              |
| 34      | 10.31 | 1561880 |       | 0.00000  | DBC (CURR) * |
| Totals: |       |         |       | 0.00000  | UG/ML        |

Result File: HP9A/HP9A\_110591GR007 REC Page 1  
 Sample Name: 01232 STD 1.1 PCB 635 0.5 UG/ML  
 081701.150-0-20-100-0-1-250-8: 2UL (NJ)\*\*\*\*\*PRIMARY RUN\*\*\*\*\*  
 Peak Processor: Gentle Multilevel: False  
 Instrument: HP9A  
 Calculation: Zero Quantitation: AreaUNITS  
 Dilution: 1.00  
 Run Time: 00 00 Minutes  
 Injection Time: Tue Nov 5 1991 5:47:35 PM  
 Run Status: RunStatusOK  
 EndOffBaseline



Sample Name: -R1242 STD 1.1.PCB 622 0.5 UG/ML

281701:150-0-20-190-0-1-250-0: 2UL INJ:\*\*\*\*\*MAY RUN\*\*\*\*\*

Peak Processor: Gentle Multilevel: False

Instrument: HP9A

Calibration: Zero Quantitation: AREASUNITS

Dilution: 100

Run Time: 30.00 Minutes

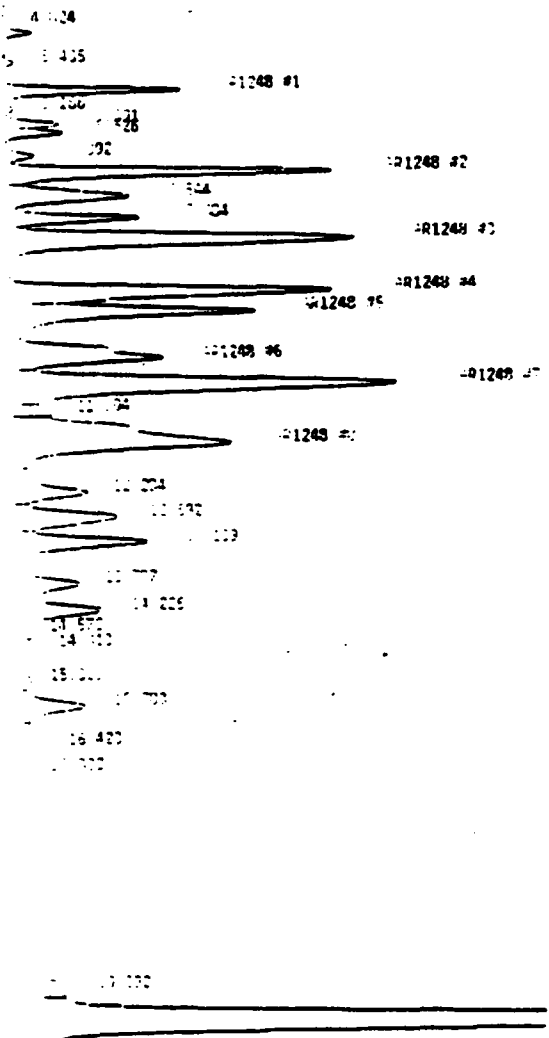
Injection time: Tue Nov 5, 1991 6:20:49 PM

Run Status: RUNSTATUSOK

EndOfBaseline

| -R1242 # | RT    | Area    | Group | UG/ML   | Name          |
|----------|-------|---------|-------|---------|---------------|
| 1        | 2.58  | 3356    |       | 06222   |               |
| 2        | 4.16  | 14374   |       | 25645   |               |
| 3        | 4.32  | 1066    |       | 91975   |               |
| 4        | 4.49  | 17266   |       | 22006   |               |
| 5        | 4.82  | 21098   |       | 39109   |               |
| 6        | 4.97  | 103831  |       | 0.00000 | AR1242 #1     |
| 7        | 5.43  | 14685   |       | 27222   |               |
| 8        | 5.56  | 4763    |       | 38829   |               |
| 9        | 5.77  | 174554  |       | 2.2564  | AR1242 #2     |
| 10       | 6.16  | 13220   |       | 17041   |               |
| 11       | 6.39  | 51203   |       | 1.17158 | AR1242 #3     |
| 12       | 6.52  | 35728   |       | 1.56912 | AR1242 #4     |
| 13       | 6.29  | 58090   |       | 1.07579 | AR1242 #5     |
| 14       | 7.15  | 140891  |       | 6.11098 | AR1242 #6     |
| 15       | 7.55  | 132826  |       | 2.57435 | AR1242 #7     |
| 16       | 7.78  | 134313  |       | 2.48971 |               |
| 17       | 8.24  | 254572  |       | 4.71292 |               |
| 18       | 9.07  | 226397  |       | 4.19664 | AR1242 #8     |
| 19       | 9.29  | 109913  |       | 2.52036 |               |
| 20       | 10.00 | 46817   |       | 26783   |               |
| 21       | 10.14 | 37813   |       | 1.62776 |               |
| 22       | 10.55 | 196766  |       | 5.31569 |               |
| 23       | 11.22 | 19372   |       | 15910   |               |
| 24       | 11.50 | 221211  |       | 4.10052 |               |
| 25       | 12.29 | 38457   |       | 1237    |               |
| 26       | 12.70 | 49684   |       | 32097   |               |
| 27       | 13.12 | 49817   |       | 22345   |               |
| 28       | 13.80 | 11124   |       | 58061   |               |
| 29       | 14.24 | 17782   |       | 79036   |               |
| 30       | 14.60 | 1793    |       | 37011   |               |
| 31       | 14.83 | 5086    |       | 12281   |               |
| 32       | 15.38 | 2551    |       | 54158   |               |
| 33       | 15.79 | 25826   |       | 49726   |               |
| 34       | 16.40 | 43700   |       | 0.00000 |               |
| 35       | 20.90 | 1317515 |       | 0.00000 | DEC (SURR)    |
| Totals   |       |         |       |         | 0.00000 UG/ML |

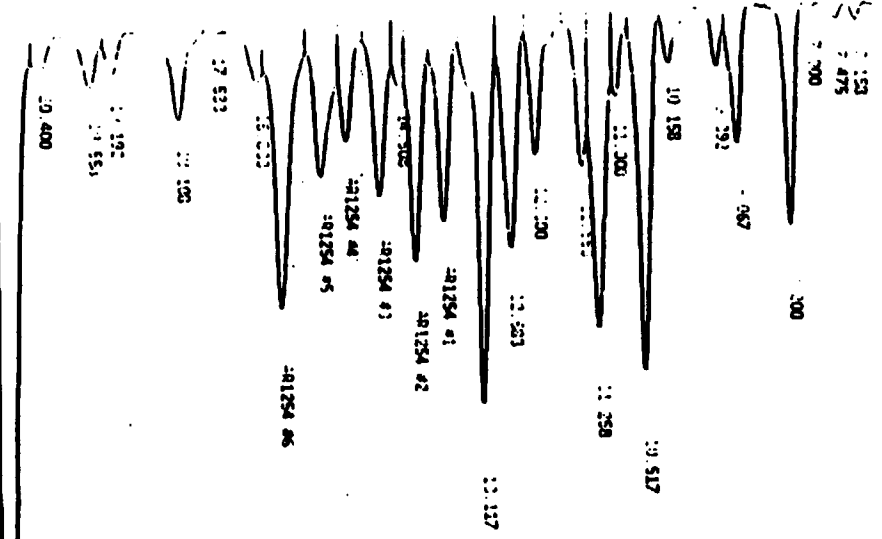
-Suite - PPA/HPPA\_110591G2009 REC Page 1  
 Sample Name -R1248 STD 1.1.PCB 613 C 500/ML  
 31701.150-0-20-150-0-1-250-8: LUL INJ:====@MARY RUN====  
 Peak Processing Date Multilevel False  
 Instrument HPPA  
 Calculation Zero Anticipation: AreaUnits  
 Dilution 100  
 Run Time 10.00 Minutes  
 Injection time Tue Nov 5, 1991 6:54 01 am  
 Run Status RunStatusOK  
 EndOffBaseline



| Peak # | RT    | Area    | Group | UG/ML   | Name      |
|--------|-------|---------|-------|---------|-----------|
| 1      | 10.02 | 2647    |       | 04696   |           |
| 2      | 10.43 | 1735    |       | 38398   |           |
| 3      | 10.67 | 28362   |       | 1.56731 | R1248 #1  |
| 4      | 10.17 | 5227    |       | 09271   |           |
| 5      | 10.39 | 27256   |       | 18523   |           |
| 6      | 10.53 | 10911   |       | 54828   |           |
| 7      | 10.69 | 16043   |       | 10456   |           |
| 8      | 10.85 | 109909  |       | 3.72320 | R1248 #2  |
| 9      | 10.94 | 111168  |       | 1.37126 |           |
| 10     | 10.99 | 35081   |       | 1.50914 |           |
| 11     | 11.02 | 139748  |       | 5.20369 | R1248 #3  |
| 12     | 11.06 | 139137  |       | 5.12360 | R1248 #4  |
| 13     | 11.08 | 120824  |       | 4.05890 | R1248 #5  |
| 14     | 11.14 | 137261  |       | 0.00000 | R1248 #6  |
| 15     | 11.55 | 142503  |       | 7.84894 | R1248 #7  |
| 16     | 11.30 | 13330   |       | 59120   |           |
| 17     | 11.49 | 136004  |       | 6.34679 | R1248 #8  |
| 18     | 11.23 | 11915   |       | 1.63034 |           |
| 19     | 11.59 | 120017  |       | 2.12302 |           |
| 20     | 11.11 | 133601  |       | 1.16977 |           |
| 21     | 11.79 | 11781   |       | 1.37300 |           |
| 22     | 14.13 | 10995   |       | 1.51401 |           |
| 23     | 14.57 | 11686   |       | 10729   |           |
| 24     | 14.31 | 11286   |       | 17756   |           |
| 25     | 15.17 | 12027   |       | 11331   |           |
| 26     | 15.70 | 70340   |       | 1.15654 |           |
| 27     | 15.42 | 12505   |       | 75394   |           |
| 28     | 15.33 | 3986    |       | 17712   |           |
| 29     | 20.39 | 10648   |       | 0.00000 |           |
| 30     | 20.30 | 1572791 |       | 0.00000 | R1248 #28 |
| Totals |       |         |       | 0.00000 | UG/ML     |

000074

Result File: HP9A/HP9A\_110591GR010.RCS  
 Sample Name: A01254 STD 1.1.PCR 620 0.5 UG/ML  
 081701:150-0-20-190-0-1-250-8: 2UL (M):\*\*\*\*\*  
 \*\*\* Processor: None Multilevel: false  
 Instrument: HP9A  
 Calculation: Zero Quantitation: Averages  
 Dilution: 100  
 Run Time: 10.00 Minutes  
 Injection time: Tue Nov 5, 1991 7:27:17 am  
 Run Status: RunStatusOK  
 EndOfBaseline



| PK # | RT   | Area    | Group | UG/ML   | Name |
|------|------|---------|-------|---------|------|
| 1    | 1.15 | 127878  |       | 1.93393 |      |
| 2    | 1.15 | 1414    |       | 0.00000 |      |
| 3    | 1.22 | 4279    |       | 0.00000 |      |
| 4    | 1.22 | 2679    |       | 0.00000 |      |
| 5    | 1.31 | 5642    |       | 0.00000 |      |
| 6    | 1.51 | 1480    |       | 0.00000 |      |
| 7    | 2.12 | 1947    |       | 0.00000 |      |
| 8    | 2.21 | 1291    |       | 0.00000 |      |
| 9    | 2.22 | 1734    |       | 0.00000 |      |
| 10   | 2.29 | 1680    |       | 0.00000 |      |
| 11   | 2.36 | 1357    |       | 0.00000 |      |
| 12   | 2.38 | 11392   |       | 0.00000 |      |
| 13   | 2.90 | 1088    |       | 0.00000 |      |
| 14   | 2.20 | 177888  |       | 0.00000 |      |
| 15   | 2.07 | 113199  |       | 0.00000 |      |
| 16   | 2.39 | 17873   |       | 0.00000 |      |
| 17   | 2.15 | 50178   |       | 0.00000 |      |
| 18   | 2.52 | 162152  |       | 0.00000 |      |
| 19   | 2.01 | 51212   |       | 0.00000 |      |
| 20   | 2.25 | 263249  |       | 0.00000 |      |
| 21   | 2.15 | 116256  |       | 0.00000 |      |
| 22   | 2.20 | 151311  |       | 0.00000 |      |
| 23   | 2.63 | 154816  |       | 0.00000 |      |
| 24   | 2.12 | 126862  |       | 0.00000 |      |
| 25   | 2.29 | 124164  |       | 0.00000 |      |
| 26   | 2.21 | 154328  |       | 0.00000 |      |
| 27   | 2.51 | 13055   |       | 0.00000 |      |
| 28   | 2.83 | 121943  |       | 0.00000 |      |
| 29   | 2.17 | 110837  |       | 0.00000 |      |
| 30   | 2.78 | 119017  |       | 0.00000 |      |
| 31   | 2.42 | 135003  |       | 0.00000 |      |
| 32   | 2.83 | 69526   |       | 0.00000 |      |
| 33   | 2.73 | 1783    |       | 0.00000 |      |
| 34   | 2.11 | 112776  |       | 0.00000 |      |
| 35   | 2.19 | 18960   |       | 0.00000 |      |
| 36   | 2.56 | 11511   |       | 0.00000 |      |
| 37   | 2.40 | 13980   |       | 0.00000 |      |
| 38   | 2.90 | 1722971 |       | 0.00000 |      |
| 39   | 2.23 | 11405   |       | 0.00000 |      |

Report Time: Thu Nov 7, 1991 4:57:10 pm  
 Method: /DATA/LOOP/METHOD/HP9A.PCR.MTH  
 Source File: /DATA/LOOP/FORMAT/SIDE.FMT

0000075

Result File: -DATA/MP9A\_110591GR011.RE7  
 Page 1  
 Sample Name: -R1260 STD 1.1.PCB 614 0.5 UG/ML  
 DB1781.155-0-09-190-0-3-250-B: 2uL INJ-----PRIMARY RUN-----  
 Peak Processor: Single Multilevel: False  
 Instrument: -MP9A  
 Calculation: Zero Quantitation: AreaUnits  
 Dilution: 100  
 Run Time: 0.02 Minutes  
 Injection time: Tue Nov 5, 1991 8:00:10 am  
 Run Status: RunStatusOK  
 EndOfBaseline

| PK #    | RT    | Area    | Group | UG/ML   | Name         |
|---------|-------|---------|-------|---------|--------------|
| 1       | 10.53 | 112113  |       | 0.00000 |              |
| 2       | 11.01 | 17441   |       | 0.00000 |              |
| 3       | 11.24 | 133505  |       | 0.00000 |              |
| 4       | 11.54 | 14059   |       | 0.00000 |              |
| 5       | 12.10 | 15996   |       | 0.00000 |              |
| 6       | 12.79 | 13682   |       | 0.00000 |              |
| 7       | 12.83 | 117670  |       | 0.00000 | R1260 #1     |
| 8       | 13.18 | 1222    |       | 0.00000 |              |
| 9       | 13.77 | 12046   |       | 0.00000 | R1260 #2     |
| 10      | 14.07 | 14922   |       | 0.00000 |              |
| 11      | 14.52 | 14604   |       | 0.00000 |              |
| 12      | 14.55 | 144403  |       | 0.00000 | R1260 #3     |
| 13      | 15.00 | 131732  |       | 0.00000 |              |
| 14      | 15.62 | 111283  |       | 0.00000 |              |
| 15      | 16.42 | 184484  |       | 0.00000 | R1260 #4     |
| 16      | 17.57 | 17389   |       | 0.00000 |              |
| 17      | 18.11 | 169497  |       | 0.00000 |              |
| 18      | 18.24 | 108867  |       | 0.00000 |              |
| 19      | 18.19 | 17065   |       | 0.00000 |              |
| 20      | 18.55 | 186092  |       | 0.00000 | R1260 #5     |
| 21      | 20.29 | 19369   |       | 0.00000 |              |
| 22      | 20.51 | 1790992 |       | 0.00000 | IBC (SURR) * |
| 23      | 21.00 | 112407  |       | 0.00000 |              |
| 24      | 22.02 | 11395   |       | 0.00000 |              |
| 25      | 22.47 | 13042   |       | 0.00000 | R1260 #6     |
| 26      | 22.14 | 18903   |       | 0.00000 |              |
| 27      | 24.74 | 159475  |       | 0.00000 |              |
| 28      | 25.51 | 12560   |       | 0.00000 | IBC (SURR) * |
| 29      | 27.53 | 1699    |       | 0.00000 |              |
| Totals: |       |         |       | 0.00000 | UG/ML        |

Report Time: Thu Nov 7, 1991 5:00:53 am  
 Method: -DATA/LOOP/METHOD/MP9A.PCB.MTH  
 Format: -DATA/LOOP/FORMAT/SIDE.FMT

000078

Result File : /HP9A/HP9A\_110591CR016.RES

Page 1

Sample Name : HEXANE.1.1.

DB1701:150-0-20-190-0-3-250-0: 2ul INJ:====PRIMARY RUN=====

Peak Processor : Genie

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreaUnits

Dilution : 100

Run Time : 30.00 Minutes

Injection time : Tue Nov 5. 1991 10:46:31 pm

Run Status : RunStatusOK

EndOffBaseline

| PK # | RT    | Area   | Group | UG/ML   | Name         |
|------|-------|--------|-------|---------|--------------|
| 1    | 20.40 | 16318  |       | 0.00000 |              |
| 2    | 20.91 | 646019 |       | 0.00000 | DBC (SURR) * |

Totals: 0 0.00000 UG/ML

20.400

DBC (SURR) \*

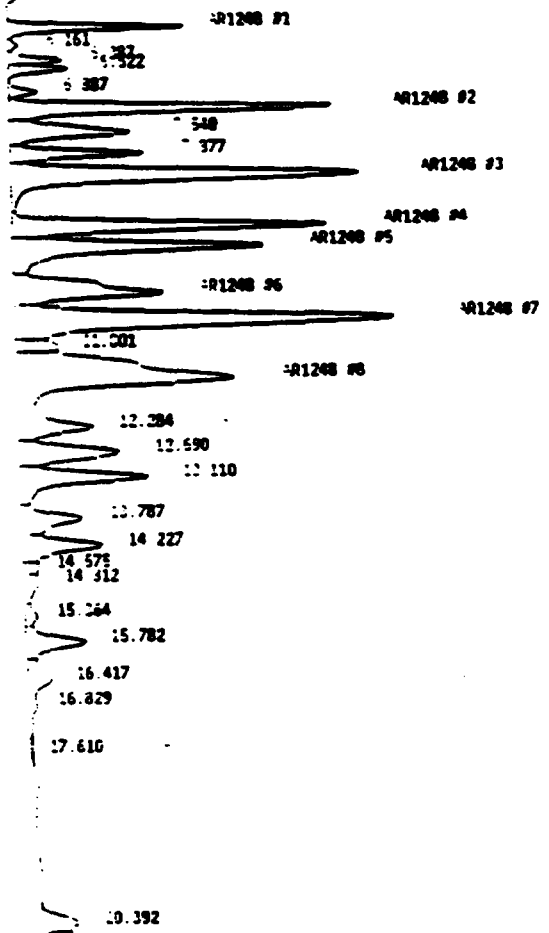
Report Time: Fri Nov 8. 1991 2:52:55 pm

Method: /DATA/LOOP/METHOD/HP9A\_PCS.MTH

Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000077

Result File: HP9A/HP9A\_110591GR017.RES Page 1  
 Sample Name: AR1248.OCCS 1.1.PCR 618  
 DB1701:150-0-20-190-0-3-250-8: 2uL INJ:ccccccPRIMARY RUNNER  
 Peak Processor: Genie Multilevel: False  
 Instrument: HP9A  
 Calculation: Zero Quantitation: AreaUnits  
 Dilution: 100  
 Run Time: 30.00 Minutes  
 Injection time: Tue Nov 5. 1991 11:19:44 pm  
 Run Status: RunStatusOK  
 EndOffBaseline



| PK # | RT    | Area    | Group | UG/ML   | Name       |
|------|-------|---------|-------|---------|------------|
| 1    | 5.87  | 37819   |       | 1.62839 | AR1248 #1  |
| 2    | 6.16  | 5756    |       | 1.0672  |            |
| 3    | 6.19  | 26960   |       | 4.9990  |            |
| 4    | 6.52  | 31276   |       | 5.7993  |            |
| 5    | 6.89  | 16180   |       | 3.0801  |            |
| 6    | 7.14  | 107804  |       | 3.86320 | AR1248 #2  |
| 7    | 7.54  | 108839  |       | 2.01814 |            |
| 8    | 7.58  | 86227   |       | 1.59886 |            |
| 9    | 8.22  | 155550  |       | 6.59279 | AR1248 #3  |
| 10   | 9.05  | 246976  |       | 4.57954 | AR1248 #4  |
| 11   | 9.38  | 232471  |       | 4.31059 | AR1248 #5  |
| 12   | 10.13 | 178822  |       | 3.31581 | AR1248 #6  |
| 13   | 10.55 | 438118  |       | 8.12379 | AR1248 #7  |
| 14   | 11.00 | 35170   |       | 1.65214 |            |
| 15   | 11.50 | 392391  |       | 7.27591 | AR1248 #8  |
| 16   | 12.28 | 98452   |       | 1.82555 |            |
| 17   | 12.69 | 121563  |       | 2.25408 |            |
| 18   | 13.11 | 137791  |       | 2.55499 |            |
| 19   | 13.79 | 73815   |       | 1.36872 |            |
| 20   | 14.23 | 38564   |       | 1.64220 |            |
| 21   | 14.58 | 13553   |       | 2.5130  |            |
| 22   | 14.81 | 25738   |       | 4.7725  |            |
| 23   | 15.36 | 14410   |       | 2.6719  |            |
| 24   | 15.78 | 68958   |       | 1.27865 |            |
| 25   | 16.42 | 42105   |       | 7.8074  |            |
| 26   | 16.83 | 15584   |       | 2.8897  |            |
| 27   | 17.61 | 3689    |       | 0.6841  |            |
| 28   | 20.19 | 41727   |       | 0.00000 |            |
| 29   | 20.90 | 1557402 |       | 0.00000 | DBC (SURR) |

E=2,139,951  
1.9%

Totals: 0 0.00000 UG/ML

254  
232  
1.775  
1.886  
2.102  
2.306

1.102  
1.682  
4.320  
4.968

7.476

9.163

20.408

Result File : /HP9A/HP9A\_110591CR022.RES Page 1  
 Sample Name : HEXANE.1.1.  
 081701:150-0-20-190-0-3-250-8: 2uL INJ:overPRIMARY RUNover  
 Peak Processor : Gentle Multilevel : False  
 Instrument : HP9A  
 Calculation : Zero Quantitation: AreaUnits  
 Dilution : 100  
 Run Time : 30.00 Minutes  
 Injection time : Wed Nov 6. 1991 2:05:47 am  
 Run Status : RunStatusOK  
 EndOfBaseline

| PK #    | RT    | Area   | Group | UG/ML   | Name          |
|---------|-------|--------|-------|---------|---------------|
| 1       | .85   | 73844  |       | 5.66163 |               |
| 2       | 1.15  | 29088  |       | 2.23822 |               |
| 3       | 1.23  | 42521  |       | 3.26814 |               |
| 4       | 1.37  | 12997  |       | .99652  |               |
| 5       | 1.73  | 3423   |       | .26246  |               |
| 6       | 1.89  | 2930   |       | .22468  |               |
| 7       | 1.95  | 2175   |       | .16674  |               |
| 8       | 2.11  | 6352   |       | .48699  |               |
| 9       | 2.31  | 4104   |       | .31466  |               |
| 10      | 3.10  | 7108   |       | .54501  |               |
| 11      | 3.68  | 4387   |       | .33638  |               |
| 12      | 4.32  | 1225   |       | .09395  |               |
| 13      | 4.97  | 1599   |       | .12260  |               |
| 14      | 7.48  | 3497   |       | .26814  |               |
| 15      | 9.16  | 5643   |       | .43265  |               |
| 16      | 20.41 | 13775  |       | 0.00000 |               |
| 17      | 20.90 | 637990 |       | 0.00000 | CBC (SURR) *  |
| Totals: |       |        |       | 0       | 0.00000 UG/ML |

CBC (SURR) \*

Report Time: Fri Nov 8. 1991 2:47:41 pm  
 Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
 Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000079

Sample Name : AR1260.OCCS 1.1.PCB 614

DB1701:150-0-20-190-0-3-250-0: 2uL INJ:\*\*\*\*PRIMARY RUN\*\*\*\*

Peak Processor : Gentle

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreaUnits

Dilution : 100

Run Time : 30.02 Minutes

Injection time : Wed Nov 6, 1991 2:38:57 am

Run Status : RunStatusOK

EndOfBaseline

| PK # | RT    | Area    | Group | UG/ML   | Name         |
|------|-------|---------|-------|---------|--------------|
| 1    | 7.88  | 1715    |       | .02369  |              |
| 2    | 9.19  | 12341   |       | .17051  |              |
| 3    | 9.12  | 7545    |       | .10425  |              |
| 4    | 9.39  | 2528    |       | .03492  |              |
| 5    | 10.49 | 118866  |       | 1.64231 |              |
| 6    | 11.00 | 16166   |       | .22335  |              |
| 7    | 11.23 | 131143  |       | 1.81194 |              |
| 8    | 11.53 | 12573   |       | .17372  |              |
| 9    | 12.20 | 5212    |       | 0.00000 |              |
| 10   | 12.79 | 34136   |       | 0.00000 |              |
| 11   | 13.12 | 223230  |       | 0.00000 | AR1260 #1    |
| 12   | 13.37 | 66753   |       | 0.00000 |              |
| 13   | 13.77 | 298482  |       | 0.00000 | AR1260 #2    |
| 14   | 14.26 | 41732   |       | 0.00000 |              |
| 15   | 14.51 | 58887   |       | 0.00000 |              |
| 16   | 14.82 | 139551  |       | 0.00000 | AR1260 #3    |
| 17   | 15.34 | 199414  |       | 0.00000 |              |
| 18   | 15.61 | 182312  |       | 0.00000 |              |
| 19   | 15.42 | 842029  |       | 0.00000 | AR1260 #4    |
| 20   | 17.56 | 66094   |       | 0.00000 |              |
| 21   | 18.10 | 271032  |       | 0.00000 |              |
| 22   | 18.34 | 179516  |       | 0.00000 |              |
| 23   | 19.19 | 51028   |       | 0.00000 |              |
| 24   | 19.55 | 558040  |       | 0.00000 | AR1260 #5    |
| 25   | 20.38 | 59261   |       | 0.00000 |              |
| 26   | 20.90 | 1704506 |       | 0.00000 | OBC (SURR) * |
| 27   | 21.28 | 414583  |       | 0.00000 |              |
| 28   | 22.01 | 21830   |       | 0.00000 |              |
| 29   | 22.45 | 11041   |       | 0.00000 |              |
| 30   | 23.13 | 64866   |       | 0.00000 |              |
| 31   | 24.74 | 149915  |       | 0.00000 |              |
| 32   | 26.52 | 48638   |       | 0.00000 |              |
| 33   | 27.53 | 11143   |       | 0.00000 |              |
| 34   | 29.82 | 1815    |       | .02508  |              |

Totals: 0 0.00000 UG/ML

Report Time: Fri Nov 8, 1991 2:44:46 pm

Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH

Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000080

Sample Name : AR1248.DCS 1.1.PCB 618 0.5 ug/mL

001701:150-0-20-130-0-3-250-0: 2dL [M]:secondary reference

Peak Processor : Genie

MultiLevel : False

Instrument : MP9A

Calibration : Zero

Quantitation: Area/units

Dilution : 100

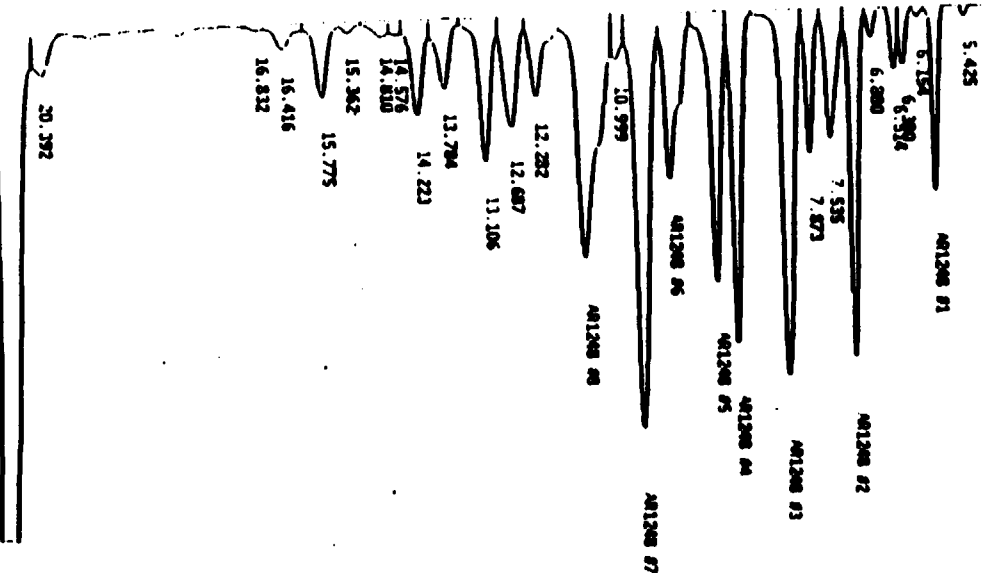
Run Time : 10.00 minutes

Injection time : Wed Nov 6, 1991 10:58:11 am

Run Status :

RunStatusOK

EndOfBaseline



| PK #    | RT    | Area    | Group   | ug/mL   | Name      |
|---------|-------|---------|---------|---------|-----------|
| 1       | 5.43  | 4640    |         | .00096  |           |
| 2       | 5.86  | 91024   |         | 1.50040 | AR1248 #1 |
| 3       | 6.15  | 5679    |         | .07911  |           |
| 4       | 6.38  | 28228   |         | .49269  |           |
| 5       | 6.51  | 11926   |         | .55712  |           |
| 6       | 6.88  | 16808   |         | .28947  |           |
| 7       | 7.14  | 220215  |         | 3.84285 | AR1248 #2 |
| 8       | 7.53  | 114209  |         | 1.99300 |           |
| 9       | 7.87  | 30739   |         | 1.50343 |           |
| 10      | 8.21  | 270328  |         | 6.46237 | AR1248 #3 |
| 11      | 9.05  | 259113  |         | 4.52163 | AR1248 #4 |
| 12      | 9.38  | 244391  |         | 4.26473 | AR1248 #5 |
| 13      | 10.13 | 190830  |         | 3.13007 | AR1248 #6 |
| 14      | 10.54 | 471624  |         | 8.22838 | AR1248 #7 |
| 15      | 11.00 | 36407   |         | .63532  |           |
| 16      | 11.49 | 413952  |         | 7.22364 | AR1248 #8 |
| 17      | 12.28 | 90352   |         | 1.71626 |           |
| 18      | 12.69 | 127063  |         | 2.31730 |           |
| 19      | 13.11 | 142892  |         | 2.49352 |           |
| 20      | 13.78 | 76909   |         | 1.34209 |           |
| 21      | 14.22 | 90312   |         | 1.71558 |           |
| 22      | 14.58 | 13266   |         | .23351  |           |
| 23      | 14.81 | 21935   |         | .38278  |           |
| 24      | 15.36 | 11081   |         | .19336  |           |
| 25      | 15.77 | 78710   |         | 1.37352 |           |
| 26      | 16.42 | 37682   |         | .65756  |           |
| 27      | 16.83 | 7275    |         | .12695  |           |
| 28      | 20.39 | 50227   |         | 0.00000 |           |
| 29      | 20.89 | 1764163 |         | 0.00000 | DBC (SUM) |
| Totals: |       | 0       | 0.00000 | ug/mL   |           |

$\bar{x} = 2,261,377$   
 $3.67$

Report Time: Tue Nov 12, 1991 10:15:34 am

Method: /DATA/LOOP/METHOD/MP9A\_PCB.MTH

Format File: /DATA/LOOP/FORMAT/SIDE.FMT

0000081

Sample Name : HEXANE.1.1.

DB1701:150-0-20-190-0-3-250-0: 2uL INJ:====PRIMARY RUN=====

Peak Processor : Genie

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreaUnits

Dilution : 100

Run Time : 30.00 Minutes

Injection time : Wed Nov 6, 1991 1:44:35 pm

Run Status : RunStatusOK

EndOffBaseline

| Pk # | RT    | Area   | Group | UG/ML   | Name         |
|------|-------|--------|-------|---------|--------------|
| 1    | 20.38 | 16873  |       | 0.00000 |              |
| 2    | 20.88 | 716000 |       | 0.00000 | DBC (SURR) * |

-----  
Totals: 0 0.00000 UG/ML

20.375

DBC (SURR) \*

Sample Name : AR1260.OCCS 1.1. PCB 614 0.5 ug/mL

001701:150-0-20-190-0-3-250-0: 2uL (M):c:\mp9a\mp9a\mp9a

Peak Processor : Genie Multilevel : False

Instrument : MP9A

Calculation : Zero Quantitation: AreaUnits

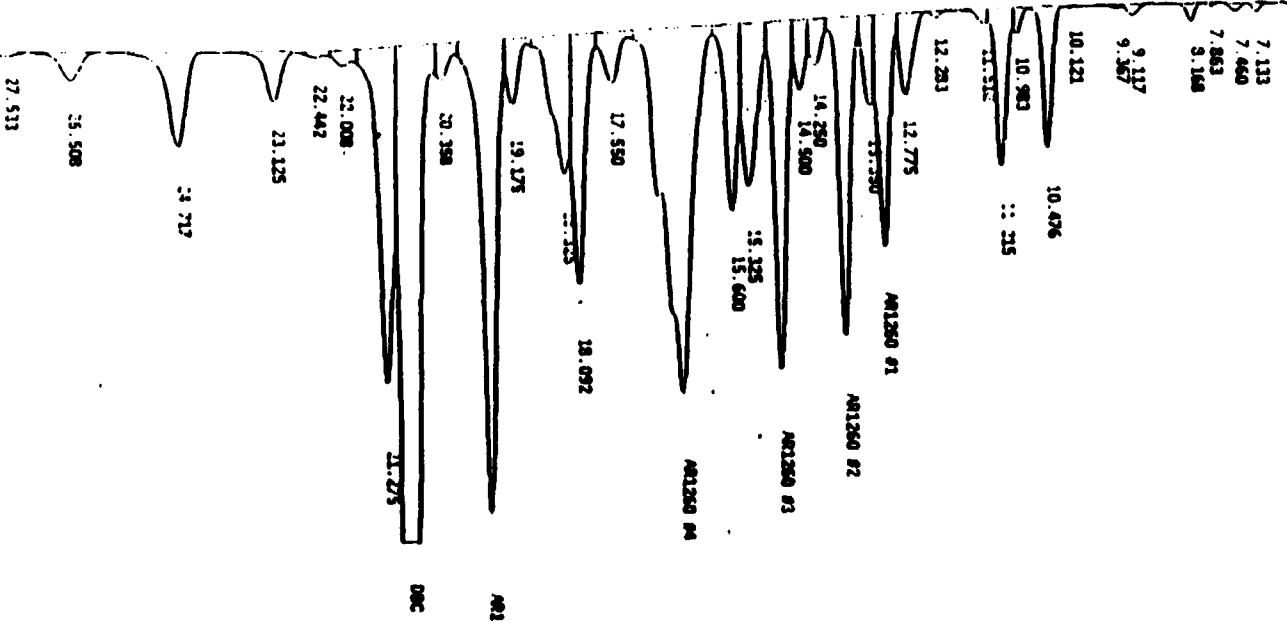
Dilution : 100

Run Time : 30.00 minutes

Injection time : Wed Nov 6, 1991 2:17:48 pm

Run Status : RunStatusOK

EndOfBaseline



| PK #    | RT    | Area    | Group | UG/ML   | Name      |
|---------|-------|---------|-------|---------|-----------|
| 1       | 7.13  | 5184    |       | 0.0046  |           |
| 2       | 7.46  | 6821    |       | 0.09148 |           |
| 3       | 7.86  | 1612    |       | 0.02168 |           |
| 4       | 8.17  | 12726   |       | 0.17051 |           |
| 5       | 9.12  | 9882    |       | 0.13135 |           |
| 6       | 9.37  | 1169    |       | 0.04231 |           |
| 7       | 10.12 | 1178    |       | 0.01679 |           |
| 8       | 10.48 | 111917  |       | 1.49995 |           |
| 9       | 10.98 | 16764   |       | 0.2464  |           |
| 10      | 11.21 | 138887  |       | 1.85037 |           |
| 11      | 11.51 | 12613   |       | 0.16901 |           |
| 12      | 12.28 | 5861    |       | 0.00080 |           |
| 13      | 12.77 | 84663   |       | 0.00080 |           |
| 14      | 13.11 | 227981  |       | 0.00080 | AR1260 01 |
| 15      | 13.35 | 75776   |       | 0.00080 |           |
| 16      | 13.75 | 107149  |       | 0.00080 | AR1260 02 |
| 17      | 14.25 | 48693   |       | 0.00080 |           |
| 18      | 14.50 | 62864   |       | 0.00080 |           |
| 19      | 14.81 | 149844  |       | 0.00080 | AR1260 03 |
| 20      | 15.33 | 211292  |       | 0.00080 |           |
| 21      | 15.60 | 188126  |       | 0.00080 |           |
| 22      | 16.42 | 888920  |       | 0.00080 | AR1260 04 |
| 23      | 17.55 | 69620   |       | 0.00080 |           |
| 24      | 18.09 | 254715  |       | 0.00080 |           |
| 25      | 18.33 | 211104  |       | 0.00080 |           |
| 26      | 19.17 | 65701   |       | 0.00080 |           |
| 27      | 19.54 | 58266   |       | 0.00080 | AR1260 05 |
| 28      | 20.36 | 44787   |       | 0.00080 |           |
| 29      | 20.89 | 1824869 |       | 0.00080 |           |
| 30      | 21.28 | 433163  |       | 0.00080 |           |
| 31      | 22.01 | 24684   |       | 0.00080 |           |
| 32      | 22.44 | 9334    |       | 0.00080 |           |
| 33      | 23.13 | 72366   |       | 0.00080 |           |
| 34      | 24.72 | 161961  |       | 0.00080 |           |
| 35      | 26.51 | 50154   |       | 0.00080 |           |
| 36      | 27.53 | 8544    |       | 0.00080 |           |
| Totals: |       | 0       |       | 0.00080 | UG/ML     |

DOC (SUM1)

DOC (SUM1) =

$\bar{E} = 2,348,350$   
0.582

Report Time: Tue Nov 12, 1991 10:18:54 pm  
Method: /DATA/LOOP/METHOD/MP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

0000083



Sample Name : AR1248.OCCS 1.1.PCR 618 0.5 ug/mL

001701:150-0-20-190-0-3-250-0: 2uL [M]:reverseDINARY RUNNER

Peak Processor : Genie MultiLevel : False

Instrument : MP9A

Calculation : Zero Quantification: AreaUnits

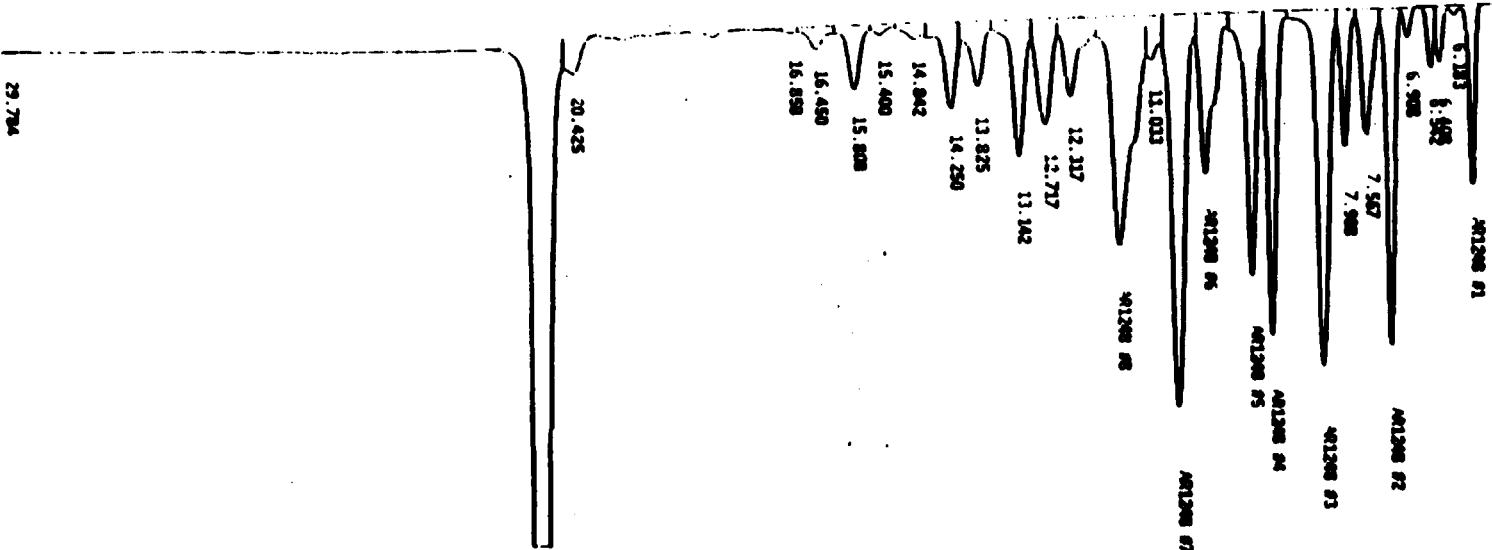
Dilution : 100

Run Time : 38.02 Minutes

Injection time : Wed Nov 6, 1991 6:04:08 pm

Run Status : RunSuccessful

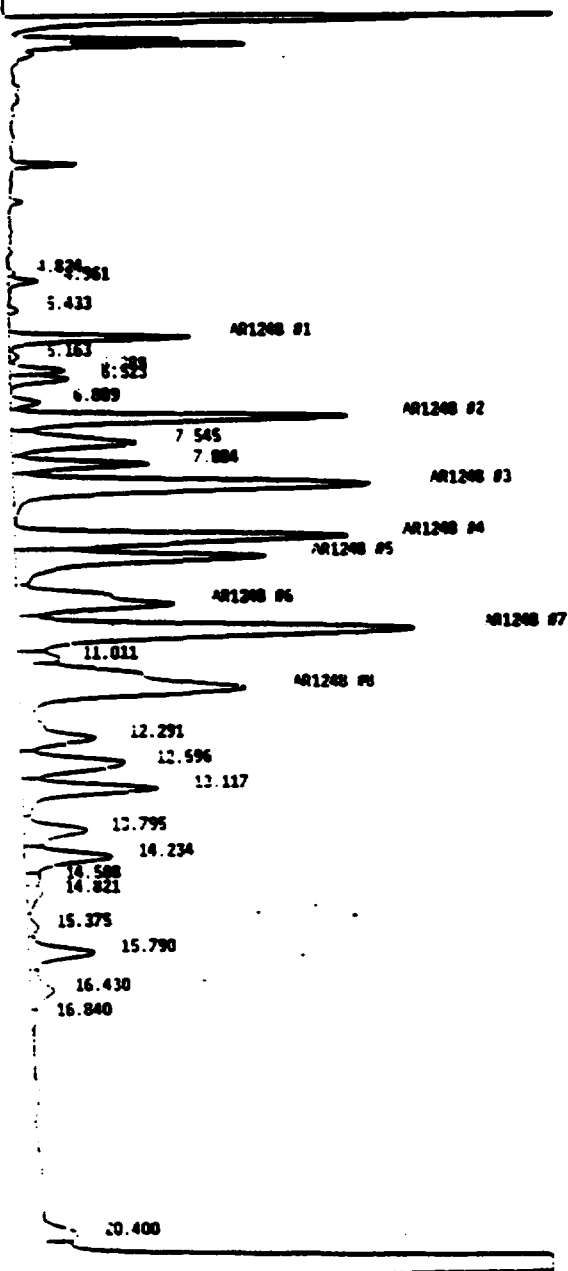
EndOfBaseline



| PK #    | RT    | Area    | Count | UG/ML   | Name         |
|---------|-------|---------|-------|---------|--------------|
| 1       | 1.15  | 45786   |       | 81120   |              |
| 2       | 1.23  | 65693   |       | 1.16390 |              |
| 3       | 1.39  | 14401   |       | .25666  |              |
| 4       | 1.51  | 4049    |       | .00691  |              |
| 5       | 1.74  | 6429    |       | .11390  |              |
| 6       | 1.89  | 4329    |       | .07670  |              |
| 7       | 1.96  | 3372    |       | .05974  |              |
| 8       | 2.06  | 3621    |       | .06230  |              |
| 9       | 2.13  | 3167    |       | .05610  |              |
| 10      | 2.12  | 2361    |       | .04183  |              |
| 11      | 5.89  | 88068   |       | 0.00000 | AR1248 01    |
| 12      | 6.18  | 5041    |       | 0.00000 |              |
| 13      | 6.41  | 27405   |       | 0.00000 |              |
| 14      | 6.54  | 30072   |       | 0.00000 |              |
| 15      | 6.91  | 15474   |       | 0.00000 |              |
| 16      | 7.17  | 200066  |       | 0.00000 | AR1248 02    |
| 17      | 7.57  | 100009  |       | 0.00000 |              |
| 18      | 7.91  | 86741   |       | 0.00000 |              |
| 19      | 8.25  | 363037  |       | 0.00000 | AR1248 03    |
| 20      | 9.08  | 246754  |       | 0.00000 | AR1248 04    |
| 21      | 9.41  | 246739  |       | 0.00000 | AR1248 05    |
| 22      | 10.16 | 181367  |       | 0.00000 | AR1248 06    |
| 23      | 10.58 | 441490  |       | 0.00000 | AR1248 07    |
| 24      | 11.03 | 43047   |       | 0.00000 |              |
| 25      | 11.52 | 396342  |       | 0.00000 | AR1248 08    |
| 26      | 12.12 | 104046  |       | 0.00000 |              |
| 27      | 12.72 | 120024  |       | 0.00000 |              |
| 28      | 13.14 | 141665  |       | 0.00000 |              |
| 29      | 13.83 | 78919   |       | 0.00000 |              |
| 30      | 14.25 | 92034   |       | 0.00000 |              |
| 31      | 14.84 | 24675   |       | 0.00000 |              |
| 32      | 15.40 | 11647   |       | 0.00000 |              |
| 33      | 15.81 | 67577   |       | 0.00000 |              |
| 34      | 16.45 | 12717   |       | 0.00000 |              |
| 35      | 16.86 | 7426    |       | 0.00000 |              |
| 36      | 20.42 | 49101   |       | 0.00000 |              |
| 37      | 20.93 | 1673795 |       | 0.00000 | ODC (SUM) 98 |
| 38      | 29.78 | 3062    |       | .05426  |              |
| Totals: |       | 0       |       | 0.00000 | UG/ML        |

$\Sigma = 2188,482$   
0.312

Result File /HP9A/HP9A\_110591GR047.RES Page 1  
Sample Name : AR1248.OCCS 1.1.PCB 618 0.5 UG/ML  
DB1701:150-0-20-190-0-3-250-0: 2uL INJ:=====PRIMARY RUN=====  
Peak Processor : Genie Multilevel : False  
Instrument HP9A  
Calculation : Zero Quantitation: AreaUnits  
Dilution : 100  
Run Time : 30.00 Minutes  
Injection time : Wed Nov 6, 1991 9:23:49 pm  
Run Status : RunStatusOK  
EndOffBaseline



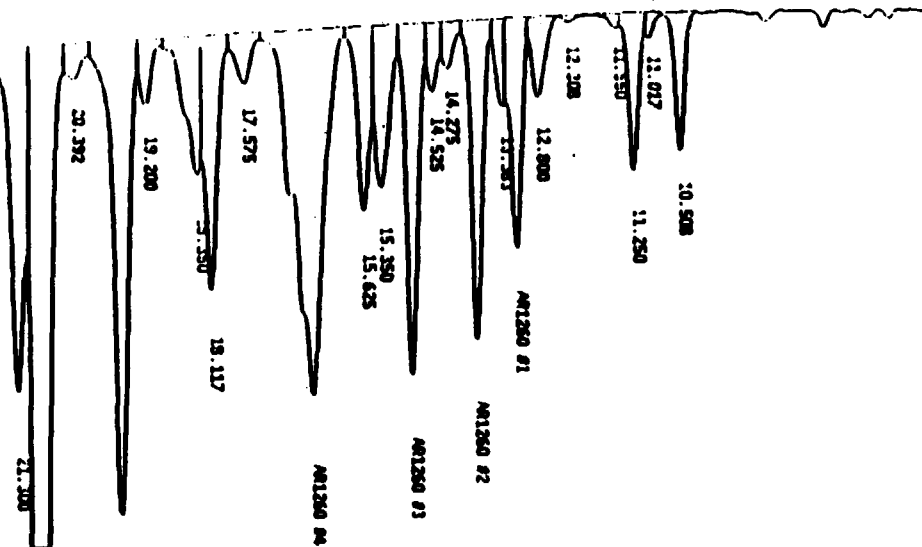
| PK #    | RT    | Area    | Group | UG/ML   | Name          |
|---------|-------|---------|-------|---------|---------------|
| 1       | 4.82  | 2544    |       | .06177  |               |
| 2       | 4.96  | 13921   |       | .24266  |               |
| 3       | 5.43  | 4751    |       | .08283  |               |
| 4       | 5.87  | 89267   |       | 1.55609 | AR1248 #1     |
| 5       | 6.16  | 5176    |       | .09023  |               |
| 6       | 6.39  | 27494   |       | .47928  |               |
| 7       | 6.52  | 31294   |       | .54482  |               |
| 8       | 6.89  | 16063   |       | .28001  |               |
| 9       | 7.15  | 213148  |       | 3.71560 | AR1248 #2     |
| 10      | 7.54  | 110760  |       | 1.93076 |               |
| 11      | 7.88  | 85963   |       | 1.49051 |               |
| 12      | 8.23  | 355211  |       | 6.19202 | AR1248 #3     |
| 13      | 9.07  | 290526  |       | 5.06445 | AR1248 #4     |
| 14      | 9.39  | 230328  |       | 4.01508 | AR1248 #5     |
| 15      | 10.14 | 185762  |       | 3.23820 | AR1248 #6     |
| 16      | 10.55 | 449453  |       | 7.83485 | AR1248 #7     |
| 17      | 11.01 | 33578   |       | .58532  |               |
| 18      | 11.50 | 392326  |       | 6.83902 | AR1248 #8     |
| 19      | 12.29 | 93656   |       | 1.63262 |               |
| 20      | 12.70 | 121610  |       | 2.11990 |               |
| 21      | 13.12 | 135850  |       | 2.36813 |               |
| 22      | 13.80 | 73047   |       | 1.27335 |               |
| 23      | 14.23 | 92045   |       | 1.60452 |               |
| 24      | 14.59 | 12436   |       | .21679  |               |
| 25      | 14.82 | 21584   |       | .37625  |               |
| 26      | 15.37 | 11819   |       | .20603  |               |
| 27      | 15.79 | 72210   |       | 1.25876 |               |
| 28      | 16.43 | 43298   |       | .75477  |               |
| 29      | 16.84 | 9442    |       | .16458  |               |
| 30      | 20.40 | 32920   |       | 0.00000 |               |
| 31      | 20.91 | 1603019 |       | 0.00000 | DBC (SURR) *  |
| Totals: |       |         |       | 0       | 0.00000 UG/ML |

$\bar{E} = 2206021$   
1.1%

Report Time: Tue Nov 12, 1991 10:20:32 pm  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000086

Result file : /MP9A/MP9A\_110591C0040.NCS  
 Sample Name : AR1260.OCCS 1.1.PCR 614 0.5 ug/mL  
 DB1701:150-0-20-190-0-3-250-0: 2uL IAD:cccc#IIPVARY REMOVER  
 Peak Processor : Genie Multilevel : False  
 Instrument : MP9A  
 Calculation : Zero Quantitation: Areacounts  
 Distinction : 100  
 Run Time : 30.02 Minutes  
 Injection time : Wed Nov 6, 1991 9:57:05 pm  
 Run Status : RunSuccessful  
 EndOfBaseline



| PK #    | RT    | Area    | Count | UG/ML   | Name        |
|---------|-------|---------|-------|---------|-------------|
| 1       | 1.15  | 32209   |       | 0.4303  |             |
| 2       | 10.51 | 113496  |       | 0.00000 |             |
| 3       | 11.02 | 17875   |       | 0.00000 |             |
| 4       | 11.25 | 138669  |       | 0.00000 |             |
| 5       | 11.55 | 14003   |       | 0.00000 |             |
| 6       | 12.31 | 6613    |       | 0.00000 |             |
| 7       | 12.80 | 90079   |       | 0.00000 |             |
| 8       | 13.13 | 234966  |       | 0.00000 | AR1260 #1   |
| 9       | 13.38 | 61201   |       | 0.00000 |             |
| 10      | 13.77 | 106328  |       | 0.00000 | AR1260 #2   |
| 11      | 14.27 | 49162   |       | 0.00000 |             |
| 12      | 14.52 | 62861   |       | 0.00000 |             |
| 13      | 14.83 | 353854  |       | 0.00000 | AR1260 #3   |
| 14      | 15.35 | 207195  |       | 0.00000 |             |
| 15      | 15.63 | 195827  |       | 0.00000 |             |
| 16      | 16.43 | 88606   |       | 0.00000 | AR1260 #4   |
| 17      | 17.58 | 69508   |       | 0.00000 |             |
| 18      | 18.12 | 286148  |       | 0.00000 |             |
| 19      | 18.35 | 187276  |       | 0.00000 |             |
| 20      | 19.20 | 67052   |       | 0.00000 |             |
| 21      | 19.57 | 586480  |       | 0.00000 | AR1260 #5   |
| 22      | 20.39 | 56600   |       | 0.00000 |             |
| 23      | 20.92 | 1800403 |       | 0.00000 | DBC (SUM) * |
| 24      | 21.30 | 449878  |       | 0.00000 |             |
| 25      | 22.03 | 21509   |       | 0.00000 |             |
| 26      | 22.47 | 12823   |       | 0.00000 |             |
| 27      | 23.16 | 71175   |       | 0.00000 |             |
| 28      | 24.76 | 166022  |       | 0.00000 |             |
| 29      | 26.53 | 50468   |       | 0.00000 |             |
| Totals: |       | 0       |       | 0.00000 | UG/ML       |

$\bar{E} = 2,367,234$   
 1.47.

Report Time: Tue Nov 12, 1991 10:22:09 pm  
 Method: /DATA/LOOP/METHOD/MP9A\_PCR.MTH  
 Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000087

GC/ECD

PCB

RAW DATA

000088

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

METHOD BLANK

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: Q5-0319

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR015

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 05, 1991 22:13

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 80.                  | U |
| 11104-28-2 | Aroclor-1221 | 80.                  | U |
| 11141-16-5 | Aroclor-1232 | 80.                  | U |
| 53469-21-9 | Aroclor-1242 | 80.                  | U |
| 12672-29-6 | Aroclor-1248 | 80.                  | U |
| 11097-69-1 | Aroclor-1254 | 160                  | U |
| 11096-82-5 | Aroclor-1260 | 160                  | U |

Report File: HP9A/HP9A\_110501GR015.REC Page: 1  
 Sample Name: F-0319 1.1.5PC ACID  
 DB1701:150-0-10-130-0-1-250-8: SUL INJ. (MAY 1991)  
 Peak Processor: Gentle Multilevel False  
 Instrument: HP9A  
 Calculation: Zero Quantitation: AreaUnits  
 Dilution: 100  
 Run Time: 10 00 Minutes  
 Injection time: Tue Nov 5, 1991 10:12:15 pm  
 Run Status: RunStatusOK  
 EndOfBaseline

| PK #    | RT    | Area    | Group | UG/ML   | Name       |
|---------|-------|---------|-------|---------|------------|
| 1       | 20.27 | 41920   |       | 0.00000 |            |
| 2       | 20.91 | 1157562 |       | 0.00000 | PCB (CURR) |
| -----   |       |         |       |         |            |
| Totals: |       | 0       |       | 0.00000 | UG/ML      |

PCB (CURR)

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

METHOD BLANK

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: Q5-0320

Sample wt/vol: 1000 mL

Lab File ID: HP9A\_110591GR012

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 05, 1991 20:33

GPC Cleanup: (Y/N) Y pH: 7.5

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 0.50                 | U |
| 11104-28-2 | Aroclor-1221 | 0.50                 | U |
| 11141-16-5 | Aroclor-1232 | 0.50                 | U |
| 53469-21-9 | Aroclor-1242 | 0.50                 | U |
| 12672-29-6 | Aroclor-1248 | 0.50                 | U |
| 11097-69-1 | Aroclor-1254 | 0.50                 | U |
| 11096-82-5 | Aroclor-1260 | 0.50                 | U |

Result File 009A/HP9A 110591GR012 RES Page .  
 Sample Name 15-0000 1 LGFC ACID  
 081701.150-0-20-130-0-1-250-0 DUL (NJ)====PRIMARY RUN=====

|                |                            |              |           |
|----------------|----------------------------|--------------|-----------|
| Peak Processor | Genie                      | Multilevel   | False     |
| Instrument     | HP9A                       |              |           |
| Calculation    | Zero                       | Quantitation | AreaUnits |
| Dilution       | 100                        |              |           |
| Run Time       | 30 00 Minutes              |              |           |
| Injection time | Tue Nov 5, 1991 8 03 45 pm |              |           |
| Run Status     | EndOfBaseline              |              |           |
|                | SignalOverload             |              |           |

| PK #   | RT    | Area   | Group | U/ML    | Name       |
|--------|-------|--------|-------|---------|------------|
| 1      | 0.58  | 1131   |       | 0.00000 |            |
| 1      | 20.90 | 114600 |       | 0.00000 | DBC (CURR) |
| -----  |       |        |       |         |            |
| Totals |       | 0      |       | 0.00000 | U/ML       |

570

DEC (CURR)

EndOfRun Time: Tue Nov 5, 1991 8 31 52 pm  
 Method: DATA/LOOP/METHOD/HP9A.PCB.MTH  
 Format File: DATA/LOOP/FORMAT/SIDE.FMT

760092

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9110151520023MS

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: 5177-002

Sample wt/vol: 100 mL

Lab File ID: HP9A\_110591GR021

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 21, 1991

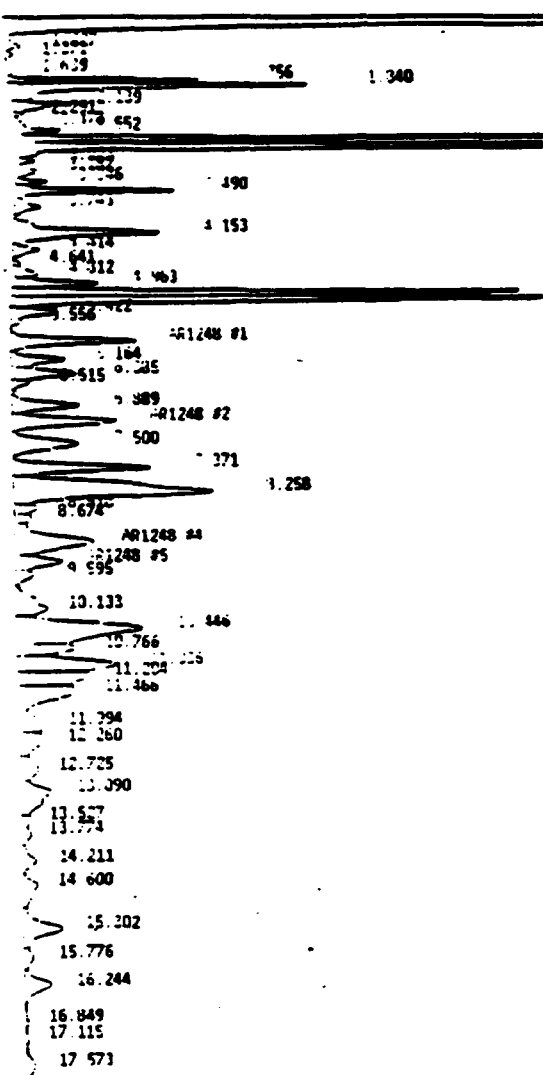
Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 06, 1991 01:32

GPC Cleanup: (Y/N) Y pH: 14

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 5.0                  | U |
| 11104-28-2 | Aroclor-1221 | 5.0                  | U |
| 11141-16-5 | Aroclor-1232 | 5.0                  | U |
| 53469-21-9 | Aroclor-1242 | 5.0                  | U |
| 12672-29-6 | Aroclor-1248 | 15.                  |   |
| 11097-69-1 | Aroclor-1254 | 5.0                  | U |
| 11096-82-5 | Aroclor-1260 | 5.0                  | U |



DEC (SUAR)

20 912

Result File HP9A/HP9A\_110591CR021.RE: Page 1  
 Sample Name 5177-002.1.1.MATRIX SPIKE  
 DB1701.150-0-20-190-0-1-250-8: 2uL INJ:====PRIMARY RUN====  
 Peak Processor Genie Multilevel False  
 Instrument HP9A  
 Calculation Zero Quantitation: AreaUnits  
 Dilution 100  
 Run Time 30.00 Minutes  
 Injection time Wed Nov 6, 1991 1:32:32 am  
 Run Status RunStatusOK  
 EndOffBaseline

| PK # | RT    | Area   | Group | UG/ML    | Name      |
|------|-------|--------|-------|----------|-----------|
| 1    | 35    | 592453 |       | 14.64124 |           |
| 2    | 1.23  | 10249  |       | 25327    |           |
| 3    | 1.37  | 2108   |       | 07681    |           |
| 4    | 1.54  | 4345   |       | 10737    |           |
| 5    | 1.76  | 50341  |       | 1.24407  |           |
| 6    | 1.84  | 118670 |       | 2.93267  |           |
| 7    | 2.14  | 25759  |       | 51657    |           |
| 8    | 2.29  | 2522   |       | 06232    |           |
| 9    | 2.48  | 1963   |       | 04851    |           |
| 10   | 2.55  | 8741   |       | 21601    |           |
| 11   | 2.57  | 143204 |       | 2.53899  |           |
| 12   | 2.80  | 549192 |       | 12.57215 |           |
| 13   | 3.32  | 4292   |       | 10607    |           |
| 14   | 3.13  | 8374   |       | 20696    |           |
| 15   | 3.25  | 3533   |       | 21088    |           |
| 16   | 3.49  | 49694  |       | 1.22809  |           |
| 17   | 3.74  | 15198  |       | 37559    |           |
| 18   | 4.15  | 37868  |       | 2.17148  |           |
| 19   | 4.41  | 11982  |       | 29610    |           |
| 20   | 4.64  | 2059   |       | 05089    |           |
| 21   | 4.81  | 14106  |       | 34861    |           |
| 22   | 4.96  | 39838  |       | 98451    |           |
| 23   | 5.12  | 184359 |       | 4.55605  |           |
| 24   | 5.22  | 209489 |       | 5.17707  |           |
| 25   | 5.42  | 24862  |       | 51442    |           |
| 26   | 5.56  | 3793   |       | 09373    |           |
| 27   | 5.87  | 62906  |       | 1.35459  | AR1248 #1 |
| 28   | 6.16  | 30459  |       | 75271    |           |
| 29   | 6.38  | 35152  |       | 36871    |           |
| 30   | 6.51  | 8588   |       | 21222    |           |
| 31   | 6.89  | 30079  |       | 39047    |           |
| 32   | 7.14  | 61943  |       | 1.53079  | AR1248 #2 |
| 33   | 7.50  | 53109  |       | 1.31249  |           |
| 34   | 7.87  | 78243  |       | 1.93362  |           |
| 35   | 8.26  | 214495 |       | 5.30079  |           |
| 36   | 8.52  | 14617  |       | 36122    |           |
| 37   | 9.67  | 11154  |       | 27565    |           |
| 38   | 9.06  | 90182  |       | 2.22867  | AR1248 #4 |
| 39   | 9.28  | 35436  |       | 37574    | AR1248 #5 |
| 40   | 9.59  | 12393  |       | 30627    |           |
| 41   | 10.13 | 18241  |       | 34504    |           |
| 42   | 10.45 | 156606 |       | 3.87019  |           |

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|    |       |       |         |
|----|-------|-------|---------|
| 44 | 11.04 | 95490 | 2.35904 |
| 45 | 11.20 | 59463 | 1.46950 |
| 46 | 11.47 | 68524 | 1.69342 |
| 47 | 11.99 | 31354 | .77486  |
| 48 | 12.26 | 30851 | .76242  |
| 49 | 12.73 | 25780 | .63711  |
| 50 | 13.09 | 49246 | 1.21702 |
| 51 | 13.53 | 6203  | .15520  |
| 52 | 13.77 | 9600  | .23922  |
| 53 | 14.21 | 15106 | .37331  |
| 54 | 14.60 | 21800 | .53874  |
| 55 | 15.30 | 47608 | 1.17050 |
| 56 | 15.78 | 10577 | .26138  |
| 57 | 16.24 | 31360 | .77520  |
| 58 | 16.85 | 3157  | .07802  |
| 59 | 17.12 | 3107  | .07677  |
| 60 | 17.57 | 11332 | .28005  |
| 61 | 20.91 | 27396 | 0.00000 |
| 62 | 29.81 | 1621  | .04005  |

08C (SURR)

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Totals: 0 0.00000 UC/ML

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9110151520023MSD

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: 5177-003

Sample wt/vol: 100 mL

Lab File ID: HP9A\_110591GR036

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 21, 1991

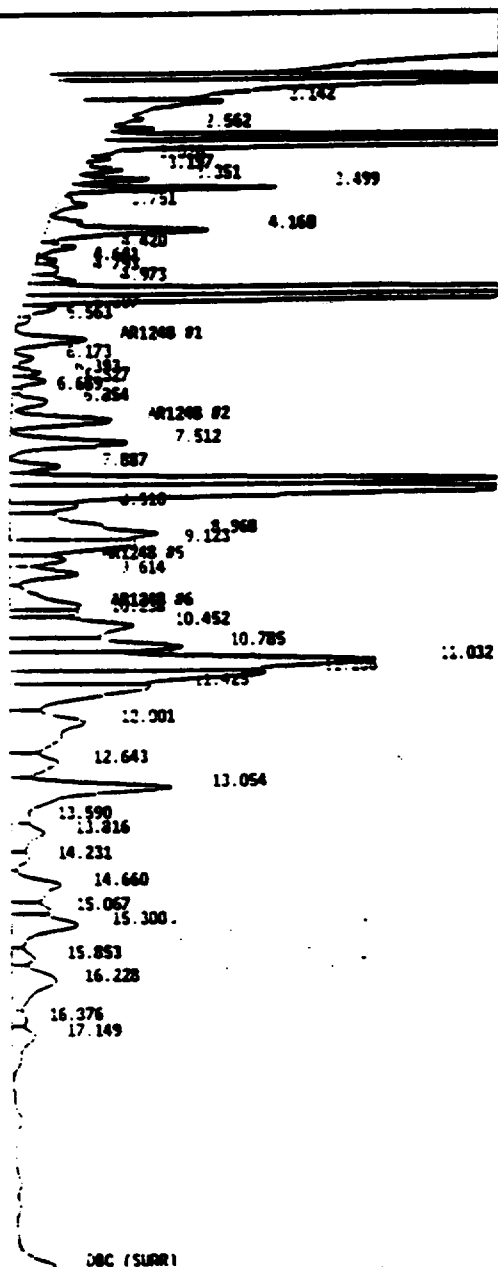
Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 06, 1991 15:07

GPC Cleanup: (Y/N) Y pH: 14

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 5.0                  | U |
| 11104-28-2 | Aroclor-1221 | 5.0                  | U |
| 11141-16-5 | Aroclor-1232 | 5.0                  | U |
| 53469-21-9 | Aroclor-1242 | 5.0                  | U |
| 12672-29-6 | Aroclor-1248 | 16.                  |   |
| 11097-69-1 | Aroclor-1254 | 5.0                  | U |
| 11096-82-5 | Aroclor-1260 | 5.0                  | U |



DOC (SURR)

Result File : /HP9A/HP9A.110591GR036.RES Page 1  
Sample Name : 5177-003.1.1.GPC ACID MATRIX SPIKE D  
DB1701:150-0-20-190-0-3-250-0: 2uL INJ:wwwPRIMARY RUNwww  
Peak Processor : Genie Multilevel : False  
Instrument : HP9A  
Calculation : Zero Quantitation: Areadmits  
Dilution : 100  
Run Time : 30.00 Minutes  
Injection time : Wed Nov 6, 1991 3:07:28 pm  
Run Status : EndOfBaseline  
SignalOverload

| PK # | RT    | Area     | Group | UG/ML    | Name      |
|------|-------|----------|-------|----------|-----------|
| 1    | 1.15  | 28311240 |       | 81.28738 |           |
| 2    | 1.76  | 186599   |       | 53289    |           |
| 3    | 1.84  | 185069   |       | 1.10561  |           |
| 4    | 2.14  | 108827   |       | 31247    |           |
| 5    | 2.56  | 9906     |       | 02844    |           |
| 6    | 2.68  | 243356   |       | 69873    |           |
| 7    | 2.81  | 738855   |       | 2.11193  |           |
| 8    | 3.03  | 5266     |       | 01512    |           |
| 9    | 3.20  | 11707    |       | 01361    |           |
| 10   | 3.35  | 22752    |       | 06533    |           |
| 11   | 3.50  | 58805    |       | 16884    |           |
| 12   | 3.75  | 16194    |       | 04650    |           |
| 13   | 4.16  | 103814   |       | 29807    |           |
| 14   | 4.42  | 16625    |       | 04773    |           |
| 15   | 4.64  | 7813     |       | 02243    |           |
| 16   | 4.79  | 16739    |       | 04806    |           |
| 17   | 4.97  | 23722    |       | 06811    |           |
| 18   | 5.12  | 449544   |       | 1.29073  |           |
| 19   | 5.23  | 316924   |       | 90995    |           |
| 20   | 5.40  | 18162    |       | 05215    |           |
| 21   | 5.56  | 5485     |       | 01575    |           |
| 22   | 5.88  | 42787    |       | 12252    | AR1248 #1 |
| 23   | 5.17  | 10071    |       | 02892    |           |
| 24   | 6.39  | 12697    |       | 03646    |           |
| 25   | 6.53  | 17098    |       | 04907    |           |
| 26   | 6.67  | 4814     |       | 01153    |           |
| 27   | 6.85  | 27074    |       | 07774    |           |
| 28   | 7.15  | 68267    |       | 19681    | AR1248 #2 |
| 29   | 7.51  | 80761    |       | 23188    |           |
| 30   | 7.89  | 27958    |       | 08827    |           |
| 31   | 8.12  | 284407   |       | 01659    |           |
| 32   | 8.28  | 437845   |       | 1.25714  |           |
| 33   | 9.51  | 45320    |       | 11012    |           |
| 34   | 9.97  | 186312   |       | 53494    |           |
| 35   | 9.12  | 114042   |       | 32744    |           |
| 36   | 9.39  | 39232    |       | 11264    | AR1248 #5 |
| 37   | 9.61  | 53955    |       | 15492    |           |
| 38   | 10.14 | 76047    |       | 21835    | AR1248 #6 |
| 39   | 10.24 | 13788    |       | 09678    |           |
| 40   | 10.45 | 153000   |       | 43929    |           |
| 41   | 10.78 | 138423   |       | 39744    |           |
| 42   | 11.03 | 356556   |       | 1.32374  |           |

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Report Time: Tue Nov 12, 1991 9:16:16 AM  
 Method: DATA/LOOP/METHOD/MP9A.PCS WITH  
 Format File: DATA/LOOP/FORMAT/SIDE.FMT

| Totals: |       | 0      | 0.00000 UC/ML |
|---------|-------|--------|---------------|
| 58      | 20.91 | 43097  | 0.00000       |
| 57      | 17.15 | 43480  | 12484         |
| 56      | 16.88 | 14866  | 04268         |
| 55      | 16.23 | 90662  | 26031         |
| 54      | 15.85 | 24950  | 07164         |
| 53      | 15.30 | 92546  | 26572         |
| 52      | 15.07 | 31062  | 08918         |
| 51      | 14.66 | 74559  | 21407         |
| 50      | 14.23 | 18267  | 05245         |
| 49      | 13.82 | 49256  | 14143         |
| 48      | 13.59 | 14021  | 04026         |
| 47      | 12.05 | 191042 | 54852         |
| 46      | 12.64 | 64979  | 10657         |
| 45      | 12.00 | 161870 | 16476         |
| 44      | 12.42 | 152905 | 16771         |
| Total:  |       | 100000 | 0.00000       |
| Total:  |       | 100000 | 0.00000       |

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109251210116MS

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: 5177-007

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR031

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

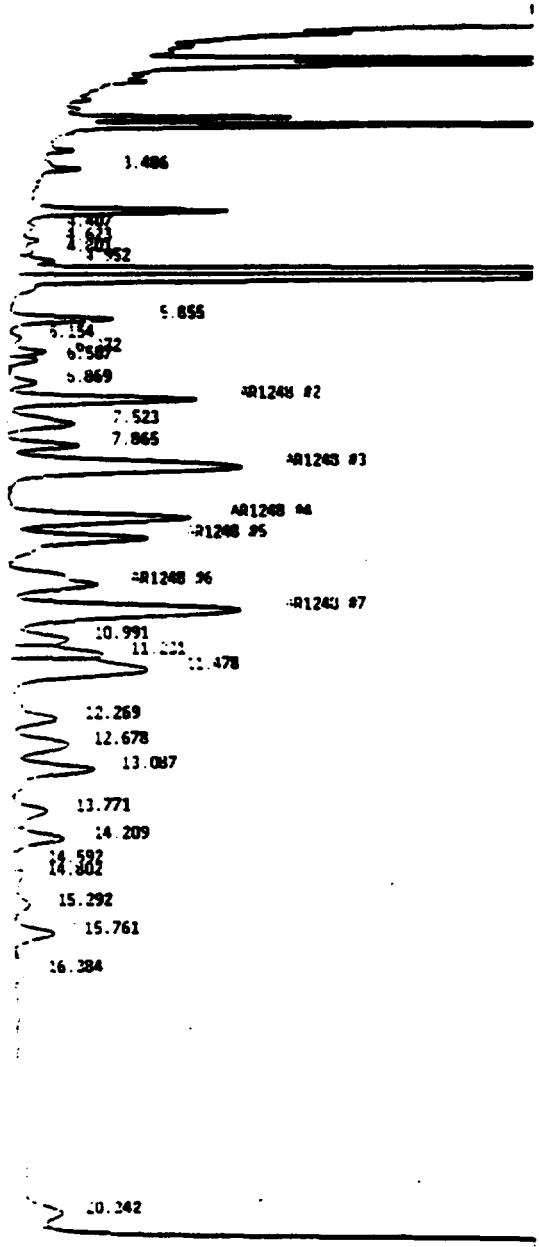
Date Analyzed: Nov 06, 1991 12:04

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 80.                  | U |
| 11104-28-2 | Aroclor-1221 | 80.                  | U |
| 11141-16-5 | Aroclor-1232 | 80.                  | U |
| 53469-21-9 | Aroclor-1242 | 80.                  | U |
| 12672-29-6 | Aroclor-1248 | 190                  |   |
| 11097-69-1 | Aroclor-1254 | 160                  | U |
| 11096-82-5 | Aroclor-1260 | 160                  | U |

Sample Name -5177-007.1.1.GPC ACID MATRIX SPIKE  
 DB1701:150-0-20-190-0-3-250-8: 2uL INJ:evenPRIMARY RUN  
 Peak Processor - Serie Multilevel False  
 Instrument -HP9A  
 Calculation -Zero Quantitation: AreasUnits  
 Dilution -100  
 Run Time -10.00 Minutes  
 Injection time -Wed Nov 6, 1991 12:04:53 pm  
 Run Status -EndOffBaseline  
 SignalOverload



| PK # | RT    | Area    | Group | UG/ML   | Name       |
|------|-------|---------|-------|---------|------------|
| 1    | 3.49  | 13308   |       | 08666   |            |
| 2    | 4.41  | 1098    |       | 01794   |            |
| 3    | 4.62  | 5127    |       | 02750   |            |
| 4    | 4.80  | 5952    |       | 02672   |            |
| 5    | 4.95  | 15161   |       | 07254   |            |
| 6    | 5.11  | 142195  |       | 1.53597 |            |
| 7    | 5.21  | 171171  |       | 1.66603 |            |
| 8    | 5.36  | 19471   |       | 02205   |            |
| 9    | 5.15  | 5510    |       | 02518   |            |
| 10   | 6.37  | 18287   |       | 08208   |            |
| 11   | 6.51  | 11844   |       | 06214   |            |
| 12   | 6.37  | 15644   |       | 07022   |            |
| 13   | 7.13  | 110887  |       | 09773   | AR1248 #2  |
| 14   | 7.52  | 54522   |       | 24473   |            |
| 15   | 7.37  | 10727   |       | 18281   |            |
| 16   | 8.22  | 142421  |       | 1.08812 | AR1248 #3  |
| 17   | 9.04  | 119327  |       | 62538   | AR1248 #4  |
| 18   | 9.37  | 120149  |       | 53930   | AR1248 #5  |
| 19   | 10.12 | 39845   |       | 44816   | AR1248 #6  |
| 20   | 10.53 | 147273  |       | 1.10991 | AR1248 #7  |
| 21   | 10.99 | 47353   |       | 21255   |            |
| 22   | 11.23 | 75845   |       | 34043   |            |
| 23   | 12.48 | 173740  |       | 76638   |            |
| 24   | 12.27 | 16244   |       | 20757   |            |
| 25   | 12.68 | 4164    |       | 23801   |            |
| 26   | 12.09 | 34652   |       | 37997   |            |
| 27   | 13.77 | 17497   |       | 16831   |            |
| 28   | 14.21 | 45858   |       | 20583   |            |
| 29   | 14.59 | 11286   |       | 05066   |            |
| 30   | 14.80 | 10030   |       | 04502   |            |
| 31   | 15.29 | 15832   |       | 07106   |            |
| 32   | 15.76 | 18289   |       | 17186   |            |
| 33   | 15.38 | 15252   |       | 06846   |            |
| 34   | 20.14 | 45820   |       | 0.00000 |            |
| 35   | 20.88 | 1022478 |       | 0.00000 | DBC (LURR) |

Totals: 0 0.00000 UG/ML

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

9109251210116MSD

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: 5177-008

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR032

Level : (low/med) LOW

Date Received: Oct 15, 1991

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 06, 1991 12:38

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |    |
|------------|--------------|----------------------|----|
|            |              | ug/Kg                | Q. |
| 12674-11-2 | Aroclor-1016 | 80.                  | U  |
| 11104-28-2 | Aroclor-1221 | 80.                  | U  |
| 11141-16-5 | Aroclor-1232 | 80.                  | U  |
| 53469-21-9 | Aroclor-1242 | 80.                  | U  |
| 12672-29-6 | Aroclor-1248 | 180                  |    |
| 11097-69-1 | Aroclor-1254 | 160                  | U  |
| 11096-82-5 | Aroclor-1260 | 160                  | U  |

Sample Name : 5177-008-1.1.CPC ACID MATRIX SPIK

Injection Time : 12 Nov 6, 1991 12:38:09 PM

Peak Processor : Gentle Multilevel : False

Instrument : HP9A

Quantitation: AreaUnits

Calculation : Zero  
Dilution : 100  
Run Time : 30.00 Minutes

Injection Time : Wed Nov 6, 1991 12:38:09 PM

Run Status : EndOfBaseline

SignalOverload

| PK # | RT    | Area     | Group | UG/ML    | Name      |
|------|-------|----------|-------|----------|-----------|
| 1    | 3.6   | 15157676 |       | 69.94061 |           |
| 2    | 1.14  | 1083234  |       | 4.99826  |           |
| 3    | 1.36  | 173130   |       | 79886    |           |
| 4    | 1.54  | 68455    |       | 31587    |           |
| 5    | 1.66  | 61791    |       | 28512    |           |
| 6    | 1.75  | 174513   |       | 20524    |           |
| 7    | 1.84  | 241572   |       | 1.11466  |           |
| 8    | 2.02  | 36596    |       | 16886    |           |
| 9    | 2.11  | 58904    |       | 11794    |           |
| 10   | 2.29  | 11245    |       | 35188    |           |
| 11   | 2.54  | 3698     |       | 01705    |           |
| 12   | 2.67  | 78613    |       | 36273    |           |
| 13   | 2.80  | 291768   |       | 1.34628  |           |
| 14   | 2.19  | 8972     |       | 04140    |           |
| 15   | 3.40  | 3164     |       | 31460    |           |
| 16   | 3.48  | 20184    |       | 09213    |           |
| 17   | 3.74  | 1510     |       | 00697    |           |
| 18   | 4.15  | 96006    |       | 44299    |           |
| 19   | 4.41  | 6084     |       | 22807    |           |
| 20   | 4.62  | 7593     |       | 03504    |           |
| 21   | 4.80  | 7173     |       | 02402    |           |
| 22   | 4.95  | 18429    |       | 08503    |           |
| 23   | 5.11  | 430253   |       | 1.98527  |           |
| 24   | 5.21  | 465589   |       | 2.14832  |           |
| 25   | 5.54  | 1510     |       | 00697    |           |
| 26   | 5.85  | 49661    |       | 22915    |           |
| 27   | 6.15  | 6280     |       | 32861    |           |
| 28   | 6.37  | 18403    |       | 08492    |           |
| 29   | 6.51  | 13415    |       | 06190    |           |
| 30   | 6.87  | 16803    |       | 07384    |           |
| 31   | 7.13  | 106662   |       | 49216    | AR1248 #2 |
| 32   | 7.52  | 53087    |       | 24496    |           |
| 33   | 7.87  | 39116    |       | 13049    |           |
| 34   | 8.23  | 237696   |       | 1.09678  | AR1248 #3 |
| 35   | 8.63  | 1325     |       | 30612    |           |
| 36   | 9.04  | 133980   |       | 61823    | AR1248 #4 |
| 37   | 9.37  | 118156   |       | 54520    | AR1248 #5 |
| 38   | 9.97  | 48848    |       | 22540    |           |
| 39   | 10.11 | 63105    |       | 29118    |           |
| 40   | 10.53 | 233166   |       | 1.07538  | AR1248 #7 |
| 41   | 10.99 | 46448    |       | 21432    |           |
| 42   | 11.23 | 77082    |       | 35567    |           |

DOC (SUM)

|         |       |        |         |
|---------|-------|--------|---------|
| 45      | 12.68 | 56245  | 25953   |
| 46      | 13.09 | 71132  | 32822   |
| 47      | 13.34 | 9772   | .04509  |
| 48      | 13.77 | 34510  | .15924  |
| 49      | 14.21 | 42335  | .19534  |
| 50      | 14.60 | 11678  | .05388  |
| 51      | 14.81 | 9289   | .04286  |
| 52      | 15.29 | 17979  | .08296  |
| 53      | 15.77 | 35171  | .16228  |
| 54      | 16.39 | 13521  | .06239  |
| 55      | 20.35 | 40161  | 0.00000 |
| 56      | 20.88 | 785091 | 0.00000 |
| -----   |       |        |         |
| Totals: |       | 0      | 0.00000 |
|         |       |        | UG/ML   |

DBC (SURR1)

Report Time: Tue Nov 12, 1991 2:37:42 pm  
Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH  
Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000103

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

BLANK SPIKE

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: Q5-0320BS

Sample wt/vol: 1000 mL

Lab File ID: HP9A\_110591GR013

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 05, 1991 21:06

GPC Cleanup: (Y/N) Y pH: 7.5

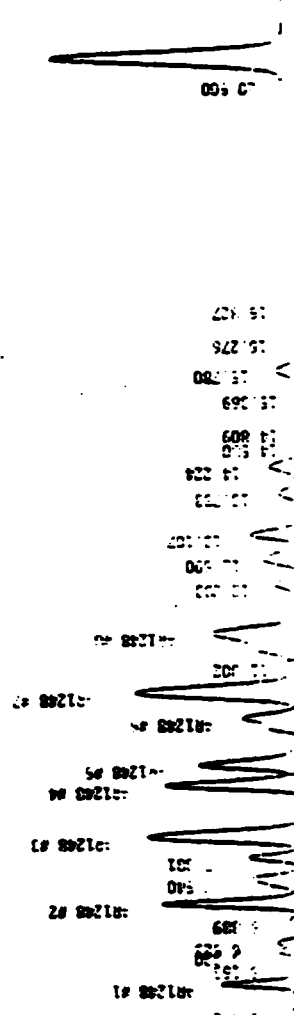
Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 0.50                 | U |
| 11104-28-2 | Aroclor-1221 | 0.50                 | U |
| 11141-16-5 | Aroclor-1232 | 0.50                 | U |
| 53469-21-9 | Aroclor-1242 | 0.50                 | U |
| 12672-29-6 | Aroclor-1248 | 2.0                  |   |
| 11097-69-1 | Aroclor-1254 | 0.50                 | U |
| 11096-82-5 | Aroclor-1260 | 0.50                 | U |

000105

Report Time: 11:00 AM 11/05/91 11:00 AM  
Method: DATA/LOOP/METHOD/MP9A.PCM  
Format: DATA/LOOP/FORMAT/SIDE.FMT

| NAME        | AREA | CONC | UIC/ML |
|-------------|------|------|--------|
| 001248 #1   | 1.12 | 1.12 | 1.12   |
| 001248 #2   | 1.12 | 1.12 | 1.12   |
| 001248 #3   | 1.12 | 1.12 | 1.12   |
| 001248 #4   | 1.12 | 1.12 | 1.12   |
| 001248 #5   | 1.12 | 1.12 | 1.12   |
| 001248 #6   | 1.12 | 1.12 | 1.12   |
| 001248 #7   | 1.12 | 1.12 | 1.12   |
| 001248 #8   | 1.12 | 1.12 | 1.12   |
| 001248 #9   | 1.12 | 1.12 | 1.12   |
| 001248 #10  | 1.12 | 1.12 | 1.12   |
| 001248 #11  | 1.12 | 1.12 | 1.12   |
| 001248 #12  | 1.12 | 1.12 | 1.12   |
| 001248 #13  | 1.12 | 1.12 | 1.12   |
| 001248 #14  | 1.12 | 1.12 | 1.12   |
| 001248 #15  | 1.12 | 1.12 | 1.12   |
| 001248 #16  | 1.12 | 1.12 | 1.12   |
| 001248 #17  | 1.12 | 1.12 | 1.12   |
| 001248 #18  | 1.12 | 1.12 | 1.12   |
| 001248 #19  | 1.12 | 1.12 | 1.12   |
| 001248 #20  | 1.12 | 1.12 | 1.12   |
| 001248 #21  | 1.12 | 1.12 | 1.12   |
| 001248 #22  | 1.12 | 1.12 | 1.12   |
| 001248 #23  | 1.12 | 1.12 | 1.12   |
| 001248 #24  | 1.12 | 1.12 | 1.12   |
| 001248 #25  | 1.12 | 1.12 | 1.12   |
| 001248 #26  | 1.12 | 1.12 | 1.12   |
| 001248 #27  | 1.12 | 1.12 | 1.12   |
| 001248 #28  | 1.12 | 1.12 | 1.12   |
| 001248 #29  | 1.12 | 1.12 | 1.12   |
| 001248 #30  | 1.12 | 1.12 | 1.12   |
| 001248 #31  | 1.12 | 1.12 | 1.12   |
| 001248 #32  | 1.12 | 1.12 | 1.12   |
| 001248 #33  | 1.12 | 1.12 | 1.12   |
| 001248 #34  | 1.12 | 1.12 | 1.12   |
| 001248 #35  | 1.12 | 1.12 | 1.12   |
| 001248 #36  | 1.12 | 1.12 | 1.12   |
| 001248 #37  | 1.12 | 1.12 | 1.12   |
| 001248 #38  | 1.12 | 1.12 | 1.12   |
| 001248 #39  | 1.12 | 1.12 | 1.12   |
| 001248 #40  | 1.12 | 1.12 | 1.12   |
| 001248 #41  | 1.12 | 1.12 | 1.12   |
| 001248 #42  | 1.12 | 1.12 | 1.12   |
| 001248 #43  | 1.12 | 1.12 | 1.12   |
| 001248 #44  | 1.12 | 1.12 | 1.12   |
| 001248 #45  | 1.12 | 1.12 | 1.12   |
| 001248 #46  | 1.12 | 1.12 | 1.12   |
| 001248 #47  | 1.12 | 1.12 | 1.12   |
| 001248 #48  | 1.12 | 1.12 | 1.12   |
| 001248 #49  | 1.12 | 1.12 | 1.12   |
| 001248 #50  | 1.12 | 1.12 | 1.12   |
| 001248 #51  | 1.12 | 1.12 | 1.12   |
| 001248 #52  | 1.12 | 1.12 | 1.12   |
| 001248 #53  | 1.12 | 1.12 | 1.12   |
| 001248 #54  | 1.12 | 1.12 | 1.12   |
| 001248 #55  | 1.12 | 1.12 | 1.12   |
| 001248 #56  | 1.12 | 1.12 | 1.12   |
| 001248 #57  | 1.12 | 1.12 | 1.12   |
| 001248 #58  | 1.12 | 1.12 | 1.12   |
| 001248 #59  | 1.12 | 1.12 | 1.12   |
| 001248 #60  | 1.12 | 1.12 | 1.12   |
| 001248 #61  | 1.12 | 1.12 | 1.12   |
| 001248 #62  | 1.12 | 1.12 | 1.12   |
| 001248 #63  | 1.12 | 1.12 | 1.12   |
| 001248 #64  | 1.12 | 1.12 | 1.12   |
| 001248 #65  | 1.12 | 1.12 | 1.12   |
| 001248 #66  | 1.12 | 1.12 | 1.12   |
| 001248 #67  | 1.12 | 1.12 | 1.12   |
| 001248 #68  | 1.12 | 1.12 | 1.12   |
| 001248 #69  | 1.12 | 1.12 | 1.12   |
| 001248 #70  | 1.12 | 1.12 | 1.12   |
| 001248 #71  | 1.12 | 1.12 | 1.12   |
| 001248 #72  | 1.12 | 1.12 | 1.12   |
| 001248 #73  | 1.12 | 1.12 | 1.12   |
| 001248 #74  | 1.12 | 1.12 | 1.12   |
| 001248 #75  | 1.12 | 1.12 | 1.12   |
| 001248 #76  | 1.12 | 1.12 | 1.12   |
| 001248 #77  | 1.12 | 1.12 | 1.12   |
| 001248 #78  | 1.12 | 1.12 | 1.12   |
| 001248 #79  | 1.12 | 1.12 | 1.12   |
| 001248 #80  | 1.12 | 1.12 | 1.12   |
| 001248 #81  | 1.12 | 1.12 | 1.12   |
| 001248 #82  | 1.12 | 1.12 | 1.12   |
| 001248 #83  | 1.12 | 1.12 | 1.12   |
| 001248 #84  | 1.12 | 1.12 | 1.12   |
| 001248 #85  | 1.12 | 1.12 | 1.12   |
| 001248 #86  | 1.12 | 1.12 | 1.12   |
| 001248 #87  | 1.12 | 1.12 | 1.12   |
| 001248 #88  | 1.12 | 1.12 | 1.12   |
| 001248 #89  | 1.12 | 1.12 | 1.12   |
| 001248 #90  | 1.12 | 1.12 | 1.12   |
| 001248 #91  | 1.12 | 1.12 | 1.12   |
| 001248 #92  | 1.12 | 1.12 | 1.12   |
| 001248 #93  | 1.12 | 1.12 | 1.12   |
| 001248 #94  | 1.12 | 1.12 | 1.12   |
| 001248 #95  | 1.12 | 1.12 | 1.12   |
| 001248 #96  | 1.12 | 1.12 | 1.12   |
| 001248 #97  | 1.12 | 1.12 | 1.12   |
| 001248 #98  | 1.12 | 1.12 | 1.12   |
| 001248 #99  | 1.12 | 1.12 | 1.12   |
| 001248 #100 | 1.12 | 1.12 | 1.12   |



Result File: 001248-150-0-20-190-0-1-250-8-2UL INJ  
Sample Name: 5-012085.1.1.CPC ACID  
Injection Time: 10.00 MINUTES  
Run Time: 10.00 MINUTES  
Run Status: EndOfBaseline  
SignalOverload: 001248 #100  
Peak Processor: 1.12  
Instrument: MP9A  
Calibration: 1.12  
Quantitation: 1.12  
Page 1

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

BLANK SPIKE

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: Q5-0319BS

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR018

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 05, 1991 23:52

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 80.                  | U |
| 11104-28-2 | Aroclor-1221 | 80.                  | U |
| 11141-16-5 | Aroclor-1232 | 80.                  | U |
| 53469-21-9 | Aroclor-1242 | 80.                  | U |
| 12672-29-6 | Aroclor-1248 | 120                  |   |
| 11097-69-1 | Aroclor-1254 | 160                  | U |
| 11096-82-5 | Aroclor-1260 | 160                  | U |

Sample Name : 05-031905.1.1.CPC ACID

001701:150-0-20-190-0-3-250-0: 2uL INJ:ccccPRIMARY RUNcccc

Peak Processor : Genie

Multilevel : False

Instrument : HP9A

Calculation : Zero

Quantitation: AreaUnits

Dilution : 100

Run Time : 30.00 Minutes

Injection time : Tue Nov 5. 1991 11:52:53 pm

Run Status : RunStatusOK

EndOfBaseline

AR1248 #1  
6.161  
6.527  
6.890

AR1248 #2  
7.539  
7.879

AR1248 #3

AR1248 #4  
AR1248 #5

AR1248 #6  
AR1248 #7

11.000

AR1248 #8

12.324  
12.692  
13.110

13.786  
14.227  
14.579  
14.814

15.370  
15.781

16.414

20.375

| Pk #    | RT    | Area    | Group | UG/ML   | Name       |
|---------|-------|---------|-------|---------|------------|
| 1       | 5.87  | 30847   |       | .60352  | AR1248 #1  |
| 2       | 6.16  | 2876    |       | .05626  |            |
| 3       | 6.39  | 10076   |       | .19714  |            |
| 4       | 6.52  | 9772    |       | .19120  |            |
| 5       | 6.89  | 6381    |       | .12485  |            |
| 6       | 7.15  | 73104   |       | 1.43027 | AR1248 #2  |
| 7       | 7.54  | 39880   |       | .78025  |            |
| 8       | 7.98  | 28945   |       | .56630  |            |
| 9       | 8.22  | 131152  |       | 2.56597 | AR1248 #3  |
| 10      | 9.05  | 92236   |       | 1.80458 | AR1248 #4  |
| 11      | 9.38  | 77679   |       | 1.51977 | AR1248 #5  |
| 12      | 10.13 | 59885   |       | 1.17165 | AR1248 #6  |
| 13      | 10.54 | 172546  |       | 3.17584 | AR1248 #7  |
| 14      | 11.00 | 10715   |       | .20963  |            |
| 15      | 11.50 | 135782  |       | 2.65655 | AR1248 #8  |
| 16      | 12.28 | 28002   |       | .54785  |            |
| 17      | 12.69 | 40021   |       | .78300  |            |
| 18      | 13.11 | 44156   |       | .86390  |            |
| 19      | 13.79 | 23023   |       | .45045  |            |
| 20      | 14.23 | 30645   |       | .59957  |            |
| 21      | 14.58 | 3304    |       | .06464  |            |
| 22      | 14.81 | 5265    |       | .10300  |            |
| 23      | 15.37 | 2415    |       | .04726  |            |
| 24      | 15.78 | 24737   |       | .48397  |            |
| 25      | 16.41 | 14503   |       | .28374  |            |
| 26      | 20.38 | 43801   |       | 0.00000 |            |
| 27      | 20.90 | 1254758 |       | 0.00000 | DBC (SURR) |
| Totals: |       | 0       |       | 0.00000 | UG/ML      |

Report Time: Fri Nov 8. 1991 2:51:40 pm

Method: /DATA/LOOP/METHOD/HP9A\_PCB.MTH

Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000107

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

CHECK SAMPLE

Lab Task Number : 5177

Matrix: (soil/water) WATER

Lab Sample ID: Q5-0320CS

Sample wt/vol: 1000 mL

Lab File ID: HP9A\_110591GR014

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted: Oct 21, 1991

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: Nov 05, 1991 21:40

GPC Cleanup: (Y/N) Y pH: 7.5

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/L                 | Q |
| 12674-11-2 | Aroclor-1016 | 0.50                 | U |
| 11104-28-2 | Aroclor-1221 | 0.50                 | U |
| 11141-16-5 | Aroclor-1232 | 0.50                 | U |
| 53469-21-9 | Aroclor-1242 | 0.50                 | U |
| 12672-29-6 | Aroclor-1248 | 0.50                 | U |
| 11097-69-1 | Aroclor-1254 | 0.50                 | U |
| 11096-82-5 | Aroclor-1260 | 1.8                  |   |

Sample Name : 05-0120CS.1.1.CPC ACID

DB1701:110-0-20-190-0-3-250-8: 2uL [M]:method:MAINMAY RUNNERS

Peak Processor : Genie

Multilevel : False

Instrument : HP9A

Quantitation: AreaWidths

Calculation : Zero

Quantitation: AreaWidths

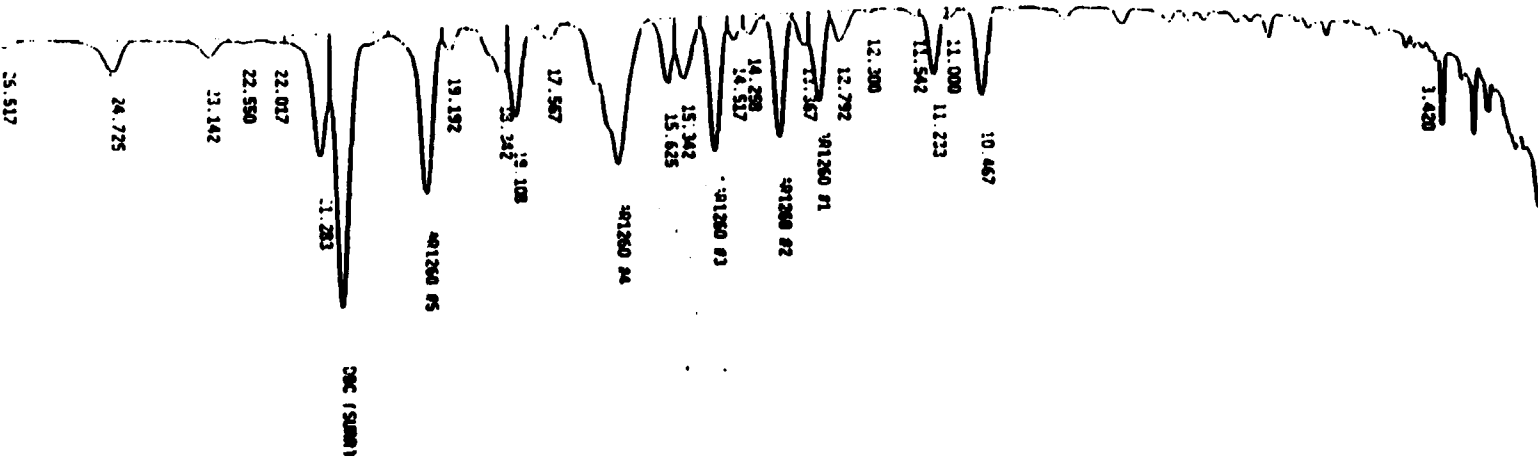
Offset : 100

Run Time : 10.00 Minutes

Injection time : Tue Nov 5, 1991 9:00:07 pm

Run Status : EndOfBaseline

SignalOverload



| PK #    | RT    | Area   | Group | UC/ML   | Name      |
|---------|-------|--------|-------|---------|-----------|
| 1       | 10.47 | 2850   |       | 0.0230  |           |
| 2       | 10.47 | 79972  |       | 0.00000 |           |
| 3       | 11.00 | 6397   |       | 0.00000 |           |
| 4       | 11.23 | 58719  |       | 0.00000 |           |
| 5       | 11.54 | 6244   |       | 0.00000 |           |
| 6       | 12.30 | 2345   |       | 0.00000 |           |
| 7       | 12.79 | 33038  |       | 0.00000 |           |
| 8       | 13.12 | 82679  |       | 0.00000 | AR1260 #1 |
| 9       | 13.37 | 28785  |       | 0.00000 |           |
| 10      | 13.77 | 112885 |       | 0.00000 | AR1260 #2 |
| 11      | 14.26 | 19072  |       | 0.00000 |           |
| 12      | 14.52 | 20438  |       | 0.00000 |           |
| 13      | 14.83 | 130435 |       | 0.00000 | AR1260 #3 |
| 14      | 15.34 | 74938  |       | 0.00000 |           |
| 15      | 15.63 | 65877  |       | 0.00000 |           |
| 16      | 16.43 | 333380 |       | 0.00000 | AR1260 #4 |
| 17      | 17.57 | 17207  |       | 0.00000 |           |
| 18      | 18.11 | 98737  |       | 0.00000 |           |
| 19      | 18.34 | 74247  |       | 0.00000 |           |
| 20      | 19.19 | 19957  |       | 0.00000 |           |
| 21      | 19.56 | 205102 |       | 0.00000 | AR1260 #5 |
| 22      | 20.91 | 346043 |       | 0.00000 | 08C (SUM) |
| 23      | 21.28 | 163891 |       | 0.00000 |           |
| 24      | 22.02 | 10845  |       | 0.00000 |           |
| 25      | 22.55 | 9086   |       | 0.00000 |           |
| 26      | 23.14 | 29301  |       | 0.00000 |           |
| 27      | 24.72 | 55068  |       | 0.00000 |           |
| 28      | 25.52 | 12623  |       | 0.00000 |           |
| Totals: |       | 0      |       | 0.00000 | UC/ML     |

Report Time: Fri Nov 8, 1991 2:43:10 pm  
 Method: /DATA/LOG/METHOD/HP9A\_PCG.MTH  
 Format File: /DATA/LOG/FORMAT/SIDE.FMT

000109

# PCB/PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE No.

Lab Name: Galson Laboratories

CHECK SAMPLE

Lab Task Number : 5177

Matrix: (soil/water) SOIL

Lab Sample ID: Q5-0319CS

Sample wt/vol: 30 g

Lab File ID: HP9A\_110591GR019

Level : (low/med) LOW

Date Received:

% Moisture: 0

Date Extracted: Oct 18, 1991

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: Nov 06, 1991 00:26

GPC Cleanup: (Y/N) Y pH:

Dilution Factor: 1

| CAS NO.    | COMPOUND     | CONCENTRATION UNITS: |   |
|------------|--------------|----------------------|---|
|            |              | ug/Kg                | Q |
| 12674-11-2 | Aroclor-1016 | 80.                  | U |
| 11104-28-2 | Aroclor-1221 | 80.                  | U |
| 11141-16-5 | Aroclor-1232 | 80.                  | U |
| 53469-21-9 | Aroclor-1242 | 80.                  | U |
| 12672-29-6 | Aroclor-1248 | 80.                  | U |
| 11097-69-1 | Aroclor-1254 | 160                  | U |
| 11096-82-5 | Aroclor-1260 | 140                  | J |

Sample Name : 05-031PCS.1.1.CPC ACID

001701:150-0-20-190-0-3-250-0: 2UL (M):greenPRIMARY Runover

Peak Processor : Genie

MultiLevel : False

Instrument : MP9A

Calculation : Zero

Quantitation: AreaUnits

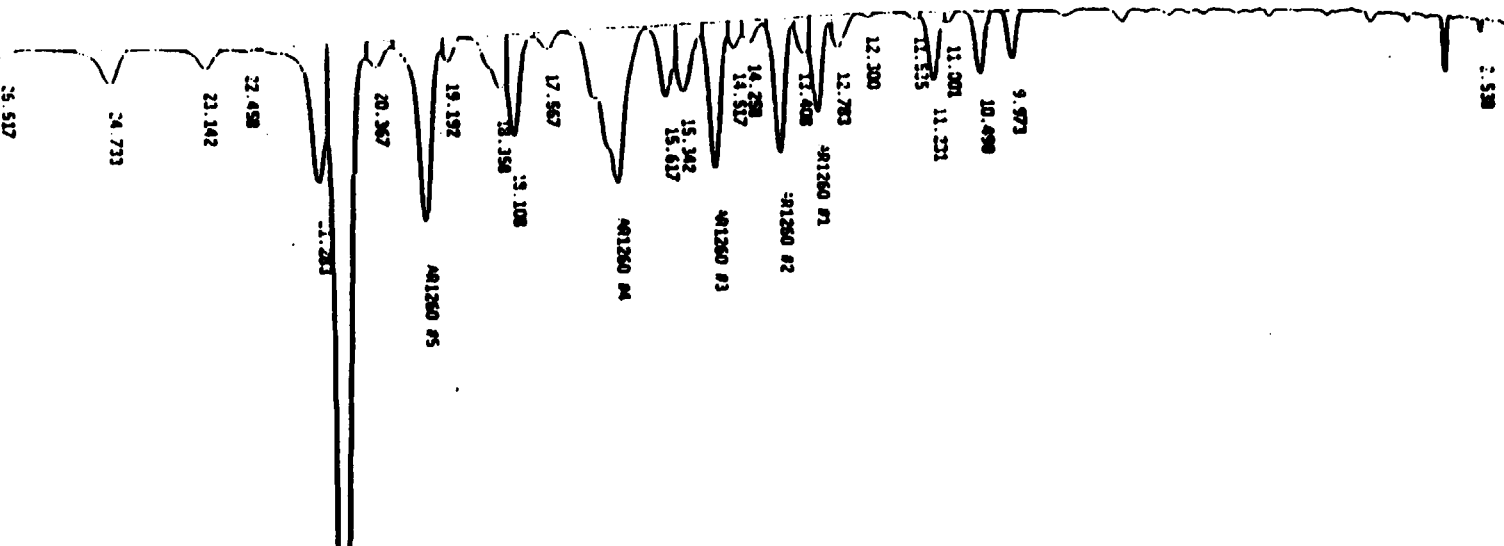
Dilution : 100

Run Time : 30.00 Minutes

Injection time : Wed Nov 6, 1991 12:26:04 am

Run Status : RunSuccessful

EndOfBaseline



| PK #    | RT    | Area   | Group | UC/ML   | Name        |
|---------|-------|--------|-------|---------|-------------|
| 1       | 2.54  | 2635   |       | 0.0000  |             |
| 2       | 9.97  | 32202  |       | 0.7318  |             |
| 3       | 10.49 | 50699  |       | 1.16375 |             |
| 4       | 11.00 | 6761   |       | 1.5497  |             |
| 5       | 11.23 | 59903  |       | 1.37685 |             |
| 6       | 11.54 | 6023   |       | 1.3826  |             |
| 7       | 12.10 | 3136   |       | 0.00000 |             |
| 8       | 12.78 | 32258  |       | 0.00000 |             |
| 9       | 13.13 | 89013  |       | 0.00000 | AR1260 #1   |
| 10      | 13.41 | 36465  |       | 0.00000 |             |
| 11      | 13.77 | 125629 |       | 0.00000 | AR1260 #2   |
| 12      | 14.26 | 23473  |       | 0.00000 |             |
| 13      | 14.52 | 22601  |       | 0.00000 |             |
| 14      | 14.83 | 144203 |       | 0.00000 | AR1260 #3   |
| 15      | 15.34 | 81953  |       | 0.00000 |             |
| 16      | 15.62 | 81739  |       | 0.00000 |             |
| 17      | 16.42 | 368864 |       | 0.00000 | AR1260 #4   |
| 18      | 17.57 | 20977  |       | 0.00000 |             |
| 19      | 18.11 | 101617 |       | 0.00000 |             |
| 20      | 18.36 | 35825  |       | 0.00000 |             |
| 21      | 19.19 | 19568  |       | 0.00000 |             |
| 22      | 19.56 | 235082 |       | 0.00000 | AR1260 #5   |
| 23      | 20.37 | 33837  |       | 0.00000 |             |
| 24      | 20.91 | 938950 |       | 0.00000 | DRC (SUM#1) |
| 25      | 21.28 | 203280 |       | 0.00000 |             |
| 26      | 22.46 | 4238   |       | 0.00000 |             |
| 27      | 23.14 | 10978  |       | 0.00000 |             |
| 28      | 24.73 | 64226  |       | 0.00000 |             |
| 29      | 26.52 | 15861  |       | 0.00000 |             |
| Totals: |       | 0      |       | 0.00000 | UC/ML       |

DRC (SUM#1)

-1.203

AR1260 #5

AR1260 #4

AR1260 #3

AR1260 #2

AR1260 #1

14.258

14.517

15.342

15.617

17.567

18.358

19.108

19.192

20.367

22.458

23.142

24.733

26.517

Report Time: Fri Nov 8, 1991 2:49:37 PM  
 Method: /DATA/LOOP/RETHOD/MP9A.PCR.MTH  
 Format File: /DATA/LOOP/FORMAT/SIDE.FMT

000111

US-C-20-ET

EXTRACTION METHOD : GC-MSD (PBB)  
MATRIX : WATER  
EXTRACTION SOLVENT : Meck.  
FINAL SOLVENT : hexane

|                |        |      |           |
|----------------|--------|------|-----------|
| EXTRACTION     | 1/1/81 | DATE | 21 Oct 91 |
| CONCENTRATION  | 1/1/81 | DATE | 21 Oct 91 |
| CLEANUP        | 1/1/81 | DATE | 21 Oct 91 |
| EXTRACTS REC'D | 1/1/81 | DATE | 22 Oct 91 |

000112

Q.C. BATCH # :

B-0320.EG

| GTS #     | CLIENT ID # | COMMENTS                                                                   |
|-----------|-------------|----------------------------------------------------------------------------|
| 177-001   |             | LIGHT OILY <del>BAD SAMPLE</del> DROWN CLOUDY SAMPLE                       |
| " - 004   |             | <del>BROWN CLOUDY SAMPLE</del> // <del>SAMPLE SPECIFIC AFTER IN WORK</del> |
| " - 004   |             | <del>BLACK OIL LOOKING</del> SAMPLE * NOT CONC. LIGHT OIL                  |
|           |             | SOLVENT EXCH. 10ml → Fm: hexane                                            |
|           |             | 2 → 1 CONC.                                                                |
|           |             | FOR GPC CU:                                                                |
|           |             | measured all volumes (see attached sheet) // CONC. 05 w/ MECL <sub>2</sub> |
|           |             | GPC'd 1 → 2 - solvent exchange from                                        |
|           |             | to hexane to final volume of 10ml                                          |
|           |             | concentr.                                                                  |
| PS        |             | W10.2 MILLI QH20                                                           |
| BLANK     |             | W10.2 MILLI QH20                                                           |
| IS/ 20    |             | Brown cloudy sample                                                        |
| ISD/ 550  |             | Brown cloudy sample                                                        |
| CHK. STD. |             | W10.2 MILLI QH20 E-129.0 1.0ml, 5.0 w/ml                                   |

000113



Q.C. BATCH # :

Q5-0380-E

GTS # CLIENT ID #

COMMENTS

5197-009

1 → minilevel

151 HSC1

minile

↓

✓

BLANK  
3 / 35  
USD / 350  
IK. STD.

Cleanup: Harviti

received: Harviti

date: 11-6-91

date: 11-6-91

Q50319.IL

EXTRACTION METHOD : ES-8080  
MATRIX : soil  
EXTRACTION SOLVENT : 1:1 MeOH:Aceton  
FINAL SOLVENT : Hexane

[illegible]

VOLUME : 2BC.IV

VOLUME : 1.0 ml

|               |          |
|---------------|----------|
| EXTRACTION    | 10-18-91 |
| CONCENTRATION | 11-18-91 |
| CLEANUP       | 12-18-91 |
| EXTRACTS RECD | 12-24-91 |

000116

Q5 0319.EL

## COMMENTS

! Nazkouni lau.

↓

CPD

Chemical

BS

# ~~BANK~~

MS 88

**MSD/ BOM**

**CHK. STD.**

1. Add 30 mg of sodium sulfate

Markauc Day.

! Used 30 g Sodium metal. E124 1.0 ml at 50 vol%



**Project Correspondence**

000119



6601 Kirtwile Road  
E. Syracuse, NY 13057  
Tel (315) 432-0506  
1-800-850-0506

Date: October 15, 1991  
To: Leena Tsai  
From: Laurie Johnston  
Re: Quote for PCB analysis

PCB SW-846 method 8080  
following  
NYS-DEC ASP category B

|                    |          |
|--------------------|----------|
| Treated soil       | \$170.00 |
| Untreated soil     | \$170.00 |
| Soil matrix spike  | \$170.00 |
| Soil spike dup.    | \$170.00 |
| Blank spike        | N/C      |
| Water (per sample) | \$165.00 |
| Water matrix spike | \$165.00 |
| Water spike dup.   | \$165.00 |
| Blank spike        | N/C      |
| Vent trap          | \$170.00 |

Please add a 4% NYS Certification Fee to all work.  
DEC ASP CROs will be used but are matrix and moisture dependent.  
Turnaround time will not 35 days.  
If you are in need of further assistance, please do not hesitate to  
call me.

January 30, 1992

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GRC ENVIRONMENTAL, INC.  
Appendix 4: Cost Estimate

## PRELIMINARY COST ESTIMATE

As previously discussed, cost estimating from laboratory data has poor precision due to scale up factor limitations. The following calculations differ in total soil volume and production rate, which strongly affect labor and capital costs. The 1% reagent loss used for calculation is consistent with the qualitative lab reagent recovery data. Minor costs have been omitted from the spreadsheet.

|             |                      |
|-------------|----------------------|
| Assumptions | 10,000 tons sediment |
|             | 40 tons per day      |
|             | 2 ppm clean level    |
|             | 8 hour batch time    |
|             | 1% reagent loss      |

|                     |                  |
|---------------------|------------------|
| <b>MOBILIZATION</b> | <b>\$500,000</b> |
|---------------------|------------------|

## PROCESSING

|                      |           |
|----------------------|-----------|
| Capital Depreciation | 1,200,000 |
| Labor & OH           | 2,010,000 |

| Chemical | Costs | (1,000 batches) |
|----------|-------|-----------------|
| PEG 400  | 250   | lbs/batch       |
| TMH      | 250   | lbs/batch       |
| DMSO     | 500   | lbs/batch       |
| 45% KOH  | 1,000 | lbs/batch       |

**\$1,000,000**

|             |         |
|-------------|---------|
| Fuel        | 150,000 |
| Electricity | 150,000 |

|                |                |
|----------------|----------------|
| DEMOBILIZATION | <u>400.000</u> |
|----------------|----------------|

|                     |                    |
|---------------------|--------------------|
| <b><u>TOTAL</u></b> | <b>\$5,410,000</b> |
|---------------------|--------------------|

**ESTIMATED COST PER TON, 10,000 tons** **\$550/ton**

**Expected Accuracy,  $\pm 50\%$**

## PRELIMINARY COST ESTIMATE

|                                      |                                                                                                        |                     |
|--------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------|
| Assumptions                          | 100,000 tons sediment<br>250 tons per day<br>2 ppm clean level<br>8 hour batch time<br>1% reagent loss |                     |
| MOBILIZATION                         |                                                                                                        | \$700,000           |
| PROCESSING                           |                                                                                                        |                     |
|                                      | Capital Depreciation                                                                                   | 2,500,000           |
|                                      | Labor & OH                                                                                             | 3,000,000           |
|                                      | Chemical Costs (10,000 batches)                                                                        |                     |
|                                      | PEG 400 250 lbs/batch                                                                                  |                     |
|                                      | TMH 250 lbs/batch                                                                                      |                     |
|                                      | DMSO 500 lbs/batch                                                                                     |                     |
|                                      | 45% KOH 1,000 lbs/batch                                                                                |                     |
|                                      |                                                                                                        | <u>\$10,000,000</u> |
|                                      | Fuel                                                                                                   | 1,500,000           |
|                                      | Electricity                                                                                            | 1,500,000           |
| DEMOBILIZATION                       |                                                                                                        | <u>500,000</u>      |
| <u>TOTAL</u>                         |                                                                                                        | \$19,700,000        |
| ESTIMATED COST PER TON, 100,000 tons |                                                                                                        | \$200/ton           |
| Estimated accuracy, $\pm 50\%$       |                                                                                                        |                     |

January 30, 1992

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GRC ENVIRONMENTAL, INC.  
Appendix 5: Quality Assurance Report

## **PCB Analysis**

The Relative Standard Deviation (RSD) is equal to the standard deviation divided by the mean and expressed as a percentage. The RSD is used to indicate the precision in duplicate PCB analysis of a sample. Accuracy in PCB analysis is evaluated by examining the per cent recovery of PCB spiked samples and the per cent recovery of the recovery surrogate, decachlorobiphenyl (DCB). The results of a duplicate and spike analysis on the treated sediment from Sheboygan's Sediment are listed in Table 5-1.

For the purpose of implementing QC/QA, a performance evaluation (PE) sample was prepared and analyzed. The PE sample was prepared by taking about 1 g of clean soil and spiking it with a certain amount of PCB. The results of these analyses are in Table 5-1.

**Table 5-1. PCB Analysis Duplicate, Spike for Treated Sediment  
and Performance Evaluation Sample Results**

| Sample Description                | ppm<br>PCB | Average<br>ppm | %RSD | ppm<br>Added | % Spike<br>Recovery |
|-----------------------------------|------------|----------------|------|--------------|---------------------|
| Reaction 2, Final Sediment        | 0.27       | 0.27           | 0.00 |              |                     |
| Reaction 2, Final Sediment, Dup.  | 0.26       |                |      |              |                     |
| Reaction 2, Final Sediment, Spike | 3.20       |                |      | 3.7          | 80                  |
| PE Sample (Solid)                 | 7.3        |                |      | 6.9          | 110                 |
| PE Sample (Liquid)                | 6.3        |                |      | 6.9          | 92                  |

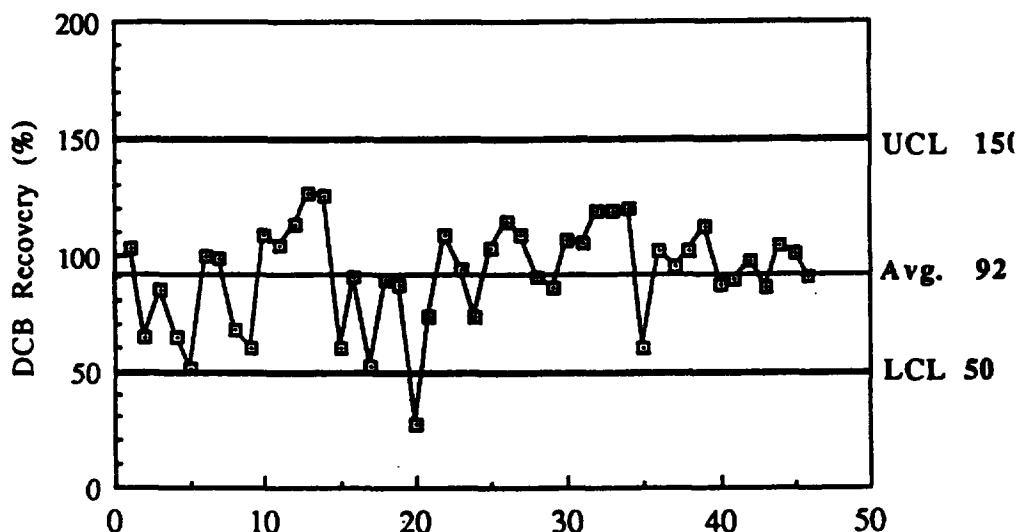
All of the QA criteria were within acceptable limits under the quality assurance protection plan (QAPP) (QAPP spike recovery guidelines requires recoveries within 50-150% and less than 50% relative standard deviation).

Figure 5-1 is a control chart showing the percent recoveries of the recovery surrogate (decachlorobiphenyl) for all of the samples analyzed for PCBs during this project.

The average DCB recovery for this project was 96% with a standard deviation of 22%, percentage points for a relative standard deviation of 24%. These results

are well within the QA goals. It is important to note, however that samples having DCB recoveries under 50% or over 150% were rejected as invalid and that such analyses were repeated whenever there was sufficient sample available. The only invalid data was the hour two monitoring sample which was first analyzed as 6.7 ppm of PCB and 26.7% of DCB recovery. The second backup sample was reanalyzed and had 46 ppm of PCB and 74% of DCB recovery.

Figure 5-1. DCB Percent Recovery Control Chart



Completeness is evaluated by dividing the number of samples for which valid results were obtained by the total number of samples analyzed. A total of 46 samples were analyzed for the Sheboygan Project. Valid data were obtained for 45 of them, making the data 98% complete. The data that was rejected was the sample that had decachlorobiphenyl recoveries under 50%; it was reanalyzed.

#### Reagent Component Analysis

A set of samples was analyzed for the reagent components (PEG, TMH, and DMSO) during the Sheboygan Harbor and River treatability study. A single

Performance Evaluation Sample, consisting of clean soil spiked with the reagents, was analyzed with the batch of samples. Results are in Table 5-2.

Table 5-2. Results of Reagent Performance Evaluation Sample

| Compound    | Reported Values | Actual Values | % Recovery |
|-------------|-----------------|---------------|------------|
| PEG (mg/g)  | 15              | 15            | 100        |
| TMH (mg/g)  | 14              | 13            | 93         |
| DMSO (mg/g) | 30              | 27            | 90         |

All the recoveries were within QAPP guidelines ( $\pm 50\%$ ,  $\pm 50\%$  and  $\pm 20\%$  for PEG, TMH and DMSO). The performance evaluation recovery does support the methodology GRC used.