# SITE INVESTIGATION REPORT FOR IRP SITES NO. 25 AND NO. 26

# VOLUME II

## 148th FIGHTER WING
## MINNESOTA AIR NATIONAL GUARD
## DULUTH AIR NATIONAL GUARD BASE
## DULUTH, MINNESOTA

DISTRIBUTION STATEMENT A
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JUNE 1996




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*Prepared For*

HQ ANG/CEVR
ANDREWS AFB, MARYLAND

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ANDREWS AFB, MARYLAND

*Prepared By*

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1315-197

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Site Investigation Report for IRP Sites No. 25 and No. 26, 148th Fighter Wing, Duluth Air National Guard Base, Duluth, MN, Volume II, Appendix A through L. This is the second volume of a four volume site investigation report. This investigation involves two sites; site 25 -- Old Motor Pool area, and site 26 -- Ramp Disposal Area. Soil and groundwater contamination above state action levels were found at site 25; no significant contamination was found at site 26. Site 25 cleanup will be included in the scheduled cleanup of site 21.

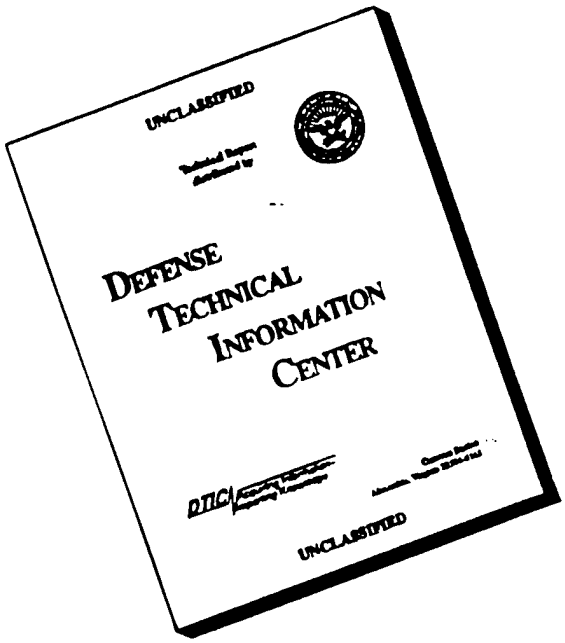
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# APPENDIX A

# BORING LOGS

## INTRODUCTION

Boring log diagrams have been compiled for each borehole location drilled during this study. Diagrams are presented in numerical order within each site. The borehole identification is keyed to the site number (017-01BH), borehole (BH), or monitor well designation (MW). The diagrams combine in one page both a verbal and graphical illustration of the lithology encountered during drilling, water level data encountered during drilling, and surveyed elevation of the ground surface at the borehole location.

Drilling records are organized sequentially by number for boreholes and the monitor well. The borehole identification is keyed to the site number and borehole type such as soil boring for acoustic topography survey (BH) or monitor well designation (MW).

The soil core was scanned for volatile organic compounds prior to describing the soil core and results were recorded on the boring logs. As soon as the soil core was removed from the sampling assembly, a portable Thermo Instrument Model 580B photoionization detector was used to monitor for volatile organic compounds and a portable HMX251 explosimeter was used to monitor the lower explosive limit and percent oxygen.

The sample description includes the primary major component or components, color, consistency, relative density, texture, moisture, and observations of each distinct lithologic change encountered. Each distinct lithologic change that was encountered was defined by the Unified Soil Classification System (USCS), which is based on texture, sorting of clasts, and plasticity of soils. The color was determined by visually comparing the color of the sample with the Munsell Soil Color Charts. The texture was visually estimated and described suing the following semi-quantitative adjectives:

| Adjective | Estimated Percent of Total Sample |
|---|---|
| Trace | 0 - 5 |
| Little | 5 - 12 |
| Some | 12 - 35 |
| Add | 35 - 50 |

These adjectives precede the lithology, such as little clay (5 - 12% clay) or some sand (12 - 35% sand).

The classification: Sand, granule, cobble, and boulder, was assigned using the grain-size scale given in the USCS. Gravel clast sizes, boulder, cobble, and pebbles were measured using a steel tape in the field. On the original field lithologic logs, clasts that were 4 inches or greater in size and those that were from 2 to 4 inches in size were reported as boulders and cobbles, respectively.

The fine fraction was described using one of the following terms: Silt, silt and clay, or clay. These are field terms and take into account plasticity as well as grain size. The distinction between clay and silt was based on how easily a small piece of soil could be rolled into a thin ribbon. Clay can easily be smeared into a ribbon when wet while silt is smeared with more difficulty. A dry sample of clay is difficult to crush with fingers while a dry sample of silt is more easily crushed.

## LITHOLOGIC LOGS

Lithologic symbols are derived and generalized from the USCS shown in Figure A.1.

In the boring logs that follow, the column headings have the following meaning:

| | |
|---|---|
| Depth: | Depth in feet below surface. |
| Blows: | The number of blows required to drive a split-spoon sampler an additional 24 inches into the ground beyond the initial 6-inch set. |
| Ambient Temperature Headspace Analysis (ATHA): | The reading of photoionizable compounds detected in the contained soil sample by a photoionization detector. |
| Samples: | The interval of sample cored below land surface. |
| Percent Recovery: | The percentage of sample recovered in the split-spoon sampler per sampling run. |
| USCS: | Unified Soil Classification System based on texture, sorting of clasts and plasticity of soils. |

# KEY TO BORING LOG SYMBOLS

## UNIFIED SOIL CLASSIFICATION SYSTEM – ASTM D2487

| MAJOR DIVISIONS | | | SYMBOL/ GRAPHIC | DESCRIPTIONS |
|---|---|---|---|---|
| COARSE-GRAINED SOILS (>50% Smaller Than #200 Sieve) | GRAVELS (More than 50% of coarse fraction is larger than the #4 sieve size.) | Clean gravels with little or no fines | GW | Well-Graded Gravels, Gravel – Sand Mixtures |
| | | | GP | Poorly Graded Gravels, Gravels – Sand Mixtures |
| | | Gravels with over 12% fines | GM | Silty Gravels, Poorly Graded Gravel-Sand-Clay Mixtures |
| | | | GC | Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures |
| | SANDS (More than 50% of coarse fraction is smaller than the #4 sieve size.) | Clean sands with little or no fines | SW | Well-Graded Sands, Gravelly Sands |
| | | | SP | Poorly Graded Sands, Gravelly Sands |
| | | Sands with over 12% fines | SM | Silty Sands, Poorly Graded Sand-Silt Mixtures |
| | | | SC | Clayey Sands, Poorly Graded Sand-Clay Mixtures |
| FINE-GRAINED SOILS (>50% Smaller Than #200 Sieve) | SILTS AND CLAYS (Liquid limit less than 50) | | ML | Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands |
| | | | CL | Inorganic Clays of Low to Medium Plasticity: Gravelly, Sandy or Silty Clays; Lean Clays |
| | | | OL | Organic Clays and Organic Silty Clays of Low Plasticity |
| | SILTS AND CLAYS (Liquid limit greater than 50) | | MH | Inorganic Silts, Micaceous or Diatomacious Fine Sandy or Silty Soils, Elastic Silts |
| | | | CH | Inorganic Clays of High Plasticity Fat Clays |
| | | | OH | Organic Clays of Medium to High Plasticity, Organic Silts |
| HIGHLY ORGANIC SOILS | | | Pt | Peat and Other Highly Organic Soils |

Sample retained for on-site screening.

Sample prepared for laboratory analysis.

Water Table Level.

PID Photo-Ionization Detector readings (ppm).

ND Parameter Not Detected

NA Measurement Not Applicable, Groundwater Not Detected

– No Measurement Performed

NR No Sample Recovery

| |
|---|
| Asphaltic Concrete |
| Portland Cement Concrete |
| Cement Grout |
| Boulders or Bedrock |

DRAFT

FIGURE A.1

FORMS\KEYLOG2

KEY TO BORING LOG SYMBOLS

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AUGUST 1995

PID: A Photoionization Detector used to monitor volatile organic compounds in uncontained soil and/or groundwater samples.

## REFERENCES

Casagrande, A., 1948. Classification and identification of soils. Transactions of the American Society of Civil Engineers 113:901.

Folk, R. L., 1980. Petrology of Sedimentary Rocks. Hemphill Publishing Company. Austin, TX. p. 182.

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DULUTH, MINNESOTA, SITE 25

**O P T E C H**

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## LOG OF BORING 025-01BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 7 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Tuura | **Date Measured:** | 05/15/95 |
| **Date Drilled:** | 05/15/95 | **Surface Elevation:** | 1421.34 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 7<br>6<br>6<br>6 | 30 | | | Asphalt<br>Silt, trace sand (fine), trace gravel (up to pebble). Soft, Dry dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 6<br>12<br>12<br>15 | 80 | | | Strong hydrocarbon odor. Silt, little sand (fine to coarse). Slightly moist. Dark brown (7.5 YR 4/4). | 742 | 1096 | | |
| | | | | | Boring Terminated at 7 ft. BLS<br>Note: Drilling terminated at 7 feet BLS due to lower explosive limit of 12 and breathing zone level on the PID of 45 ppm. | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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# LOG OF BORING 025-02BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 15 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 11 ft |
| **Driller:** | J. Tuura | **Date Measured:** | 05/15/95 |
| **Date Drilled:** | 05/15/95 | **Surface Elevation:** | 1421.24 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asphalt | | | | |
| | 4<br>17<br>9<br>7 | 40 | | | Silt, little sand (fine), trace gravel (pebble-cobble) dry. Dark Brown (7.5 YR 4/4). | 0 | 58 | | |
| | | | | | Same as above. | | | | |
| 5 | 11<br>10<br>16<br>15 | 60 | | | | 541 | 1391 | | |
| | | | | | | | | | |
| 10 | 10<br>6<br>12<br>47 | 60 | | | Strong hydrocarbon odor, silt, some sand (coarse) Moist to wet (10 YR 2/2) Very dark brown. | 330 | 1339 | | |
| | | | | | | | | | |
| 15 | | | | | Boring terminated at 15 ft. BLS<br>Note: Drilling terminated at 15 feet BLS due to high LEL (12.0) & PID (421 ppm) reading. | | | | |
| | | | | | | | | | |
| 20 | | | | | | | | | |

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## LOG OF BORING 025-03BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 25 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 23 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/15/95 |
| **Date Drilled:** | 05/15/95 | **Surface Elevation:** | 1420.48 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asphalt | | | | |
| | 4<br>5<br>7<br>5 | 60 | | | Silt, little sand (fine, trace clay. Dry. Soft. Dark brown. (7.5 YR 4/4) | 0 | 0 | | |
| 5 | 8<br>8<br>11<br>11 | 75 | | | Silt, trace sand (fine), trace gravel. Firm. Slightly moist. Dark brown (7.5 YR 3/4). | 0 | 467 | | |
| 10 | 8<br>16<br>14<br>9 | 75 | | | Strong hydrocarbon odor. Silt, trace sand (fine to coarse), trace gravel. Slightly moist. Dark brown (7.5 YR 4/4). | 273 | 727 | | |
| 15 | 9<br>11<br>13<br>16 | 80 | | | Silt, trace sand (fine), slightly moist. Dark brown (7.5 YR 4/4). | 133 | 53 | | |
| 20 | 10<br>8 | 80 | | | Same as above. | 9.5 | 10.6 | | |

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## LOG OF BORING 025-03BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 25 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 23 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/15/95 |
| **Date Drilled:** | 05/15/95 | **Surface Elevation:** | 1420.48 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 6<br>6 | | | | | | | | |
| | | | | | No recovery | | | | |
| | 6<br>4 | 0 | | | Silt, little sand (up to coarse), trace gravel (up to cobble). Wet, dark brown (7.5 YR 4/4). | - | - | | |
| | 5<br>5 | 30 | | | | 0 | 0 | | |
| 25 | | | | | Boring terminated at 25 ft. BLS<br>Note: Duplicate samples taken from 11.0-11.5 ft.<br>Duplicate samples taken from 16.0-16.5 ft.<br>Sidewall collapsed 23-25 ft., recollected from 24-25 ft. for screening only. | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |

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# LOG OF BORING 025-04BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 20 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Tuura | **Date Measured:** | NA |
| **Date Drilled:** | 05/16/95 | **Surface Elevation:** | 1423.53 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asphalt | | | | |
| | 8<br>8<br>12<br>12 | 10 | | | Fill material, silt, trace sand, trace gravel. Dry. | 0 | 0 | | |
| 5 | 11<br>16<br>13<br>13 | 75 | | | Silt, platy structure, fragile trace gravel (cobble). Dry. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 10 | 10<br>6<br>9<br>16 | 75 | | | Silt and sand, dry, fragile. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 15 | | | | | | | | | |
| | 6<br>6<br>3<br>4 | 30 | | | Silt, trace sand (fine). fragile. dry. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 20 | | | | | Boring terminated at 20 ft. BLS | | | | |

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## LOG OF BORING 025-05BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 14 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/16/95 |
| **Date Drilled:** | 05/16/95 | **Surface Elevation:** | 1423.87 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 5<br>8<br>6<br>8 | 40 | | | Silt, trace clay, dry. Dark brown (7.5 YR 4/4). | 1.8* | 0 | | |
| 5 | 15<br>16<br>10<br>10 | 0 | | | No recovery. | 0 | 0 | | |
| 10 | 10<br>13<br>16<br>10 | 80 | | | Silt, some sand (medium). Soft dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 15 | | | | | | | | | |
| | 12<br>10<br>8<br>8 | 0 | | | No recovery. | | | | |
| 20 | 4<br>7 | 75 | | | Silt, trace sand (medium), trace gravel (up to cobble) dark brown (7.5 YR 3/4). Very moist to wet. | 0 | 0 | | |

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# LOG OF BORING 025-05BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 14 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/16/95 |
| **Date Drilled:** | 05/16/95 | **Surface Elevation:** | 1423.87 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 7 7 | | | | Boring terminated at 22 ft. BLS<br>Note: * was background PID value, that was compensated for on future samples. | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |

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## LOG OF BORING 025-06BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Tuura | **Date Measured:** | 05/12/95 |
| **Date Drilled:** | 05/12/95 | **Surface Elevation:** | 1421.05 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asphalt | | | | |
| | 5<br>6<br>7<br>7 | 80 | | | Silt, little sand, fine to coarse grained sand, dry, fragile, dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 10<br>10<br>11<br>12 | 80 | | | Same as above: slightly moist. | 0 | 0 | | |
| 10 | 5<br>9<br>13<br>17 | 80 | | | Silt trace sand, trace gravel: fine to coarse grained sand; granite cobble clasts, slightly moist; dark brown (7.5 YR 4/4). | | | | |
| 15 | | | | | | | | | |
| | 22<br>38<br>28<br>21 | 0 | | | No recovery. | | | | |
| 20 | 9<br>14 | | | | Same as above, moist. | 0.7 | 0 | | |

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# LOG OF BORING 025-06BH

| | | | |
|---|---|---|---|
| Project No.: | 1315-197 | Sampling Method: | Split Spoon Sampler |
| Logged By: | Kathleen Merino | Depth Drilled: | 22 ft. |
| Drilling Co.: | American Engineering Testing | Depth To Water: | NA |
| Driller: | J. Tuura | Date Measured: | 05/15/95 |
| Date Drilled: | 05/12/95 | Surface Elevation: | 1421.05 ft. |
| Drilling Method: | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 30<br>16 | | | | | | | | |
| | | | | | Boring terminated at 22 ft. BLS | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |

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## LOG OF BORING 025-07BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 14 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/16/95 |
| **Date Drilled:** | 05/16/95 | **Surface Elevation:** | 1425.96 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 1<br>2<br>3<br>5 | 35 | | | Silt, trace sand (fine), trace gravel (up to cobble) slightly moist. Soft (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 7<br>15<br>15<br>9 | 50 | | | Silt, little sand (fine) slightly moist. Firm. Dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 10 | 10<br>10<br>13<br>17 | 75 | | | Same as above. | 0 | 0 | | |
| 15 | 5<br>3<br>4<br>6 | 20 | | | Same as above. | 0 | 0 | | |
| 20 | 2<br>5 | 10 | | | Silt, trace clay, trace gravel (up to cobble) trace sand (fine) Wet. Brown (7.5 YR 5/4). | 0 | 0 | | |

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## LOG OF BORING 025-07BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 14 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/16/95 |
| **Date Drilled:** | 05/16/95 | **Surface Elevation:** | 1425.96 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 6<br>7 | | | | Boring Terminated at 22 ft. | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |
| 40 | | | | | | | | | |

DULUTH SI

DULUTH, MINNESOTA, SITE 25

OPTECH

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 025-08BH

| | | | |
|---|---|---|---|
| **Project No.:** | **1315-197** | **Sampling Method:** | **Split Spoon Sampler** |
| **Logged By:** | **Kathleen Merino** | **Depth Drilled:** | **15 ft.** |
| **Drilling Co.:** | **American Engineering Testing** | **Depth To Water:** | **NA** |
| **Driller:** | **J. Tuura** | **Date Measured:** | **NA** |
| **Date Drilled:** | **05/12/95** | **Surface Elevation:** | **1421.97 ft.** |
| **Drilling Method:** | **Hollow-Stem Auger** | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 2 2 4 4 | 25 | | | Silt, little sand (fine to coarse), trace gravel (up to cobble). Dry dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 4 5 5 4 | 0 | | | No recovery | | | | |
| | 7 16 9 11 | 10 | | | Silt, little sand (fine to coarse) trace gravel (up to cobble). Moist dark brown (7.5 YR 4/4). | 2 | 12.4 | | |
| 10 | 5 9 13 11 | 80 | | | Silt, trace sand (fine), trace gravel (up to cobble) dark brown (7.5 YR 4/4). | .5 | 0 | | |
| | 4 3 5 9 | 60 | | | Same as above. | 0 | 0 | | |
| 15 | | | | | Boring Terminated at 15 ft. | | | | |
| 20 | | | | | | | | | |

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**OPTECH**

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 025-09BH

| | | | |
|---|---|---|---|
| **Project No.:** | **1315-197** | **Sampling Method:** | **Split Spoon Sampler** |
| **Logged By:** | **Kathleen Merino** | **Depth Drilled:** | **15 ft.** |
| **Drilling Co.:** | **American Engineering Testing** | **Depth To Water:** | **NA** |
| **Driller:** | **J. Tuura** | **Date Measured:** | **05/12/95** |
| **Date Drilled:** | **05/12/95** | **Surface Elevation:** | **1417.29 ft.** |
| **Drilling Method:** | **Hollow-Stem Auger** | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 2<br>3<br>7<br>8 | 30 | | | Silt, organics, trace sand (fine) trace gravel. Dry. Dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 2<br>4<br>4<br>4 | 30 | | | Silt, trace sand (fine to medium) Very moist, Dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 10 | 3<br>5<br>12<br>11 | 50 | | | Same as above. | 0 | 0 | | |
| | 3<br>5<br>7<br>6 | 60 | | | Same as above. | 0 | 0 | | |
| 15 | | | | | Boring Terminated at 15 ft. | | | | |
| 20 | | | | | | | | | |

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# LOG OF BORING 025-10BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 7 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 6.5 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/12/95 |
| **Date Drilled:** | 05/12/95 | **Surface Elevation:** | 1398.19 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 1<br>1<br>2<br>3 | 40 | | | Silt, some sand (fine to coarse), trace gravel (up to cobble) moist, dark brown (7.5 YR 4/4). | 0 | NA | | |
| 5 | 5<br>6<br>3<br>3 | 50 | | | Same as above; wet. | 0 | 0 | | |
| | | | | | Boring Terminated at 7 ft.<br>Note: Interval .5-2.5 was redrilled approx 1 ft. away due to poor recovery. | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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# LOG OF BORING 025-11BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 7 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 6.5 ft. BLS |
| **Driller:** | J. Tuura | **Date Measured:** | 05/12/95 |
| **Date Drilled:** | 05/12/95 | **Surface Elevation:** | 1397.29 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 1<br>3<br>4<br>5 | 30 | | | Silt, trace (fine), moist Dark brown (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 7<br>9<br>9<br>9 | 75 | | | Same as above; wet. | 0 | - | | |
| | | | | | Boring Terminated at 7 ft. | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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# LOG OF BORING 025-12BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 20 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Tuura | **Date Measured:** | NA |
| **Date Drilled:** | 05/17/95 | **Surface Elevation:** | 1421.29 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asphalt | | | | |
| | 7<br>7<br>6<br>6 | 90 | | | Silt, trace sand (medium), trace gravel (pebble). Fragile. Dry. Dark brown (7.5 YR 3/4). | 0 | 2.8 | | |
| 5 | 4<br>8<br>9<br>18 | 50 | | | Silt, trace sand (fine). Firm. Slightly moist. Dark brown (7.5 YR 3/4). | 9.6 | 6.9 | | |
| 10 | 8<br>13<br>17<br>13 | 75 | | | Same as above. | 7.5 | 6.5 | | |
| 15 | | | | | | | | | |
| | 3<br>5<br>4<br>5 | 60 | | | Silt, trace sand (fine), trace gravel (up to cobble). Firm. Slightly moist. Dark brown (7.5 YR 3/4). | 4.5 | 3.2 | | |
| 20 | | | | | Boring Terminated at 20 ft. | | | | |

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# LOG OF BORING 025-13BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 20 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Tuura | **Date Measured:** | NA |
| **Date Drilled:** | 05/17/95 | **Surface Elevation:** | 1421.97 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Asphalt | | | | |
| | 6<br>4<br>4<br>9 | 80 | | | Silt, trace sand (fine), trace gravel (pebble) Fragile. Soft. Dry. Dark Brown (7.5 YR 4/4). | 0 | 0 | | |
| 5 | 12<br>10<br>18<br>24 | 20 | | | Same as above. | 0 | 0 | | |
| 10 | 5<br>10<br>19<br>14 | 75 | | | Silt, little gravel (up to brass sleeve 1.6"). Trace sand. Firm. Moist Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 15 | | | | | | | | | |
| | 6<br>13<br>16<br>18 | 75 | | | Silt, little to some sand (medium) well sorted, moist. Soft. Dark brown (7.5 YR 3/4). | 0 | 10.6 | | |
| 20 | | | | | Boring Terminated at 20 ft. | | | | |

DULUTH SI

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OPTECH

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 026-01BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 10 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 6.8 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/04/95 |
| **Date Drilled:** | 05/03/95 | **Surface Elevation:** | 1422.28 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 4 | 30 | | | Silt, little gravel (cobble) trace clay, trace sand (fine to | 0 | 0 | | |
| | 10 | 75 | | | medium) moist Dark brown (7.5 YR 3/3). | - | - | | |
| | 7 | | | | | | | | |
| | 10 | | | | | | | | |
| | 3 | | | | | | | | |
| | 5 | | | | | | | | |
| | 7 | | | | | | | | |
| | 7 | | | | | | | | |
| 5 | 25 | 25 | | | Gravel (cobble) and clay. Dark brown (7.5 YR 5/3). | 0 | 0 | | |
| | 20 | 75 | | | | - | - | | |
| | 25 | | | | | | | | |
| | 23 | | | | | | | | |
| | 8 | | | | | | | | |
| | 8 | 75 | | | | | | | |
| | 11 | | | | Silt & sand (med-coarse), trace clay. Dark brown, | 0 | 0 | | |
| | 13 | | | | very moist (7.5 YR 3/3). | | | | |
| | 8 | | | | | | | | |
| | 8 | | | | | | | | |
| 10 | 13 | | | | Boring Terminated at 10 ft. | | | | |
| | 14 | | | | Note: Intervals .5-2.5 and 5-7 were redrilled approx 1 foot from original location. | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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**O P T E C H**

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 026-02BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 7 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 7 ft. |
| **Driller:** | J. Turra | **Date Measured:** | 05/04/95 |
| **Date Drilled:** | 05/03/95 | **Surface Elevation:** | 1421.61 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 3 | 10 | | | No recovery (cobble) | 0 | 0 | | |
| | 3 | 20 | | | | 0 | 0 | | |
| | 5 | 50 | | | | 0 | 0 | | |
| | 10 | | | | | | | | |
| | 3 | | | | | | | | |
| | 4 | | | | | | | | |
| | 5 | | | | | | | | |
| | 5 | 35 | | | | 0 | 0 | | |
| | 3 | | | | | | | | |
| 5 | 3 | 50 | | | Sand, some gravel, trace silt. Very moist. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| | 4 | | | | | | | | |
| | 5 | | | | | | | | |
| | 16 | | | | | | | | |
| | 13 | | | | | | | | |
| | 36 | | | | Boring Terminated at 7 ft. | | | | |
| | 18 | | | | Note: Second set of intervals drilled approximately 1 foot from original location. | | | | |
| | 50 | | | | | | | | |
| | 13 | | | | | | | | |
| | 18 | | | | | | | | |
| 10 | 16 | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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OPTECH

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 026-03BH

| | | | |
|---|---|---|---|
| **Project No.:** | **1315-197** | **Sampling Method:** | **Split Spoon Sampler** |
| **Logged By:** | **Kathleen Merino** | **Depth Drilled:** | **7 ft.** |
| **Drilling Co.:** | **American Engineering Testing** | **Depth To Water:** | **7 ft.** |
| **Driller:** | **J. Turra** | **Date Measured:** | **05/04/95** |
| **Date Drilled:** | **05/03/95** | **Surface Elevation:** | **1422.21 ft.** |
| **Drilling Method:** | **Hollow-Stem Auger** | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 6<br>9<br>13<br>13 | 75 | | | Silt, some sand (fine to coarse), some gravel, trace clay. Dry. Dark brown (7.5 Yr 3/3). | 0<br>0 | 0<br>0 | | |
| | 3<br>7<br>16<br>15 | | | | | | | | |
| 5 | 8<br>19<br>22<br>21 | 55 | | | Same as above (very moist). | 0 | 0 | | |
| | | | | | Boring Terminated at 7 ft. | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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**O P T E C H**

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 026-04BH

| | | | |
|---|---|---|---|
| **Project No.:** | **1315-197** | **Sampling Method:** | **Split Spoon Sampler** |
| **Logged By:** | **Kathleen Merino** | **Depth Drilled:** | **10 ft.** |
| **Drilling Co.:** | **American Engineering Testing** | **Depth To Water:** | **10 ft.** |
| **Driller:** | **J. Turra** | **Date Measured:** | **05/03/95** |
| **Date Drilled:** | **05/03/95** | **Surface Elevation:** | **1423.90 ft.** |
| **Drilling Method:** | **Hollow-Stem Auger** | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 5<br>6<br>9<br>12 | 70 | | | Silt, trace sand (fine) trace gravel (cobble). Dry, Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 5 | 8<br>10<br>11<br>16 | 10 | | | Sand (medium), some silt, little gravel (cobble) dry. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| | 6<br>6<br>8<br>9 | 50 | | | Same as above (slightly moist-wet). | 0 | 0.2 | | |
| 10 | 50 | | | | Boring Terminated at 10 ft. | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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OPTECH

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## LOG OF BORING 026-05BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 10 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Turra | **Date Measured:** | 05/03/95 |
| **Date Drilled:** | 05/03/95 | **Surface Elevation:** | 1424.77 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 4<br>7<br>7<br>7 | 75 | | | Silt and sand (fine), some gravel (cobble) dry. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 5 | 3<br>21<br>19<br>5 | 75 | | | Sand (fine to medium), some silt, trace gravel (cobble) Dry. Dark brown (7.5 YR 3/4). | 0 | 0 | | |
| | 10<br>10<br>11<br>12 | 15 | | | Sand (medium) and silt, some gravel (cobble). Slightly moist, dark brown (7.5 YR 3/3). | 0 | 0.3 | | |
| 10 | | | | | Boring Terminated at 10 ft. | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |

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OPTECH

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 026-06BH

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 12 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | NA |
| **Driller:** | J. Turra | **Date Measured:** | 05/03/95 |
| **Date Drilled:** | 05/03/95 | **Surface Elevation:** | 1425.43 ft. |
| **Drilling Method:** | Hollow-Stem Auger | | |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID | ATHA | - | - |
|---|---|---|---|---|---|---|---|---|---|
| | 7<br>9<br>9<br>7 | 70 | | | Silt and sand (fine), some gravel (cobble), loose, dark brown (7.5 YR 3/4). | 0 | 0 | | |
| 5 | 11<br>13<br>10<br>10 | 75 | | | Silt, little gravel (cobble) trace clay, trace sand (fine) slightly moist, dark brown (7.5 YR 4/4). | 0 | 0 | | |
| | 17<br>14<br>17<br>21 | 0 | | | No recovery | 0 | 0 | | |
| 10 | 9<br>15<br>20<br>21 | 90 | | | Silt and clay, traces and (fine to coarse), trace to little gravel, moist, dark brown (7.5 YR 3/4). | 0 | 0 | | |
| | | | | | Boring Terminated at 12 ft. | | | | |
| 15 | | | | | | | | | |

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**OPTECH**

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 025-01MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 39.8 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 32.4 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/10/95 |
| **Date Drilled:** | 05/10/95 | **Surface Elevation:** | 1422.59 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1422.56 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3<br>4<br>4<br>5 | 50 | | | Asphalt<br>Silt, trace sand (fine), trace clay, trace gravel (up to pebble) moist Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 5 | 2<br>5<br>16<br>16 | 50 | | | Silt, trace sand (fine to medium) trace gravel (up to pebble) dry Dark brown. | 0 | 0 | | | |
| 10 | 6<br>3<br>4<br>7 | 60 | | | Silt, trace sand (fine), trace gravel, (up to pebble), trace clay Soft, brittle Brown (7.5 YR 5/3). Slightly Moist | 0 | 0 | | | |
| 15 | 11<br>16<br>18<br>18 | 100 | | | Silt, trace sand (fine), trace clay, trace gravel (up to cobble) Dry. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 20 | 7<br>13 | 60 | | | Silt, trace clay, trace sand (fine). Dark brown (7.5 YR 4/4). | 0 | 0 | | | |

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**O P T E C H**

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 025-01MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 39.8 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 32.4 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/10/95 |
| **Date Drilled:** | 05/10/95 | **Surface Elevation:** | 1422.59 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1422.56 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 37<br>50 | | | | Sand (medium to coarse) and silt, trace gravel. Dark brown (7.5 YR 4/4). | | | | | |
| 25 | 14<br>20<br>24<br>7 | 75 | | | Sand (fine to coarse) and granular, little gravel (up to cobble). Dark brown (7.5 YR 4/4) wet.<br>Silt, trace sand (fine), trace gravel-firm. Dry. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 30 | 11<br>13<br>19<br>35 | 50 | | | Silt, trace sand (fine). trace gravel (up to cobble) firm. Slightly moist. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 35 | 8<br>11<br>17<br>18 | 60 | | | Same as above (moist to saturated). | 0 | 0 | | | |
| | | | | | Boring Terminated at 39.8 ft. | | | | | |
| 40 | | | | | | | | | | |

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**OPTECH**

OPERATIONAL TECHNOLOGIES CORPORATION

## LOG OF BORING 025-02MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 17.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 6.0 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/11/95 |
| **Date Drilled:** | 05/10/95 | **Surface Elevation:** | 1397.83 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1400.21 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3<br>5<br>7<br>11 | 60 | | | Silt, some sand (medium). Dry dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 5 | 3<br>4<br>7<br>8 | 60 | | | Same as above. | 0 | 0 | | | |
| 10 | 6<br>8<br>11<br>11 | 60 | | | Silt, trace sand (fine), trace gravel (up to cobble). Dry to very moist. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 15 | 2<br>3<br>6<br>8 | 60 | | | Silt, trace sand (fine), trace clay, trace gravel (up to pebble) wet. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| | | | | | Boring Terminated at 17 ft. | | | | | |
| 20 | | | | | | | | | | |

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## LOG OF BORING 025-03MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 12.7 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/11/95 |
| **Date Drilled:** | 05/11/95 | **Surface Elevation:** | 1402.71 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1405.32 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3<br>4<br>7<br>9 | 60 | | | Silt, little sand (fine to coarse) trace gravel (up to cobble). Soft Moist. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 5 | 11<br>11<br>24<br>14 | 60 | | | Silt, trace sand (fine), trace gravel (up to pebble). dry. Soft. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 10 | 11<br>11<br>7<br>7 | 25 | | | Silt, little sand (fine to coarse), trace gravel (up to cobble). Brown (7.5 YR 3/4). | .8 | 25.8 | | | |
| 15 | 5<br>1<br>2<br>2 | 75 | | | Clay, wood fragments & peat. Moist. Black (10 YR 2/1). | 15.6 | 5 | | | |
| 20 | 1<br>1 | 50 | | | Silt, sand lenses (1-2" thick). Trace clay, trace gravel (up to cobble), high organics and | 0 | 0.8 | | | |

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## LOG OF BORING 025-03MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 12.7 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/11/95 |
| **Date Drilled:** | 05/11/95 | **Surface Elevation:** | 1402.71 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1405.32 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5<br>9 | | | | wood fragments. Wet Dark brown to black (10 YR 2/1). | | | | | |
| | | | | | Boring Terminated at 22 ft. | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 40 | | | | | | | | | | |

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## LOG OF BORING 026-01MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 26.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 17.2 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/05/95 |
| **Date Drilled:** | 05/05/95 | **Surface Elevation:** | 1424.69 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1424.62 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5<br>5<br>5<br>5 | 60 | | | Asphalt<br>Silt, some gravel (fine to medium), trace gravel (up to cobble), moist dark red-brown (7.5 YR 4/4). | 0 | 0 | | | |
| 5 | 15<br>20<br>15<br>14 | 80 | | | Silt, some gravel (up to cobble), trace sand (fine), dry. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 10 | 4<br>2<br>3<br>4 | 30 | | | Silt, trace clay, trace gravel (up to cobble), trace sand (fine-coarse) Moist. Dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| | 8<br>11<br>13<br>40 | 80 | | | Silt, trace little clay, trace sand (fine to coarse) trace gravel (up to cobble) very moist dark brown (7.15 YR 4/4). | 0 | 0 | | | |
| 15 | 6<br>10<br>11<br>13 | 80 | | | Same as above. | 0 | 0 | | | |
| 20 | 11<br>9 | 60 | | | Silt and sand (fine to medium) Dark brown. | 0 | 0 | | | |

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## LOG OF BORING 026-01MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 26.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 17.2 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/05/95 |
| **Date Drilled:** | 05/05/95 | **Surface Elevation:** | 1424.69 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1424.62 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 8<br>11 | | | | Sand and granular, some gravel (pebble-cobble) poorly sorted. Dark brown. | | | | | |
| 25 | 8<br>9<br>13<br>19 | 70 | | | Silt, little-trace sand (fine to coarse) trace clay, Grain size decreasing downward, wet. Dark brown (7.5 YR 4/4). | - | - | | | |
| | | | | | Boring terminated at 26 ft.<br>Note: Boulder encountered at 18.5 ft BLS. | | | | | |
| 30 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 40 | | | | | | | | | | |

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## LOG OF BORING 026-02MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 11.3 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/08/95 |
| **Date Drilled:** | 05/06/95 | **Surface Elevation:** | 1421.90 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1424.28 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2<br>3<br>7<br>7 | 50<br>50 | | | Asphalt<br>Silt, little sand (fine to medium), trace gravel (up to cobble) dry dark brown (7.5 YR 3/4). | 0 | 0 | | | |
| | 5<br>7<br>9<br>8 | | | | | | | | | |
| 5 | 9<br>11<br>16<br>14 | 25 | | | Same as above, slightly moist. | 0 | 0 | | | |
| 10 | 8<br>19<br>14<br>17 | 60 | | | Same as above, very moist to saturated. | 0 | 0 | | | |
| 15 | 7<br>4<br>4<br>7 | | | | Silt, little to some clay, trace sand, trace gravel, fine to coarse grained sand, pebble sized clasts. | | | | | |
| 20 | 4<br>5 | 45 | | | Silt and sand; little to some gravel, trace clay, fine to coarse grained sand, pebble | | | | | |

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## LOG OF BORING 026-02MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 22.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 11.3 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/08/95 |
| **Date Drilled:** | 05/06/95 | **Surface Elevation:** | 1421.90 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1424.28 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10<br>12 | | | | sized clasts, soft to firm; fining downward in section. | | | | | |
| | | | | | Boring Terminated at 22 ft.<br>Note: Second sample was collected from 0.5 - 2.5 ft. approximately 1 foot away from borehole. | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 40 | | | | | | | | | | |

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## LOG OF BORING 026-03MW

| | | | |
|---|---|---|---|
| **Project No.:** | 1315-197 | **Sampling Method:** | Split-Spoon Sampler |
| **Logged By:** | Kathleen Merino | **Depth Drilled:** | 17.0 ft. |
| **Drilling Co.:** | American Engineering Testing | **Depth To Water:** | 6.3 ft. |
| **Driller:** | J. Tuura | **Date Measured:** | 05/06/95 |
| **Date Drilled:** | 05/06/95 | **Surface Elevation:** | 1420.44 ft. |
| **Drilling Method:** | Hollow Stem Auger | **TOC Elevation:** | 1422.90 ft. |

| Depth (ft.) | Blows/6" | % Recovery | Samples | Graphic | DESCRIPTION OF MATERIALS | FIELD SCREENING PID (ppm) | ATHA (ppm) | BTEX (ppb) | Benzene (ppb) | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2<br>3<br>4<br>6 | 25 | | | Asphalt<br>Silt, some sand (fine) trace clay, wet, dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 5 | 48<br>16<br>19<br>20 | | | | Sand and gravel, trace granular, little silt, wet, fine-grained to coarse-grained sand, dark brown (7.5 YR 4/4). | 0 | 0 | | | |
| 10 | 45<br>15<br>23<br>24 | 50 | | | Same as above. | 0 | 0 | | | |
| 15 | 1<br>8<br>10<br>12 | 75 | | | Same as above. | 0 | 0 | | | |
| | | | | | Boring Terminated at 17 ft. | | | | | |
| 20 | | | | | | | | | | |

# APPENDIX B

# FIELD GAS CHROMATOGRAPH ANALYSIS RESULTS

## INTRODUCTION

This appendix describes the field gas chromatography (GC) analysis results of the Site Investigation (SI) for IRP Sites No. 25 and No. 26 at the Minnesota Air National Guard Base, Duluth, Minnesota. A PHOTOVAC 10S Plus portable gas chromatograph was used for field analysis. A summary of the GC results is presented in Table B.1, followed by the raw data.

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## Table B.1
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **4 May 1995** | | | | | | | | |
| 100 ppb BTEX | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 10 | 4 | 8 | 14 | 9 | 45 |
| 026-004BH | 0.5'-2.5'<br>5'-7'<br>8'-10' | 10<br>10<br>10 | 11<br>7<br>1 | 4<br>3<br>2 | 5<br>2<br>2 | 9<br>5<br>4 | 4<br>2<br>3 | 33<br>19<br>12 |
| 026-001BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | 7<br>ND | 1<br>2 | 3<br>ND | 17<br>ND | 26<br>ND | 54<br>2 |
| 100 ppb BTEX | – | – | 100 | 102 | 101 | 211 | 105 | 619 |
| Air Blank | – | – | ND | 1 | ND | ND | ND | 1 |
| 026-004BH Reshot | 0.5'-2.5' | 10 | ND | 2 | 1 | 14 | 11 | 28 |
| 026-001BH | 8'-10' | 10 | ND | 2 | 2 | 11 | 5 | 20 |
| 026-005BH | 1.0'-1.5'<br>6'-6.5'<br>10' | 10<br>10<br>10 | ND<br>ND<br>ND | 2<br>2<br>1 | ND<br>2<br>ND | 5<br>5<br>2 | 3<br>ND<br>1 | 10<br>9<br>4 |
| 100 ppb BTEX | – | – | 93 | 89 | 83 | 171 | 95 | 531 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | ND | 1 | ND | ND | 1 |
| 026-006BH | 0.5'-2.5'<br>6'-6.5'<br>11'-11.5' | 10<br>10<br>10 | 7<br>ND<br>5 | 2<br>1<br>2 | 2<br>ND<br>ND | 4<br>3<br>4 | 4<br>ND<br>2 | 19<br>4<br>13 |
| 026-002BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>ND | 2<br>1 | 1<br>ND | 2<br>ND | ND<br>ND | 5<br>1 |
| 100 ppb BTEX | – | – | 90 | 81 | 81 | 159 | 73 | 483 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | ND | 1 | ND | ND | 1 |
| 026-003BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>ND | 2<br>2 | 1<br>ND | 8<br>4 | 2<br>ND | 13<br>6 |

## Table B.1 (Continued)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **4 May 1995 (Concluded)** | | | | | | | | |
| 100 ppb BTEX | –<br>– | –<br>– | 109<br>100 | 96<br>100 | 95<br>100 | 181<br>200 | 88<br>100 | 569<br>600 |
| **5 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 5,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| Air Blank | – | – | 4 | 4 | 6 | 13 | ND | 27 |
| 026-001MW | 1'-2'<br>5'-7'<br>10'-12'<br>12.5'-14.5'<br>15'-17' | 10<br>10<br>10<br>10<br>10 | ND<br>4<br>3<br>3<br>ND | 3<br>3<br>3<br>3<br>ND | ND<br>3<br>2<br>3<br>6 | ND<br>6<br>6<br>9<br>13 | ND<br>ND<br>5<br>8<br>ND | 3<br>16<br>19<br>26<br>19 |
| 100 ppb BTEX | – | – | 100 | 96 | 106 | 216 | 115 | 633 |
| Air Blank | – | – | ND | 1 | ND | ND | ND | 1 |
| 026-001MW | 20'-22'<br>24'-26' | 10<br>10 | ND<br>ND | 2<br>2 | 1<br>1 | 4<br>3 | ND<br>ND | 7<br>6 |
| 100 ppb BTEX | –<br>– | –<br>– | 84<br>100 | 90<br>100 | 102<br>100 | 215<br>200 | 174<br>100 | 665<br>600 |
| **6 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 4 | 3 | 8 | 21 | ND | 36 |
| 026-003MW | 0.5'-2.5'<br>5'-7'<br>10'-12' | 10<br>10<br>10 | 5<br>3<br>3 | 4<br>3<br>3 | 6<br>10<br>11 | 26<br>25<br>32 | 5<br>27<br>28 | 46<br>68<br>77 |
| 026-002MW | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>ND | 3<br>2 | 12<br>3 | 31<br>15 | 32<br>17 | 78<br>37 |
| 100 ppb BTEX | – | – | 100 | 90 | 86 | 169 | 78 | 523 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | 1 | ND | ND | ND | 1 |
| 026-002MW | 10'-12'<br>15'-17' | 10<br>10 | 1<br>3 | 3<br>3 | 3<br>2 | 9<br>7 | 7<br>4 | 23<br>19 |

## Table B.1 (Continued)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **6 May 1995 (Concluded)** | | | | | | | | |
| 100 ppb BTEX | –<br>– | –<br>– | 100<br>100 | 94<br>100 | 91<br>100 | 185<br>200 | 97<br>100 | 567<br>600 |
| **8 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,020 | 1,010 | 2,030 | 1,290 | 6,350 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 2 | 8 | 7 | 13 | 14 | 44 |
| 026-002MW | 20'-22' | 10 | 4 | 6 | 7 | 13 | 11 | 41 |
| 100 ppb BTEX | –<br>– | –<br>– | 99<br>100 | 80<br>100 | 72<br>100 | 133<br>200 | 47<br>100 | 431<br>600 |
| **11 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 8 | 18 | 22 | 51 | 21 | 120 |
| 025-001MW | 0.5'-2.5'<br>5'-7'<br>10'-12'<br>15'-17'<br>20'-22' | 10<br>10<br>10<br>10<br>10 | 6<br>1<br>2<br>1<br>1 | 6<br>4<br>4<br>4<br>4 | 8<br>8<br>13<br>3<br>3 | 18<br>21<br>19<br>11<br>8 | ND<br>ND<br>ND<br>ND<br>ND | 38<br>34<br>38<br>19<br>16 |
| 100 ppb BTEX | – | – | 91 | 87 | 89 | 193 | 87 | 547 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | 2 | 2 | ND | ND | 4 |
| 025-001MW | 25'-27'<br>30'-32'<br>35'-37' | 10<br>10<br>10 | 3<br>3<br>ND | 4<br>4<br>4 | 2<br>5<br>18 | 5<br>9<br>29 | ND<br>ND<br>ND | 14<br>21<br>51 |
| 025-002MW | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>3 | 4<br>4 | 2<br>1 | 7<br>3 | ND<br>ND | 13<br>11 |
| 100 ppb BTEX | – | – | 108 | 104 | 104 | 212 | 108 | 636 |
| Air Blank | – | – | ND | 1 | 1 | ND | ND | 2 |
| 025-002MW | 10'-12'<br>15'-17' | 10<br>10 | 4<br>ND | 4<br>4 | 2<br>1 | 7<br>4 | 4<br>3 | 21<br>12 |
| 100 ppb BTEX | – | – | 86 | 85 | 81 | 166 | 83 | 501 |

## Table B.1 (Continued)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **11 May 1995 (Concluded)** | | | | | | | | |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | 1 | ND | 27 | ND | 28 |
| 025-003MW | 0.5'-2.5'<br>5'-7'<br>10'-12' | 10<br>10<br>10 | ND<br>25<br>774 | 5<br>4<br>350 | 3<br>2<br>297 | 13<br>15<br>1,840 | 9<br>ND<br>827 | 30<br>46<br>4,090 |
| 025-003MW Reshot | 10'-12' | 10 | 665 | 515 | 540 | 2,220 | 985 | 4,930 |
| 025-003MW | 15'-17' | 10 | 2,220 | 140 | ND | ND | ND | 2,360 |
| 1 ppm BTEX | – | – | 696 | 679 | 658 | 1,389 | 586 | 4,008 |
| Recal | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| Air Blank | – | – | ND | 1 | 1 | 3 | ND | 5 |
| 025-003MW | 20'-22' | 10 | 149 | 15 | 9 | 25 | 16 | 214 |
| Air Blank | – | – | ND | 1 | 1 | 2 | ND | 4 |
| **13 May 1995** | | | | | | | | |
| 100 ppb BTEX | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 4 | 3 | 8 | 14 | ND | 29 |
| 025-009BH | 0.5'-2.5'<br>5'-7'<br>10'-12' | 10<br>10<br>10 | 4<br>3<br>3 | 4<br>4<br>3 | 4<br>3<br>ND | 9<br>2<br>ND | ND<br>ND<br>ND | 21<br>12<br>6 |
| 025-011BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | 2<br>ND | 3<br>4 | 1<br>2 | 4<br>6 | ND<br>ND | 10<br>12 |
| 100 ppb BTEX | – | – | 106 | 100 | 101 | 207 | 99 | 613 |
| Air Blank | – | – | ND | 1 | ND | 3 | ND | 4 |
| 025-008BH | 0.5'-2.5'<br>7'-9' | 10<br>10 | ND<br>36 | 3<br>92 | 1<br>635 | 3<br>645 | ND<br>9,450 | 7<br>10,858 |
| 025-008BH Reshot | 7'-9' | 10 | 35 | 110 | 630 | 790 | 4,030 | 5,595 |
| 025-008BH | 9'-11' | 10 | ND | ND | ND | ND | ND | ND |

## Table B.1 (Continued)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **13 May 1995 (Concluded)** | | | | | | | | |
| 025-008BH Reshot | 9'-11' | 10 | 4 | 4 | 12 | ND | 60 | 80 |
| 100 ppb BTEX | – | – | 108 | 95 | 101 | 214 | 144 | 662 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | 1 | 2 | 1 | 2 | ND | 6 |
| 025-008BH | 13'-15' | 10 | ND | 3 | 2 | ND | ND | 5 |
| 025-010BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>3 | 3<br>3 | 7<br>1 | 17<br>3 | 9<br>2 | 36<br>12 |
| 025-006BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>ND | 3<br>3 | 1<br>1 | 3<br>3 | 1<br>1 | 8<br>8 |
| 100 ppb BTEX | – | – | 89 | 97 | 88 | 159 | 34 | 467 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | 12 | ND | 3 | ND | 15 |
| 025-006BH | 10'-12'<br>20'-22' | 10<br>10 | ND<br>3 | 5<br>32 | 5<br>35 | ND<br>ND | 14<br>78 | 24<br>148 |
| 100 ppb BTEX | –<br>– | –<br>– | 93<br>100 | 92<br>100 | 96<br>100 | 193<br>200 | 101<br>100 | 575<br>600 |
| **15 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 2 | 1 | 3 | 4 | ND | 10 |
| 1 ppm BTEX | – | – | 827 | 778 | 664 | 1,300 | 632 | 4,201 |
| Recal | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| Air Blank | – | – | 1 | 2 | 3 | 3 | ND | 9 |
| 025-003BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | 7<br>ND | 10<br>ND | 41<br>3,620 | ND<br>35,650 | 82<br>15,050 | 140<br>54,320 |
| 025-003BH Re-Reshot | 5'-7' | 10 | ND | 23,950 | 3,740 | 13,700 | 20,150 | 61,540 |
| 025-003BH | 10'-12' | 10 | ND | 47,550 | 5,200 | 36,450 | 27,000 | 116,200 |
| 10 ppm BTEX | – | – | 8,720 | 8,470 | 5,510 | 11,620 | 5,810 | 40,130 |

## Table B.1 (Continued)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **15 May 1995 (Concluded)** | | | | | | | | |
| Recal | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 11 | 5 | 11 | 25 | ND | 52 |
| 025-003BH | 15'-17'<br>20'-22' | 10<br>10 | 140<br>276 | 215<br>314 | 205<br>246 | 1,140<br>1,832 | 420<br>1,110 | 2,120<br>3,778 |
| 025-003BH Reshot | 25' | 10 | 20 | 276 | 42 | 364 | 47 | 749 |
| 025-002BH | 0.5'-2.5' | 10 | 13 | 152 | 12 | 31 | ND | 208 |
| 1 ppm BTEX | – | – | 900 | 828 | 718 | 1,440 | 824 | 4,710 |
| Recal | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| Air Blank | – | – | ND | 2 | 3 | 6 | ND | 11 |
| 025-002BH Reshot | 5'-7' | 10 | 5,800,000 | 263,000 | 25,500 | 205,000 | 114,000 | 6,407,500 |
| 025-002BH | 10'-12' | 10 | 20,200 | 214,000 | 2,700 | 156,000 | 104,000 | 496,900 |
| 025-002BH Re-Reshot | 5'-7' | 10 | 73,800 | 209,000 | 3,360 | 145,000 | 93,000 | 524,160 |
| 10 ppm BTEX | – | – | 9,050 | 8,790 | 8,290 | 16,840 | 8,390 | 51,360 |
| Recal | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | –<br>– | –<br>– | 11<br>3 | 38<br>4 | 41<br>1 | 521<br>3 | 103<br>ND | 714<br>11 |
| 025-001BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | 60<br>ND | 207<br>613,000 | 27<br>6,600 | 107<br>387,000 | ND<br>180,000 | 401<br>1,186,600 |
| 10 ppm BTEX | – | – | 10,940 | 9,800 | 8,540 | 16,560 | 7,750 | 53,590 |
| **16 May 1995** | | | | | | | | |
| 100 ppb BTEX | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,010 | 6,010 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | ND | 9 | 5 | 6 | ND | 20 |

## Table B.1 (Continued)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **16 May 1995 (Concluded)** | | | | | | | | |
| 025-007BH | 0.5'-2.5'<br>5'-7'<br>10'-12'<br>15'-17'<br>20'-22' | 10<br>10<br>10<br>10<br>10 | 2<br>5<br>4<br>4<br>ND | 6<br>12<br>4<br>11<br>4 | 1<br>5<br>ND<br>1<br>1 | 3<br>14<br>ND<br>ND<br>ND | ND<br>ND<br>ND<br>ND<br>21 | 12<br>36<br>8<br>16<br>26 |
| 100 ppb BTEX | – | – | 101 | 83 | 54 | 75 | 1 | 314 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | 5 | ND | ND | ND | 5 |
| 025-005BH | 0.5'-2.5'<br>10'-12'<br>20'-22' | 10<br>10<br>10 | 2<br>ND<br>3 | 4<br>4<br>4 | ND<br>2<br>1 | 9<br>ND<br>9 | ND<br>ND<br>ND | 14<br>6<br>17 |
| 025-004BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | ND<br>2 | 4<br>4 | ND<br>10 | ND<br>178 | ND<br>157 | 4<br>351 |
| 100 ppb BTEX | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 1 | 1 | 6 | 9 | ND | 17 |
| 025-004BH | 10'-12'<br>18'-20' | 10<br>10 | 1<br>1 | 4<br>3 | 4<br>ND | 8<br>ND | ND<br>ND | 17<br>4 |
| 025-004BH Reshot | 5'-7' | 10 | 1 | 3 | 2 | 6 | ND | 12 |
| 100 ppb BTEX | –<br>– | –<br>– | 106<br>100 | 103<br>100 | 98<br>100 | 188<br>200 | 68<br>100 | 563<br>600 |
| **17 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 1 | 12 | ND | 83 | 20 | 116 |
| 100 ppb BTEX | – | – | 97 | 70 | 62 | 119 | 51 | 399 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | 3 | ND | 1 | ND | ND | 4 |
| 025-012BH | 0.5'-2.5'<br>5'-7' | 10<br>10 | 3<br>ND | 21<br>ND | 17<br>ND | ND<br>ND | 39<br>ND | 80<br>ND |

## Table B.1 (Concluded)
## Field Gas Chromatograph Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Sample Interval (ft. BLS) | Sample Mass (grams) | Concentrations (ppb) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Toluene | Ethyl-benzene | m,p-Xylene | o-Xylene | Total BTEX |
| **17 May 1995 (Concluded)** | | | | | | | | |
| 025-012BH Reshot | 5'-7' | 10 | ND | ND | ND | ND | ND | ND |
| 025-012BH | 10'-12'<br>18'-20' | 10<br>10 | 48<br>41 | 31<br>46 | 4<br>ND | ND<br>ND | 14<br>ND | 97<br>87 |
| 100 ppb BTEX | – | – | 77 | 84 | 80 | 151 | 78 | 470 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | 3 | ND | 1 | ND | 73 | 77 |
| 025-013BH | 0.5'-2.5'<br>5'-7'<br>10'-12'<br>18'-20' | 10<br>10<br>10<br>10 | 4<br>3<br>4<br>10 | 3<br>2<br>2<br>17 | 1<br>20<br>4<br>3 | 3<br>ND<br>2<br>ND | ND<br>106<br>ND<br>4 | 11<br>131<br>12<br>34 |
| 100 ppb BTEX | –<br>– | –<br>– | 96<br>100 | 92<br>100 | 87<br>100 | 178<br>200 | 93<br>100 | 546<br>600 |
| **20 May 1995** | | | | | | | | |
| 1 ppm BTEX | – | – | 1,000 | 1,000 | 1,000 | 2,000 | 1,000 | 6,000 |
| 10 ppm BTEX | – | – | 10,000 | 10,000 | 10,000 | 20,000 | 10,000 | 60,000 |
| Air Blank | – | – | 13 | 5 | 28 | 40 | 95 | 181 |
| 026-001MW | Water | 10 ml | 10 | 2 | 3 | ND | ND | 15 |
| 026-002MW | Water | 10 ml | 1 | ND | ND | ND | ND | 1 |
| 026-003MW | Water | 10 ml | ND | ND | ND | ND | ND | ND |
| 025-001MW | Water | 10 ml | ND | ND | ND | ND | ND | ND |
| 025-002MW | Water | 10 ml | 4 | ND | ND | ND | ND | 4 |
| 100 ppb BTEX | – | – | 109 | 97 | 92 | 178 | 77 | 553 |
| Recal | – | – | 100 | 100 | 100 | 200 | 100 | 600 |
| Air Blank | – | – | ND | ND | ND | ND | ND | ND |
| 025-003MW | Water | 10 ml | 1,920 | 963 | 318 | 1,400 | 1,090 | 5,690 |
| 1 ppm BTEX | – | – | 1,020 | 1,040 | 1,110 | 2,300 | 1,130 | 6,600 |

MW – Monitor Well.
BH – Borehole.
ml – milliliters.
Recal – Recalibration.

ppb – parts per billion.
ppm – parts per million.
ND – Non-Detect.

ft. BLS – feet Below Land Surface.
BTEX – Benzene, Toluene, Ethylbenzene, and Xylenes.

**Table B.2**
**PID Screening Results – IRP Sites No. 25 and No. 26**
**148th FW, Duluth ANGB, Duluth International Airport, Duluth, Minnesota**

| Boring | Interval (ft. BLS) | PID Screening Results | ATHA Screening Results |
|---|---|---|---|
| 025-01BH | 0.5-2.5<br>5.0-7.0 | 0<br>742 | 0<br>1,096 |
| 025-02BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0 | 0<br>541<br>330 | 58<br>1,391<br>1,339 |
| 025-03BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0<br>15.0-17.0<br>20.0-22.0<br>23.0-25.0 | 0<br>0<br>273<br>133<br>9.5<br>0 | 0<br>467<br>727<br>53<br>10.6<br>0 |
| 025-04BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0<br>18.0-20.0 | 0<br>0<br>0<br>0 | 0<br>0<br>0<br>0 |
| 025-05BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0<br>20.0-22.0 | 0<br>0<br>0<br>0 | 0<br>0<br>0<br>0 |
| 025-06BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0<br>20.0-22.0 | 0<br>0<br>NA<br>0.7 | 0<br>0<br>NA<br>0 |
| 025-07BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0<br>15.0-17.0<br>20.0-22.0 | 0<br>0<br>0<br>0<br>0 | 0<br>0<br>0<br>0<br>0 |
| 025-08BH | 0.5-2.5<br>7.0-9.0<br>9.0-11.0<br>13.0-15.0 | 0<br>2<br>0.5<br>0 | 0<br>12.4<br>0<br>0 |
| 025-09BH | 0.5-2.5<br>5.0-7.0<br>10.0-12.0<br>13.0-15.0 | 0<br>0<br>0<br>0 | 0<br>0<br>0<br>0 |
| 025-10BH | 0.5-2.5<br>5.0-7.0 | 0<br>0 | NA<br>0 |
| 025-11BH | 0.5-2.5<br>5.0-7.0 | 0<br>0 | 0<br>NA |

## Table B.2 (Continued)
## PID Screening Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Interval (ft. BLS) | PID Screening Results | ATHA Screening Results |
|---|---|---|---|
| 025-12BH | 0.5-2.5 | 0 | 2.8 |
| | 5.0-7.0 | 9.6 | 6.9 |
| | 10.0-12.0 | 7.5 | 6.5 |
| | 18.0-20.0 | 4.5 | 3.2 |
| 025-13BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| | 18.0-20.0 | 0 | 10.6 |
| 025-01MW | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| | 15.0-17.0 | 0 | 0 |
| | 20.0-22.0 | 0 | 0 |
| | 25.0-27.0 | 0 | 0 |
| | 30.0-32.0 | 0 | 0 |
| | 35.0-37.0 | 0 | 0 |
| 025-02MW | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| | 15.0-17.0 | 0 | 0 |
| 025-03MW | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0.8 | 25.8 |
| | 15.0-17.0 | 15.6 | 5 |
| | 20.0-22.0 | 0 | 0.8 |
| 026-01BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 8.0-10.0 | 0 | 0 |
| 026-02BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| 026-03BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| 026-04BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 8.0-10.0 | 0 | 0.2 |
| 026-05BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 8.0-10.0 | 0 | 0.3 |

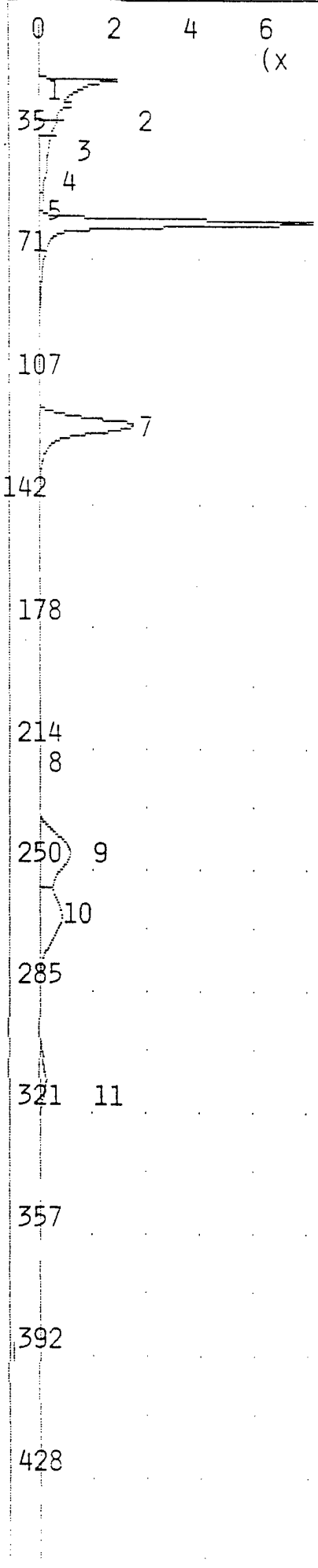
## Table B.2 (Concluded)
## PID Screening Results – IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Boring | Interval (ft. BLS) | PID Screening Results | ATHA Screening Results |
|---|---|---|---|
| 026-06BH | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 8.0-10.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| 026-01MW | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| | 12.5-14.5 | 0 | 0 |
| | 15.0-17.0 | 0 | 0 |
| | 20.0-22.0 | 0 | 0 |
| | 24.0-26.0 | NA | NA |
| 026-02MW | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| | 15.0-17.0 | NA | NA |
| | 20.0-22.0 | NA | NA |
| 026-03MW | 0.5-2.5 | 0 | 0 |
| | 5.0-7.0 | 0 | 0 |
| | 10.0-12.0 | 0 | 0 |
| | 15.0-17.0 | 0 | 0 |

MW – Monitor Well.
BH – Borehole.
ft. BLS – feet Below Land Surface.
PID – Photoionization Detector.
ATHA – Ambient Temperature Headspace Analysis.
NA – Not Analyzed.

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ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 12:03
SAMPLE TIME: MAY 4,95 11:55

METHOD

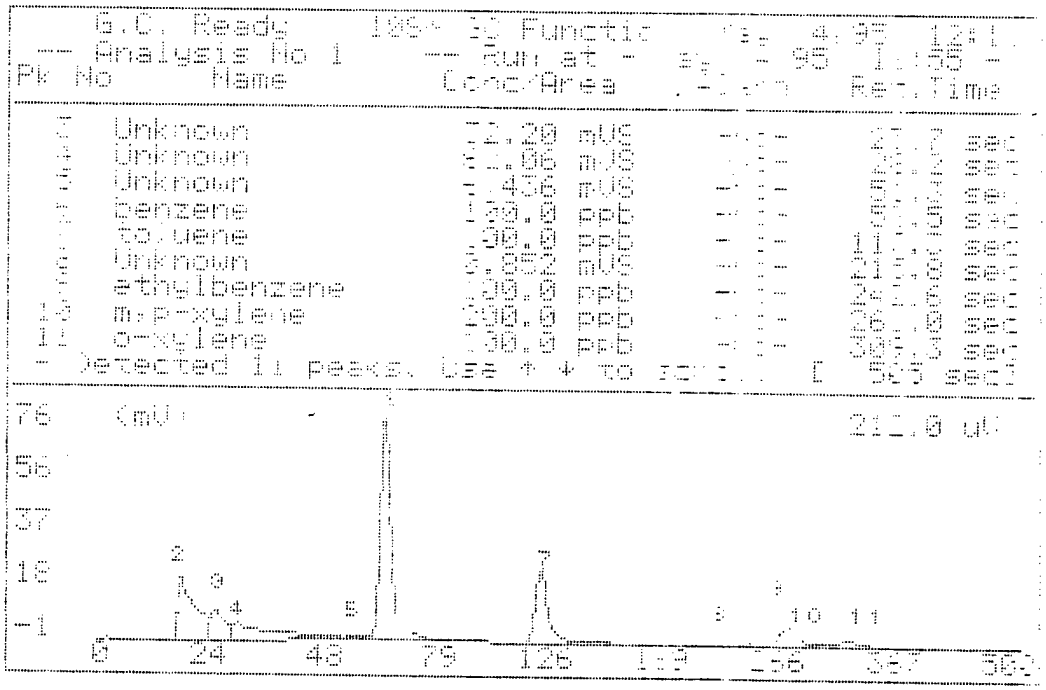
| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

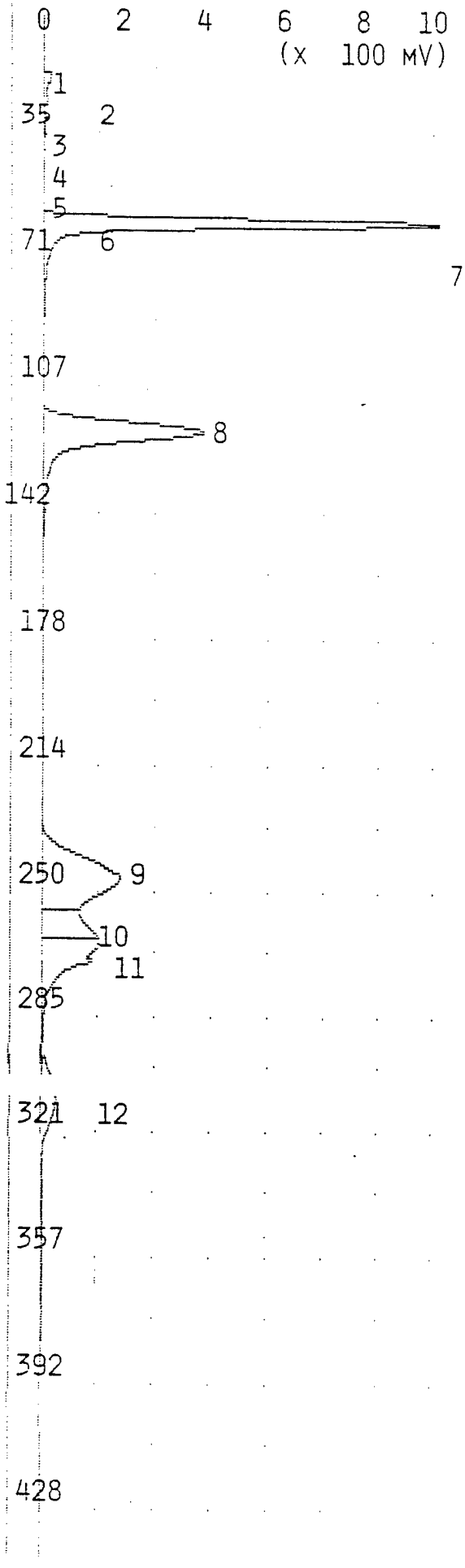
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.058 MVS | 15.0 |
| 2 | UNKNOWN | 81.39 MVS | 16.6 |
| 3 | UNKNOWN | 32.20 MVS | 23.7 |
| 4 | UNKNOWN | 62.06 MVS | 28.2 |
| 5 | UNKNOWN | 6.436 MVS | 51.3 |
| 6 | UNKNOWN | 218.4 MVS | 58.5 |
| 7 | UNKNOWN | 161.5 MVS | 117.3 |
| 8 | UNKNOWN | 0.852 MVS | 215.8 |
| 9 | UNKNOWN | 117.2 MVS | 242.6 |
| 10 | UNKNOWN | 100.4 MVS | 261.0 |
| 11 | UNKNOWN | 34.73 MVS | 309.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


G.C. Ready
Analysis No 1
Pk No Name Conc/Area Ret.Time
1 Unknown 12.20 mVS 27.7 sec
2 Unknown 11.06 mVS 32.2 sec
3 Unknown 1.436 mVS 38.1 sec
4 benzene 130.0 ppb 41.1 sec
5 toluene 30.0 ppb 44.1 sec
6 Unknown 3.852 mVS 47.0 sec
7 ethylbenzene 30.0 ppb 52.0 sec
8 m.p-xylene 90.0 ppb 56.0 sec
9 o-xylene 30.0 ppb 59.3 sec
76
56
37
18
-1
5
24
42
79
125
212.0 uV

ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 12:22
SAMPLE TIME: MAY 4,95 12:14

METHOD

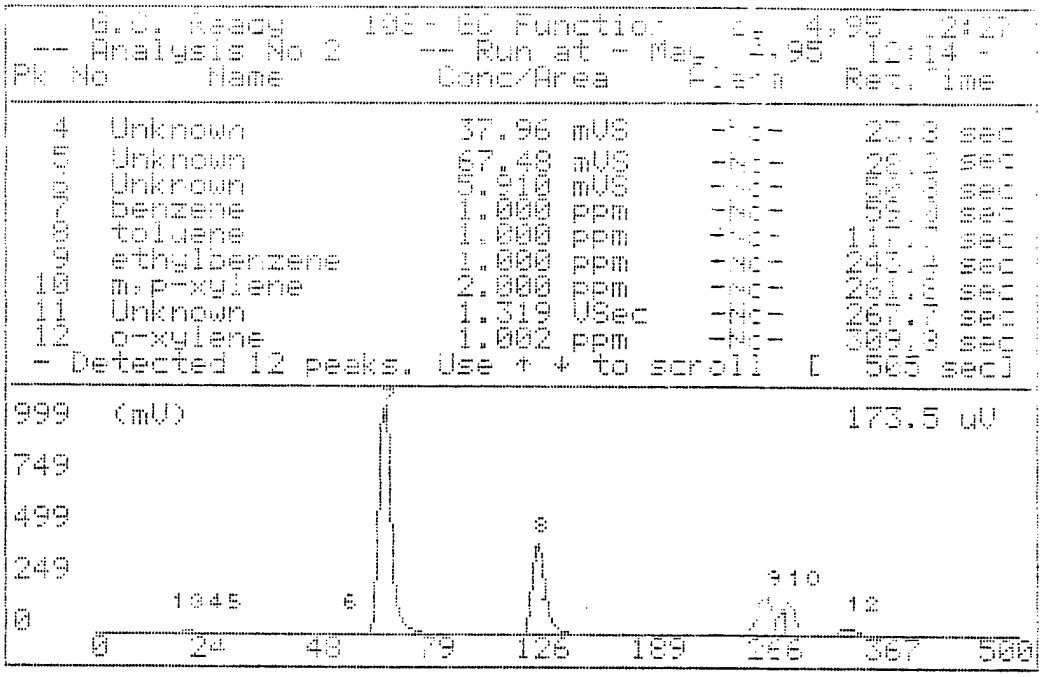
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

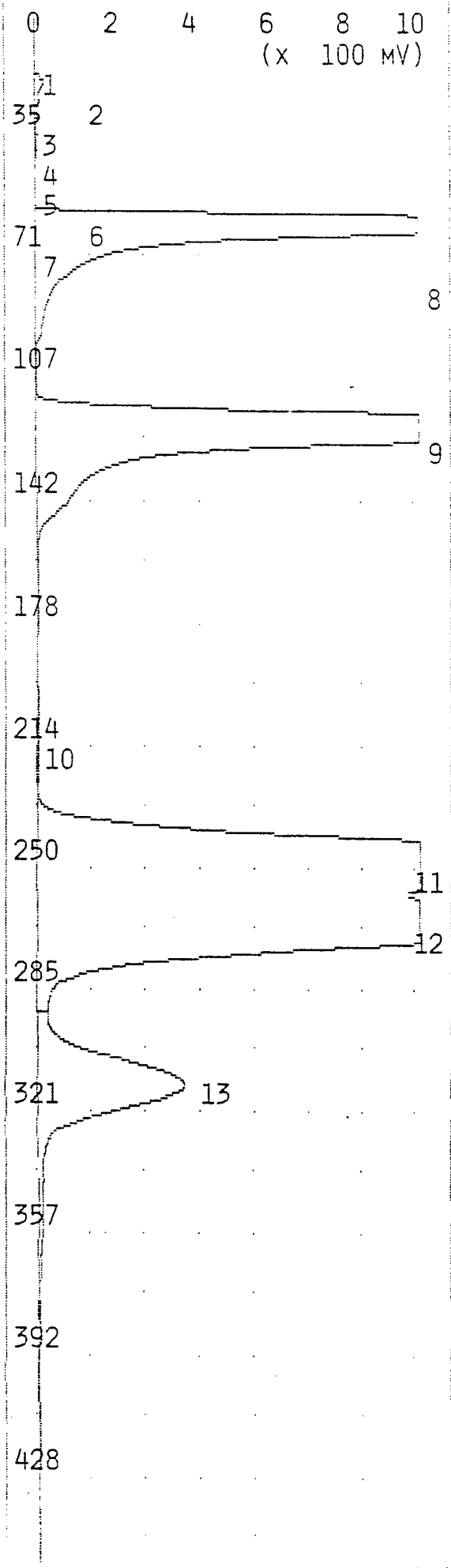
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.068 | MVS | 14.9 |
| 2 | UNKNOWN | 28.17 | MVS | 16.6 |
| 3 | UNKNOWN | 66.61 | MVS | 18.2 |
| 4 | UNKNOWN | 37.96 | MVS | 23.8 |
| 5 | UNKNOWN | 67.48 | MVS | 28.2 |
| 6 | UNKNOWN | 5.910 | MVS | 50.8 |
| 7 | BENZENE | 1.730 | PPM | 59.0 |
| 8 | TOLUENE | 1.797 | PPM | 117.7 |
| 9 | ETHYLBENZENE | 2.311 | PPM | 243.4 |
| 10 | M,P-XYLENE | 1.977 | PPM | 261.8 |
| 11 | UNKNOWN | 1.319 | VSEC | 267.7 |
| 12 | O-XYLENE | 2.571 | PPM | 309.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


G.C. Ready 10s - EC Function 1 4.95 2:27
-- Analysis No 2 -- Run at - May 1.95 12:14 -
Pk No Name Conc/Area Flag Ret. Time
4 Unknown 37.96 mUS 22.3 sec
5 Unknown 67.48 mUS 25.2 sec
9 Unknown 5.910 mUS 53.3 sec
6 benzene 1.000 ppm 58.2 sec
7 toluene 1.000 ppm 111.1 sec
8 ethylbenzene 1.000 ppm 247.4 sec
10 m,p-xylene 2.000 ppm 261.4 sec
11 Unknown 1.319 USec 268.4 sec
12 o-xylene 1.002 ppm 288.3 sec
- Detected 12 peaks. Use ↑ ↓ to scroll [ 565 sec]
999 (mV)
749
499
249
0
173.5 uV
1045
6
8
910
12
0 24 48 79 126 189 256 367 500

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 12:38
SAMPLE TIME: MAY 4,95 12:30

METHOD

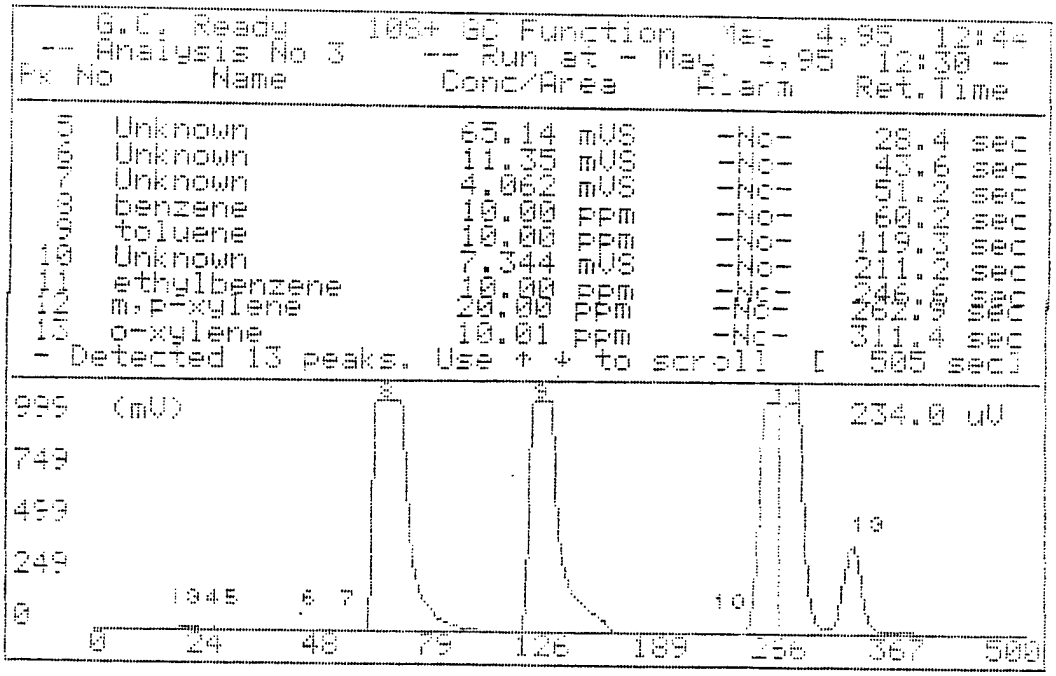
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

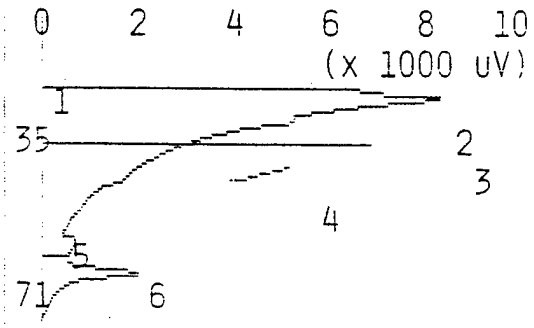
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.082 | MVS | 15.0 |
| 2 | UNKNOWN | 21.60 | MVS | 16.8 |
| 3 | UNKNOWN | 98.39 | MVS | 18.4 |
| 4 | UNKNOWN | 49.99 | MVS | 24.0 |
| 5 | UNKNOWN | 65.05 | MVS | 28.4 |
| 6 | UNKNOWN | 11.28 | MVS | 43.6 |
| 7 | UNKNOWN | 4.007 | MVS | 51.2 |
| 8 | BENZENE | 5.510 | PPM | 60.2 |
| 9 | TOLUENE | 8.414 | PPM | 119.3 |
| 10 | UNKNOWN | 7.344 | MVS | 211.2 |
| 11 | ETHYLBENZENE | 10.08 | PPM | 246.6 |
| 12 | M,P-XYLENE | 39.30 | PPM | 262.9 |
| 13 | O-XYLENE | 7.916 | PPM | 311.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX


G.C. Ready 100+ GC Function Mar 4,95 12:44
Analysis No 3 Run at 4 Mar 4,95 12:30
Pk No Name Conc/Area Alarm Ret.Time
1 Unknown 63.14 mVS 28.4 sec
2 Unknown 11.35 mVS 0 sec
3 Unknown 4.062 mVS 0 sec
4 benzene 10.000 ppm 0 sec
5 toluene 10.000 ppm 0 sec
6 Unknown 7.344 mVS 0 sec
7 ethylbenzene 10.00 ppm 0 sec
8 m,p-xylene 20.00 ppm 0 sec
9 o-xylene 10.01 ppm 0 sec
4 Detected 13 peaks. Use ↑ ↓ to scroll [ 505 sec]
999
749
499
249
0
(mV)
234.0 uV
1945
6 7
10
19
0 24 48 79 126 189 256 367 500

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 12:54
SAMPLE TIME: MAY 4,95 12:46

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

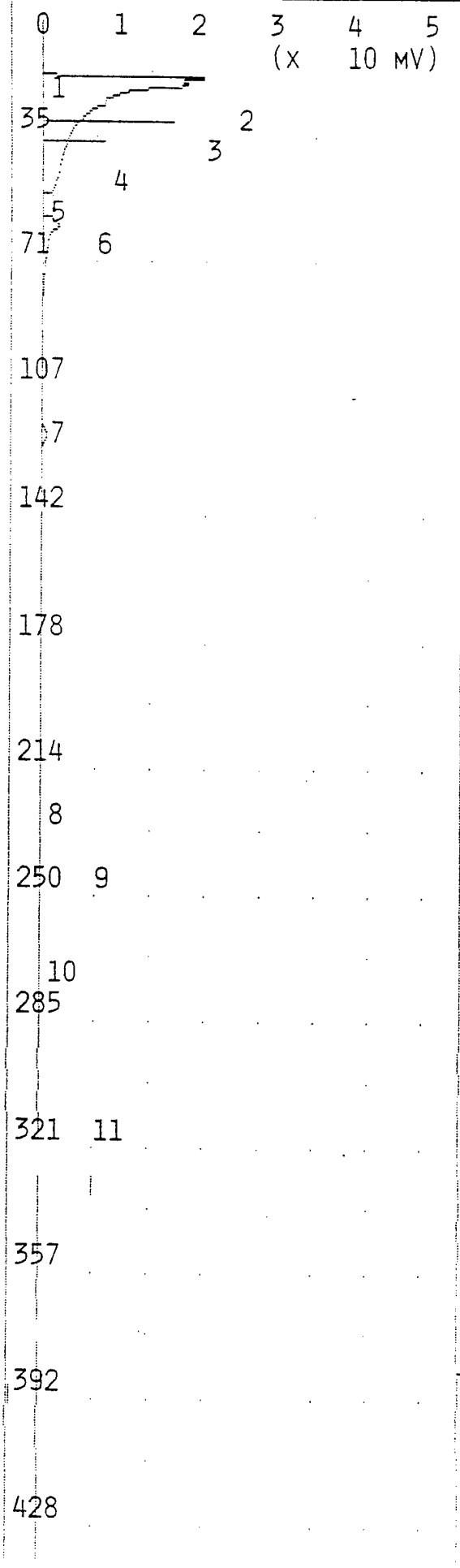
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.061 | MVS | 14.8 |
| 2 | UNKNOWN | 9.807 | MVS | 16.8 |
| 3 | UNKNOWN | 110.7 | MVS | 18.3 |
| 4 | UNKNOWN | 0.645 | MVS | 23.8 |
| 5 | UNKNOWN | 0.851 | MVS | 51.3 |
| 6 | BENZENE | 10.25 | PPB | 58.8 |
| 7 | TOLUENE | 4.357 | PPB | 117.7 |
| 8 | ETHYLBENZENE | 8.333 | PPB | 244.2 |
| 9 | M,P-XYLENE | 14.48 | PPB | 262.1 |
| 10 | O-XYLENE | 9.373 | PPB | 308.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 13:06
SAMPLE TIME: MAY 4,95 12:57

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

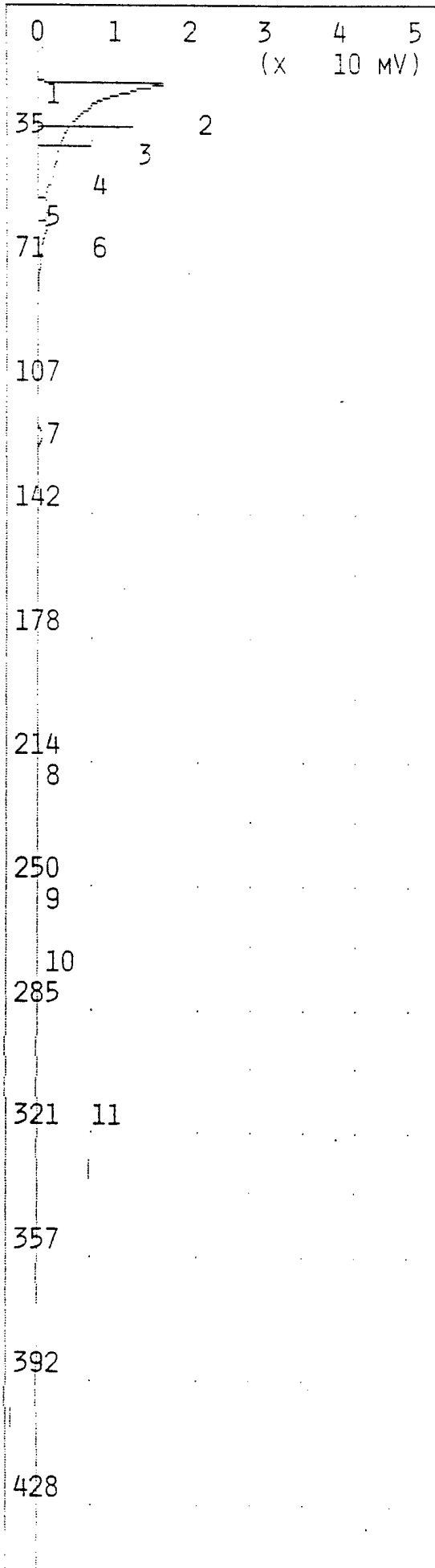
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.123 | MVS | 15.1 |
| 2 | UNKNOWN | 29.36 | MVS | 16.7 |
| 3 | UNKNOWN | 72.78 | MVS | 18.2 |
| 4 | UNKNOWN | 102.5 | MVS | 23.8 |
| 5 | UNKNOWN | 10.26 | MVS | 50.8 |
| 6 | BENZENE | 10.92 | PPB | 58.8 |
| 7 | TOLUENE | 3.660 | PPB | 117.7 |
| 8 | UNKNOWN | 0.853 | MVS | 220.0 |
| 9 | ETHYLBENZENE | 4.590 | PPB | 244.0 |
| 10 | M,P-XYLENE | 8.939 | PPB | 264.0 |
| 11 | O-XYLENE | 3.716 | PPB | 311.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-004BH 0.5-2.5 ~~16~~
10g 53

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 13:18
SAMPLE TIME: MAY 4,95 13:10

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

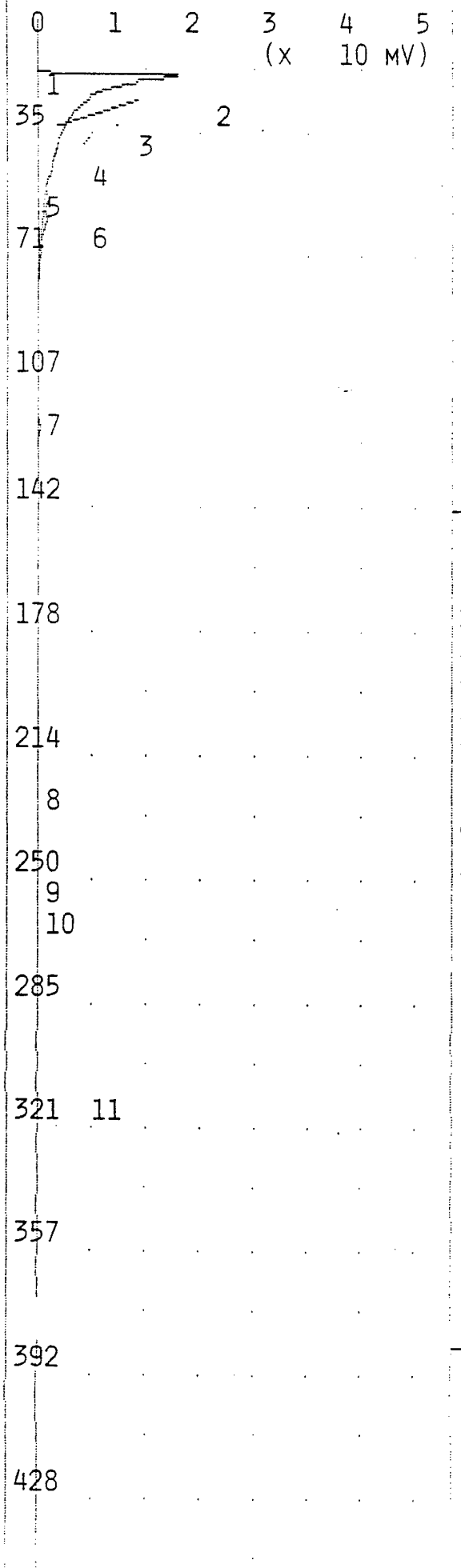
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.437 MVS | 14.2 |
| 2 | UNKNOWN | 26.13 MVS | 16.7 |
| 3 | UNKNOWN | 56.24 MVS | 18.2 |
| 4 | UNKNOWN | 94.17 MVS | 23.7 |
| 5 | UNKNOWN | 10.21 MVS | 50.8 |
| 6 | BENZENE | 7.368 PPB | 58.7 |
| 7 | TOLUENE | 3.415 PPB | 118.1 |
| 8 | UNKNOWN | 1.338 MVS | 217.2 |
| 9 | ETHYLBENZENE | 1.945 PPB | 245.3 |
| 10 | M,P-XYLENE | 4.567 PPB | 262.6 |
| 11 | O-XYLENE | 2.291 PPB | 311.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-004BH
5.0-7.0 10G

ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 13:30
SAMPLE TIME: MAY 4,95 13:22

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

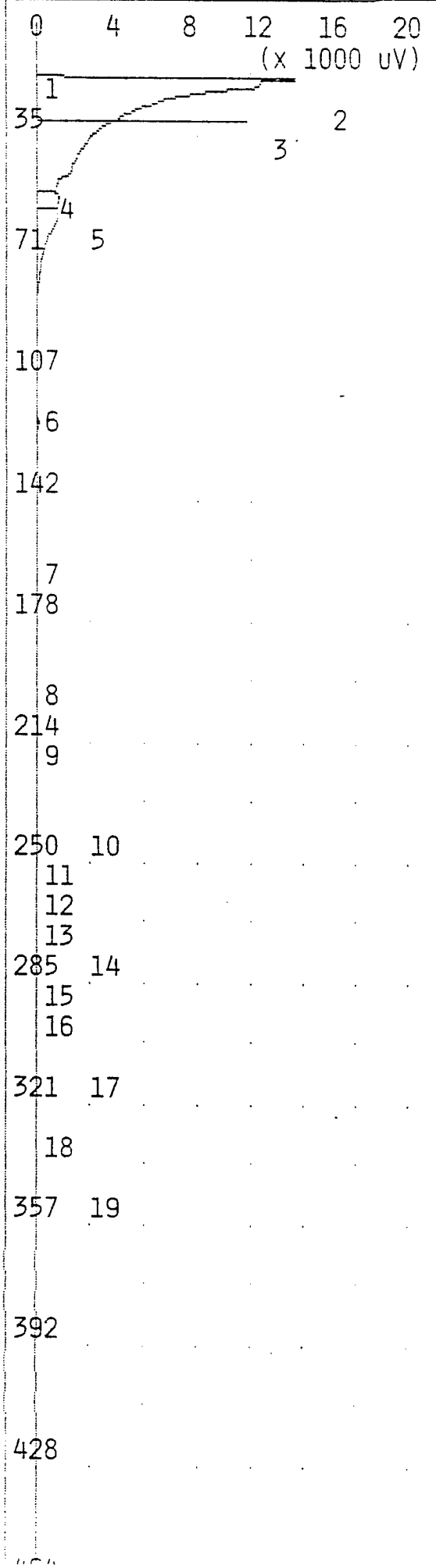
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.136 | MVS | 15.1 |
| 2 | UNKNOWN | 187.5 | MVS | 16.8 |
| 3 | UNKNOWN | 1.429 | MVS | 18.1 |
| 4 | UNKNOWN | 0.261 | MVS | 23.6 |
| 5 | UNKNOWN | 1.893 | MVS | 51.2 |
| 6 | BENZENE | 1.171 | PPB | 59.0 |
| 7 | TOLUENE | 2.182 | PPB | 118.0 |
| 8 | UNKNOWN | 2.267 | MVS | 220.2 |
| 9 | ETHYLBENZENE | 1.928 | PPB | 246.6 |
| 10 | M,P-XYLENE | 4.476 | PPB | 261.6 |
| 11 | O-XYLENE | 2.643 | PPB | 308.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-004BH
8.0-10.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 13:42
SAMPLE TIME: MAY 4,95 13:34

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

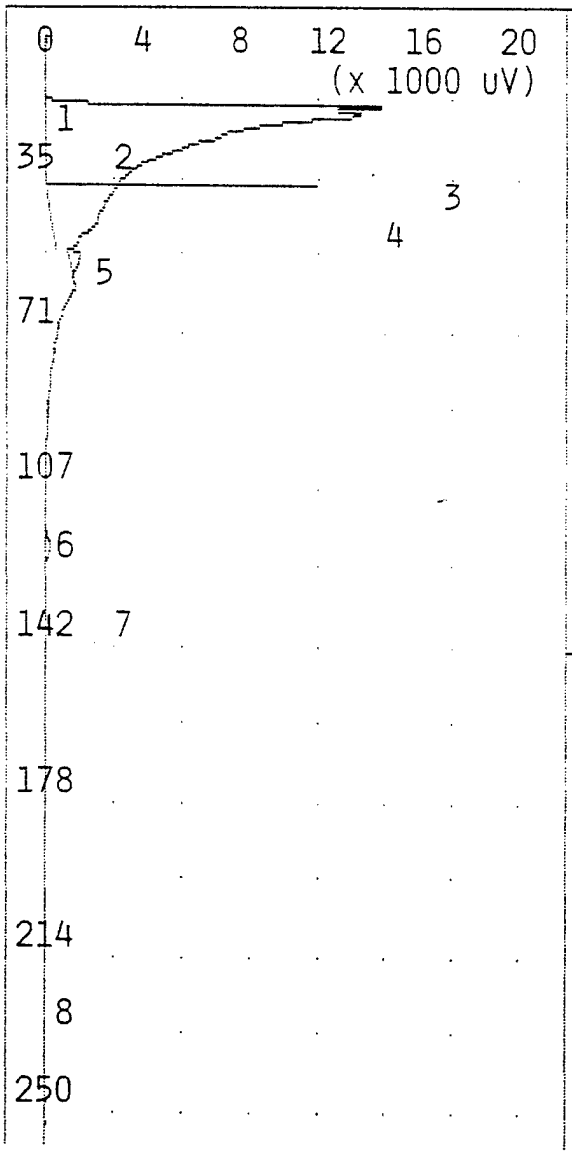
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.094 | MVS | 14.8 |
| 2 | UNKNOWN | 20.19 | MVS | 16.7 |
| 3 | UNKNOWN | 133.7 | MVS | 18.5 |
| 4 | UNKNOWN | 6.334 | MVS | 51.6 |
| 5 | BENZENE | 6.536 | PPB | 56.4 |
| 6 | TOLUENE | 1.377 | PPB | 117.7 |
| 7 | UNKNOWN | 2.237 | MVS | 156.8 |
| 8 | UNKNOWN | 3.125 | MVS | 199.0 |
| 9 | UNKNOWN | 7.984 | MVS | 212.8 |
| 10 | UNKNOWN | 2.627 | MVS | 239.6 |
| 11 | UNKNOWN | 2.442 | MVS | 243.7 |
| 12 | ETHYLBENZENE | 3.062 | PPB | 248.5 |
| 13 | UNKNOWN | 2.040 | MVS | 253.8 |
| 14 | M,P-XYLENE | 16.95 | PPB | 261.0 |
| 15 | UNKNOWN | 9.501 | MVS | 272.2 |
| 16 | UNKNOWN | 2.552 | MVS | 293.3 |
| 17 | O-XYLENE | 26.25 | PPB | 311.4 |
| 18 | UNKNOWN | 1.003 | MVS | 328.5 |
| 19 | UNKNOWN | 0.501 | MVS | 346.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001BH
0.5- 2.5 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 13:55
SAMPLE TIME: MAY 4,95 13:46

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

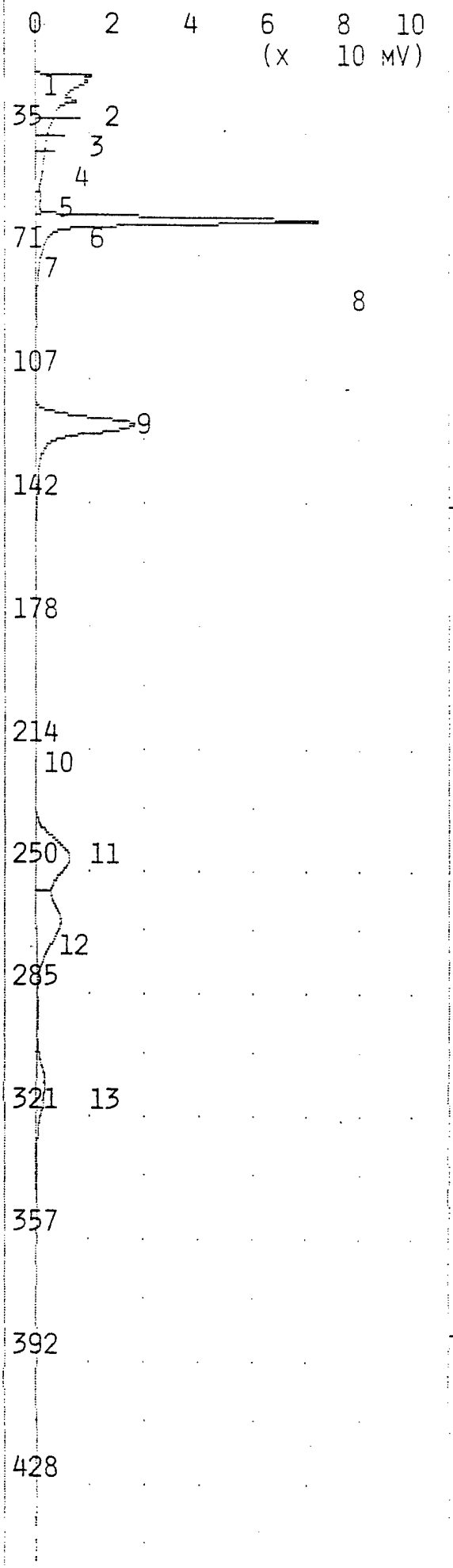
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.073 | MVS | 13.2 |
| 2 | UNKNOWN | 0.415 | MVS | 14.8 |
| 3 | UNKNOWN | 18.78 | MVS | 16.7 |
| 4 | UNKNOWN | 130.6 | MVS | 18.4 |
| 5 | UNKNOWN | 1.900 | MVS | 50.8 |
| 6 | TOLUENE | 1.843 | PPB | 117.4 |
| 7 | UNKNOWN | 0.187 | MVS | 129.4 |
| 8 | UNKNOWN | 0.915 | MVS | 217.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001BH
5.0- 7.0 10G

ANALYSIS #10  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 14:06
SAMPLE TIME: MAY 4,95 13:58

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

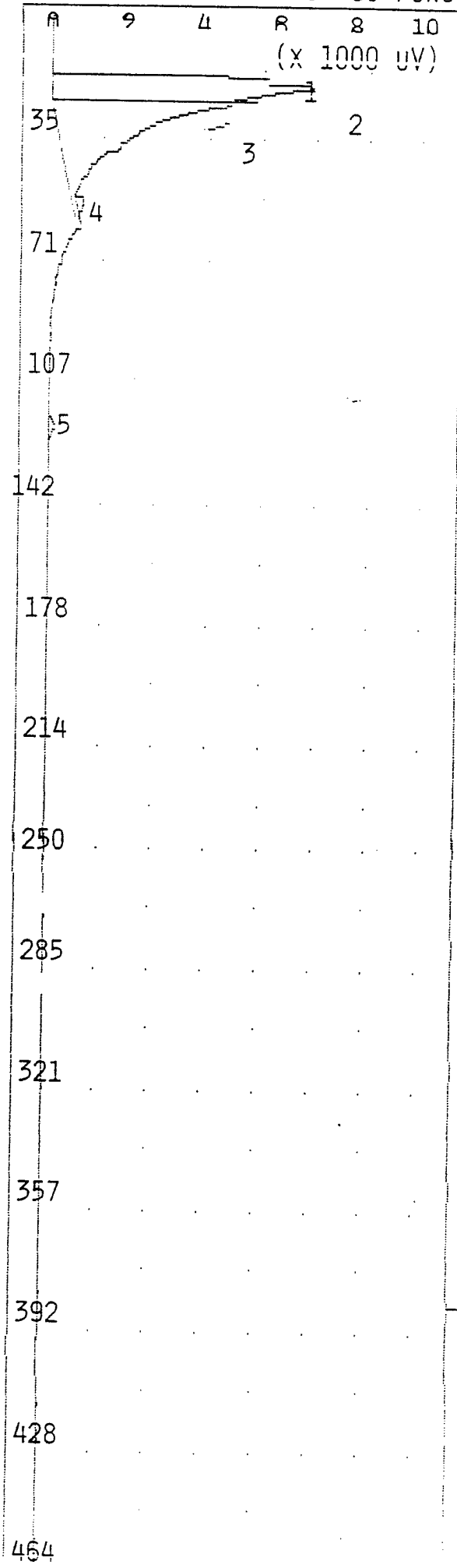
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.188 | MVS | 15.1 |
| 2 | UNKNOWN | 20.11 | MVS | 16.8 |
| 3 | UNKNOWN | 57.93 | MVS | 18.4 |
| 4 | UNKNOWN | 36.16 | MVS | 23.9 |
| 5 | UNKNOWN | 63.57 | MVS | 28.2 |
| 6 | UNKNOWN | 0.929 | MVS | 51.4 |
| 7 | UNKNOWN | 4.714 | MVS | 52.2 |
| 8 | BENZENE | 99.98 | PPB | 58.8 |
| 9 | TOLUENE | 101.7 | PPB | 117.7 |
| 10 | UNKNOWN | 0.518 | MVS | 214.0 |
| 11 | ETHYLBENZENE | 101.0 | PPB | 244.0 |
| 12 | M,P-XYLENE | 210.8 | PPB | 262.6 |
| 13 | O-XYLENE | 105.0 | PPB | 310.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #11  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 14:18
SAMPLE TIME: MAY 4,95 14:10

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

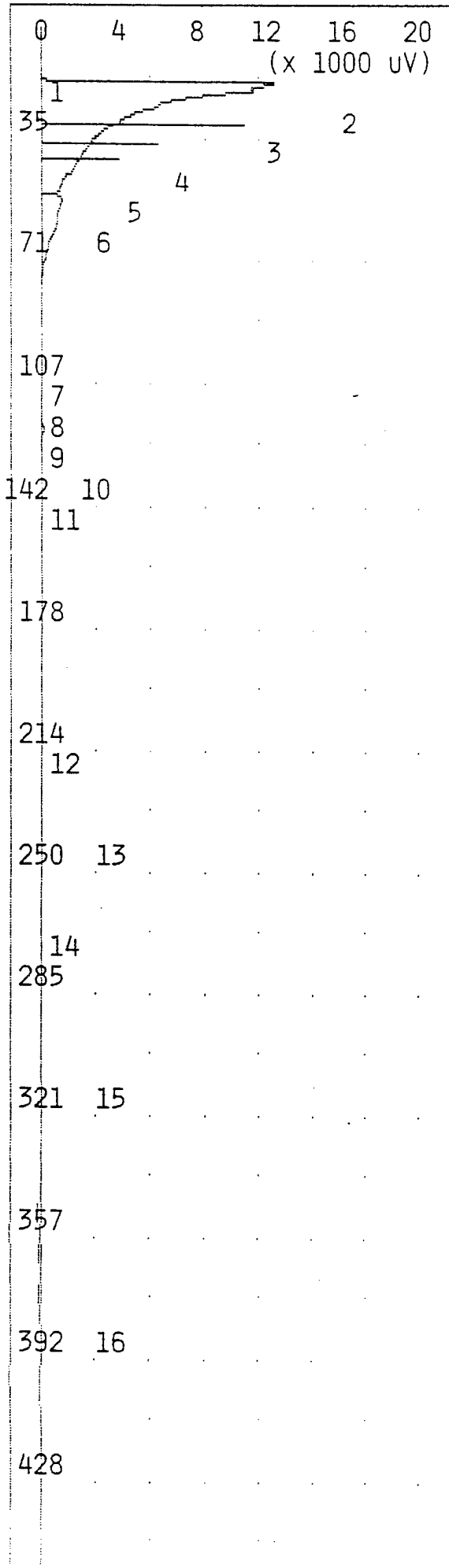
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 7.535 | MVS | 17.0 |
| 2 | UNKNOWN | 80.74 | MVS | 18.3 |
| 3 | UNKNOWN | 0.327 | MVS | 23.7 |
| 4 | UNKNOWN | 0.953 | MVS | 50.9 |
| 5 | TOLUENE | 1.192 | PPB | 117.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #12  10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: | MAY 4,95 | 14:30 |
| SAMPLE TIME: | MAY 4,95 | 14:22 |

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

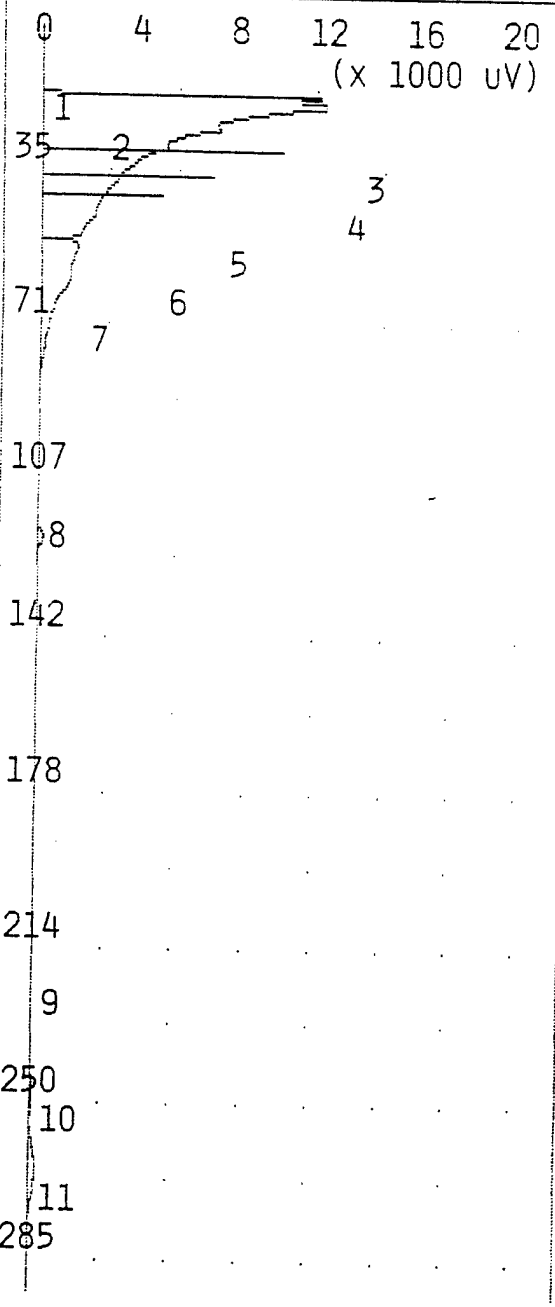
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.234 | MVS | 15.2 |
| 2 | UNKNOWN | 19.07 | MVS | 16.8 |
| 3 | UNKNOWN | 48.59 | MVS | 18.8 |
| 4 | UNKNOWN | 24.11 | MVS | 23.8 |
| 5 | UNKNOWN | 53.65 | MVS | 28.2 |
| 6 | UNKNOWN | 19.48 | MVS | 51.5 |
| 7 | UNKNOWN | 0.081 | MVS | 109.6 |
| 8 | TOLUENE | 1.932 | PPB | 118.1 |
| 9 | UNKNOWN | 0.439 | MVS | 125.8 |
| 10 | UNKNOWN | 0.094 | MVS | 131.7 |
| 11 | UNKNOWN | 0.041 | MVS | 135.0 |
| 12 | UNKNOWN | 2.430 | MVS | 216.4 |
| 13 | ETHYLBENZENE | 1.452 | PPB | 242.6 |
| 14 | M,P-XYLENE | 14.26 | PPB | 267.2 |
| 15 | O-XYLENE | 11.15 | PPB | 311.4 |
| 16 | UNKNOWN | 29.59 | MVS | 378.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-004BH RESHOT
0.5-2.5 10G

ANALYSIS #13  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 14:42
SAMPLE TIME: MAY 4,95 14:34

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

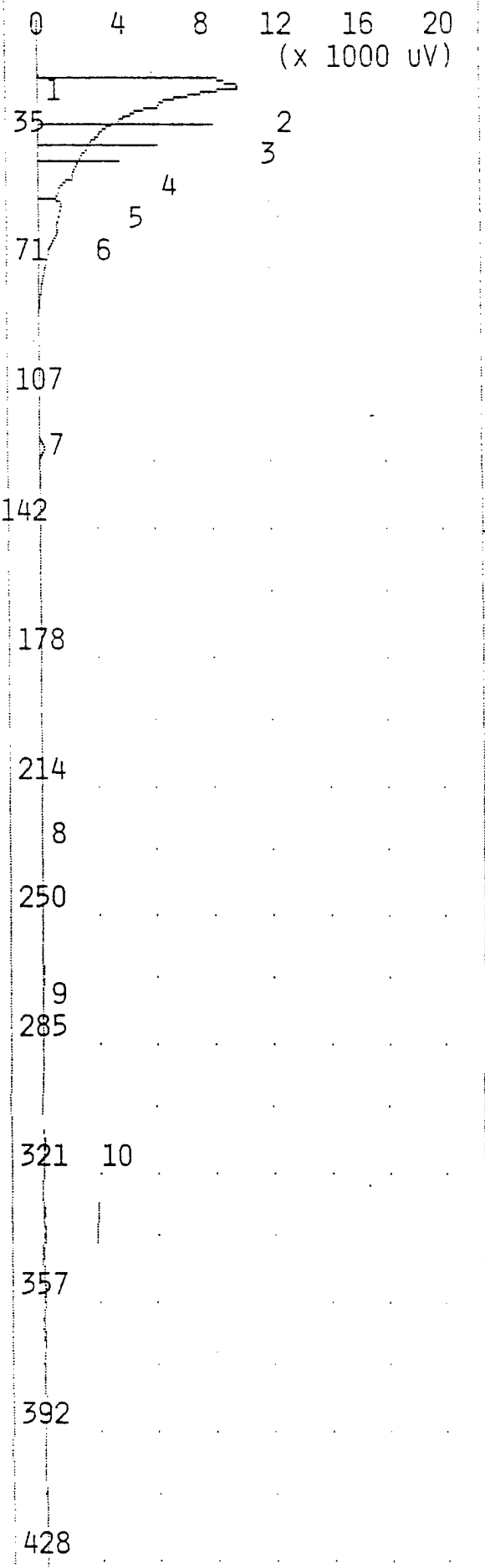
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.085 MVS | 12.0 |
| 2 | UNKNOWN | 0.084 MVS | 15.2 |
| 3 | UNKNOWN | 16.26 MVS | 16.8 |
| 4 | UNKNOWN | 53.37 MVS | 18.4 |
| 5 | UNKNOWN | 29.33 MVS | 23.8 |
| 6 | UNKNOWN | 68.98 MVS | 28.4 |
| 7 | UNKNOWN | 26.22 MVS | 51.0 |
| 8 | TOLUENE | 1.859 PPB | 118.2 |
| 9 | UNKNOWN | 1.215 MVS | 224.0 |
| 10 | ETHYLBENZENE | 2.415 PPB | 244.8 |
| 11 | M,P-XYLENE | 10.99 PPB | 262.9 |
| 12 | O-XYLENE | 4.920 PPB | 309.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001BH
8.0-10.0 10G

ANALYSIS #14  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 14:54
SAMPLE TIME: MAY 4,95 14:46

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

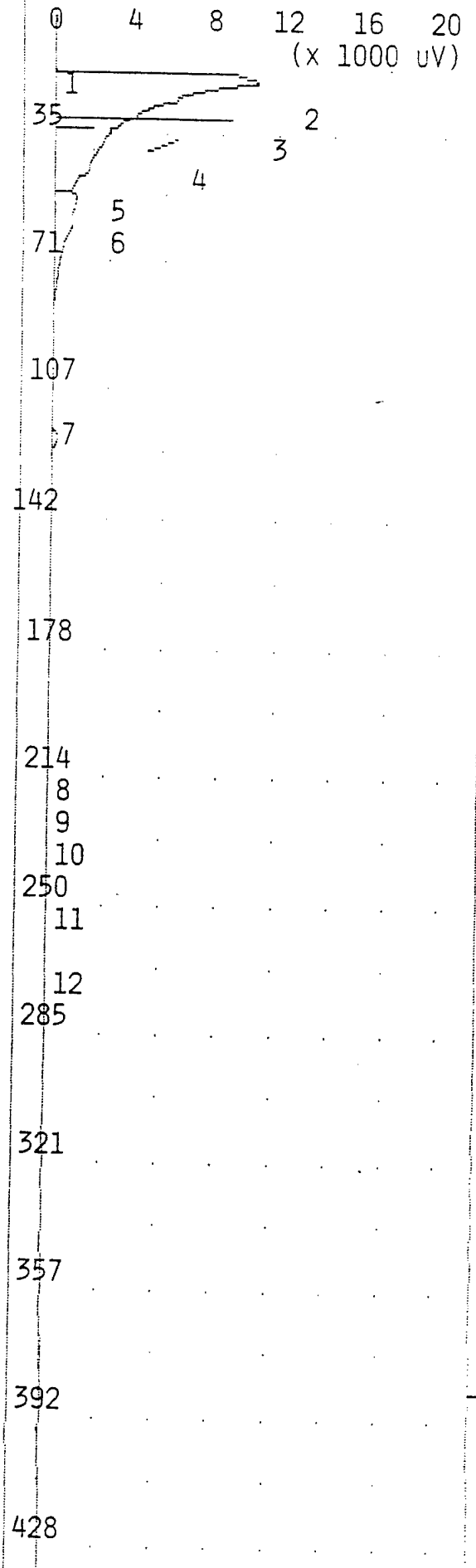
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.056 | MVS | 14.8 |
| 2 | UNKNOWN | 13.59 | MVS | 16.8 |
| 3 | UNKNOWN | 45.94 | MVS | 18.4 |
| 4 | UNKNOWN | 24.28 | MVS | 23.6 |
| 5 | UNKNOWN | 50.52 | MVS | 28.2 |
| 6 | UNKNOWN | 18.28 | MVS | 51.4 |
| 7 | TOLUENE | 1.567 | PPB | 118.9 |
| 8 | UNKNOWN | 1.430 | MVS | 218.6 |
| 9 | M,P-XYLENE | 5.282 | PPB | 263.2 |
| 10 | O-XYLENE | 2.772 | PPB | 311.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-005BH
1.0- 1.5 10G

ANALYSIS #15  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 15:06
SAMPLE TIME: MAY 4,95 14:58

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

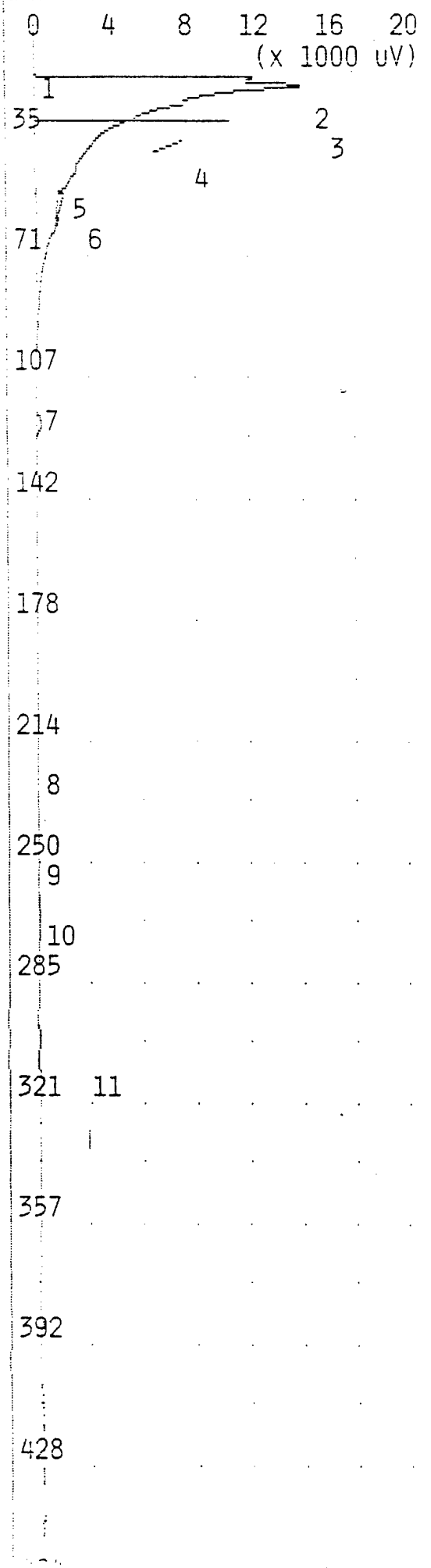
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.055 | MVS | 15.0 |
| 2 | UNKNOWN | 14.32 | MVS | 16.8 |
| 3 | UNKNOWN | 86.62 | MVS | 18.4 |
| 4 | UNKNOWN | 2.331 | MVS | 23.8 |
| 5 | UNKNOWN | 35.27 | MVS | 32.4 |
| 6 | UNKNOWN | 17.73 | MVS | 51.6 |
| 7 | TOLUENE | 1.834 | PPB | 118.9 |
| 8 | UNKNOWN | 1.032 | MVS | 215.4 |
| 9 | UNKNOWN | 2.566 | MVS | 219.6 |
| 10 | UNKNOWN | 3.830 | MVS | 225.6 |
| 11 | ETHYLBENZENE | 2.298 | PPB | 247.4 |
| 12 | M,P-XYLENE | 4.692 | PPB | 265.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-005BH
6.0- 6.5 10G

ANALYSIS #16  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 15:18
SAMPLE TIME: MAY 4,95 15:10

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

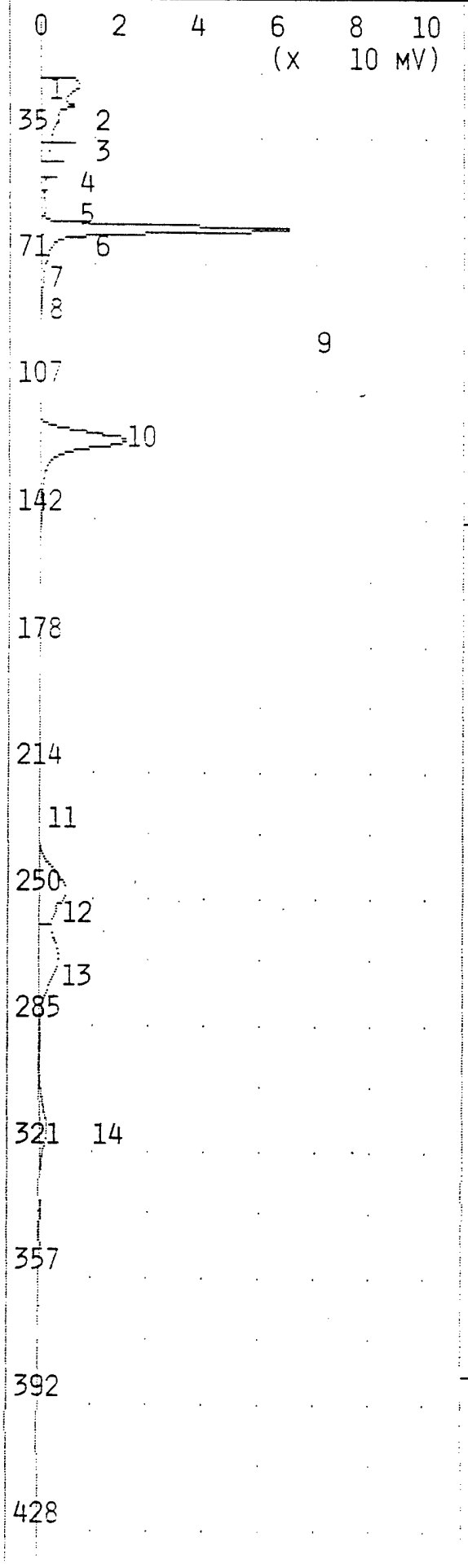
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.071 MVS | 14.9 |
| 2 | UNKNOWN | 16.64 MVS | 16.8 |
| 3 | UNKNOWN | 184.9 MVS | 18.4 |
| 4 | UNKNOWN | 0.728 MVS | 23.8 |
| 5 | UNKNOWN | 1.182 MVS | 51.0 |
| 6 | BENZENE | 0.063 PPB | 58.6 |
| 7 | TOLUENE | 1.379 PPB | 118.4 |
| 8 | UNKNOWN | 0.892 MVS | 219.6 |
| 9 | ETHYLBENZENE | 0.282 PPB | 248.2 |
| 10 | M,P-XYLENE | 2.216 PPB | 265.8 |
| 11 | O-XYLENE | 1.157 PPB | 307.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-005BH
10.0 10G

ANALYSIS #17  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 15:30
SAMPLE TIME: MAY 4,95 15:22

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.118 | MVS | 12.8 |
| 2 | UNKNOWN | 0.121 | MVS | 15.2 |
| 3 | UNKNOWN | 14.51 | MVS | 16.8 |
| 4 | UNKNOWN | 46.10 | MVS | 18.4 |
| 5 | UNKNOWN | 29.96 | MVS | 24.0 |
| 6 | UNKNOWN | 47.06 | MVS | 28.5 |
| 7 | UNKNOWN | 11.54 | MVS | 43.5 |
| 8 | UNKNOWN | 6.932 | MVS | 51.2 |
| 9 | BENZENE | 92.64 | PPB | 59.2 |
| 10 | TOLUENE | 88.84 | PPB | 118.5 |
| 11 | UNKNOWN | 1.017 | MVS | 222.2 |
| 12 | ETHYLBENZENE | 83.08 | PPB | 245.0 |
| 13 | M,P-XYLENE | 171.0 | PPB | 264.2 |
| 14 | O-XYLENE | 94.51 | PPB | 311.4 |

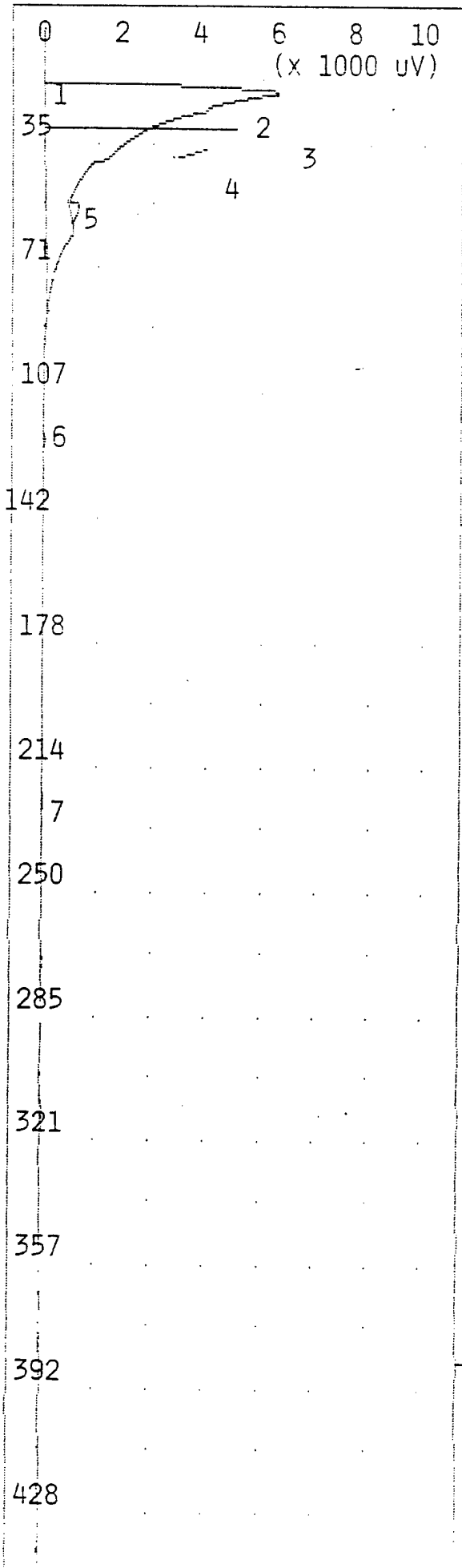
NOTES

JOE BYRD, JR.
DULUTH ANGB
~~026-005BH~~
~~10.0 10C~~
100 ppb BTEX

13

G.C. Ready
Set GC Function
-- Analysis No 17 -- Run at - May
Pk No Name Conc/Area r.e'n Ret.Time
5 Unknown 47.06 mVS
6 Unknown 11.554 mVS
7 Unknown 6.922 mVS
8 benzene 100.0 ppb
9 toluene 100.0 ppb
10 Unknown 1.017 mVS
11 ethylbenzene 99.99 ppb
12 m,p-xylene 200.0 ppb
13 o-xylene 99.99 ppb
- Detected 14 peaks. Use ↑ ↓ to scroll
(mV)
382.0 uV
0
24
48
79
125
189
256
367
500

ANALYSIS #18  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 15:53
SAMPLE TIME: MAY 4,95 15:38

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

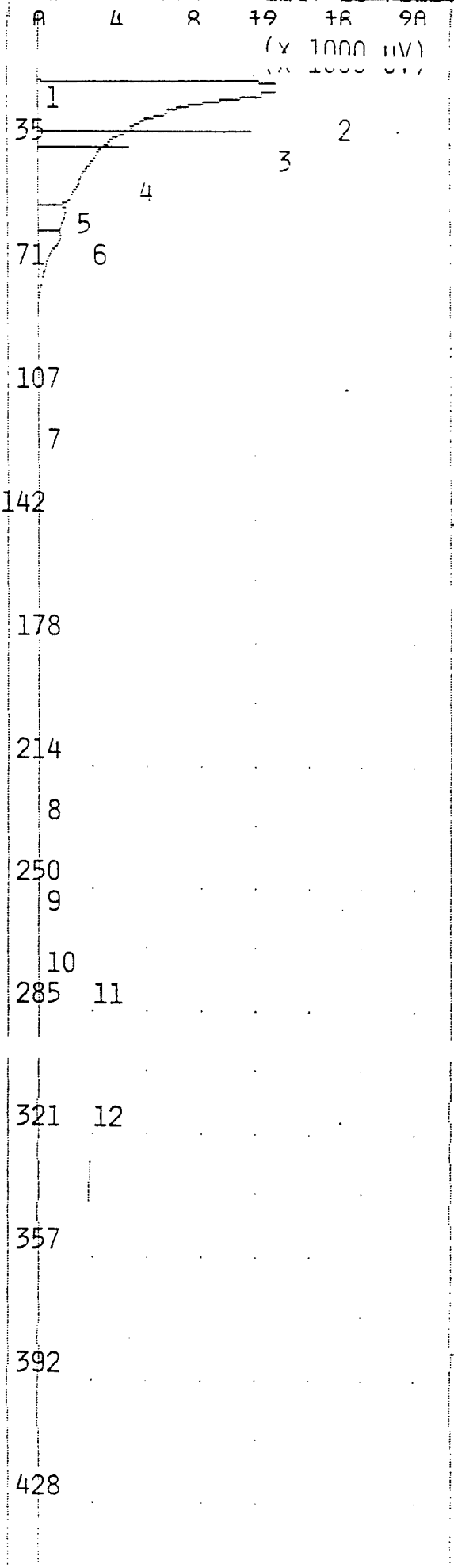
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.090 | MVS | 14.6 |
| 2 | UNKNOWN | 6.144 | MVS | 16.9 |
| 3 | UNKNOWN | 97.76 | MVS | 18.4 |
| 4 | UNKNOWN | 0.285 | MVS | 23.5 |
| 5 | UNKNOWN | 1.108 | MVS | 51.5 |
| 6 | TOLUENE | 0.653 | PPB | 118.5 |
| 7 | ETHYLBENZENE | 1.473 | PPB | 220.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #19 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 15:56
SAMPLE TIME: MAY 4,95 15:56

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MV SEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

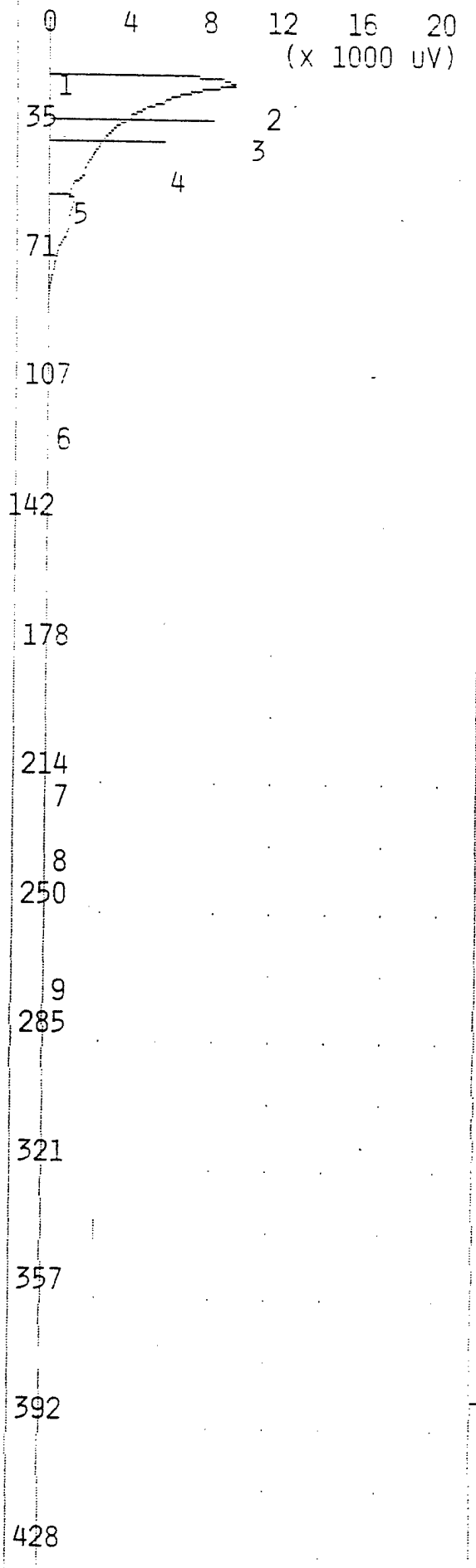
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.076 | MVS | 15.2 |
| 2 | UNKNOWN | 19.72 | MVS | 16.9 |
| 3 | UNKNOWN | 80.69 | MVS | 18.4 |
| 4 | UNKNOWN | 66.59 | MVS | 28.5 |
| 5 | UNKNOWN | 11.56 | MVS | 51.4 |
| 6 | BENZENE | 7.335 | PPB | 59.2 |
| 7 | TOLUENE | 1.900 | PPB | 118.9 |
| 8 | UNKNOWN | 2.853 | MVS | 219.6 |
| 9 | ETHYLBENZENE | 1.824 | PPB | 246.4 |
| 10 | M,P-XYLENE | 3.847 | PPB | 265.3 |
| 11 | UNKNOWN | 0.309 | MVS | 273.0 |
| 12 | O-XYLENE | 3.561 | PPB | 307.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-006BH
0.5- 2.5 DG

ANALYSIS #20  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 16:23
SAMPLE TIME: MAY 4,95 16:15

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

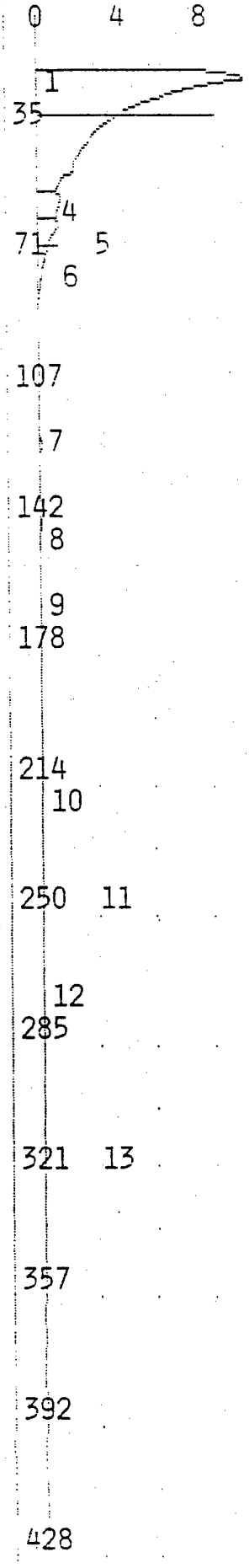
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.044 | MVS | 14.7 |
| 2 | UNKNOWN | 12.28 | MVS | 16.9 |
| 3 | UNKNOWN | 45.55 | MVS | 18.7 |
| 4 | UNKNOWN | 79.58 | MVS | 23.8 |
| 5 | UNKNOWN | 23.34 | MVS | 51.2 |
| 6 | TOLUENE | 1.173 | PPB | 118.8 |
| 7 | UNKNOWN | 0.500 | MVS | 217.0 |
| 8 | ETHYLBENZENE | 0.263 | PPB | 227.0 |
| 9 | M,P-XYLENE | 2.936 | PPB | 265.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-006BH
0.5- 2.5  10G

ANALYSIS #21  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 16:35
SAMPLE TIME: MAY 4,95 16:27

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

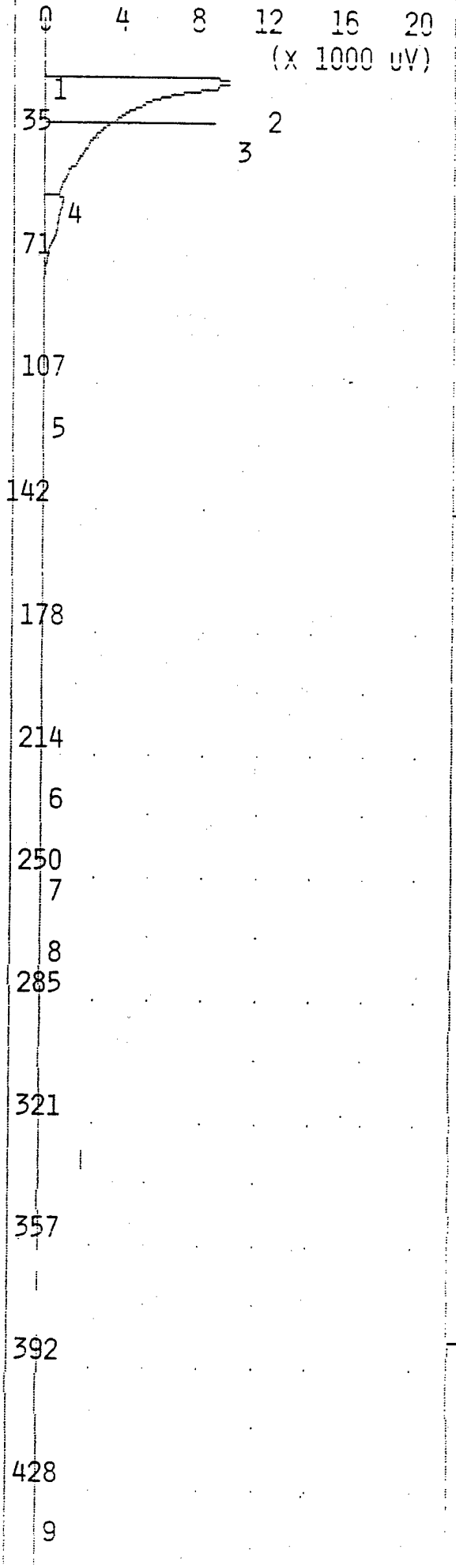
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.011 | MVS | 14.8 |
| 2 | UNKNOWN | 13.43 | MVS | 16.8 |
| 3 | UNKNOWN | 130.2 | MVS | 18.4 |
| 4 | UNKNOWN | 8.796 | MVS | 51.4 |
| 5 | UNKNOWN | 1.760 | MVS | 58.6 |
| 6 | BENZENE | 5.456 | PPB | 59.3 |
| 7 | TOLUENE | 2.228 | PPB | 118.2 |
| 8 | UNKNOWN | 2.715 | MVS | 140.6 |
| 9 | UNKNOWN | 3.136 | MVS | 160.8 |
| 10 | UNKNOWN | 1.860 | MVS | 213.6 |
| 11 | ETHYLBENZENE | 0.483 | PPB | 244.0 |
| 12 | M,P-XYLENE | 3.539 | PPB | 266.1 |
| 13 | O-XYLENE | 1.761 | PPB | 312.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-006BH
11.0-11.5 [illegible]

ANALYSIS #22 10S1 GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 16:47
SAMPLE TIME: MAY 4,95 16:39

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

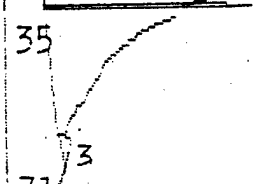
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.059 | MVS | 14.8 |
| 2 | UNKNOWN | 15.59 | MVS | 16.8 |
| 3 | UNKNOWN | 112.8 | MVS | 18.3 |
| 4 | UNKNOWN | 16.84 | MVS | 50.7 |
| 5 | TOLUENE | 1.598 | PPB | 119.0 |
| 6 | UNKNOWN | 1.160 | MVS | 220.0 |
| 7 | ETHYLBENZENE | 0.860 | PPB | 249.3 |
| 8 | M,P-XYLENE | 2.493 | PPB | 264.0 |
| 9 | UNKNOWN | 0.077 | MVS | 433.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002BH
0.5- 2.5 10G

ANALYSIS #23 10S+ GC FUNCTION ANALYSIS REPORT




PRINTED: MAY 4 85 18:59
SAMPLE TIME: MAY 4 85 18:51

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

107

4

142

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 12.77 | MVS | 16.8 |
| 2 | UNKNOWN | 101.2 | MVS | 18.8 |
| 3 | UNKNOWN | 2.405 | MVS | 51.2 |
| 4 | TOLUENE | 1.414 | PPB | 119.0 |
| 5 | UNKNOWN | 1.087 | MVS | 219.0 |

178

214

5

250

285

321

357

392

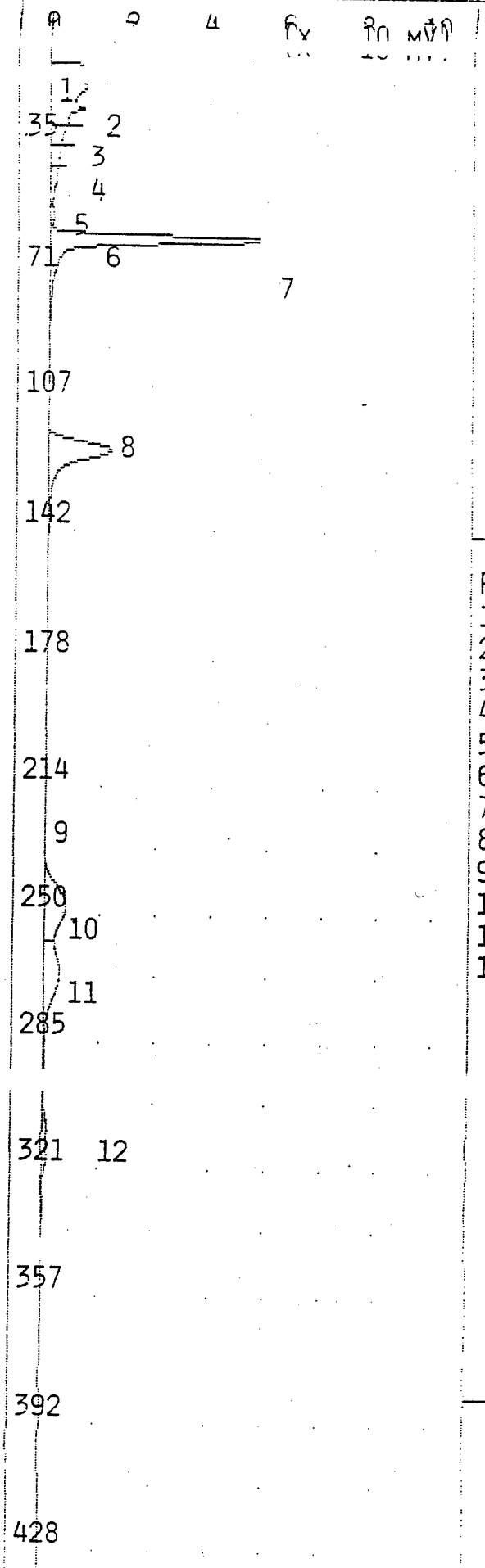
NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002BH
5.0- 7.5 10G

428

464

ANALYSIS #24 10S+ GC FUNCTION ANALYSIS REPORT




PRINTED: MAY 4'85 17:42

METHOD

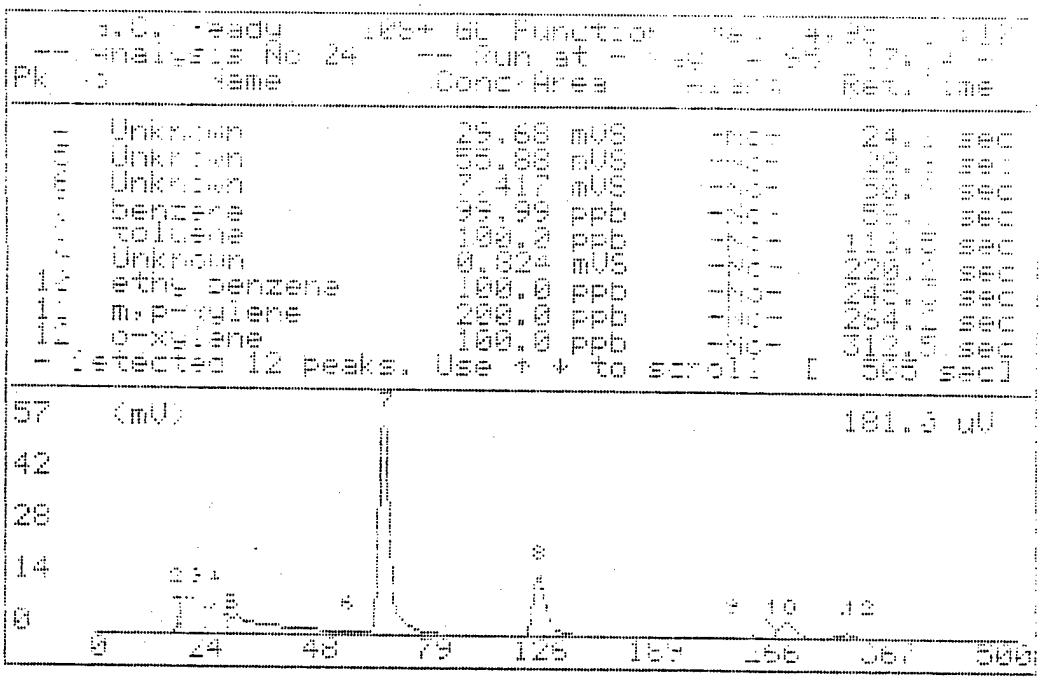
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

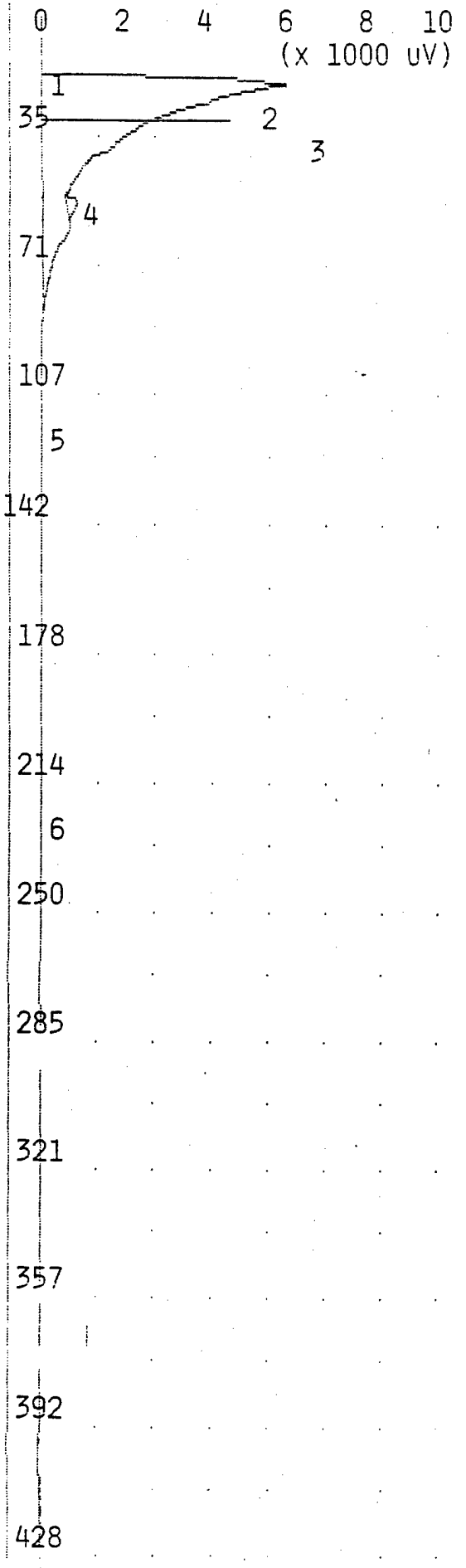
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.071 | MVS | 14.8 |
| 2 | UNKNOWN | 11.67 | MVS | 16.8 |
| 3 | UNKNOWN | 44.68 | MVS | 18.5 |
| 4 | UNKNOWN | 29.68 | MVS | 24.1 |
| 5 | UNKNOWN | 55.88 | MVS | 28.6 |
| 6 | UNKNOWN | 7.417 | MVS | 50.9 |
| 7 | BENZENE | 89.53 | PPB | 59.3 |
| 8 | TOLUENE | 80.78 | PPB | 118.5 |
| 9 | UNKNOWN | 0.824 | MVS | 220.2 |
| 10 | ETHYLBENZENE | 80.83 | PPB | 245.3 |
| 11 | M,P-XYLENE | 158.9 | PPB | 264.2 |
| 12 | O-XYLENE | 72.85 | PPB | 312.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



ANALYSIS #25  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 17:27
SAMPLE TIME: MAY 4,95 17:19

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

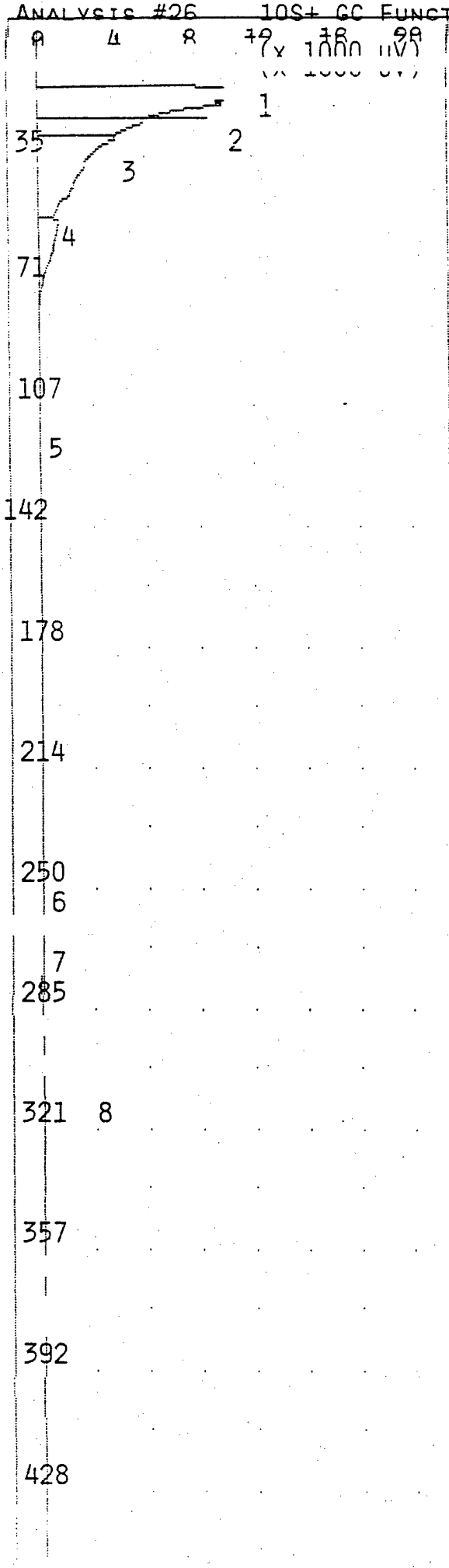
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.030 | MVS | 15.0 |
| 2 | UNKNOWN | 6.022 | MVS | 17.0 |
| 3 | UNKNOWN | 99.35 | MVS | 18.6 |
| 4 | UNKNOWN | 1.079 | MVS | 51.2 |
| 5 | TOLUENE | 0.353 | PPB | 118.5 |
| 6 | ETHYLBENZENE | 0.537 | PPB | 220.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #26 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 17:39
SAMPLE TIME: MAY 4 95 17:31

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

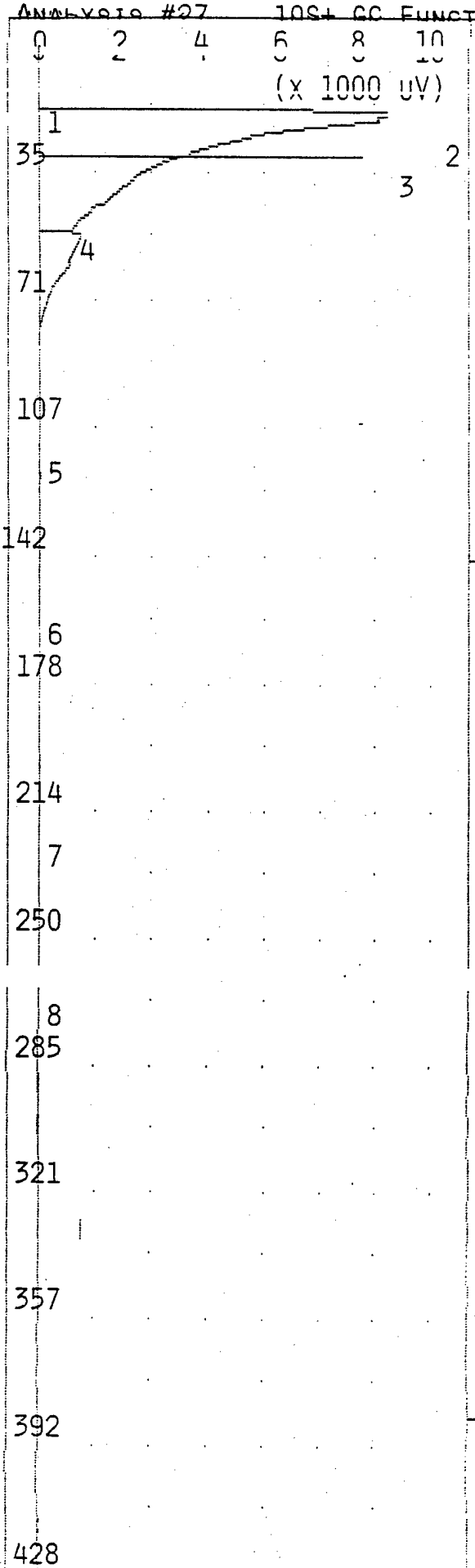
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 15.15 | MVS | 16.9 |
| 2 | UNKNOWN | 67.29 | MVS | 19.0 |
| 3 | UNKNOWN | 52.60 | MVS | 28.6 |
| 4 | UNKNOWN | 19.23 | MVS | 51.0 |
| 5 | TOLUENE | 1.779 | PPB | 118.2 |
| 6 | ETHYLBENZENE | 0.834 | PPB | 245.0 |
| 7 | M,P-XYLENE | 7.643 | PPB | 263.4 |
| 8 | O-XYLENE | 2.089 | PPB | 314.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
~~AIR BLANK~~
026-003 BH
0.5'-2.5' 10g

ANALYSIS #27 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 17:51
SAMPLE TIME: MAY 4,95 17:43

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

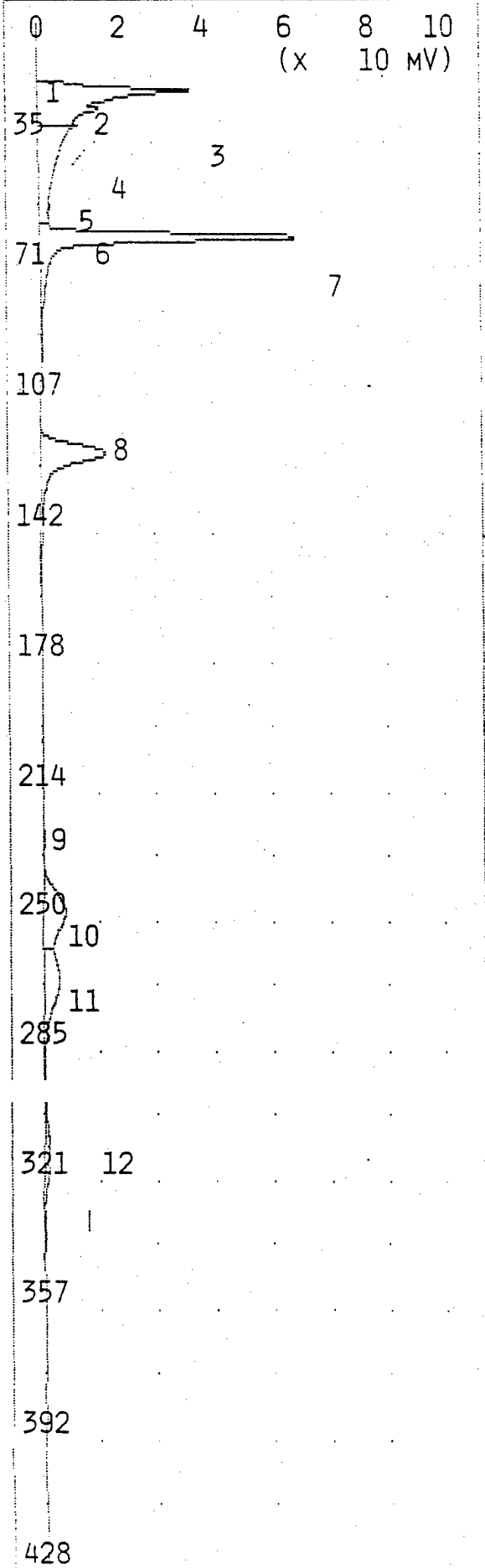
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.034 | MVS | 14.7 |
| 2 | UNKNOWN | 12.82 | MVS | 16.9 |
| 3 | UNKNOWN | 110.8 | MVS | 18.6 |
| 4 | UNKNOWN | 18.07 | MVS | 51.2 |
| 5 | TOLUENE | 1.596 | PPB | 118.4 |
| 6 | UNKNOWN | 0.583 | MVS | 157.0 |
| 7 | UNKNOWN | 0.432 | MVS | 218.0 |
| 8 | M,P-XYLENE | 3.998 | PPB | 266.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-003BH
5.0-7.0 10G

ANALYSIS #28  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 4,95 18:04
SAMPLE TIME: MAY 4,95 17:56

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

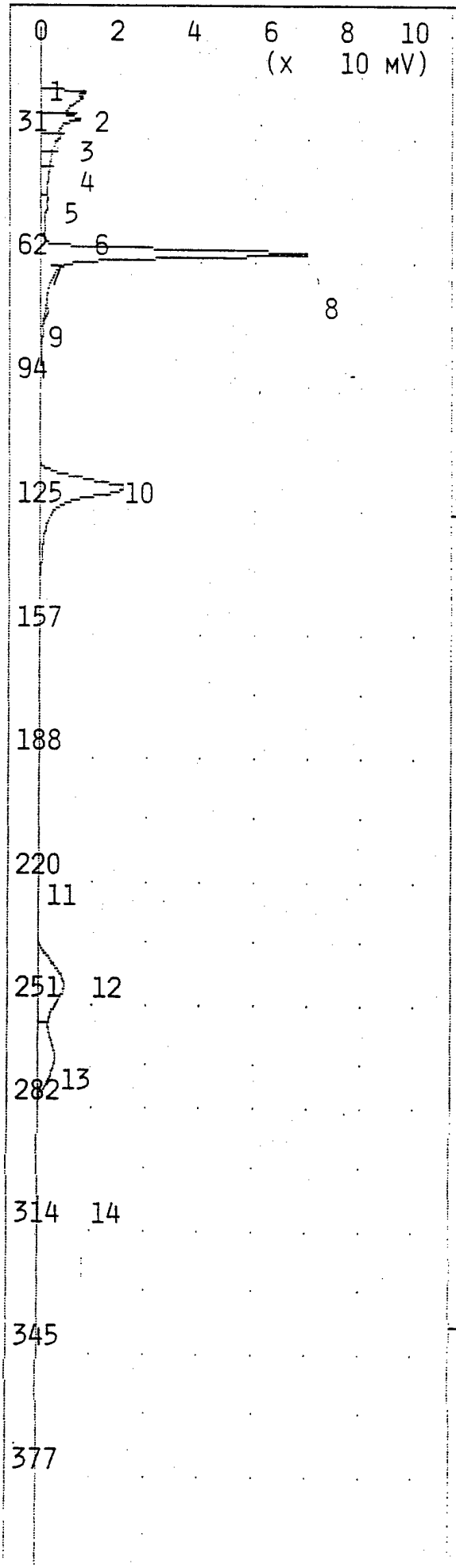
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.203 | MVS | 13.5 |
| 2 | UNKNOWN | 13.51 | MVS | 17.0 |
| 3 | UNKNOWN | 302.0 | MVS | 18.7 |
| 4 | UNKNOWN | 6.501 | MVS | 24.3 |
| 5 | UNKNOWN | 1.111 | MVS | 28.8 |
| 6 | UNKNOWN | 0.778 | MVS | 51.1 |
| 7 | BENZENE | 108.6 | PPB | 59.4 |
| 8 | TOLUENE | 96.42 | PPB | 118.5 |
| 9 | UNKNOWN | 1.804 | MVS | 218.8 |
| 10 | ETHYLBENZENE | 95.01 | PPB | 245.3 |
| 11 | M,P-XYLENE | 180.8 | PPB | 263.4 |
| 12 | O-XYLENE | 87.87 | PPB | 311.2 |

NOTES

DESTRY GREENWAY
DULUTH ANGB
100 PPB BTEX

ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 12:09
SAMPLE TIME: MAY 5,95 12:01

METHOD

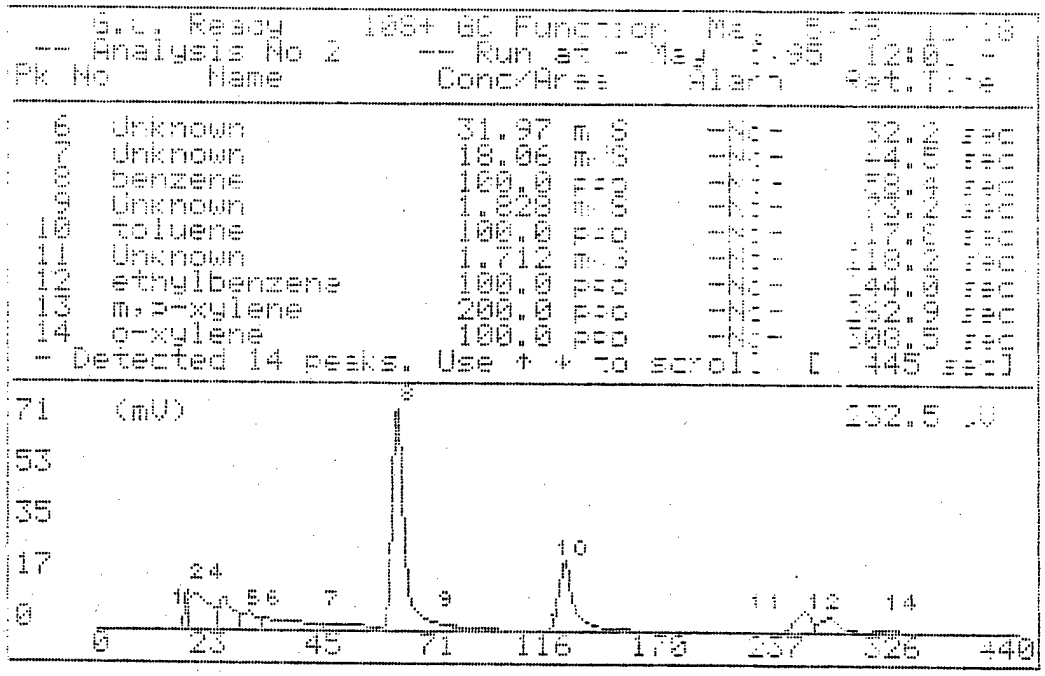
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

PEAK REPORT

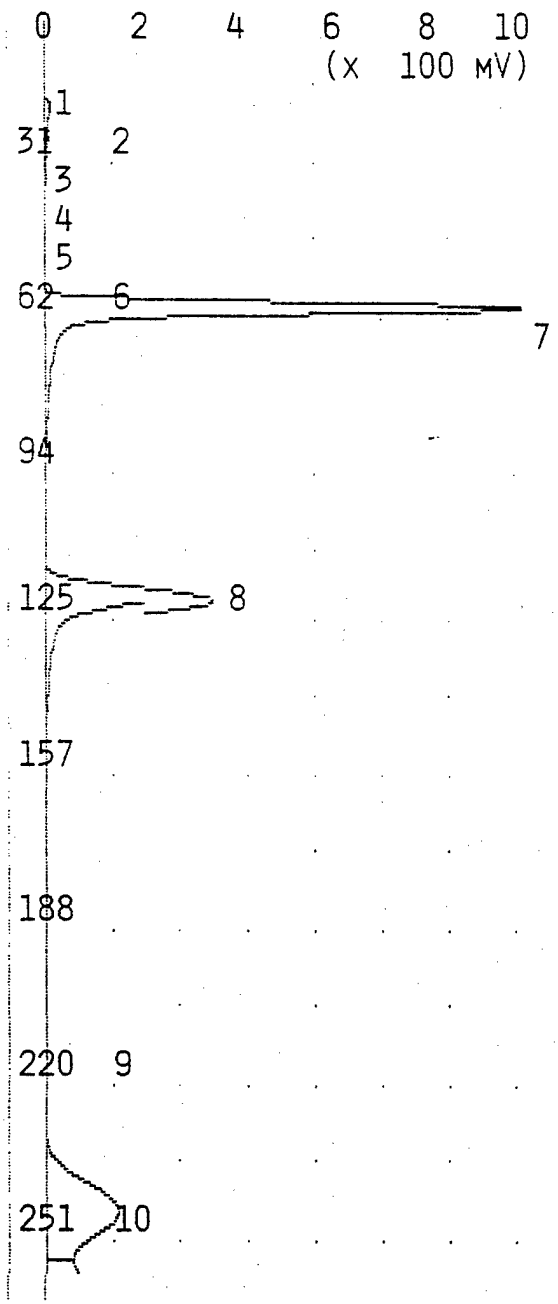
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.050 | MVS | 15.5 |
| 2 | UNKNOWN | 15.29 | MVS | 17.0 |
| 3 | UNKNOWN | 46.72 | MVS | 18.5 |
| 4 | UNKNOWN | 34.06 | MVS | 24.2 |
| 5 | UNKNOWN | 19.27 | MVS | 28.8 |
| 6 | UNKNOWN | 31.97 | MVS | 32.2 |
| 7 | UNKNOWN | 18.06 | MVS | 44.5 |
| 8 | BENZENE | 108.0 | PPB | 58.4 |
| 9 | UNKNOWN | 1.828 | MVS | 73.2 |
| 10 | TOLUENE | 89.07 | PPB | 117.8 |
| 11 | UNKNOWN | 1.712 | MVS | 218.2 |
| 12 | ETHYLBENZENE | 83.53 | PPB | 244.0 |
| 13 | UNKNOWN | 72.21 | MVS | 262.9 |
| 14 | O-XYLENE | 72.36 | PPB | 308.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


S.C. Ready 105+ GC Function Ma
-- Analysis No 2 -- Run at - May
Pk No Name Conc/Area Flag Ret.Time
5 Unknown 31.97 m/s 32.
6 Unknown 18.06 m/s 44.
7 benzene 160.0 ppb 68.
8 Unknown 1.223 m/s 80.
10 toluene 100.0 ppb 110.
11 Unknown 1.712 m/s 132.
12 ethylbenzene 100.0 ppb 144.
13 m,p-xylene 200.0 ppb 152.
14 o-xylene 100.0 ppb 300.
* Detected 14 peaks. Use ↑ ↓ to scroll [ 445 sec]
71 (mV)
132.5 mV
53
35
17
0
0 23 45 71 116 170 237 325 440

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 12:29
SAMPLE TIME: MAY 5,95 12:22

METHOD

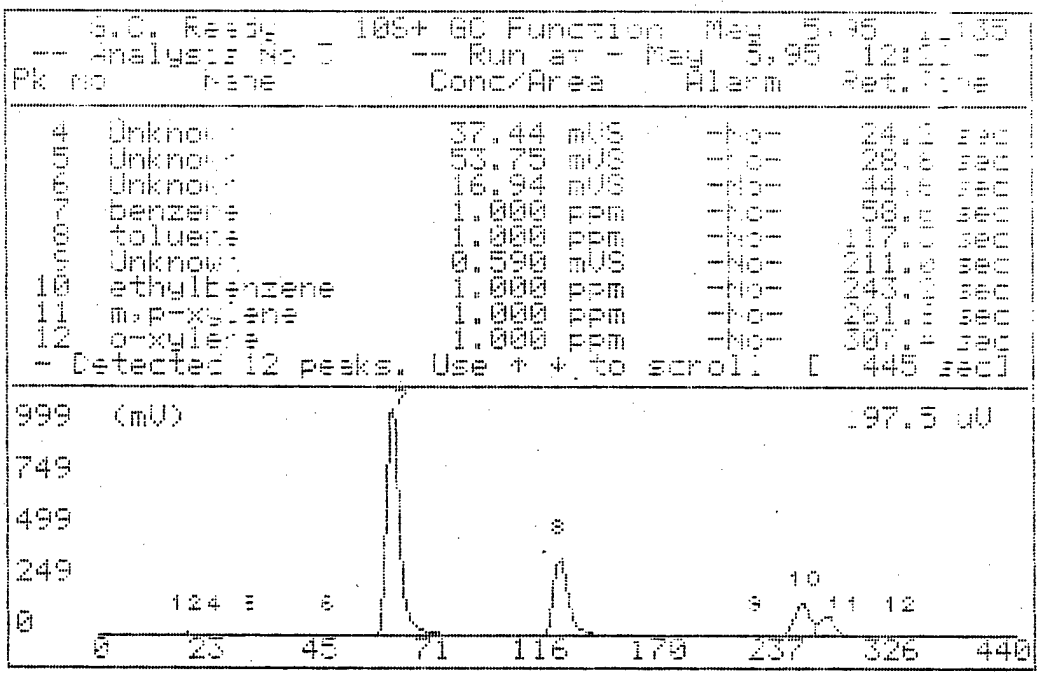
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

PEAK REPORT

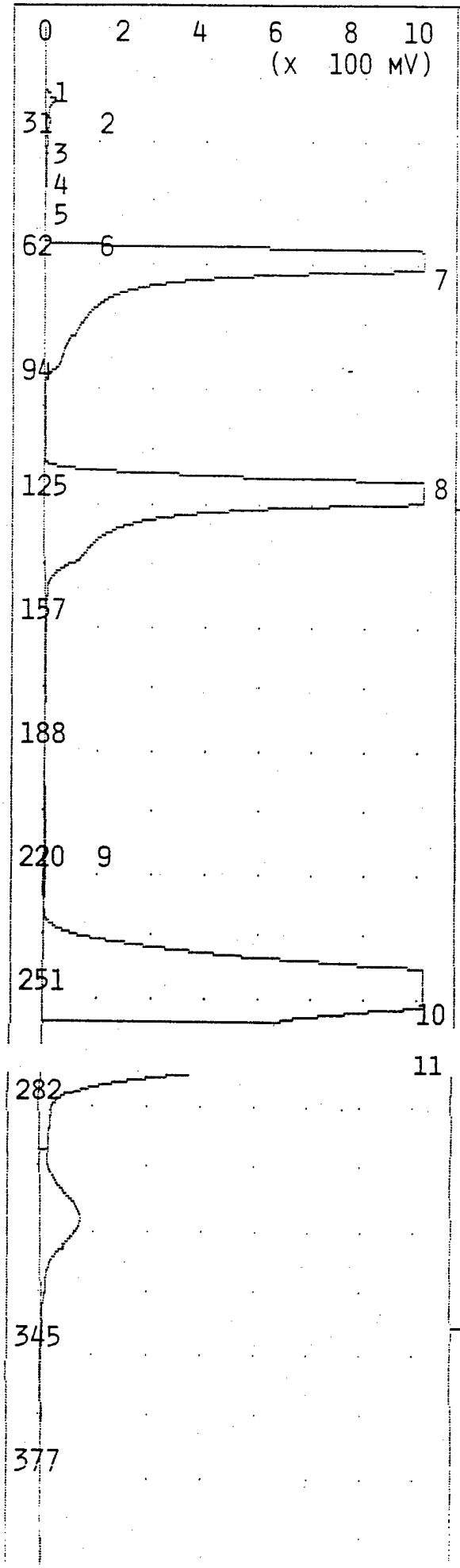
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.035 | MVS | 15.0 |
| 2 | UNKNOWN | 18.43 | MVS | 17.0 |
| 3 | UNKNOWN | 56.33 | MVS | 18.6 |
| 4 | UNKNOWN | 37.44 | MVS | 24.2 |
| 5 | UNKNOWN | 53.75 | MVS | 28.6 |
| 6 | UNKNOWN | 16.94 | MVS | 44.6 |
| 7 | BENZENE | 1.472 | PPM | 58.6 |
| 8 | TOLUENE | 1.635 | PPM | 117.3 |
| 9 | UNKNOWN | 0.590 | MVS | 211.0 |
| 10 | ETHYLBENZENE | 2.139 | PPM | 243.2 |
| 11 | M,P-XYLENE | 3.952 | PPM | 261.6 |
| 12 | O-XYLENE | 2.758 | PPM | 307.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


S.C. Ready 105+ GC Function May 5,95
-- Analysis No -- Run at - May 5,95 12:
Pk no Name Conc/Area Alarm Ret. time
4 Unknown 37.44 mVS -No- 24.1 sec
5 Unknown 52.75 mVS -No- 28.6 sec
6 Unknown 16.94 mVS -No- 44.1 sec
7 benzene 1.000 ppm -No- 58. sec
8 toluene 1.000 ppm -No- 117. sec
9 Unknown 0.590 mVS -No- 211. sec
10 ethylbenzene 1.000 ppm -No- 243. sec
11 m,p-Xylene 1.000 ppm -No- 261. sec
12 o-xylene 1.000 ppm -No- 307. sec
- Detected 12 peaks. Use ↑ ↓ to scrol. [ 445 sec]
999 (mV)
197.5 uV
749
499
249
0
1 2 4 5 6
8
9
10
11 12
0 25 45 71 116 170 237 326 440

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 12:45
SAMPLE TIME: MAY 5,95 12:38

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

PEAK REPORT

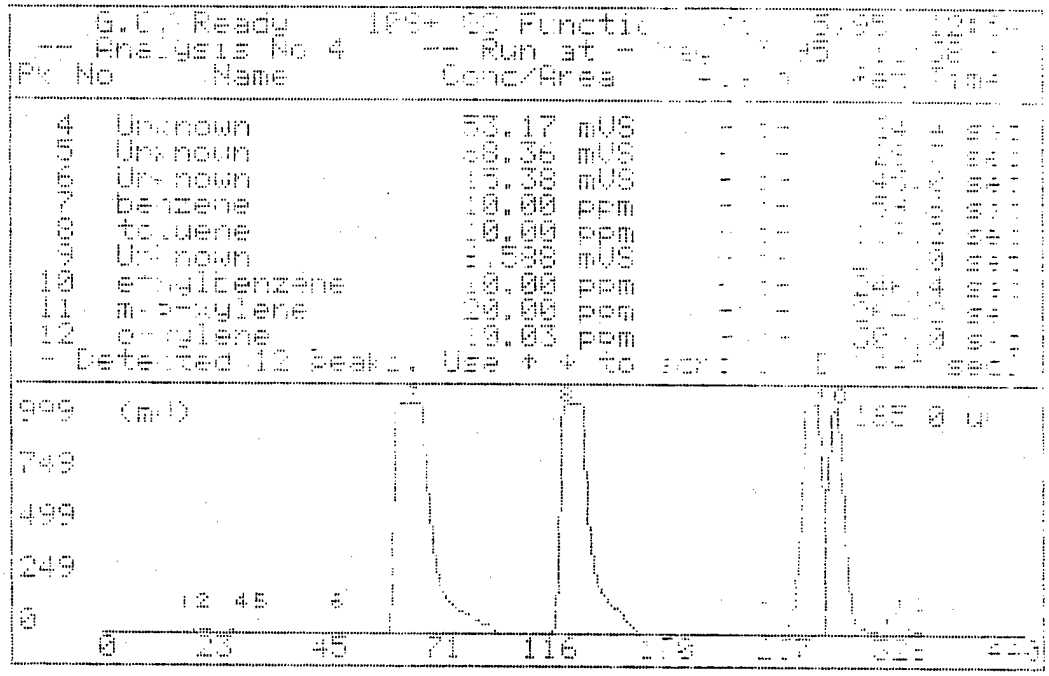
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.046 | MVS | 15.0 |
| 2 | UNKNOWN | 17.07 | MVS | 17.0 |
| 3 | UNKNOWN | 90.60 | MVS | 18.6 |
| 4 | UNKNOWN | 53.17 | MVS | 24.4 |
| 5 | UNKNOWN | 68.36 | MVS | 28.7 |
| 6 | UNKNOWN | 15.38 | MVS | 45.0 |
| 7 | BENZENE | 5.453 | PPM | 59.6 |
| 8 | TOLUENE | 8.451 | PPM | 119.2 |
| 9 | UNKNOWN | 6.588 | MVS | 211.0 |
| 10 | ETHYLBENZENE | 9.865 | PPM | 246.4 |
| 11 | M,P-XYLENE | 8.935 | PPM | 264.2 |
| 12 | O-XYLENE | 6.312 | PPM | 309.0 |

NOTES

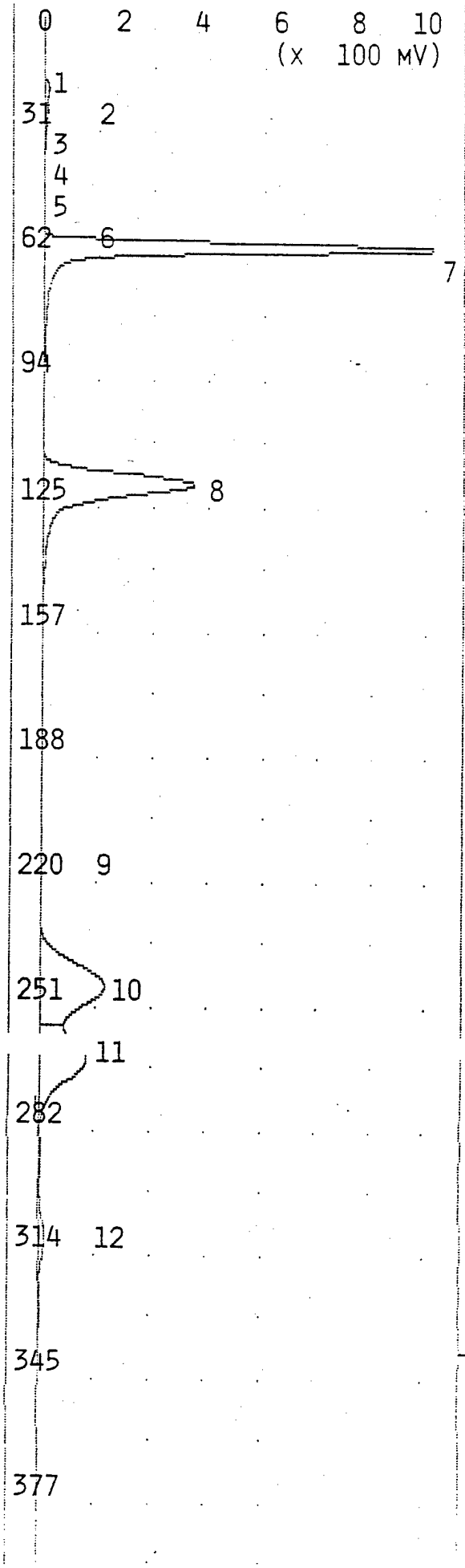
JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

2

314


G.C. Ready
Analysis No 4
Run at
Pk No
Name
Conc/Area
4 Unknown 53.17 mVS
5 Unknown 8.36 mVS
6 Unknown 11.38 mVS
7 Benzene 10.00 ppm
8 Toluene 10.00 ppm
9 Unknown 1.538 mVS
10 Ethylbenzene 10.00 ppm
11 m-p-Xylene 20.00 ppm
12 o-Xylene 10.00 ppm
- Detected 12 peaks. Use + + to
(mV)
999
749
499
249
0
0
23
45
71
116

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 13:10
SAMPLE TIME: MAY 5,95 13:02

METHOD

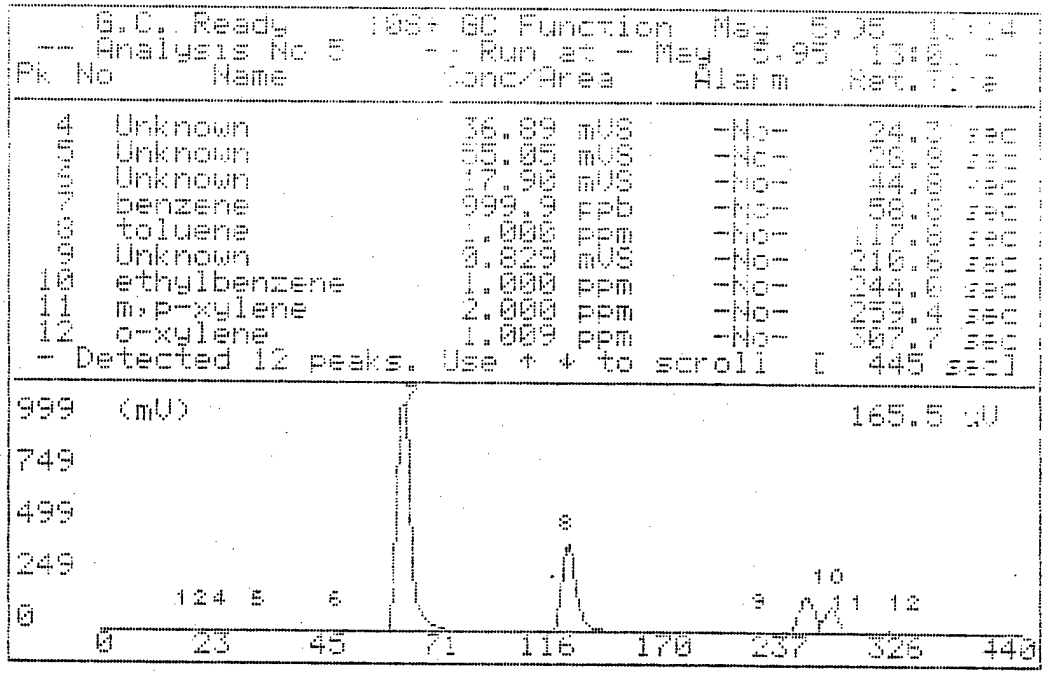
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

PEAK REPORT

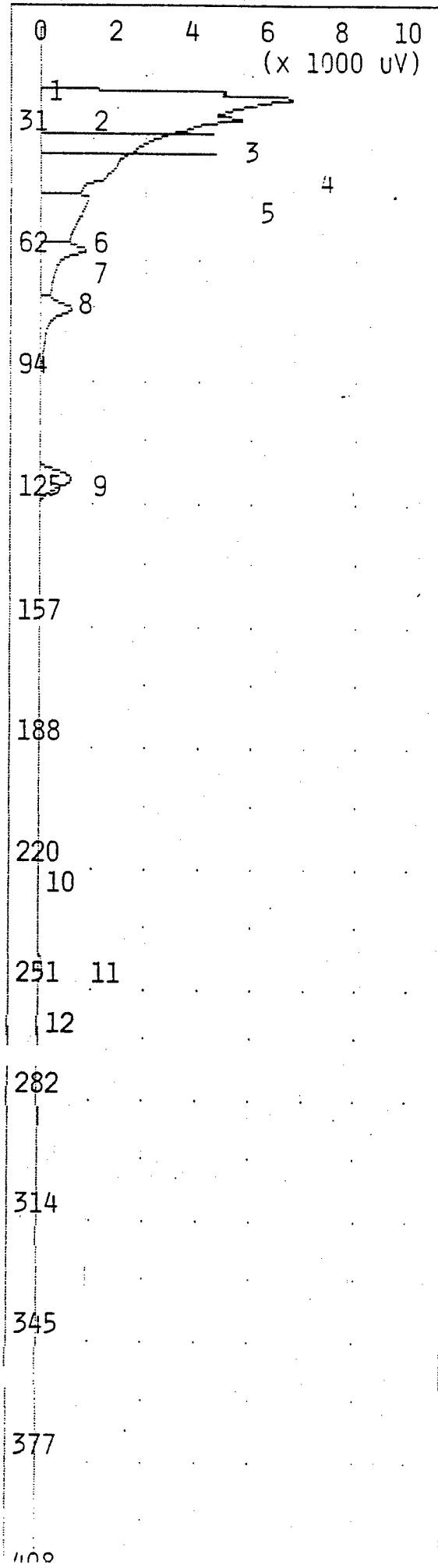
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.057 | MVS | 15.1 |
| 2 | UNKNOWN | 16.91 | MVS | 17.0 |
| 3 | UNKNOWN | 57.57 | MVS | 18.6 |
| 4 | UNKNOWN | 36.89 | MVS | 24.3 |
| 5 | UNKNOWN | 55.05 | MVS | 28.8 |
| 6 | UNKNOWN | 17.90 | MVS | 44.8 |
| 7 | BENZENE | 1.231 | PPM | 58.8 |
| 8 | TOLUENE | 1.111 | PPM | 117.8 |
| 9 | UNKNOWN | 0.829 | MVS | 210.6 |
| 10 | ETHYLBENZENE | 1.074 | PPM | 244.0 |
| 11 | M,P-XYLENE | 1.310 | PPM | 259.4 |
| 12 | O-XYLENE | 1.060 | PPM | 307.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


G.C. Ready
GC Function
Analysis No 5
Run at - May
Pk No
Name
Conc/Area
Alarm
Ret. Time
4 Unknown 36.89 mVS No 24.7 sec
5 Unknown 55.05 mVS No 36.8 sec
6 Unknown 7.90 mVS No 44.0 sec
benzene 999.9 ppb No 58.0 sec
toluene 1.0000 ppm No 117.0 sec
9 Unknown 0.8229 mVS No 210.6 sec
10 ethylbenzene 1.0000 ppm No 244.5 sec
11 m,p-Xylene 2.0000 ppm No 253.3 sec
12 o-xylene 1.0009 ppm No 267.4 sec
Detected 12 peaks. Use ↑ ↓ to scroll [ 445 sec]
999
(mV)
165.5 mV
749
499
249
0
1 2 4 5 6
8
9
10
11 12
0
23
45
71
116
170
237
325
440

ANALYSIS #6 10S÷ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 5,95 | 13:24 | |
| SAMPLE TIME: MAY 5,95 | 13:17 | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

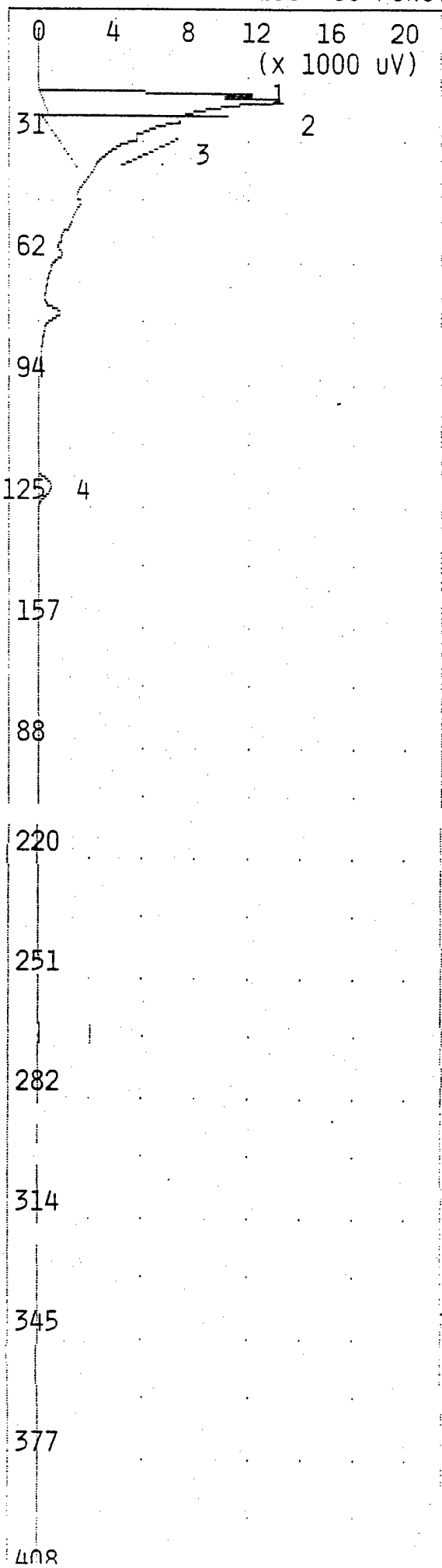
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.021 | MVS | 13.3 |
| 2 | UNKNOWN | 0.059 | MVS | 15.5 |
| 3 | UNKNOWN | 5.599 | MVS | 17.2 |
| 4 | UNKNOWN | 33.16 | MVS | 18.8 |
| 5 | UNKNOWN | 58.27 | MVS | 24.2 |
| 6 | UNKNOWN | 14.17 | MVS | 44.8 |
| 7 | BENZENE | 3.586 | PPB | 58.2 |
| 8 | UNKNOWN | 5.698 | MVS | 72.9 |
| 9 | TOLUENE | 4.090 | PPB | 116.9 |
| 10 | UNKNOWN | 0.604 | MVS | 219.2 |
| 11 | ETHYLBENZENE | 6.202 | PPB | 243.7 |
| 12 | M,P-XYLENE | 13.28 | PPB | 261.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 13:35
SAMPLE TIME: MAY 5,95 13:28

METHOD

| | | |
|---|---|---|
| SLOPE UP | 3.500 | MV/SEC |
| SLOPE DOWN | 10.50 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

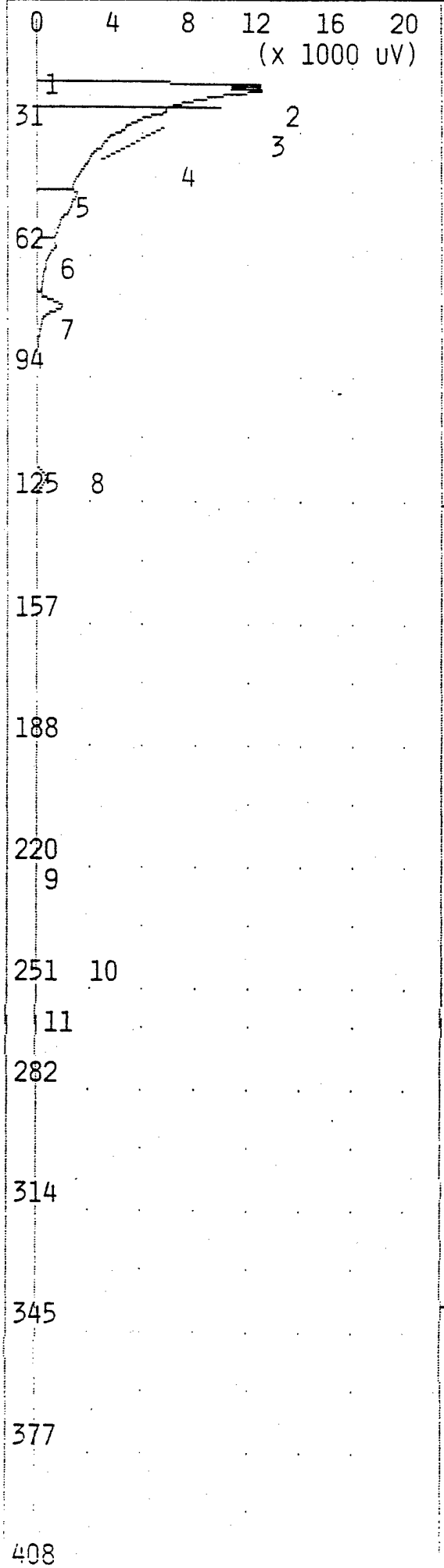
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 16.23 | MVS | 17.0 |
| 2 | UNKNOWN | 89.25 | MVS | 18.6 |
| 3 | UNKNOWN | 0.487 | MVS | 24.2 |
| 4 | TOLUENE | 3.253 | PPB | 118.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
1.0- 2.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 13:46
SAMPLE TIME: MAY 5,95 13:39

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

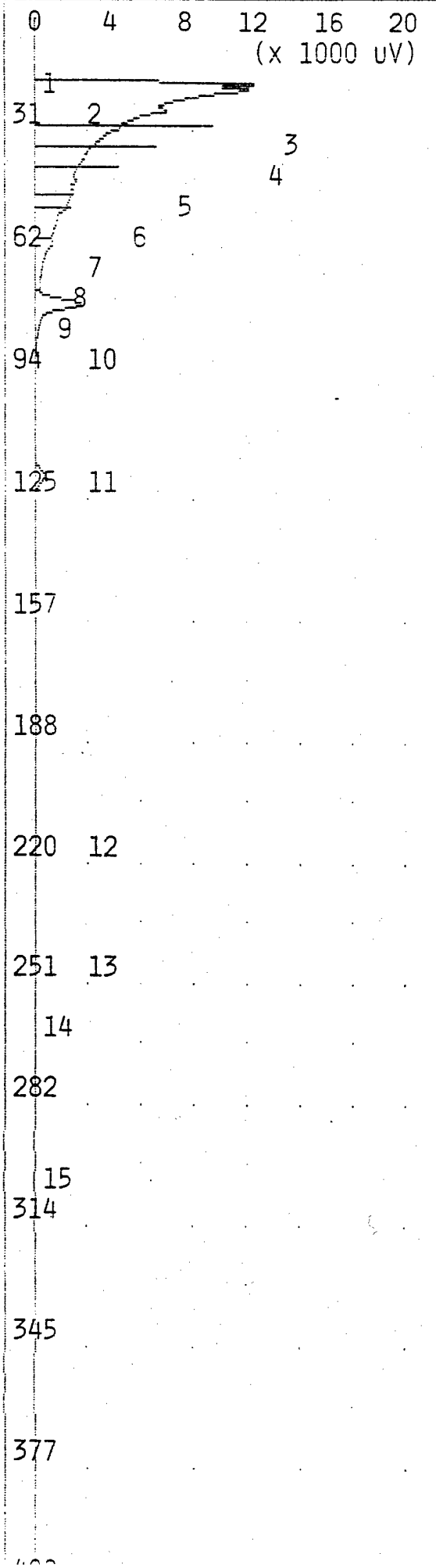
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.071 | MVS | 14.5 |
| 2 | UNKNOWN | 16.13 | MVS | 17.0 |
| 3 | UNKNOWN | 131.0 | MVS | 18.6 |
| 4 | UNKNOWN | 0.543 | MVS | 24.0 |
| 5 | UNKNOWN | 21.36 | MVS | 44.9 |
| 6 | BENZENE | 3.592 | PPB | 58.2 |
| 7 | UNKNOWN | 8.024 | MVS | 73.6 |
| 8 | TOLUENE | 2.854 | PPB | 118.0 |
| 9 | UNKNOWN | 2.154 | MVS | 219.2 |
| 10 | ETHYLBENZENE | 3.111 | PPB | 245.6 |
| 11 | M,P-XYLENE | 5.708 | PPB | 261.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
5.0- 7.0 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 13:57
SAMPLE TIME: MAY 5,95 13:50

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

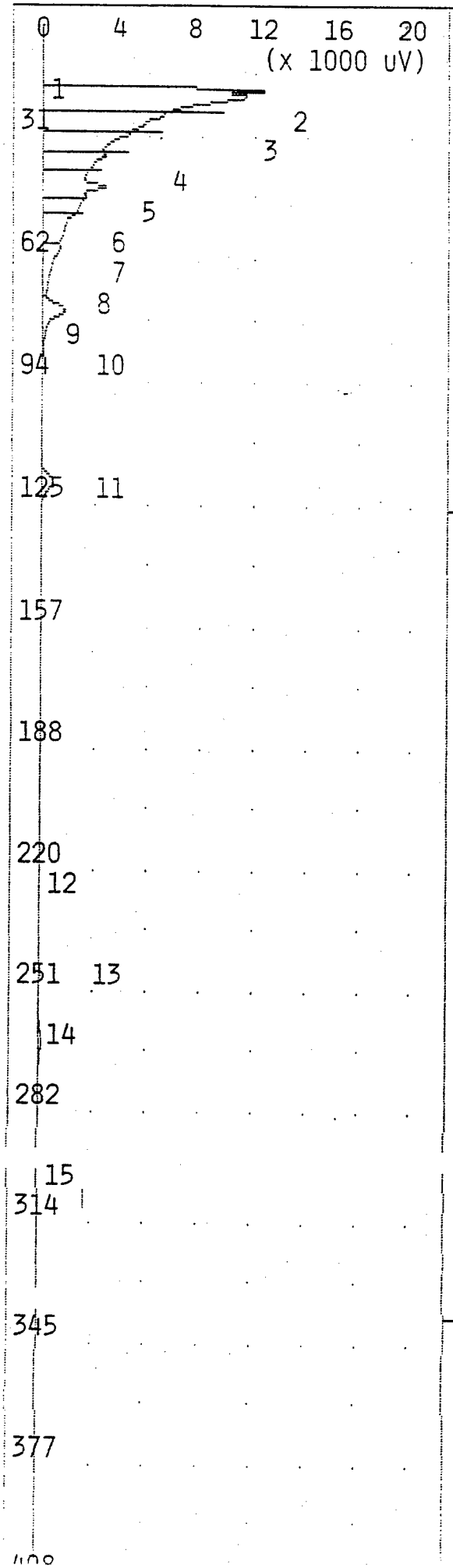
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.036 | MVS | 13.2 |
| 2 | UNKNOWN | 0.107 | MVS | 15.4 |
| 3 | UNKNOWN | 15.60 | MVS | 17.0 |
| 4 | UNKNOWN | 50.46 | MVS | 18.6 |
| 5 | UNKNOWN | 29.63 | MVS | 24.2 |
| 6 | UNKNOWN | 41.96 | MVS | 28.8 |
| 7 | UNKNOWN | 6.564 | MVS | 42.2 |
| 8 | UNKNOWN | 21.19 | MVS | 44.6 |
| 9 | BENZENE | 3.097 | PPB | 58.2 |
| 10 | UNKNOWN | 11.87 | MVS | 73.4 |
| 11 | TOLUENE | 2.977 | PPB | 117.3 |
| 12 | UNKNOWN | 2.619 | MVS | 213.0 |
| 13 | ETHYLBENZENE | 2.198 | PPB | 245.0 |
| 14 | M,P-XYLENE | 6.394 | PPB | 261.0 |
| 15 | O-XYLENE | 5.036 | PPB | 299.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
10.0-12.0 10G

ANALYSIS #10  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 14:08
SAMPLE TIME: MAY 5,95 14:01

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

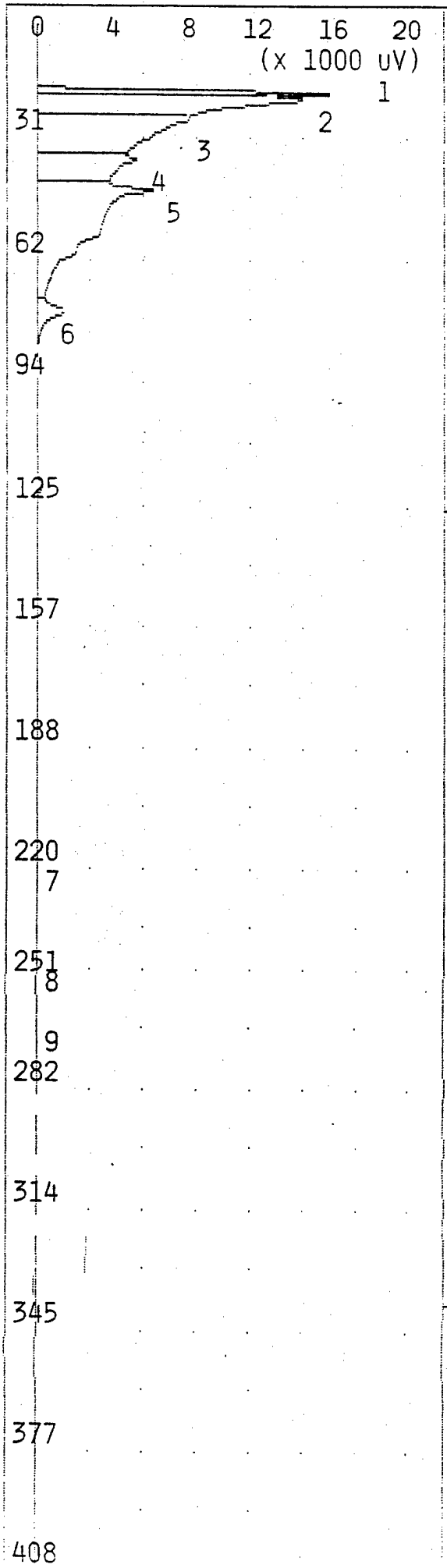
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.104 MVS | 15.3 |
| 2 | UNKNOWN | 16.73 MVS | 17.0 |
| 3 | UNKNOWN | 49.92 MVS | 19.0 |
| 4 | UNKNOWN | 27.33 MVS | 24.0 |
| 5 | UNKNOWN | 19.98 MVS | 28.6 |
| 6 | UNKNOWN | 20.61 MVS | 34.1 |
| 7 | UNKNOWN | 10.60 MVS | 42.2 |
| 8 | UNKNOWN | 21.18 MVS | 44.6 |
| 9 | BENZENE | 2.955 PPB | 58.0 |
| 10 | UNKNOWN | 6.841 MVS | 73.4 |
| 11 | TOLUENE | 3.365 PPB | 117.7 |
| 12 | UNKNOWN | 2.170 MVS | 219.4 |
| 13 | ETHYLBENZENE | 2.637 PPB | 244.5 |
| 14 | M,P-XYLENE | 9.060 PPB | 261.0 |
| 15 | O-XYLENE | 8.235 PPB | 299.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
12.5-14.5 10G

ANALYSIS #11  10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 5,95 | 14:19 | |
| SAMPLE TIME: MAY 5,95 | 14:12 | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

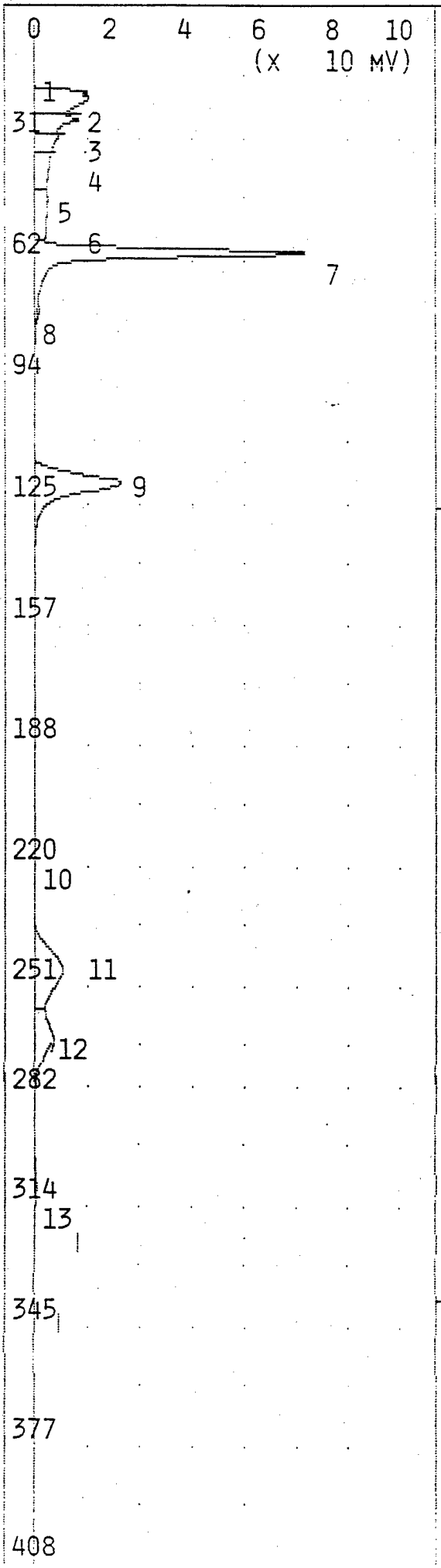
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 23.28 | MVS | 17.7 |
| 2 | UNKNOWN | 63.67 | MVS | 19.5 |
| 3 | UNKNOWN | 63.73 | MVS | 24.8 |
| 4 | UNKNOWN | 33.38 | MVS | 35.0 |
| 5 | UNKNOWN | 86.99 | MVS | 42.8 |
| 6 | UNKNOWN | 14.85 | MVS | 74.0 |
| 7 | UNKNOWN | 10.06 | MVS | 219.8 |
| 8 | ETHYLBENZENE | 5.634 | PPB | 246.9 |
| 9 | M,P-XYLENE | 12.66 | PPB | 265.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
15.0-17.0  10G

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 14:30
SAMPLE TIME: MAY 5,95 14:23

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

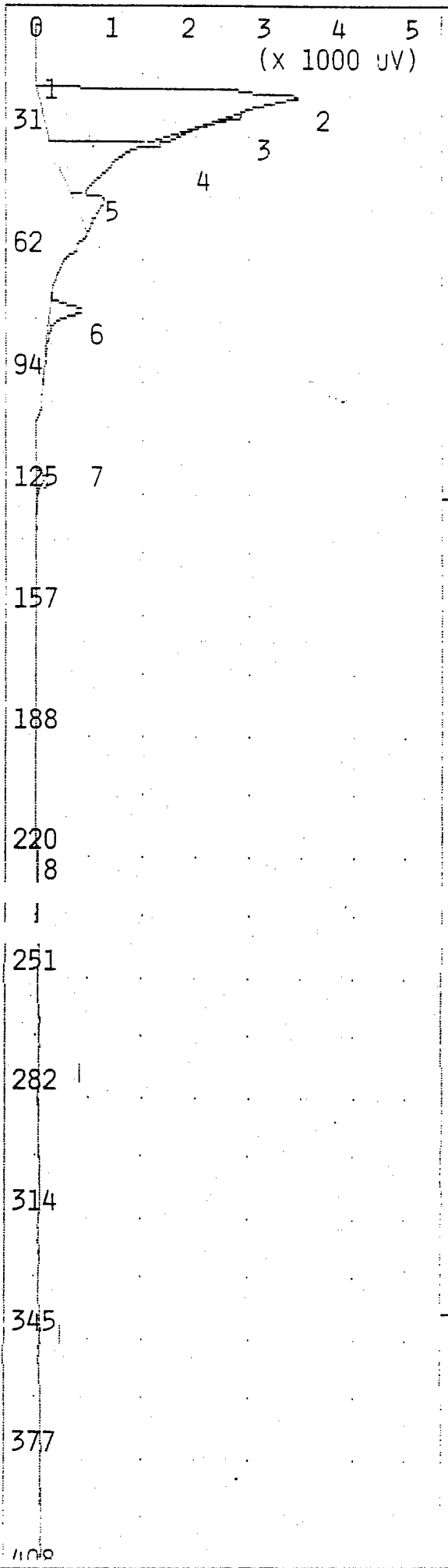
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.063 MVS | 15.0 |
| 2 | UNKNOWN | 20.57 MVS | 17.1 |
| 3 | UNKNOWN | 63.82 MVS | 18.6 |
| 4 | UNKNOWN | 40.08 MVS | 24.4 |
| 5 | UNKNOWN | 70.89 MVS | 28.8 |
| 6 | UNKNOWN | 47.49 MVS | 45.0 |
| 7 | BENZENE | 99.93 PPB | 58.6 |
| 8 | UNKNOWN | 1.494 MVS | 73.6 |
| 9 | TOLUENE | 95.88 PPB | 118.1 |
| 10 | UNKNOWN | 7.576 MVS | 219.4 |
| 11 | ETHYLBENZENE | 106.2 PPB | 245.0 |
| 12 | M,P-XYLENE | 216.4 PPB | 263.4 |
| 13 | O-XYLENE | 115.1 PPB | 309.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #13  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 14:42
SAMPLE TIME: MAY 5,95 14:35

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

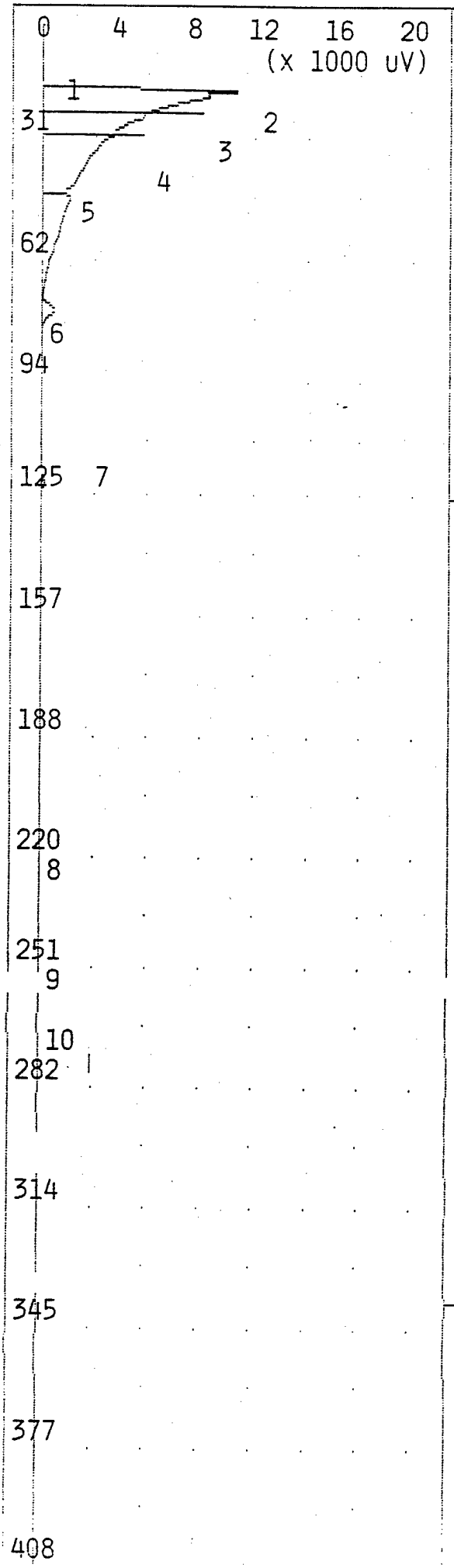
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.037 | MVS | 15.0 |
| 2 | UNKNOWN | 37.15 | MVS | 18.6 |
| 3 | UNKNOWN | 0.826 | MVS | 24.4 |
| 4 | UNKNOWN | 8.563 | MVS | 31.5 |
| 5 | UNKNOWN | 2.321 | MVS | 45.2 |
| 6 | UNKNOWN | 1.706 | MVS | 73.7 |
| 7 | TOLUENE | 0.729 | PPB | 118.5 |
| 8 | UNKNOWN | 0.451 | MVS | 218.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #14 10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 5,95 14:53 | | |
| SAMPLE TIME: MAY 5,95 14:45 | | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1:500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

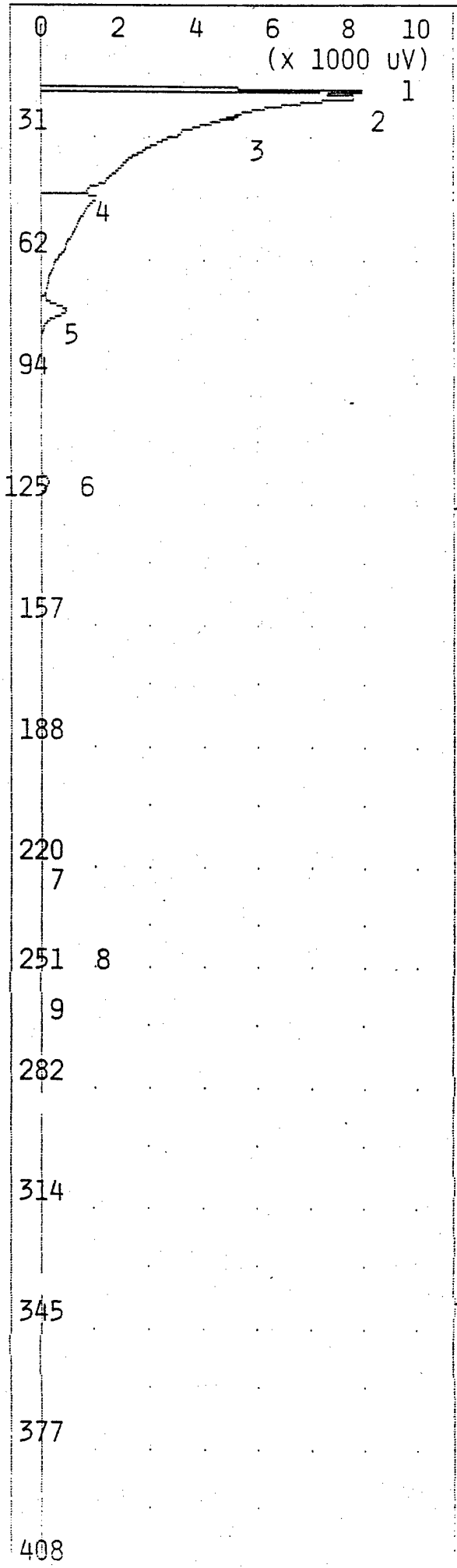
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.127 | MVS | 15.4 |
| 2 | UNKNOWN | 14.43 | MVS | 17.0 |
| 3 | UNKNOWN | 42.18 | MVS | 18.6 |
| 4 | UNKNOWN | 62.32 | MVS | 24.2 |
| 5 | UNKNOWN | 23.02 | MVS | 45.2 |
| 6 | UNKNOWN | 4.527 | MVS | 73.8 |
| 7 | TOLUENE | 2.123 | PPB | 118.4 |
| 8 | UNKNOWN | 1.504 | MVS | 218.6 |
| 9 | ETHYLBENZENE | 1.180 | PPB | 248.8 |
| 10 | M,P-XYLENE | 3.769 | PPB | 264.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
20.0-22.0 10G

ANALYSIS #15  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 15:04
SAMPLE TIME: MAY 5,95 14:56

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

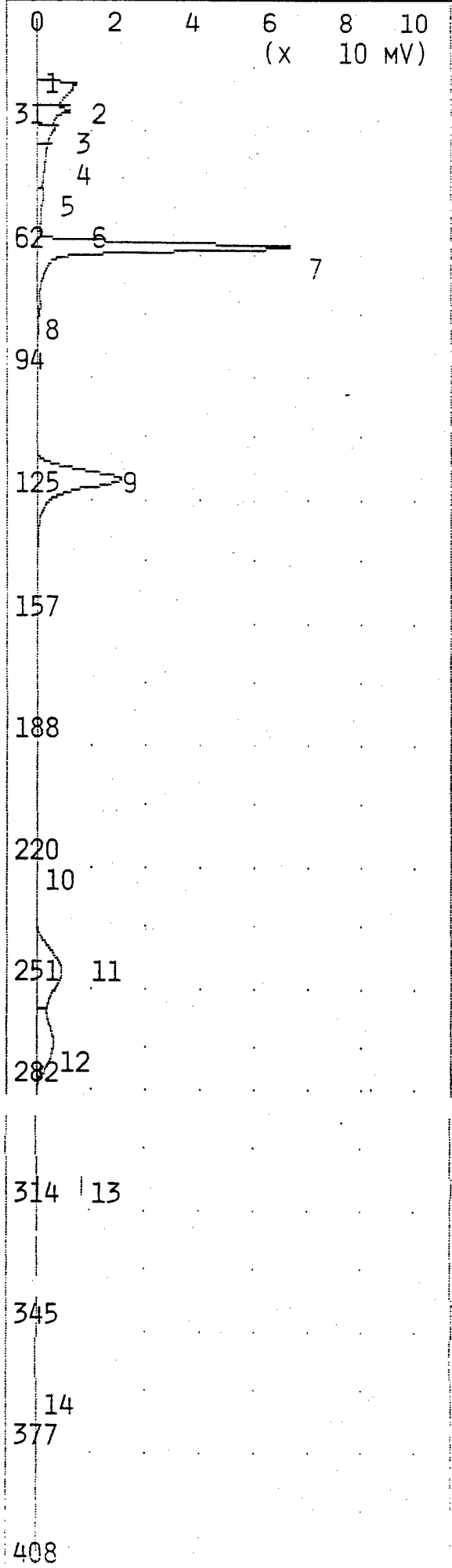
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 11.79 | MVS | 17.0 |
| 2 | UNKNOWN | 99.93 | MVS | 19.0 |
| 3 | UNKNOWN | 0.232 | MVS | 24.0 |
| 4 | UNKNOWN | 21.68 | MVS | 45.0 |
| 5 | UNKNOWN | 4.262 | MVS | 73.7 |
| 6 | TOLUENE | 1.845 | PPB | 118.5 |
| 7 | UNKNOWN | 1.310 | MVS | 218.6 |
| 8 | ETHYLBENZENE | 0.787 | PPB | 243.7 |
| 9 | M,P-XYLENE | 2.676 | PPB | 261.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-001MW
24.0-26.0 10G

ANALYSIS #16  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 5,95 15:43
SAMPLE TIME: MAY 5,95 15:36

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 440.0 | SEC |

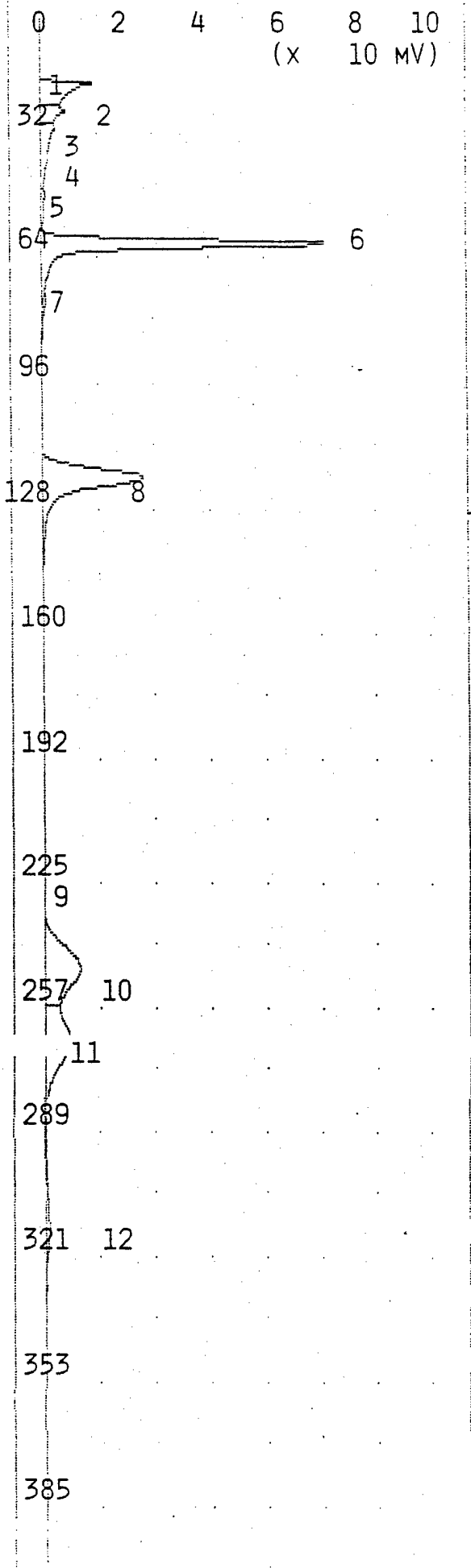
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.050 | MVS | 15.4 |
| 2 | UNKNOWN | 14.91 | MVS | 17.0 |
| 3 | UNKNOWN | 41.23 | MVS | 18.5 |
| 4 | UNKNOWN | 29.35 | MVS | 24.3 |
| 5 | UNKNOWN | 46.76 | MVS | 28.8 |
| 6 | UNKNOWN | 16.81 | MVS | 44.6 |
| 7 | BENZENE | 84.43 | PPB | 58.6 |
| 8 | UNKNOWN | 1.497 | MVS | 73.7 |
| 9 | TOLUENE | 90.34 | PPB | 118.0 |
| 10 | UNKNOWN | 11.32 | MVS | 218.8 |
| 11 | ETHYLBENZENE | 101.7 | PPB | 245.0 |
| 12 | M,P-XYLENE | 214.6 | PPB | 263.2 |
| 13 | O-XYLENE | 174.3 | PPB | 308.8 |
| 14 | UNKNOWN | 6.110 | MVS | 356.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 14:12
SAMPLE TIME: MAY 6,95 14:04

METHOD

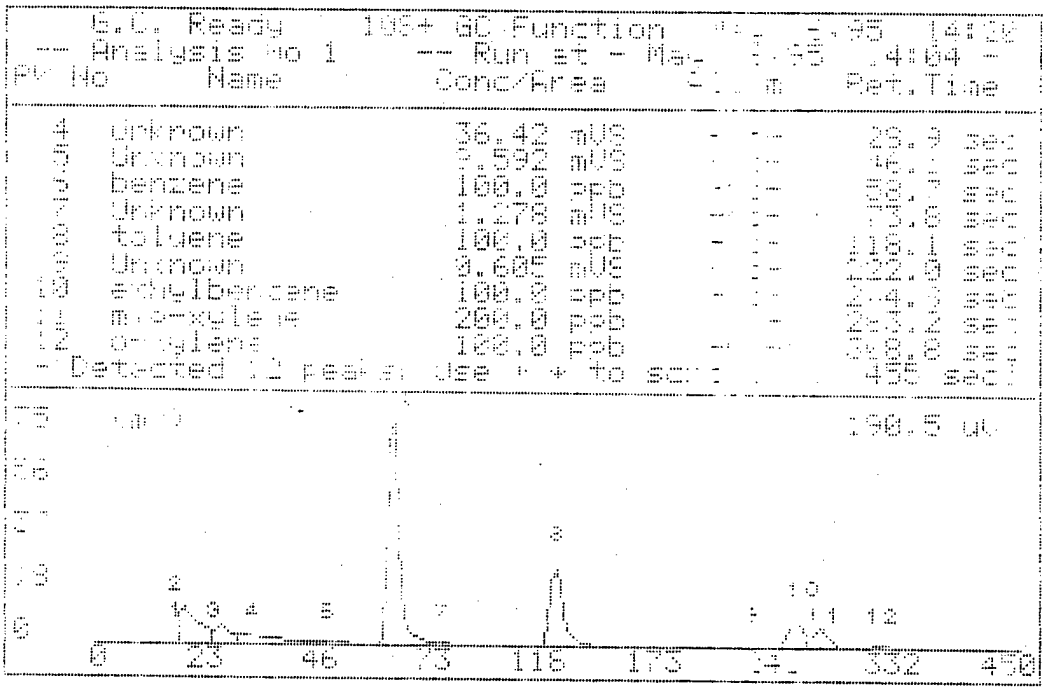
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

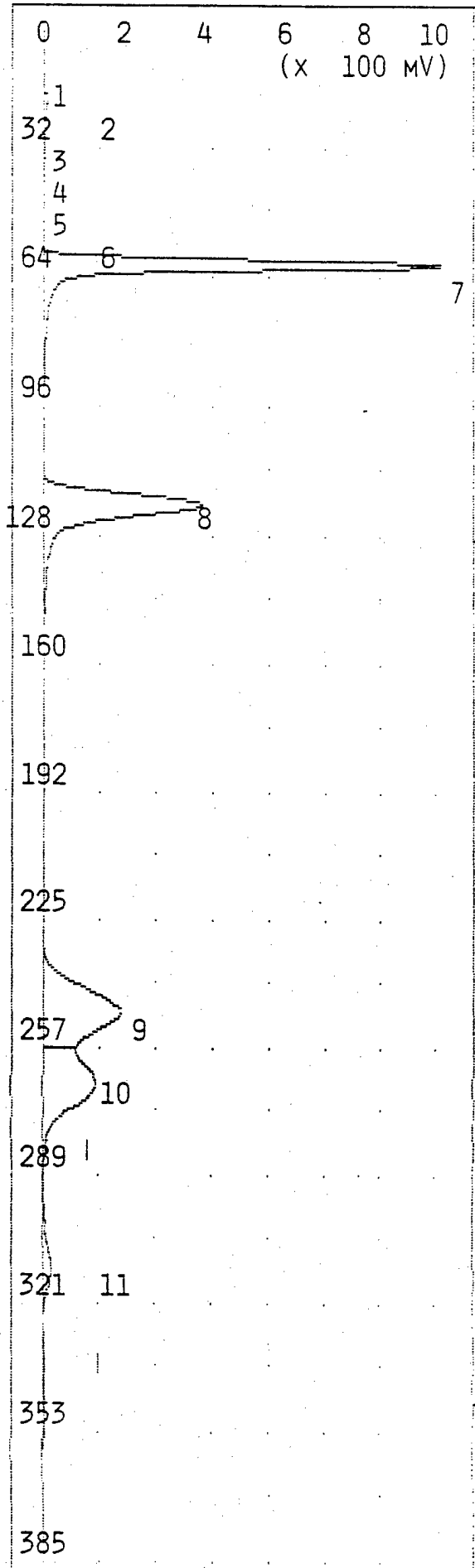
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.052 MVS | 15.2 |
| 2 | UNKNOWN | 54.75 MVS | 17.0 |
| 3 | UNKNOWN | 22.54 MVS | 24.2 |
| 4 | UNKNOWN | 36.42 MVS | 28.9 |
| 5 | UNKNOWN | 9.592 MVS | 46.1 |
| 6 | UNKNOWN | 220.1 MVS | 58.7 |
| 7 | UNKNOWN | 1.278 MVS | 73.8 |
| 8 | UNKNOWN | 171.3 MVS | 118.1 |
| 9 | UNKNOWN | 0.605 MVS | 222.0 |
| 10 | UNKNOWN | 123.0 MVS | 244.8 |
| 11 | UNKNOWN | 97.45 MVS | 263.2 |
| 12 | UNKNOWN | 18.42 MVS | 308.8 |

NOTES

Joe Byrd, Jr
Duluth Arc 6B
100 PPB BTEX


G.C. Ready
Analysis No 1
Peak No
Name
Conc/Area
Ret.Time
4 Unknown 36.42 mVS 28.9 sec
5 Unknown 7.592 mVS 46.1 sec
2 benzene 100.0 ppb 58.7 sec
Unknown 1.278 mVS 73.6 sec
3 toluene 100.0 ppb 118.1 sec
Unknown 0.605 mVS 122.0 sec
10 ethylbenzene 100.0 ppb 244.2 sec
m,p-xylene 200.0 ppb 252.2 sec
o-xylene 100.0 ppb 268.0 sec
Detected 12 peaks. Use ↑ ↓ to scr
190.5 uA
0
23
46
73
116
175
332
450

ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 14:29
SAMPLE TIME: MAY 6,95 14:22

METHOD

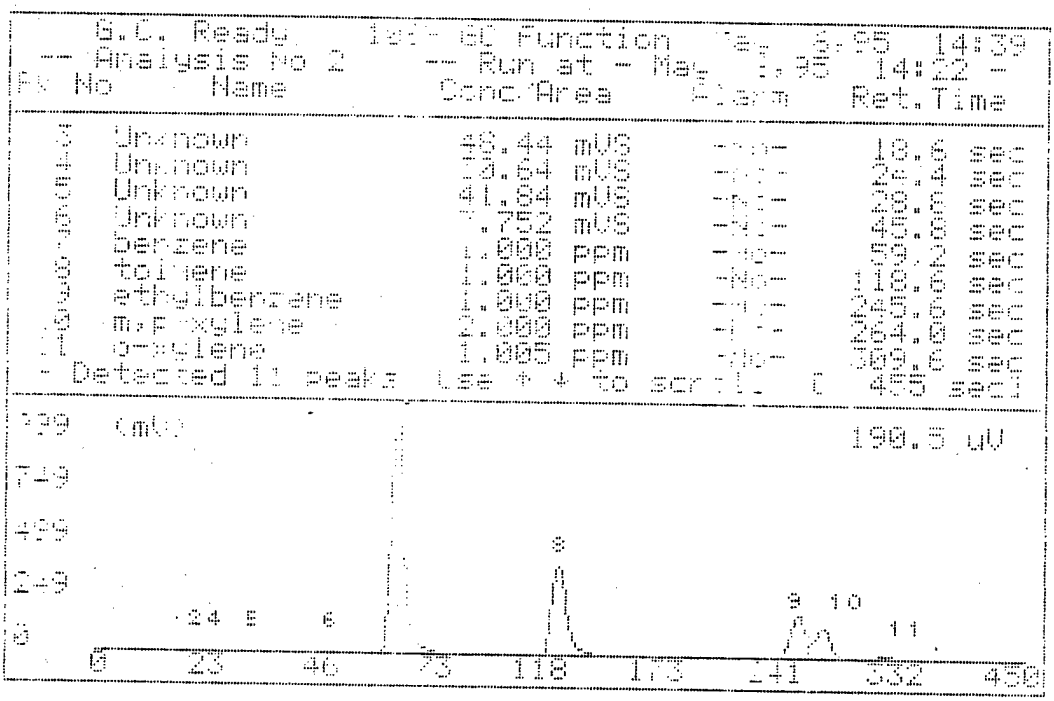
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

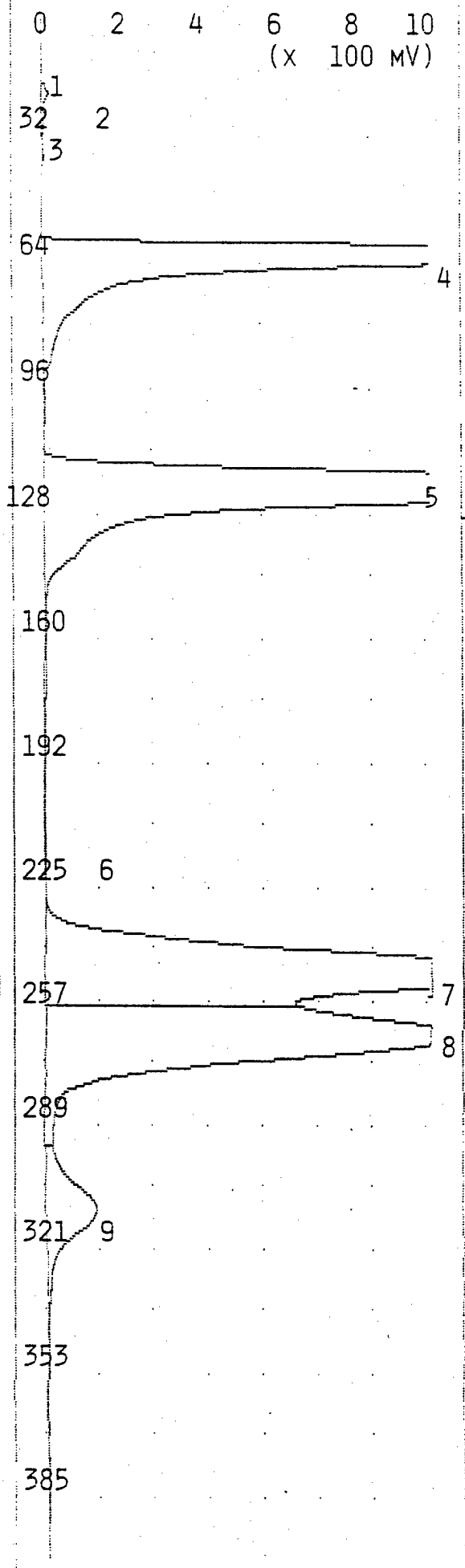
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.056 MVS | 15.4 |
| 2 | UNKNOWN | 16.47 MVS | 17.0 |
| 3 | UNKNOWN | 48.43 MVS | 18.6 |
| 4 | UNKNOWN | 30.64 MVS | 24.4 |
| 5 | UNKNOWN | 41.80 MVS | 28.8 |
| 6 | UNKNOWN | 7.712 MVS | 45.8 |
| 7 | BENZENE | 1.712 PPM | 59.2 |
| 8 | TOLUENE | 1.721 PPM | 118.6 |
| 9 | ETHYLBENZENE | 2.143 PPM | 245.6 |
| 10 | M,P-XYLENE | 3.989 PPM | 264.0 |
| 11 | O-XYLENE | 2.266 PPM | 309.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


G.C. Ready
-- Analysis No 2
Pk No Name
Conc Area
Ret.Time
3 Unknown 48.44 mVS 13.6 sec
4 Unknown 20.64 mVS 24.4 sec
5 Unknown 41.84 mVS 30.4 sec
6 Unknown .752 mVS 50.6 sec
7 Benzene 1.000 ppm 59.2 sec
8 toluene 1.000 ppm 110.6 sec
9 ethylbenzene 1.000 ppm 245.0 sec
10 m,p-xylene 2.000 ppm 264.4 sec
11 o-xylene 1.005 ppm 309.6 sec
- Detected 11 peaks Use ↑ ↓ to scroll [ 450 sec]
(mV)
190.5 uV
0
23
46
73
118
173
241
332
450

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 14:48
SAMPLE TIME: MAY 6,95 14:41

METHOD

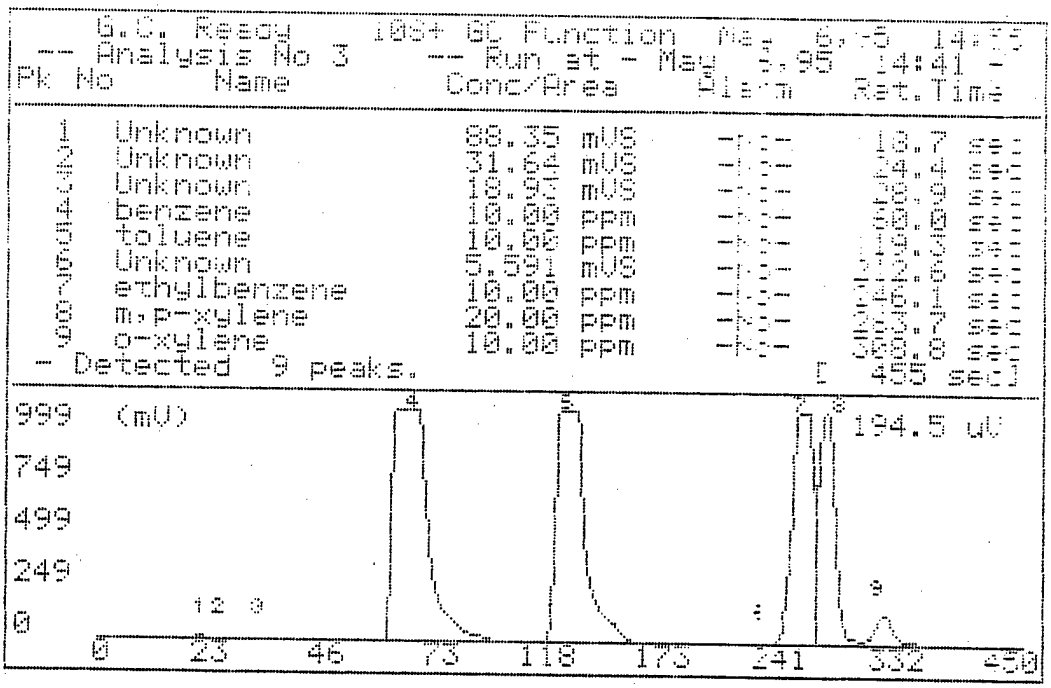
| | | |
|---|---|---|
| SLOPE UP | 4.000 | MV/SEC |
| SLOPE DOWN | 12.00 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

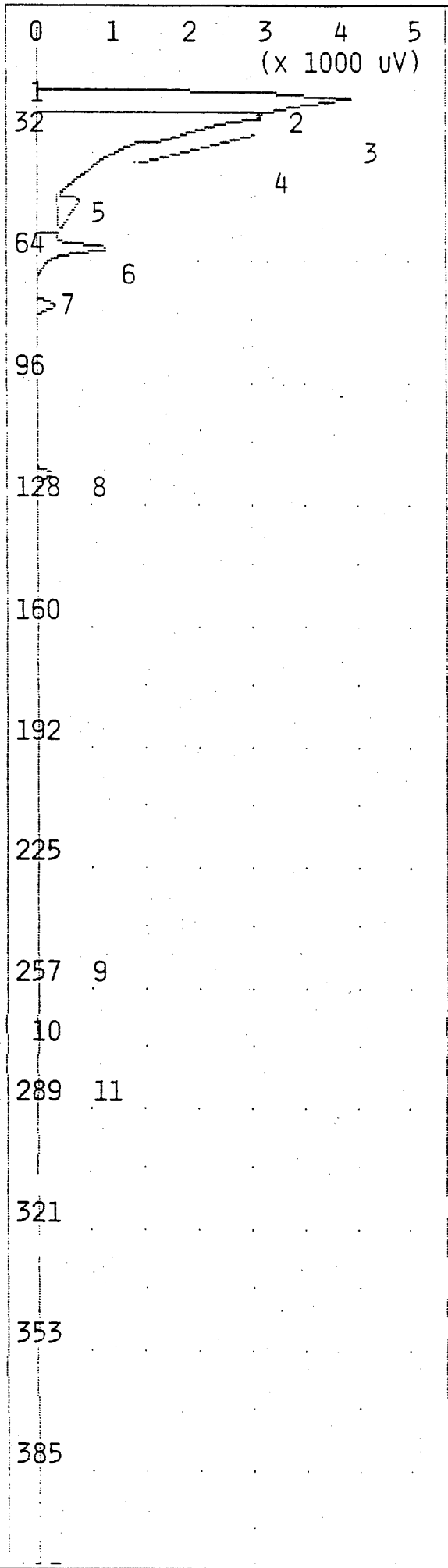
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 88.35 | MVS | 18.7 |
| 2 | UNKNOWN | 31.64 | MVS | 24.4 |
| 3 | UNKNOWN | 18.93 | MVS | 28.9 |
| 4 | BENZENE | 4.293 | PPM | 60.0 |
| 5 | TOLUENE | 6.586 | PPM | 119.3 |
| 6 | UNKNOWN | 5.591 | MVS | 212.6 |
| 7 | ETHYLBENZENE | 7.985 | PPM | 246.1 |
| 8 | M,P-XYLENE | 15.28 | PPM | 263.7 |
| 9 | O-XYLENE | 5.526 | PPM | 308.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX
JB


G.C. Ready 10SH GC Function Me: 05-05 14:15
-- Analysis No 3 -- Run at - May 3.95 14:41 -
Pk No Name Conc/Area Elem Ret.Time
1 Unknown 88.35 mVS 18.7 sec
2 Unknown 31.64 mVS 44 sec
3 Unknown 10.97 mVS 59 sec
4 benzene 10.00 ppm 1:10 sec
5 toluene 10.00 ppm 3:04 sec
6 Unknown 5.59 mVS 5:10 sec
7 ethylbenzene 10.00 ppm 8:08 sec
8 m,p-xylene 20.00 ppm 8:56 sec
9 o-xylene 10.00 ppm 9:55 sec
- Detected 9 peaks.
999
749
499
249
0
(mV)
194.5 uV
0
23
46
73
118
173
241
332
450

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 15:04
SAMPLE TIME: MAY 6,95 14:56

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

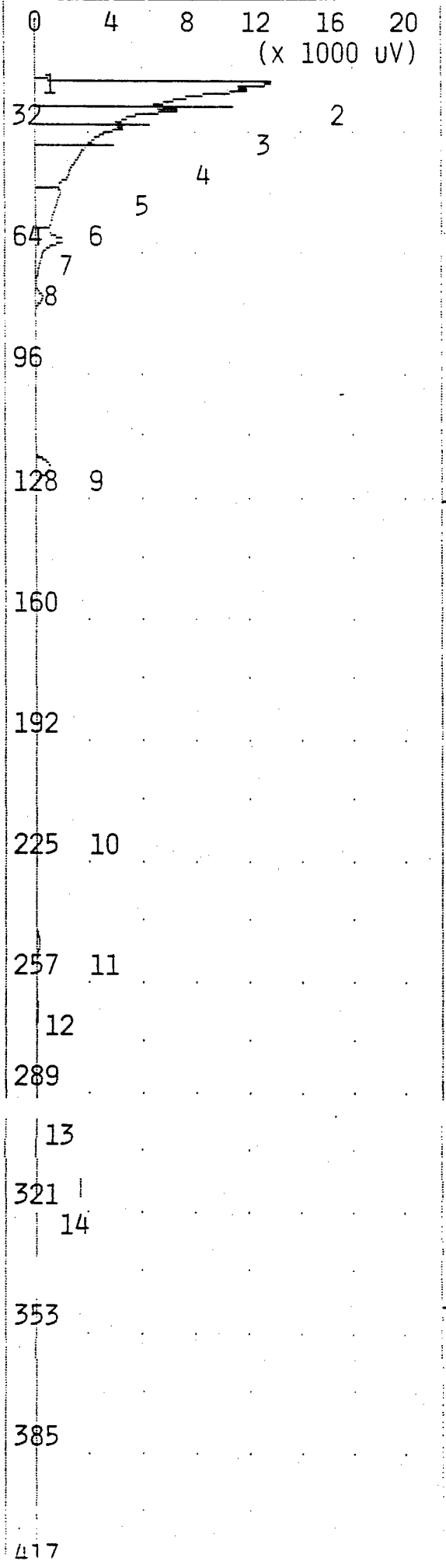
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.035 | MVS | 15.0 |
| 2 | UNKNOWN | 3.828 | MVS | 17.4 |
| 3 | UNKNOWN | 61.37 | MVS | 13.9 |
| 4 | UNKNOWN | 0.887 | MVS | 24.2 |
| 5 | UNKNOWN | 1.597 | MVS | 46.9 |
| 6 | BENZENE | 4.051 | PPB | 59.0 |
| 7 | UNKNOWN | 4.909 | MVS | 74.1 |
| 8 | TOLUENE | 2.628 | PPB | 118.2 |
| 9 | ETHYLBENZENE | 8.036 | PPB | 244.8 |
| 10 | M,P-XYLENE | 20.56 | PPB | 262.4 |
| 11 | UNKNOWN | 2.611 | MVS | 276.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 6,95 | 15:15 | |
| SAMPLE TIME: MAY 6,95 | 15:07 | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

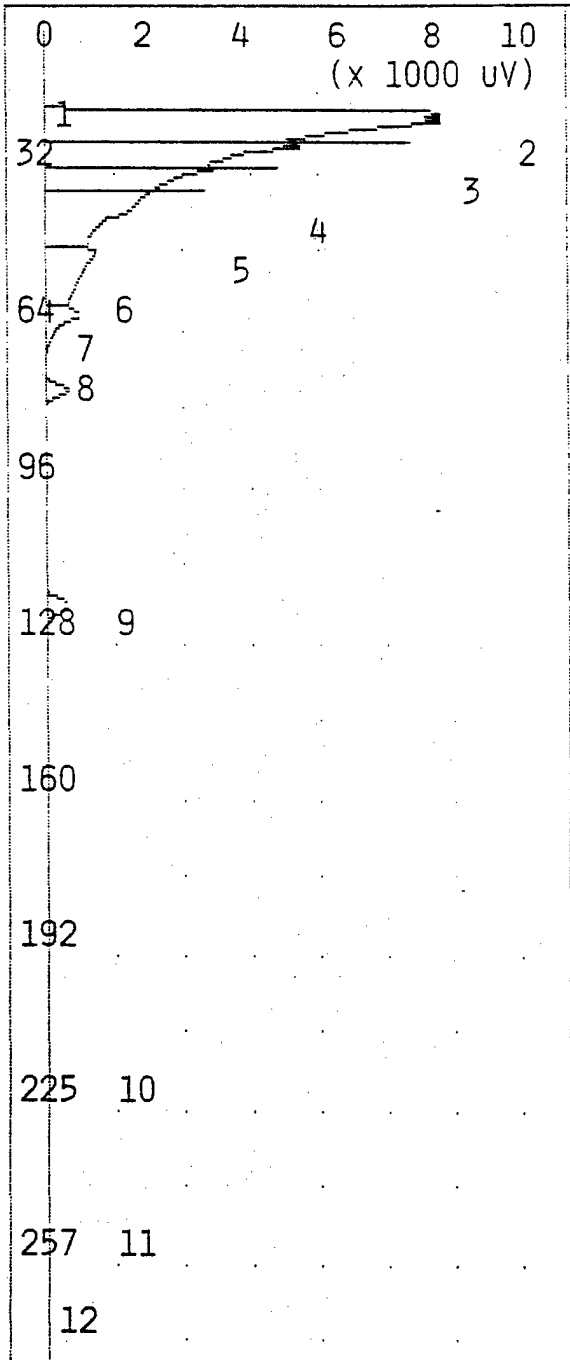
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.039 | MVS | 15.2 |
| 2 | UNKNOWN | 19.40 | MVS | 17.2 |
| 3 | UNKNOWN | 47.14 | MVS | 19.0 |
| 4 | UNKNOWN | 27.92 | MVS | 24.4 |
| 5 | UNKNOWN | 46.99 | MVS | 29.0 |
| 6 | UNKNOWN | 14.15 | MVS | 46.0 |
| 7 | BENZENE | 5.185 | PPB | 58.7 |
| 8 | UNKNOWN | 5.073 | MVS | 73.8 |
| 9 | TOLUENE | 4.483 | PPB | 118.4 |
| 10 | UNKNOWN | 0.857 | MVS | 217.6 |
| 11 | ETHYLBENZENE | 5.565 | PPB | 244.8 |
| 12 | M,P-XYLENE | 25.66 | PPB | 263.2 |
| 13 | O-XYLENE | 4.846 | PPB | 298.6 |
| 14 | UNKNOWN | 0.793 | MVS | 320.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-003MW
0.5- 2.5 10G

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 15:26
SAMPLE TIME: MAY 6,95 15:18

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

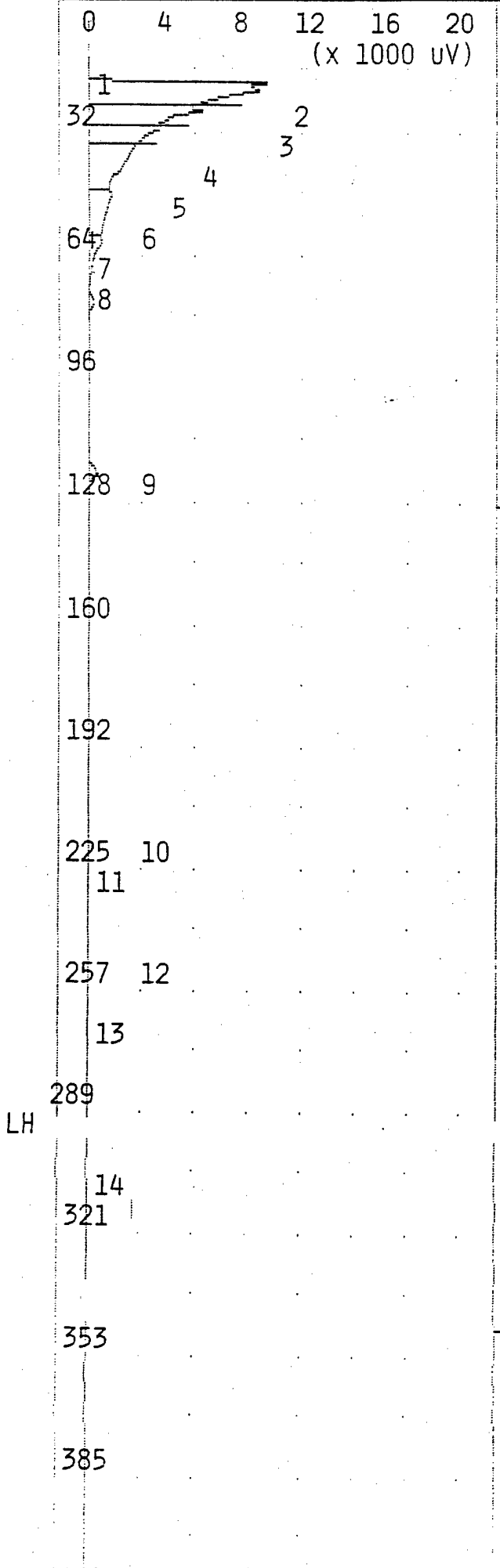
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.062 | MVS | 15.1 |
| 2 | UNKNOWN | 12.69 | MVS | 17.2 |
| 3 | UNKNOWN | 37.68 | MVS | 18.8 |
| 4 | UNKNOWN | 21.67 | MVS | 24.3 |
| 5 | UNKNOWN | 36.54 | MVS | 28.8 |
| 6 | UNKNOWN | 12.38 | MVS | 45.8 |
| 7 | BENZENE | 3.038 | PPB | 58.7 |
| 8 | UNKNOWN | 4.963 | MVS | 73.8 |
| 9 | TOLUENE | 3.301 | PPB | 118.9 |
| 10 | UNKNOWN | 62.07 | MVS | 214.8 |
| 11 | ETHYLBENZENE | 10.46 | PPB | 246.4 |
| 12 | M,P-XYLENE | 24.58 | PPB | 264.2 |
| 13 | O-XYLENE | 26.56 | PPB | 307.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-003MW
5.0- 7.0 10G

LH

ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 6,95 15:37 | | |
| SAMPLE TIME: MAY 6,95 15:29 | | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

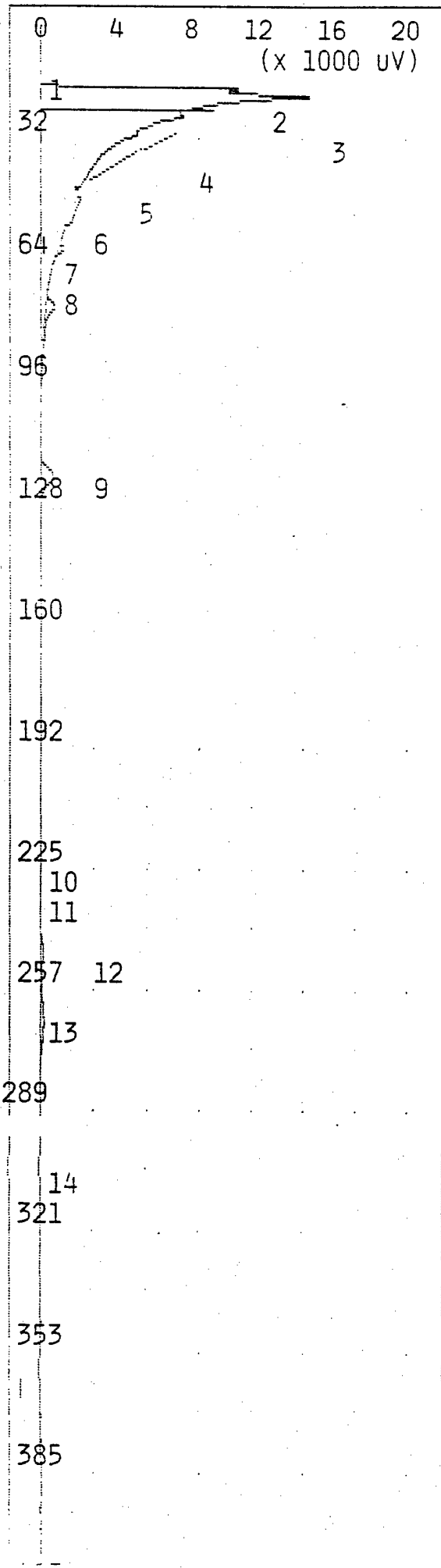
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.044 | MVS | 15.0 |
| 2 | UNKNOWN | 13.20 | MVS | 17.0 |
| 3 | UNKNOWN | 41.40 | MVS | 18.8 |
| 4 | UNKNOWN | 23.35 | MVS | 24.3 |
| 5 | UNKNOWN | 39.98 | MVS | 28.8 |
| 6 | UNKNOWN | 13.45 | MVS | 45.8 |
| 7 | BENZENE | 2.672 | PPB | 58.8 |
| 8 | UNKNOWN | 2.669 | MVS | 73.8 |
| 9 | TOLUENE | 2.630 | PPB | 119.2 |
| 10 | UNKNOWN | 7.318 | MVS | 218.0 |
| 11 | UNKNOWN | 9.277 | MVS | 227.0 |
| 12 | ETHYLBENZENE | 10.93 | PPB | 245.3 |
| 13 | M,P-XYLENE | 31.80 | PPB | 265.3 |
| 14 | O-XYLENE | 28.49 | PPB | 305.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-003MW
10.0-12.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 6,95 15:48 | | |
| SAMPLE TIME: MAY 6,95 15:40 | | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

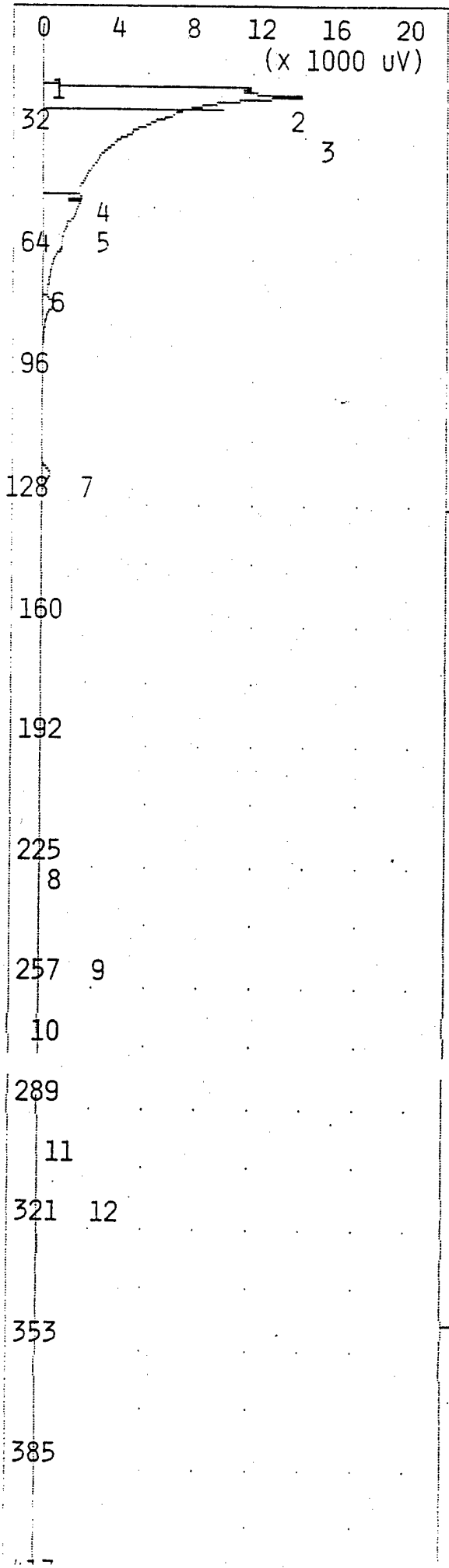
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.073 | MVS | 15.4 |
| 2 | UNKNOWN | 14.66 | MVS | 17.1 |
| 3 | UNKNOWN | 179.2 | MVS | 18.8 |
| 4 | UNKNOWN | 1.237 | MVS | 24.4 |
| 5 | UNKNOWN | 0.375 | MVS | 28.9 |
| 6 | UNKNOWN | 1.424 | MVS | 45.8 |
| 7 | BENZENE | 0.219 | PPB | 58.8 |
| 8 | UNKNOWN | 1.723 | MVS | 74.2 |
| 9 | TOLUENE | 3.058 | PPB | 118.5 |
| 10 | UNKNOWN | 12.68 | MVS | 220.6 |
| 11 | UNKNOWN | 10.55 | MVS | 221.2 |
| 12 | ETHYLBENZENE | 12.44 | PPB | 247.2 |
| 13 | M,P-XYLENE | 30.50 | PPB | 262.9 |
| 14 | O-XYLENE | 32.28 | PPB | 306.9 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002MW
0.5- 2.5 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 15:59
SAMPLE TIME: MAY 6,95 15:51

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

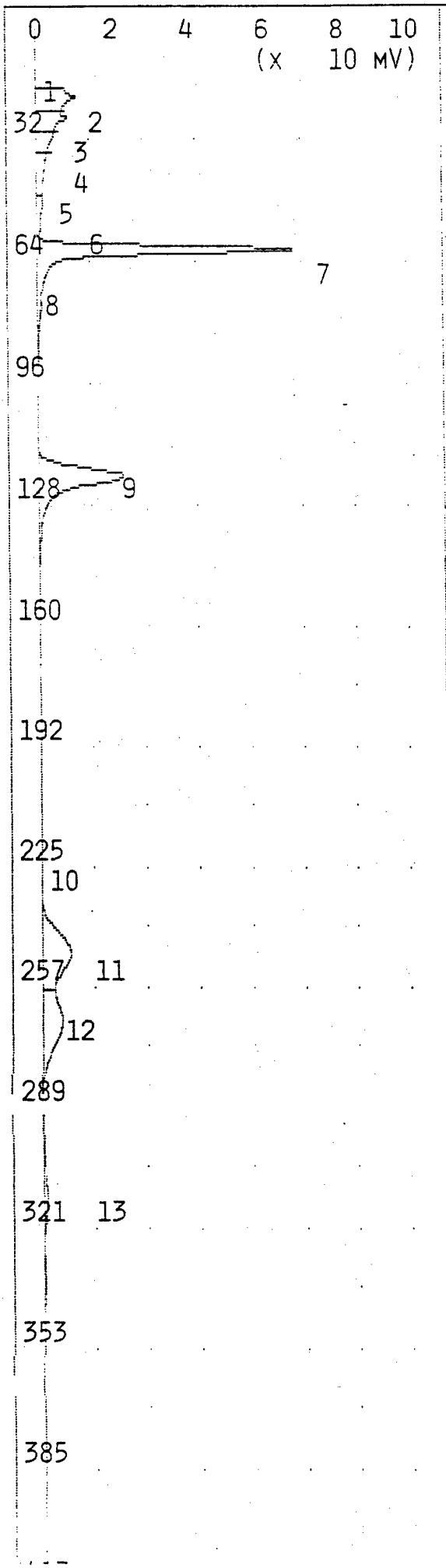
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.055 | MVS | 15.6 |
| 2 | UNKNOWN | 16.14 | MVS | 17.2 |
| 3 | UNKNOWN | 140.7 | MVS | 18.8 |
| 4 | UNKNOWN | 29.08 | MVS | 46.4 |
| 5 | BENZENE | 0.065 | PPB | 58.7 |
| 6 | UNKNOWN | 4.194 | MVS | 74.0 |
| 7 | TOLUENE | 2.309 | PPB | 118.8 |
| 8 | UNKNOWN | 3.213 | MVS | 220.0 |
| 9 | ETHYLBENZENE | 3.285 | PPB | 247.4 |
| 10 | M,P-XYLENE | 15.49 | PPB | 263.2 |
| 11 | UNKNOWN | 0.819 | MVS | 294.1 |
| 12 | O-XYLENE | 16.70 | PPB | 310.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002MW
5.0- 7.0 10G

ANALYSIS #10  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 16:10
SAMPLE TIME: MAY 6,95 16:02

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

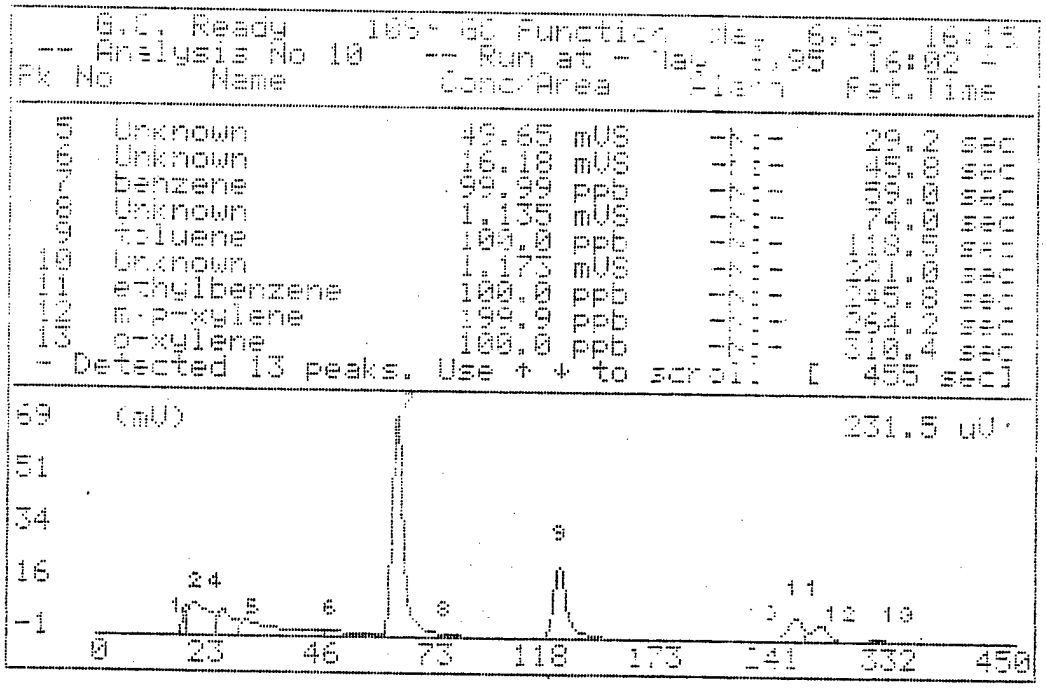
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.043 | MVS | 15.4 |
| 2 | UNKNOWN | 11.21 | MVS | 17.2 |
| 3 | UNKNOWN | 47.49 | MVS | 18.8 |
| 4 | UNKNOWN | 31.49 | MVS | 24.5 |
| 5 | UNKNOWN | 49.65 | MVS | 29.2 |
| 6 | UNKNOWN | 16.18 | MVS | 45.8 |
| 7 | BENZENE | 99.53 | PPB | 59.0 |
| 8 | UNKNOWN | 1.135 | MVS | 74.0 |
| 9 | TOLUENE | 90.08 | PPB | 118.5 |
| 10 | UNKNOWN | 1.173 | MVS | 221.0 |
| 11 | ETHYLBENZENE | 86.17 | PPB | 245.8 |
| 12 | M,P-XYLENE | 169.0 | PPB | 264.2 |
| 13 | O-XYLENE | 77.83 | PPB | 310.4 |

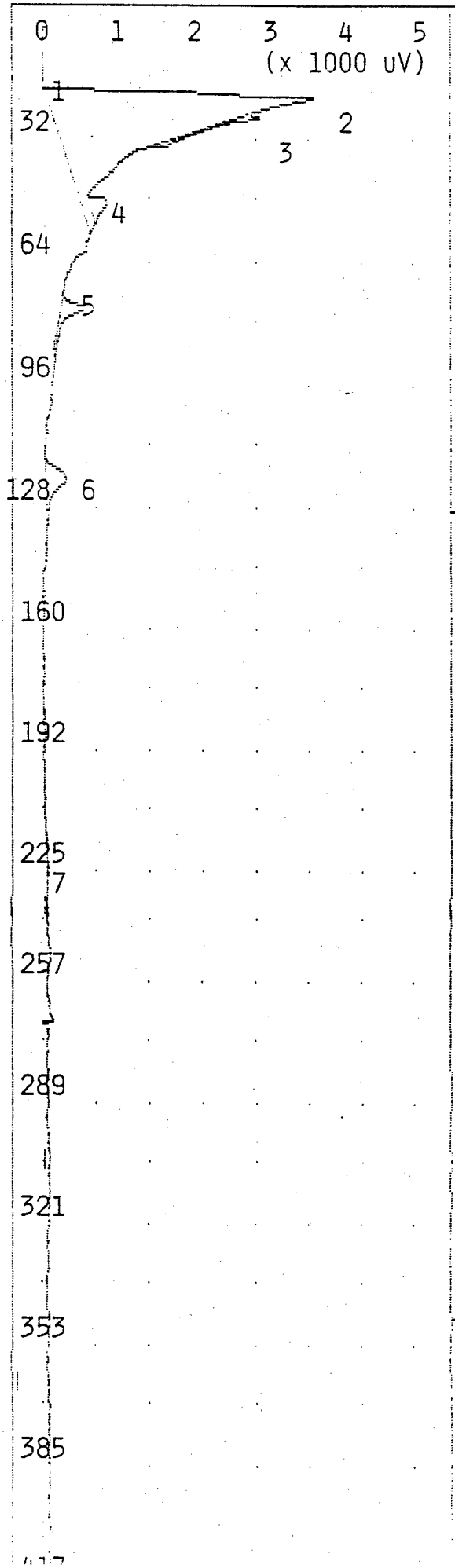
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

LH


G.C. Ready 105° dC Function dle 6:35 16:15
-- Analysis No 10 -- Run at - lar 1.90 16:02 -
Pk No Name Conc/Area Flag Ret.Time
5 Unknown 49.65 mVS 20.2 sec
6 Unknown 16.18 mVS 30.0 sec
benzene 90.99 ppb 39.0 sec
Unknown 1.135 mVS 74.0 sec
toluene 100.0 ppb 110.5 sec
10 Unknown 1.172 mVS 221.0 sec
11 ethylbenzene 100.0 ppb 245.5 sec
12 m-p-xylene 199.9 ppb 254.2 sec
13 o-xylene 100.0 ppb 270.4 sec
- Detected 13 peaks. Use ↑ ↓ to scroll. [ 455 sec]
59
51
34
16
-1
(mV)
231.5 uV
0
23
46
73
118
173
241
332
450

ANALYSIS #11  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 16:24
SAMPLE TIME: MAY 6,95 16:16

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

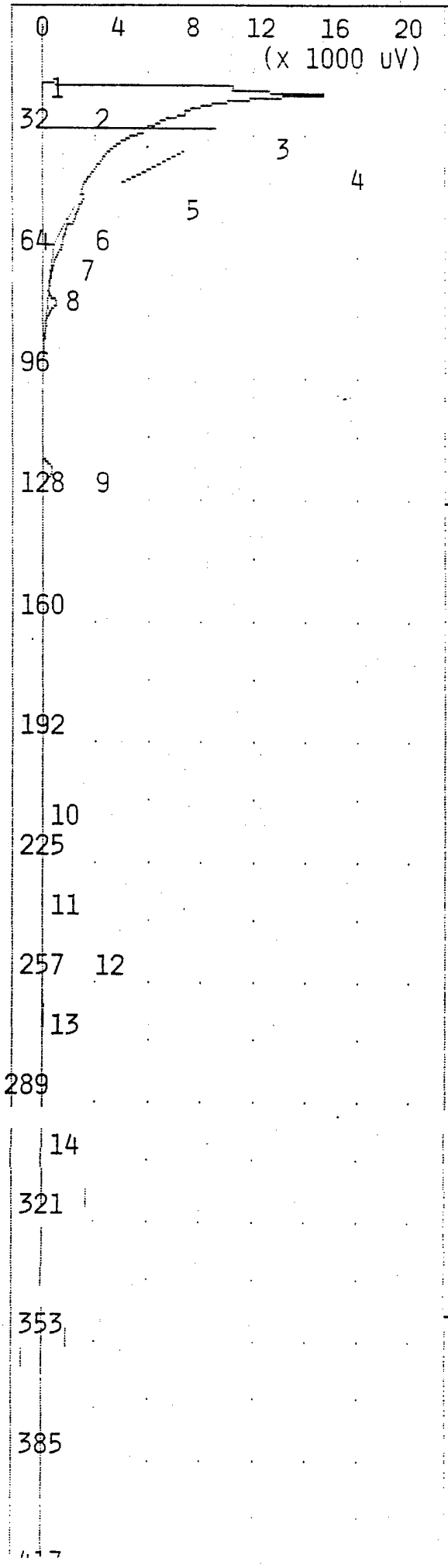
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.036 | MVS | 15.1 |
| 2 | UNKNOWN | 47.07 | MVS | 19.0 |
| 3 | UNKNOWN | 0.948 | MVS | 24.3 |
| 4 | UNKNOWN | 1.060 | MVS | 46.6 |
| 5 | UNKNOWN | 1.159 | MVS | 74.6 |
| 6 | TOLUENE | 1.214 | PPB | 118.6 |
| 7 | ETHYLBENZENE | 0.196 | PPB | 221.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #12  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 16:35
SAMPLE TIME: MAY 6,95 16:27

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

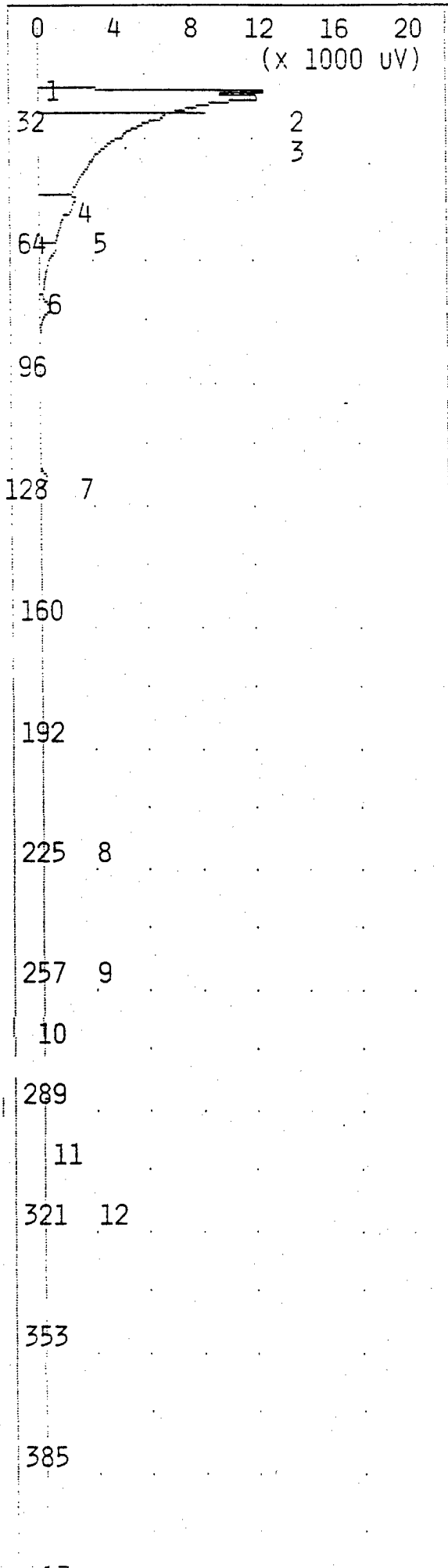
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.046 | MVS | 13.2 |
| 2 | UNKNOWN | 0.141 | MVS | 15.7 |
| 3 | UNKNOWN | 14.33 | MVS | 17.2 |
| 4 | UNKNOWN | 186.6 | MVS | 18.8 |
| 5 | UNKNOWN | 0.450 | MVS | 24.2 |
| 6 | UNKNOWN | 3.903 | MVS | 45.4 |
| 7 | BENZENE | 0.559 | PPB | 59.3 |
| 8 | UNKNOWN | 1.832 | MVS | 73.8 |
| 9 | TOLUENE | 3.005 | PPB | 118.6 |
| 10 | UNKNOWN | 1.907 | MVS | 204.2 |
| 11 | UNKNOWN | 0.129 | MVS | 233.6 |
| 12 | ETHYLBENZENE | 2.733 | PPB | 248.0 |
| 13 | M,P-XYLENE | 8.597 | PPB | 266.4 |
| 14 | O-XYLENE | 7.251 | PPB | 293.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002MW
10.0-12.0 10G

ANALYSIS #13  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 16:46
SAMPLE TIME: MAY 6,95 16:38

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

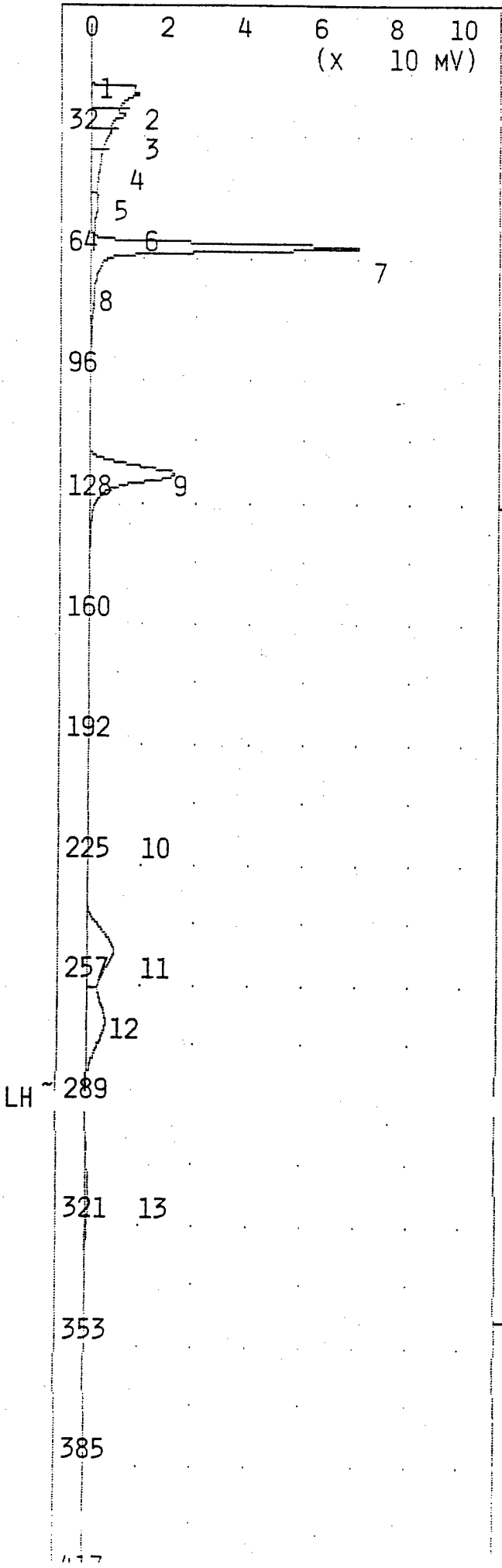
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.062 | MVS | 16.0 |
| 2 | UNKNOWN | 14.80 | MVS | 17.6 |
| 3 | UNKNOWN | 128.4 | MVS | 19.2 |
| 4 | UNKNOWN | 19.73 | MVS | 46.6 |
| 5 | BENZENE | 3.345 | PPB | 58.8 |
| 6 | UNKNOWN | 4.052 | MVS | 74.2 |
| 7 | TOLUENE | 2.511 | PPB | 118.9 |
| 8 | UNKNOWN | 1.280 | MVS | 219.2 |
| 9 | ETHYLBENZENE | 1.660 | PPB | 245.0 |
| 10 | M,P-XYLENE | 7.493 | PPB | 264.2 |
| 11 | UNKNOWN | 0.300 | MVS | 295.4 |
| 12 | O-XYLENE | 4.160 | PPB | 313.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
026-002MW
15.0-17.0 10G

ANALYSIS #14 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 6,95 16:56
SAMPLE TIME: MAY 6,95 16:49

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

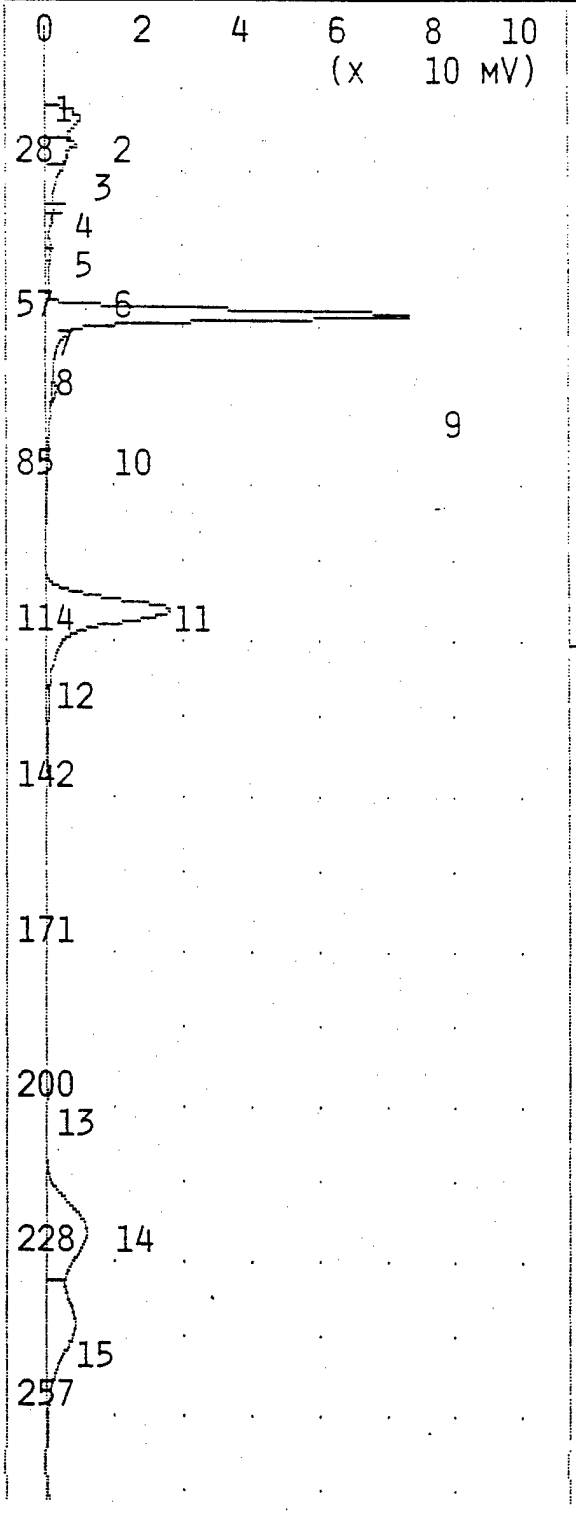
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.037 | MVS | 15.2 |
| 2 | UNKNOWN | 17.16 | MVS | 17.2 |
| 3 | UNKNOWN | 54.15 | MVS | 18.8 |
| 4 | UNKNOWN | 34.42 | MVS | 24.6 |
| 5 | UNKNOWN | 54.19 | MVS | 29.0 |
| 6 | UNKNOWN | 18.71 | MVS | 45.8 |
| 7 | BENZENE | 99.81 | PPB | 59.0 |
| 8 | UNKNOWN | 0.464 | MVS | 73.8 |
| 9 | TOLUENE | 94.48 | PPB | 118.5 |
| 10 | UNKNOWN | 1.151 | MVS | 219.2 |
| 11 | ETHYLBENZENE | 91.20 | PPB | 245.8 |
| 12 | M,P-XYLENE | 184.7 | PPB | 264.5 |
| 13 | O-XYLENE | 96.60 | PPB | 310.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 8,95 10:17 | | |
| SAMPLE TIME: MAY 8,95 10:10 | | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

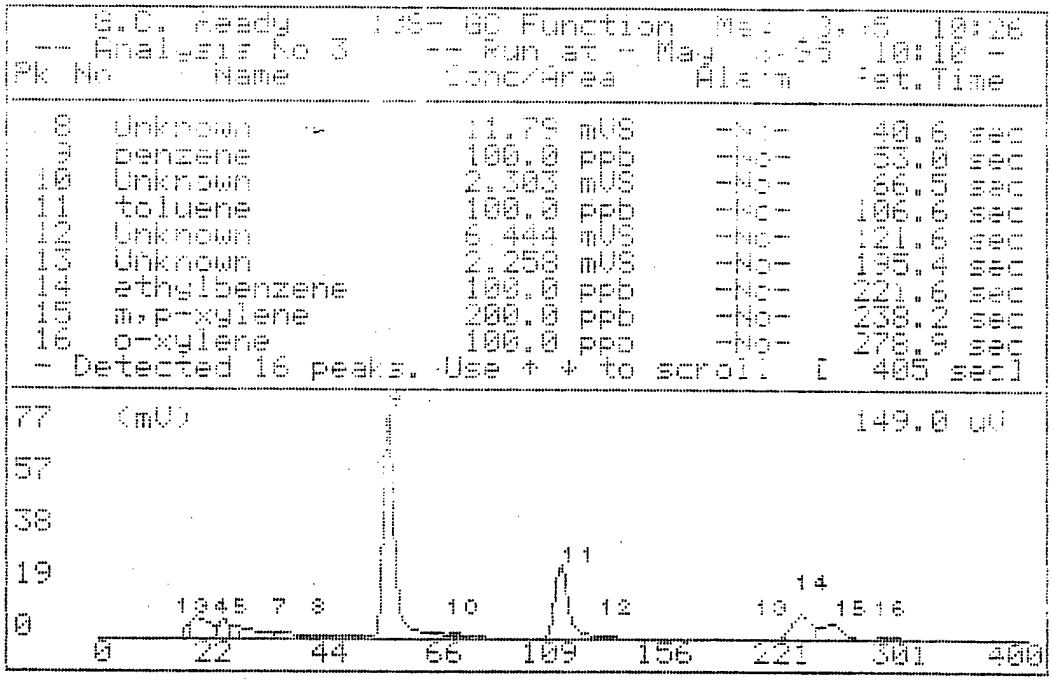
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.086 MVS | 14.1 |
| 2 | UNKNOWN | 6.964 MVS | 15.5 |
| 3 | UNKNOWN | 31.05 MVS | 16.9 |
| 4 | UNKNOWN | 15.11 MVS | 22.1 |
| 5 | UNKNOWN | 8.947 MVS | 24.3 |
| 6 | UNKNOWN | 17.48 MVS | 26.0 |
| 7 | UNKNOWN | 12.30 MVS | 33.5 |
| 8 | UNKNOWN | 11.79 MVS | 40.6 |
| 9 | UNKNOWN | 229.1 MVS | 53.0 |
| 10 | UNKNOWN | 2.303 MVS | 66.5 |
| 11 | UNKNOWN | 158.5 MVS | 106.6 |
| 12 | UNKNOWN | 6.444 MVS | 121.6 |
| 13 | UNKNOWN | 2.258 MVS | 195.4 |
| 14 | UNKNOWN | 106.2 MVS | 221.6 |
| 15 | UNKNOWN | 84.78 MVS | 238.2 |
| 16 | UNKNOWN | 17.20 MVS | 278.9 |

NOTES

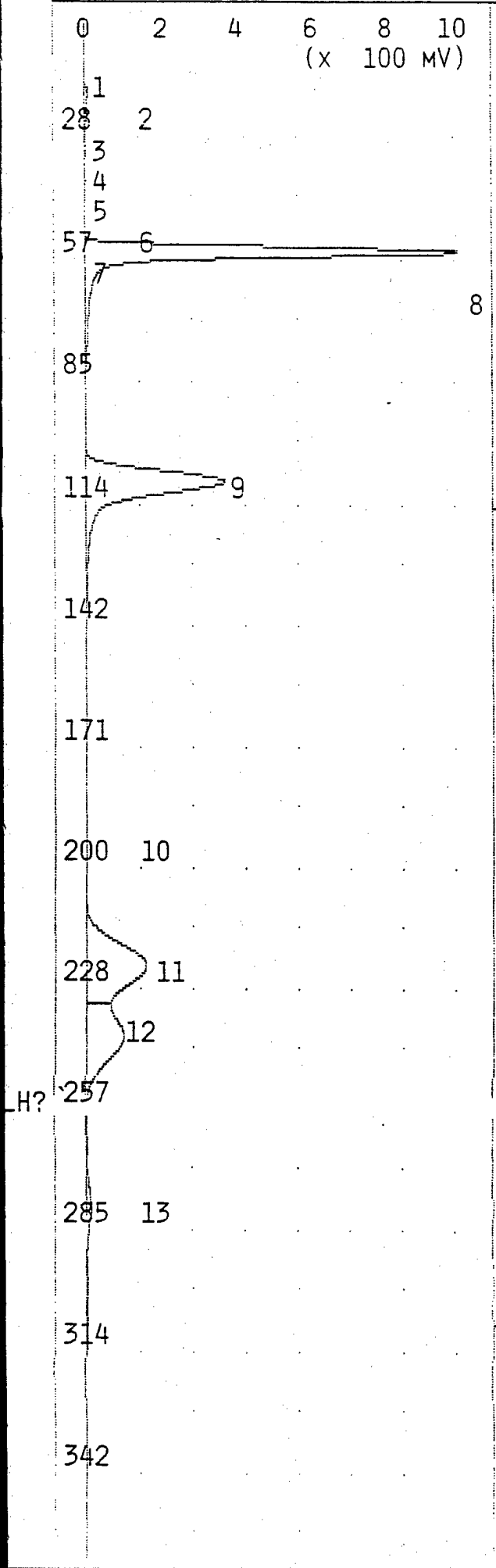
DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
100 PPB BTEX

J. BYRD, JR. (OPERATOR)

LH


G.C. ready
Analysis No 3
Run at - May
Function
Pk No
Name
Conc/Area
Ret.Time
1 Unknown 11.75 mVS 40.6 sec
3 Benzene 100.0 ppb 330. sec
10 Unknown 2.383 mVS 1066. sec
11 toluene 100.0 ppb 1106. sec
12 Unknown 5.444 mVS 1221. sec
13 Unknown 2.258 mVS 1351. sec
14 ethylbenzene 100.0 ppb 1422. sec
15 m,p-xylene 200.0 ppb 1458. sec
16 o-xylene 100.0 ppb 1708. sec
- Detected 16 peaks. Use ↑ ↓ to scroll.
405 sec
77
(mV)
149.0 uV
57
38
19
0
1 2 3 4 5 7 8 10 11 12 14 15 16
0 22 44 66 109 156 221 301 400

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 8,95 10:36
SAMPLE TIME: MAY 8,95 10:29

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

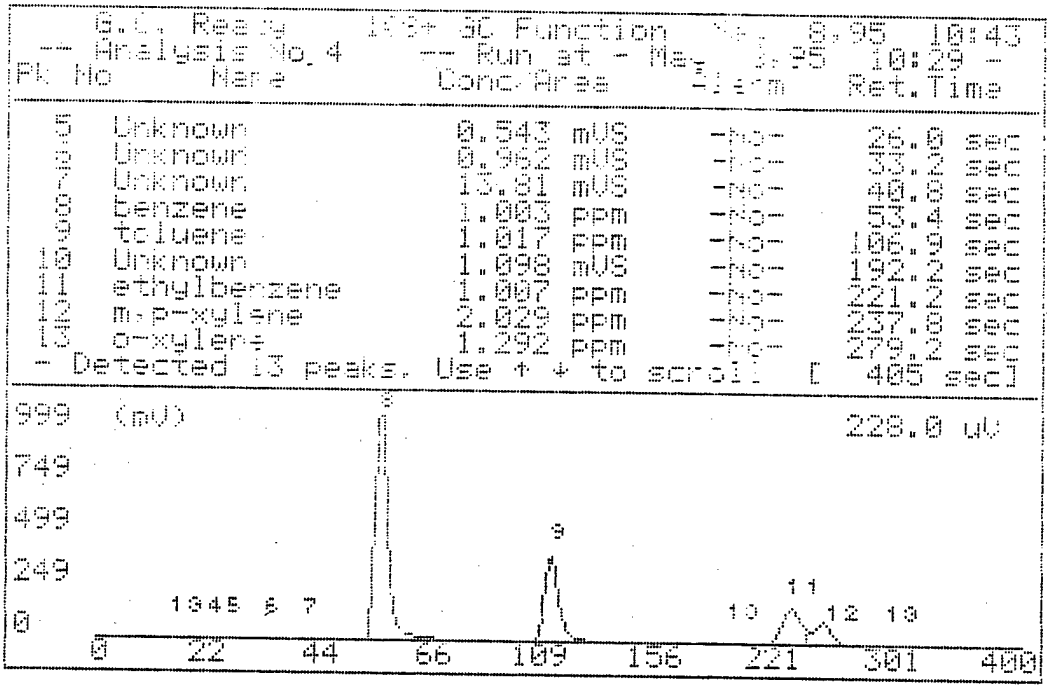
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.057 | MVS | 13.8 |
| 2 | UNKNOWN | 11.66 | MVS | 15.4 |
| 3 | UNKNOWN | 44.28 | MVS | 17.0 |
| 4 | UNKNOWN | 66.64 | MVS | 22.1 |
| 5 | UNKNOWN | 0.543 | MVS | 26.0 |
| 6 | UNKNOWN | 0.962 | MVS | 33.2 |
| 7 | UNKNOWN | 12.23 | MVS | 40.8 |
| 8 | BENZENE | 1.492 | PPM | 53.4 |
| 9 | TOLUENE | 1.648 | PPM | 106.9 |
| 10 | UNKNOWN | 1.098 | MVS | 192.2 |
| 11 | ETHYLBENZENE | 1.870 | PPM | 221.2 |
| 12 | M,P-XYLENE | 3.156 | PPM | 237.8 |
| 13 | O-XYLENE | 1.683 | PPM | 279.2 |

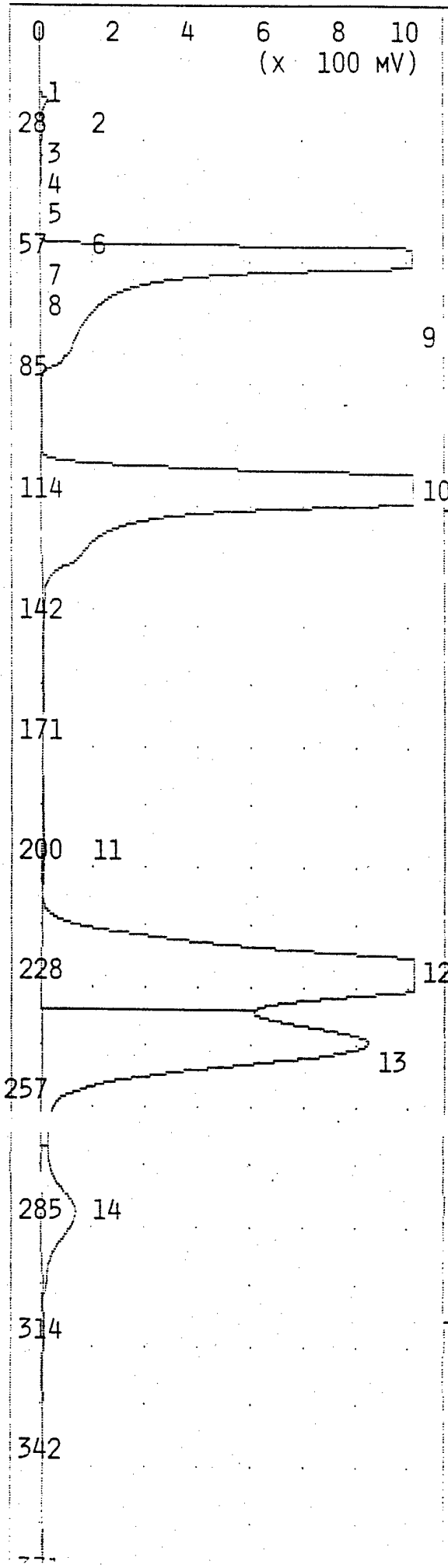
NOTES

DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
1 PPM BTEX

J. BYRD, JR. (OPERATOR)


G.C. Ready
-- Analysis No. 4
Pk No Name
Conc/Area
Ret.Time
5 Unknown 0.543 mVS 26.0 sec
6 Unknown 0.962 mVS 33.0 sec
7 Unknown 15.81 mVS 40.0 sec
8 benzene 1.003 ppm 50.5 sec
9 toluene 1.017 ppm 66.5 sec
10 Unknown 1.090 mVS 192.5 sec
11 ethylbenzene 1.007 ppm 221.5 sec
12 m-p-xylene 2.029 ppm 237.0 sec
13 o-xylene 1.292 ppm 270.0 sec
- Detected 13 peaks. Use ↑ ↓ to scroll [ 405 sec]
999 (mV)
749
499
249
0
228.0 uV
1 2 3 4 5 6 7 8 9 10 11 12 13
0 22 44 66 109 156 221 301 400

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 8,95 10:51
SAMPLE TIME: MAY 8,95 10:45

METHOD

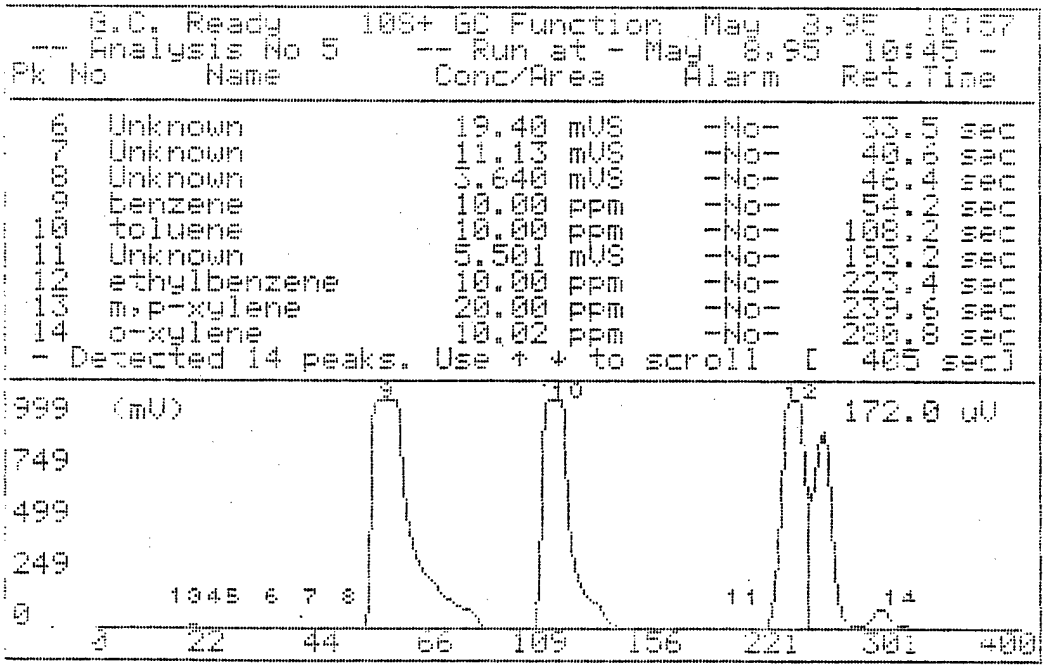
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

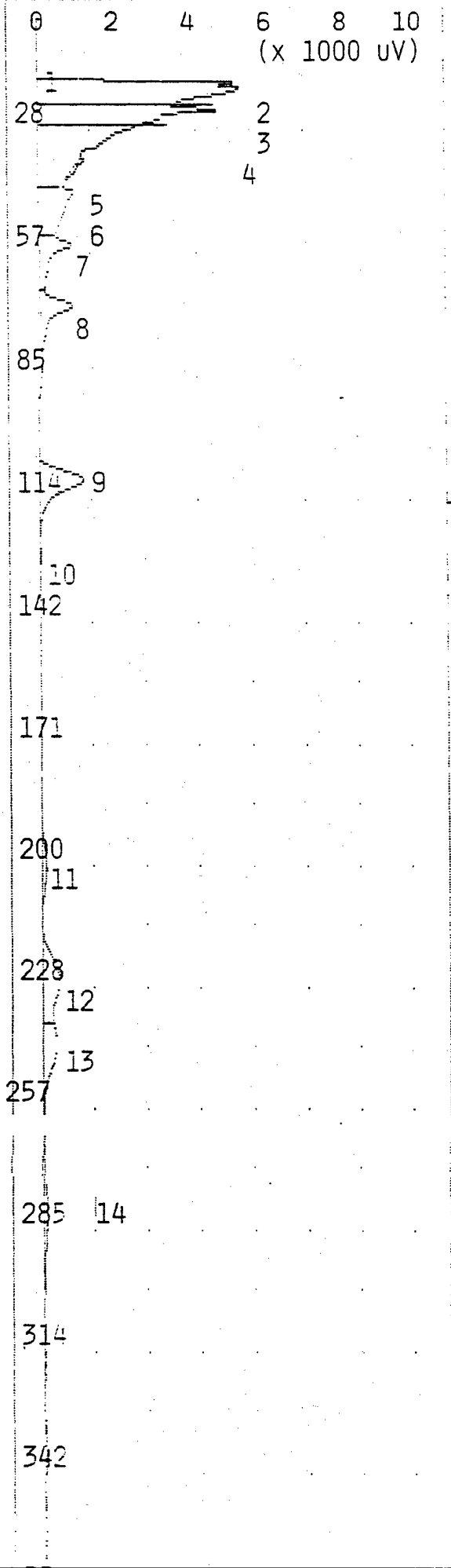
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.037 | MVS | 14.0 |
| 2 | UNKNOWN | 8.568 | MVS | 15.6 |
| 3 | UNKNOWN | 72.20 | MVS | 17.1 |
| 4 | UNKNOWN | 70.96 | MVS | 22.2 |
| 5 | UNKNOWN | 0.449 | MV$ | 26.2 |
| 6 | UNKNOWN | 19.37 | MVS | 33.5 |
| 7 | UNKNOWN | 11.09 | MVS | 40.6 |
| 8 | UNKNOWN | 3.611 | MVS | 46.4 |
| 9 | BENZENE | 5.418 | PPM | 54.2 |
| 10 | TOLUENE | 7.524 | PPM | 108.2 |
| 11 | UNKNOWN | 5.501 | MVS | 193.2 |
| 12 | ETHYLBENZENE | 9.005 | PPM | 223.4 |
| 13 | M,P-XYLENE | 16.83 | PPM | 239.6 |
| 14 | O-XYLENE | 5.844 | PPM | 280.8 |

NOTES

DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
10 PPM BTEX
J. BYRD, JR. (OPERATOR)


G.C. Ready 10S+ GC Function May 8,95 10:57
-- Analysis No 5 -- Run at - May 8,95 10:45 -
Pk No Name Conc/Area Alarm Ret.Time
6 Unknown 19.40 mVS -No- 400.5 sec
7 Unknown 11.13 mVS -No- 400.5 sec
8 Unknown 3.640 mVS -No- 400.5 sec
9 benzene 10.00 ppm -No- 400.5 sec
10 toluene 10.00 ppm -No- 400.5 sec
11 Unknown 5.501 mVS -No- 400.5 sec
12 ethylbenzene 10.00 ppm -No- 400.5 sec
13 m,p-xylene 20.00 ppm -No- 400.5 sec
14 o-xylene 10.02 ppm -No- 400.5 sec
- Detected 14 peaks. Use ↑ ↓ to scroll [ 405 sec]
999
749
499
249
0
(mV)
172.0 uV
1 2 3 4 5 6 7 8
9
10
11
12
13
14
1
22
44
66
105
156
221
301
400

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




| | | |
|---|---|---|
| TIME PRINTED: MAY 8,95 12:07 | | |
| SAMPLE TIME: MAY 8,95 12:00 | | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.076 | MVS | 14.1 |
| 2 | UNKNOWN | 5.985 | MVS | 15.6 |
| 3 | UNKNOWN | 23.16 | MVS | 17.2 |
| 4 | UNKNOWN | 38.31 | MVS | 22.2 |
| 5 | UNKNOWN | 0.409 | MVS | 33.8 |
| 6 | UNKNOWN | 8.861 | MVS | 40.8 |
| 7 | BENZENE | 2.184 | PPB | 53.2 |
| 8 | UNKNOWN | 4.767 | MVS | 67.2 |
| 9 | TOLUENE | 8.239 | PPB | 108.0 |
| 10 | UNKNOWN | 3.575 | MVS | 125.2 |
| 11 | UNKNOWN | 3.601 | MVS | 199.0 |
| 12 | ETHYLBENZENE | 7.450 | PPB | 224.8 |
| 13 | M,P-XYLENE | 12.76 | PPB | 240.0 |
| 14 | O-XYLENE | 13.91 | PPB | 276.2 |

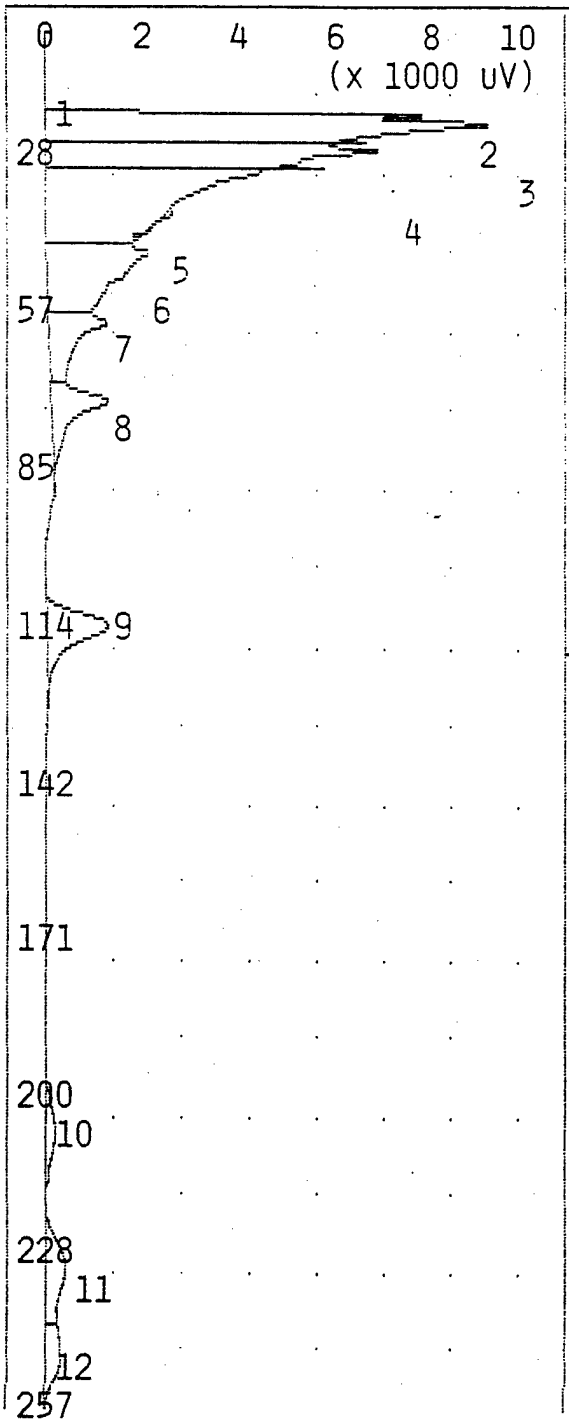
NOTES

DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
AIR BLANK

J. BYRD, JR. (OPERATOR)

LH

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT




LH

| | | |
|---|---|---|
| TIME PRINTED: MAY 8,95 | 13:03 | |
| SAMPLE TIME: MAY 8,95 | 12:56 | |
| METHOD | | |
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

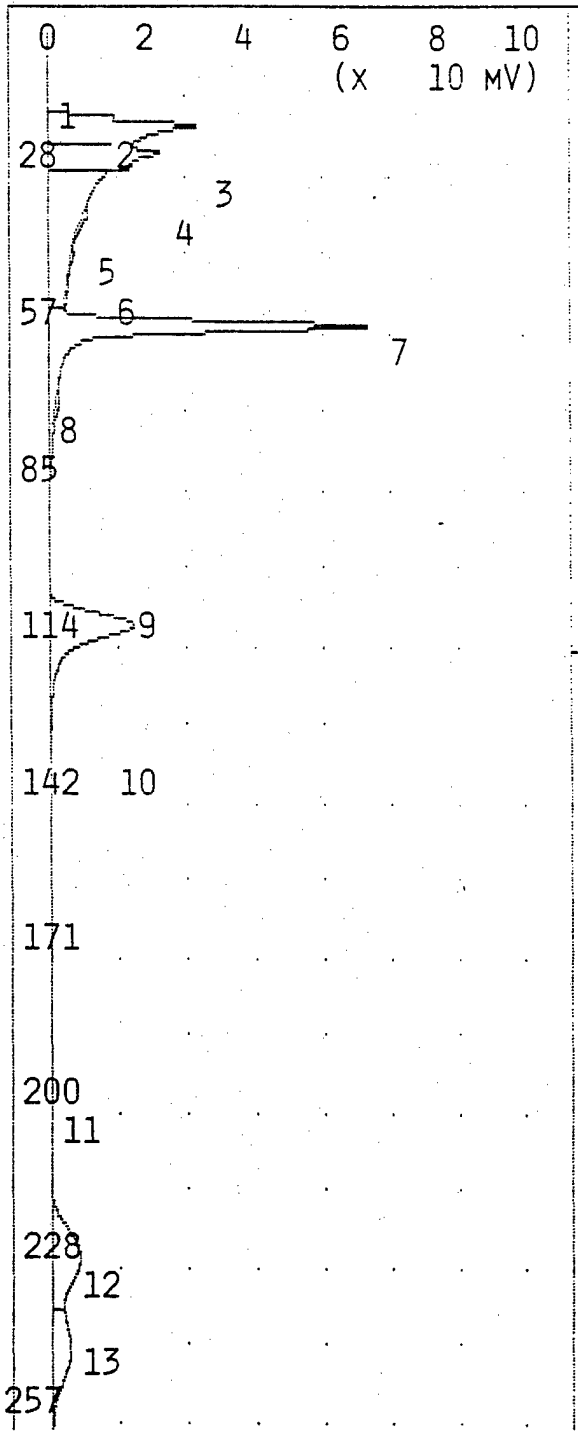
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.090 | MVS | 14.2 |
| 2 | UNKNOWN | 8.805 | MVS | 15.7 |
| 3 | UNKNOWN | 38.35 | MVS | 17.1 |
| 4 | UNKNOWN | 66.22 | MVS | 22.4 |
| 5 | UNKNOWN | 0.200 | MVS | 33.8 |
| 6 | UNKNOWN | 18.82 | MVS | 40.8 |
| 7 | BENZENE | 3.501 | PPB | 53.6 |
| 8 | UNKNOWN | 7.348 | MVS | 67.6 |
| 9 | TOLUENE | 5.687 | PPB | 108.2 |
| 10 | UNKNOWN | 5.390 | MVS | 201.8 |
| 11 | ETHYLBENZENE | 7.190 | PPB | 225.8 |
| 12 | M,P-XYLENE | 12.61 | PPB | 241.0 |
| 13 | O-XYLENE | 10.59 | PPB | 276.0 |

NOTES

DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
026-002MW
20.0-22.0 10G
J. BYRD, JR. (OPERATOR)

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 8,95 13:13
SAMPLE TIME: MAY 8,95 13:07

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

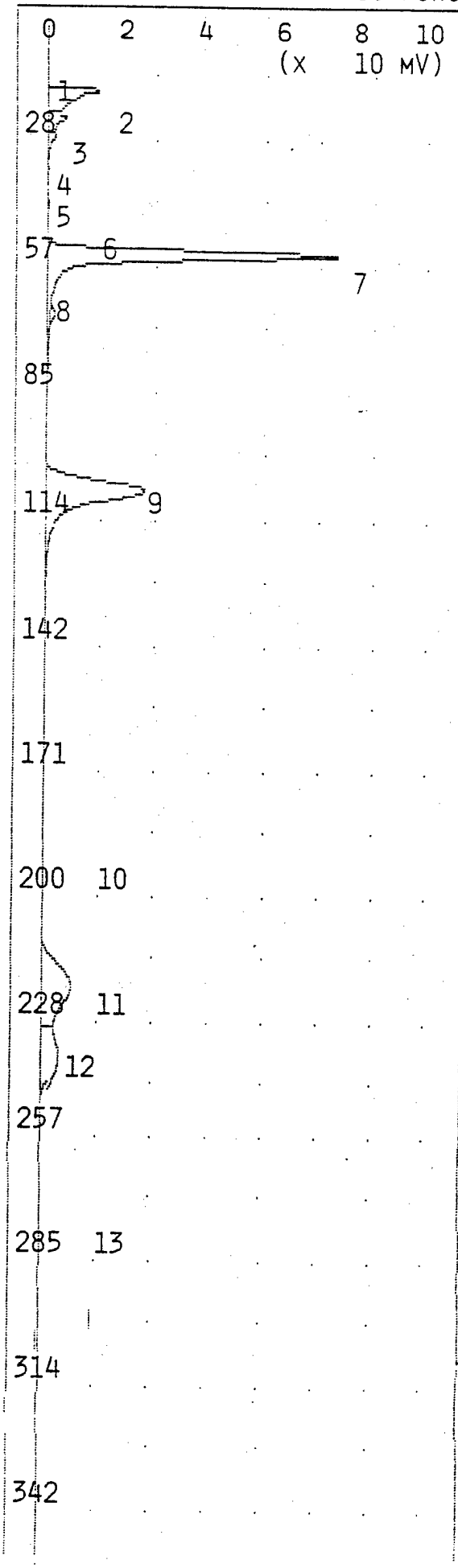
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.073 | MVS | 14.1 |
| 2 | UNKNOWN | 15.64 | MVS | 15.7 |
| 3 | UNKNOWN | 113.8 | MVS | 17.1 |
| 4 | UNKNOWN | 247.1 | MVS | 22.4 |
| 5 | UNKNOWN | 2.439 | MVS | 33.8 |
| 6 | UNKNOWN | 3.491 | MVS | 41.0 |
| 7 | BENZENE | 98.54 | PPB | 53.7 |
| 8 | UNKNOWN | 1.653 | MVS | 67.4 |
| 9 | TOLUENE | 80.12 | PPB | 108.2 |
| 10 | UNKNOWN | 2.313 | MVS | 134.1 |
| 11 | UNKNOWN | 1.798 | MVS | 199.6 |
| 12 | ETHYLBENZENE | 71.95 | PPB | 224.6 |
| 13 | M,P-XYLENE | 132.6 | PPB | 241.3 |
| 14 | O-XYLENE | 47.18 | PPB | 282.9 |

NOTES

DESTRY GREENWAY (TRAINEE)
DULUTH ANGB
100 PPB BTEX STANDARD

J. BYRD, JR. (OPERATOR)

ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 08:01
SAMPLE TIME: MAY 11,95 07:54

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

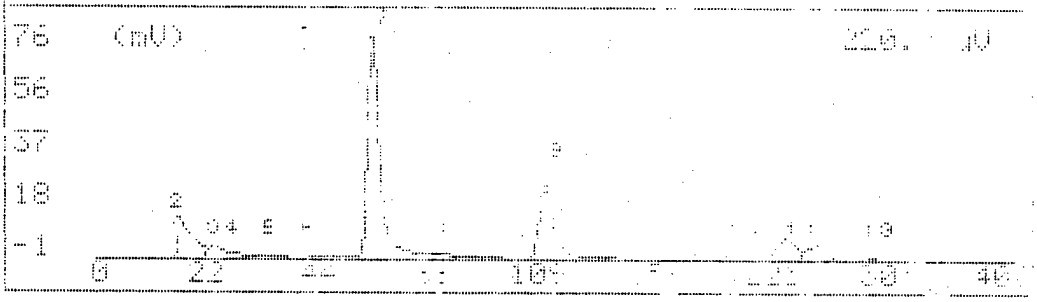
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.084 MVS | 14.0 |
| 2 | UNKNOWN | 47.29 MVS | 15.3 |
| 3 | UNKNOWN | 15.14 MVS | 21.8 |
| 4 | UNKNOWN | 9.843 MVS | 25.9 |
| 5 | UNKNOWN | 3.327 MVS | 33.0 |
| 6 | UNKNOWN | 7.071 MVS | 41.0 |
| 7 | UNKNOWN | 238.5 MVS | 52.4 |
| 8 | UNKNOWN | 3.147 MVS | 66.0 |
| 9 | UNKNOWN | 170.2 MVS | 105.4 |
| 10 | UNKNOWN | 1.826 MVS | 192.2 |
| 11 | UNKNOWN | 104.2 MVS | 218.8 |
| 12 | UNKNOWN | 73.10 MVS | 234.8 |
| 13 | UNKNOWN | 13.85 MVS | 275.4 |

NOTES

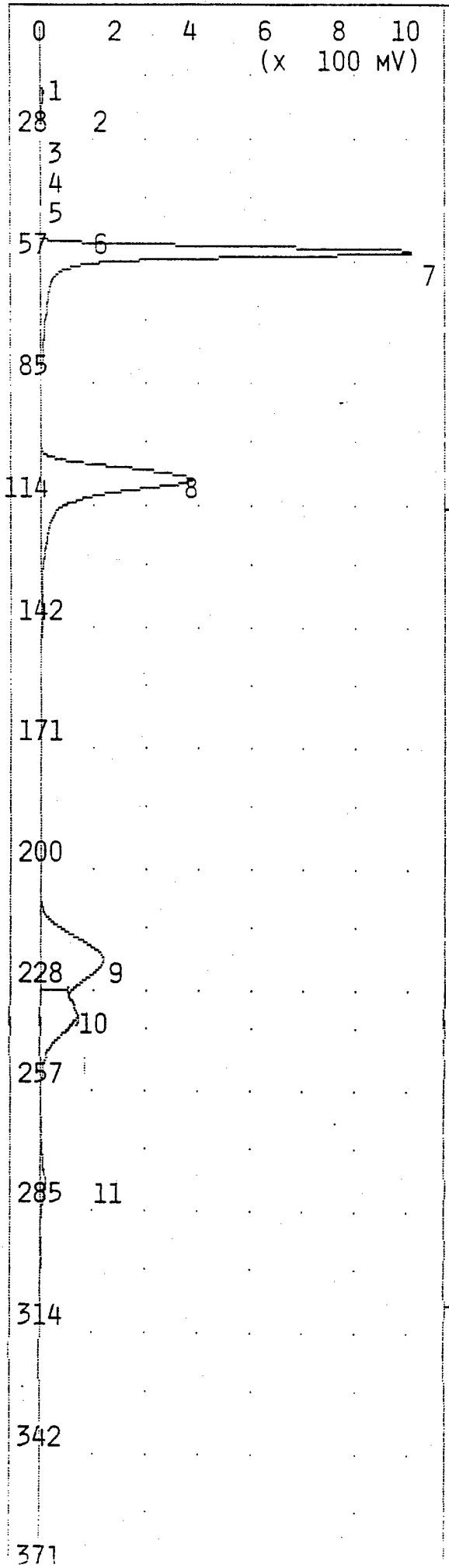
JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX STANDARD

G.C. Ready
-- Analysis No
Pk No Name

| Pk No | Name | | | | | |
|---|---|---|---|---|---|---|
| 5 | Unknown | | mV* | | | sec |
| 6 | Unknown | | mV* | | | sec |
| 7 | benzene | | spc | | | sec |
| 8 | Unknown | | mV* | | | sec |
| 9 | toluene | | spc | | | sec |
| 10 | Unknown | | mV* | | | sec |
| 11 | ethylbenzene | | spc | | | sec |
| 12 | m,p-xylene | | spc | | | sec |
| 13 | o-xylene | | spc | | | sec |
| - Detected 13 peaks. | | | | | | |



ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 08:17
SAMPLE TIME: MAY 11,95 08:10

METHOD

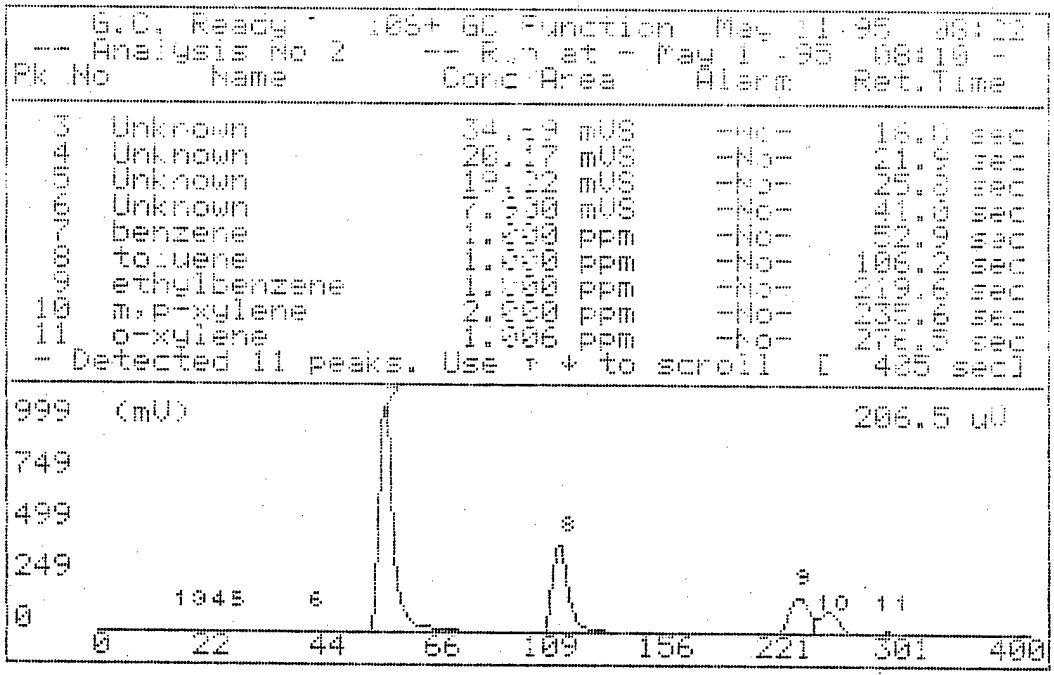
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

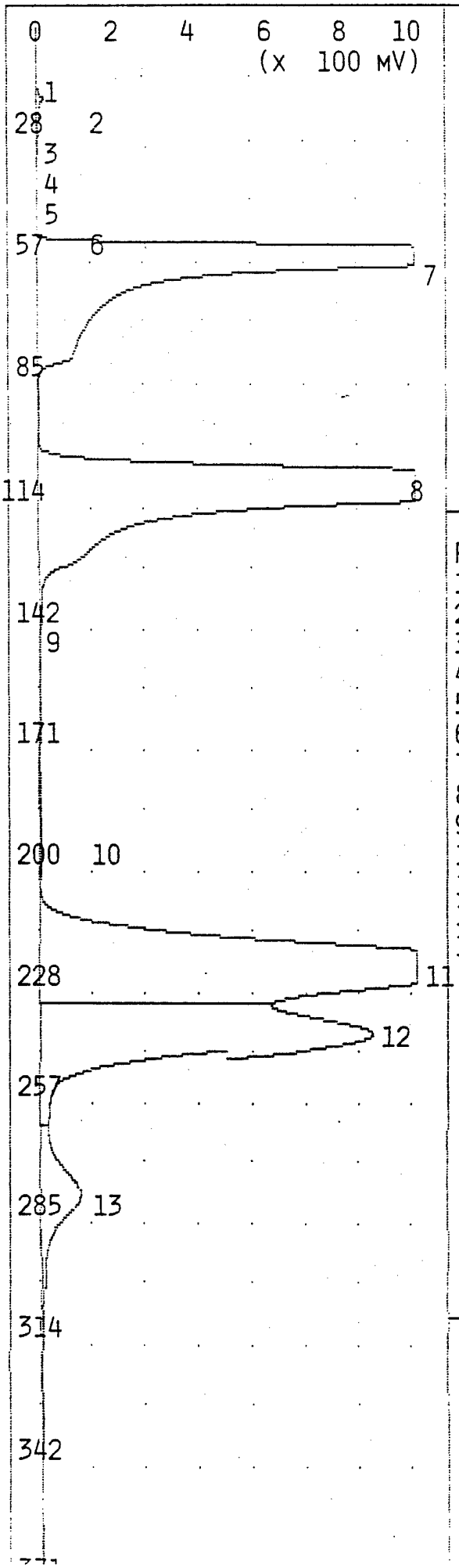
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.092 | MVS | 14.0 |
| 2 | UNKNOWN | 14.71 | MVS | 15.3 |
| 3 | UNKNOWN | 34.69 | MVS | 16.8 |
| 4 | UNKNOWN | 20.17 | MVS | 21.9 |
| 5 | UNKNOWN | 19.19 | MVS | 25.8 |
| 6 | UNKNOWN | 7.857 | MVS | 41.0 |
| 7 | BENZENE | 1.579 | PPM | 52.9 |
| 8 | TOLUENE | 1.844 | PPM | 106.2 |
| 9 | ETHYLBENZENE | 2.122 | PPM | 219.6 |
| 10 | M,P-XYLENE | 3.912 | PPM | 235.6 |
| 11 | O-XYLENE | 2.662 | PPM | 276.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX STANDARD


G.C. Ready
Function
Analysis No 2
Pay 1 -35
Pk No
Name
Conc
Area
Alarm
Ret.Time
3 Unknown
4 Unknown
5 Unknown
6 Unknown
7 Benzene
8 toluene
9 ethylbenzene
10 m.p-xylene
11 o-xylene
- Detected 11 peaks. Use ↑ ↓ to scroll
(mV)
206.5 uV
999
749
499
249
0
1945
6
8
9
10
11
0
22
44
66
109
156
221
301
400

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 08:31
SAMPLE TIME: MAY 11,95 08:24

METHOD

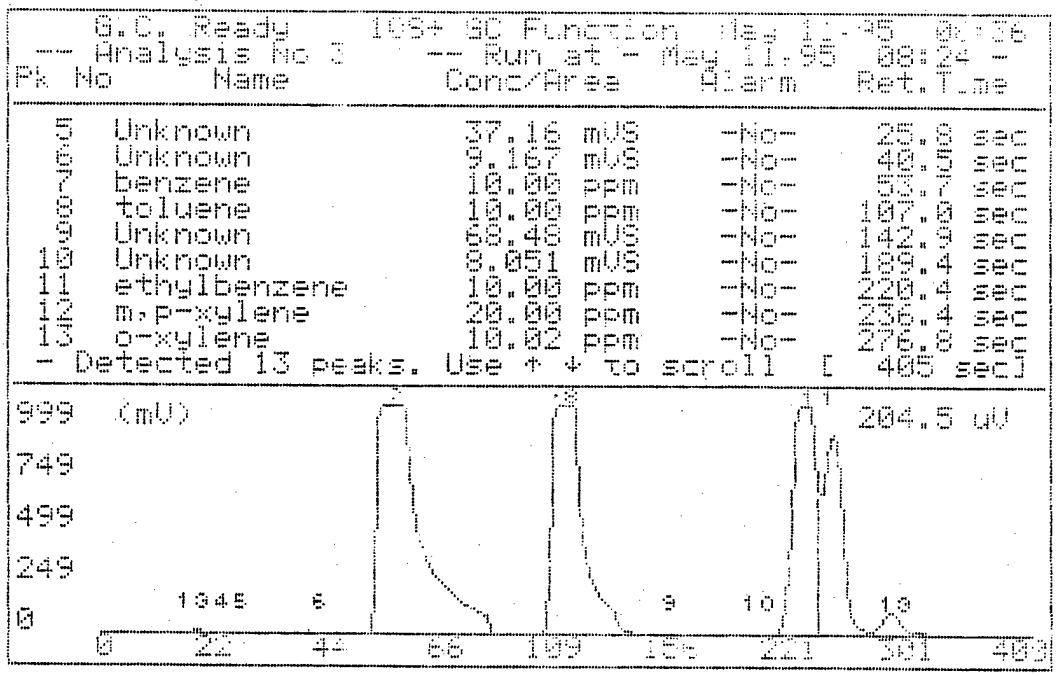
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

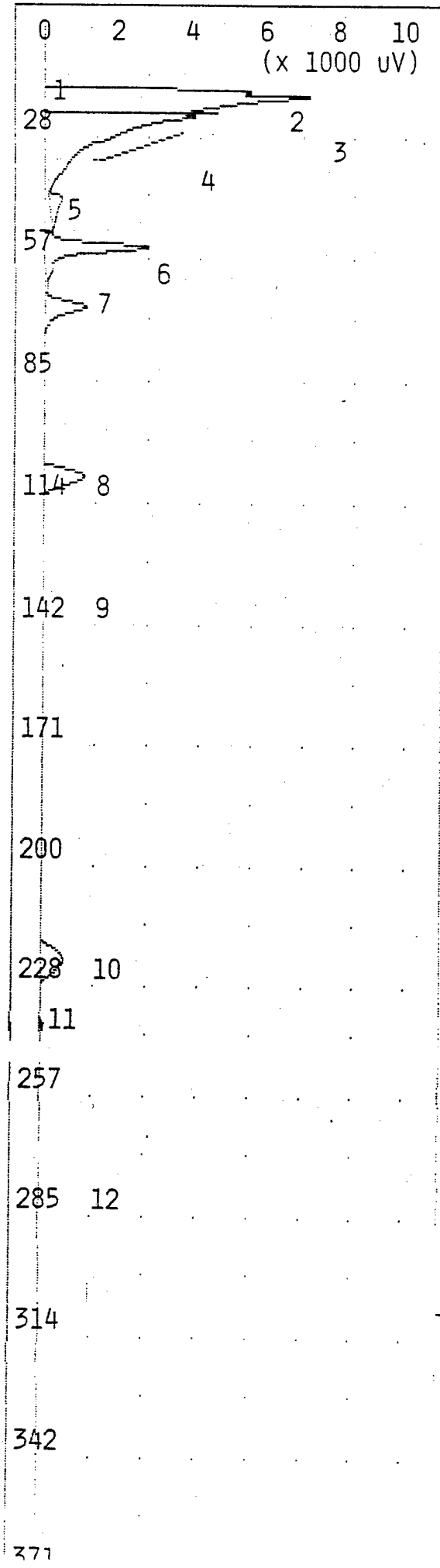
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.109 | MVS | 13.8 |
| 2 | UNKNOWN | 12.12 | MVS | 15.2 |
| 3 | UNKNOWN | 62.90 | MVS | 16.8 |
| 4 | UNKNOWN | 27.77 | MVS | 21.9 |
| 5 | UNKNOWN | 37.16 | MVS | 25.8 |
| 6 | UNKNOWN | 9.167 | MVS | 40.5 |
| 7 | BENZENE | 5.231 | PPM | 53.7 |
| 8 | TOLUENE | 6.822 | PPM | 107.0 |
| 9 | UNKNOWN | 68.48 | MVS | 142.9 |
| 10 | UNKNOWN | 8.051 | MVS | 189.4 |
| 11 | ETHYLBENZENE | 8.435 | PPM | 220.4 |
| 12 | M,P-XYLENE | 15.70 | PPM | 236.4 |
| 13 | O-XYLENE | 5.318 | PPM | 276.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX STANDAR


G.C. Ready
ICS+ GC Function
-- Analysis No 3
-- Run at - May 11.95
Pk No
Name
Conc/Area
Alarm
Ret.Time
5 Unknown 37.16 mVS -No- 425.0 sec
6&7 Unknown 9.167 mVS -No- 450.5 sec
8 benzene 10.00 ppm -No- 470.0 sec
9 toluene 10.00 ppm -No- 1142.0 sec
Unknown 60.46 mVS -No- 1142.9 sec
10 Unknown 0.051 mVS -No- 1999.4 sec
11 ethylbenzene 10.00 ppm -No- 2200.4 sec
12 m,p-xylene 20.00 ppm -No- 2366.4 sec
13 o-xylene 10.02 ppm -No- 2760.8 sec
- Detected 13 peaks. Use ↑ ↓ to scroll [ 405 sec]
999
749
499
249
0
(mV)
204.5 uV
1 2 3 4 5 6 7 8 9 10 11 12 13
0 22 44 66 199 154 221 301 403

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 08:43
SAMPLE TIME: MAY 11,95 08:37

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

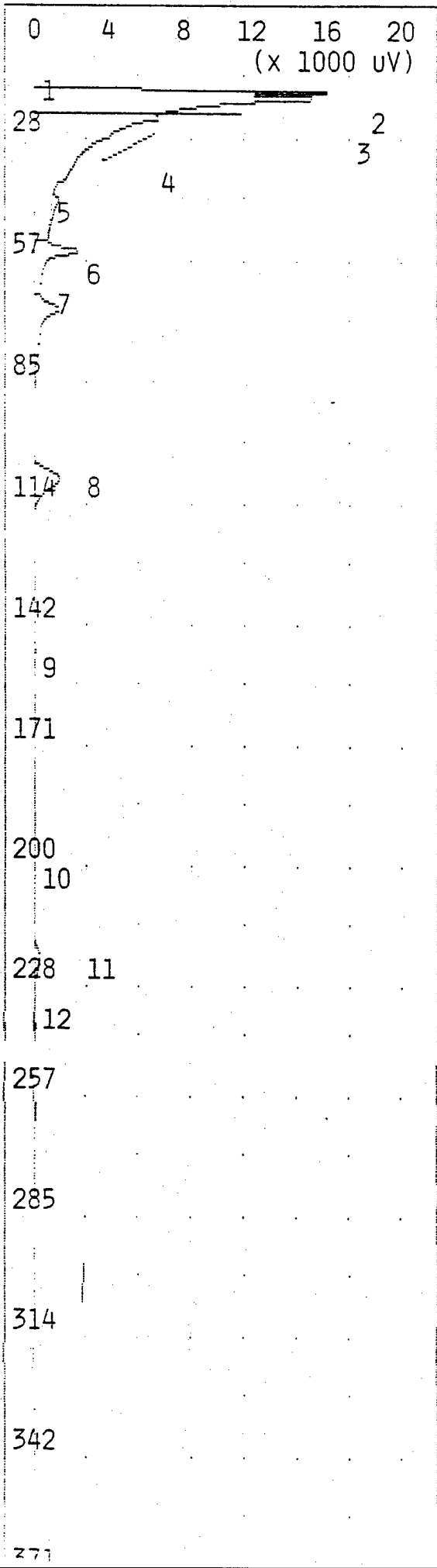
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.109 | MVS | 13.8 |
| 2 | UNKNOWN | 6.790 | MVS | 15.4 |
| 3 | UNKNOWN | 75.27 | MVS | 16.9 |
| 4 | UNKNOWN | 0.583 | MVS | 21.7 |
| 5 | UNKNOWN | 1.864 | MVS | 41.6 |
| 6 | BENZENE | 8.416 | PPB | 52.5 |
| 7 | UNKNOWN | 31.31 | MVS | 66.4 |
| 8 | TOLUENE | 17.84 | PPB | 106.2 |
| 9 | UNKNOWN | 1.272 | MVS | 131.0 |
| 10 | ETHYLBENZENE | 21.50 | PPB | 220.6 |
| 11 | M,P-XYLENE | 51.14 | PPB | 236.6 |
| 12 | O-XYLENE | 21.45 | PPB | 276.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 08:54
SAMPLE TIME: MAY 11,95 08:47

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

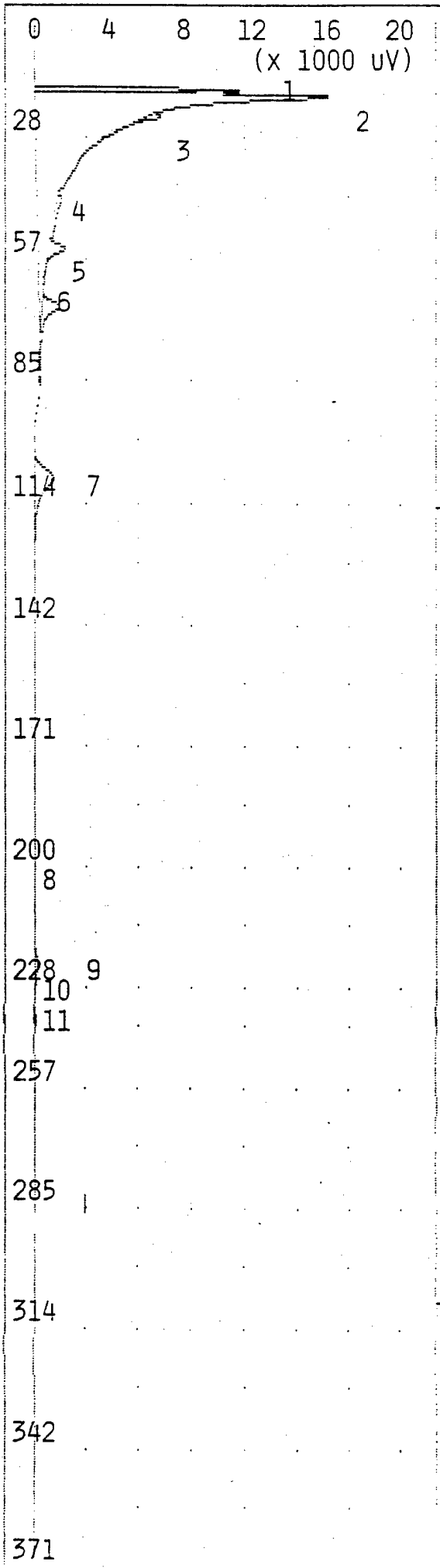
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.065 | MVS | 13.8 |
| 2 | UNKNOWN | 18.17 | MVS | 15.6 |
| 3 | UNKNOWN | 128.6 | MVS | 17.1 |
| 4 | UNKNOWN | 0.478 | MVS | 22.0 |
| 5 | UNKNOWN | 1.634 | MVS | 40.9 |
| 6 | BENZENE | 5.813 | PPB | 52.8 |
| 7 | UNKNOWN | 14.78 | MVS | 66.4 |
| 8 | TOLUENE | 6.031 | PPB | 106.5 |
| 9 | UNKNOWN | 0.885 | MVS | 147.2 |
| 10 | UNKNOWN | 0.988 | MVS | 196.2 |
| 11 | ETHYLBENZENE | 8.347 | PPB | 220.2 |
| 12 | M,P-XYLENE | 18.19 | PPB | 235.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
0.5- 2.5 10G

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 09:04
SAMPLE TIME: MAY 11,95 08:57

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

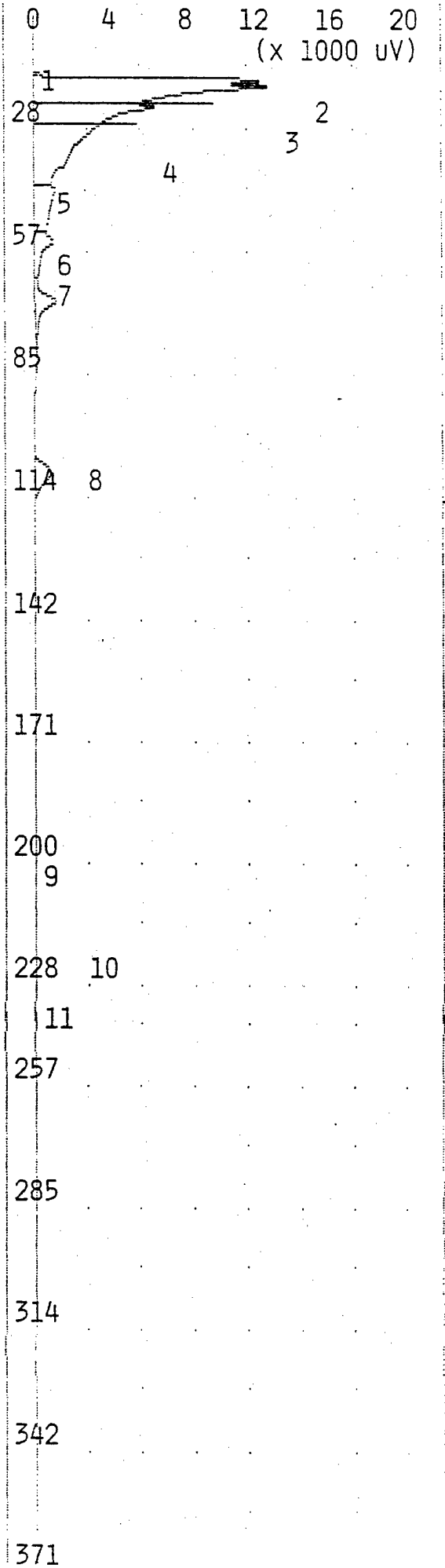
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 13.02 | MVS | 15.4 |
| 2 | UNKNOWN | 142.8 | MVS | 17.0 |
| 3 | UNKNOWN | 0.893 | MVS | 21.9 |
| 4 | UNKNOWN | 1.472 | MVS | 40.9 |
| 5 | BENZENE | 0.867 | PPB | 52.8 |
| 6 | UNKNOWN | 3.967 | MVS | 66.6 |
| 7 | TOLUENE | 3.873 | PPB | 106.6 |
| 8 | UNKNOWN | 7.840 | MVS | 197.8 |
| 9 | UNKNOWN | 2.642 | MVS | 216.8 |
| 10 | ETHYLBENZENE | 8.407 | PPB | 220.2 |
| 11 | M,P-XYLENE | 20.59 | PPB | 237.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
5.0- 7.0 10G

ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 09:14
SAMPLE TIME: MAY 11,95 09:07

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

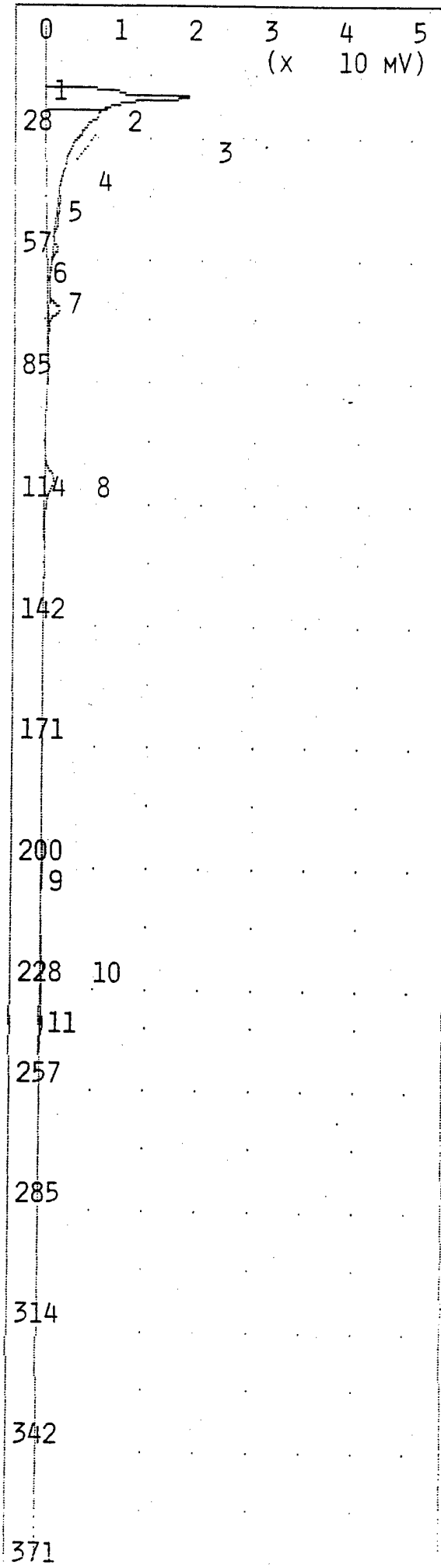
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.549 | MVS | 13.9 |
| 2 | UNKNOWN | 16.42 | MVS | 15.3 |
| 3 | UNKNOWN | 42.95 | MVS | 16.8 |
| 4 | UNKNOWN | 54.88 | MVS | 21.8 |
| 5 | UNKNOWN | 10.85 | MVS | 40.8 |
| 6 | BENZENE | 2.496 | PPB | 52.9 |
| 7 | UNKNOWN | 6.488 | MVS | 66.5 |
| 8 | TOLUENE | 3.826 | PPB | 106.8 |
| 9 | UNKNOWN | 20.58 | MVS | 198.8 |
| 10 | ETHYLBENZENE | 13.00 | PPB | 221.2 |
| 11 | M,P-XYLENE | 19.44 | PPB | 237.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
10.0-12.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 09:24
SAMPLE TIME: MAY 11,95 09:17

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

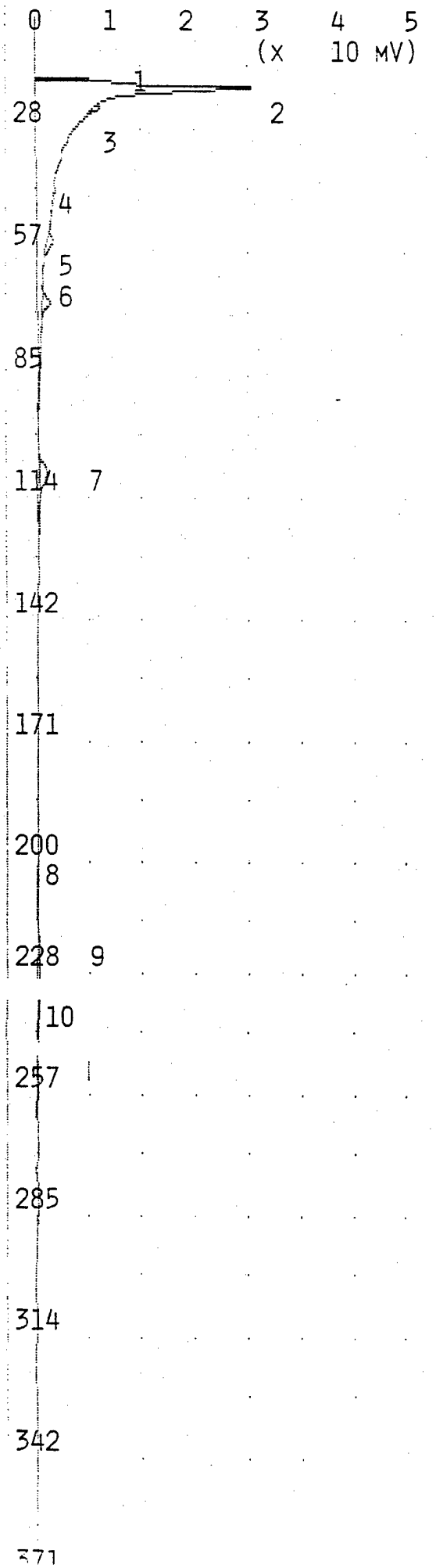
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.023 | MVS | 13.6 |
| 2 | UNKNOWN | 10.91 | MVS | 15.4 |
| 3 | UNKNOWN | 163.0 | MVS | 16.9 |
| 4 | UNKNOWN | 0.510 | MVS | 21.8 |
| 5 | UNKNOWN | 1.974 | MVS | 41.0 |
| 6 | BENZENE | 0.538 | PPB | 52.6 |
| 7 | UNKNOWN | 5.595 | MVS | 66.5 |
| 8 | TOLUENE | 4.293 | PPB | 106.8 |
| 9 | UNKNOWN | 1.612 | MVS | 198.4 |
| 10 | ETHYLBENZENE | 3.302 | PPB | 222.4 |
| 11 | M,P-XYLENE | 10.60 | PPB | 237.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
15.0-17.0 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 09:34
SAMPLE TIME: MAY 11,95 09:28

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

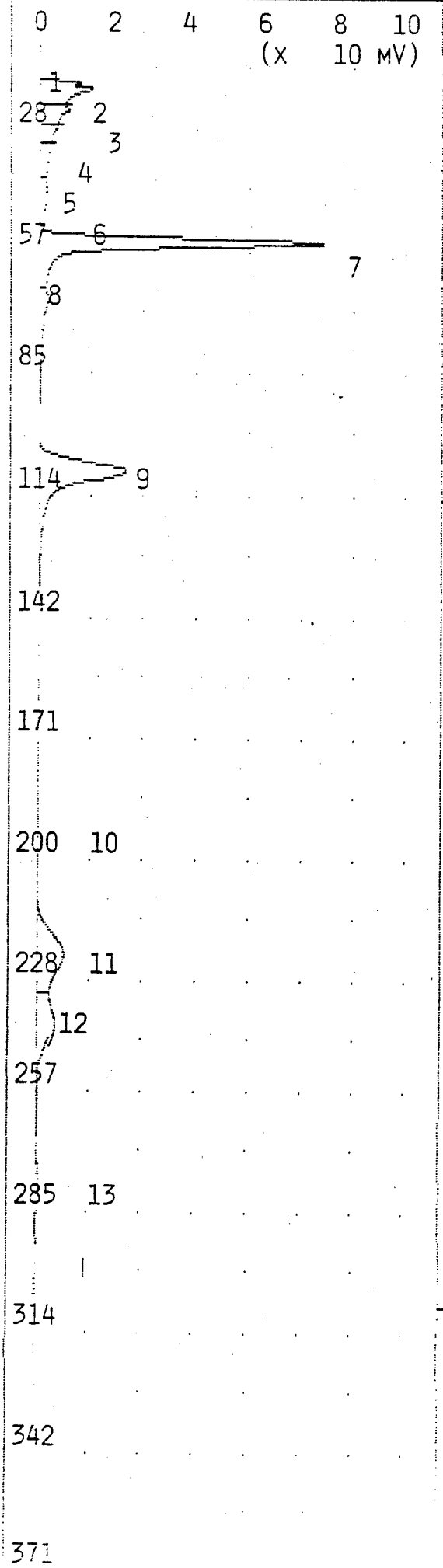
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 11.31 | MVS | 15.4 |
| 2 | UNKNOWN | 230.9 | MVS | 16.8 |
| 3 | UNKNOWN | 1.058 | MVS | 21.8 |
| 4 | UNKNOWN | 0.781 | MVS | 40.8 |
| 5 | BENZENE | 0.853 | PPB | 52.8 |
| 6 | UNKNOWN | 4.015 | MVS | 66.4 |
| 7 | TOLUENE | 3.931 | PPB | 106.9 |
| 8 | UNKNOWN | 0.980 | MVS | 199.2 |
| 9 | ETHYLBENZENE | 2.896 | PPB | 222.2 |
| 10 | M,P-XYLENE | 8.366 | PPB | 237.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
20.0-22.0 10G

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 09:44
SAMPLE TIME: MAY 11,95 09:38

METHOD

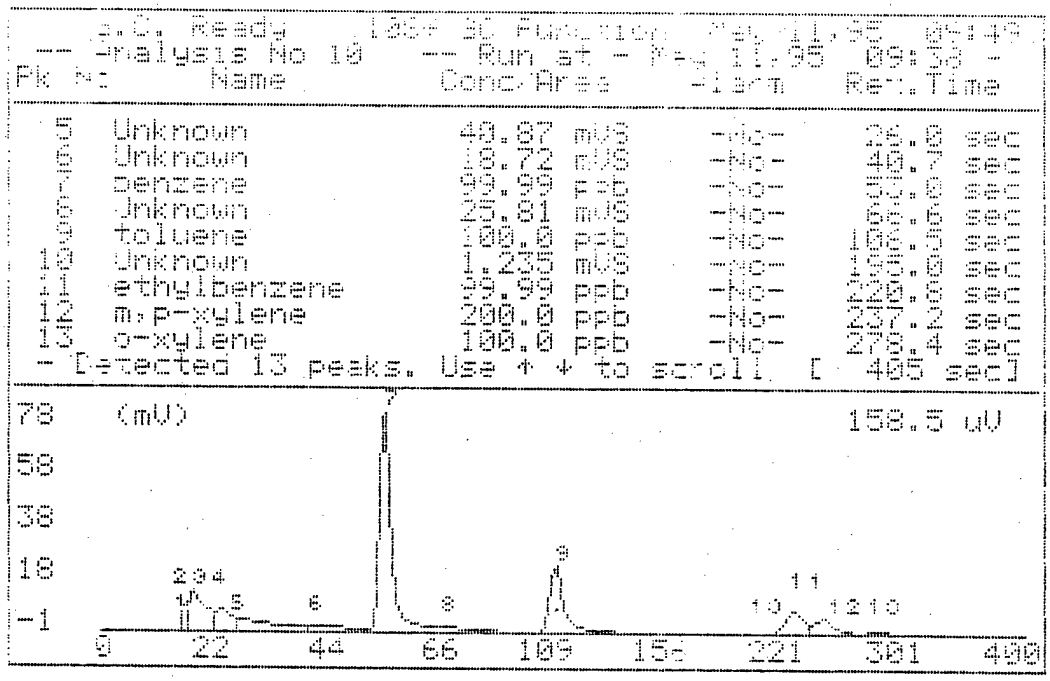
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

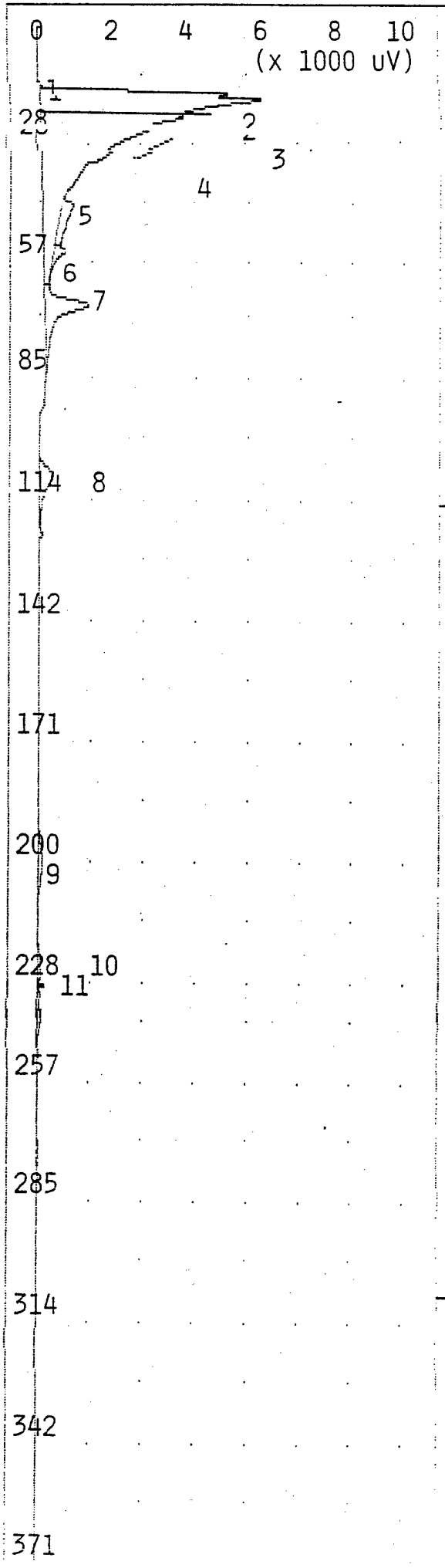
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.058 | MVS | 13.7 |
| 2 | UNKNOWN | 12.61 | MVS | 15.5 |
| 3 | UNKNOWN | 49.87 | MVS | 17.0 |
| 4 | UNKNOWN | 28.65 | MVS | 22.1 |
| 5 | UNKNOWN | 40.87 | MVS | 26.0 |
| 6 | UNKNOWN | 18.72 | MVS | 40.7 |
| 7 | BENZENE | 90.56 | PPB | 53.0 |
| 8 | UNKNOWN | 25.81 | MVS | 66.6 |
| 9 | TOLUENE | 87.03 | PPB | 106.5 |
| 10 | UNKNOWN | 1.235 | MVS | 195.0 |
| 11 | ETHYLBENZENE | 89.03 | PPB | 220.8 |
| 12 | M,P-XYLENE | 193.3 | PPB | 237.2 |
| 13 | O-XYLENE | 86.62 | PPB | 278.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


S.C. Ready
Analysis No 10
Pk N: Name Conc Area Alarm Ret. Time
5 Unknown 40.87 mV3 -No- 326.0 sec
6 Unknown 18.72 mV8 -No- 340.7 sec
7 Benzene 99.99 ppb -No- 342.0 sec
8 Unknown 25.01 mV8 -No- 356.5 sec
9 toluene 100.0 ppb -No- 366.5 sec
10 Unknown 1.235 mVs -No- 380.0 sec
11 ethylbenzene 99.99 ppb -No- 420.0 sec
12 m-p-xylene 200.0 ppb -No- 427.0 sec
13 o-xylene 100.0 ppb -No- 438.4 sec
- Detected 13 peaks. Use ↑ ↓ to scroll. [ 405 sec]
78 (mV)
158.5 uV
58
38
18
-1
0 22 44 66 109 15c 221 301 400

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 09:57
SAMPLE TIME: MAY 11,95 09:50

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

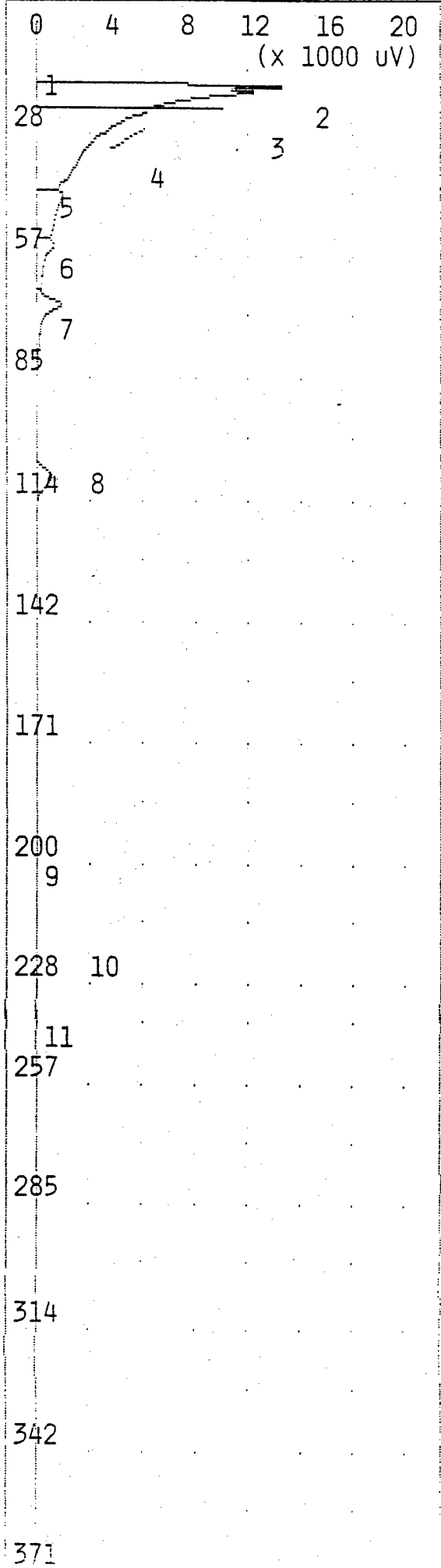
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.279 | MVS | 14.0 |
| 2 | UNKNOWN | 5.590 | MVS | 15.5 |
| 3 | UNKNOWN | 68.33 | MVS | 16.9 |
| 4 | UNKNOWN | 0.416 | MVS | 21.8 |
| 5 | UNKNOWN | 2.456 | MVS | 41.4 |
| 6 | BENZENE | 0.367 | PPB | 52.4 |
| 7 | UNKNOWN | 6.480 | MVS | 66.6 |
| 8 | TOLUENE | 1.803 | PPB | 106.9 |
| 9 | UNKNOWN | 4.480 | MVS | 198.6 |
| 10 | ETHYLBENZENE | 2.298 | PPB | 220.6 |
| 11 | UNKNOWN | 4.276 | MVS | 227.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
~~100 PPB BTEX~~ JB
AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 10:08
SAMPLE TIME: MAY 11,95 10:02

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

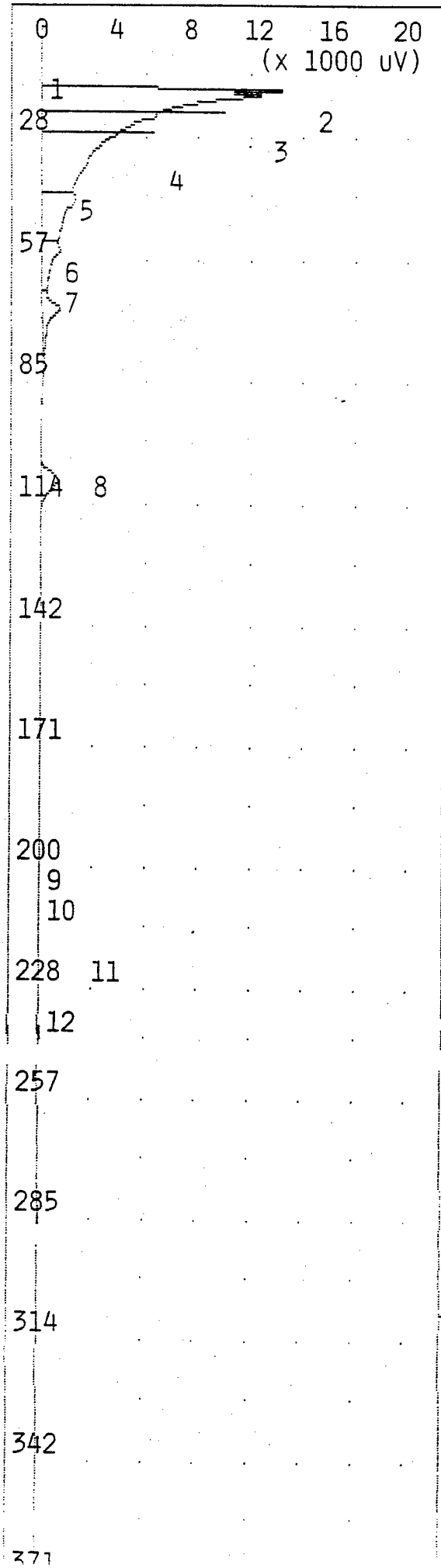
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.038 | MVS | 13.6 |
| 2 | UNKNOWN | 16.49 | MVS | 15.5 |
| 3 | UNKNOWN | 101.0 | MVS | 16.8 |
| 4 | UNKNOWN | 0.359 | MVS | 21.8 |
| 5 | UNKNOWN | 13.46 | MVS | 40.9 |
| 6 | BENZENE | 2.862 | PPB | 52.8 |
| 7 | UNKNOWN | 6.725 | MVS | 66.9 |
| 8 | TOLUENE | 3.946 | PPB | 106.9 |
| 9 | UNKNOWN | 2.595 | MVS | 198.8 |
| 10 | ETHYLBENZENE | 1.967 | PPB | 223.2 |
| 11 | M,P-XYLENE | 4.725 | PPB | 238.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
25.0-27.0 DG

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 10:19
SAMPLE TIME: MAY 11,95 10:12

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

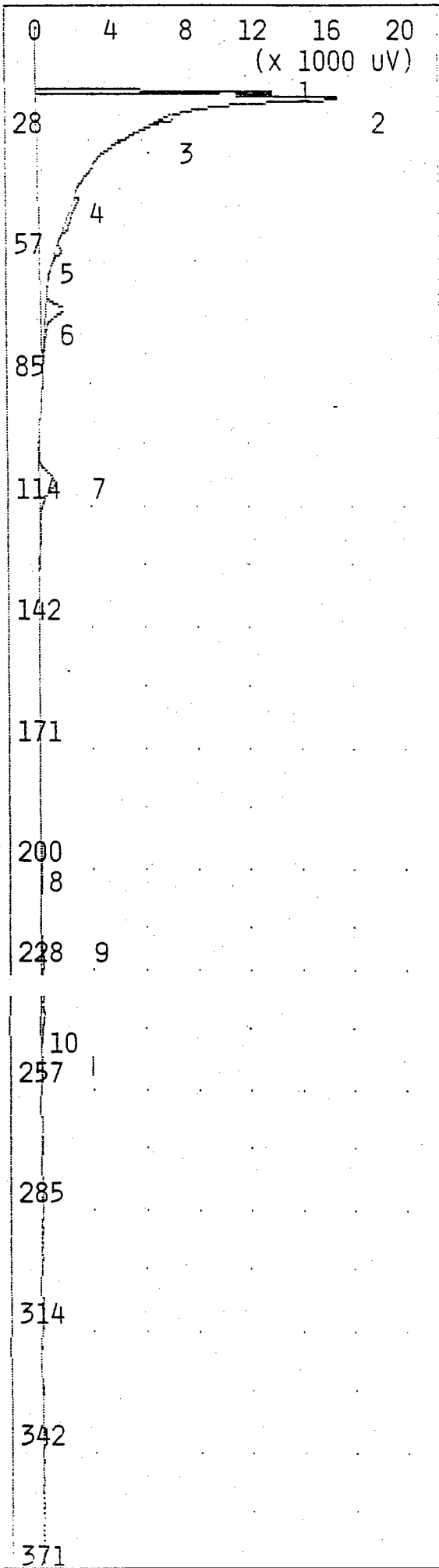
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.033 | MVS | 13.7 |
| 2 | UNKNOWN | 15.19 | MVS | 15.5 |
| 3 | UNKNOWN | 44.66 | MVS | 16.9 |
| 4 | UNKNOWN | 61.80 | MVS | 21.9 |
| 5 | UNKNOWN | 15.08 | MVS | 40.7 |
| 6 | BENZENE | 2.966 | PPB | 52.5 |
| 7 | UNKNOWN | 5.615 | MVS | 66.6 |
| 8 | TOLUENE | 4.089 | PPB | 106.6 |
| 9 | UNKNOWN | 3.376 | MVS | 198.4 |
| 10 | UNKNOWN | 4.178 | MVS | 201.6 |
| 11 | ETHYLBENZENE | 4.732 | PPB | 223.4 |
| 12 | M,P-XYLENE | 8.636 | PPB | 236.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
30.0-32.0 10G

ANALYSIS #14  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 10:29
SAMPLE TIME: MAY 11,95 10:22

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

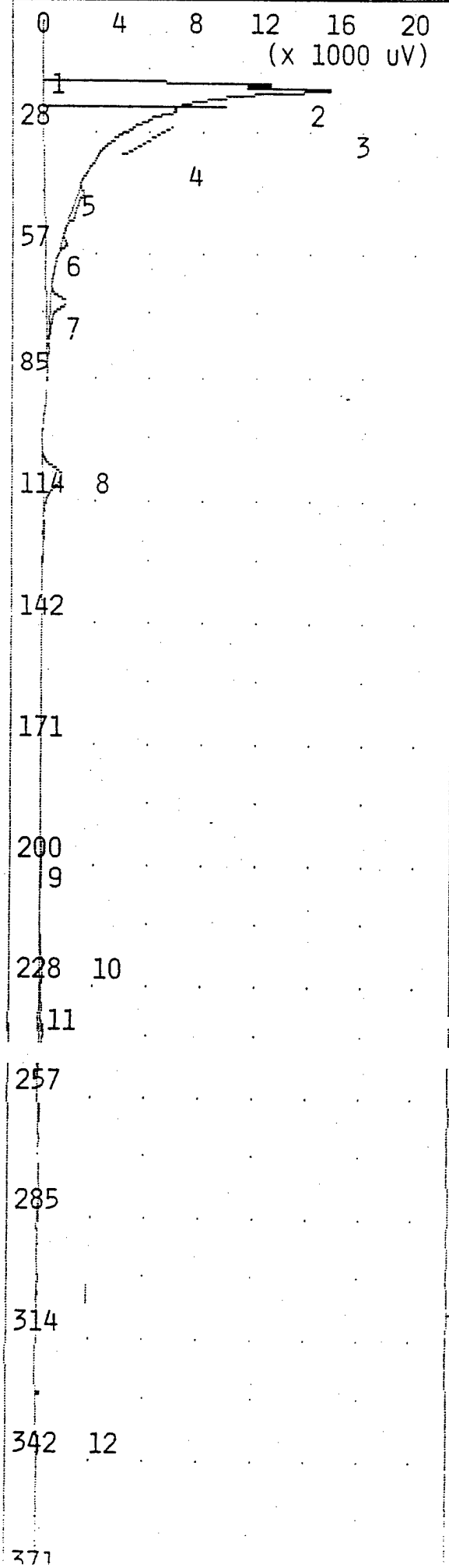
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 13.95 | MVS | 15.5 |
| 2 | UNKNOWN | 164.0 | MVS | 17.0 |
| 3 | UNKNOWN | 0.404 | MVS | 22.0 |
| 4 | UNKNOWN | 1.981 | MVS | 40.8 |
| 5 | BENZENE | 0.211 | PPB | 52.8 |
| 6 | UNKNOWN | 3.515 | MVS | 66.8 |
| 7 | TOLUENE | 3.644 | PPB | 106.8 |
| 8 | UNKNOWN | 7.567 | MVS | 197.0 |
| 9 | ETHYLBENZENE | 17.75 | PPB | 222.0 |
| 10 | M,P-XYLENE | 29.24 | PPB | 238.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001MW
35.0-37.0 10G

ANALYSIS #15 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 10:39
SAMPLE TIME: MAY 11,95 10:32

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

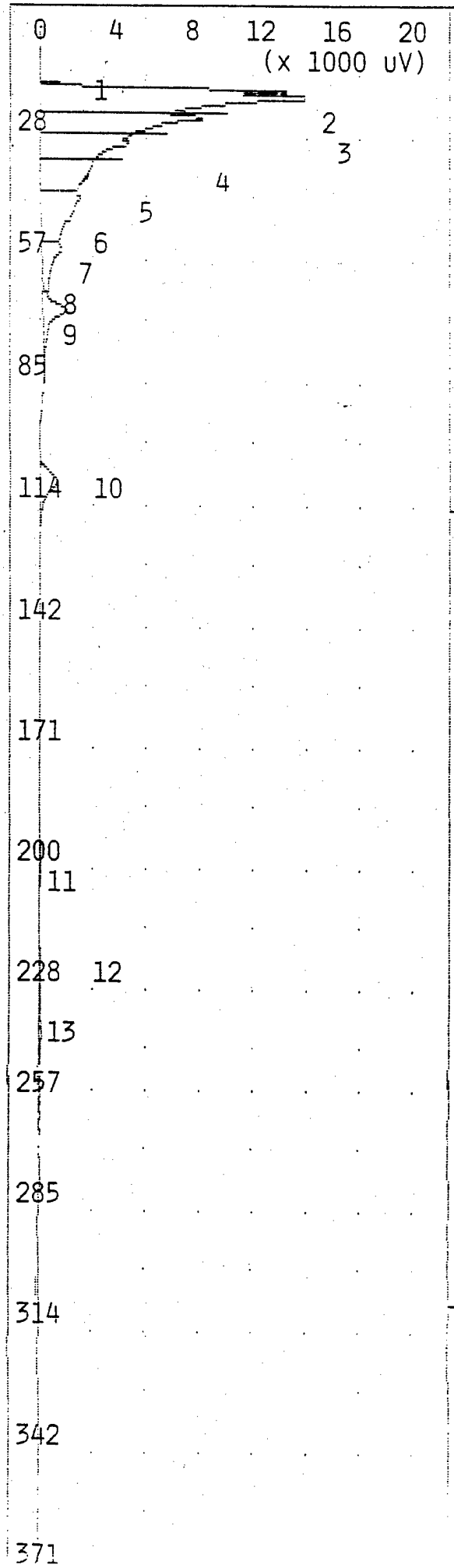
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.037 | MVS | 13.6 |
| 2 | UNKNOWN | 13.23 | MVS | 15.5 |
| 3 | UNKNOWN | 153.8 | MVS | 17.0 |
| 4 | UNKNOWN | 0.479 | MVS | 22.0 |
| 5 | UNKNOWN | 1.531 | MVS | 40.8 |
| 6 | BENZENE | 0.007 | PPB | 53.0 |
| 7 | UNKNOWN | 3.143 | MVS | 66.8 |
| 8 | TOLUENE | 4.295 | PPB | 107.2 |
| 9 | UNKNOWN | 1.512 | MVS | 198.8 |
| 10 | ETHYLBENZENE | 1.673 | PPB | 223.2 |
| 11 | M,P-XYLENE | 7.019 | PPB | 236.4 |
| 12 | UNKNOWN | 0.276 | MVS | 334.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002MW
0.5- 2.5 10G

ANALYCIC #16 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 10:49
SAMPLE TIME: MAY 11,95 10:42

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

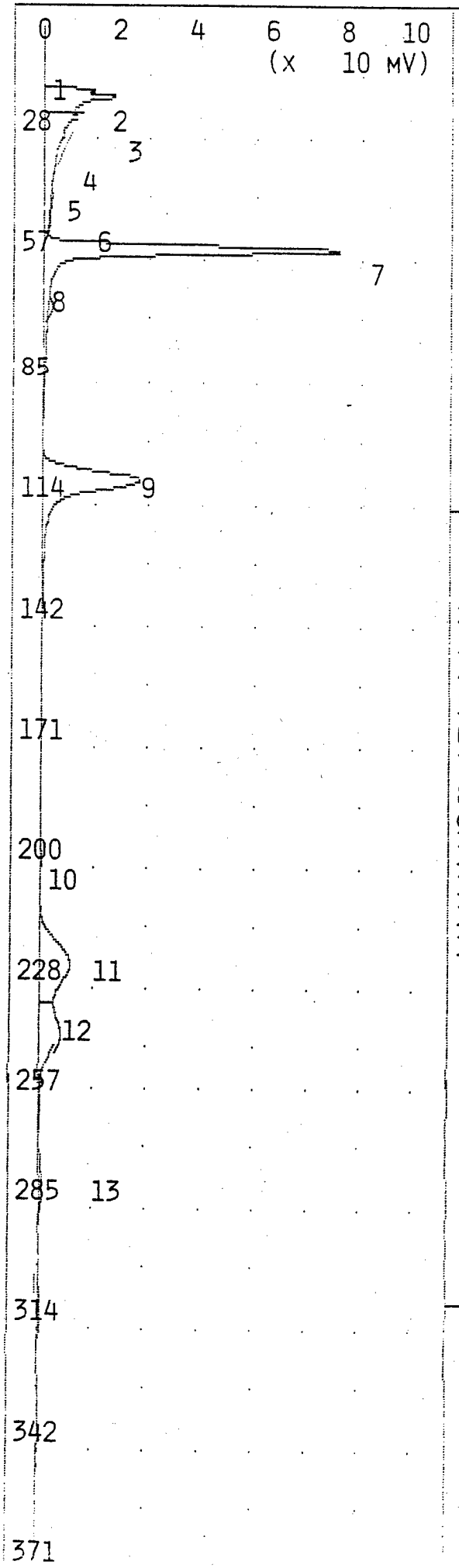
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 2.050 | MVS | 14.2 |
| 2 | UNKNOWN | 16.34 | MVS | 15.4 |
| 3 | UNKNOWN | 51.06 | MVS | 17.2 |
| 4 | UNKNOWN | 38.17 | MVS | 22.0 |
| 5 | UNKNOWN | 37.86 | MVS | 27.8 |
| 6 | UNKNOWN | 0.233 | MVS | 35.2 |
| 7 | UNKNOWN | 18.12 | MVS | 40.6 |
| 8 | BENZENE | 3.339 | PPB | 52.5 |
| 9 | UNKNOWN | 7.733 | MVS | 66.5 |
| 10 | TOLUENE | 4.013 | PPB | 106.6 |
| 11 | UNKNOWN | 1.393 | MVS | 196.4 |
| 12 | ETHYLBENZENE | 1.147 | PPB | 220.2 |
| 13 | M,P-XYLENE | 2.739 | PPB | 234.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002MW
5.0- 7.0 10s

ANALYSIS #17 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 10:59
SAMPLE TIME: MAY 11,95 10:52

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

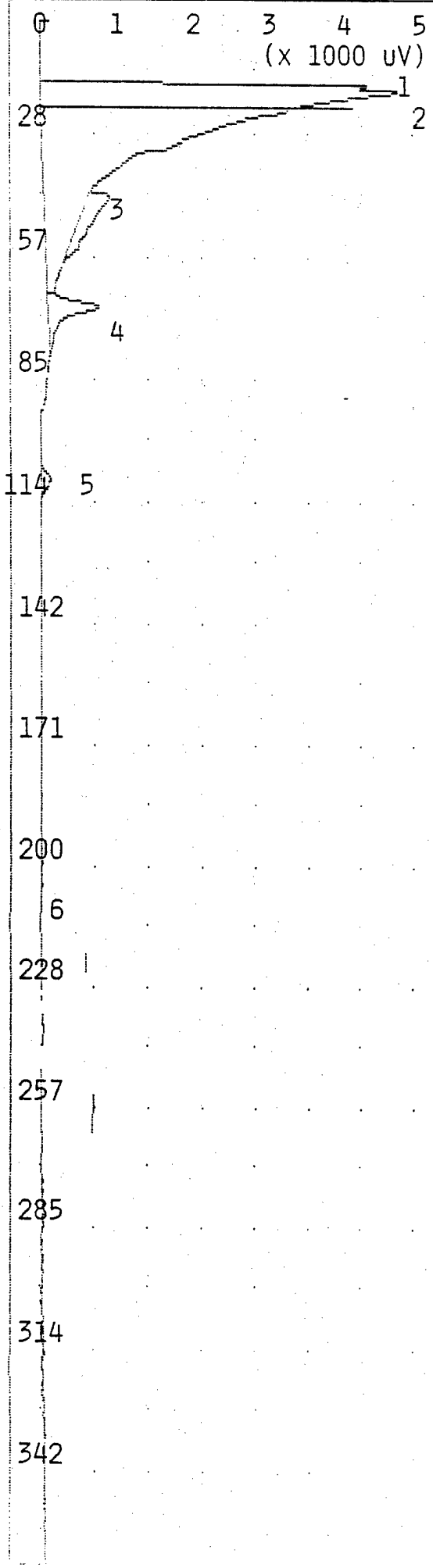
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.042 | MVS | 13.9 |
| 2 | UNKNOWN | 15.78 | MVS | 15.4 |
| 3 | UNKNOWN | 153.1 | MVS | 16.9 |
| 4 | UNKNOWN | 3.226 | MVS | 22.0 |
| 5 | UNKNOWN | 0.753 | MVS | 26.0 |
| 6 | UNKNOWN | 2.630 | MVS | 40.6 |
| 7 | BENZENE | 107.6 | PPB | 52.9 |
| 8 | UNKNOWN | 4.014 | MVS | 66.1 |
| 9 | TOLUENE | 103.7 | PPB | 106.5 |
| 10 | UNKNOWN | 1.214 | MVS | 195.4 |
| 11 | ETHYLBENZENE | 103.7 | PPB | 221.4 |
| 12 | M,P-XYLENE | 212.2 | PPB | 237.6 |
| 13 | O-XYLENE | 108.1 | PPB | 279.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #18 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 12:33
SAMPLE TIME: MAY 11,95 12:26

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

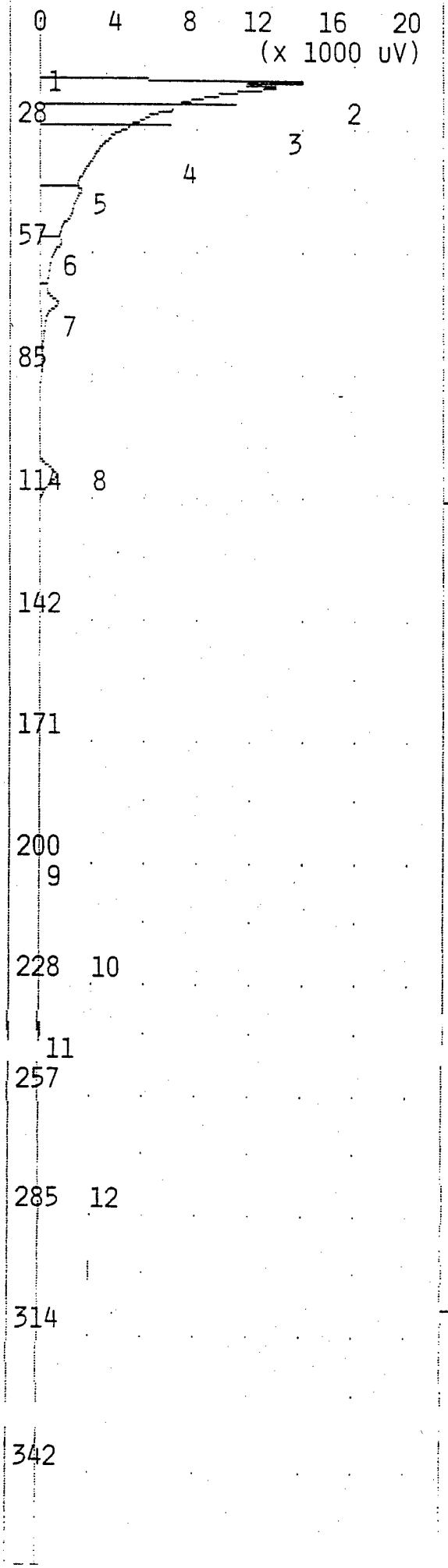
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 4.790 | MVS | 15.6 |
| 2 | UNKNOWN | 62.29 | MVS | 17.0 |
| 3 | UNKNOWN | 2.728 | MVS | 40.8 |
| 4 | UNKNOWN | 3.254 | MVS | 66.8 |
| 5 | TOLUENE | 0.924 | PPB | 107.3 |
| 6 | ETHYLBENZENE | 0.653 | PPB | 202.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #19 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 12:48
SAMPLE TIME: MAY 11,95 12:41

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

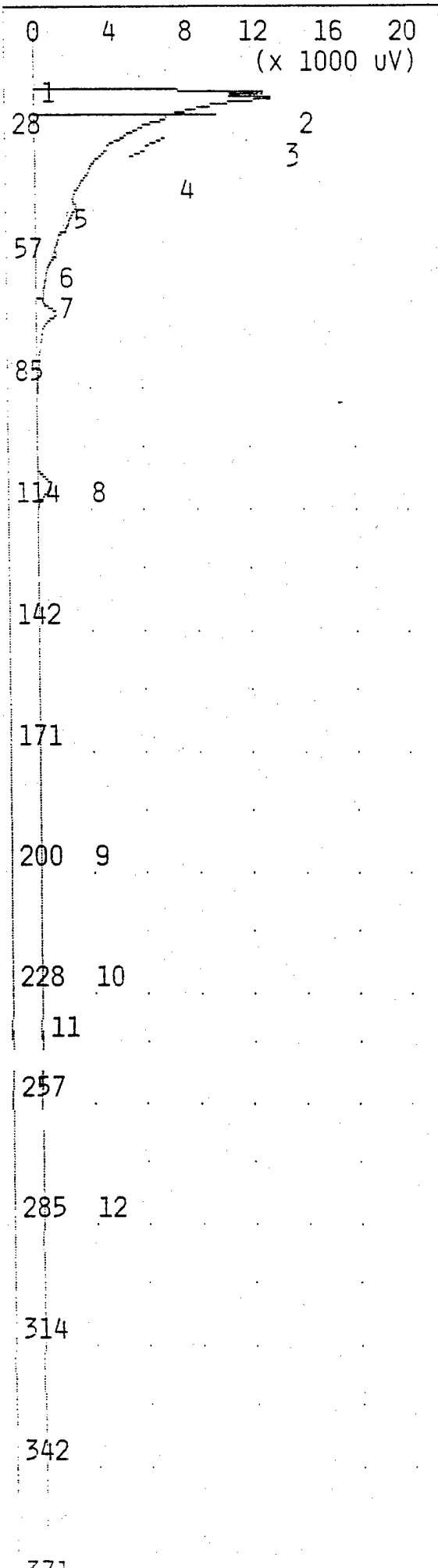
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.020 | MVS | 14.0 |
| 2 | UNKNOWN | 15.82 | MVS | 15.6 |
| 3 | UNKNOWN | 51.09 | MVS | 17.0 |
| 4 | UNKNOWN | 72.26 | MVS | 22.0 |
| 5 | UNKNOWN | 20.40 | MVS | 40.8 |
| 6 | BENZENE | 3.548 | PPB | 53.1 |
| 7 | UNKNOWN | 6.041 | MVS | 67.2 |
| 8 | TOLUENE | 4.294 | PPB | 107.2 |
| 9 | UNKNOWN | 1.462 | MVS | 200.4 |
| 10 | ETHYLBENZENE | 1.859 | PPB | 223.4 |
| 11 | M,P-XYLENE | 7.298 | PPB | 238.4 |
| 12 | O-XYLENE | 3.791 | PPB | 275.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002MW
[illegible]
10.0-12.0 10G

ANALYCIC #20 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 12:59
SAMPLE TIME: MAY 11,95 12:52

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

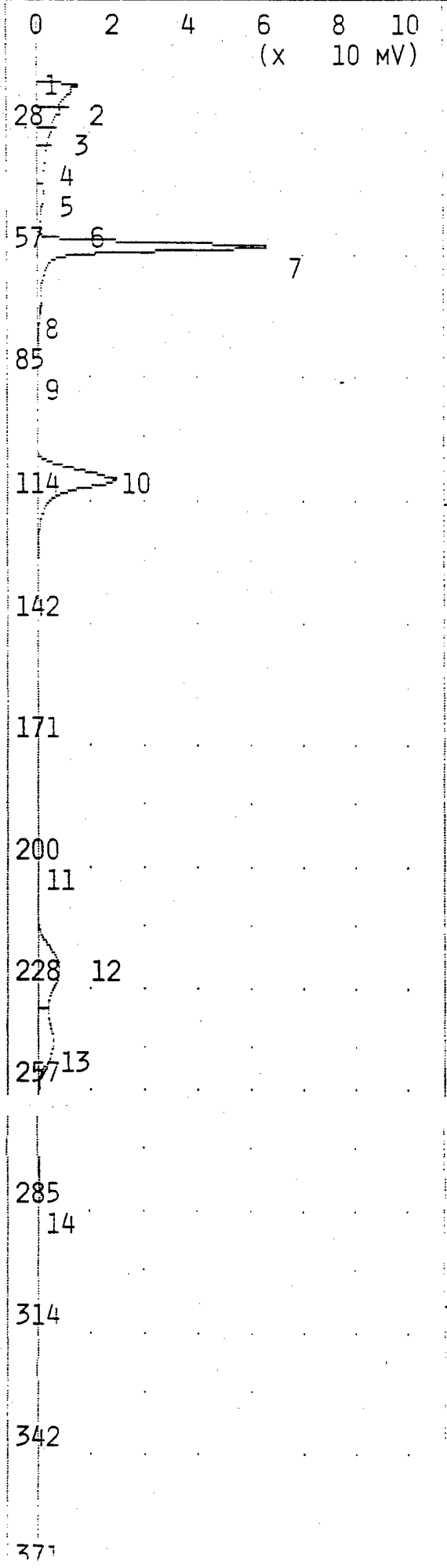
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.015 | MVS | 13.6 |
| 2 | UNKNOWN | 14.80 | MVS | 15.4 |
| 3 | UNKNOWN | 147.3 | MVS | 16.8 |
| 4 | UNKNOWN | 0.221 | MVS | 21.8 |
| 5 | UNKNOWN | 1.845 | MVS | 41.1 |
| 6 | BENZENE | 0.130 | PPB | 52.9 |
| 7 | UNKNOWN | 6.636 | MVS | 66.6 |
| 8 | TOLUENE | 3.593 | PPB | 106.9 |
| 9 | UNKNOWN | 1.148 | MVS | 194.4 |
| 10 | ETHYLBENZENE | 0.972 | PPB | 223.4 |
| 11 | M,P-XYLENE | 4.297 | PPB | 236.4 |
| 12 | O-XYLENE | 3.309 | PPB | 274.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002MW
15.0-17.0 10G

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 14:14
SAMPLE TIME: MAY 11,95 14:07

METHOD

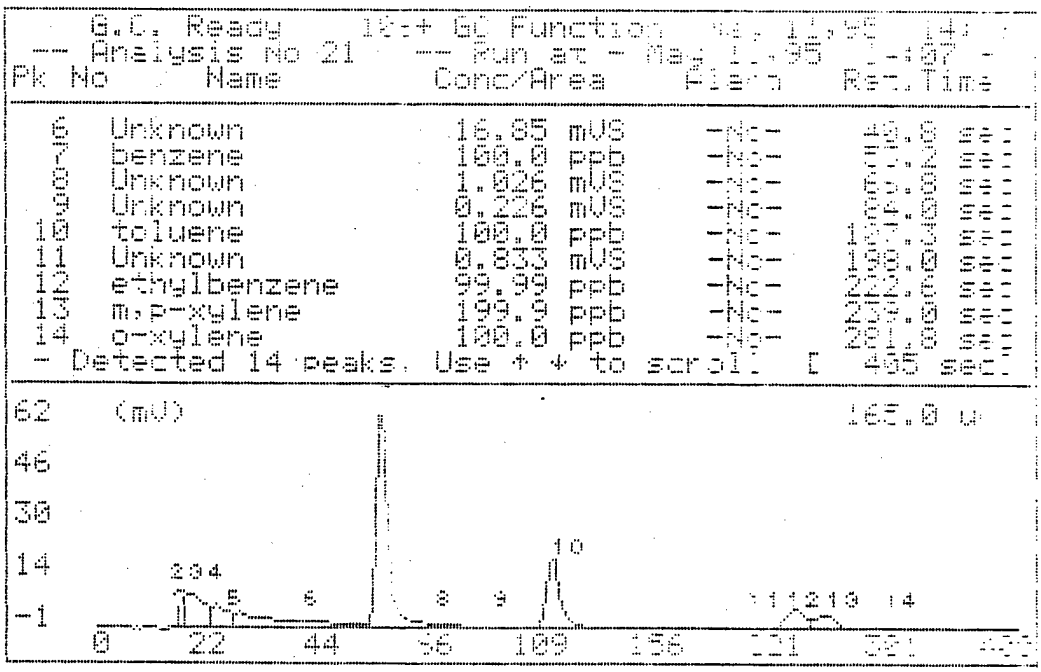
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

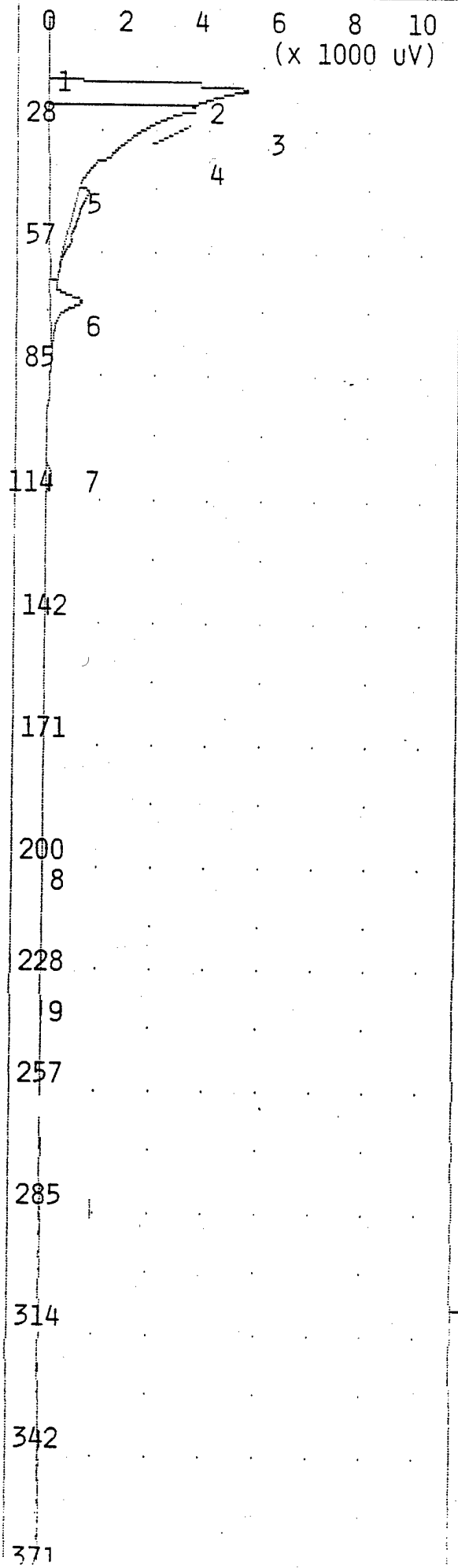
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.045 | MVS | 13.8 |
| 2 | UNKNOWN | 14.20 | MVS | 15.4 |
| 3 | UNKNOWN | 38.20 | MVS | 16.8 |
| 4 | UNKNOWN | 23.60 | MVS | 22.0 |
| 5 | UNKNOWN | 39.14 | MVS | 26.0 |
| 6 | UNKNOWN | 16.85 | MVS | 40.8 |
| 7 | BENZENE | 85.59 | PPB | 53.2 |
| 8 | UNKNOWN | 1.026 | MVS | 66.8 |
| 9 | UNKNOWN | 0.226 | MVS | 84.0 |
| 10 | TOLUENE | 85.32 | PPB | 107.3 |
| 11 | UNKNOWN | 0.833 | MVS | 198.0 |
| 12 | ETHYLBENZENE | 81.49 | PPB | 222.6 |
| 13 | M,P-XYLENE | 165.5 | PPB | 239.0 |
| 14 | O-XYLENE | 83.28 | PPB | 281.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


G.C. Ready
Analysis No 21
Run at - May
Pk No
Name
Conc/Area
Flag
Ret.Time
6 Unknown 16.85 mVS
7 benzene 150.0 ppb
8 Unknown 1.026 mVS
9 Unknown 0.226 mVS
10 toluene 100.0 ppb
11 Unknown 0.837 mVS
12 ethylbenzene 99.99 ppb
13 m,p-xylene 199.9 ppb
14 o-xylene 100.0 ppb
Detected 14 peaks. Use ↑ ↓ to scroll.
(mV)
62
46
30
14
-1
0
22
44
10
2 3 4
5
6
8
9
11 12 13
14

ANALYSIS #22 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 14:28
SAMPLE TIME: MAY 11,95 14:21

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

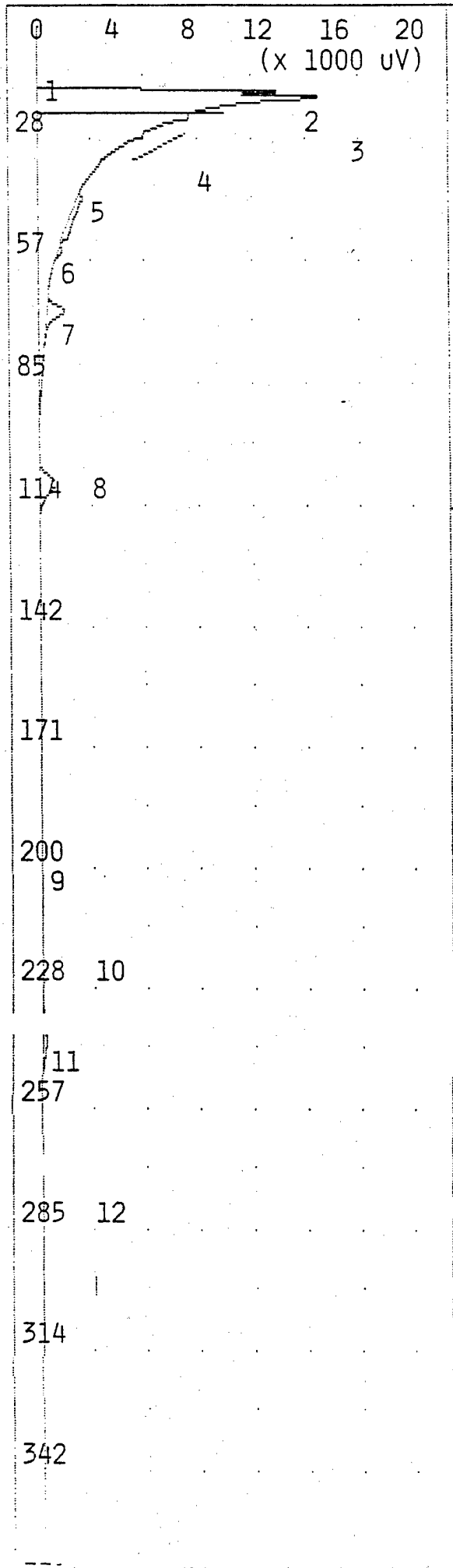
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.094 | MVS | 14.0 |
| 2 | UNKNOWN | 4.452 | MVS | 15.6 |
| 3 | UNKNOWN | 75.34 | MVS | 17.1 |
| 4 | UNKNOWN | 0.534 | MVS | 22.0 |
| 5 | UNKNOWN | 2.527 | MVS | 41.2 |
| 6 | UNKNOWN | 4.760 | MVS | 66.8 |
| 7 | TOLUENE | 1.151 | PPB | 106.6 |
| 8 | UNKNOWN | 13.58 | MVS | 196.8 |
| 9 | M,P-XYLENE | 27.29 | PPB | 237.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #23  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 14:38
SAMPLE TIME: MAY 11,95 14:31

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

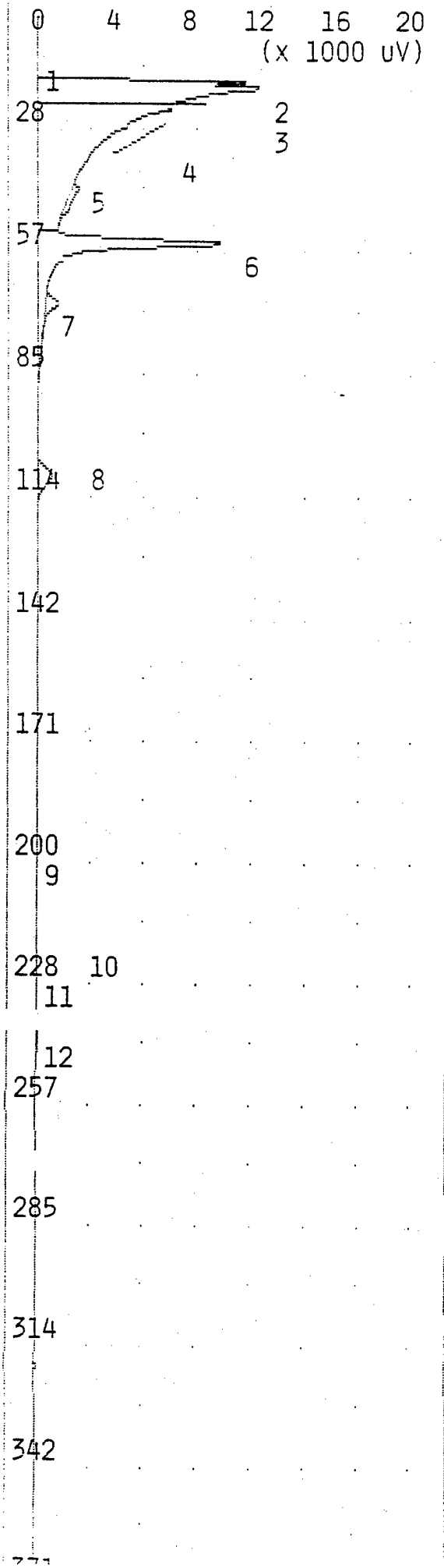
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.189 | MVS | 14.0 |
| 2 | UNKNOWN | 13.81 | MVS | 15.6 |
| 3 | UNKNOWN | 185.6 | MVS | 17.0 |
| 4 | UNKNOWN | 0.392 | MVS | 22.0 |
| 5 | UNKNOWN | 2.708 | MVS | 40.8 |
| 6 | BENZENE | 0.191 | PPB | 52.4 |
| 7 | UNKNOWN | 3.600 | MVS | 66.9 |
| 8 | TOLUENE | 4.826 | PPB | 107.3 |
| 9 | UNKNOWN | 1.442 | MVS | 198.4 |
| 10 | ETHYLBENZENE | 2.736 | PPB | 223.0 |
| 11 | M,P-XYLENE | 13.47 | PPB | 239.8 |
| 12 | O-XYLENE | 8.640 | PPB | 280.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW
0.5- 2.5  10G

ANALYSIS #24 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 14:48
SAMPLE TIME: MAY 11,95 14:41

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

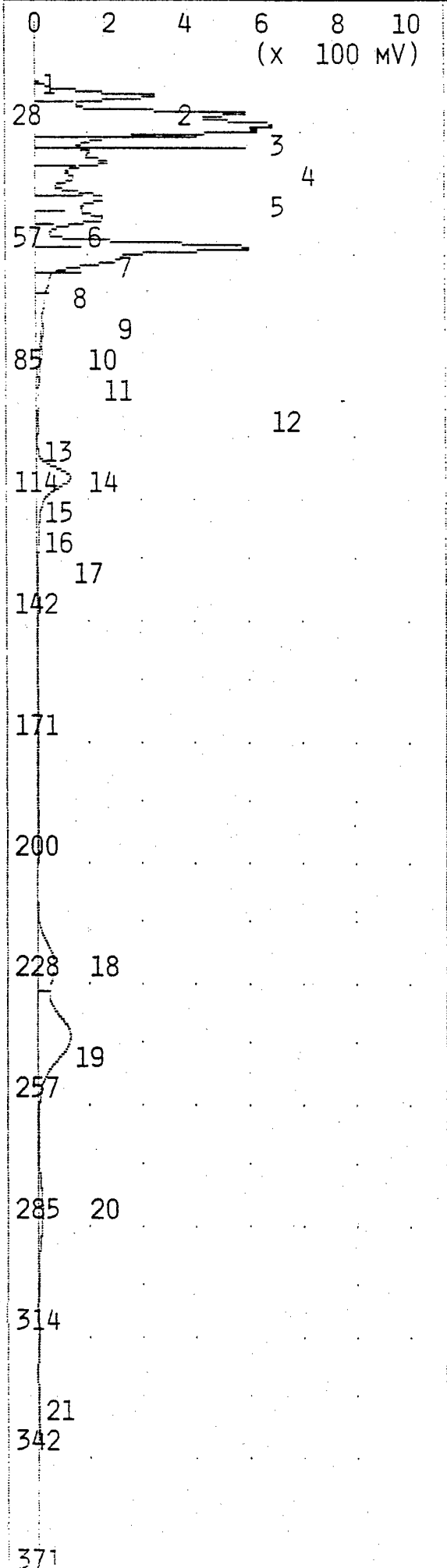
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.048 | MVS | 13.8 |
| 2 | UNKNOWN | 12.86 | MVS | 15.6 |
| 3 | UNKNOWN | 137.7 | MVS | 17.0 |
| 4 | UNKNOWN | 0.534 | MVS | 22.2 |
| 5 | UNKNOWN | 1.728 | MVS | 40.8 |
| 6 | BENZENE | 25.07 | PPB | 53.4 |
| 7 | UNKNOWN | 1.511 | MVS | 66.9 |
| 8 | TOLUENE | 4.365 | PPB | 107.4 |
| 9 | UNKNOWN | 5.100 | MVS | 199.2 |
| 10 | ETHYLBENZENE | 2.137 | PPB | 221.2 |
| 11 | UNKNOWN | 2.585 | MVS | 225.4 |
| 12 | M,P-XYLENE | 15.13 | PPB | 239.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW
5.0- 7.0 10G

ANALYSIS #25  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 14:58
SAMPLE TIME: MAY 11,95 14:51

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

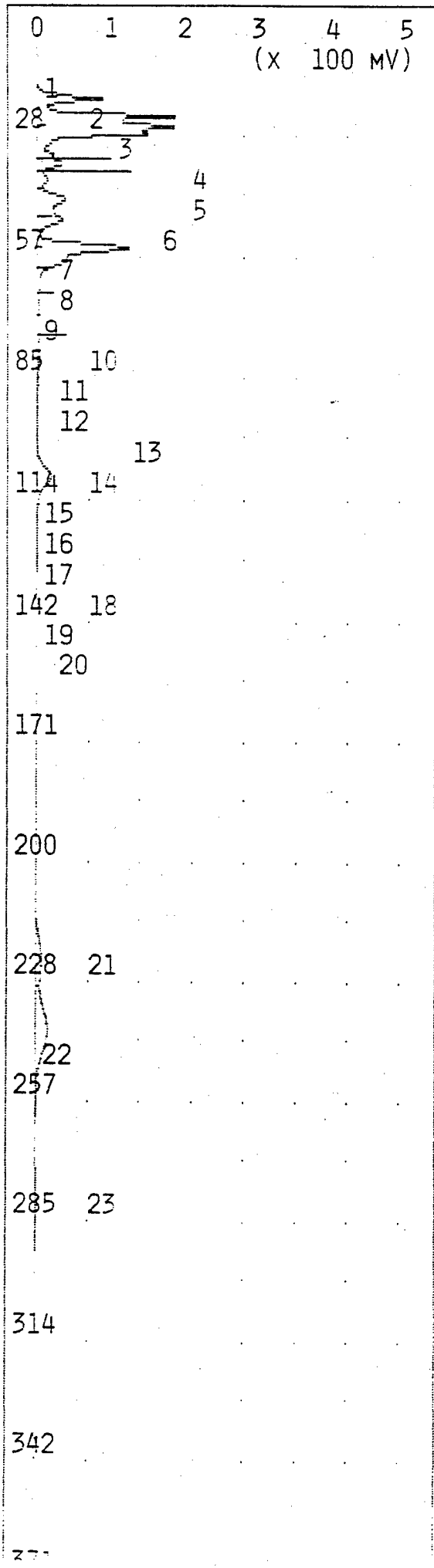
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 26.22 MVS | 15.6 |
| 2 | UNKNOWN | 756.2 MVS | 18.2 |
| 3 | UNKNOWN | 1.044 VSEC | 22.4 |
| 4 | UNKNOWN | 1.398 VSEC | 25.0 |
| 5 | UNKNOWN | 1.292 VSEC | 26.3 |
| 6 | UNKNOWN | 296.1 MVS | 31.2 |
| 7 | UNKNOWN | 545.5 MVS | 33.5 |
| 8 | UNKNOWN | 304.5 MVS | 37.4 |
| 9 | UNKNOWN | 671.1 MVS | 42.0 |
| 10 | UNKNOWN | 146.1 MVS | 44.7 |
| 11 | UNKNOWN | 597.3 MVS | 46.9 |
| 12 | BENZENE | 773.7 PPB | 53.5 |
| 13 | UNKNOWN | 18.20 MVS | 73.0 |
| 14 | UNKNOWN | 10.26 MVS | 78.4 |
| 15 | UNKNOWN | 2.362 MVS | 83.3 |
| 16 | UNKNOWN | 5.419 MVS | 92.8 |
| 17 | TOLUENE | 350.4 PPB | 107.3 |
| 18 | ETHYLBENZENE | 297.4 PPB | 222.6 |
| 19 | M,P-XYLENE | 1.838 PPM | 239.2 |
| 20 | O-XYLENE | 827.1 PPB | 280.8 |
| 21 | UNKNOWN | 50.55 MVS | 328.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW
10.0-12.0  10G

ANALYSIS #26 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 15:18
SAMPLE TIME: MAY 11,95 15:11

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

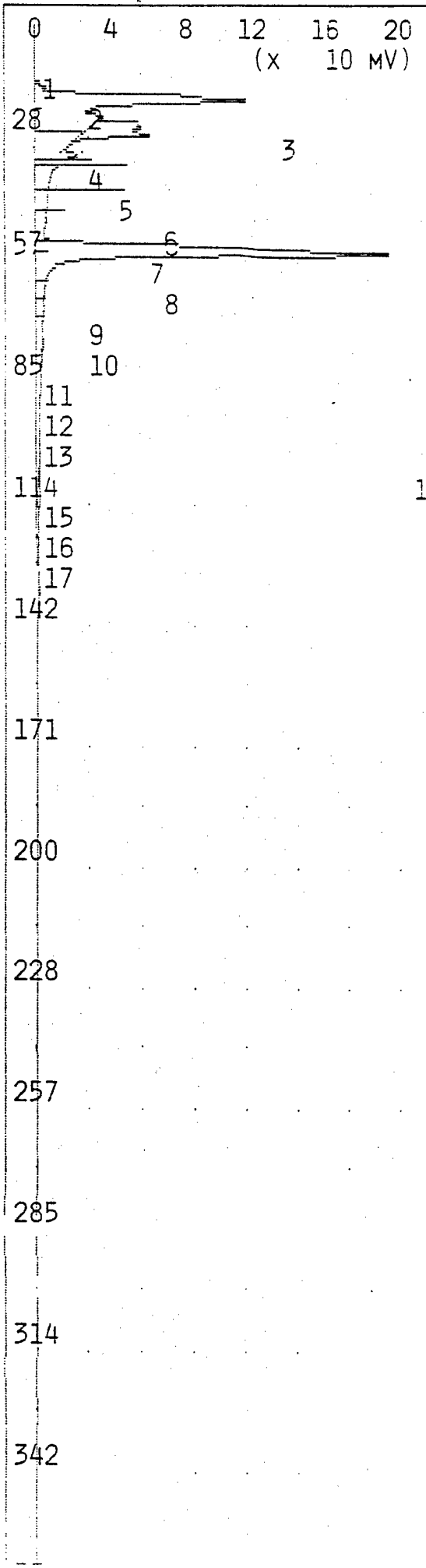
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.384 | MVS | 14.0 |
| 2 | UNKNOWN | 4.163 | MVS | 15.2 |
| 3 | UNKNOWN | 160.0 | MVS | 18.0 |
| 4 | UNKNOWN | 289.0 | MVS | 22.1 |
| 5 | UNKNOWN | 369.2 | MVS | 24.7 |
| 6 | UNKNOWN | 262.5 | MVS | 26.2 |
| 7 | UNKNOWN | 40.58 | MVS | 31.0 |
| 8 | UNKNOWN | 87.46 | MVS | 33.2 |
| 9 | UNKNOWN | 40.63 | MVS | 37.2 |
| 10 | UNKNOWN | 129.7 | MVS | 41.7 |
| 11 | UNKNOWN | 28.65 | MVS | 44.4 |
| 12 | UNKNOWN | 105.1 | MVS | 46.6 |
| 13 | BENZENE | 133.0 | PPB | 53.0 |
| 14 | UNKNOWN | 135.9 | MVS | 55.8 |
| 15 | UNKNOWN | 1.420 | MVS | 61.4 |
| 16 | UNKNOWN | 17.54 | MVS | 66.4 |
| 17 | UNKNOWN | 21.78 | MVS | 72.9 |
| 18 | UNKNOWN | 30.69 | MVS | 78.1 |
| 19 | UNKNOWN | 14.12 | MVS | 92.6 |
| 20 | TOLUENE | 103.3 | PPB | 106.6 |
| 21 | ETHYLBENZENE | 107.5 | PPB | 221.6 |
| 22 | M,P-XYLENE | 442.9 | PPB | 238.4 |
| 23 | O-XYLENE | 197.2 | PPB | 280.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW RESHOT
10.0-12.0 10G
5X DILUTION
20 MICROLITER INJECTION

ANALYSIS #27  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 15:38
SAMPLE TIME: MAY 11,95 15:31

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 33 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

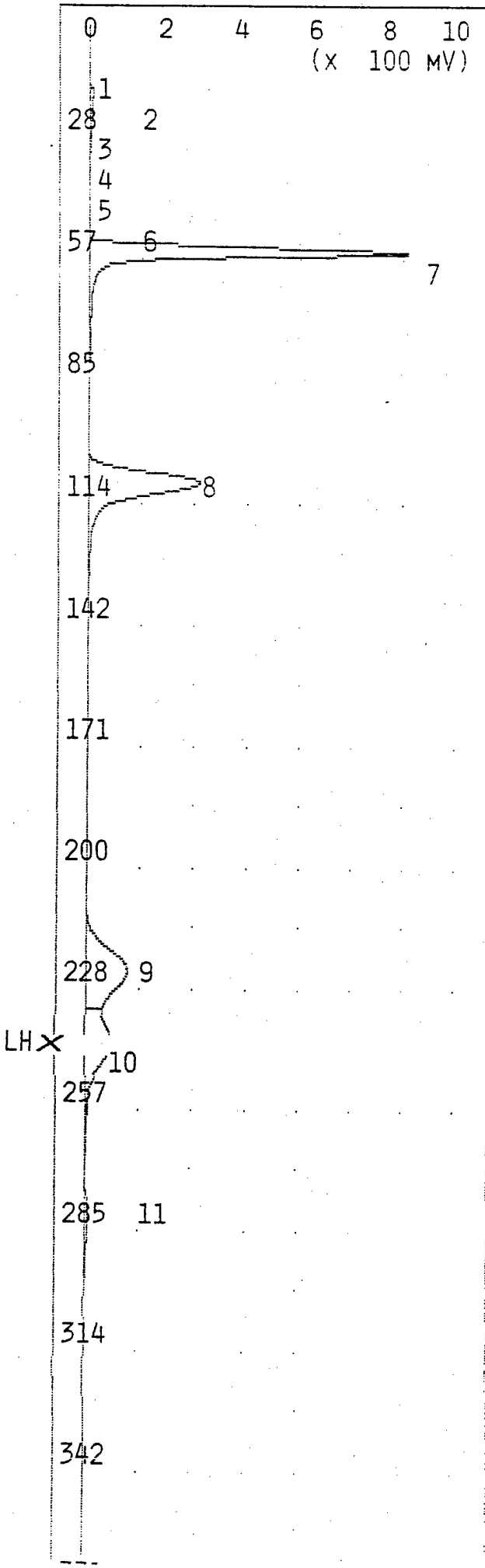
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 3.042 | MVS | 14.0 |
| 2 | UNKNOWN | 7.031 | MVS | 15.1 |
| 3 | UNKNOWN | 321.0 | MVS | 18.1 |
| 4 | UNKNOWN | 1.326 | MVS | 20.6 |
| 5 | UNKNOWN | 52.37 | MVS | 22.0 |
| 6 | UNKNOWN | 77.05 | MVS | 23.7 |
| 7 | UNKNOWN | 62.94 | MVS | 24.8 |
| 8 | UNKNOWN | 148.1 | MVS | 26.2 |
| 9 | UNKNOWN | 51.26 | MVS | 31.0 |
| 10 | UNKNOWN | 69.98 | MVS | 33.0 |
| 11 | UNKNOWN | 15.28 | MVS | 40.7 |
| 12 | UNKNOWN | 27.29 | MVS | 42.2 |
| 13 | UNKNOWN | 25.43 | MVS | 46.6 |
| 14 | BENZENE | 221.8 | PPB | 53.1 |
| 15 | UNKNOWN | 0.109 | MVS | 66.4 |
| 16 | TOLUENE | 13.57 | PPB | 106.5 |
| 17 | UNKNOWN | 10.33 | MVS | 120.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW
15.0-17.0 10G
10X DILUTION
10 MICROLITER INJECTION

ANALYSIS #28  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 15:52
SAMPLE TIME: MAY 11,95 15:45

METHOD

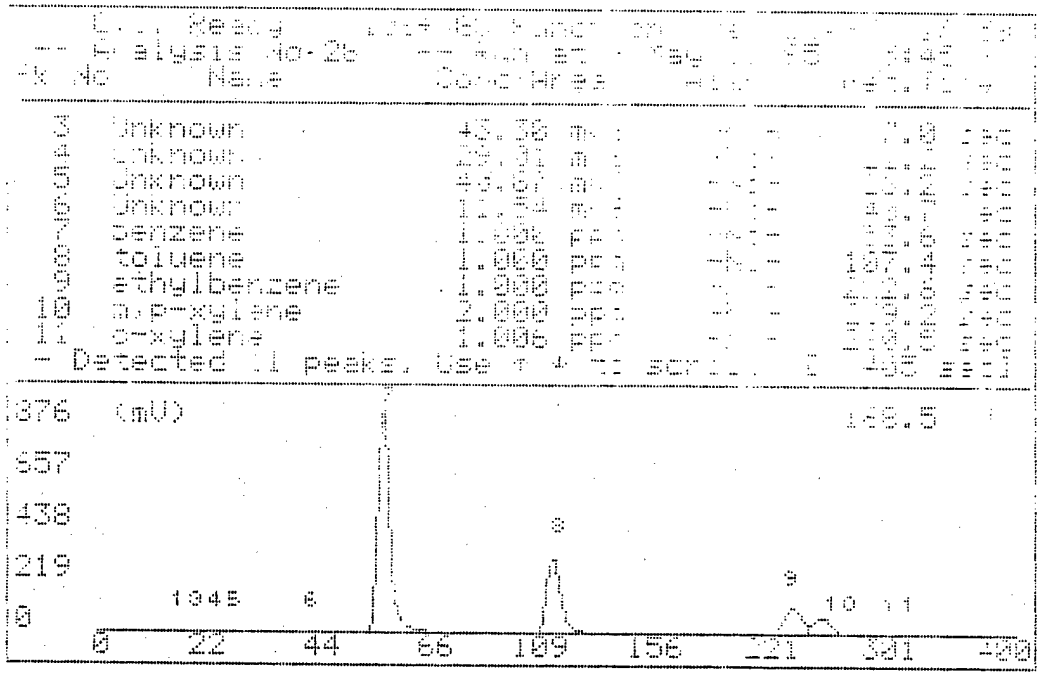
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 33 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

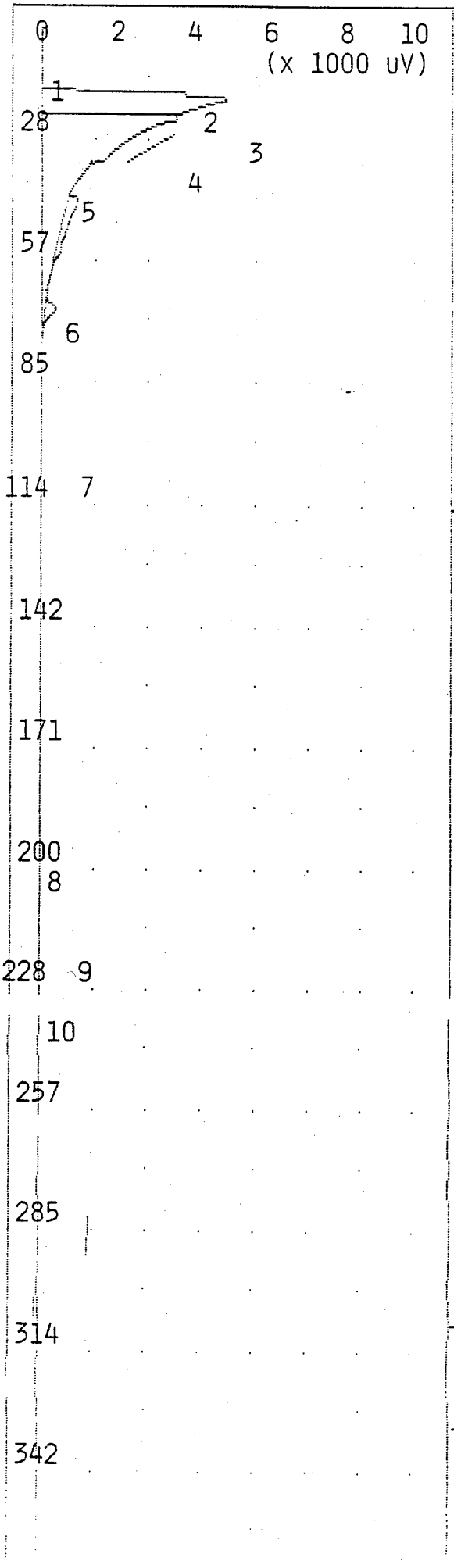
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.038 | MVS | 14.2 |
| 2 | UNKNOWN | 14.35 | MVS | 15.6 |
| 3 | UNKNOWN | 43.29 | MVS | 17.0 |
| 4 | UNKNOWN | 29.01 | MVS | 22.2 |
| 5 | UNKNOWN | 40.85 | MVS | 26.2 |
| 6 | UNKNOWN | 11.51 | MVS | 40.7 |
| 7 | BENZENE | 696.2 | PPB | 53.6 |
| 8 | TOLUENE | 679.1 | PPB | 107.4 |
| 9 | ETHYLBENZENE | 658.2 | PPB | 222.6 |
| 10 | M,P-XYLENE | 1.389 | PPM | 239.2 |
| 11 | O-XYLENE | 585.5 | PPB | 280.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX STD


Unknown
Unknown
Unknown
Unknown
Benzene
toluene
ethylbenzene
m,p-xylene
o-xylene
(mV)
1345
6
9
10
11
0
22
44
66
109
156
221
301
400

ANALYSIS #29  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 16:07
SAMPLE TIME: MAY 11,95 16:01

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 33 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

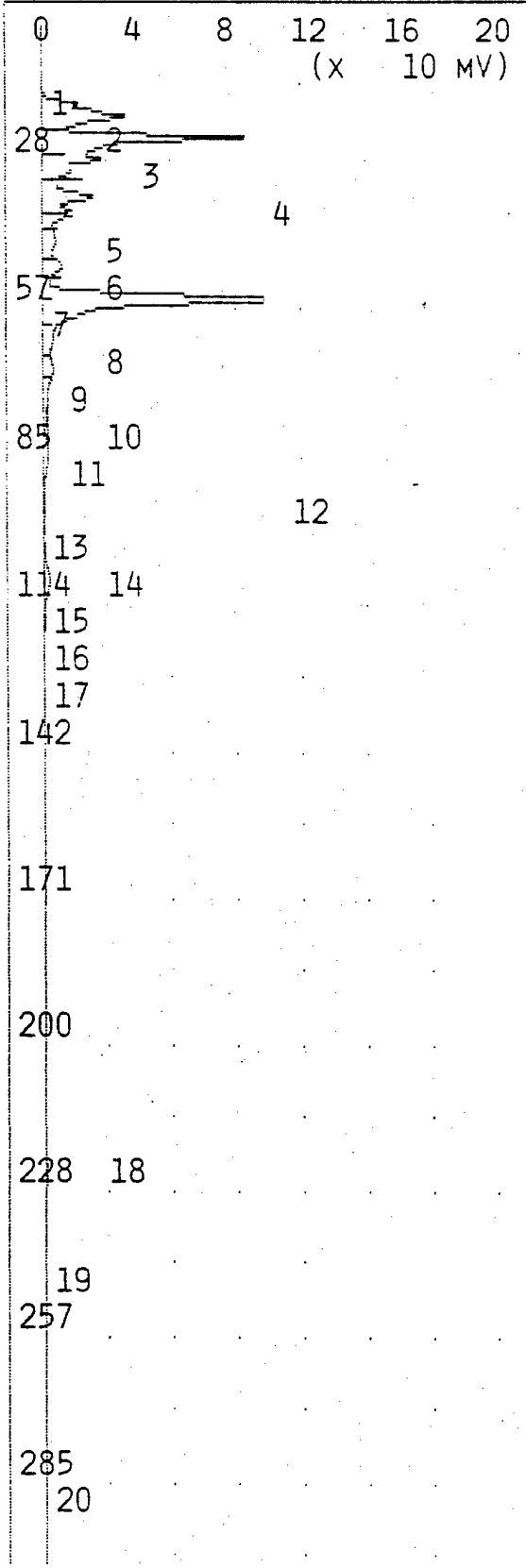
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.015 | MVS | 14.1 |
| 2 | UNKNOWN | 4.188 | MVS | 15.6 |
| 3 | UNKNOWN | 72.35 | MVS | 17.1 |
| 4 | UNKNOWN | 0.135 | MVS | 22.0 |
| 5 | UNKNOWN | 2.584 | MVS | 41.0 |
| 6 | UNKNOWN | 1.104 | MVS | 67.0 |
| 7 | TOLUENE | 1.287 | PPB | 107.2 |
| 8 | UNKNOWN | 0.831 | MVS | 201.4 |
| 9 | ETHYLBENZENE | 0.887 | PPB | 222.4 |
| 10 | M;P-XYLENE | 2.824 | PPB | 237.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
~~1 PPM BTEX STD~~
AIR BLANK JB

ANALYSIS #30  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 11,95 16:18
SAMPLE TIME: MAY 11,95 16:12

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 33 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

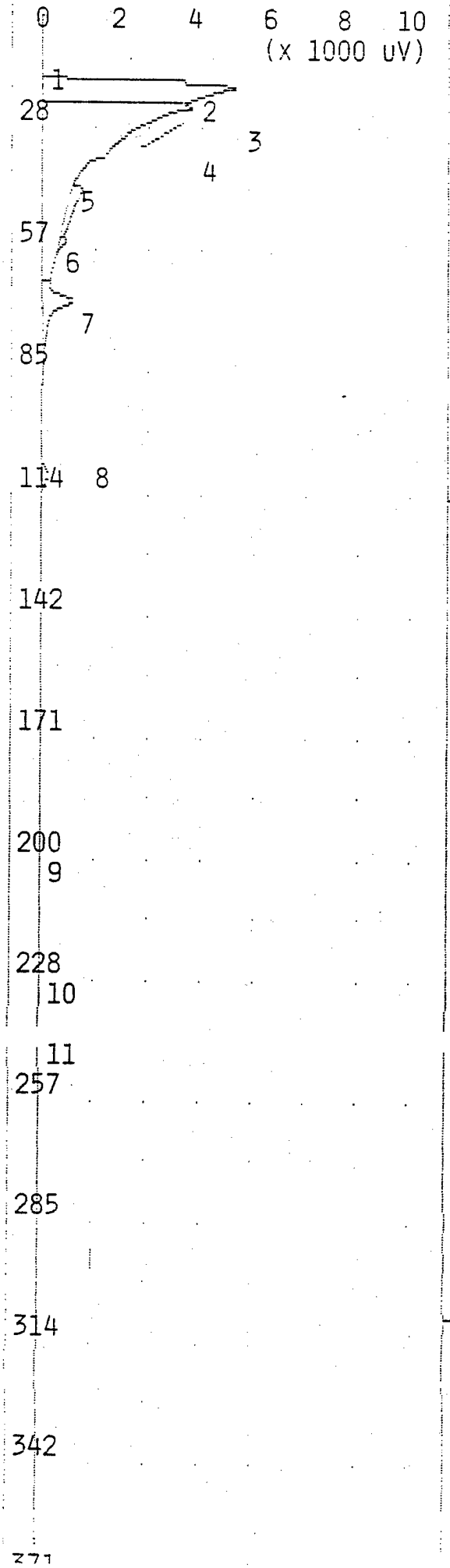
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 2.360 | MVS | 14.2 |
| 2 | UNKNOWN | 18.66 | MVS | 15.6 |
| 3 | UNKNOWN | 107.0 | MVS | 18.2 |
| 4 | UNKNOWN | 191.1 | MVS | 22.3 |
| 5 | UNKNOWN | 46.24 | MVS | 26.4 |
| 6 | UNKNOWN | 30.62 | MVS | 28.6 |
| 7 | UNKNOWN | 7.651 | MVS | 31.1 |
| 8 | UNKNOWN | 54.63 | MVS | 33.5 |
| 9 | UNKNOWN | 39.68 | MVS | 36.8 |
| 10 | UNKNOWN | 26.07 | MVS | 42.4 |
| 11 | UNKNOWN | 36.19 | MVS | 47.0 |
| 12 | BENZENE | 148.8 | PPB | 53.4 |
| 13 | UNKNOWN | 49.73 | MVS | 66.9 |
| 14 | UNKNOWN | 0.370 | MVS | 72.9 |
| 15 | UNKNOWN | 0.114 | MVS | 78.9 |
| 16 | UNKNOWN | 17.78 | MVS | 84.0 |
| 17 | TOLUENE | 14.79 | PPB | 107.4 |
| 18 | ETHYLBENZENE | 9.370 | PPB | 223.2 |
| 19 | M,P-XYLENE | 24.88 | PPB | 240.5 |
| 20 | O-XYLENE | 15.88 | PPB | 284.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003MW
20.0-22.0  10G

ANALYSIS #31 10S+ GC FUNCTION ANALYSIS REPORT




LH

TIME PRINTED: MAY 11,95 16:34
SAMPLE TIME: MAY 11,95 16:27

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 33 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

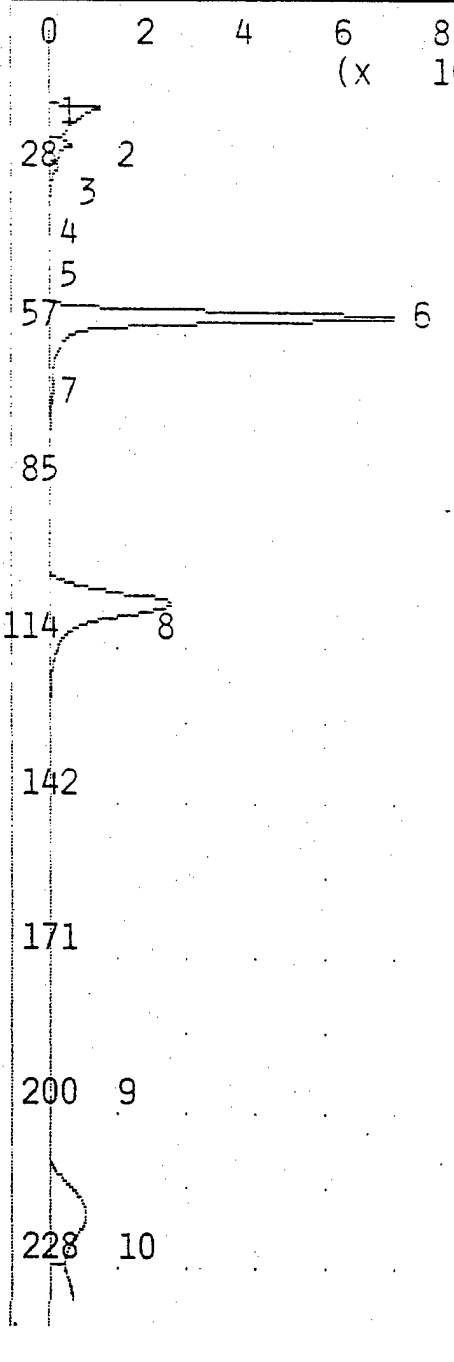
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.202 MVS | 14.2 |
| 2 | UNKNOWN | 4.079 MVS | 15.7 |
| 3 | UNKNOWN | 76.47 MVS | 17.1 |
| 4 | UNKNOWN | 0.660 MVS | 22.0 |
| 5 | UNKNOWN | 2.241 MVS | 41.0 |
| 6 | BENZENE | 0.158 PPB | 53.0 |
| 7 | UNKNOWN | 4.291 MVS | 67.3 |
| 8 | TOLUENE | 1.298 PPB | 107.6 |
| 9 | UNKNOWN | 0.789 MVS | 200.8 |
| 10 | ETHYLBENZENE | 0.629 PPB | 228.2 |
| 11 | M,P-XYLENE | 2.178 PPB | 238.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 08:55
SAMPLE TIME: MAY 13,95 08:48

METHOD

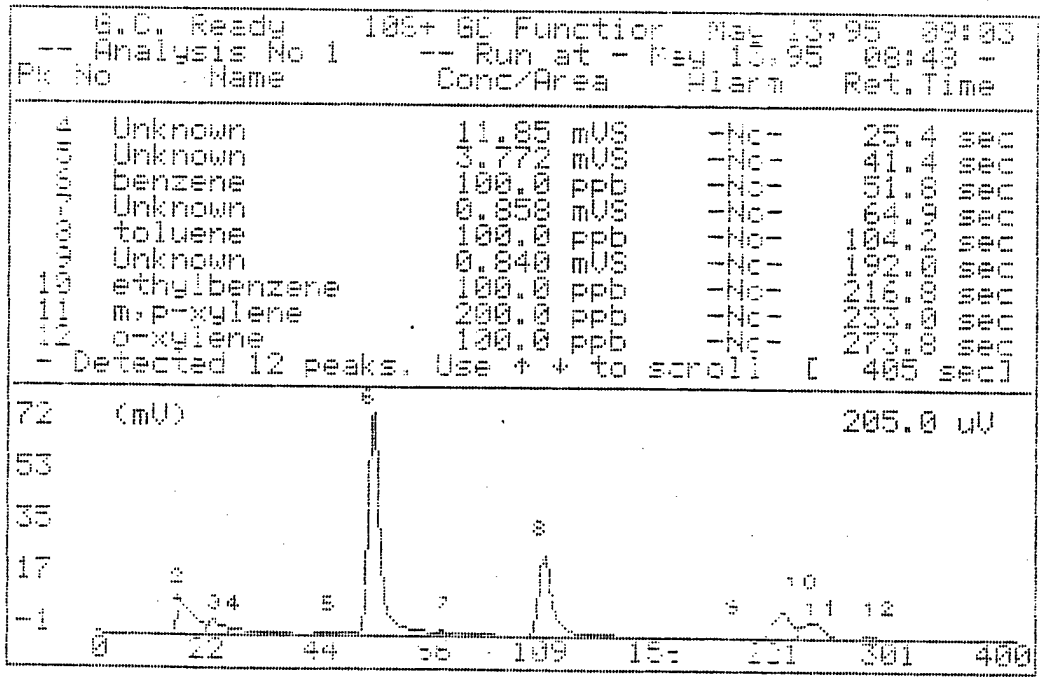
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 27 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

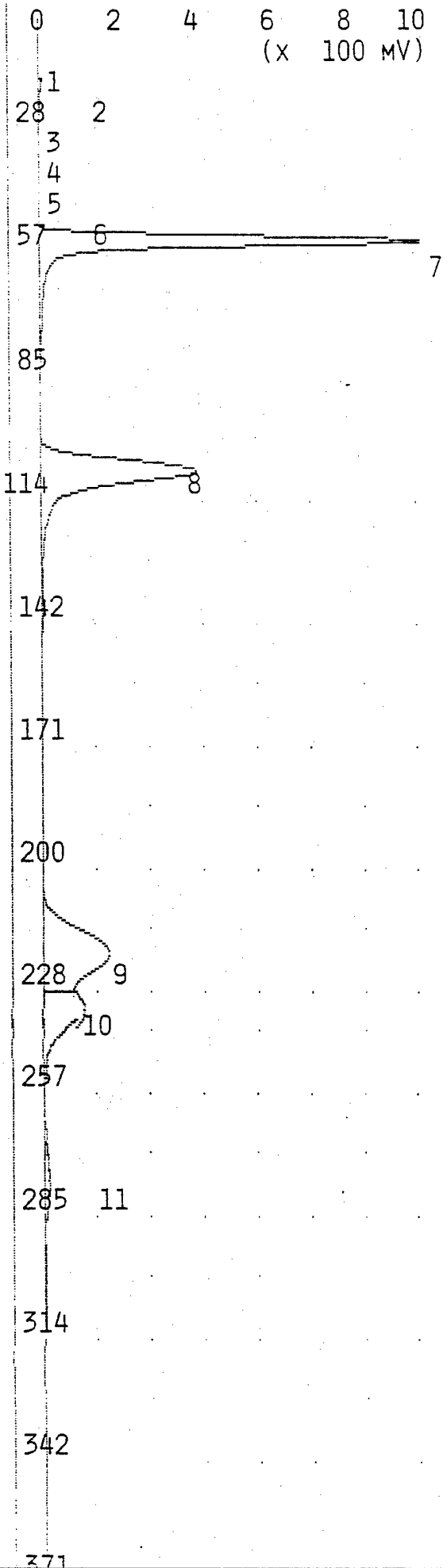
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.050 | MVS | 13.4 |
| 2 | UNKNOWN | 38.52 | MVS | 15.2 |
| 3 | UNKNOWN | 14.16 | MVS | 21.4 |
| 4 | UNKNOWN | 11.85 | MVS | 25.4 |
| 5 | UNKNOWN | 3.772 | MVS | 41.4 |
| 6 | UNKNOWN | 212.0 | MVS | 51.8 |
| 7 | UNKNOWN | 0.858 | MVS | 64.9 |
| 8 | UNKNOWN | 162.2 | MVS | 104.2 |
| 9 | UNKNOWN | 0.840 | MVS | 192.0 |
| 10 | UNKNOWN | 106.4 | MVS | 216.8 |
| 11 | UNKNOWN | 78.16 | MVS | 233.0 |
| 12 | UNKNOWN | 16.18 | MVS | 273.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


S.C. Ready 105+ GC Function
Analysis No 1 -- Run at -
Pk No Name Conc/Area Alarm Ret.Time
4 Unknown 11.85 mVS -Nc- 425.4 sec
5 Unknown 3.772 mVS -Nc- 441.4 sec
benzene 100.0 ppb -Nc- 451.6 sec
Unknown 0.850 mVS -Nc- 644.0 sec
toluene 100.0 ppb -Nc- 1044.2 sec
Unknown 0.840 mVS -Nc- 1192.0 sec
10 ethylbenzene 100.0 ppb -Nc- 2216.0 sec
11 m,p-xylene 200.0 ppb -Nc- 2340.0 sec
12 o-xylene 100.0 ppb -Nc- 2736.0 sec
Detected 12 peaks. Use ↑ ↓ to scroll [ 405 sec]
72 (mV)
205.0 uV
53
35
17
-1
0
22
44
88
109
132
301
400

ANALYSIS #2  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 09:11
SAMPLE TIME: MAY 13,95 09:04

METHOD

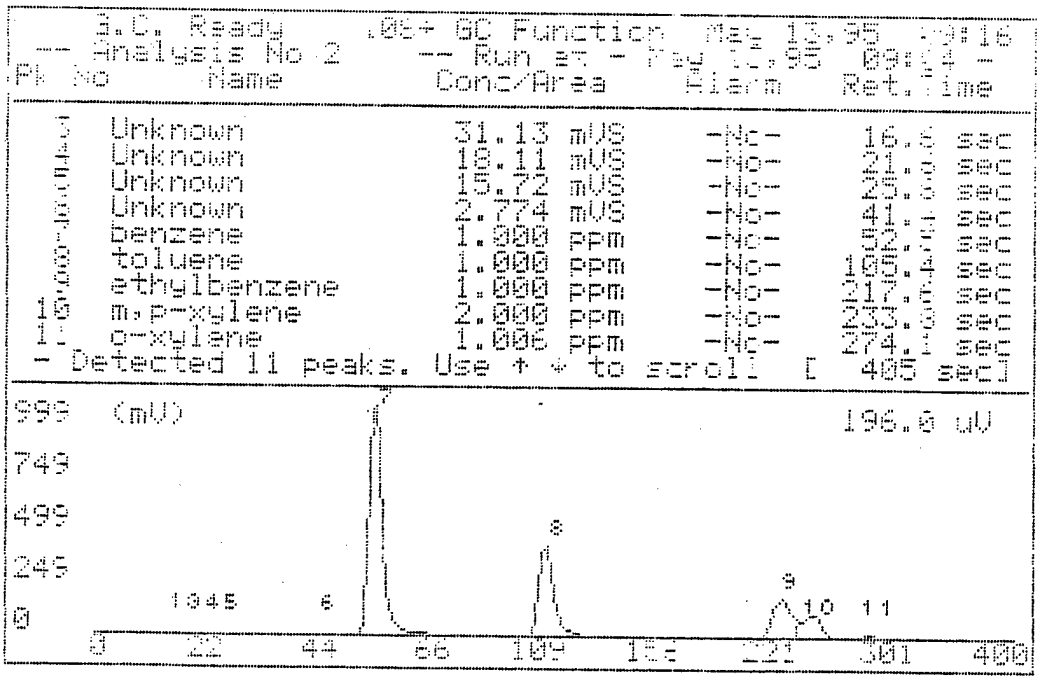
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

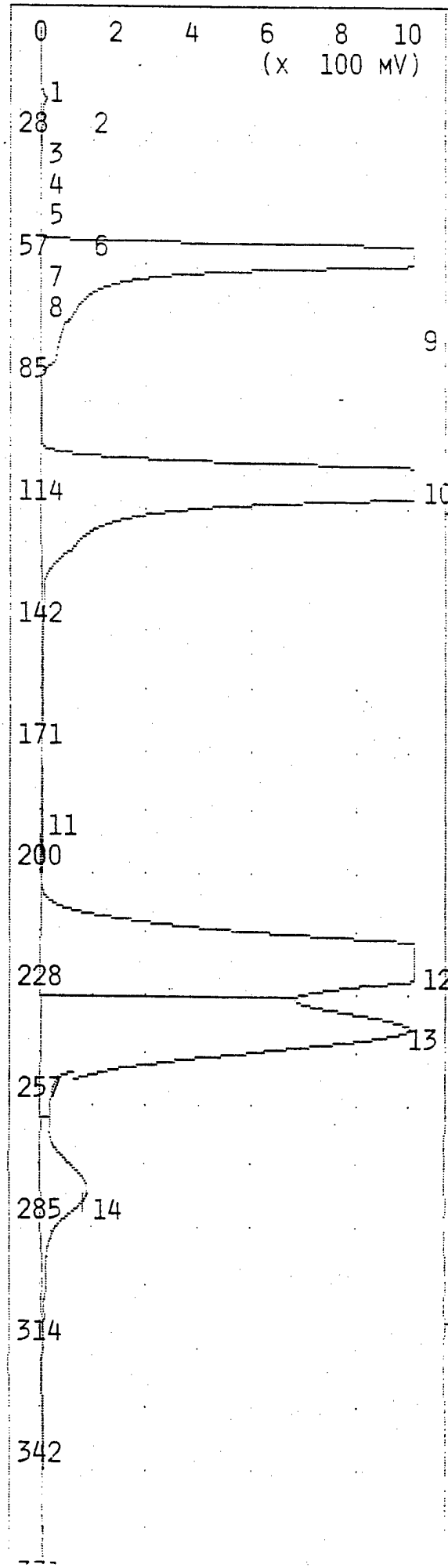
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.038 | MVS | 13.4 |
| 2 | UNKNOWN | 13.15 | MVS | 15.2 |
| 3 | UNKNOWN | 31.12 | MVS | 16.6 |
| 4 | UNKNOWN | 18.11 | MVS | 21.6 |
| 5 | UNKNOWN | 15.68 | MVS | 25.6 |
| 6 | UNKNOWN | 2.735 | MVS | 41.4 |
| 7 | BENZENE | 1.639 | PPM | 52.5 |
| 8 | TOLUENE | 1.852 | PPM | 105.4 |
| 9 | ETHYLBENZENE | 2.147 | PPM | 217.6 |
| 10 | M,P-XYLENE | 3.827 | PPM | 233.8 |
| 11 | O-XYLENE | 2.327 | PPM | 274.1 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


G.C. Ready
GC Function
Analysis No 2
Run #: - Rev
Pk No Name Conc/Area Alarm Ret. Time
Unknown 31.13 mVS No 16.6 sec
Unknown 18.11 mVS No 26.0 sec
Unknown 15.72 mVS No 41.0 sec
Unknown 2.774 mVS No 84.4 sec
benzene 1.000 ppm No 92.1 sec
toluene 1.000 ppm No 130.4 sec
ethylbenzene 1.000 ppm No 217.0 sec
m,p-xylene 2.000 ppm No 233.3 sec
o-xylene 1.006 ppm No 244.1 sec
- Detected 11 peaks. Use ↑ ↓ to scroll
405 sec
(mV)
196.0 uV
999
749
499
249
0
1 2 3 4 5 6 7 8 9 10 11
0 22 44 66 109 132 221 301 400

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 09:24
SAMPLE TIME: MAY 13,95 09:18

METHOD

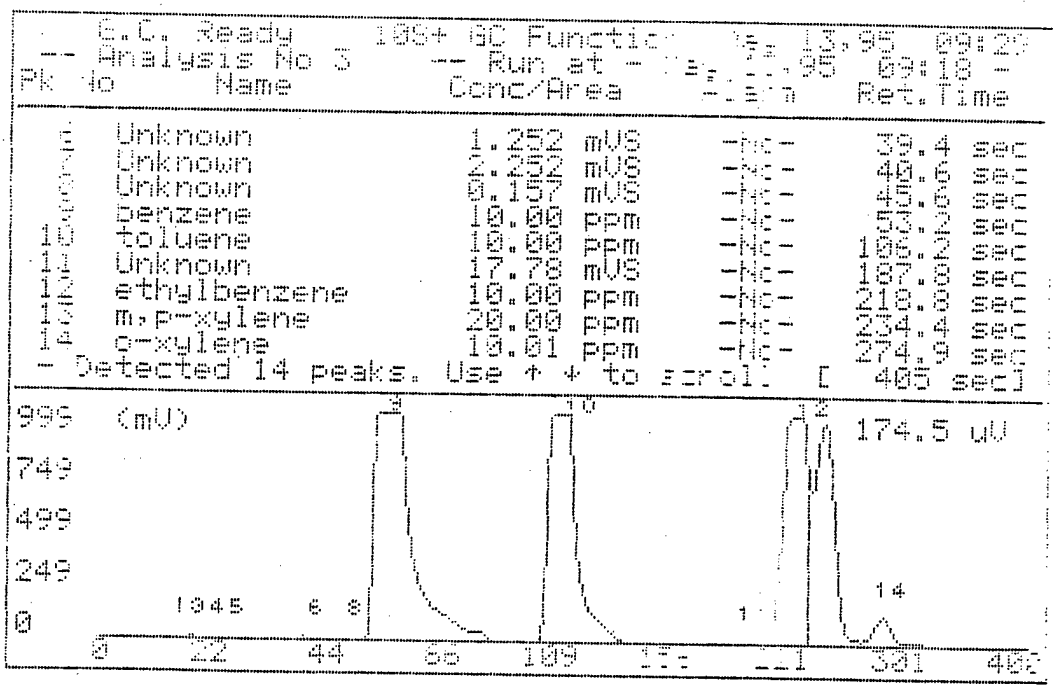
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

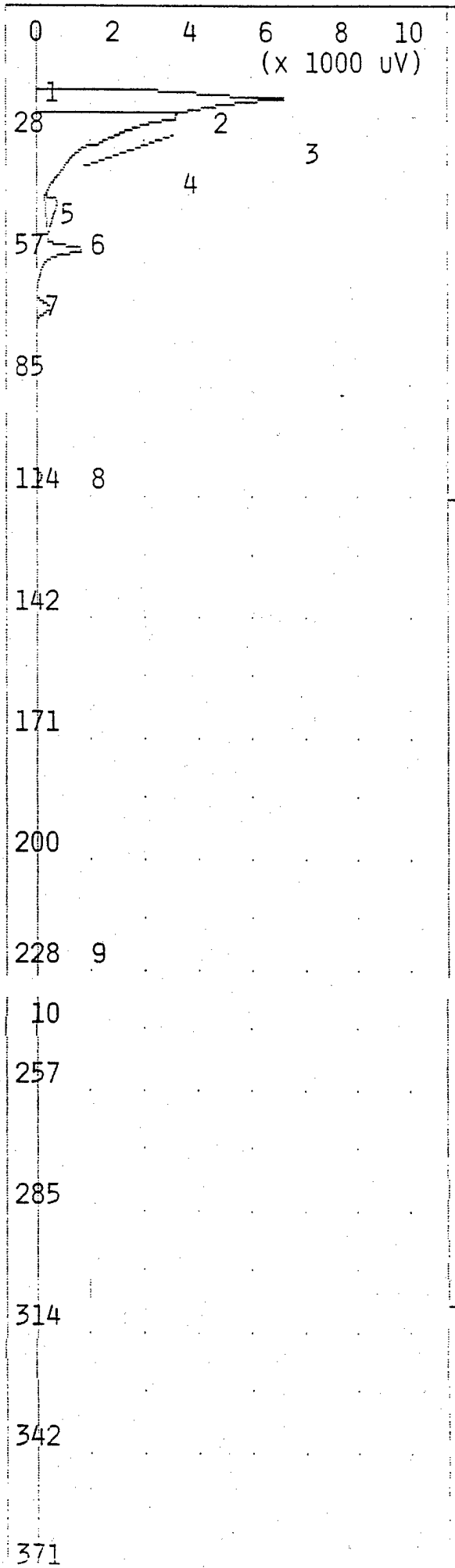
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.054 | MVS | 13.8 |
| 2 | UNKNOWN | 10.38 | MVS | 15.2 |
| 3 | UNKNOWN | 55.30 | MVS | 16.8 |
| 4 | UNKNOWN | 30.16 | MVS | 21.8 |
| 5 | UNKNOWN | 31.95 | MVS | 25.7 |
| 6 | UNKNOWN | 1.252 | MVS | 39.4 |
| 7 | UNKNOWN | 2.252 | MVS | 40.6 |
| 8 | UNKNOWN | 0.157 | MVS | 45.6 |
| 9 | BENZENE | 4.828 | PPM | 53.2 |
| 10 | TOLUENE | 6.827 | PPM | 106.2 |
| 11 | UNKNOWN | 17.78 | MVS | 187.8 |
| 12 | ETHYLBENZENE | 8.992 | PPM | 218.8 |
| 13 | M,P-XYLENE | 16.59 | PPM | 234.4 |
| 14 | O-XYLENE | 6.053 | PPM | 274.9 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX


G.C. Ready
Analysis No 3
Run at
Pk No
Name
Conc/Area
Ret.Time
Unknown
Unknown
Unknown
Benzene
toluene
Unknown
ethylbenzene
m,p-xylene
o-xylene
Detected 14 peaks. Use ↑ ↓ to scroll.
(mV)
999
749
499
249
0
174.5 uV
1945
0
22
44
66
88
110
132
154
176
198
220
242
264
286
308
330
352
374
396
418
440
462

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 09:38
SAMPLE TIME: MAY 13,95 09:31

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

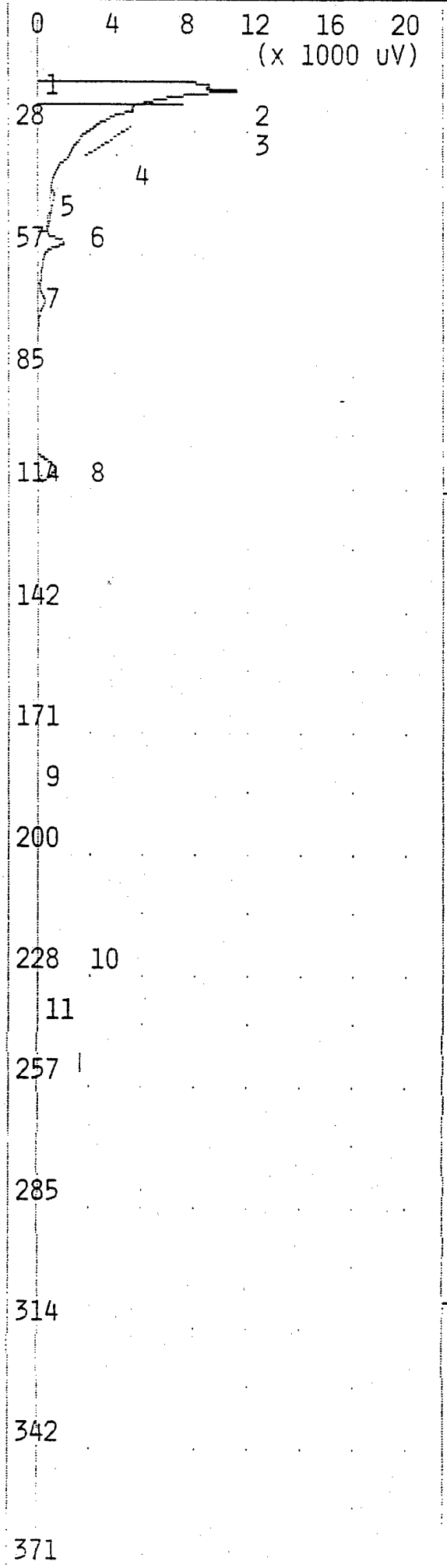
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.082 | MVS | 13.5 |
| 2 | UNKNOWN | 4.908 | MVS | 15.4 |
| 3 | UNKNOWN | 64.84 | MVS | 16.8 |
| 4 | UNKNOWN | 0.384 | MVS | 21.5 |
| 5 | UNKNOWN | 1.583 | MVS | 41.5 |
| 6 | BENZENE | 4.368 | PPB | 52.1 |
| 7 | UNKNOWN | 5.403 | MVS | 65.6 |
| 8 | TOLUENE | 2.513 | PPB | 105.7 |
| 9 | ETHYLBENZENE | 7.607 | PPB | 218.4 |
| 10 | M,P-XYLENE | 14.32 | PPB | 233.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 09:48
SAMPLE TIME: MAY 13,95 09:41

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

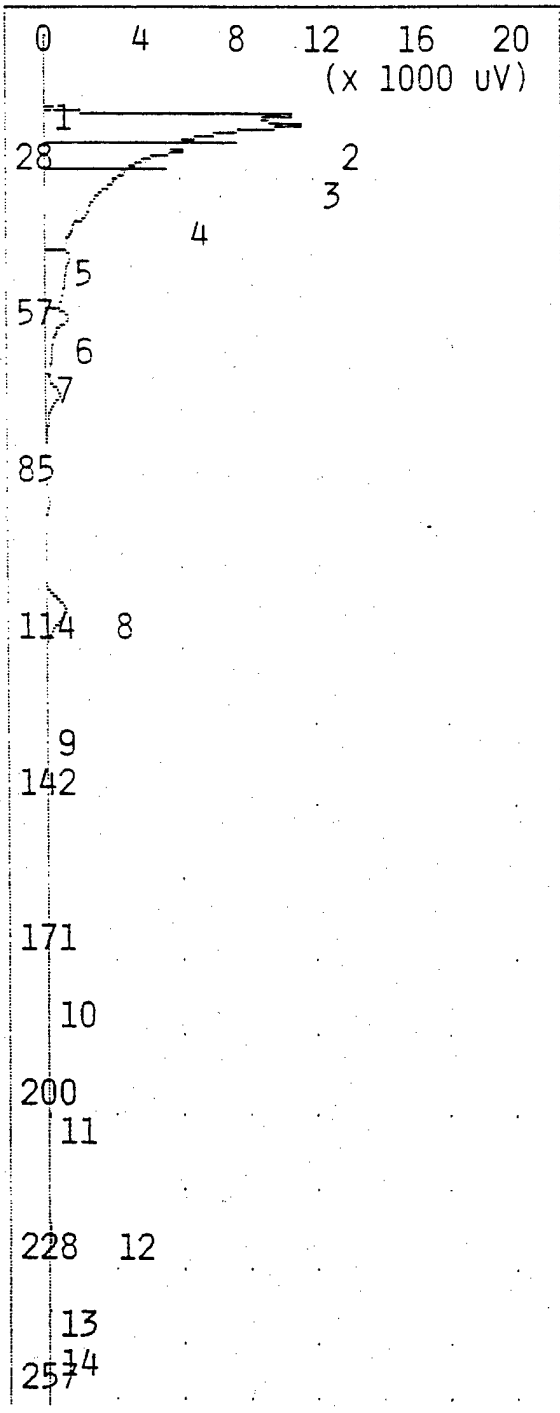
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.031 | MVS | 13.6 |
| 2 | UNKNOWN | 11.75 | MVS | 15.3 |
| 3 | UNKNOWN | 94.62 | MVS | 16.7 |
| 4 | UNKNOWN | 0.457 | MVS | 21.6 |
| 5 | UNKNOWN | 1.048 | MVS | 41.0 |
| 6 | BENZENE | 3.724 | PPB | 52.2 |
| 7 | UNKNOWN | 3.857 | MVS | 66.1 |
| 8 | TOLUENE | 4.311 | PPB | 105.7 |
| 9 | UNKNOWN | 3.199 | MVS | 177.6 |
| 10 | ETHYLBENZENE | 4.346 | PPB | 218.8 |
| 11 | M,P-XYLENE | 9.210 | PPB | 233.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-009BH
0.5- 2.5 10G

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 09:59
SAMPLE TIME: MAY 13,95 09:52

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

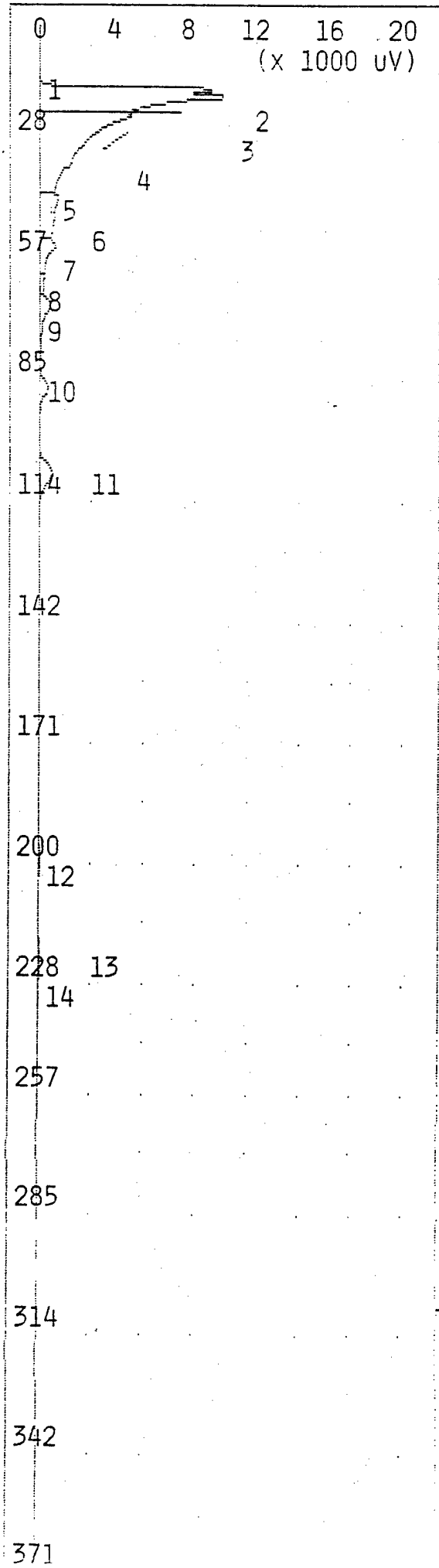
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.570 | MVS | 13.9 |
| 2 | UNKNOWN | 12.84 | MVS | 15.2 |
| 3 | UNKNOWN | 39.49 | MVS | 16.8 |
| 4 | UNKNOWN | 50.78 | MVS | 21.7 |
| 5 | UNKNOWN | 10.41 | MVS | 41.0 |
| 6 | BENZENE | 3.098 | PPB | 52.6 |
| 7 | UNKNOWN | 4.202 | MVS | 66.2 |
| 8 | TOLUENE | 3.969 | PPB | 105.6 |
| 9 | UNKNOWN | 0.294 | MVS | 124.2 |
| 10 | UNKNOWN | 0.474 | MVS | 180.2 |
| 11 | UNKNOWN | 3.136 | MVS | 198.4 |
| 12 | ETHYLBENZENE | 3.380 | PPB | 218.8 |
| 13 | M,P-XYLENE | 2.321 | PPB | 234.6 |
| 14 | UNKNOWN | 1.483 | MVS | 237.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-009BH
5.0- 7.0 10G

ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 10:09
SAMPLE TIME: MAY 13,95 10:03

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

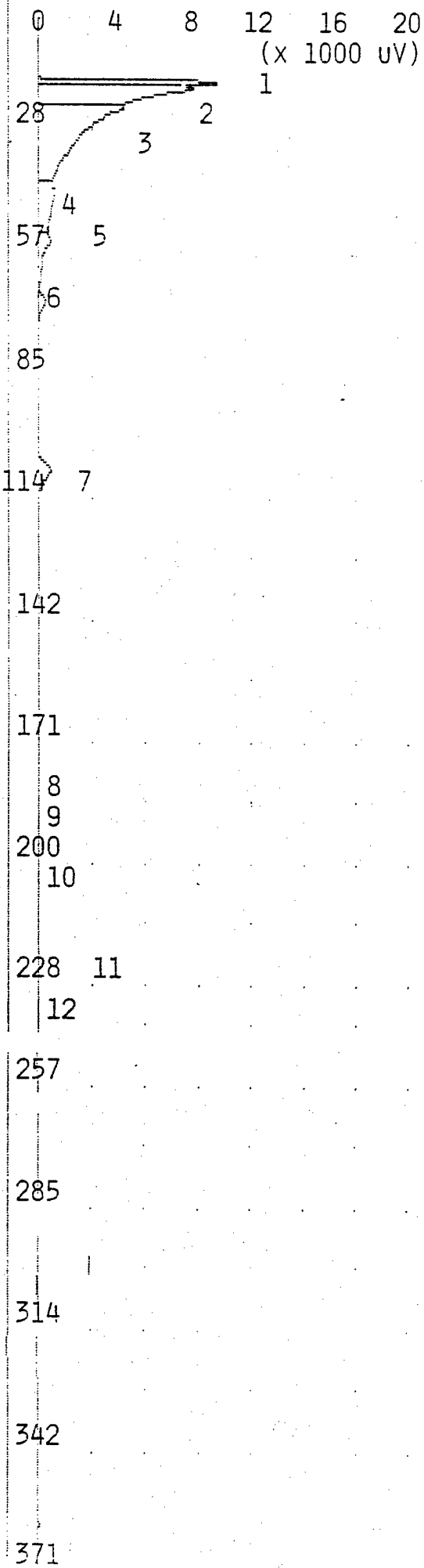
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.048 | MVS | 11.0 |
| 2 | UNKNOWN | 13.11 | MVS | 15.2 |
| 3 | UNKNOWN | 83.85 | MVS | 17.2 |
| 4 | UNKNOWN | 0.924 | MVS | 21.8 |
| 5 | UNKNOWN | 0.015 | MVS | 39.2 |
| 6 | UNKNOWN | 10.31 | MVS | 40.8 |
| 7 | BENZENE | 2.510 | PPB | 52.5 |
| 8 | UNKNOWN | 1.613 | MVS | 59.2 |
| 9 | UNKNOWN | 5.620 | MVS | 66.4 |
| 10 | UNKNOWN | 3.196 | MVS | 85.6 |
| 11 | TOLUENE | 3.173 | PPB | 105.7 |
| 12 | UNKNOWN | 2.049 | MVS | 197.4 |
| 13 | ETHYLBENZENE | 0.102 | PPB | 216.8 |
| 14 | UNKNOWN | 0.890 | MVS | 222.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-009BH
10.0-12.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 10:20
SAMPLE TIME: MAY 13,95 10:13

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

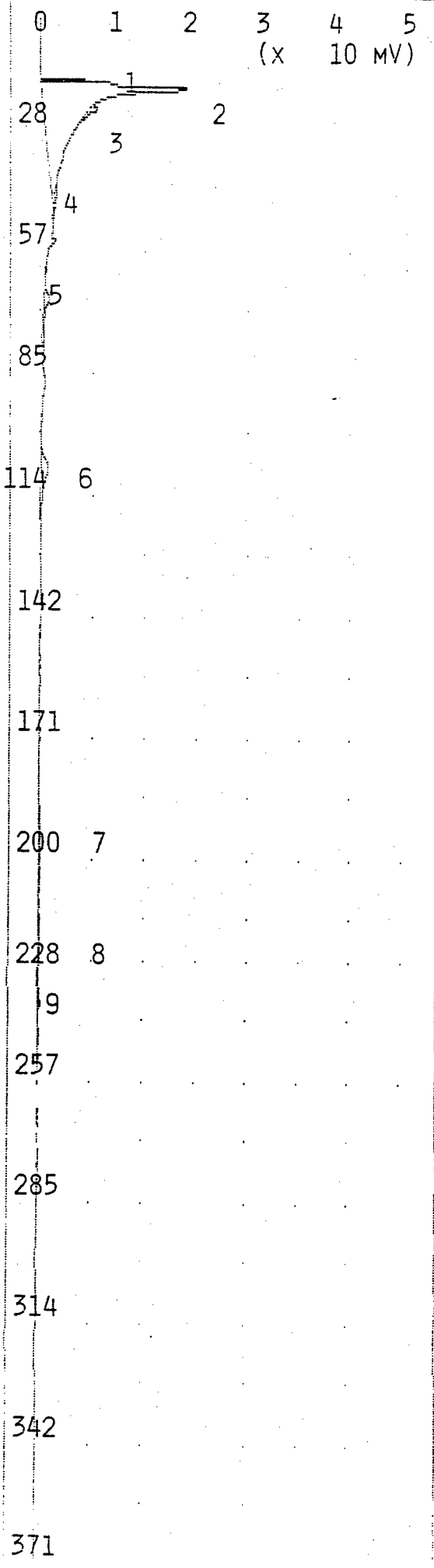
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 13.55 | MVS | 15.4 |
| 2 | UNKNOWN | 32.71 | MVS | 16.8 |
| 3 | UNKNOWN | 40.86 | MVS | 21.9 |
| 4 | UNKNOWN | 10.27 | MVS | 40.8 |
| 5 | BENZENE | 2.234 | PPB | 52.2 |
| 6 | UNKNOWN | 2.847 | MVS | 66.4 |
| 7 | TOLUENE | 3.209 | PPB | 106.1 |
| 8 | UNKNOWN | 0.121 | MVS | 177.0 |
| 9 | UNKNOWN | 0.113 | MVS | 183.6 |
| 10 | UNKNOWN | 1.343 | MVS | 196.0 |
| 11 | ETHYLBENZENE | 1.352 | PPB | 222.6 |
| 12 | M,P-XYLENE | 4.279 | PPB | 236.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-011BH
0.5- 2.5 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 10:30
SAMPLE TIME: MAY 13,95 10:23

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

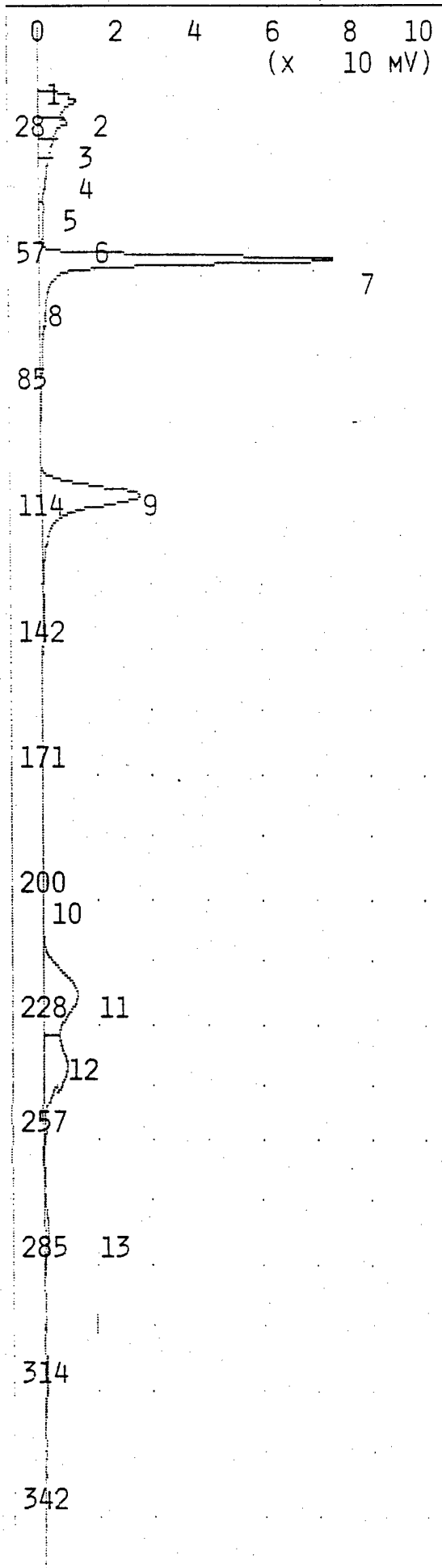
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 9.868 | MVS | 15.4 |
| 2 | UNKNOWN | 121.7 | MVS | 16.9 |
| 3 | UNKNOWN | 1.529 | MVS | 21.9 |
| 4 | UNKNOWN | 0.973 | MVS | 41.0 |
| 5 | UNKNOWN | 2.854 | MVS | 66.4 |
| 6 | TOLUENE | 3.718 | PPB | 106.2 |
| 7 | UNKNOWN | 1.185 | MVS | 194.8 |
| 8 | ETHYLBENZENE | 2.205 | PPB | 221.2 |
| 9 | M,P-XYLENE | 5.703 | PPB | 238.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-011BH
5.0- 7.0 10G

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 10:40
SAMPLE TIME: MAY 13,95 10:33

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

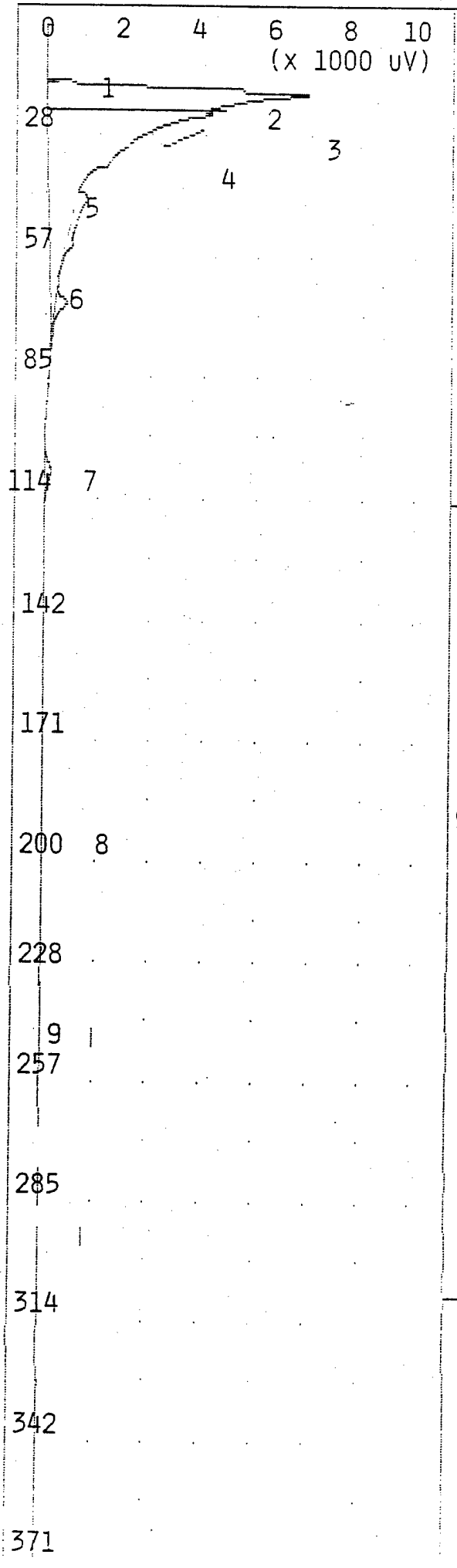
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.037 MVS | 13.6 |
| 2 | UNKNOWN | 9.026 MVS | 15.4 |
| 3 | UNKNOWN | 36.52 MVS | 16.9 |
| 4 | UNKNOWN | 25.22 MVS | 22.0 |
| 5 | UNKNOWN | 35.84 MVS | 26.0 |
| 6 | UNKNOWN | 10.47 MVS | 40.8 |
| 7 | BENZENE | 105.9 PPB | 52.7 |
| 8 | UNKNOWN | 1.140 MVS | 65.7 |
| 9 | TOLUENE | 100.4 PPB | 106.1 |
| 10 | UNKNOWN | 0.797 MVS | 195.6 |
| 11 | ETHYLBENZENE | 101.4 PPB | 220.0 |
| 12 | M,P-XYLENE | 206.9 PPB | 236.2 |
| 13 | O-XYLENE | 99.11 PPB | 277.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 10:50
SAMPLE TIME: MAY 13,95 10:43

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MV*SEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

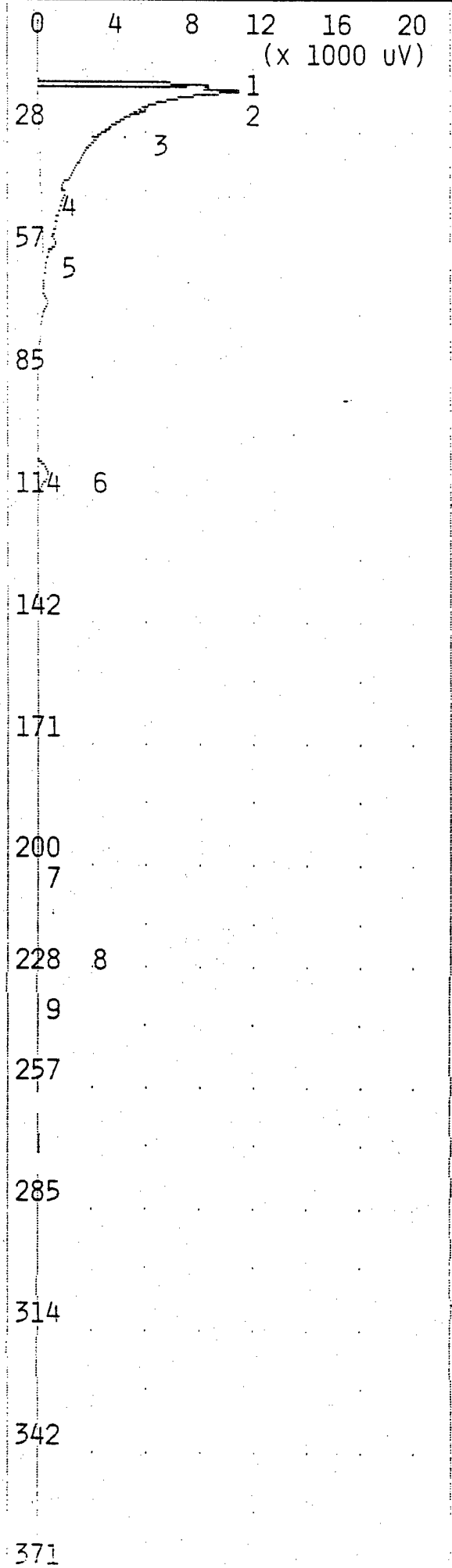
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 1.070 | MVS | 14.2 |
| 2 | UNKNOWN | 5.542 | MVS | 15.5 |
| 3 | UNKNOWN | 85.71 | MVS | 16.8 |
| 4 | UNKNOWN | 0.629 | MVS | 21.8 |
| 5 | UNKNOWN | 2.354 | MVS | 41.0 |
| 6 | UNKNOWN | 1.092 | MVS | 66.2 |
| 7 | TOLUENE | 0.753 | PPB | 106.4 |
| 8 | UNKNOWN | 0.597 | MVS | 193.8 |
| 9 | M,P-XYLENE | 3.468 | PPB | 238.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 11:00
SAMPLE TIME: MAY 13,95 10:54

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

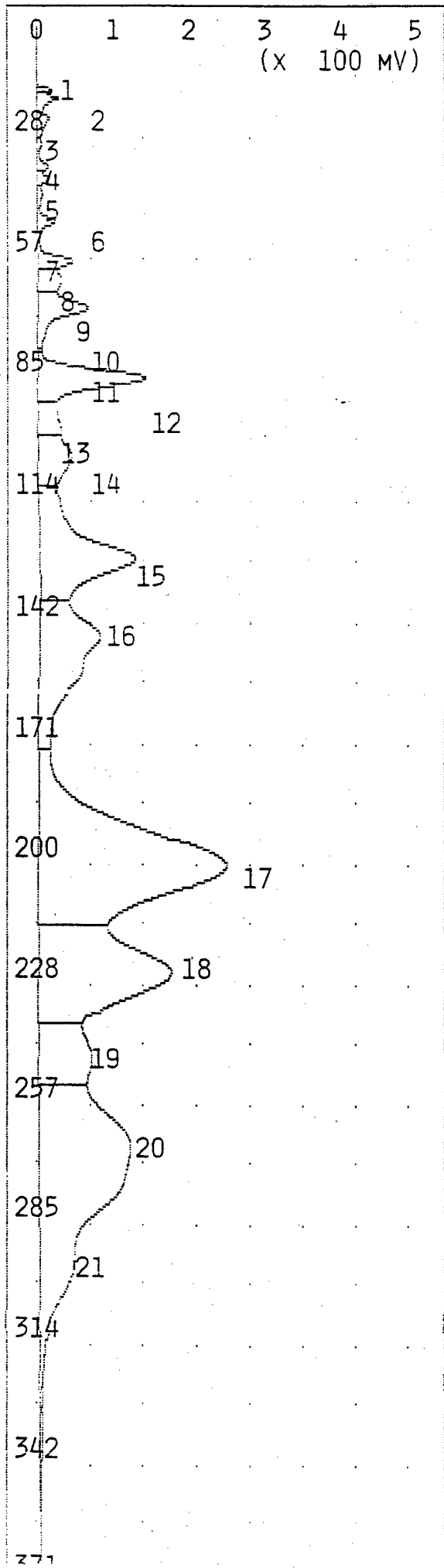
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 10.91 | MVS | 15.4 |
| 2 | UNKNOWN | 108.4 | MVS | 16.8 |
| 3 | UNKNOWN | 0.369 | MVS | 21.8 |
| 4 | UNKNOWN | 1.166 | MVS | 40.8 |
| 5 | BENZENE | 0.216 | PPB | 52.5 |
| 6 | TOLUENE | 2.543 | PPB | 106.2 |
| 7 | UNKNOWN | 0.790 | MVS | 195.4 |
| 8 | ETHYLBENZENE | 1.204 | PPB | 220.6 |
| 9 | M,P-XYLENE | 2.719 | PPB | 236.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-008BH
0.5- 2.5 10G

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 11:10
SAMPLE TIME: MAY 13,95 11:04

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

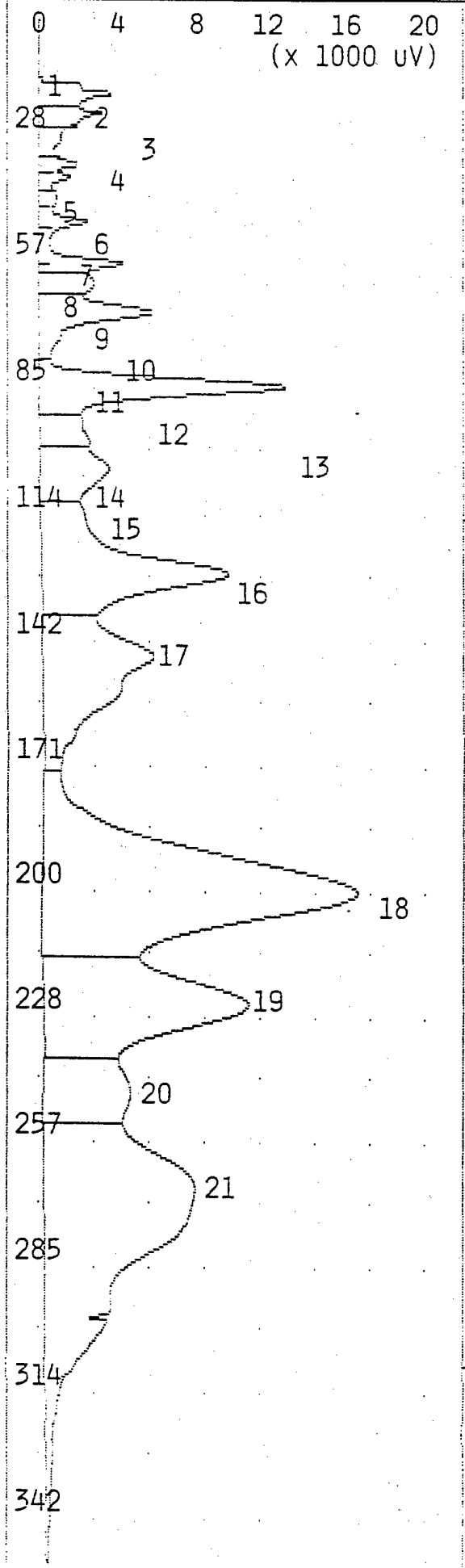
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 29.13 | MVS | 15.4 |
| 2 | UNKNOWN | 75.27 | MVS | 17.4 |
| 3 | UNKNOWN | 64.53 | MVS | 22.1 |
| 4 | UNKNOWN | 17.10 | MVS | 28.0 |
| 5 | UNKNOWN | 41.53 | MVS | 33.4 |
| 6 | UNKNOWN | 36.00 | MVS | 36.4 |
| 7 | UNKNOWN | 28.57 | MVS | 40.2 |
| 8 | UNKNOWN | 72.05 | MVS | 46.4 |
| 9 | BENZENE | 72.22 | PPB | 55.8 |
| 10 | UNKNOWN | 146.3 | MVS | 60.4 |
| 11 | UNKNOWN | 379.0 | MVS | 66.9 |
| 12 | UNKNOWN | 781.9 | MVS | 83.6 |
| 13 | UNKNOWN | 212.3 | MVS | 96.2 |
| 14 | TOLUENE | 183.9 | PPB | 102.0 |
| 15 | UNKNOWN | 1.647 | VSEC | 125.7 |
| 16 | UNKNOWN | 1.545 | VSEC | 144.2 |
| 17 | UNKNOWN | 5.131 | VSEC | 198.0 |
| 18 | ETHYLBENZENE | 1.274 | PPM | 223.4 |
| 19 | M,P-XYLENE | 1.291 | PPM | 244.0 |
| 20 | O-XYLENE | 18.92 | PPM | 265.0 |
| 21 | UNKNOWN | 1.441 | MVS | 291.4 |

NOTES

JOE BYRD, JR
DULUTH ANGB
025-008BH
7.0- 9.0 20G

ANALYSIS #14  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 11:28
SAMPLE TIME: MAY 13,95 11:21

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

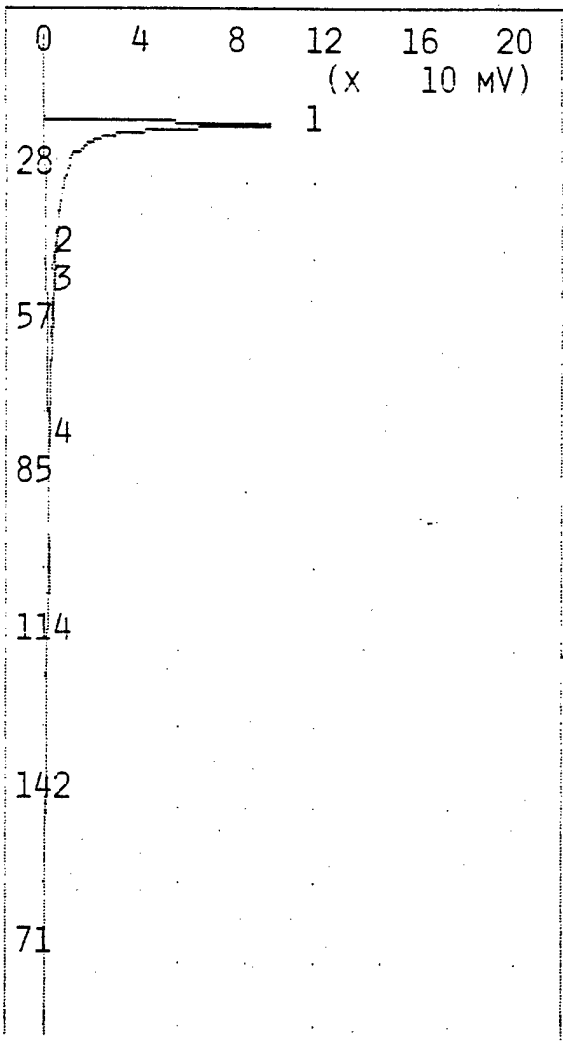
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.322 | MVS | 14.0 |
| 2 | UNKNOWN | 3.064 | MVS | 14.9 |
| 3 | UNKNOWN | 13.60 | MVS | 17.2 |
| 4 | UNKNOWN | 13.18 | MVS | 21.6 |
| 5 | UNKNOWN | 3.867 | MVS | 27.6 |
| 6 | UNKNOWN | 6.124 | MVS | 32.9 |
| 7 | UNKNOWN | 4.646 | MVS | 36.0 |
| 8 | UNKNOWN | 4.462 | MVS | 40.6 |
| 9 | UNKNOWN | 9.834 | MVS | 46.2 |
| 10 | BENZENE | 7.096 | PPB | 55.6 |
| 11 | UNKNOWN | 13.83 | MVS | 59.5 |
| 12 | UNKNOWN | 34.50 | MVS | 66.5 |
| 13 | UNKNOWN | 67.10 | MVS | 83.3 |
| 14 | UNKNOWN | 17.99 | MVS | 95.6 |
| 15 | TOLUENE | 21.83 | PPB | 101.8 |
| 16 | UNKNOWN | 118.9 | MVS | 125.6 |
| 17 | UNKNOWN | 112.7 | MVS | 143.8 |
| 18 | UNKNOWN | 324.6 | MVS | 198.2 |
| 19 | ETHYLBENZENE | 126.4 | PPB | 223.6 |
| 20 | M,P-XYLENE | 157.6 | PPB | 244.0 |
| 21 | O-XYLENE | 805.7 | PPB | 266.1 |

NOTES

JOE BYRD, JR
DULUTH ANGB
025-008BH RESHOT
7.0- 9.0 20G
10 MICROLITER INJECTION

ANALYSIS #15 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 11:43
SAMPLE TIME: MAY 13,95 11:36

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

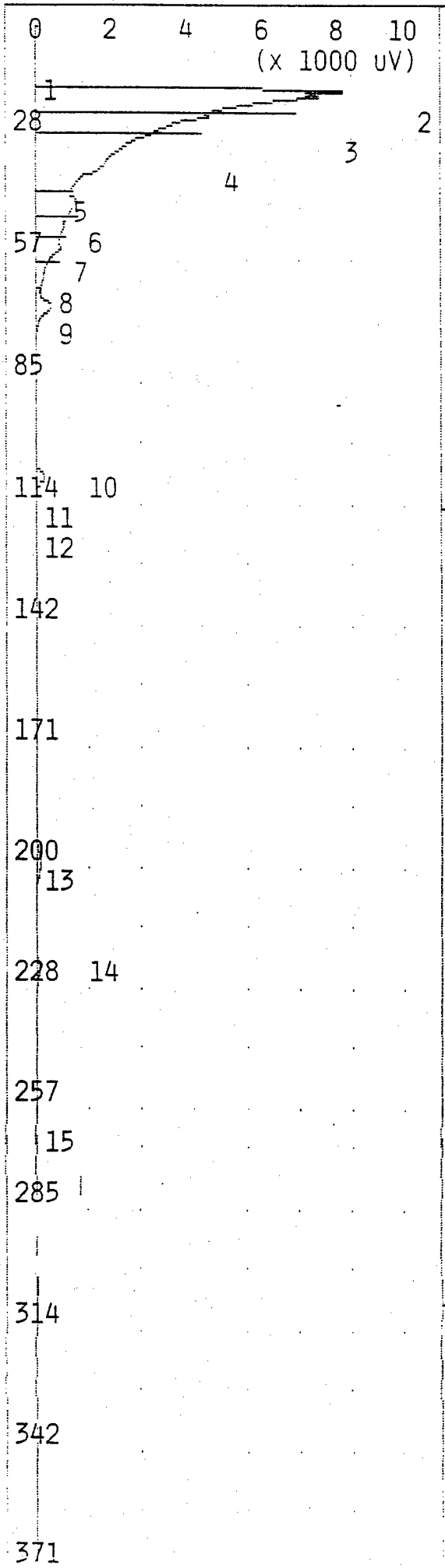
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 485.5 MVS | 16.6 |
| 2 | UNKNOWN | 0.538 MVS | 34.8 |
| 3 | UNKNOWN | 1.735 MVS | 40.7 |
| 4 | UNKNOWN | 0.343 MVS | 66.9 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-008BH
9.0-11.0 10G
10 MICROLITER INJECTION

ANALYSIS #16 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 11:54
SAMPLE TIME: MAY 13,95 11:47

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

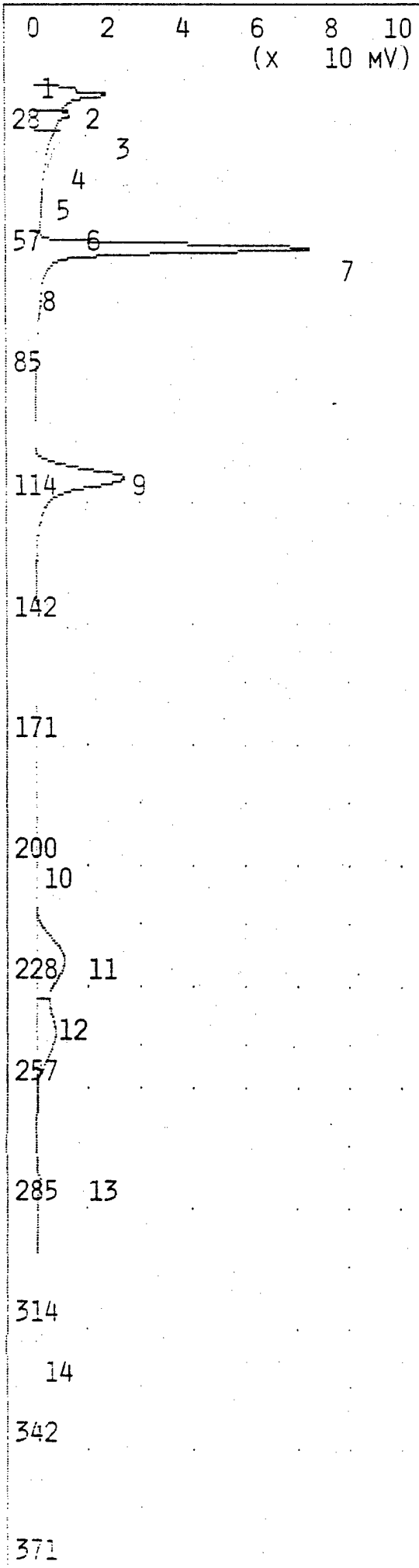
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.023 | MVS | 13.6 |
| 2 | UNKNOWN | 10.76 | MVS | 15.2 |
| 3 | UNKNOWN | 30.78 | MVS | 16.7 |
| 4 | UNKNOWN | 46.44 | MVS | 21.7 |
| 5 | UNKNOWN | 1.399 | MVS | 41.0 |
| 6 | UNKNOWN | 5.266 | MVS | 42.0 |
| 7 | UNKNOWN | 4.864 | MVS | 46.0 |
| 8 | BENZENE | 2.285 | PPB | 52.4 |
| 9 | UNKNOWN | 3.342 | MVS | 66.1 |
| 10 | TOLUENE | 1.706 | PPB | 105.0 |
| 11 | UNKNOWN | 0.121 | MVS | 115.3 |
| 12 | UNKNOWN | 0.133 | MVS | 122.5 |
| 13 | UNKNOWN | 6.735 | MVS | 197.4 |
| 14 | ETHYLBENZENE | 6.271 | PPB | 222.6 |
| 15 | O-XYLENE | 30.13 | PPB | 266.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-008BH RESHOT
9.0-11.0 10G
50 MICROLITER INJECTION

ANALYCIC #17  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 12:04
SAMPLE TIME: MAY 13,95 11:58

METHOD

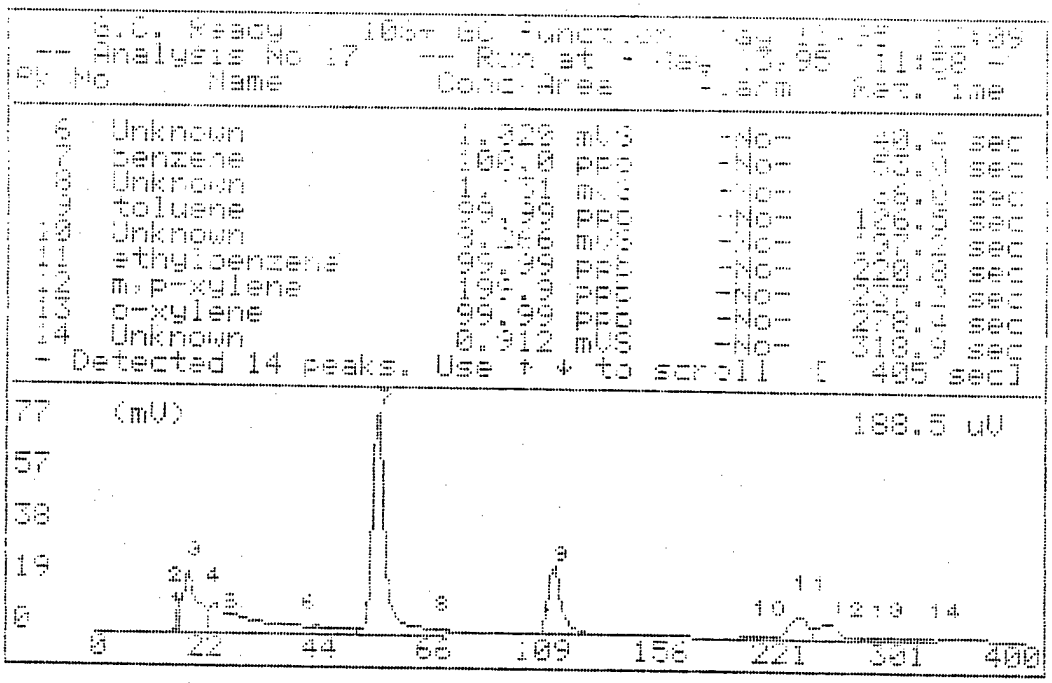
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

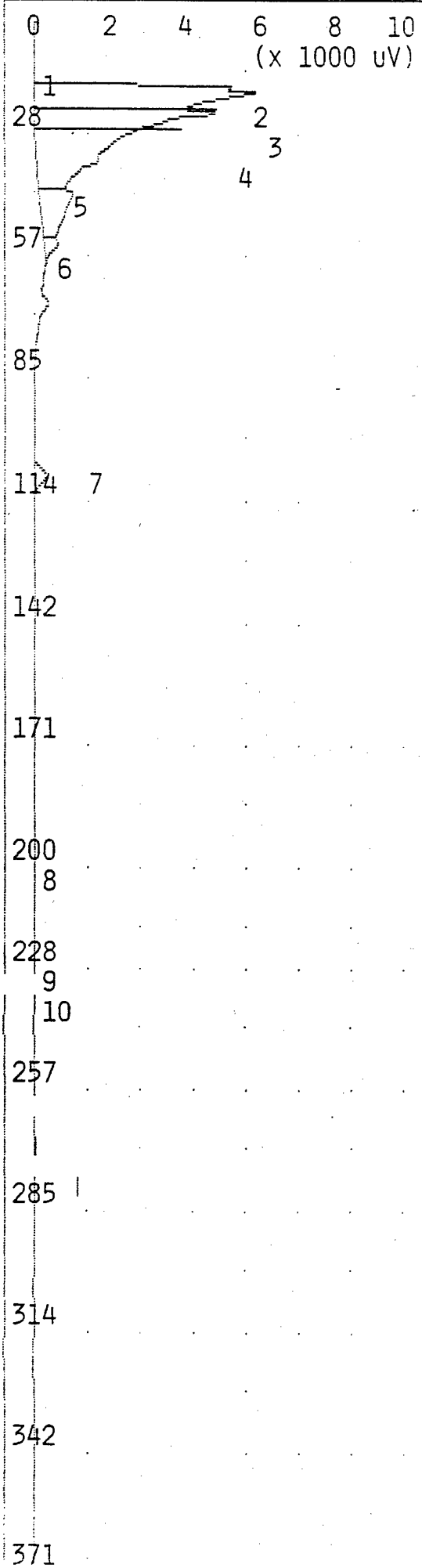
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.056 | MVS | 13.8 |
| 2 | UNKNOWN | 12.71 | MVS | 15.4 |
| 3 | UNKNOWN | 61.14 | MVS | 16.9 |
| 4 | UNKNOWN | 107.9 | MVS | 22.0 |
| 5 | UNKNOWN | 0.194 | MVS | 26.0 |
| 6 | UNKNOWN | 1.020 | MVS | 40.4 |
| 7 | BENZENE | 108.4 | PPB | 53.0 |
| 8 | UNKNOWN | 1.131 | MVS | 66.0 |
| 9 | TOLUENE | 94.77 | PPB | 106.5 |
| 10 | UNKNOWN | 8.266 | MVS | 197.2 |
| 11 | ETHYLBENZENE | 100.7 | PPB | 220.8 |
| 12 | M,P-XYLENE | 214.4 | PPB | 237.2 |
| 13 | O-XYLENE | 143.7 | PPB | 278.4 |
| 14 | UNKNOWN | 0.912 | MVS | 318.9 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


S.C. Measey
Analysis No 17
Run at
Pk No
Name
Conc
Area
Warn
Ret. time
Unknown
benzene
Unknown
toluene
Unknown
ethylbenzene
m,P-xylene
o-xylene
Unknown
Detected 14 peaks. Use ↑ ↓ to scroll
77
(mU)
57
38
19
0
188.5 uV
0
22
44
66
109
154
221
331
400

ANALYSIS #18  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 12:17
SAMPLE TIME: MAY 13,95 12:10

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

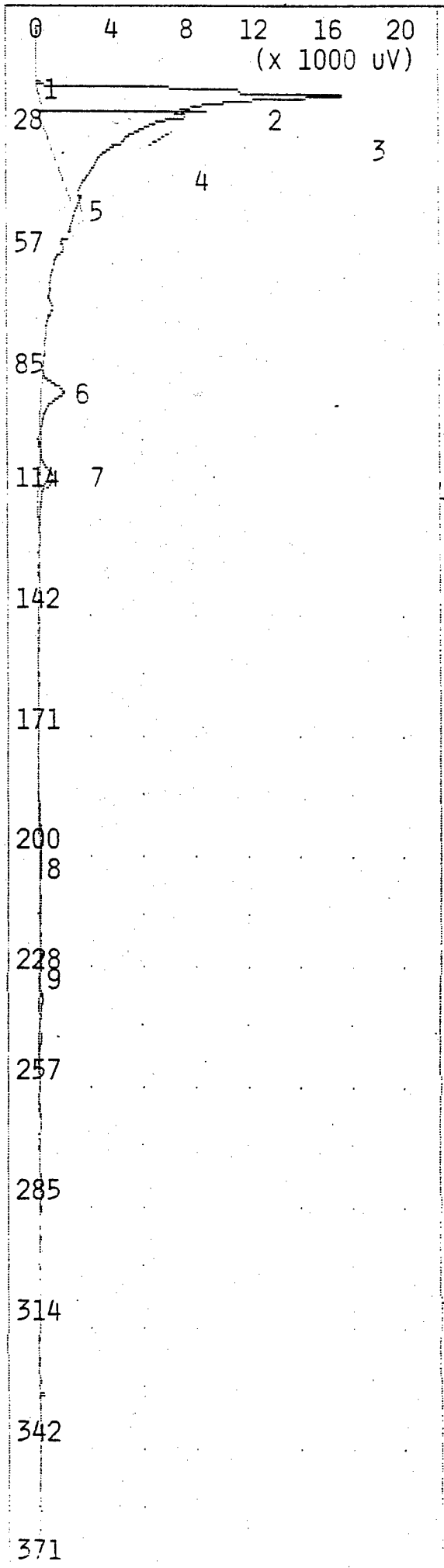
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.162 | MVS | 14.0 |
| 2 | UNKNOWN | 5.943 | MVS | 15.5 |
| 3 | UNKNOWN | 24.13 | MVS | 16.8 |
| 4 | UNKNOWN | 41.35 | MVS | 21.8 |
| 5 | UNKNOWN | 7.231 | MVS | 41.0 |
| 6 | BENZENE | 0.516 | PPB | 52.4 |
| 7 | TOLUENE | 1.721 | PPB | 106.9 |
| 8 | UNKNOWN | 1.523 | MVS | 197.0 |
| 9 | ETHYLBENZENE | 0.947 | PPB | 228.4 |
| 10 | M,P-XYLENE | 2.371 | PPB | 235.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #19 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 12:27
SAMPLE TIME: MAY 13,95 12:21

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.000 | MV/SEC |
| SLOPE DOWN | 3.000 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

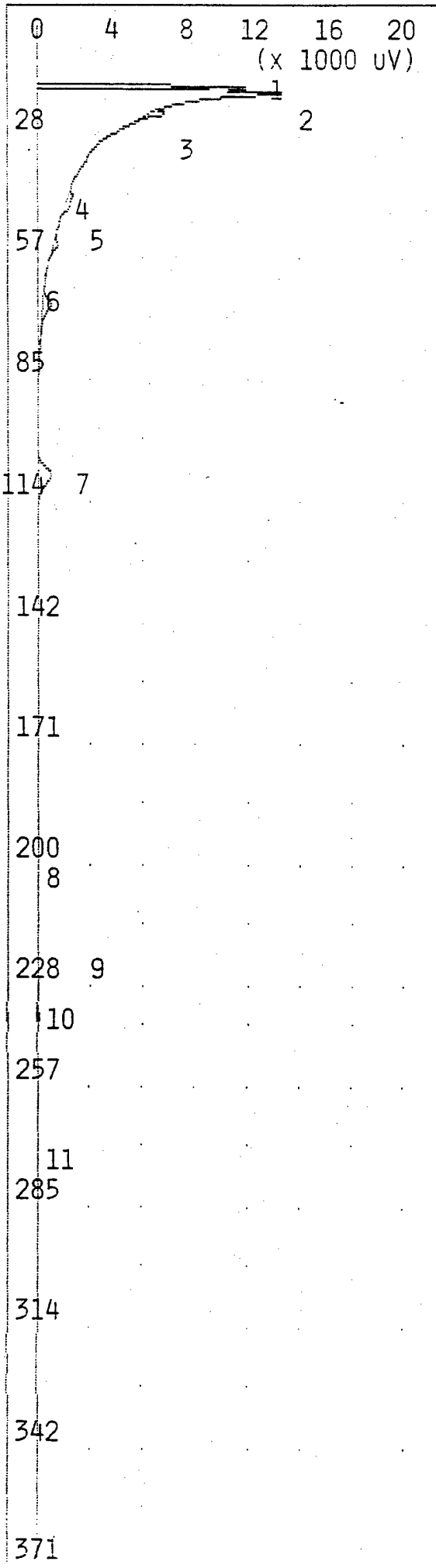
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.392 | MVS | 14.1 |
| 2 | UNKNOWN | 11.99 | MVS | 15.4 |
| 3 | UNKNOWN | 107.8 | MVS | 16.8 |
| 4 | UNKNOWN | 1.300 | MVS | 21.9 |
| 5 | UNKNOWN | 0.212 | MVS | 40.7 |
| 6 | UNKNOWN | 5.854 | MVS | 86.4 |
| 7 | TOLUENE | 3.075 | PPB | 106.8 |
| 8 | UNKNOWN | 0.903 | MVS | 200.8 |
| 9 | ETHYLBENZENE | 2.494 | PPB | 228.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-008BH
13.0-15.0 10G

ANALYCIC #20 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 12:37
SAMPLE TIME: MAY 13,95 12:31

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

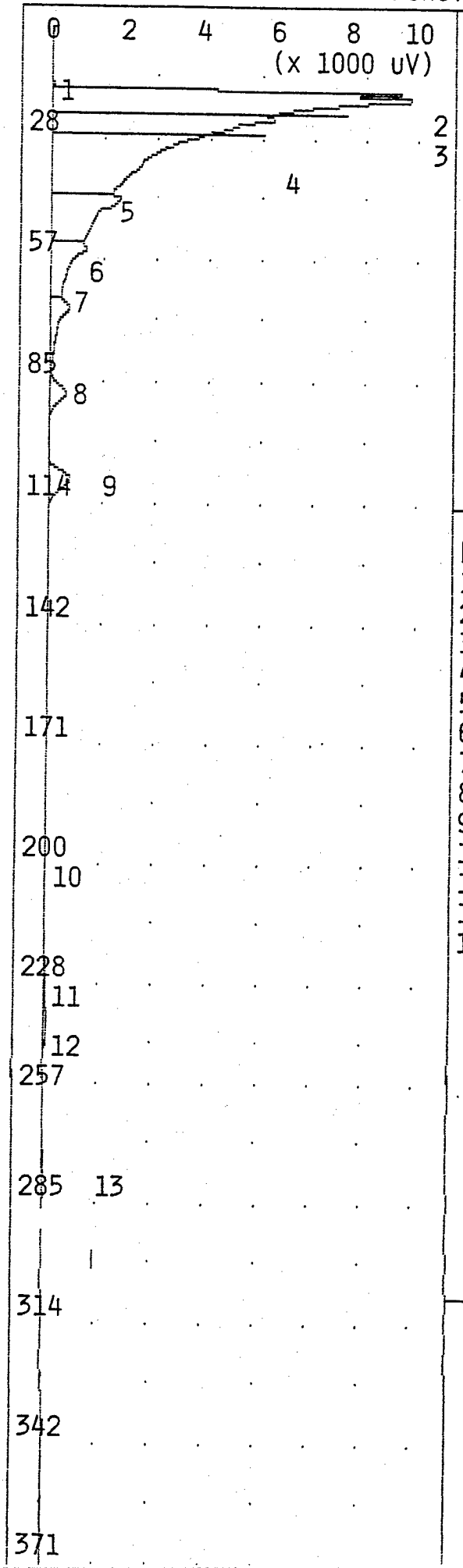
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 13.18 | MVS | 14.8 |
| 2 | UNKNOWN | 144.0 | MVS | 16.3 |
| 3 | UNKNOWN | 1.143 | MVS | 21.3 |
| 4 | UNKNOWN | 0.577 | MVS | 40.9 |
| 5 | BENZENE | 0.124 | PPB | 52.3 |
| 6 | UNKNOWN | 1.633 | MVS | 66.1 |
| 7 | TOLUENE | 3.441 | PPB | 106.2 |
| 8 | UNKNOWN | 7.815 | MVS | 196.4 |
| 9 | ETHYLBENZENE | 7.276 | PPB | 220.4 |
| 10 | M,P-XYLENE | 16.50 | PPB | 237.4 |
| 11 | O-XYLENE | 8.636 | PPB | 273.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-010BH
0.5- 2.5 10G

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 12:49
SAMPLE TIME: MAY 13,95 12:42

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

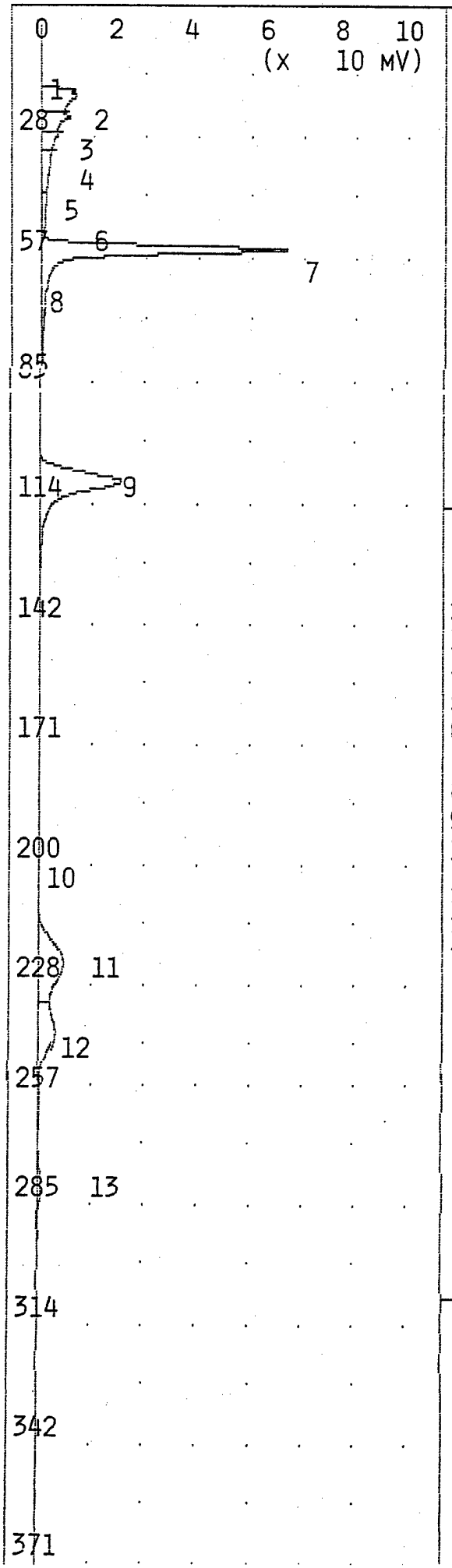
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.191 MVS | 13.9 |
| 2 | UNKNOWN | 11.09 MVS | 15.5 |
| 3 | UNKNOWN | 39.59 MVS | 17.0 |
| 4 | UNKNOWN | 61.22 MVS | 22.0 |
| 5 | UNKNOWN | 16.12 MVS | 40.9 |
| 6 | BENZENE | 3.302 PPB | 52.9 |
| 7 | UNKNOWN | 5.111 MVS | 66.1 |
| 8 | UNKNOWN | 3.420 MVS | 86.5 |
| 9 | TOLUENE | 2.678 PPB | 107.0 |
| 10 | UNKNOWN | 1.370 MVS | 199.2 |
| 11 | ETHYLBENZENE | 1.206 PPB | 226.2 |
| 12 | M,P-XYLENE | 2.937 PPB | 238.6 |
| 13 | O-XYLENE | 1.854 PPB | 276.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-010BH
5.0- 7.0 10G

ANALYSIS #28  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 13,95 14:11
SAMPLE TIME: MAY 13,95 14:04

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

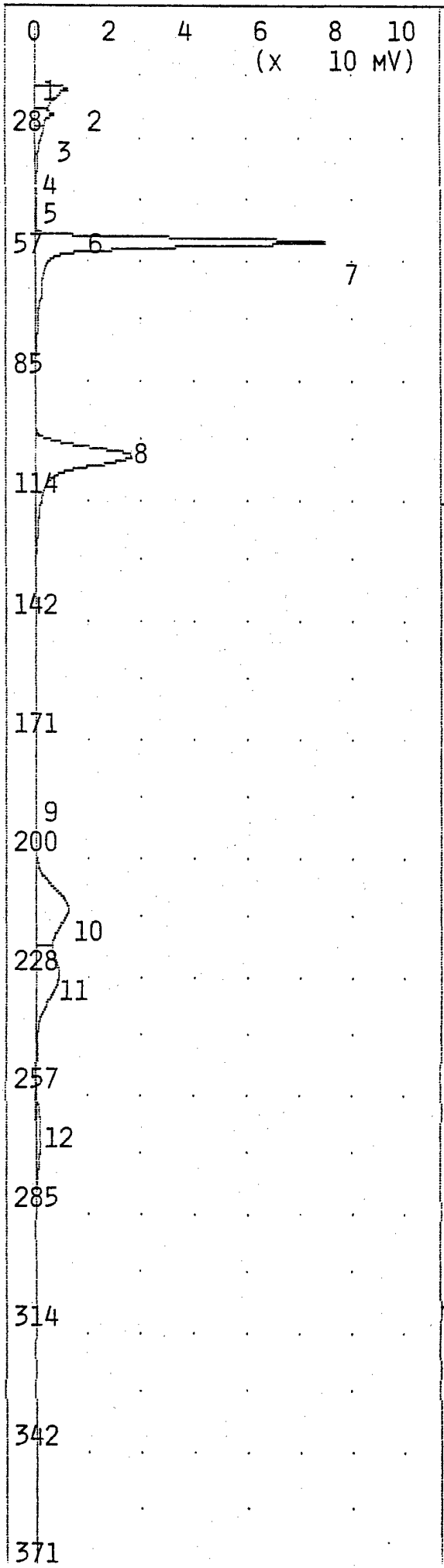
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.042 | MVS | 14.0 |
| 2 | UNKNOWN | 10.70 | MVS | 15.5 |
| 3 | UNKNOWN | 38.65 | MVS | 17.0 |
| 4 | UNKNOWN | 26.49 | MVS | 22.1 |
| 5 | UNKNOWN | 40.37 | MVS | 26.0 |
| 6 | UNKNOWN | 12.84 | MVS | 40.8 |
| 7 | BENZENE | 92.50 | PPB | 53.1 |
| 8 | UNKNOWN | 0.126 | MVS | 66.1 |
| 9 | TOLUENE | 91.84 | PPB | 106.8 |
| 10 | UNKNOWN | 3.060 | MVS | 197.4 |
| 11 | ETHYLBENZENE | 95.59 | PPB | 221.8 |
| 12 | M,P-XYLENE | 192.6 | PPB | 238.2 |
| 13 | O-XYLENE | 100.5 | PPB | 279.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 08:18
SAMPLE TIME: MAY 15,95 08:12

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.084 MVS | 13.2 |
| 2 | UNKNOWN | 36.63 MVS | 14.7 |
| 3 | UNKNOWN | 16.31 MVS | 21.0 |
| 4 | UNKNOWN | 12.82 MVS | 24.8 |
| 5 | UNKNOWN | 7.370 MVS | 31.0 |
| 6 | UNKNOWN | 4.747 MVS | 41.1 |
| 7 | UNKNOWN | 233.6 MVS | 50.8 |
| 8 | UNKNOWN | 168.8 MVS | 101.6 |
| 9 | UNKNOWN | 2.133 MVS | 187.0 |
| 10 | UNKNOWN | 114.5 MVS | 210.0 |
| 11 | UNKNOWN | 85.61 MVS | 225.8 |
| 12 | UNKNOWN | 22.68 MVS | 265.3 |

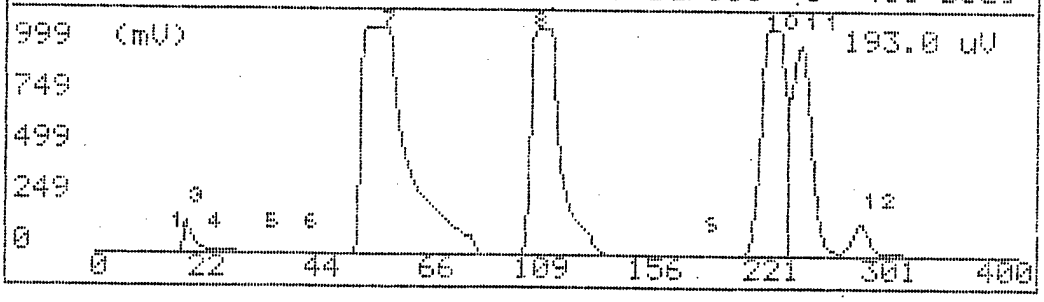
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

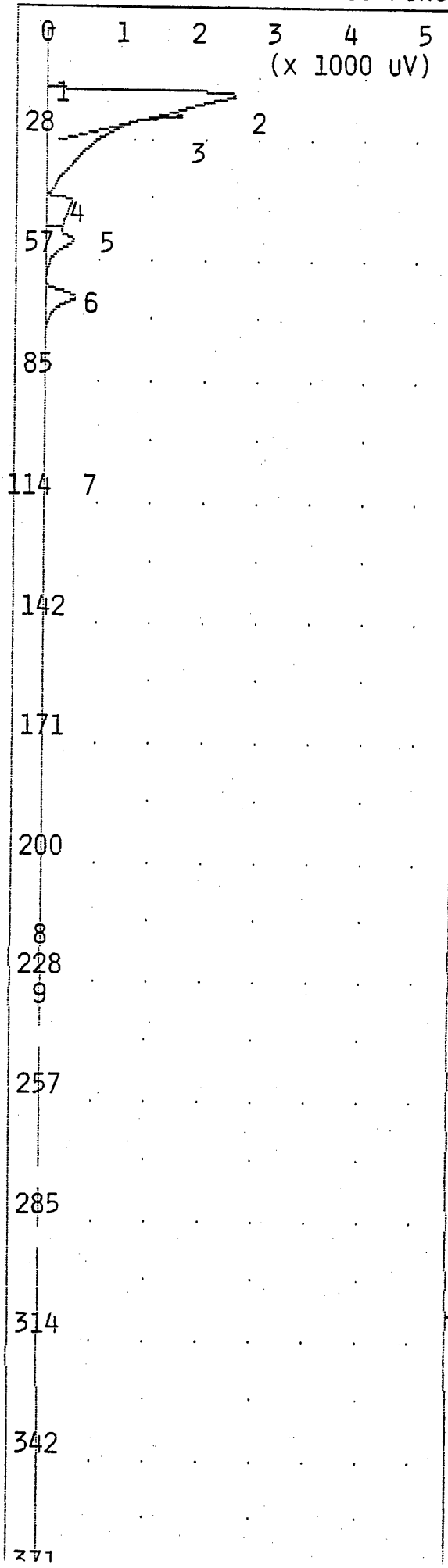
G.C. Ready  10S+ GC Function  May 15,95  09:10
-- Analysis No 3  -- Run at - May 15,95  08:55 -

| Pk No | Name | Conc/Area | Alarm | Ret.Time |
|---|---|---|---|---|
| 4 | Unknown | 4.020 mVS | -No- | 21.1 sec |
| 5 | Unknown | 0.875 mVS | -No- | 33.7 sec |
| 6 | Unknown | 0.151 mVS | -No- | 38.4 sec |
| 7 | benzene | 10.00 ppm | -No- | 52.2 sec |
| 8 | toluene | 10.00 ppm | -No- | 103.2 sec |
| 9 | Unknown | 5.065 mVS | -No- | 182.6 sec |
| 10 | ethylbenzene | 10.00 ppm | -No- | 212.4 sec |
| 11 | m:p-xylene | 20.00 ppm | -No- | 227.4 sec |
| 12 | o-xylene | 10.02 ppm | -No- | 266.6 sec |

- Detected 12 peaks. Use ↑ ↓ to scroll  [ 405 sec]



ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 09:18
SAMPLE TIME: MAY 15,95 09:12

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

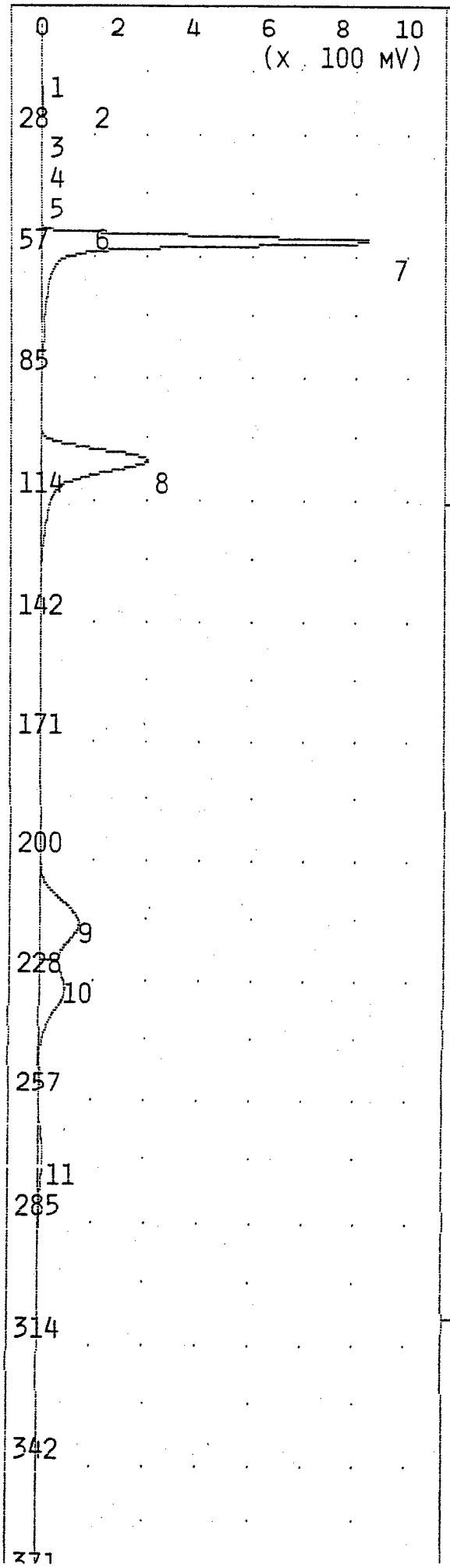
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.080 | MVS | 13.5 |
| 2 | UNKNOWN | 29.12 | MVS | 16.1 |
| 3 | UNKNOWN | 0.246 | MVS | 20.8 |
| 4 | UNKNOWN | 3.645 | MVS | 41.8 |
| 5 | BENZENE | 1.693 | PPB | 50.8 |
| 6 | UNKNOWN | 4.391 | MVS | 63.9 |
| 7 | TOLUENE | 0.895 | PPB | 102.4 |
| 8 | ETHYLBENZENE | 3.152 | PPB | 211.2 |
| 9 | M,P-XYLENE | 4.396 | PPB | 227.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 11:10
SAMPLE TIME: MAY 15,95 11:03

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

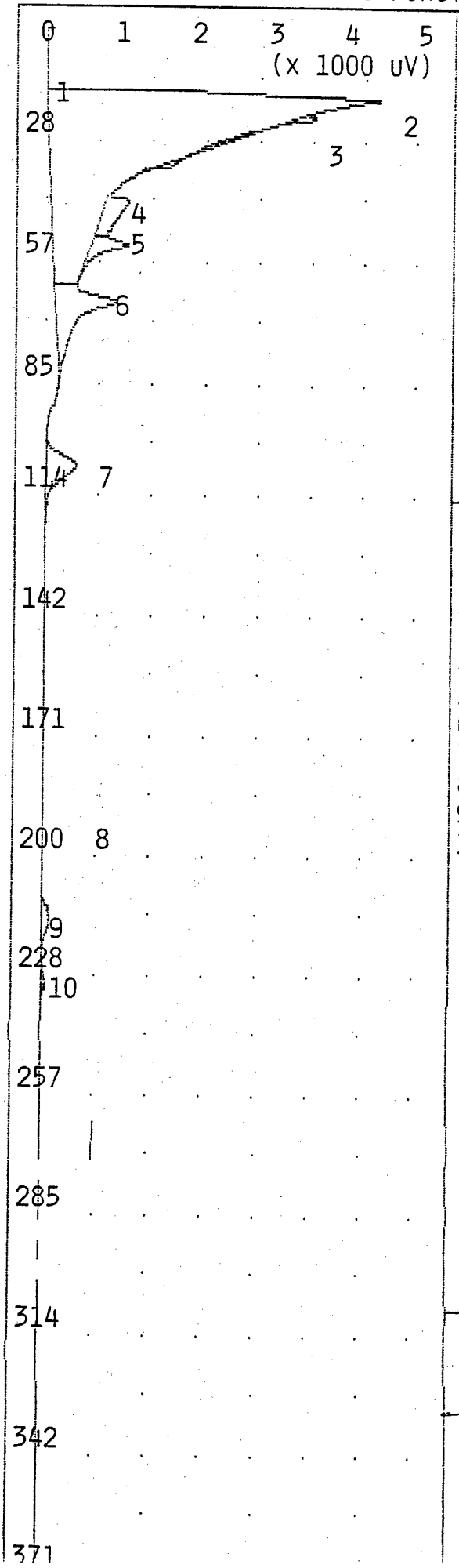
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.042 | MVS | 13.2 |
| 2 | UNKNOWN | 3.328 | MVS | 15.1 |
| 3 | UNKNOWN | 18.02 | MVS | 16.6 |
| 4 | UNKNOWN | 42.86 | MVS | 21.3 |
| 5 | UNKNOWN | 0.498 | MVS | 25.2 |
| 6 | UNKNOWN | 0.852 | MVS | 40.8 |
| 7 | BENZENE | 827.2 | PPB | 51.6 |
| 8 | TOLUENE | 778.3 | PPB | 103.0 |
| 9 | ETHYLBENZENE | 664.2 | PPB | 213.0 |
| 10 | M,P-XYLENE | 1.304 | PPM | 228.8 |
| 11 | O-XYLENE | 631.7 | PPB | 268.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 11:23
SAMPLE TIME: MAY 15,95 11:17

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.030 | MVS | 13.3 |
| 2 | UNKNOWN | 74.80 | MVS | 16.6 |
| 3 | UNKNOWN | 0.021 | MVS | 21.2 |
| 4 | UNKNOWN | 2.117 | MVS | 41.1 |
| 5 | BENZENE | 0.690 | PPB | 51.3 |
| 6 | UNKNOWN | 5.865 | MVS | 64.6 |
| 7 | TOLUENE | 1.606 | PPB | 103.3 |
| 8 | UNKNOWN | 1.127 | MVS | 191.0 |
| 9 | ETHYLBENZENE | 2.951 | PPB | 212.6 |
| 10 | M,P-XYLENE | 3.487 | PPB | 229.8 |

NOTES

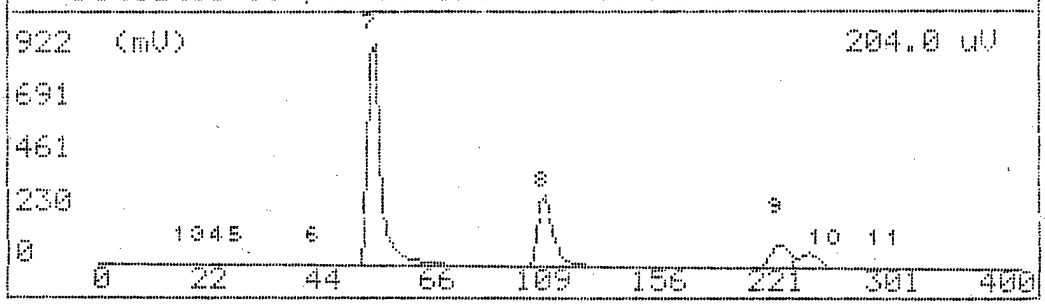
JOE BYRD, JR.
DULUTH ANGB
~~1 PPM BTEX~~
AIR BLANK JB

G.C. Ready  105+ GC Function  May 15,95  11:15

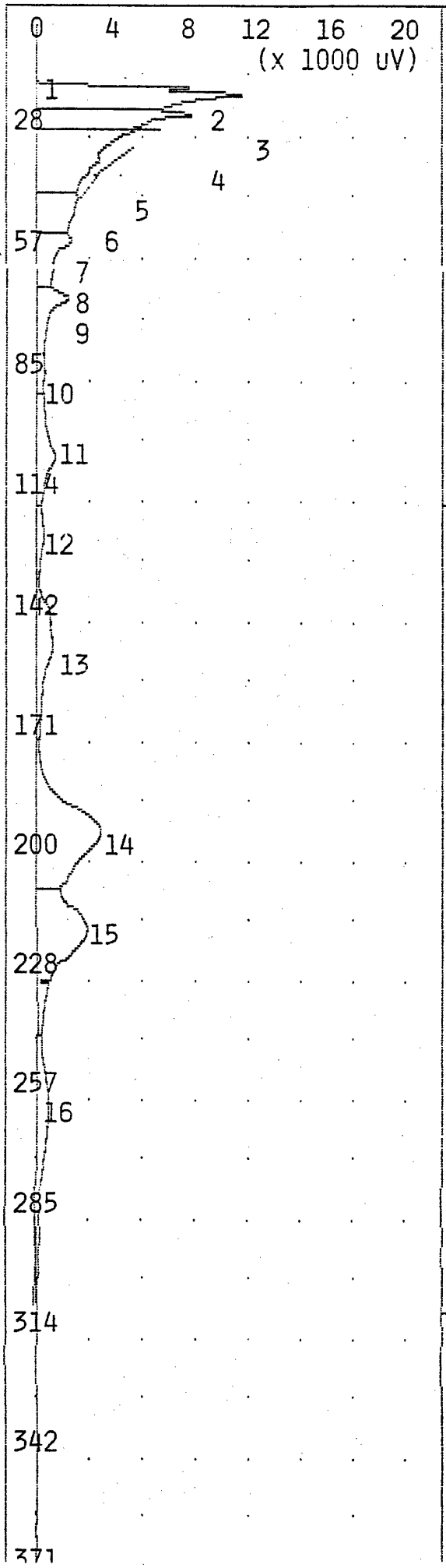
-- Analysis No 5  -- Run at - May 15,95  11:03 -

| Pk No | Name | Conc/Area | Alarm | Ret.Time |
|---|---|---|---|---|
| 3 | Unknown | 18.02 mVS | -No- | 16.6 sec |
| 4 | Unknown | 42.93 mVS | -No- | 21.3 sec |
| 5 | Unknown | 0.498 mVS | -No- | 25.2 sec |
| 6 | Unknown | 0.852 mVS | -No- | 40.8 sec |
| 7 | benzene | 1.000 ppm | -No- | 51.6 sec |
| 8 | toluene | 1.000 ppm | -No- | 103.0 sec |
| 9 | ethylbenzene | 1.000 ppm | -No- | 213.0 sec |
| 10 | m,p-xylene | 2.000 ppm | -No- | 228.0 sec |
| 11 | o-xylene | 1.008 ppm | -No- | 268.5 sec |

- Detected 11 peaks. Use ↑ ↓ to scroll  [ 405 secl



ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 11:33
SAMPLE TIME: MAY 15,95 11:27

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

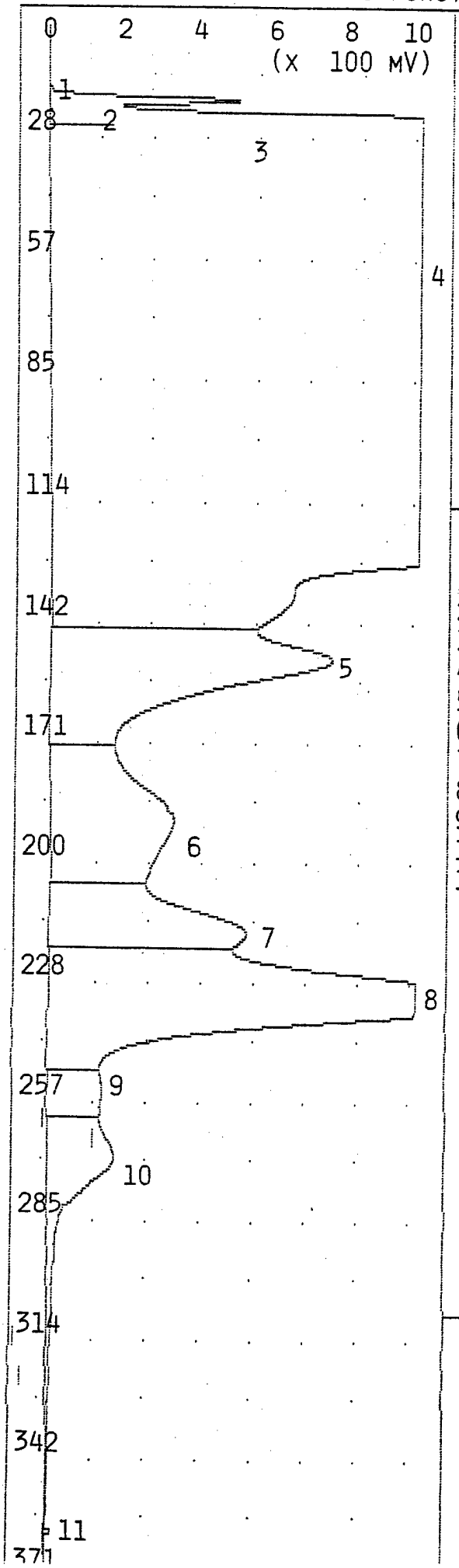
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.330 MVS | 13.6 |
| 2 | UNKNOWN | 9.082 MVS | 15.0 |
| 3 | UNKNOWN | 41.66 MVS | 16.5 |
| 4 | UNKNOWN | 82.39 MVS | 21.4 |
| 5 | UNKNOWN | 0.263 MVS | 25.2 |
| 6 | UNKNOWN | 0.682 MVS | 32.0 |
| 7 | UNKNOWN | 19.93 MVS | 40.8 |
| 8 | BENZENE | 6.523 PPB | 51.2 |
| 9 | UNKNOWN | 18.73 MVS | 64.2 |
| 10 | UNKNOWN | 0.008 MVS | 81.7 |
| 11 | TOLUENE | 9.838 PPB | 101.8 |
| 12 | UNKNOWN | 5.590 MVS | 120.0 |
| 13 | UNKNOWN | 18.84 MVS | 147.0 |
| 14 | UNKNOWN | 60.17 MVS | 191.0 |
| 15 | ETHYLBENZENE | 40.92 PPB | 214.4 |
| 16 | O-XYLENE | 82.13 PPB | 257.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
0.5- 2.5 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 11:44
SAMPLE TIME: MAY 15,95 11:37

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

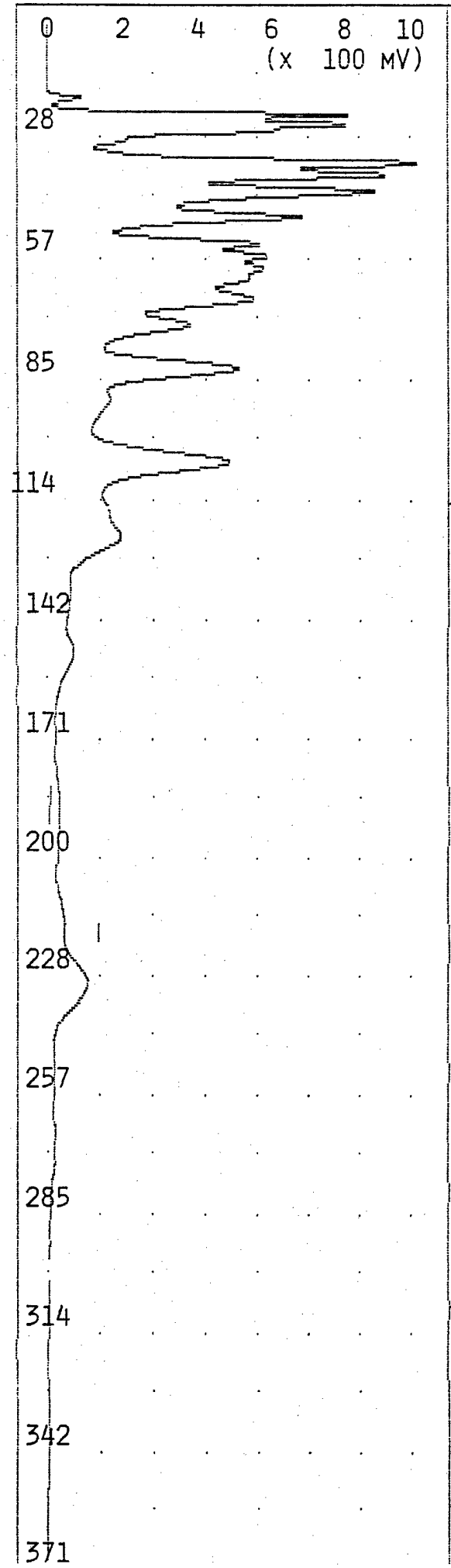
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.903 | MVS | 14.0 |
| 2 | UNKNOWN | 6.847 | MVS | 15.0 |
| 3 | UNKNOWN | 1.065 | VSEC | 17.8 |
| 4 | UNKNOWN | 3694. | VSEC | 58.0 |
| 5 | UNKNOWN | 12.53 | VSEC | 149.4 |
| 6 | UNKNOWN | 8.940 | VSEC | 188.2 |
| 7 | ETHYLBENZENE | 3.621 | PPM | 214.6 |
| 8 | M,P-XYLENE | 35.65 | PPM | 230.2 |
| 9 | UNKNOWN | 1.673 | VSEC | 252.2 |
| 10 | O-XYLENE | 15.05 | PPM | 268.2 |
| 11 | UNKNOWN | 61.29 | MVS | 358.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
5.0- 7.0 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 11:55
SAMPLE TIME: MAY 15,95 11:49

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

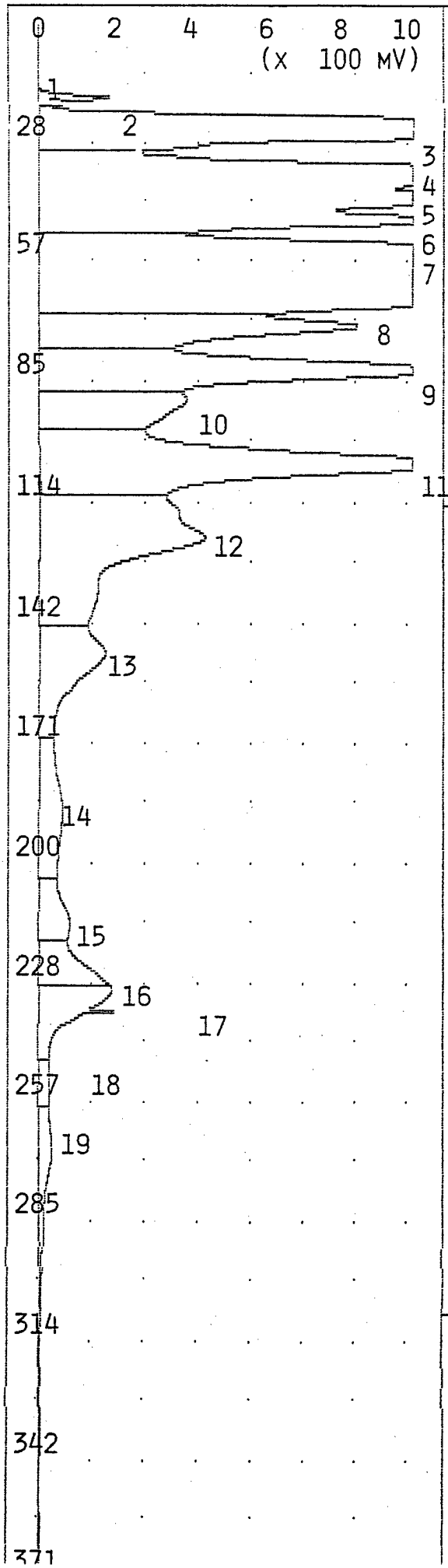
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH RESHOT
5.0- 7.0 10G
10 MICROLITER INJECTION

ANALYSIS #10 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 12:08
SAMPLE TIME: MAY 15,95 12:01

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

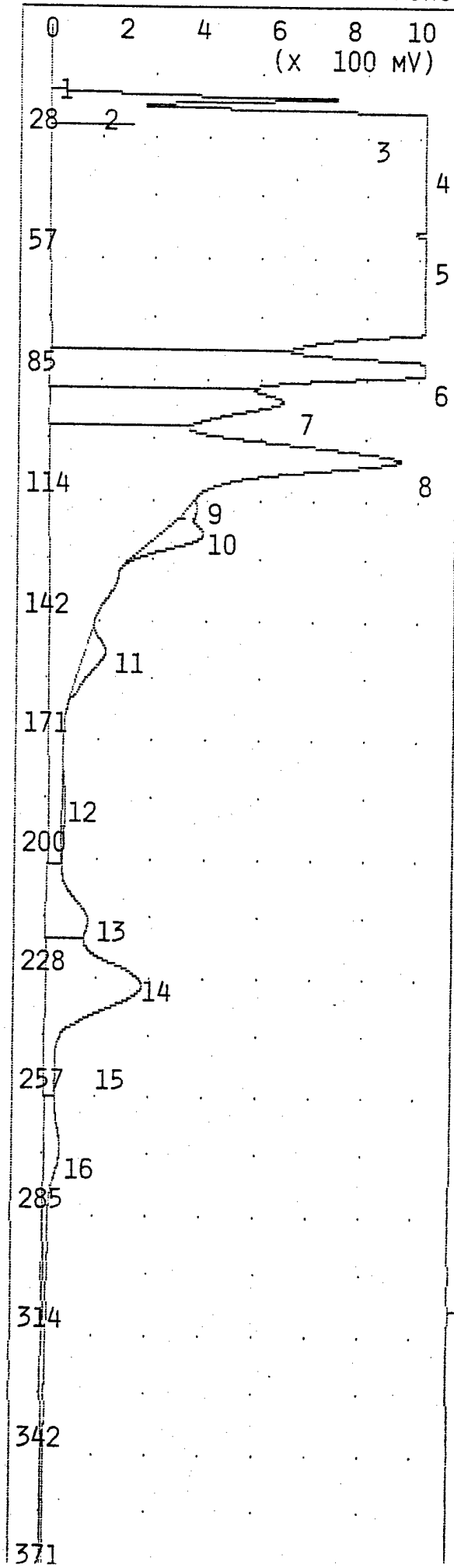
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.276 | MVS | 13.6 |
| 2 | UNKNOWN | 329.3 | MVS | 17.4 |
| 3 | UNKNOWN | 18.56 | VSEC | 23.3 |
| 4 | UNKNOWN | 14.87 | VSEC | 34.4 |
| 5 | UNKNOWN | 5.542 | VSEC | 39.8 |
| 6 | UNKNOWN | 5.542 | VSEC | 45.4 |
| 7 | UNKNOWN | 77.85 | VSEC | 57.9 |
| 8 | UNKNOWN | 5.012 | VSEC | 70.6 |
| 9 | UNKNOWN | 7.924 | VSEC | 81.0 |
| 10 | UNKNOWN | 3.185 | VSEC | 88.2 |
| 11 | TOLUENE | 4.792 | PPM | 103.2 |
| 12 | UNKNOWN | 8.105 | VSEC | 120.5 |
| 13 | UNKNOWN | 2.722 | VSEC | 148.0 |
| 14 | UNKNOWN | 1.677 | VSEC | 185.8 |
| 15 | ETHYLBENZENE | 747.1 | PPB | 212.6 |
| 16 | M,P-XYLENE | 2.743 | PPM | 227.8 |
| 17 | UNKNOWN | 1.656 | VSEC | 233.6 |
| 18 | UNKNOWN | 305.3 | MVS | 250.9 |
| 19 | O-XYLENE | 4.034 | PPM | 266.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH RE-RESHO
5.0- 7.0 10G
20 MICROLITER INJECTION

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 12:21
SAMPLE TIME: MAY 15,95 12:15

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

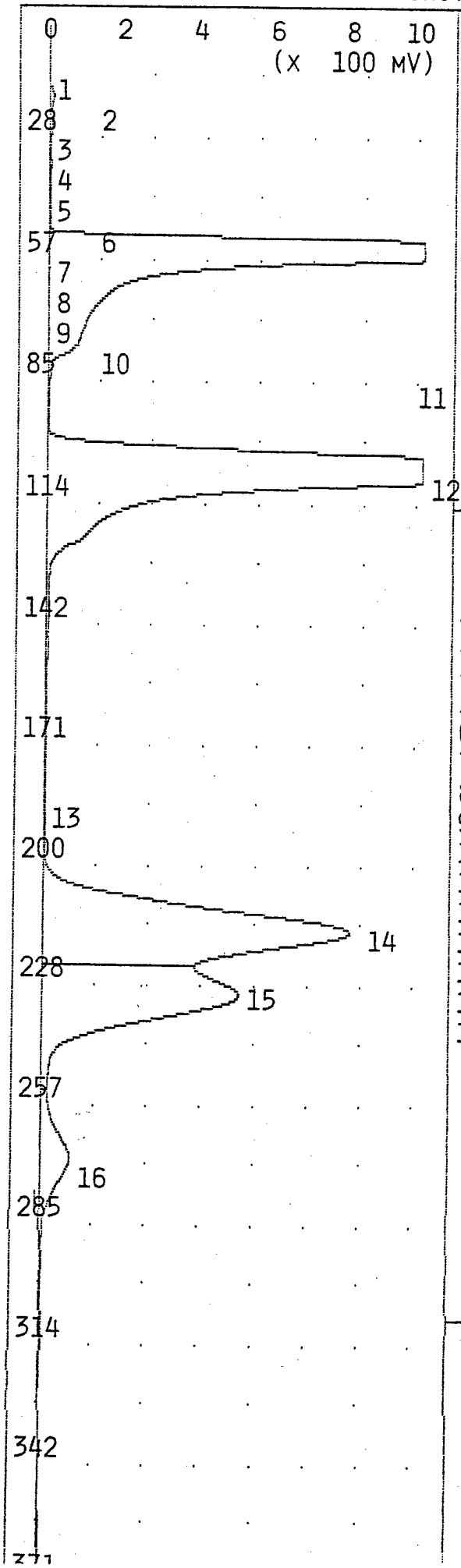
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.666 | MVS | 13.7 |
| 2 | UNKNOWN | 3.453 | MVS | 14.6 |
| 3 | UNKNOWN | 1.461 | VSEC | 17.5 |
| 4 | UNKNOWN | 256.3 | VSEC | 34.5 |
| 5 | UNKNOWN | 53.70 | VSEC | 59.2 |
| 6 | UNKNOWN | 9.080 | VSEC | 81.0 |
| 7 | UNKNOWN | 4.846 | VSEC | 88.8 |
| 8 | TOLUENE | 9.510 | PPM | 102.5 |
| 9 | UNKNOWN | 107.9 | MVS | 114.1 |
| 10 | UNKNOWN | 688.4 | MVS | 120.1 |
| 11 | UNKNOWN | 536.7 | MVS | 148.2 |
| 12 | UNKNOWN | 92.82 | MVS | 184.8 |
| 13 | ETHYLBENZENE | 1.044 | PPM | 212.8 |
| 14 | M,P-XYLENE | 7.292 | PPM | 228.2 |
| 15 | UNKNOWN | 0.840 | MVS | 249.8 |
| 16 | O-XYLENE | 5.399 | PPM | 267.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
10.0-12.0 10G
20 MICROLITER INJECTION

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 12:36
SAMPLE TIME: MAY 15,95 12:29

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.034 MVS | 13.4 |
| 2 | UNKNOWN | 9.058 MVS | 15.2 |
| 3 | UNKNOWN | 52.39 MVS | 16.6 |
| 4 | UNKNOWN | 28.07 MVS | 21.6 |
| 5 | UNKNOWN | 16.67 MVS | 23.8 |
| 6 | UNKNOWN | 33.21 MVS | 25.4 |
| 7 | UNKNOWN | 23.63 MVS | 32.6 |
| 8 | UNKNOWN | 17.08 MVS | 35.4 |
| 9 | UNKNOWN | 27.79 MVS | 39.2 |
| 10 | UNKNOWN | 17.45 MVS | 45.2 |
| 11 | BENZENE | 8.717 PPM | 52.6 |
| 12 | TOLUENE | 8.469 PPM | 104.1 |
| 13 | UNKNOWN | 2.660 MVS | 183.0 |
| 14 | ETHYLBENZENE | 5.511 PPM | 213.8 |
| 15 | M,P-XYLENE | 11.62 PPM | 228.6 |
| 16 | O-XYLENE | 5.805 PPM | 268.0 |

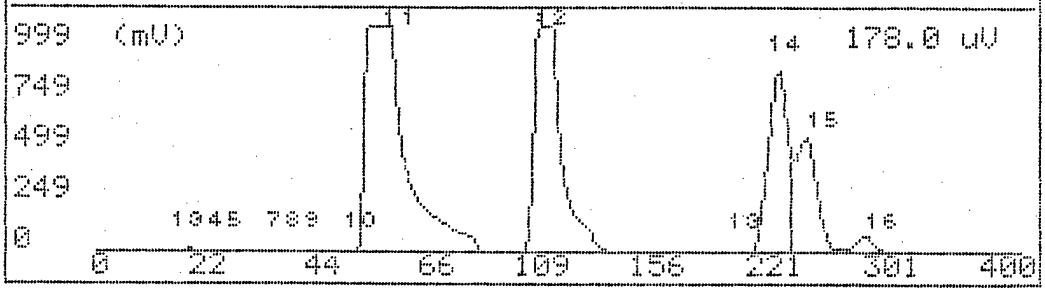
NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

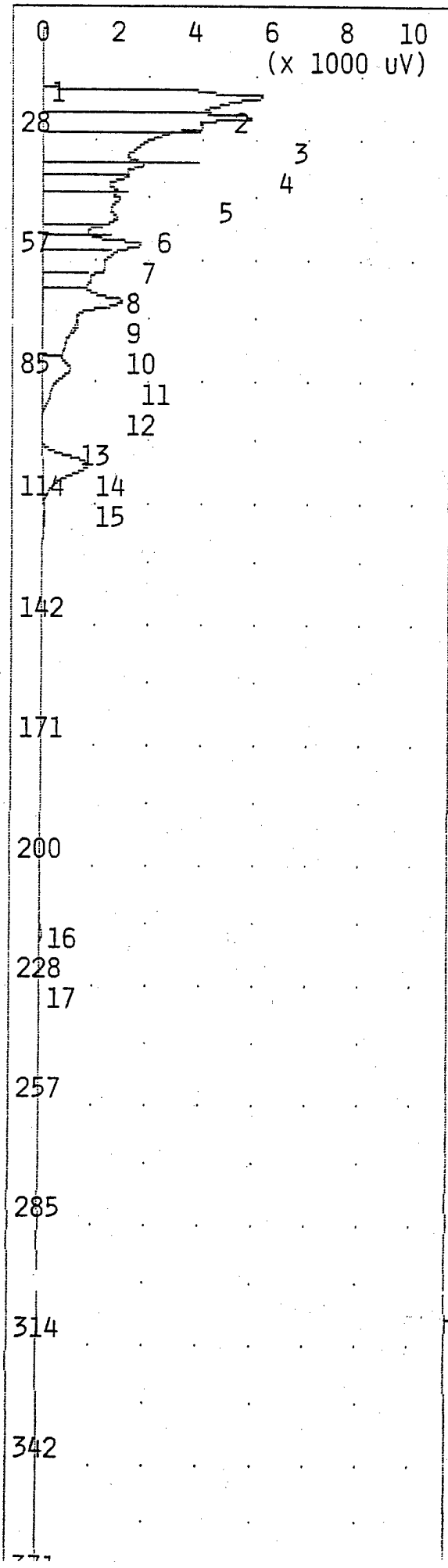
G.C. Ready  10S+ GC Function  May 15,95  12:41
-- Analysis No 12  -- Run at - May 15,95  12:29 -

| Pk No | Name | Conc/Area | Alarm | Ret.Time |
|---|---|---|---|---|
| 8 | Unknown | 17.10 mVS | -No- | 3[illegible]5.4 sec |
| 9 | Unknown | 27.84 mVS | -No- | [illegible]3[illegible].2 sec |
| 10 | Unknown | 17.49 mVS | -No- | 45[illegible].2 sec |
| 11 | benzene | 10.00 ppm | -No- | 52[illegible].6 sec |
| 12 | toluene | 10.00 ppm | -No- | 104[illegible].1 sec |
| 13 | Unknown | 2.660 mVS | -No- | 18[illegible].0 sec |
| 14 | ethylbenzene | 10.00 ppm | -No- | 213[illegible].0 sec |
| 15 | m,p-xylene | 20.00 ppm | -No- | 228[illegible].6 sec |
| 16 | o-xylene | 10.03 ppm | -No- | 2668.0 sec |

- Detected 16 peaks. Use ↑ ↓ to scroll  [  405 sec]



ANALYSIS #13  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 12:50
SAMPLE TIME: MAY 15,95 12:43

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

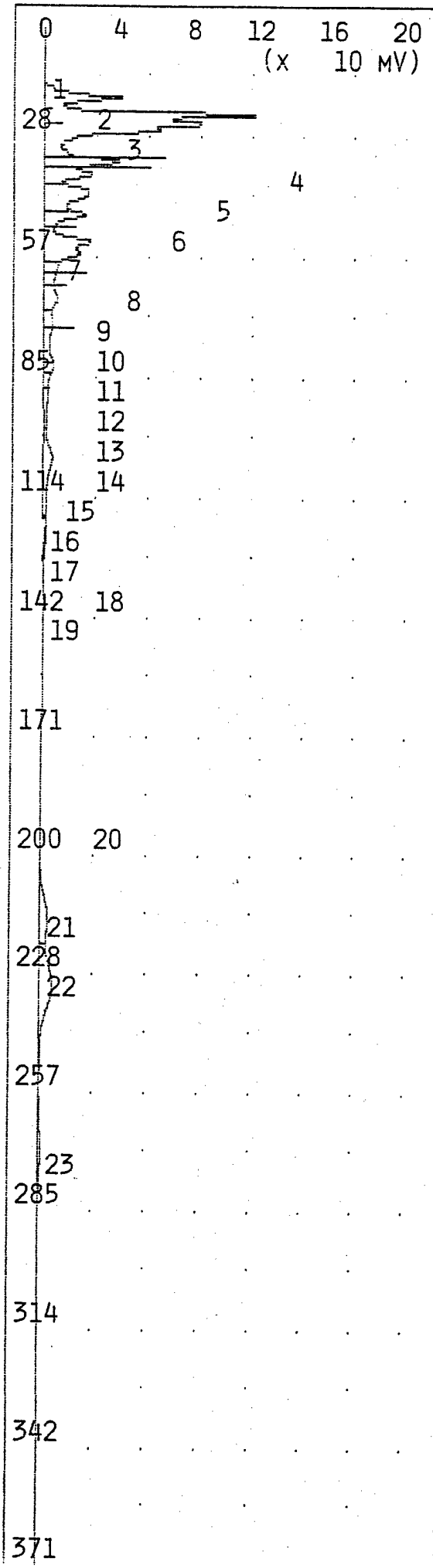
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.235 | MVS | 13.6 |
| 2 | UNKNOWN | 4.557 | MVS | 15.2 |
| 3 | UNKNOWN | 24.47 | MVS | 16.4 |
| 4 | UNKNOWN | 15.12 | MVS | 21.4 |
| 5 | UNKNOWN | 25.13 | MVS | 23.8 |
| 6 | UNKNOWN | 10.78 | MVS | 32.4 |
| 7 | UNKNOWN | 6.933 | MVS | 35.4 |
| 8 | UNKNOWN | 5.087 | MVS | 39.0 |
| 9 | UNKNOWN | 8.078 | MVS | 40.8 |
| 10 | UNKNOWN | 10.13 | MVS | 45.4 |
| 11 | BENZENE | 10.50 | PPB | 51.4 |
| 12 | UNKNOWN | 20.04 | MVS | 64.5 |
| 13 | UNKNOWN | 0.209 | MVS | 70.5 |
| 14 | UNKNOWN | 7.013 | MVS | 81.0 |
| 15 | TOLUENE | 5.070 | PPB | 103.4 |
| 16 | ETHYLBENZENE | 10.61 | PPB | 214.8 |
| 17 | M,P-XYLENE | 25.08 | PPB | 229.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #14 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 13:02
SAMPLE TIME: MAY 15,95 12:55

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

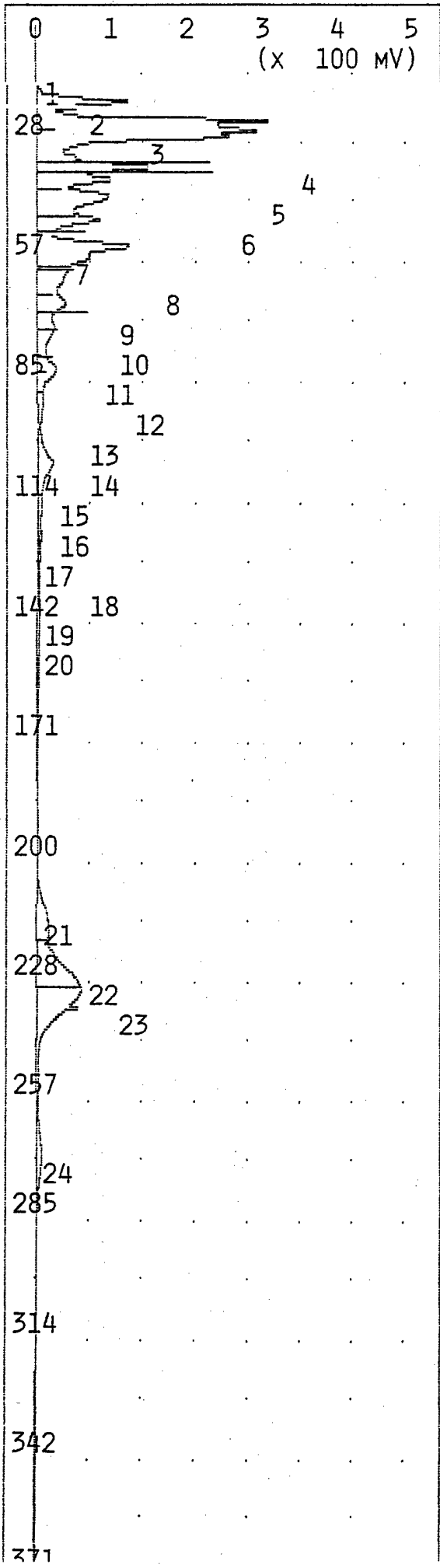
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.265 | MVS | 13.7 |
| 2 | UNKNOWN | 4.559 | MVS | 14.8 |
| 3 | UNKNOWN | 85.55 | MVS | 17.5 |
| 4 | UNKNOWN | 191.6 | MVS | 21.4 |
| 5 | UNKNOWN | 170.6 | MVS | 23.8 |
| 6 | UNKNOWN | 118.8 | MVS | 25.3 |
| 7 | UNKNOWN | 19.67 | MVS | 30.2 |
| 8 | UNKNOWN | 98.63 | MVS | 32.5 |
| 9 | UNKNOWN | 67.94 | MVS | 35.6 |
| 10 | UNKNOWN | 45.24 | MVS | 39.5 |
| 11 | UNKNOWN | 55.97 | MVS | 40.5 |
| 12 | UNKNOWN | 77.21 | MVS | 45.2 |
| 13 | BENZENE | 28.22 | PPB | 51.4 |
| 14 | UNKNOWN | 89.39 | MVS | 54.2 |
| 15 | UNKNOWN | 40.05 | MVS | 64.8 |
| 16 | UNKNOWN | 34.25 | MVS | 70.6 |
| 17 | UNKNOWN | 53.57 | MVS | 80.6 |
| 18 | TOLUENE | 42.57 | PPB | 103.0 |
| 19 | UNKNOWN | 2.261 | MVS | 119.6 |
| 20 | UNKNOWN | 0.776 | MVS | 190.2 |
| 21 | ETHYLBENZENE | 40.78 | PPB | 213.6 |
| 22 | M,P-XYLENE | 228.3 | PPB | 229.4 |
| 23 | O-XYLENE | 83.58 | PPB | 268.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
15-17 10g } JB
20 µl injection }

ANALYSIS #15  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 13:13
SAMPLE TIME: MAY 15,95 13:06

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

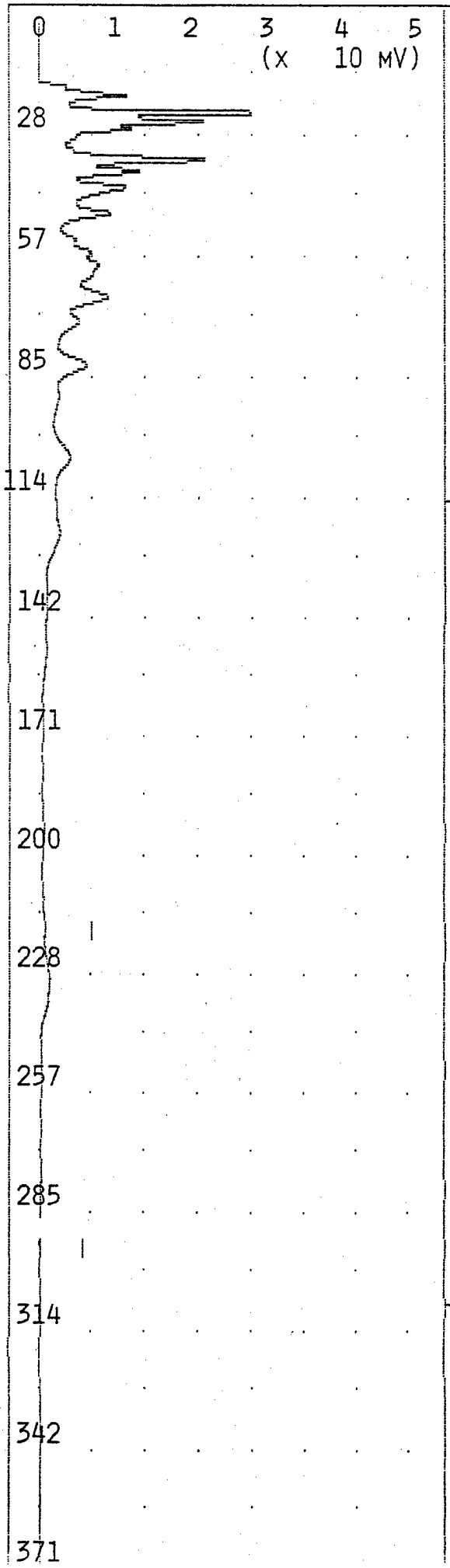
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.842 | MVS | 13.8 |
| 2 | UNKNOWN | 6.142 | MVS | 14.8 |
| 3 | UNKNOWN | 238.5 | MVS | 17.6 |
| 4 | UNKNOWN | 510.2 | MVS | 21.5 |
| 5 | UNKNOWN | 622.9 | MVS | 24.0 |
| 6 | UNKNOWN | 492.6 | MVS | 25.4 |
| 7 | UNKNOWN | 85.06 | MVS | 30.2 |
| 8 | UNKNOWN | 376.1 | MVS | 32.6 |
| 9 | UNKNOWN | 254.6 | MVS | 35.6 |
| 10 | UNKNOWN | 402.8 | MVS | 39.6 |
| 11 | UNKNOWN | 296.3 | MVS | 45.4 |
| 12 | BENZENE | 137.7 | PPB | 51.6 |
| 13 | UNKNOWN | 388.1 | MVS | 54.2 |
| 14 | UNKNOWN | 197.7 | MVS | 64.9 |
| 15 | UNKNOWN | 144.0 | MVS | 70.8 |
| 16 | UNKNOWN | 155.2 | MVS | 80.9 |
| 17 | UNKNOWN | 55.99 | MVS | 88.4 |
| 18 | TOLUENE | 156.7 | PPB | 102.8 |
| 19 | UNKNOWN | 4.711 | MVS | 120.5 |
| 20 | UNKNOWN | 3.300 | MVS | 148.6 |
| 21 | ETHYLBENZENE | 122.6 | PPB | 213.2 |
| 22 | M,P-XYLENE | 916.4 | PPB | 228.2 |
| 23 | UNKNOWN | 444.7 | MVS | 232.8 |
| 24 | O-XYLENE | 553.4 | PPB | 268.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
20.0-22.0 10G
50 MICROLITER INJECTON

ANALYSIS #16  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 13:45
SAMPLE TIME: MAY 15,95 13:39

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

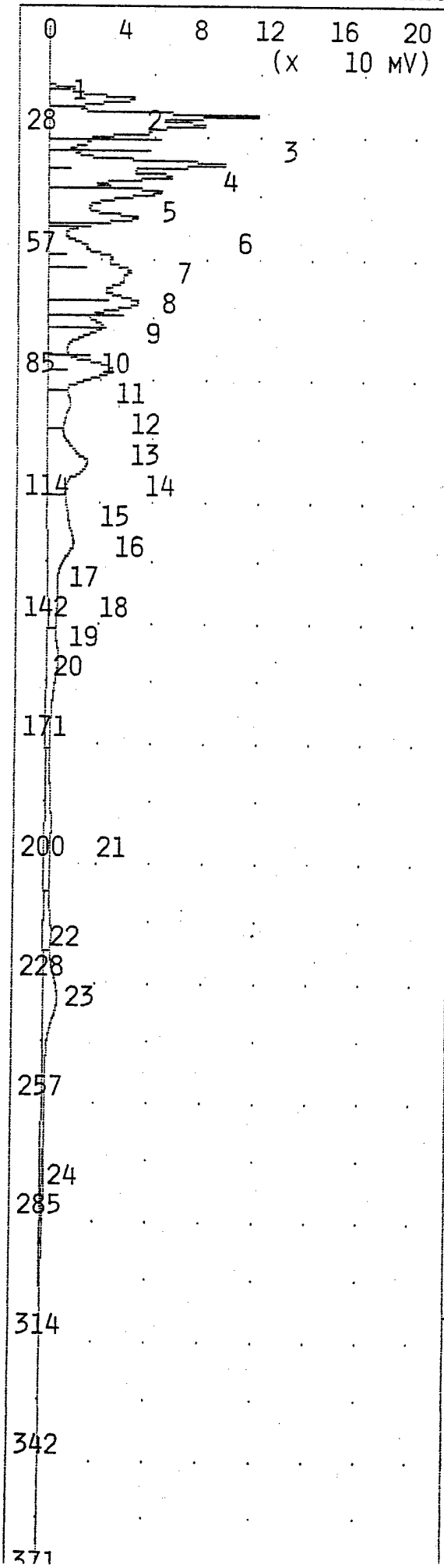
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH
25.0' 10G
20 MICROLITER INJECTON

ANALYSIS #17 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 13:57
SAMPLE TIME: MAY 15,95 13:51

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

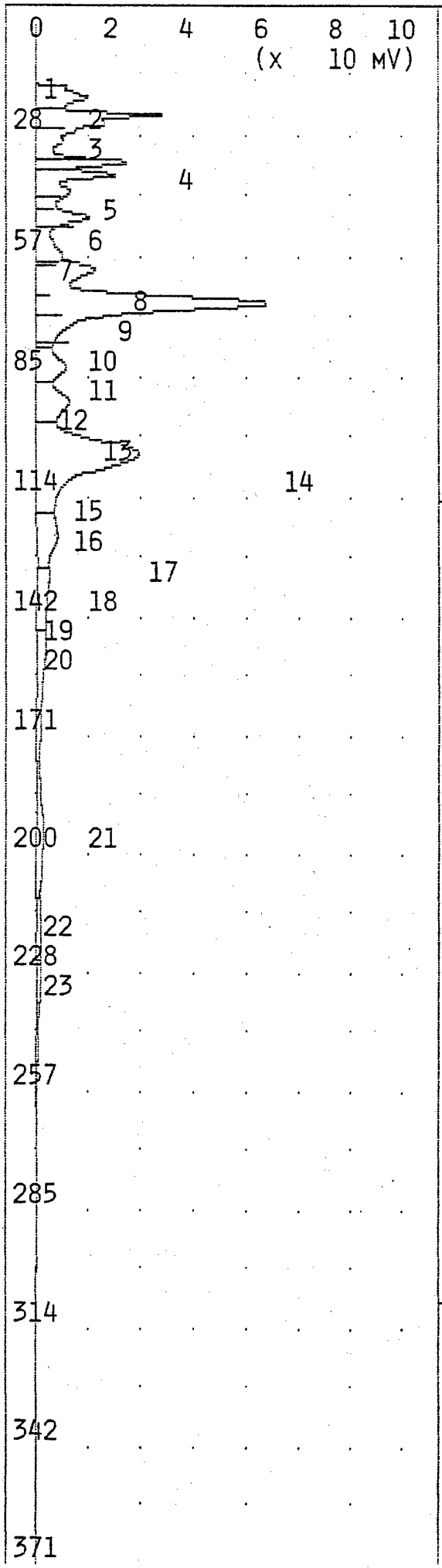
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 16.03 | MVS | 15.1 |
| 2 | UNKNOWN | 122.2 | MVS | 17.7 |
| 3 | UNKNOWN | 195.3 | MVS | 21.6 |
| 4 | UNKNOWN | 160.9 | MVS | 23.9 |
| 5 | UNKNOWN | 126.8 | MVS | 25.4 |
| 6 | UNKNOWN | 244.5 | MVS | 32.9 |
| 7 | UNKNOWN | 164.4 | MVS | 35.8 |
| 8 | UNKNOWN | 217.5 | MVS | 39.6 |
| 9 | UNKNOWN | 172.4 | MVS | 45.6 |
| 10 | BENZENE | 20.46 | PPB | 51.6 |
| 11 | UNKNOWN | 96.80 | MVS | 54.7 |
| 12 | UNKNOWN | 143.5 | MVS | 57.8 |
| 13 | UNKNOWN | 115.1 | MVS | 59.9 |
| 14 | UNKNOWN | 242.2 | MVS | 65.3 |
| 15 | UNKNOWN | 161.4 | MVS | 71.0 |
| 16 | UNKNOWN | 206.2 | MVS | 81.3 |
| 17 | UNKNOWN | 96.68 | MVS | 89.2 |
| 18 | TOLUENE | 118.3 | PPB | 102.9 |
| 19 | UNKNOWN | 275.6 | MVS | 121.6 |
| 20 | UNKNOWN | 118.0 | MVS | 149.4 |
| 21 | UNKNOWN | 92.00 | MVS | 190.0 |
| 22 | ETHYLBENZENE | 42.25 | PPB | 214.4 |
| 23 | M,P-XYLENE | 363.7 | PPB | 230.0 |
| 24 | O-XYLENE | 46.73 | PPB | 266.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-003BH RESHOT
25.0' 10G
100 MICROLITER INJECTION

ANALYSIS #18 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 14:08
SAMPLE TIME: MAY 15,95 14:02

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

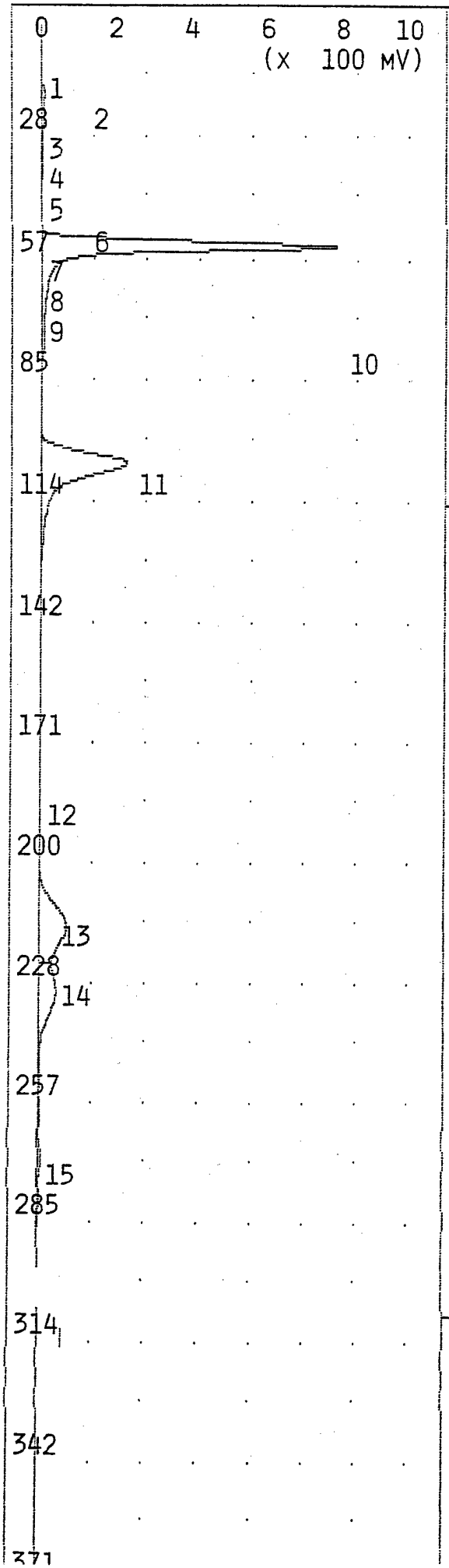
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.077 | MVS | 13.8 |
| 2 | UNKNOWN | 9.573 | MVS | 15.1 |
| 3 | UNKNOWN | 49.16 | MVS | 17.6 |
| 4 | UNKNOWN | 61.85 | MVS | 21.7 |
| 5 | UNKNOWN | 33.52 | MVS | 23.8 |
| 6 | UNKNOWN | 17.83 | MVS | 25.5 |
| 7 | UNKNOWN | 18.59 | MVS | 27.6 |
| 8 | UNKNOWN | 63.77 | MVS | 32.7 |
| 9 | UNKNOWN | 52.54 | MVS | 35.7 |
| 10 | UNKNOWN | 39.50 | MVS | 39.5 |
| 11 | UNKNOWN | 58.61 | MVS | 46.0 |
| 12 | BENZENE | 12.64 | PPB | 54.6 |
| 13 | UNKNOWN | 78.24 | MVS | 58.0 |
| 14 | UNKNOWN | 337.6 | MVS | 66.0 |
| 15 | UNKNOWN | 51.08 | MVS | 81.3 |
| 16 | UNKNOWN | 65.62 | MVS | 89.4 |
| 17 | TOLUENE | 152.1 | PPB | 101.8 |
| 18 | UNKNOWN | 63.00 | MVS | 120.9 |
| 19 | UNKNOWN | 42.42 | MVS | 131.2 |
| 20 | UNKNOWN | 48.59 | MVS | 147.8 |
| 21 | UNKNOWN | 41.26 | MVS | 191.8 |
| 22 | ETHYLBENZENE | 12.14 | PPB | 214.8 |
| 23 | M,P-XYLENE | 30.80 | PPB | 229.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002BH
0.5- 2.5 10G

ANALYSIS #19  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 14:24
SAMPLE TIME: MAY 15,95 14:18

METHOD

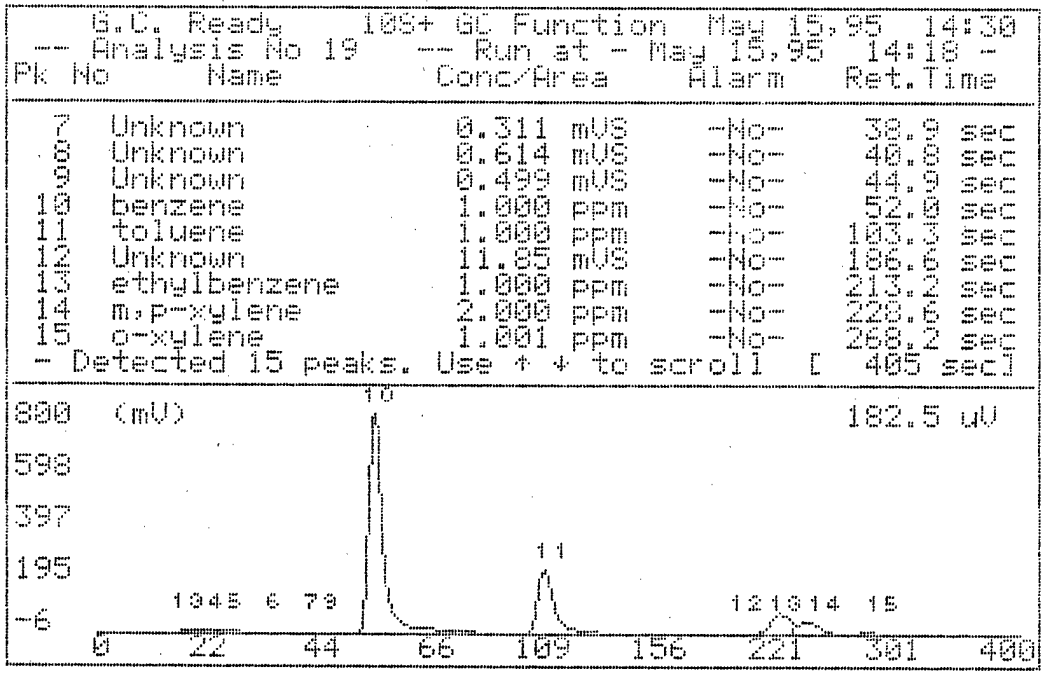
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

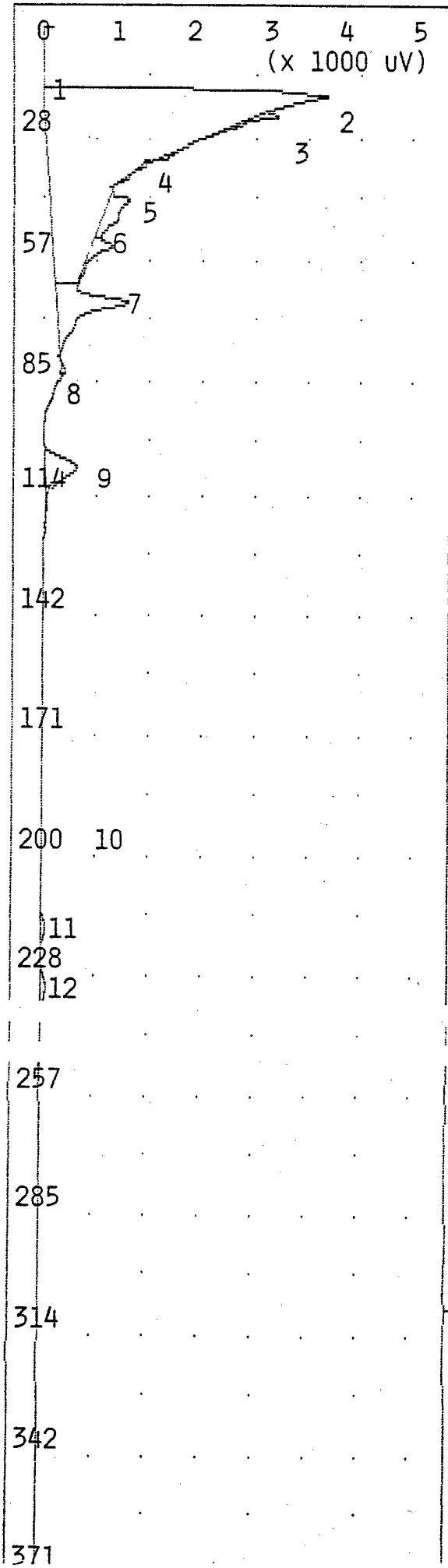
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.042 | MVS | 13.3 |
| 2 | UNKNOWN | 10.22 | MVS | 15.2 |
| 3 | UNKNOWN | 47.62 | MVS | 16.6 |
| 4 | UNKNOWN | 113.9 | MVS | 21.7 |
| 5 | UNKNOWN | 0.348 | MVS | 25.4 |
| 6 | UNKNOWN | 1.325 | MVS | 32.4 |
| 7 | UNKNOWN | 0.311 | MVS | 38.9 |
| 8 | UNKNOWN | 0.614 | MVS | 40.8 |
| 9 | UNKNOWN | 0.499 | MVS | 44.9 |
| 10 | BENZENE | 899.5 | PPB | 52.0 |
| 11 | TOLUENE | 828.1 | PPB | 103.3 |
| 12 | UNKNOWN | 11.85 | MVS | 186.6 |
| 13 | ETHYLBENZENE | 717.6 | PPB | 213.2 |
| 14 | M,P-XYLENE | 1.437 | PPM | 228.6 |
| 15 | O-XYLENE | 823.8 | PPB | 268.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


G.C. Ready 105+ GC Function May 15,95 14:30
-- Analysis No 19 -- Run at - May 15,95 14:18 -
Pk No Name Conc/Area Alarm Ret.Time
7 Unknown 0.311 mVS -No- 38.9 sec
8 Unknown 0.614 mVS -No- 40.8 sec
9 Unknown 0.499 mVS -No- 44.9 sec
10 benzene 1.000 ppm -No- 52.0 sec
11 toluene 1.000 ppm -No- 103.3 sec
12 Unknown 11.85 mVS -No- 106.6 sec
13 ethylbenzene 1.000 ppm -No- 214.2 sec
14 m,p-xylene 2.000 ppm -No- 228.5 sec
15 o-xylene 1.001 ppm -No- 268.2 sec
- Detected 15 peaks. Use ↑ ↓ to scroll [ 405 sec]
800 (mV)
598
397
195
-6
182.5 uV
10
11
1 9 4 5 6 7 3
12 13 14 15
0 22 44 66 109 156 221 301 400

ANALYSIS #20  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 14:39
SAMPLE TIME: MAY 15,95 14:32

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

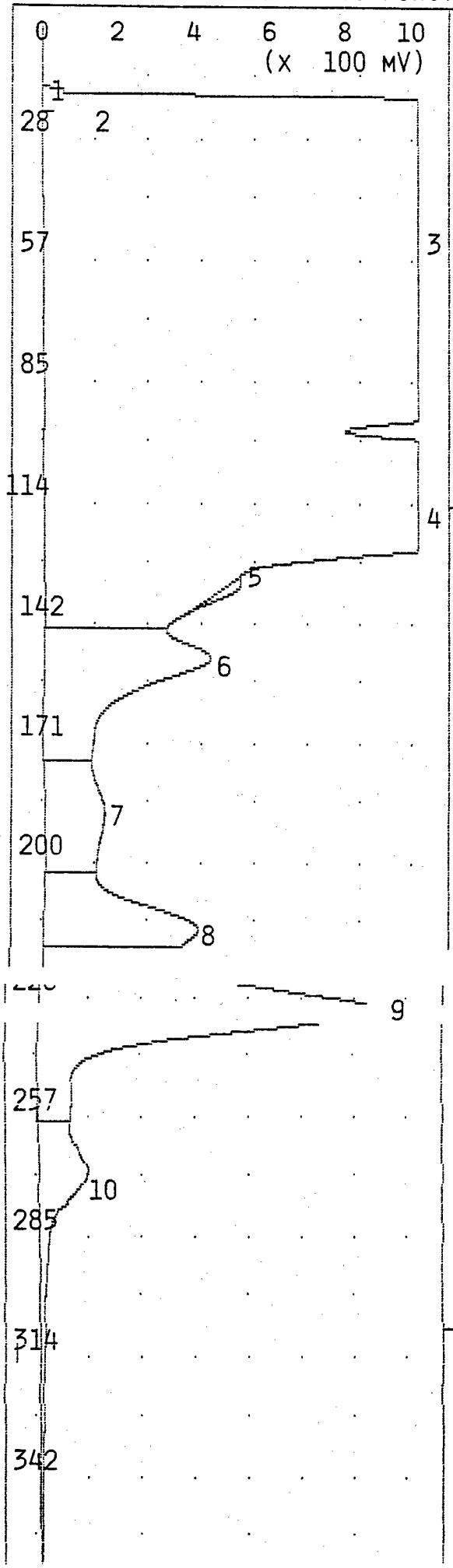
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.042 | MVS | 13.7 |
| 2 | UNKNOWN | 67.73 | MVS | 16.7 |
| 3 | UNKNOWN | 0.590 | MVS | 21.5 |
| 4 | UNKNOWN | 0.214 | MVS | 32.7 |
| 5 | UNKNOWN | 1.780 | MVS | 40.8 |
| 6 | BENZENE | 0.374 | PPB | 51.8 |
| 7 | UNKNOWN | 5.497 | MVS | 65.0 |
| 8 | UNKNOWN | 0.105 | MVS | 81.0 |
| 9 | TOLUENE | 1.837 | PPB | 103.8 |
| 10 | UNKNOWN | 1.726 | MVS | 195.0 |
| 11 | ETHYLBENZENE | 2.816 | PPB | 215.0 |
| 12 | M,P-XYLENE | 5.882 | PPB | 229.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
~~1 PPM BTEX~~
AIR BLANK JJ

ANALYSIS #22  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 15:00
SAMPLE TIME: MAY 15,95 14:54

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

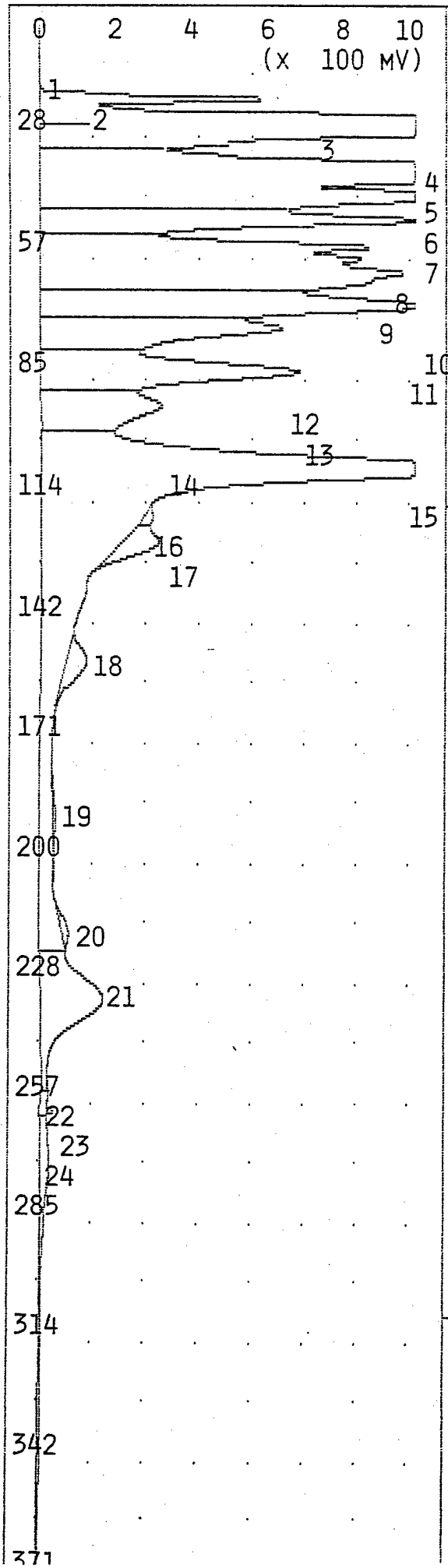
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.373 MVS | 13.8 |
| 2 | UNKNOWN | 55.12 MVS | 14.8 |
| 3 | BENZENE | 1160. PPM2 | 47.6 |
| 4 | TOLUENE | 52.51 PPM2 | 110.4 |
| 5 | UNKNOWN | 177.7 MVS | 130.8 |
| 6 | UNKNOWN | 7.988 VSEC | 149.2 |
| 7 | UNKNOWN | 3.961 VSEC | 186.4 |
| 8 | ETHYLBENZENE | 5.104 PPM | 214.0 |
| 9 | M,P-XYLENE | 41.04 PPM | 229.6 |
| 10 | O-XYLENE | 22.70 PPM | 268.0 |

PPM1 = ALARM 1  PPM2 = ALARM2

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002BH RESHOT
5.0- 7.0 10G
20 MICROLITER INJECTION

ANALYSIS #23 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 15:47
SAMPLE TIME: MAY 15,95 15:41

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

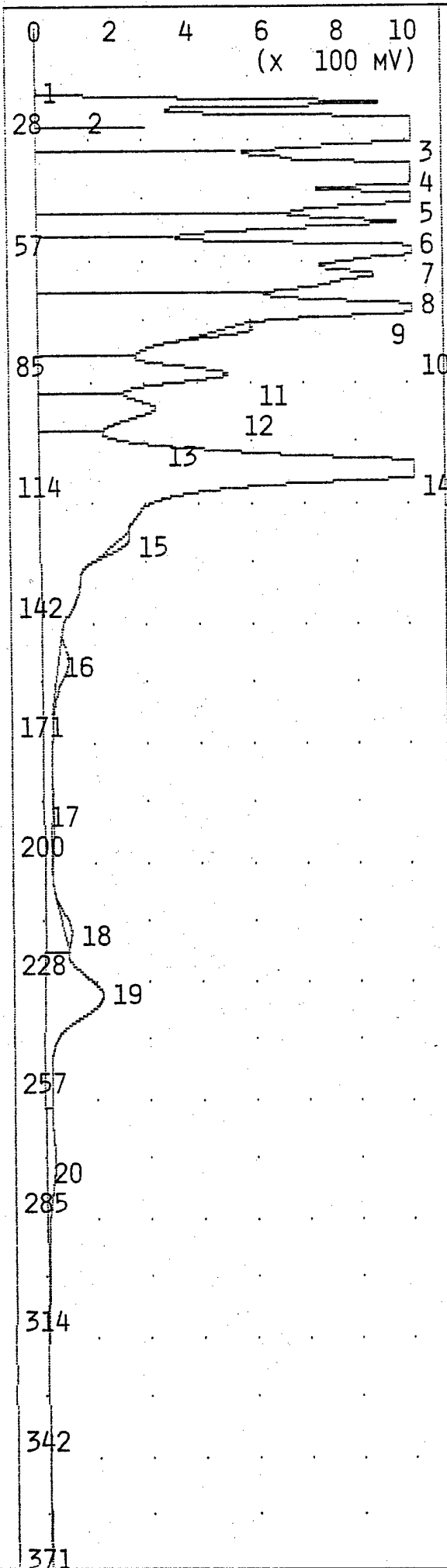
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.119 | MVS | 13.8 |
| 2 | UNKNOWN | 4.945 | MVS | 14.8 |
| 3 | UNKNOWN | 1.234 | VSEC | 17.7 |
| 4 | UNKNOWN | 19.65 | VSEC | 23.9 |
| 5 | UNKNOWN | 12.70 | VSEC | 34.8 |
| 6 | UNKNOWN | 6.993 | VSEC | 40.4 |
| 7 | UNKNOWN | 4.180 | VSEC | 46.0 |
| 8 | BENZENE | 1.011 | PPM | 52.2 |
| 9 | UNKNOWN | 2.146 | VSEC | 55.1 |
| 10 | UNKNOWN | 5.807 | VSEC | 58.2 |
| 11 | UNKNOWN | 5.636 | VSEC | 66.0 |
| 12 | UNKNOWN | 3.708 | VSEC | 71.4 |
| 13 | UNKNOWN | 4.322 | VSEC | 81.8 |
| 14 | UNKNOWN | 2.574 | VSEC | 89.8 |
| 15 | TOLUENE | 10.71 | PPM | 104.2 |
| 16 | UNKNOWN | 85.76 | MVS | 115.3 |
| 17 | UNKNOWN | 594.7 | MVS | 121.4 |
| 18 | UNKNOWN | 465.4 | MVS | 149.6 |
| 19 | UNKNOWN | 97.55 | MVS | 186.6 |
| 20 | ETHYLBENZENE | 135.1 | PPB | 214.8 |
| 21 | M,P-XYLENE | 7.808 | PPM | 230.2 |
| 22 | UNKNOWN | 0.019 | MVS | 252.8 |
| 23 | UNKNOWN | 134.7 | MVS | 257.0 |
| 24 | O-XYLENE | 5.188 | PPM | 269.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002BH
10.0-12.0 10G
5 MICROLITER INJECTION

ANALYSIS #24 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 16:03
SAMPLE TIME: MAY 15,95 15:57

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

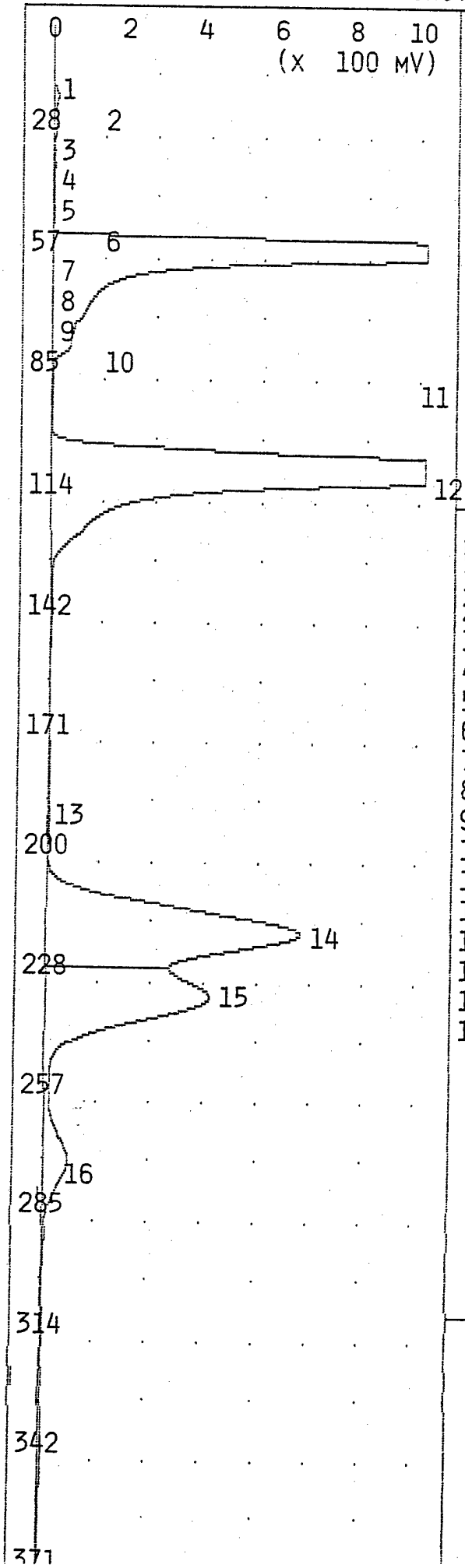
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.062 | MVS | 13.8 |
| 2 | UNKNOWN | 5.352 | MVS | 14.8 |
| 3 | UNKNOWN | 2.011 | VSEC | 17.8 |
| 4 | UNKNOWN | 22.01 | VSEC | 24.2 |
| 5 | UNKNOWN | 11.79 | VSEC | 34.7 |
| 6 | UNKNOWN | 6.533 | VSEC | 40.4 |
| 7 | UNKNOWN | 3.705 | VSEC | 46.1 |
| 8 | BENZENE | 3.685 | PPM | 52.5 |
| 9 | UNKNOWN | 5.181 | VSEC | 58.2 |
| 10 | UNKNOWN | 9.488 | VSEC | 66.2 |
| 11 | UNKNOWN | 181.3 | MVS | 71.2 |
| 12 | UNKNOWN | 3.222 | VSEC | 81.7 |
| 13 | UNKNOWN | 2.352 | VSEC | 89.8 |
| 14 | TOLUENE | 10.45 | PPM | 104.2 |
| 15 | UNKNOWN | 143.5 | MVS | 120.4 |
| 16 | UNKNOWN | 215.5 | MVS | 149.6 |
| 17 | UNKNOWN | 42.78 | MVS | 186.8 |
| 18 | ETHYLBENZENE | 167.7 | PPB | 214.8 |
| 19 | M,P-XYLENE | 7.234 | PPM | 230.0 |
| 20 | O-XYLENE | 4.654 | PPM | 269.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-002BH RE-RESHOT
5.0- 7.0 10G
5 MICROLITER INJECTION

ANALYSIS #25 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 16:44
SAMPLE TIME: MAY 15,95 16:38

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.030 | MVS | 13.7 |
| 2 | UNKNOWN | 10.39 | MVS | 15.3 |
| 3 | UNKNOWN | 55.41 | MVS | 16.7 |
| 4 | UNKNOWN | 43.66 | MVS | 21.8 |
| 5 | UNKNOWN | 0.439 | MVS | 23.7 |
| 6 | UNKNOWN | 35.54 | MVS | 25.6 |
| 7 | UNKNOWN | 18.13 | MVS | 33.0 |
| 8 | UNKNOWN | 12.13 | MVS | 35.6 |
| 9 | UNKNOWN | 18.84 | MVS | 39.6 |
| 10 | UNKNOWN | 9.326 | MVS | 45.8 |
| 11 | BENZENE | 9.052 | PPM | 53.0 |
| 12 | TOLUENE | 8.789 | PPM | 104.6 |
| 13 | UNKNOWN | 0.797 | MVS | 184.2 |
| 14 | ETHYLBENZENE | 8.293 | PPM | 214.8 |
| 15 | M,P-XYLENE | 16.84 | PPM | 229.8 |
| 16 | O-XYLENE | 8.391 | PPM | 269.3 |

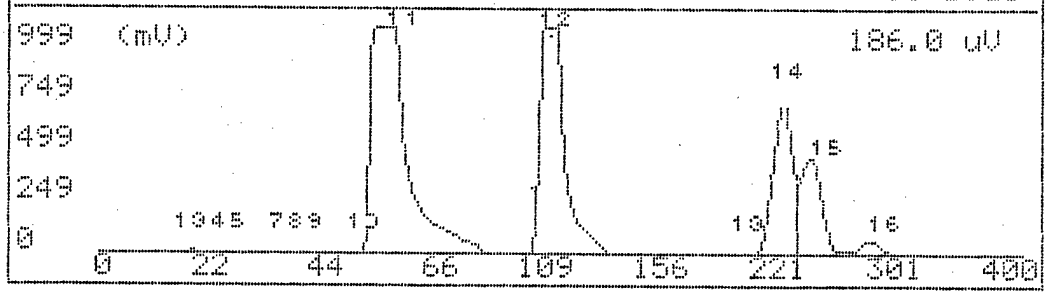
NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

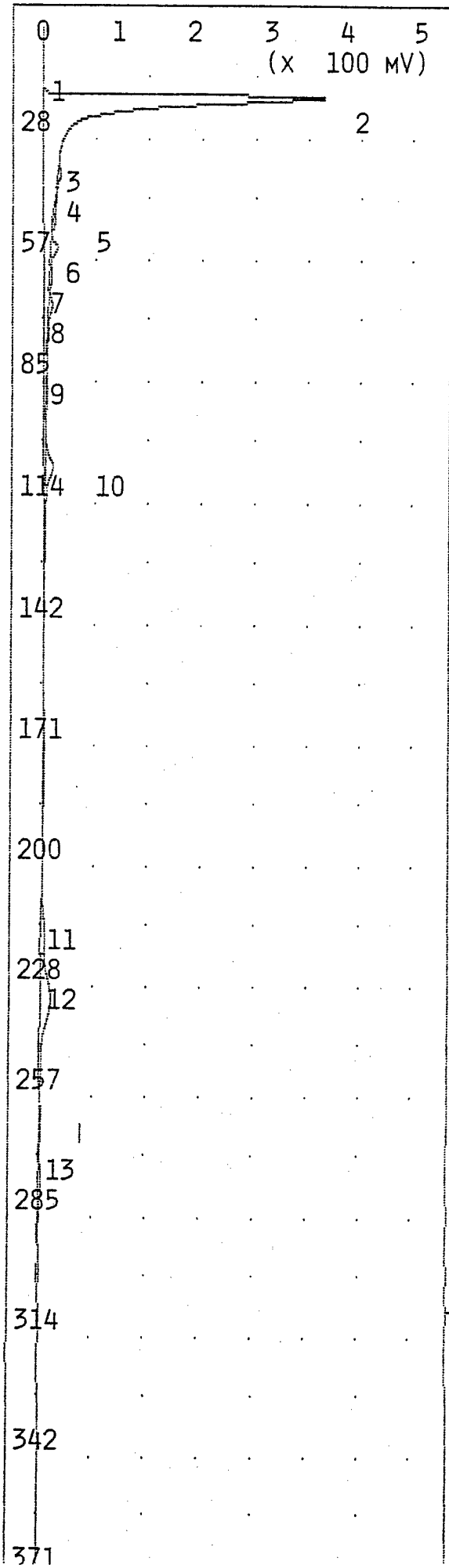
G.C. Ready  10S+ GC Function  May 15,95  16:50
-- Analysis No 25  -- Run at - May 15,95  16:38 -

| Pk No | Name | Conc/Area | | Alarm | Ret.Time |
|---|---|---|---|---|---|
| 8 | Unknown | 12.15 | mVS | -No- | 335.6 sec |
| 9 | Unknown | 10.80 | mVS | -No- | 350.0 sec |
| 10 | Unknown | 9.357 | mVS | -No- | 365.0 sec |
| 11 | benzene | 10.00 | ppm | -No- | 383.0 sec |
| 12 | toluene | 10.00 | ppm | -No- | 404.5 sec |
| 13 | Unknown | 0.797 | mVS | -No- | 484.5 sec |
| 14 | ethylbenzene | 10.00 | ppm | -No- | 514.0 sec |
| 15 | m,p-xylene | 20.00 | ppm | -No- | 529.0 sec |
| 16 | o-xylene | 10.03 | ppm | -No- | 559.5 sec |

- Detected 16 peaks. Use ↑ ↓ to scroll  [ 405 sec]



ANALYSIS #26  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 16:58
SAMPLE TIME: MAY 15,95 16:52

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

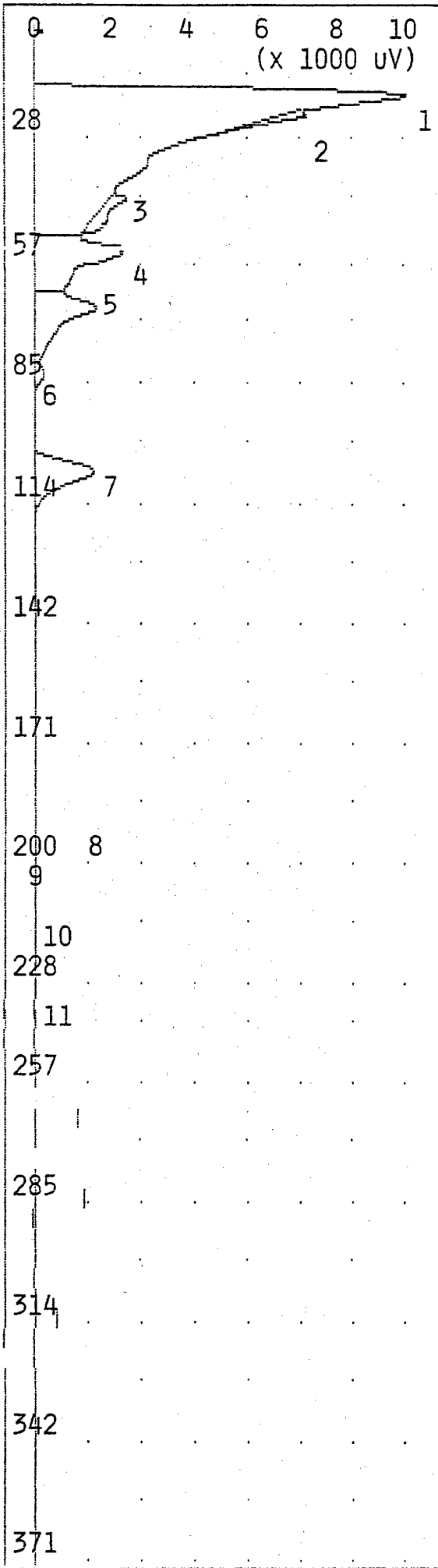
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.046 | MVS | 13.5 |
| 2 | UNKNOWN | 2.393 | VSEC | 16.6 |
| 3 | UNKNOWN | 11.94 | MVS | 34.8 |
| 4 | UNKNOWN | 1.233 | MVS | 39.5 |
| 5 | UNKNOWN | 6.099 | MVS | 45.6 |
| 6 | BENZENE | 11.05 | PPB | 52.0 |
| 7 | UNKNOWN | 8.683 | MVS | 58.0 |
| 8 | UNKNOWN | 21.30 | MVS | 65.8 |
| 9 | UNKNOWN | 2.818 | MVS | 81.6 |
| 10 | TOLUENE | 37.93 | PPB | 103.7 |
| 11 | ETHYLBENZENE | 40.74 | PPB | 214.4 |
| 12 | M,P-XYLENE | 521.2 | PPB | 229.6 |
| 13 | O-XYLENE | 103.4 | PPB | 269.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYCIC #27  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 17:09
SAMPLE TIME: MAY 15,95 17:02

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

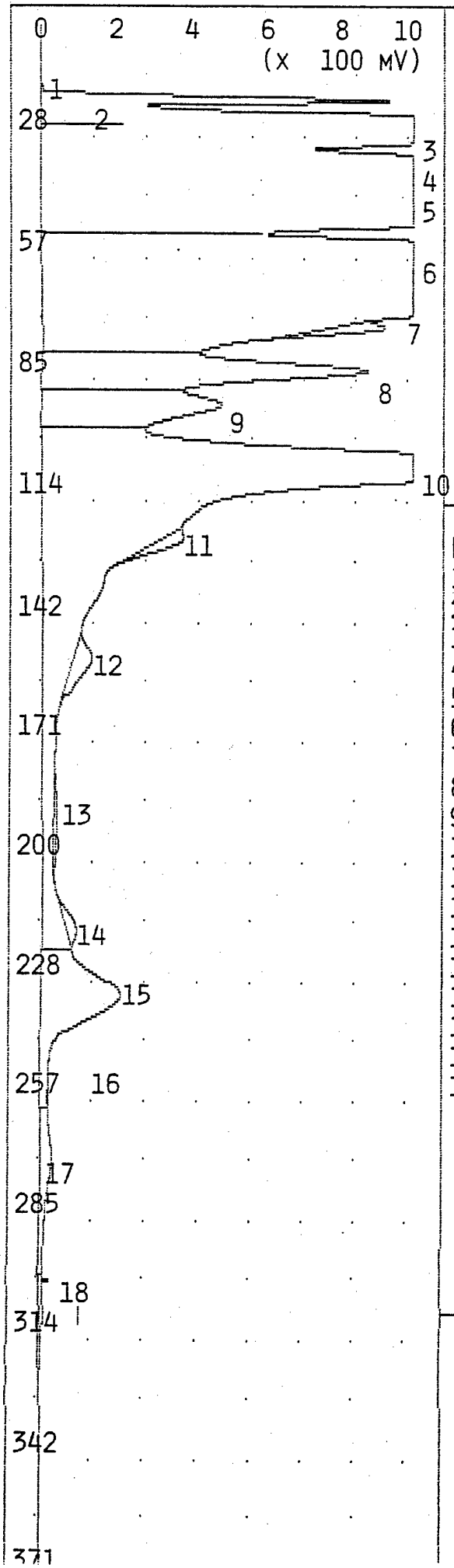
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 153.8 | MVS | 17.0 |
| 2 | UNKNOWN | 1.587 | MVS | 21.6 |
| 3 | UNKNOWN | 3.106 | MVS | 41.1 |
| 4 | BENZENE | 10.19 | PPB | 52.6 |
| 5 | UNKNOWN | 20.02 | MVS | 66.4 |
| 6 | UNKNOWN | 7.491 | MVS | 81.2 |
| 7 | TOLUENE | 13.63 | PPB | 104.9 |
| 8 | UNKNOWN | 0.142 | MVS | 190.4 |
| 9 | UNKNOWN | 0.037 | MVS | 193.4 |
| 10 | ETHYLBENZENE | 3.794 | PPB | 216.0 |
| 11 | M,P-XYLENE | 12.62 | PPB | 231.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK
400 MICROLITER INJECTON

ANALYSIS #29 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 17:30
SAMPLE TIME: MAY 15,95 17:23

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

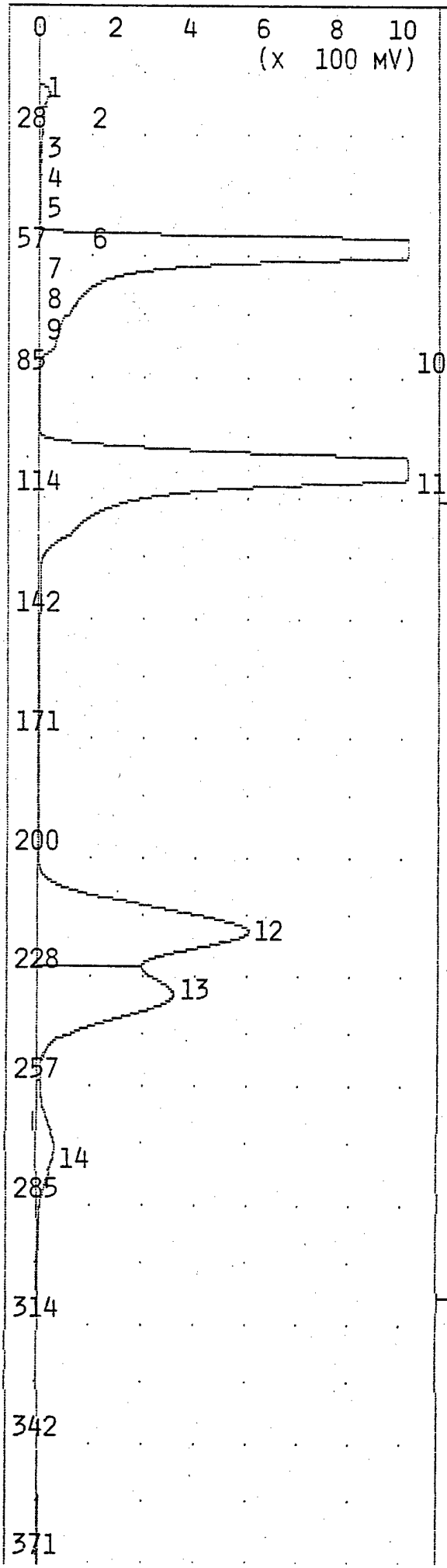
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.057 MVS | 13.8 |
| 2 | UNKNOWN | 6.434 MVS | 14.8 |
| 3 | UNKNOWN | 1.929 VSEC | 17.8 |
| 4 | UNKNOWN | 26.95 VSEC | 21.4 |
| 5 | UNKNOWN | 48.52 VSEC | 39.3 |
| 6 | UNKNOWN | 116.5 VSEC | 58.4 |
| 7 | UNKNOWN | 443.8 MVS | 71.3 |
| 8 | UNKNOWN | 5.656 VSEC | 81.6 |
| 9 | UNKNOWN | 3.681 VSEC | 89.6 |
| 10 | TOLUENE | 18.38 PPM | 104.4 |
| 11 | UNKNOWN | 305.1 MVS | 120.5 |
| 12 | UNKNOWN | 459.0 MVS | 149.4 |
| 13 | UNKNOWN | 110.6 MVS | 186.2 |
| 14 | ETHYLBENZENE | 198.0 PPB | 214.4 |
| 15 | M,P-XYLENE | 11.62 PPM | 229.4 |
| 16 | UNKNOWN | 1.110 MVS | 251.2 |
| 17 | O-XYLENE | 5.414 PPM | 268.8 |
| 18 | UNKNOWN | 306.8 MVS | 298.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-001BH
5.0- 7.0 3G
10 MICROLITER INJECTION

ANALYSIS #30 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 15,95 17:43
SAMPLE TIME: MAY 15,95 17:36

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 14 | ML/MIN |
| B/F FLOW | 14 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 400.0 | SEC |

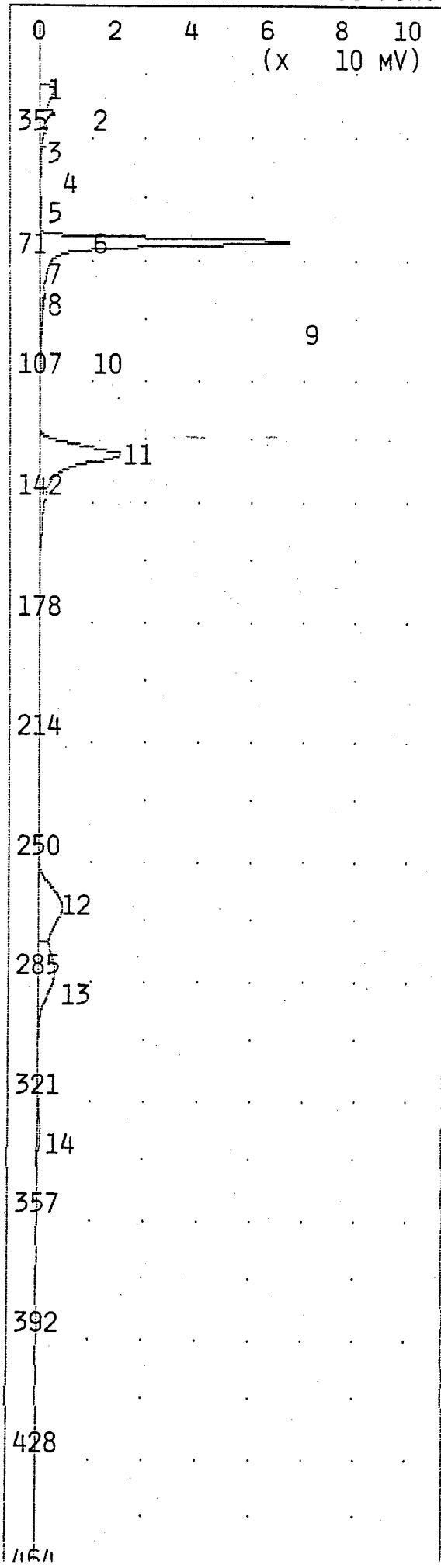
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.037 | MVS | 13.5 |
| 2 | UNKNOWN | 26.19 | MVS | 15.4 |
| 3 | UNKNOWN | 266.1 | MVS | 16.8 |
| 4 | UNKNOWN | 5.603 | MVS | 21.8 |
| 5 | UNKNOWN | 0.872 | MVS | 25.7 |
| 6 | UNKNOWN | 3.337 | MVS | 33.1 |
| 7 | UNKNOWN | 1.531 | MVS | 35.8 |
| 8 | UNKNOWN | 2.619 | MVS | 40.5 |
| 9 | UNKNOWN | 1.366 | MVS | 45.8 |
| 10 | BENZENE | 10.94 | PPM | 53.4 |
| 11 | TOLUENE | 9.802 | PPM | 105.3 |
| 12 | ETHYLBENZENE | 8.544 | PPM | 215.8 |
| 13 | M,P-XYLENE | 16.56 | PPM | 230.8 |
| 14 | O-XYLENE | 7.747 | PPM | 270.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

ANALYSIS #1 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 08:11
SAMPLE TIME: MAY 16,95 08:03

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 28 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.081 MVS | 16.3 |
| 2 | UNKNOWN | 5.752 MVS | 18.5 |
| 3 | UNKNOWN | 18.19 MVS | 20.0 |
| 4 | UNKNOWN | 14.28 MVS | 26.2 |
| 5 | UNKNOWN | 10.32 MVS | 31.0 |
| 6 | UNKNOWN | 4.422 MVS | 39.4 |
| 7 | UNKNOWN | 1.263 MVS | 47.4 |
| 8 | UNKNOWN | 4.876 MVS | 51.4 |
| 9 | UNKNOWN | 243.3 MVS | 63.3 |
| 10 | UNKNOWN | 0.726 MVS | 79.6 |
| 11 | UNKNOWN | 167.5 MVS | 126.2 |
| 12 | UNKNOWN | 98.87 MVS | 260.8 |
| 13 | UNKNOWN | 76.18 MVS | 280.2 |
| 14 | UNKNOWN | 16.68 MVS | 329.3 |

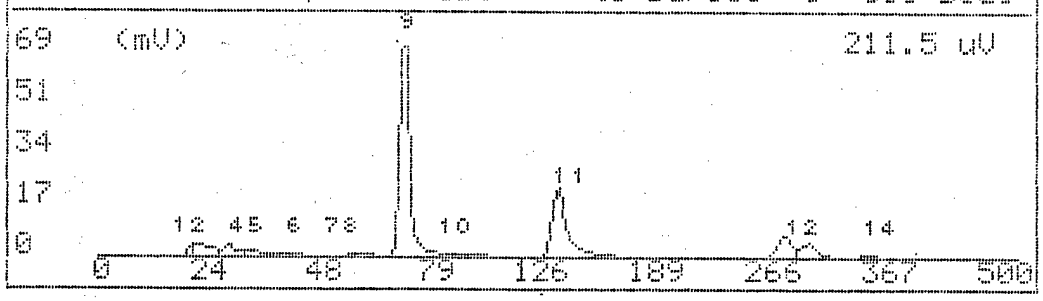
NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

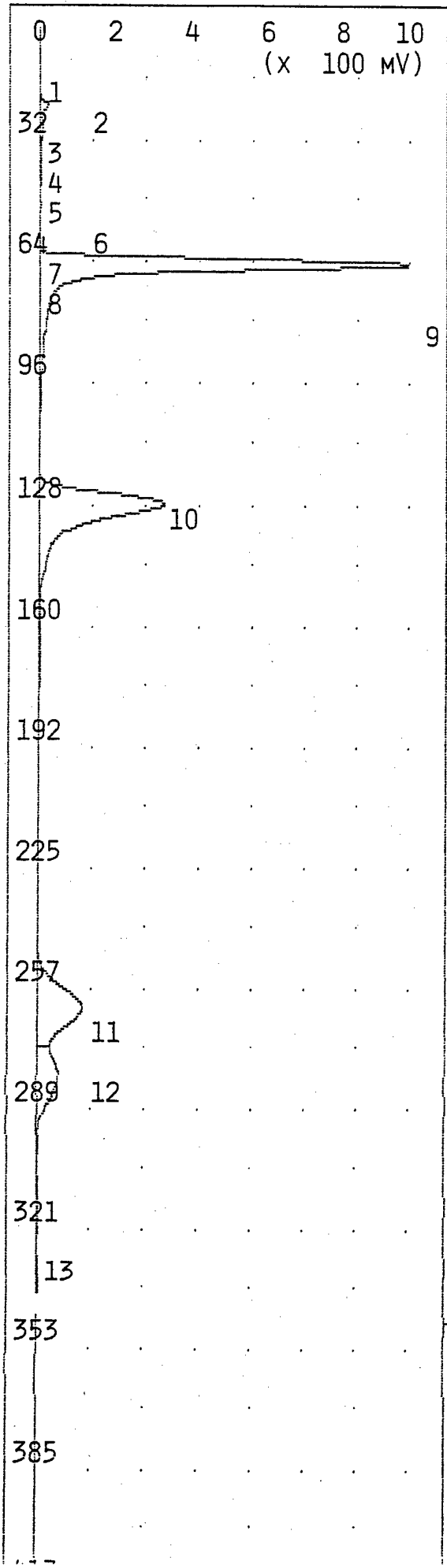
G.C. Ready  10S+ GC Function  May 16,95  08:18
-- Analysis No 1  -- Run at - May 16,95  08:03 -

| Pk No | Name | Conc/Area | | Alarm | Ret.Time |
|---|---|---|---|---|---|
| 6 | Unknown | 4.422 | mVS | -No- | 39.4 sec |
| 7 | Unknown | 1.263 | mVS | -No- | 47.4 sec |
| 8 | Unknown | 4.876 | mVS | -No- | 51.4 sec |
| 9 | benzene | 100.0 | ppb | -No- | 63.4 sec |
| 10 | Unknown | 0.726 | mVS | -No- | 79.6 sec |
| 11 | toluene | 100.0 | ppb | -No- | 126.1 sec |
| 12 | ethylbenzene | 100.0 | ppb | -No- | 265.3 sec |
| 13 | m,p-xylene | 200.0 | ppb | -No- | 289.2 sec |
| 14 | o-xylene | 100.0 | ppb | -No- | 329.3 sec |

- Detected 14 peaks. Use ↑ ↓ to scroll  [ 505 sec]



ANALYSIS #2 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 08:28
SAMPLE TIME: MAY 16,95 08:20

METHOD

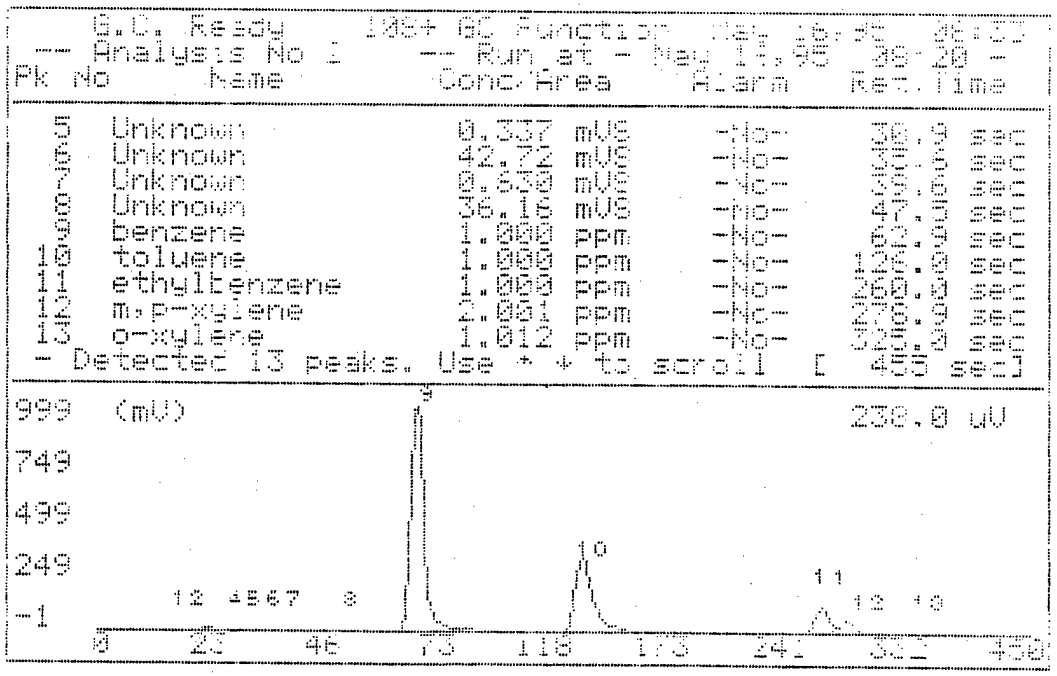
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

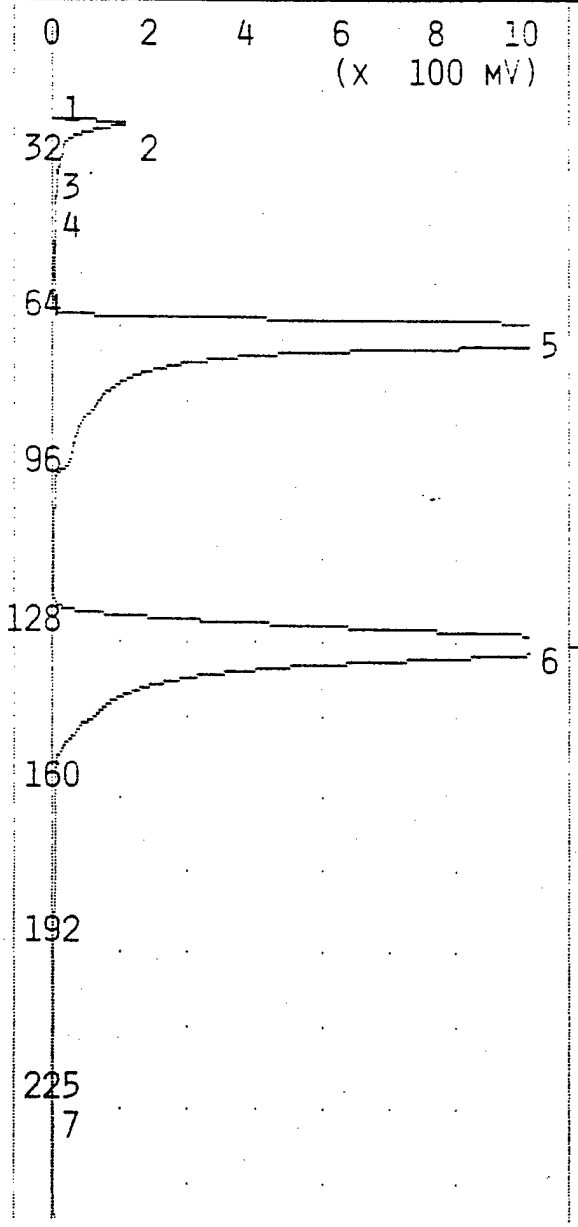
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.046 | MVS | 16.4 |
| 2 | UNKNOWN | 7.395 | MVS | 18.4 |
| 3 | UNKNOWN | 83.33 | MVS | 20.3 |
| 4 | UNKNOWN | 64.17 | MVS | 26.4 |
| 5 | UNKNOWN | 0.337 | MVS | 30.9 |
| 6 | UNKNOWN | 42.69 | MVS | 35.6 |
| 7 | UNKNOWN | 0.630 | MVS | 39.6 |
| 8 | UNKNOWN | 36.11 | MVS | 47.5 |
| 9 | BENZENE | 1.763 | PPM | 62.9 |
| 10 | TOLUENE | 1.857 | PPM | 126.0 |
| 11 | ETHYLBENZENE | 1.583 | PPM | 260.0 |
| 12 | M,P-XYLENE | 2.249 | PPM | 278.9 |
| 13 | O-XYLENE | 814.9 | PPB | 325.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


G.C. Ready
Analysis No 1
Run at
Pk No
Name
Conc/Area
Alarm
Ret.Time
Unknown
Unknown
Unknown
Unknown
benzene
toluene
ethylbenzene
m,p-xylene
o-xylene
Detected 13 peaks. Use ↑ ↓ to scroll
(mV)
999
749
499
249
-1
230.0 uV
0
23
46
70
116
173
241
322
450

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 08:42
SAMPLE TIME: MAY 16,95 08:34

METHOD

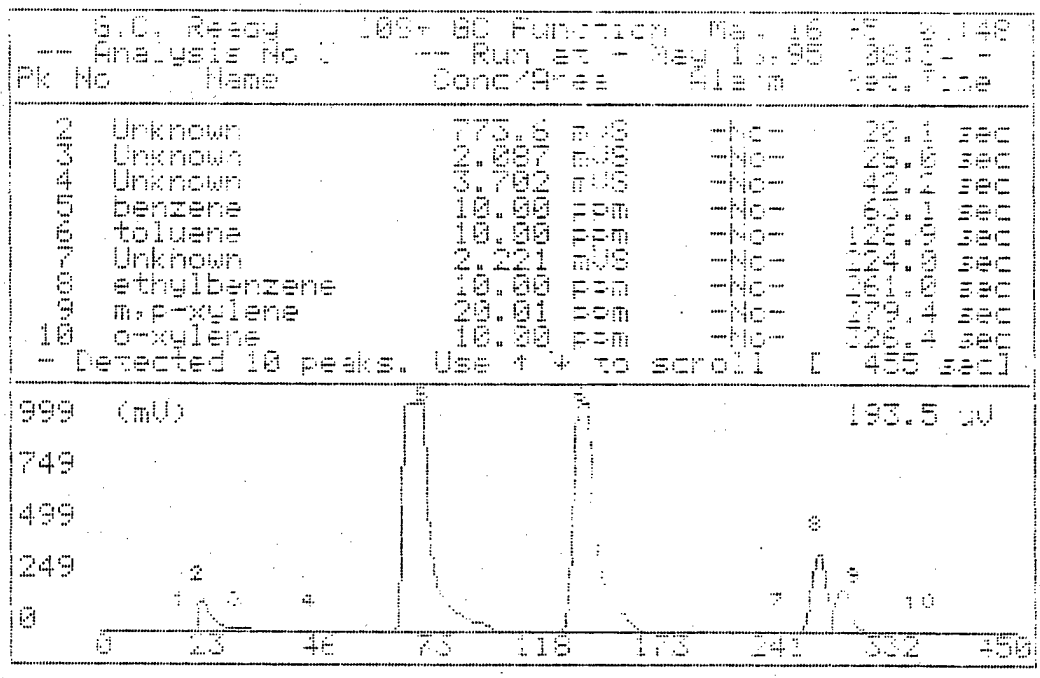
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

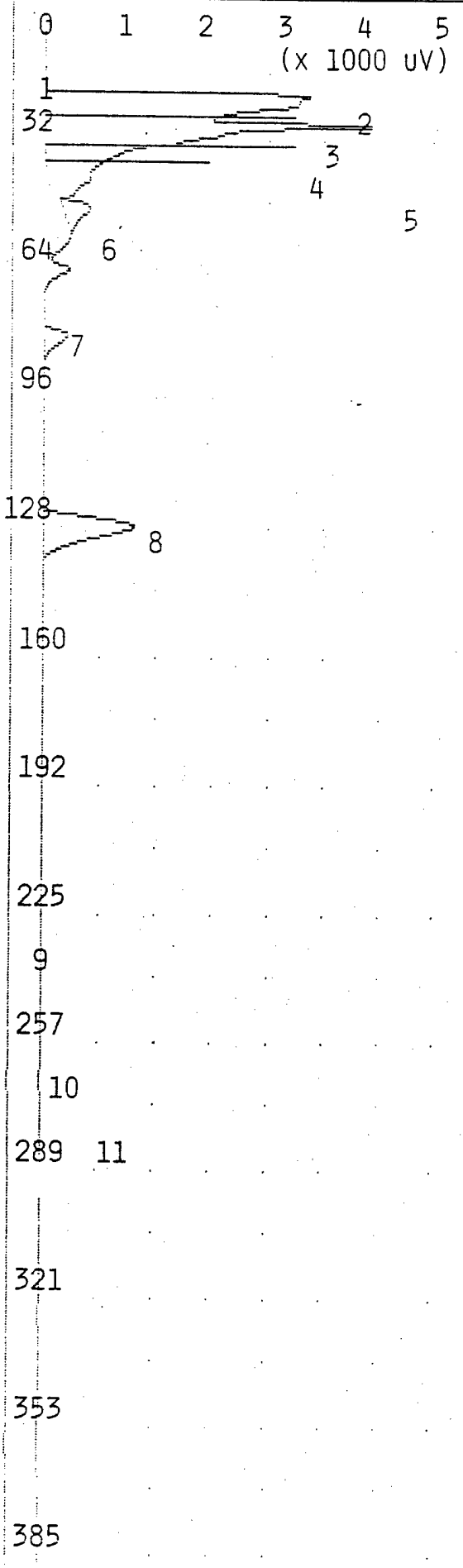
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.033 | MVS | 16.2 |
| 2 | UNKNOWN | 773.4 | MVS | 20.1 |
| 3 | UNKNOWN | 2.087 | MVS | 26.0 |
| 4 | UNKNOWN | 3.702 | MVS | 42.2 |
| 5 | BENZENE | 3.714 | PPM | 63.1 |
| 6 | TOLUENE | 4.081 | PPM | 126.9 |
| 7 | UNKNOWN | 2.221 | MVS | 224.0 |
| 8 | ETHYLBENZENE | 3.060 | PPM | 261.0 |
| 9 | M,P-XYLENE | 6.604 | PPM | 279.4 |
| 10 | O-XYLENE | 2.210 | PPM | 326.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX


G.C. Assay 105+ GC Function Ma. 16 15 3.148
-- Analysis No : -- Run at : May 1 3.95 38:-- -
Pk No Name Conc/Area Alarm Ret. Time
2 Unknown 773.3 mAS Hold 28.1 sec
Unknown 2.007 mAS Hold 26.0 sec
Unknown 3.702 mAS Hold 42.4 sec
benzene 10.00 ppm Hold 36.1 sec
toluene 10.00 ppm Hold 52.5 sec
Unknown 2.221 mAS Hold 124.3 sec
ethylbenzene 10.00 ppm Hold 261.0 sec
m,p-xylene 20.01 ppm Hold 279.4 sec
10 o-xylene 10.00 ppm Hold 326.4 sec
- Detected 10 peaks. Use ↑ ↓ to scroll [ 455 secl
999 (mV)
749
499
249
0
193.5 mV
0
23
46
70
116
163
209
233
256
303
350

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 08:58
SAMPLE TIME: MAY 16,95 08:50

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

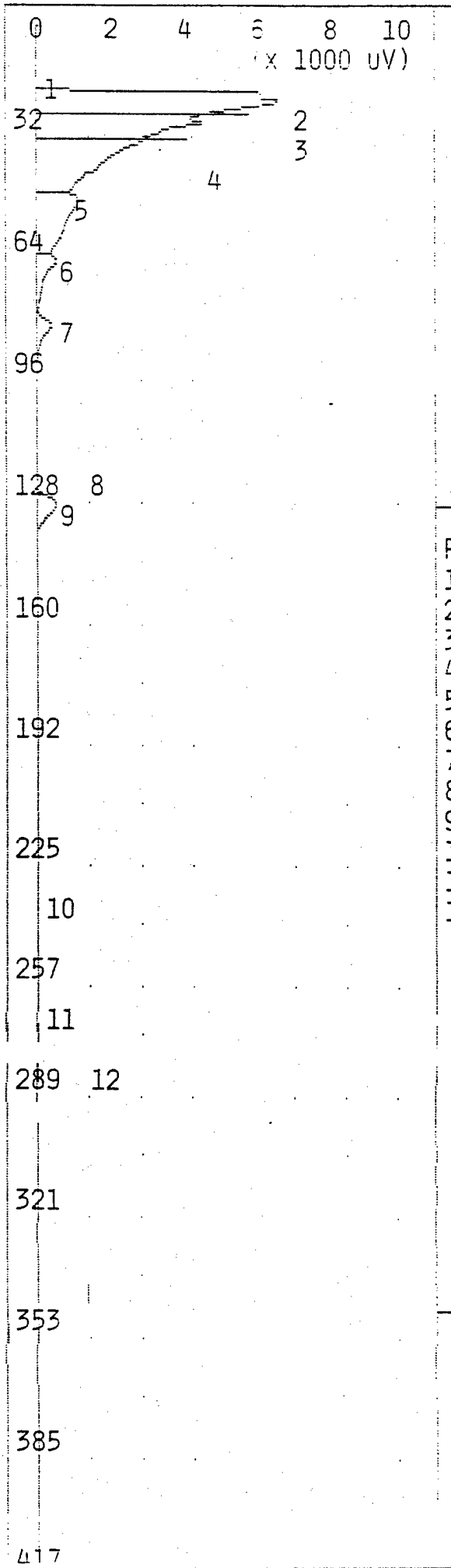
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.024 | MVS | 16.2 |
| 2 | UNKNOWN | 5.093 | MVS | 18.5 |
| 3 | UNKNOWN | 4.879 | MVS | 19.9 |
| 4 | UNKNOWN | 11.66 | MVS | 21.2 |
| 5 | UNKNOWN | 24.61 | MVS | 26.2 |
| 6 | UNKNOWN | 1.683 | MVS | 47.2 |
| 7 | UNKNOWN | 2.792 | MVS | 79.2 |
| 8 | TOLUENE | 9.145 | PPB | 126.2 |
| 9 | UNKNOWN | 2.044 | MVS | 233.4 |
| 10 | ETHYLBENZENE | 5.341 | PPB | 261.6 |
| 11 | M,P-XYLENE | 5.740 | PPB | 280.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #5 IOS+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 09:31
SAMPLE TIME: MAY 16,95 09:23

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

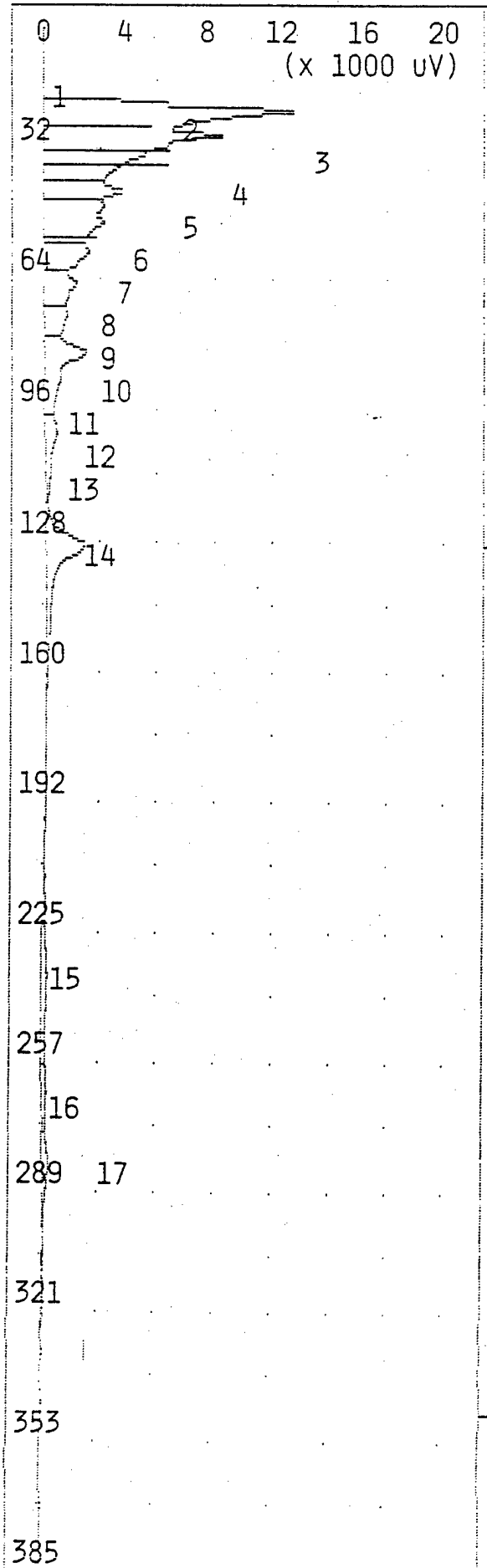
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.034 MVS | 16.4 |
| 2 | UNKNOWN | 9.450 MVS | 18.4 |
| 3 | UNKNOWN | 35.21 MVS | 20.4 |
| 4 | UNKNOWN | 47.42 MVS | 26.4 |
| 5 | UNKNOWN | 14.86 MVS | 47.4 |
| 6 | BENZENE | 2.024 PPB | 63.4 |
| 7 | UNKNOWN | 3.477 MVS | 79.4 |
| 8 | UNKNOWN | 0.332 MVS | 115.4 |
| 9 | TOLUENE | 5.726 PPB | 127.4 |
| 10 | UNKNOWN | 1.940 MVS | 235.6 |
| 11 | ETHYLBENZENE | 1.140 PPB | 264.8 |
| 12 | M,P-XYLENE | 3.136 PPB | 282.9 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
0.5- 2.5 10G

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 09:42
SAMPLE TIME: MAY 16,95 09:35

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

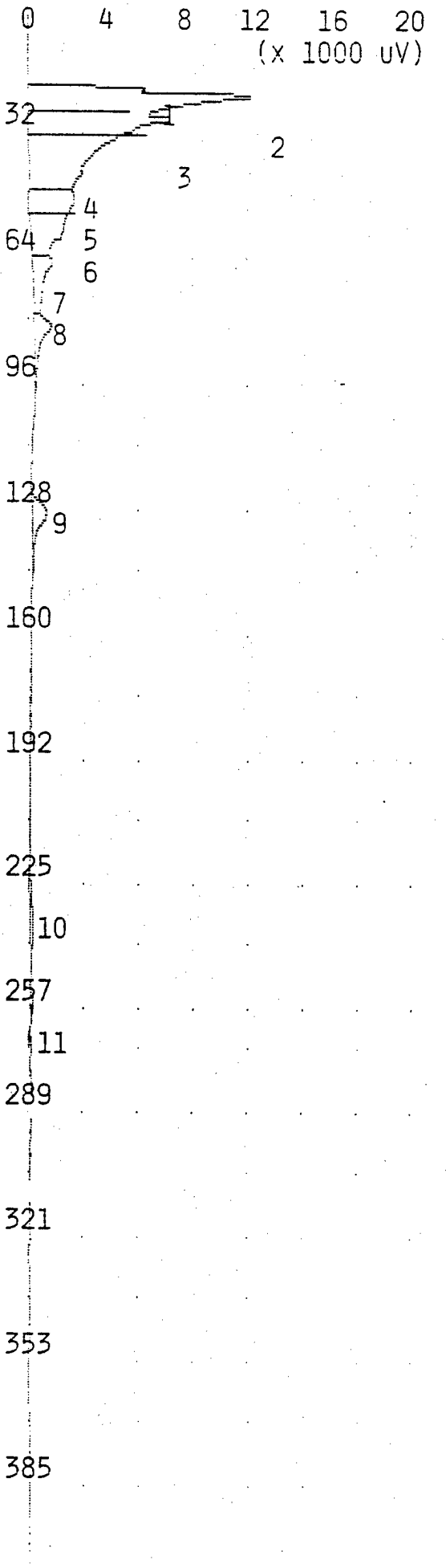
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.030 | MVS | 14.4 |
| 2 | UNKNOWN | 8.287 | MVS | 18.7 |
| 3 | UNKNOWN | 55.67 | MVS | 20.9 |
| 4 | UNKNOWN | 23.76 | MVS | 26.8 |
| 5 | UNKNOWN | 44.73 | MVS | 29.3 |
| 6 | UNKNOWN | 15.75 | MVS | 40.8 |
| 7 | UNKNOWN | 11.21 | MVS | 44.5 |
| 8 | UNKNOWN | 18.55 | MVS | 48.4 |
| 9 | UNKNOWN | 12.59 | MVS | 55.8 |
| 10 | BENZENE | 4.591 | PPB | 63.0 |
| 11 | UNKNOWN | 7.745 | MVS | 70.8 |
| 12 | UNKNOWN | 18.79 | MVS | 80.0 |
| 13 | UNKNOWN | 7.600 | MVS | 100.1 |
| 14 | TOLUENE | 12.05 | PPB | 127.6 |
| 15 | UNKNOWN | 11.62 | MVS | 229.2 |
| 16 | ETHYLBENZENE | 4.553 | PPB | 263.7 |
| 17 | M,P-XYLENE | 13.86 | PPB | 280.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
5.0- 7.0 10G

ANALYSIS #7 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 09:53
SAMPLE TIME: MAY 16,95 09:46

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

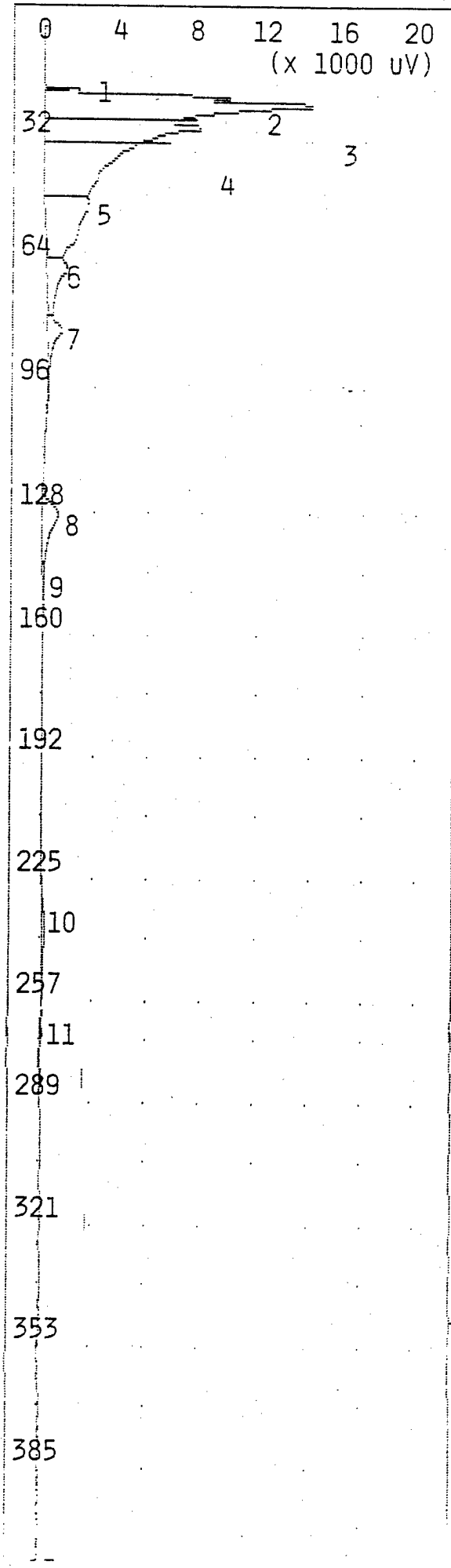
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 8.202 | MVS | 18.8 |
| 2 | UNKNOWN | 52.16 | MVS | 20.6 |
| 3 | UNKNOWN | 78.47 | MVS | 26.8 |
| 4 | UNKNOWN | 0.281 | MVS | 40.2 |
| 5 | UNKNOWN | 1.207 | MVS | 45.6 |
| 6 | UNKNOWN | 27.46 | MVS | 48.0 |
| 7 | BENZENE | 3.721 | PPB | 63.5 |
| 8 | UNKNOWN | 6.346 | MVS | 79.6 |
| 9 | TOLUENE | 3.690 | PPB | 127.2 |
| 10 | UNKNOWN | 4.395 | MVS | 230.4 |
| 11 | ETHYLBENZENE | 0.293 | PPB | 263.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
10.0-12.0 10G

ANALYSIS #8 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 10:04
SAMPLE TIME: MAY 16,95 09:57

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

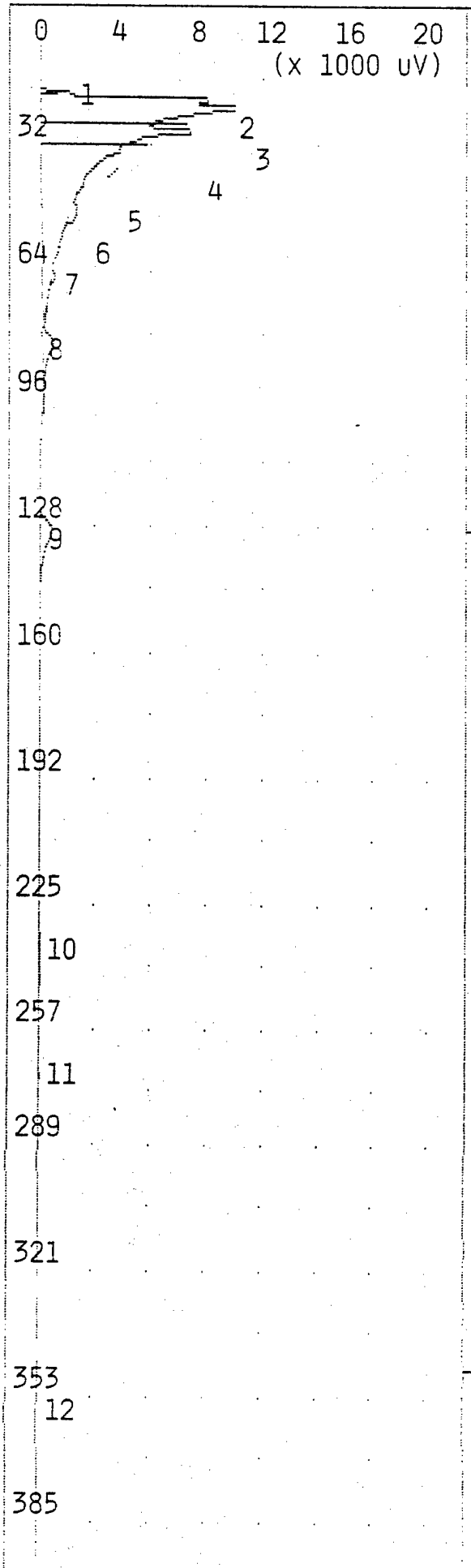
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 2.406 | MVS | 17.0 |
| 2 | UNKNOWN | 14.70 | MVS | 18.6 |
| 3 | UNKNOWN | 61.47 | MVS | 20.5 |
| 4 | UNKNOWN | 84.91 | MVS | 26.6 |
| 5 | UNKNOWN | 28.43 | MVS | 45.9 |
| 6 | BENZENE | 3.892 | PPB | 63.5 |
| 7 | UNKNOWN | 5.966 | MVS | 79.3 |
| 8 | TOLUENE | 10.87 | PPB | 126.9 |
| 9 | UNKNOWN | 8.209 | MVS | 140.9 |
| 10 | UNKNOWN | 3.239 | MVS | 234.6 |
| 11 | ETHYLBENZENE | 1.220 | PPB | 266.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
15.0-17.0 10G

ANALYSIS #9 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 10:15
SAMPLE TIME: MAY 16,95 10:08

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

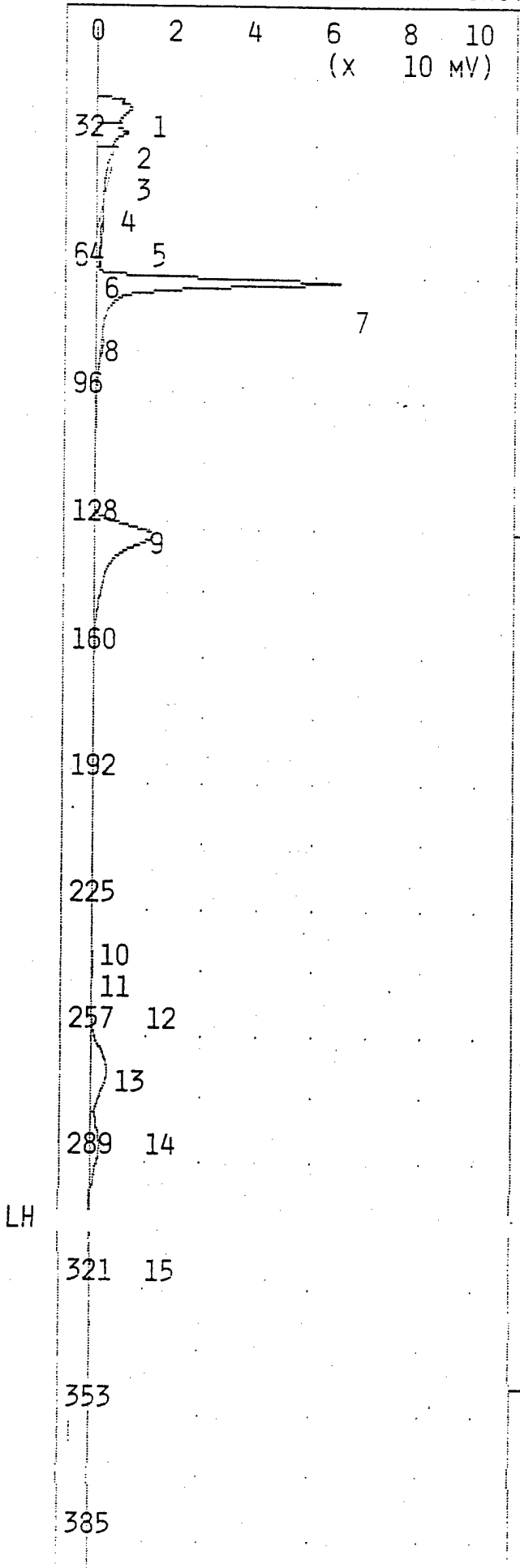
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 1.758 | MVS | 17.0 |
| 2 | UNKNOWN | 14.10 | MVS | 18.6 |
| 3 | UNKNOWN | 46.77 | MVS | 20.7 |
| 4 | UNKNOWN | 96.10 | MVS | 26.6 |
| 5 | UNKNOWN | 0.429 | MVS | 31.6 |
| 6 | UNKNOWN | 1.834 | MVS | 45.7 |
| 7 | BENZENE | 0.073 | PPB | 63.1 |
| 8 | UNKNOWN | 4.684 | MVS | 80.1 |
| 9 | TOLUENE | 3.829 | PPB | 127.2 |
| 10 | UNKNOWN | 2.850 | MVS | 232.4 |
| 11 | ETHYLBENZENE | 0.917 | PPB | 266.6 |
| 12 | O-XYLENE | 20.52 | PPB | 354.0 |
| 13 | UNKNOWN | 6.573 | MVS | 408.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-007BH
20.0-22.0 10G

ANALYSIS #10  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 10:26
SAMPLE TIME: MAY 16,95 10:19

METHOD

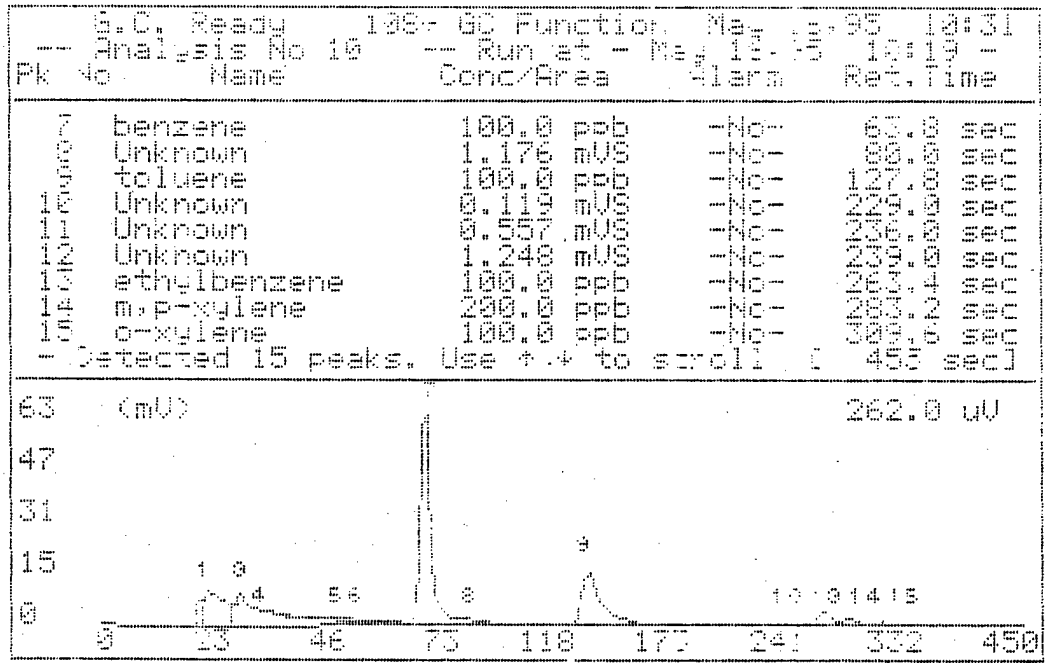
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

PEAK REPORT

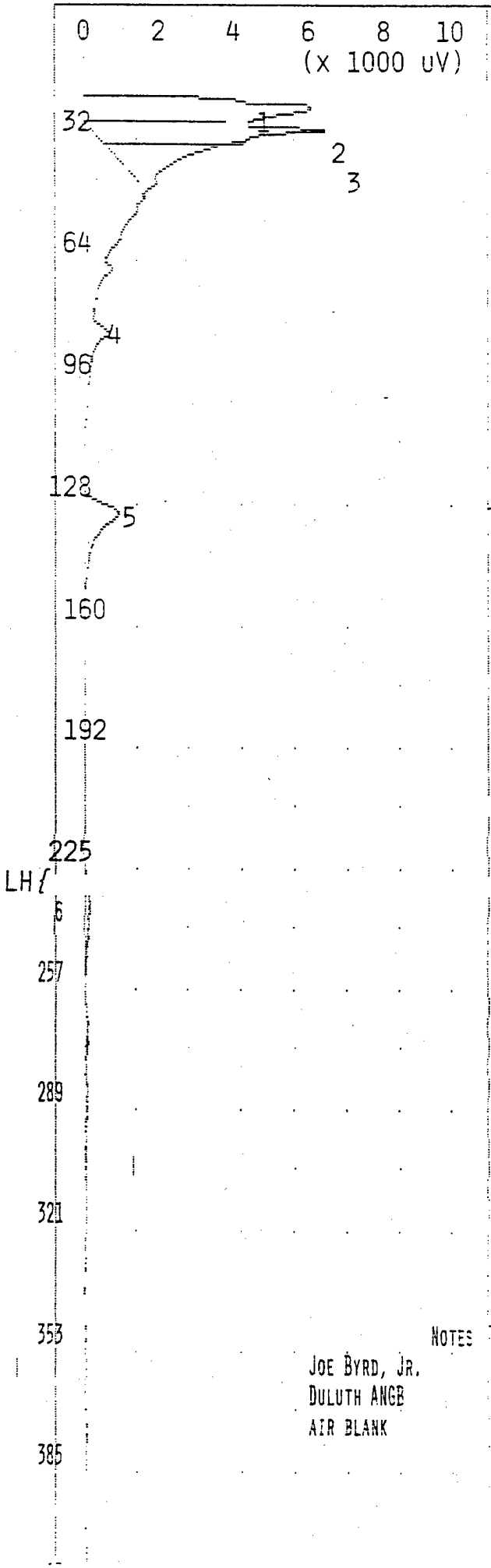
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 10.44 | MVS | 18.8 |
| 2 | UNKNOWN | 44.21 | MVS | 20.6 |
| 3 | UNKNOWN | 91.00 | MVS | 27.0 |
| 4 | UNKNOWN | 0.303 | MVS | 32.0 |
| 5 | UNKNOWN | 0.032 | MVS | 45.8 |
| 6 | UNKNOWN | 1.332 | MVS | 47.6 |
| 7 | BENZENE | 101.2 | PPB | 63.8 |
| 8 | UNKNOWN | 1.176 | MVS | 80.0 |
| 9 | TOLUENE | 82.93 | PPB | 127.8 |
| 10 | UNKNOWN | 0.119 | MVS | 229.0 |
| 11 | UNKNOWN | 0.557 | MVS | 236.0 |
| 12 | UNKNOWN | 1.248 | MVS | 239.0 |
| 13 | ETHYLBENZENE | 53.62 | PPB | 263.4 |
| 14 | M,P-XYLENE | 74.61 | PPB | 283.2 |
| 15 | O-XYLENE | 0.577 | PPB | 309.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


G.C. Ready 136- GC Function Ma 10:31
-- Analysis No 10 -- Run at - Ma 10:19 -
Pk No Name Conc/Area Alarm Ret.Time
7 benzene 100.0 ppb No 67 sec
8 Unknown 1.176 mVS No 1 1200.0 sec
9 toluene 100.0 ppb No 1 2700.0 sec
10 Unknown 0.119 mVS No 1 2 sec
11 Unknown 0.557 mVS No 1 3 sec
12 Unknown 1.248 mVS No 1 4 sec
13 ethylbenzene 100.0 ppb No 1 4 sec
14 m,p-xylene 200.0 ppb No 1 2 sec
15 o-xylene 100.0 ppb No 1 sec
Detected 15 peaks. Use ↑,↓ to scroll. [ 453 sec]
63 (mV) 262.0 uV
47
31
15
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
9 23 46 75 118 177 241 332 450

ANALYSIS #11 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 10:40
SAMPLE TIME: MAY 16,95 10:33

METHOD

| | | |
|---|---|---|
| SLOPE UP | 1.500 | MV/SEC |
| SLOPE DOWN | 4.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

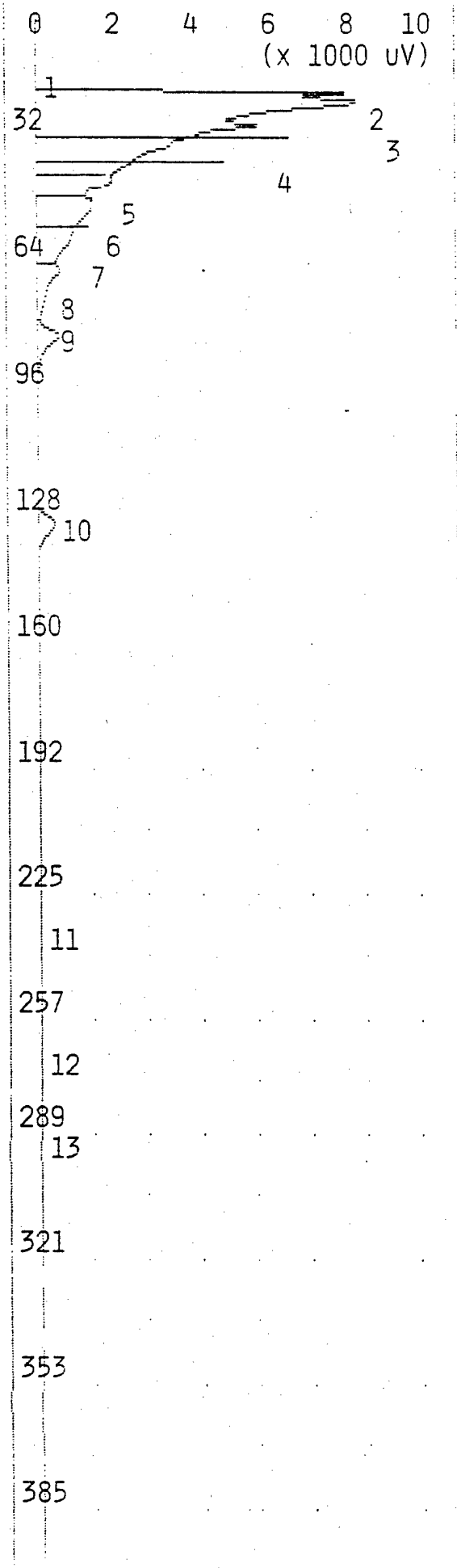
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 5.396 | MVS | 19.3 |
| 2 | UNKNOWN | 30.84 | MVS | 21.4 |
| 3 | UNKNOWN | 32.57 | MVS | 27.6 |
| 4 | UNKNOWN | 2.044 | MVS | 81.7 |
| 5 | TOLUENE | 5.320 | PPB | 128.8 |
| 6 | UNKNOWN | 1.942 | MVS | 234.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 10:52
SAMPLE TIME: MAY 16,95 10:44

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

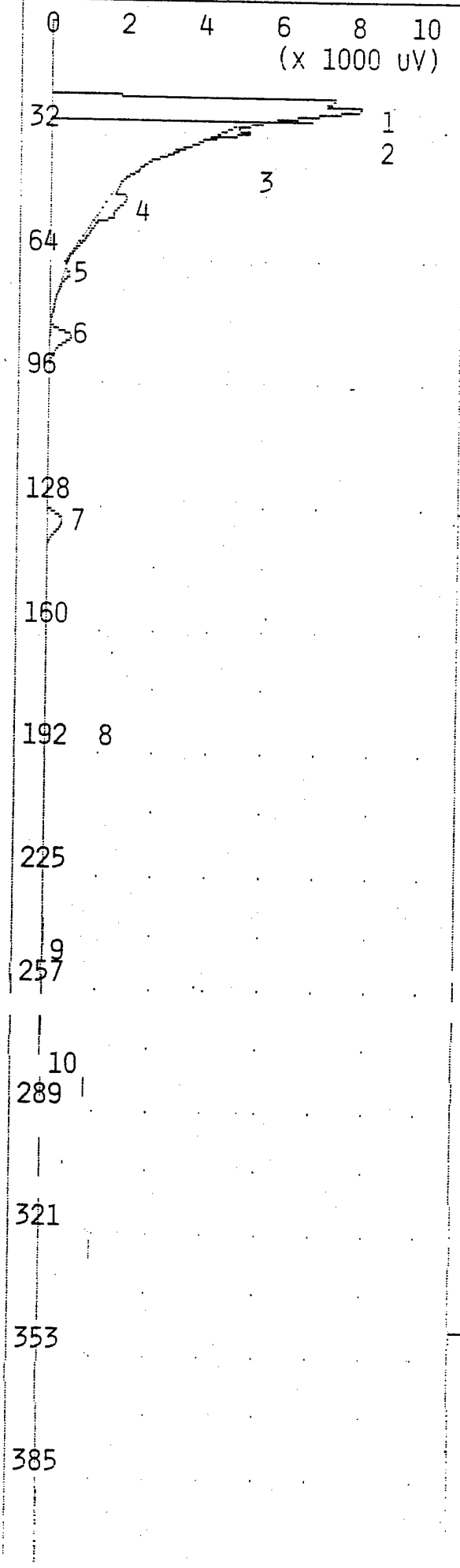
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.124 | MVS | 17.0 |
| 2 | UNKNOWN | 12.16 | MVS | 18.9 |
| 3 | UNKNOWN | 42.08 | MVS | 21.2 |
| 4 | UNKNOWN | 50.33 | MVS | 27.0 |
| 5 | UNKNOWN | 9.365 | MVS | 41.1 |
| 6 | UNKNOWN | 4.525 | MVS | 45.6 |
| 7 | UNKNOWN | 15.22 | MVS | 48.2 |
| 8 | BENZENE | 2.218 | PPB | 64.4 |
| 9 | UNKNOWN | 4.415 | MVS | 80.2 |
| 10 | TOLUENE | 3.665 | PPB | 127.7 |
| 11 | UNKNOWN | 2.179 | MVS | 233.4 |
| 12 | ETHYLBENZENE | 0.108 | PPB | 261.0 |
| 13 | M,P-XYLENE | 8.921 | PPB | 285.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-005BH
0.5- 2.5 10G

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 11:03
SAMPLE TIME: MAY 16,95 10:55

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

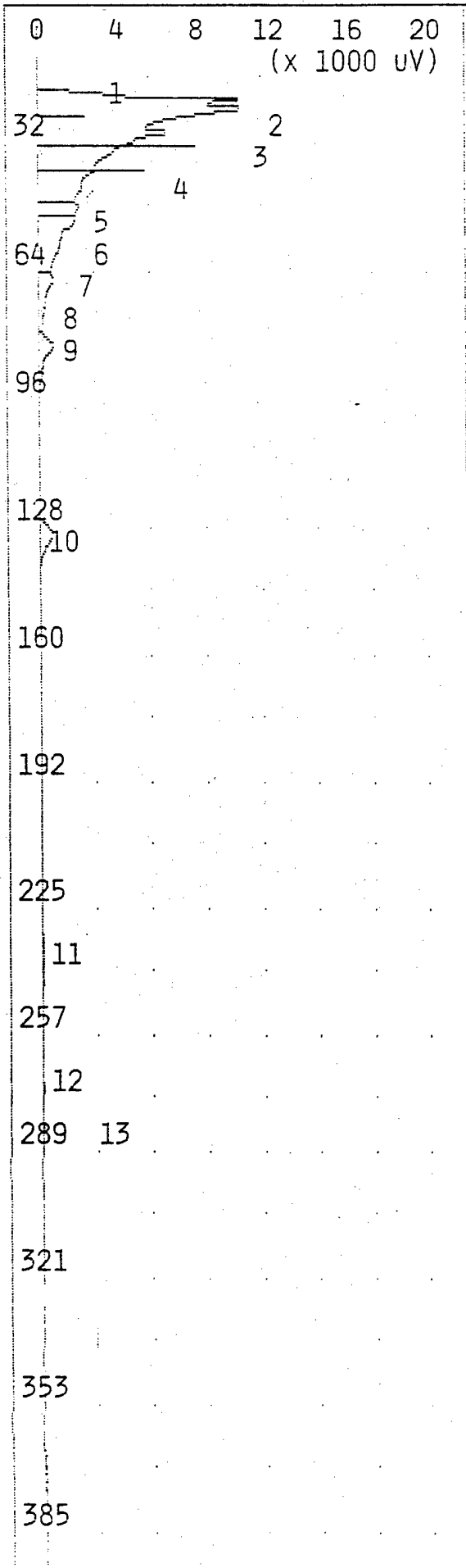
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 12.46 MVS | 20.4 |
| 2 | UNKNOWN | 131.2 MVS | 22.5 |
| 3 | UNKNOWN | 0.901 MVS | 29.0 |
| 4 | UNKNOWN | 3.375 MVS | 46.0 |
| 5 | BENZENE | 0.146 PPB | 66.6 |
| 6 | UNKNOWN | 2.614 MVS | 82.6 |
| 7 | TOLUENE | 3.560 PPB | 129.6 |
| 8 | UNKNOWN | 31.51 MVS | 185.4 |
| 9 | UNKNOWN | 16.89 MVS | 237.6 |
| 10 | ETHYLBENZENE | 2.280 PPB | 272.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-005BH
10.0-12.0 10G

ANALYSIS #14  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 11:13
SAMPLE TIME: MAY 16,95 11:06

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

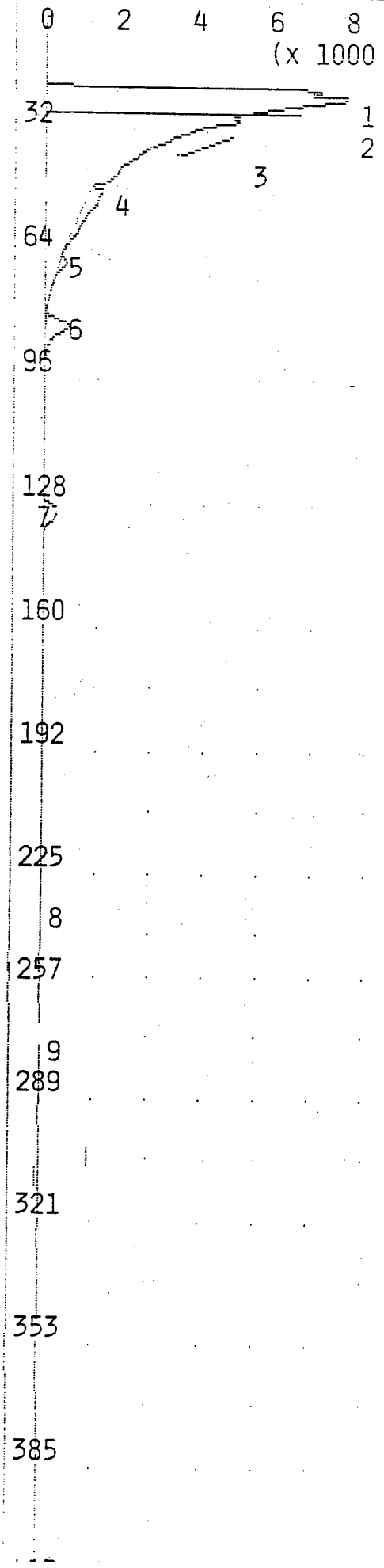
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 3.842 | MVS | 17.5 |
| 2 | UNKNOWN | 16.93 | MVS | 19.0 |
| 3 | UNKNOWN | 49.84 | MVS | 21.4 |
| 4 | UNKNOWN | 66.94 | MVS | 27.4 |
| 5 | UNKNOWN | 0.246 | MVS | 36.9 |
| 6 | UNKNOWN | 6.842 | MVS | 45.9 |
| 7 | UNKNOWN | 17.36 | MVS | 48.7 |
| 8 | BENZENE | 2.509 | PPB | 64.0 |
| 9 | UNKNOWN | 5.014 | MVS | 80.6 |
| 10 | TOLUENE | 4.305 | PPB | 128.0 |
| 11 | UNKNOWN | 3.062 | MVS | 235.2 |
| 12 | ETHYLBENZENE | 0.934 | PPB | 267.4 |
| 13 | M,P-XYLENE | 8.781 | PPB | 281.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-005BH
20.0-22.0  10G

ANALYSIS #15 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 11:49
SAMPLE TIME: MAY 16,95 11:42

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

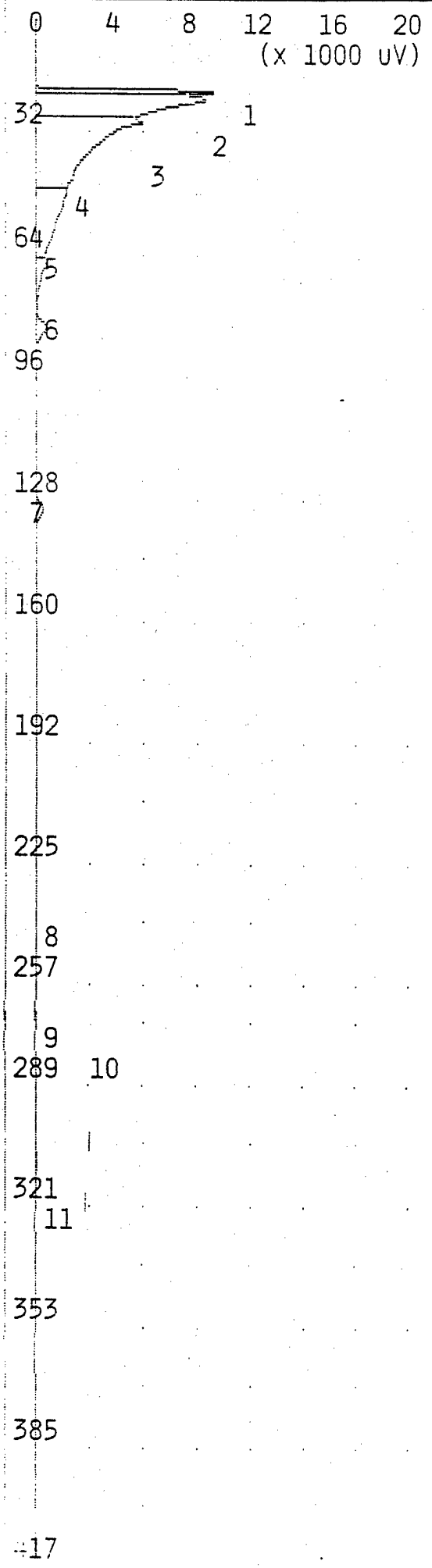
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 11.13 | MVS | 19.2 |
| 2 | UNKNOWN | 124.8 | MVS | 21.2 |
| 3 | UNKNOWN | 0.611 | MVS | 27.4 |
| 4 | UNKNOWN | 2.818 | MVS | 45.8 |
| 5 | BENZENE | 0.068 | PPB | 63.2 |
| 6 | UNKNOWN | 2.953 | MVS | 80.6 |
| 7 | TOLUENE | 3.688 | PPB | 128.5 |
| 8 | UNKNOWN | 2.329 | MVS | 235.4 |
| 9 | ETHYLBENZENE | 0.387 | PPB | 269.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH
0.5- 2.5 10G

ANALYSIS #16 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 12:00
SAMPLE TIME: MAY 16,95 11:53

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 11 | ML/MIN |
| B/F FLOW | 11 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 450.0 | SEC |

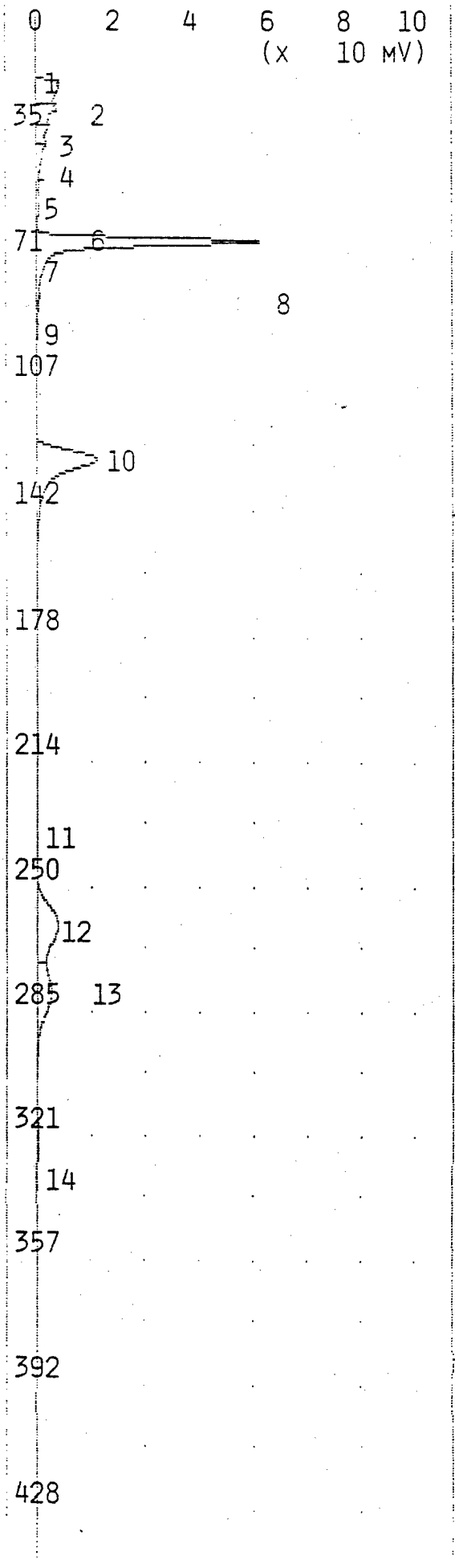
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 15.08 | MVS | 19.4 |
| 2 | UNKNOWN | 46.38 | MVS | 21.5 |
| 3 | UNKNOWN | 61.38 | MVS | 27.6 |
| 4 | UNKNOWN | 21.83 | MVS | 46.4 |
| 5 | BENZENE | 2.193 | PPB | 64.1 |
| 6 | UNKNOWN | 4.145 | MVS | 80.9 |
| 7 | TOLUENE | 3.670 | PPB | 128.2 |
| 8 | UNKNOWN | 11.97 | MVS | 237.2 |
| 9 | ETHYLBENZENE | 9.949 | PPB | 268.5 |
| 10 | M,P-XYLENE | 177.7 | PPB | 283.4 |
| 11 | O-XYLENE | 156.5 | PPB | 319.7 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH
5.0- 7.0 10G

ANALYSIS #20 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 15:38
SAMPLE TIME: MAY 16,95 15:30

METHOD

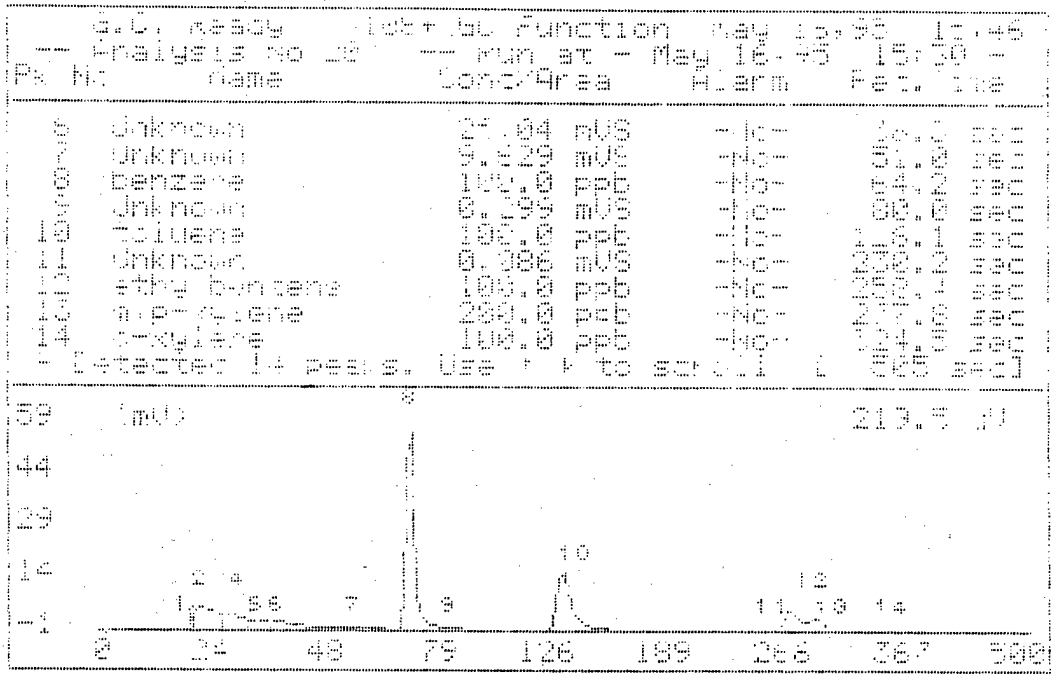
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

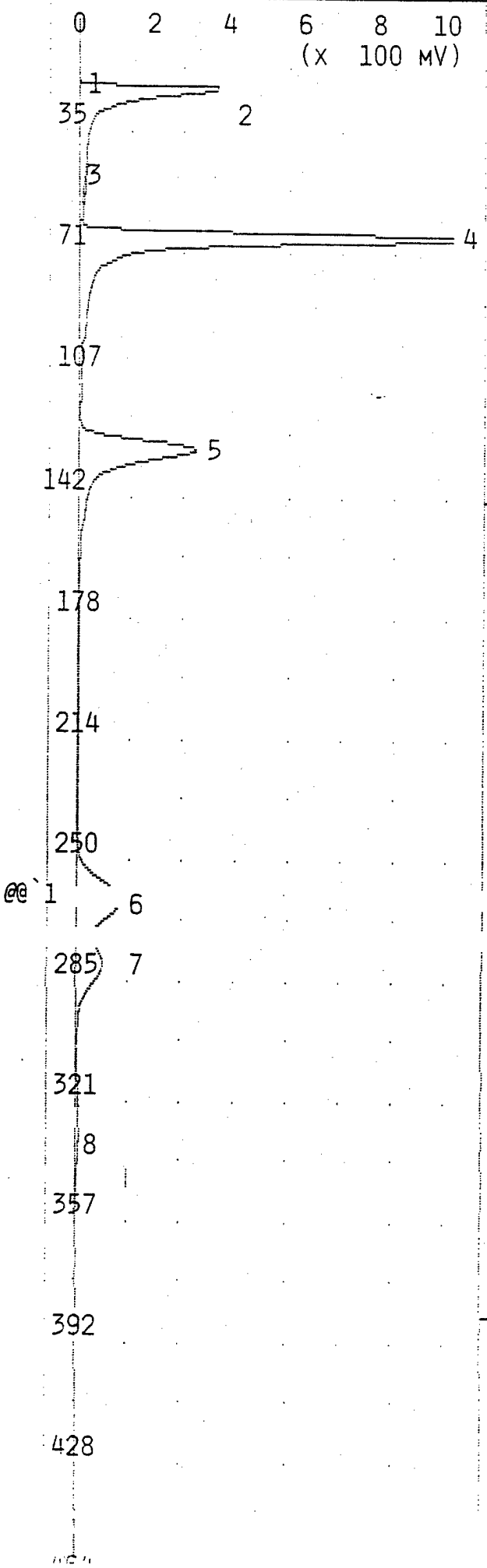
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.050 | MVS | 16.6 |
| 2 | UNKNOWN | 8.773 | MVS | 18.7 |
| 3 | UNKNOWN | 32.01 | MVS | 20.3 |
| 4 | UNKNOWN | 22.56 | MVS | 26.8 |
| 5 | UNKNOWN | 12.13 | MVS | 32.0 |
| 6 | UNKNOWN | 25.04 | MVS | 36.3 |
| 7 | UNKNOWN | 9.629 | MVS | 51.0 |
| 8 | UNKNOWN | 201.0 | MVS | 64.2 |
| 9 | UNKNOWN | 0.299 | MVS | 80.0 |
| 10 | UNKNOWN | 130.8 | MVS | 126.1 |
| 11 | UNKNOWN | 0.086 | MVS | 230.2 |
| 12 | UNKNOWN | 79.92 | MVS | 258.4 |
| 13 | UNKNOWN | 58.90 | MVS | 277.8 |
| 14 | UNKNOWN | 9.116 | MVS | 324.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


G.C. Assay
Lab Function
May 13,96 17:46
Analysis no 2
run at - May 16,95 15:30 -
Pk Nr name Conc/Area Alarm Ret. Time
5 Unknown 2.04 mVS -Nc- 20.1 sec
7 Unknown 3.329 mVS -No- 80.1 sec
8 Benzene 140.0 ppb -No- 84.2 sec
9 Unknown 0.199 mVS -No- 88.0 sec
10 Toluene 102.0 ppb -Nc- 93.1 sec
11 Unknown 0.086 mVS -No- 250.2 sec
12 ethyl benzene 106.0 ppb -No- 252.1 sec
13 m-p-Xylene 208.0 ppb -No- 277.8 sec
14 o-Xylene 100.0 ppb -No- 285.8 sec
Detector 1: press. Use ↑ ↓ to scroll
mV
59
44
29
14
-1
213.5 sec
2
32
49
79
126
159
268
367
500

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 15:56
SAMPLE TIME: MAY 16,95 15:48

METHOD

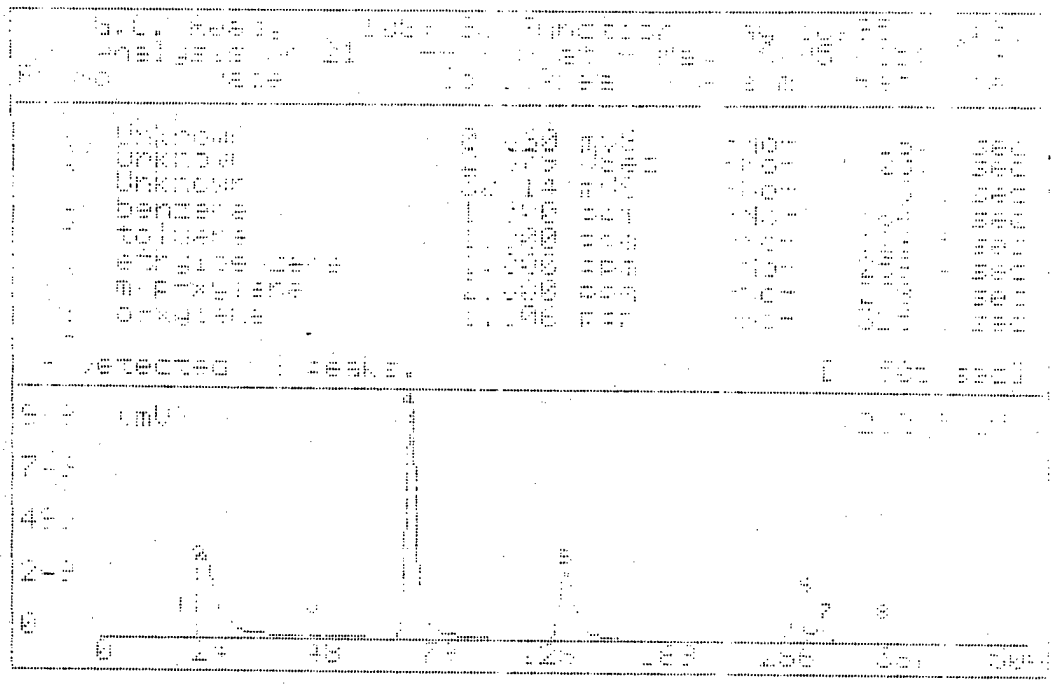
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

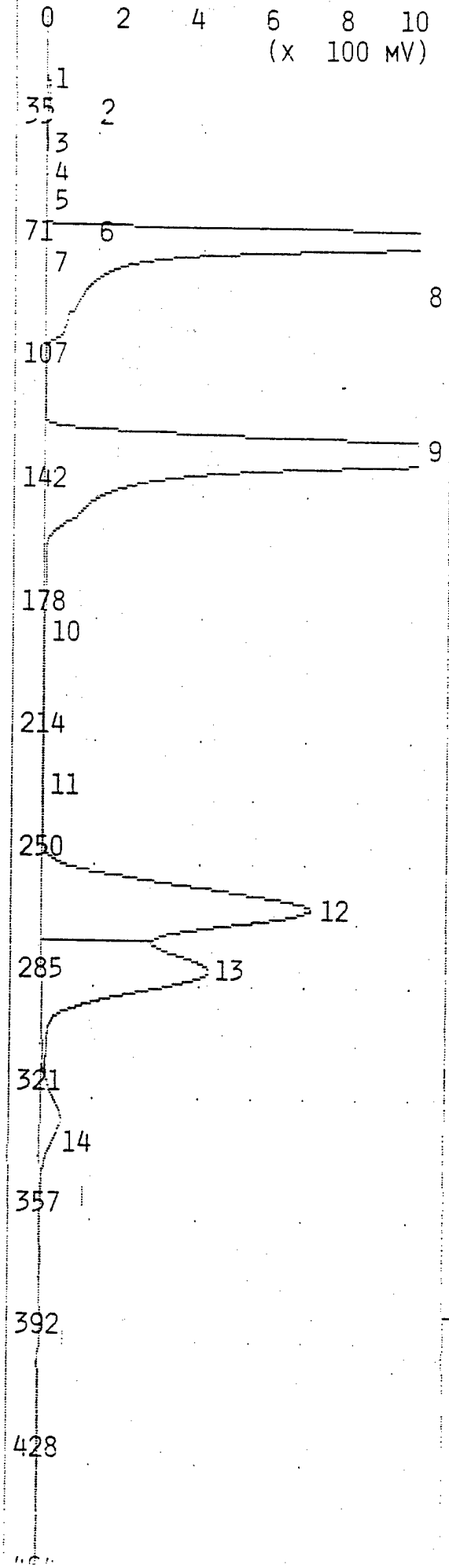
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.060 | MVS | 16.6 |
| 2 | UNKNOWN | 2.379 | VSEC | 20.4 |
| 3 | UNKNOWN | 30.14 | MVS | 43.2 |
| 4 | BENZENE | 2.803 | PPM | 64.6 |
| 5 | TOLUENE | 2.327 | PPM | 126.5 |
| 6 | ETHYLBENZENE | 2.108 | PPM | 259.4 |
| 7 | M,P-XYLENE | 3.727 | PPM | 278.4 |
| 8 | O-XYLENE | 3.723 | PPM | 325.8 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX



ANALYSIS #22 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 16:11
SAMPLE TIME: MAY 16,95 16:02

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

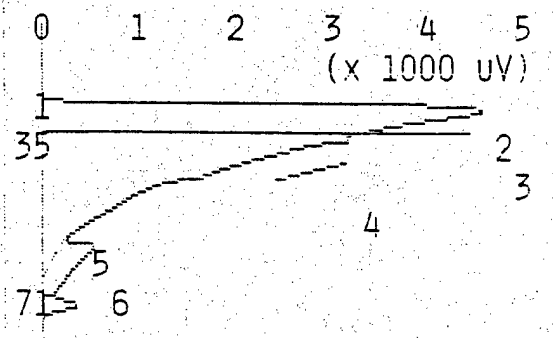
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.060 | MVS | 16.7 |
| 2 | UNKNOWN | 7.290 | MVS | 18.9 |
| 3 | UNKNOWN | 53.09 | MVS | 20.6 |
| 4 | UNKNOWN | 36.55 | MVS | 27.0 |
| 5 | UNKNOWN | 20.70 | MVS | 31.9 |
| 6 | UNKNOWN | 38.02 | MVS | 36.4 |
| 7 | UNKNOWN | 11.98 | MVS | 50.9 |
| 8 | BENZENE | 3.009 | PPM | 65.2 |
| 9 | TOLUENE | 6.233 | PPM | 127.7 |
| 10 | UNKNOWN | 18.33 | MVS | 179.2 |
| 11 | UNKNOWN | 2.078 | MVS | 223.2 |
| 12 | ETHYLBENZENE | 5.917 | PPM | 260.2 |
| 13 | M,P-XYLENE | 11.75 | PPM | 278.4 |
| 14 | O-XYLENE | 3.681 | PPM | 325.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

ANALYSIS #23 108+ GC FUNCTION ANALYSIS REPORT




0
35
71
107
142
178
214
250
285
321
357
392
428
464

TIME PRINTED: MAY 16,95 16:26
SAMPLE TIME: MAY 16,95 16:17

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 32 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

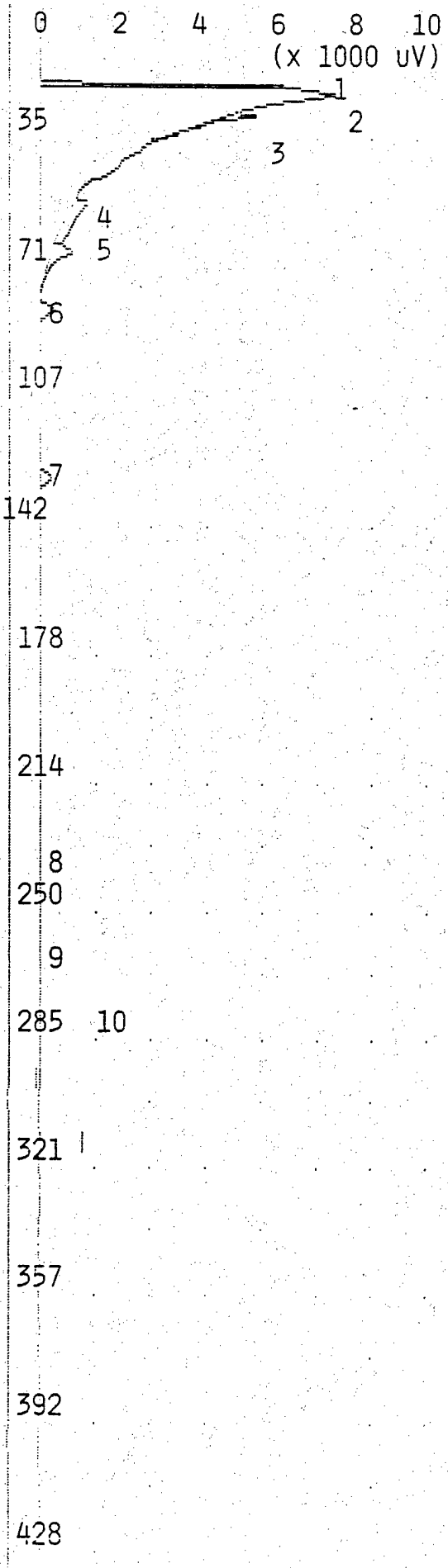
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.040 | MVS | 16.5 |
| 2 | UNKNOWN | 6.238 | MVS | 19.1 |
| 3 | UNKNOWN | 85.06 | MVS | 20.5 |
| 4 | UNKNOWN | 0.599 | MVS | 26.9 |
| 5 | UNKNOWN | 3.556 | MVS | 51.5 |
| 6 | BENZENE | 1.098 | PPB | 64.5 |
| 7 | UNKNOWN | 1.293 | MVS | 80.6 |
| 8 | TOLUENE | 0.887 | PPB | 126.9 |
| 9 | UNKNOWN | 0.162 | MVS | 129.3 |
| 10 | UNKNOWN | 0.658 | MVS | 229.8 |
| 11 | ETHYLBENZENE | 6.002 | PPB | 261.0 |
| 12 | M,P-XYLENE | 8.717 | PPB | 278.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #24 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 16:38
SAMPLE TIME: MAY 16,95 16:30

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

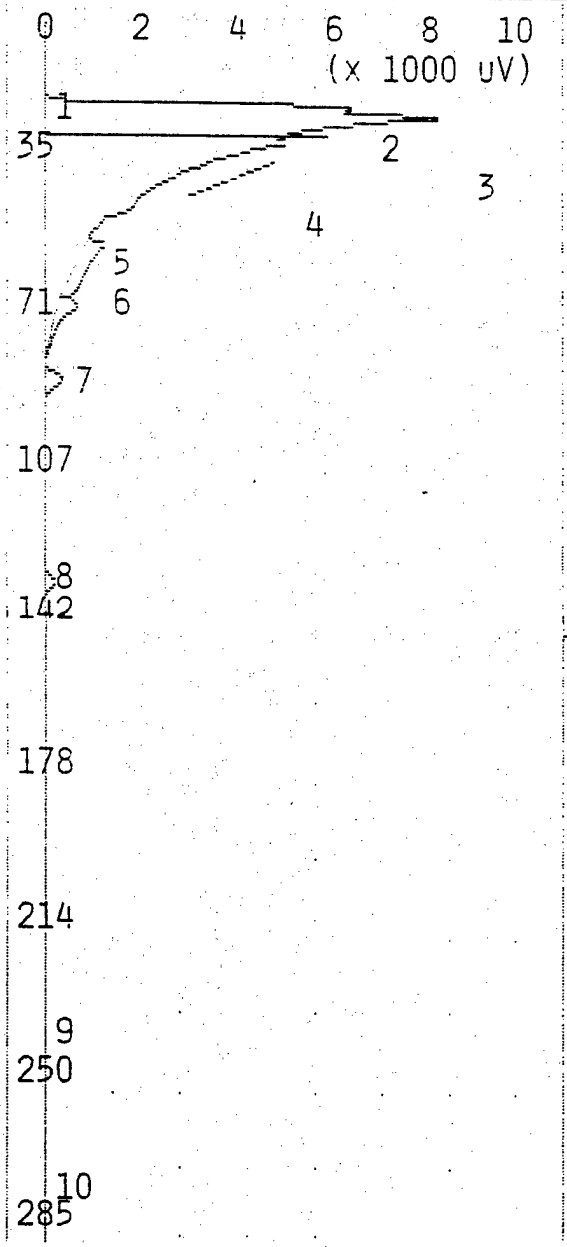
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 9.815 MVS | 19.1 |
| 2 | UNKNOWN | 129.2 MVS | 20.9 |
| 3 | UNKNOWN | 1.162 MVS | 27.1 |
| 4 | UNKNOWN | 3.264 MVS | 51.0 |
| 5 | BENZENE | 1.026 PPB | 64.6 |
| 6 | UNKNOWN | 1.713 MVS | 81.0 |
| 7 | TOLUENE | 4.015 PPB | 127.0 |
| 8 | UNKNOWN | 9.807 MVS | 231.2 |
| 9 | ETHYLBENZENE | 4.295 PPB | 260.5 |
| 10 | M,P-XYLENE | 8.423 PPB | 278.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH
10.0-12.0 10G

ANALYSIS #25 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 16:51
SAMPLE TIME: MAY 16,95 16:43

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

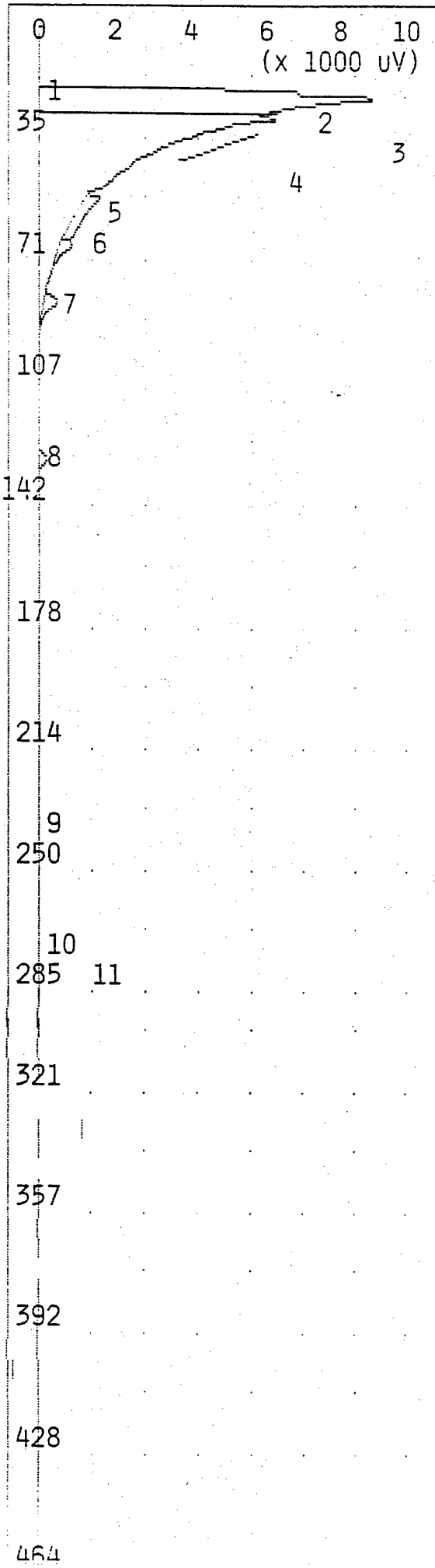
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.354 | MVS | 17.6 |
| 2 | UNKNOWN | 10.22 | MVS | 19.3 |
| 3 | UNKNOWN | 127.6 | MVS | 21.6 |
| 4 | UNKNOWN | 1.419 | MVS | 27.4 |
| 5 | UNKNOWN | 3.965 | MVS | 51.0 |
| 6 | BENZENE | 0.823 | PPB | 65.0 |
| 7 | UNKNOWN | 1.873 | MVS | 81.4 |
| 8 | TOLUENE | 3.459 | PPB | 127.7 |
| 9 | UNKNOWN | 1.753 | MVS | 232.8 |
| 10 | ETHYLBENZENE | 0.258 | PPB | 264.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH
18.0-20.0 10G

ANALYSIS #28 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 17:27
SAMPLE TIME: MAY 16,95 17:19

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

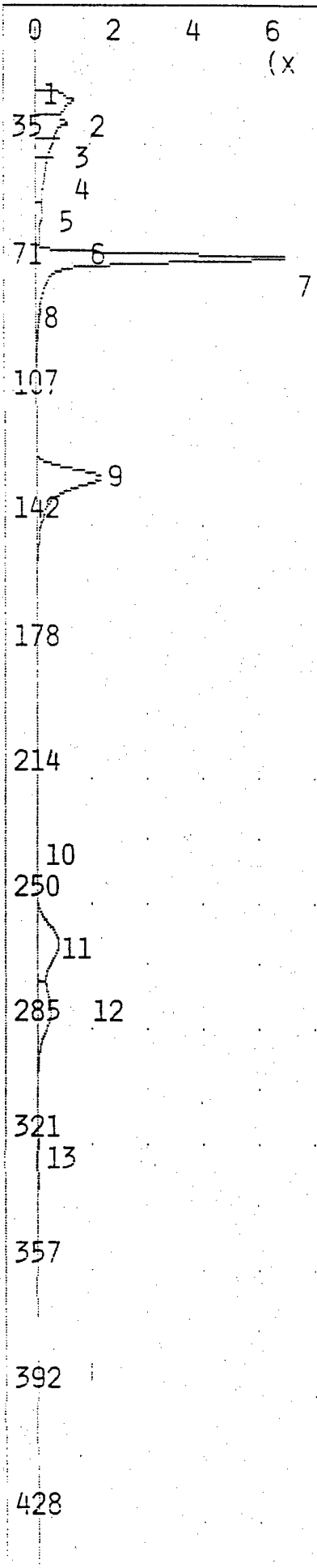
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.095 | MVS | 17.4 |
| 2 | UNKNOWN | 10.08 | MVS | 19.3 |
| 3 | UNKNOWN | 153.9 | MVS | 21.4 |
| 4 | UNKNOWN | 1.521 | MVS | 27.6 |
| 5 | UNKNOWN | 3.825 | MVS | 51.0 |
| 6 | BENZENE | 0.627 | PPB | 65.0 |
| 7 | UNKNOWN | 1.483 | MVS | 81.0 |
| 8 | TOLUENE | 2.780 | PPB | 127.3 |
| 9 | UNKNOWN | 2.663 | MVS | 231.4 |
| 10 | ETHYLBENZENE | 1.715 | PPB | 264.0 |
| 11 | M,P-XYLENE | 5.519 | PPB | 278.9 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-004BH RESHOT
5.0- 7.0 10G

ANALYSIS #29  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 16,95 17:39
SAMPLE TIME: MAY 16,95 17:31

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

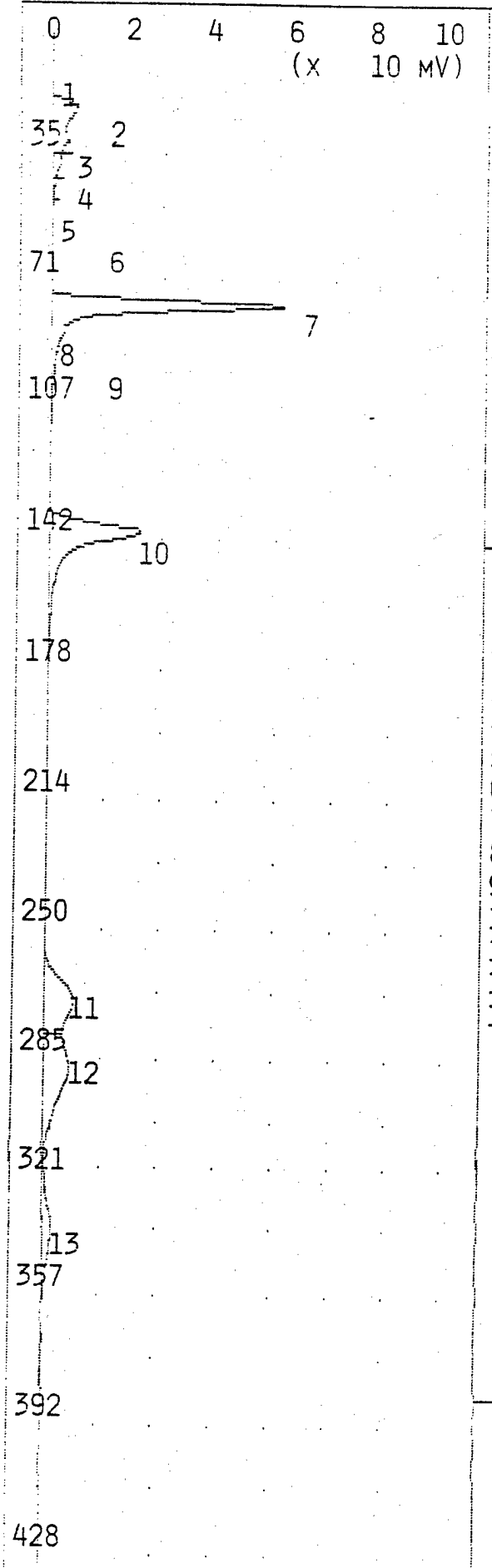
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.059 MVS | 16.9 |
| 2 | UNKNOWN | 10.52 MVS | 19.2 |
| 3 | UNKNOWN | 52.81 MVS | 21.0 |
| 4 | UNKNOWN | 37.52 MVS | 27.6 |
| 5 | UNKNOWN | 57.25 MVS | 32.6 |
| 6 | UNKNOWN | 19.65 MVS | 51.1 |
| 7 | BENZENE | 106.2 PPB | 65.2 |
| 8 | UNKNOWN | 0.651 MVS | 80.6 |
| 9 | TOLUENE | 103.2 PPB | 127.0 |
| 10 | UNKNOWN | 1.272 MVS | 231.2 |
| 11 | ETHYLBENZENE | 98.22 PPB | 259.2 |
| 12 | M,P-XYLENE | 188.0 PPB | 278.1 |
| 13 | O-XYLENE | 68.30 PPB | 324.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #3 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 08:06
SAMPLE TIME: MAY 17,95 07:57

METHOD

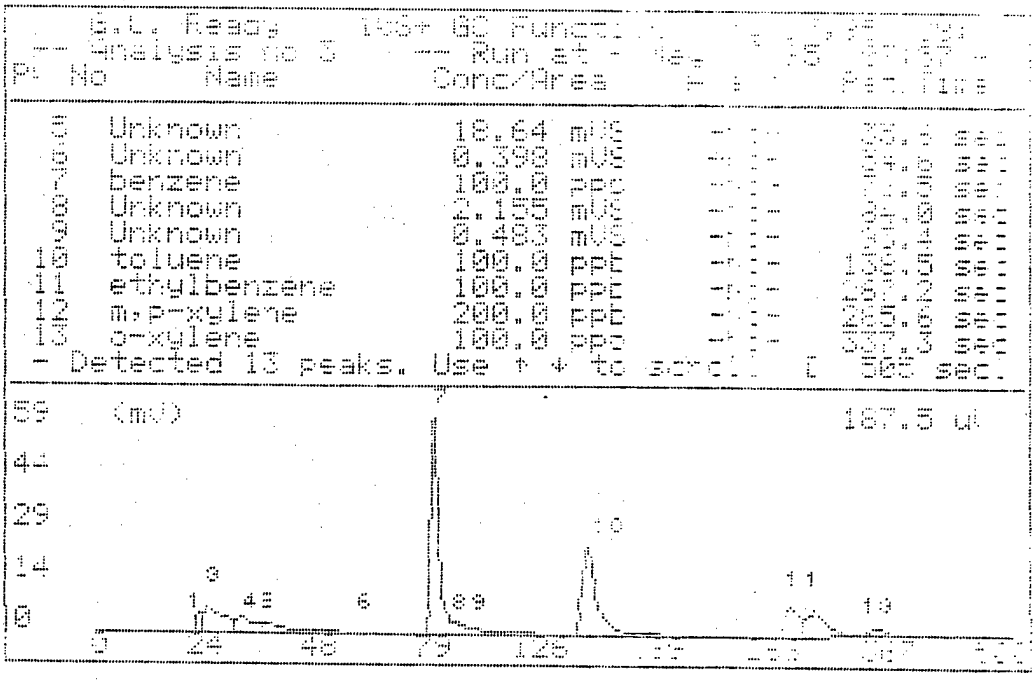
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

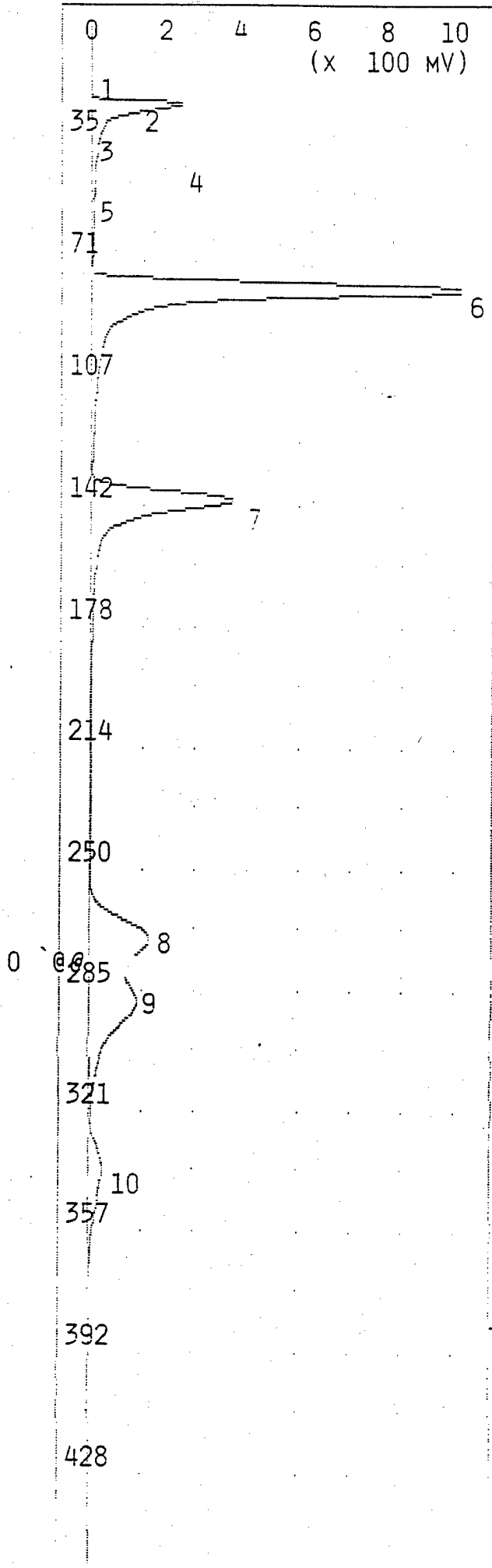
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.097 MVS | 18.6 |
| 2 | UNKNOWN | 8.173 MVS | 20.9 |
| 3 | UNKNOWN | 35.18 MVS | 22.6 |
| 4 | UNKNOWN | 19.48 MVS | 29.8 |
| 5 | UNKNOWN | 18.64 MVS | 35.6 |
| 6 | UNKNOWN | 0.398 MVS | 54.6 |
| 7 | UNKNOWN | 277.1 MVS | 76.5 |
| 8 | UNKNOWN | 2.155 MVS | 84.0 |
| 9 | UNKNOWN | 0.483 MVS | 93.4 |
| 10 | UNKNOWN | 182.4 MVS | 138.5 |
| 11 | UNKNOWN | 107.3 MVS | 267.2 |
| 12 | UNKNOWN | 130.4 MVS | 285.6 |
| 13 | UNKNOWN | 48.03 MVS | 337.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX


G.C. Ready
Analysis no 3
Run at
No
Name
Conc/Area
Ret. Time
Unknown 10.64 mVs
Unknown 0.3390 mVs
benzene 100.0 ppb
Unknown mVs
Unknown mVs
toluene 100.0 ppb
ethylbenzene 100.0 ppb
m,p-xylene 200.0 ppb
o-xylene 100.0 ppb
Detected 13 peaks. Use ↑ ↓ to scroll
sec.
(mV)
167.5 uA
59
44
29
14
0
9
10
11
12
13

ANALYSIS #4 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 08:23
SAMPLE TIME: MAY 17,95 08:15

METHOD

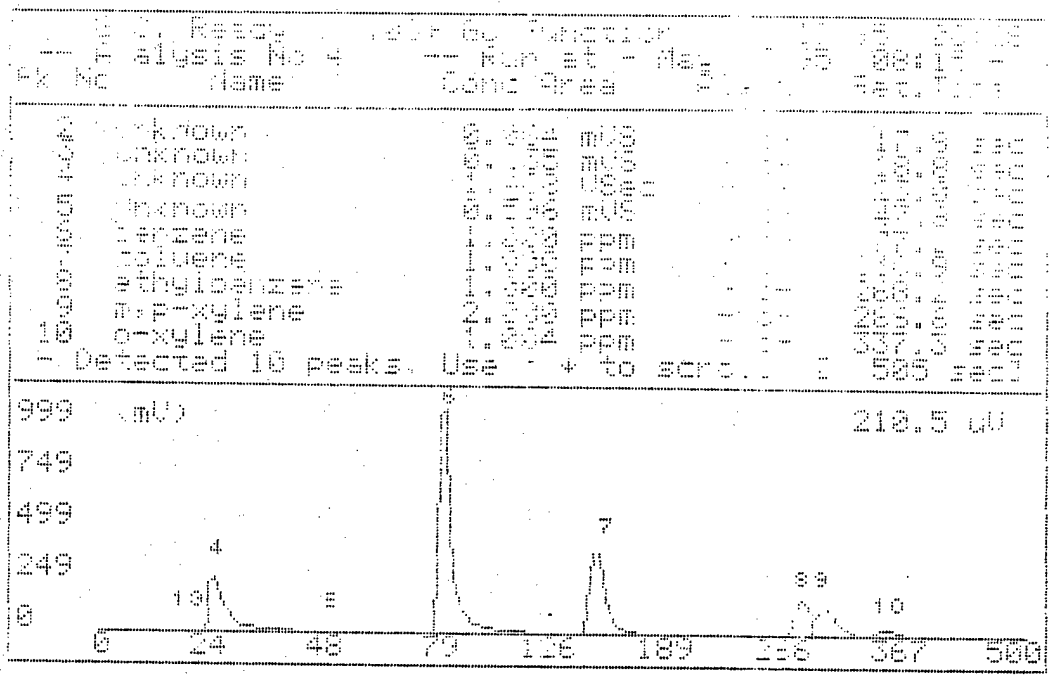
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

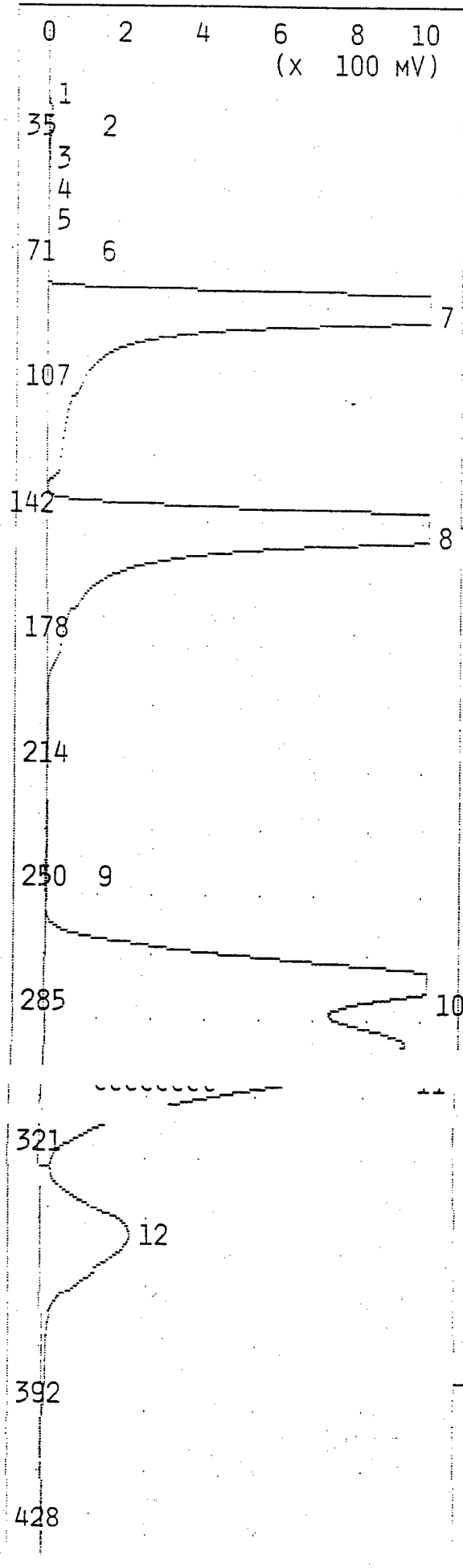
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.056 MVS | 16.0 |
| 2 | UNKNOWN | 0.084 MVS | 17.8 |
| 3 | UNKNOWN | 0.135 MVS | 18.8 |
| 4 | UNKNOWN | 1.488 VSEC | 23.0 |
| 5 | UNKNOWN | 0.596 MVS | 47.8 |
| 6 | BENZENE | 2.734 PPM | 77.2 |
| 7 | TOLUENE | 1.938 PPM | 138.9 |
| 8 | ETHYLBENZENE | 2.221 PPM | 268.2 |
| 9 | M,P-XYLENE | 3.749 PPM | 286.6 |
| 10 | O-XYLENE | 2.084 PPM | 337.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
1 PPM BTEX


Analysis No 4
Pk Nr Name Conc Area
1 Unknown
2 Unknown
3 Unknown
4 Unknown
5 Benzene
6 Toluene
7 Ethylbenzene
8 M+P-Xylene
10 O-Xylene
Detected 10 peaks. Use ↑ ↓ to scroll
999 mV
749
499
249
0
210.5 uV
0 29 48 79 125 189 236 367 500

ANALYSIS #5 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 08:38
SAMPLE TIME: MAY 17,95 08:30

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

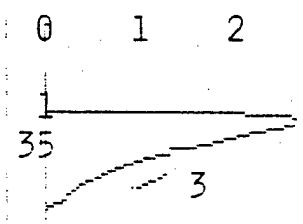
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.052 | MVS | 18.8 |
| 2 | UNKNOWN | 5.132 | MVS | 21.4 |
| 3 | UNKNOWN | 54.13 | MVS | 23.1 |
| 4 | UNKNOWN | 34.81 | MVS | 30.4 |
| 5 | UNKNOWN | 34.36 | MVS | 36.0 |
| 6 | UNKNOWN | 0.103 | MVS | 55.3 |
| 7 | BENZENE | 3.956 | PPM | 79.8 |
| 8 | TOLUENE | 7.032 | PPM | 141.3 |
| 9 | UNKNOWN | 4.330 | MVS | 236.6 |
| 10 | ETHYLBENZENE | 7.386 | PPM | 272.2 |
| 11 | M,P-XYLENE | 14.38 | PPM | 289.8 |
| 12 | O-XYLENE | 5.601 | PPM | 341.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
10 PPM BTEX

Ready
Analysis No 5
Name
Conc/Area
Ret. Time
Unknown
Unknown
Unknown
benzene
toluene
Unknown
ethylbenzene
m,p-xylene
o-xylene
Detected 12 peaks.
(mV)
194.5 uV
12
0
24
48
72
96
120
144
168
192
216

ANALYSIS #6 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 08:54
SAMPLE TIME: MAY 17,95 08:45

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

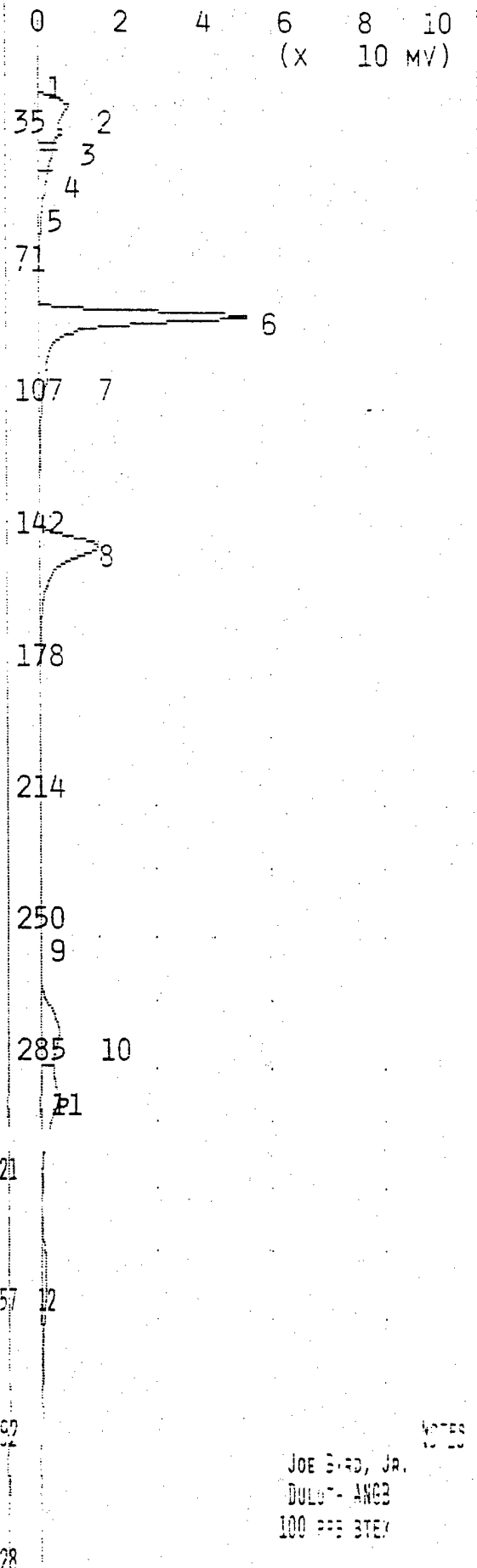
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.067 | MVS | 18.5 |
| 2 | UNKNOWN | 52.43 | MVS | 22.8 |
| 3 | UNKNOWN | 0.196 | MVS | 29.5 |
| 4 | BENZENE | 0.795 | PPB | 76.9 |
| 5 | UNKNOWN | 5.512 | MVS | 84.9 |
| 6 | UNKNOWN | 27.63 | MVS | 94.4 |
| 7 | TOLUENE | 11.98 | PPB | 140.6 |
| 8 | UNKNOWN | 5.801 | MVS | 161.0 |
| 9 | M,P-XYLENE | 83.47 | PPB | 289.8 |
| 10 | O-XYLENE | 19.58 | PPB | 347.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #12 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 10:06
SAMPLE TIME: MAY 17,95 09:58

METHOD

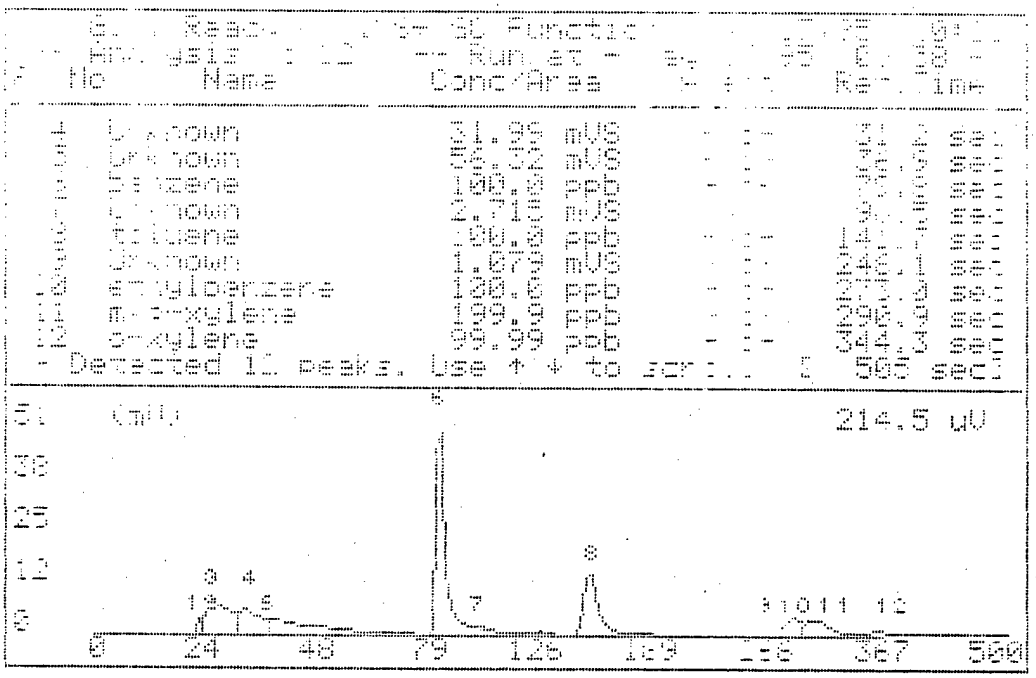
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

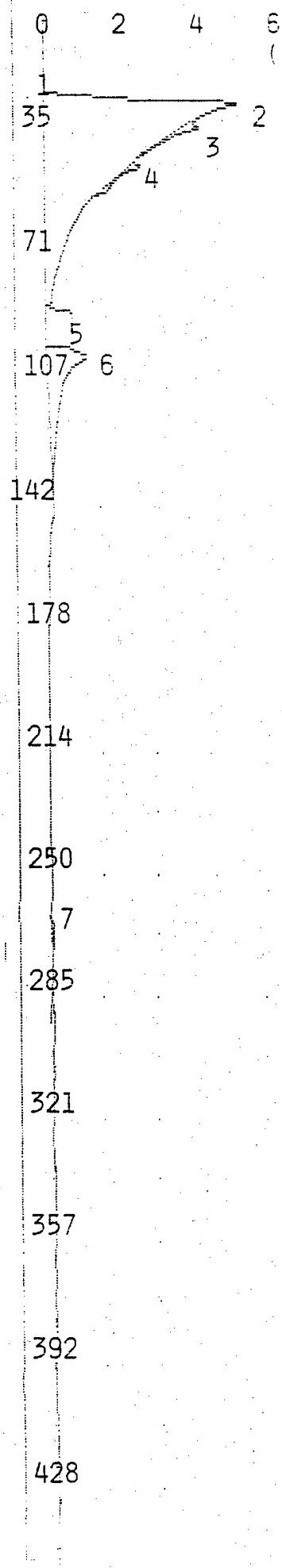
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.046 | MVS | 19.4 |
| 2 | UNKNOWN | 7.622 | MVS | 22.1 |
| 3 | UNKNOWN | 46.85 | MVS | 24.2 |
| 4 | UNKNOWN | 31.99 | MVS | 31.2 |
| 5 | UNKNOWN | 56.32 | MVS | 36.9 |
| 6 | BENZENE | 96.58 | PPB | 79.8 |
| 7 | UNKNOWN | 2.715 | MVS | 96.5 |
| 8 | TOLUENE | 70.20 | PPB | 141.7 |
| 9 | UNKNOWN | 1.079 | MVS | 246.1 |
| 10 | ETHYLBENZENE | 61.78 | PPB | 273.0 |
| 11 | M,P-XYLENE | 118.6 | PPB | 290.9 |
| 12 | O-XYLENE | 51.25 | PPB | 344.3 |

NOTES

JOE BIRD, JR.
DUPONT ANGB
100 PPB BTEX


No Name Conc/Area Ret. Time
1 Unknown 31.85 mVS
2 Unknown 96.32 mVS
3 Benzene 100.0 ppb
4 Unknown 2.715 mVS
5 Toluene 100.0 ppb
6 Unknown 1.079 mVS
7 Ethylbenzene 100.0 ppb
8 m-Pxylene 199.9 ppb
9 o-Xylene 99.99 ppb
Detected 12 peaks. Use ↑ ↓ to
214.5 uV
0
24
48
72
96
120
144
168
192
216
240

ANALYSIS #13 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 10:21
SAMPLE TIME: MAY 17,95 10:13

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

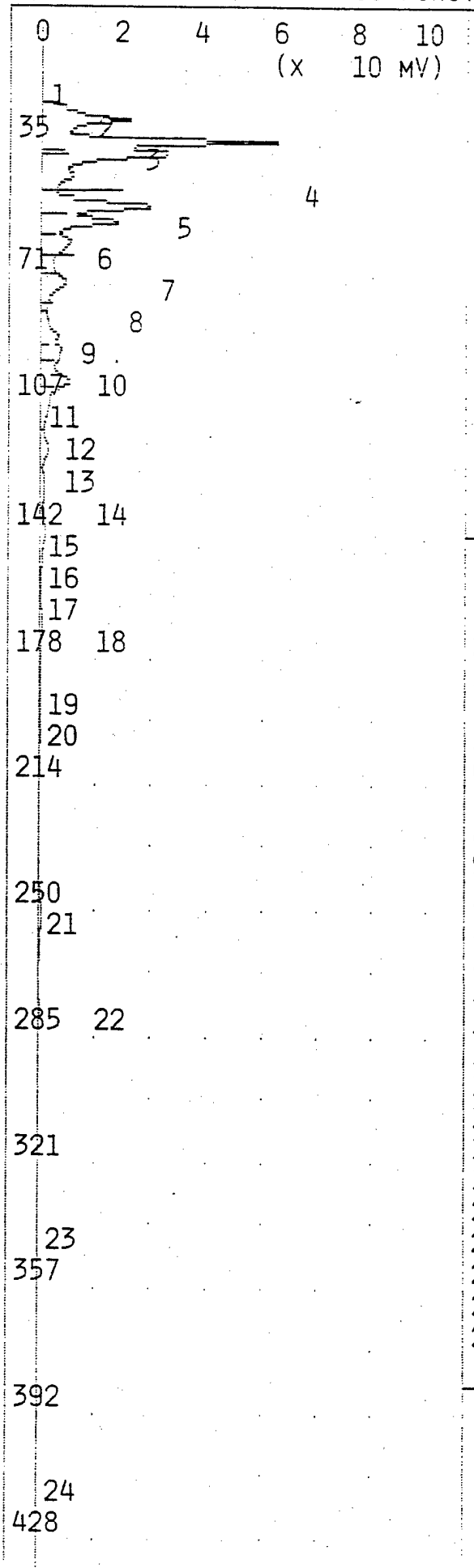
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.077 | MVS | 19.7 |
| 2 | UNKNOWN | 119.7 | MVS | 24.4 |
| 3 | UNKNOWN | 0.911 | MVS | 31.4 |
| 4 | UNKNOWN | 1.426 | MVS | 42.8 |
| 5 | BENZENE | 2.879 | PPB | 85.3 |
| 6 | UNKNOWN | 13.61 | MVS | 97.3 |
| 7 | ETHYLBENZENE | 0.985 | PPB | 255.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK

ANALYSIS #14 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 10:42
SAMPLE TIME: MAY 17,95 10:34

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MV.SEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

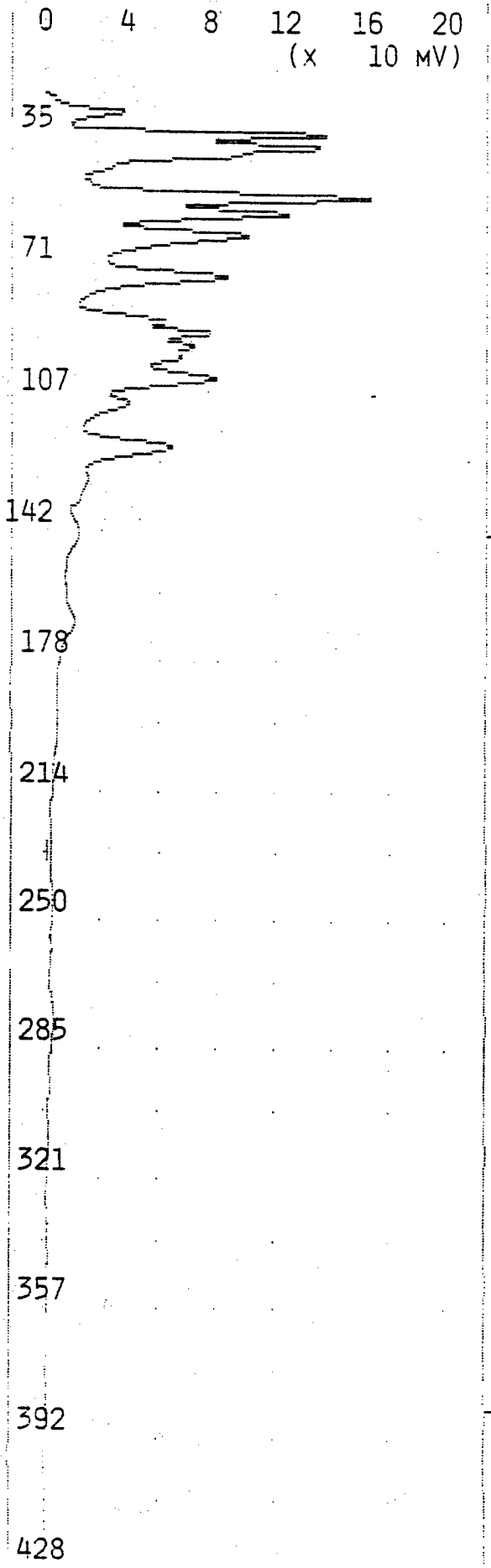
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.876 | MVS | 20.3 |
| 2 | UNKNOWN | 10.80 | MVS | 22.4 |
| 3 | UNKNOWN | 90.23 | MVS | 26.1 |
| 4 | UNKNOWN | 138.2 | MVS | 32.2 |
| 5 | UNKNOWN | 113.7 | MVS | 35.6 |
| 6 | UNKNOWN | 37.41 | MVS | 41.4 |
| 7 | UNKNOWN | 92.95 | MVS | 49.0 |
| 8 | UNKNOWN | 67.48 | MVS | 53.4 |
| 9 | UNKNOWN | 50.40 | MVS | 59.1 |
| 10 | UNKNOWN | 58.45 | MVS | 70.6 |
| 11 | BENZENE | 3.206 | PPB | 82.2 |
| 12 | UNKNOWN | 18.85 | MVS | 86.0 |
| 13 | UNKNOWN | 35.74 | MVS | 89.8 |
| 14 | UNKNOWN | 65.71 | MVS | 98.6 |
| 15 | UNKNOWN | 19.15 | MVS | 117.3 |
| 16 | UNKNOWN | 13.99 | MVS | 126.6 |
| 17 | TOLUENE | 20.95 | PPB | 141.3 |
| 18 | UNKNOWN | 17.51 | MVS | 165.8 |
| 19 | UNKNOWN | 10.29 | MVS | 186.4 |
| 20 | UNKNOWN | 9.078 | MVS | 195.6 |
| 21 | UNKNOWN | 21.56 | MVS | 248.8 |
| 22 | ETHYLBENZENE | 17.04 | PPB | 274.1 |
| 23 | O-XYLENE | 38.68 | PPB | 340.0 |
| 24 | UNKNOWN | 2.272 | MVS | 413.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH
0.5- 2.5 10G

ANALYSIS #15  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 10:56
SAMPLE TIME: MAY 17,95 10:48

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

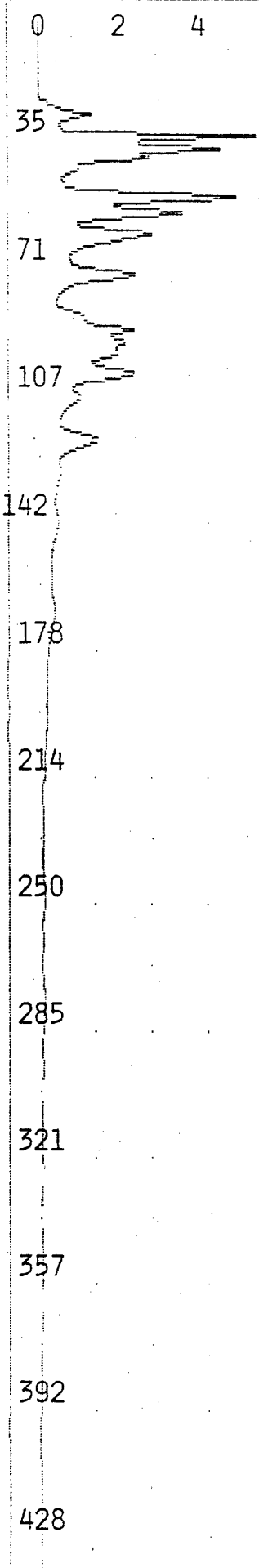
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH
5.0- 7.0 10G

ANALYSIS #16  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 11:09
SAMPLE TIME: MAY 17,95 11:01

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

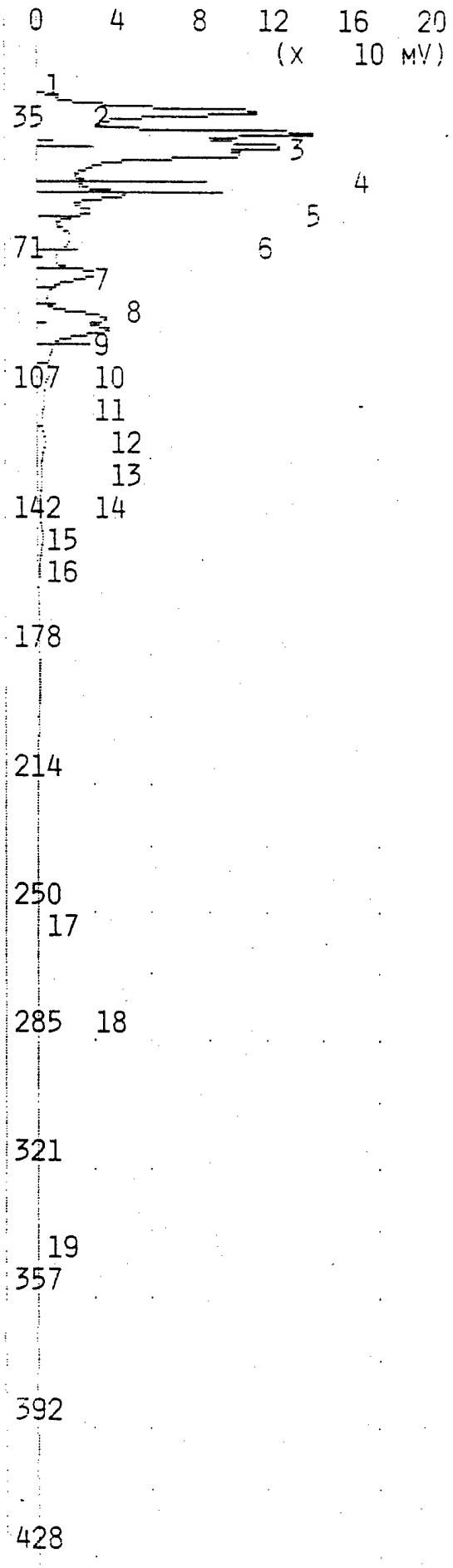
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH RESHOT
5.0- 7.0 10G
20 MICROLITER INJECTION

ANALYSIS #17  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 11:20
SAMPLE TIME: MAY 17,95 11:12

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

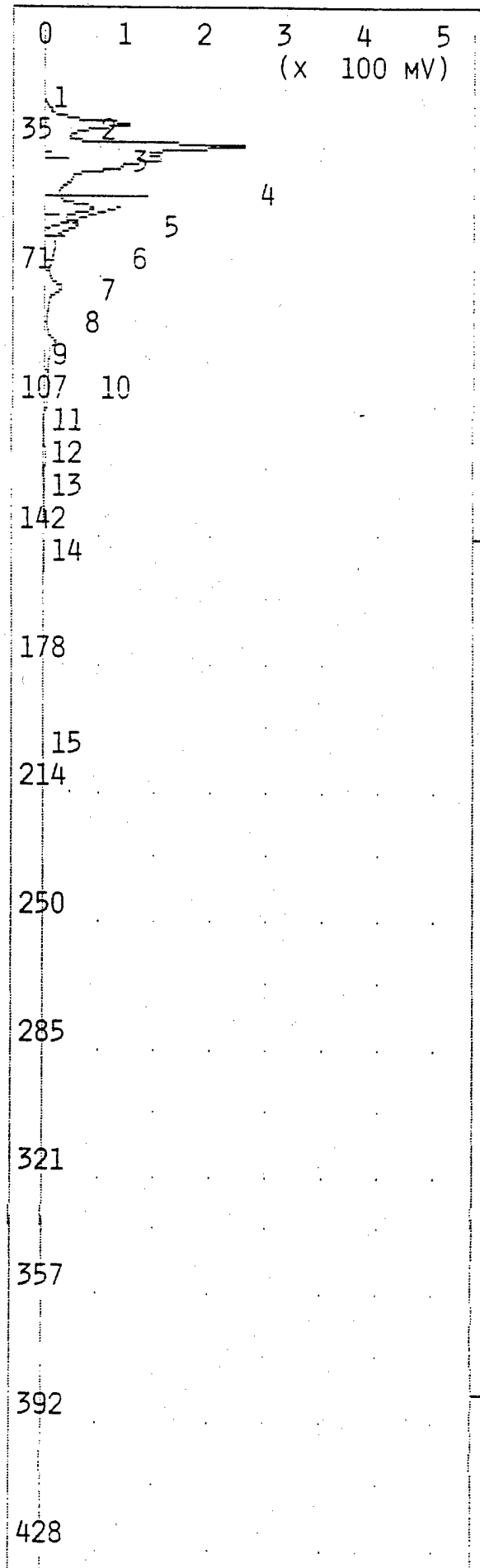
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 1.160 | MVS | 20.6 |
| 2 | UNKNOWN | 17.70 | MVS | 22.6 |
| 3 | UNKNOWN | 421.9 | MVS | 26.6 |
| 4 | UNKNOWN | 347.6 | MVS | 32.7 |
| 5 | UNKNOWN | 360.0 | MVS | 36.4 |
| 6 | UNKNOWN | 341.5 | MVS | 38.6 |
| 7 | UNKNOWN | 60.44 | MVS | 45.9 |
| 8 | UNKNOWN | 170.8 | MVS | 49.6 |
| 9 | UNKNOWN | 108.6 | MVS | 54.2 |
| 10 | UNKNOWN | 136.4 | MVS | 60.8 |
| 11 | UNKNOWN | 158.6 | MVS | 71.3 |
| 12 | BENZENE | 48.28 | PPB | 83.8 |
| 13 | UNKNOWN | 167.5 | MVS | 86.6 |
| 14 | UNKNOWN | 71.74 | MVS | 98.4 |
| 15 | UNKNOWN | 57.25 | MVS | 117.4 |
| 16 | TOLUENE | 31.41 | PPB | 143.6 |
| 17 | UNKNOWN | 5.800 | MVS | 244.2 |
| 18 | ETHYLBENZENE | 4.454 | PPB | 272.2 |
| 19 | O-XYLENE | 13.64 | PPB | 341.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH
10.0-12.0 10G

ANALYSIS #18  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 11:32
SAMPLE TIME: MAY 17,95 11:24

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

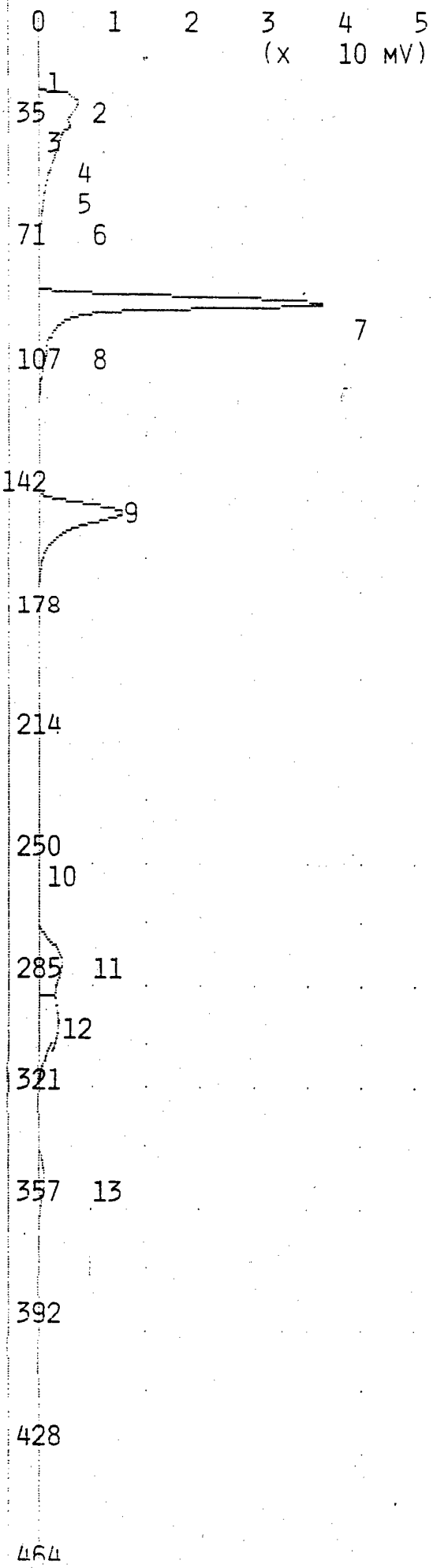
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 5.800 | MVS | 20.8 |
| 2 | UNKNOWN | 19.48 | MVS | 22.5 |
| 3 | UNKNOWN | 405.5 | MVS | 26.8 |
| 4 | UNKNOWN | 684.6 | MVS | 32.9 |
| 5 | UNKNOWN | 754.6 | MVS | 36.4 |
| 6 | UNKNOWN | 15.49 | MVS | 38.8 |
| 7 | UNKNOWN | 263.0 | MVS | 50.1 |
| 8 | UNKNOWN | 175.4 | MVS | 54.8 |
| 9 | UNKNOWN | 109.4 | MVS | 60.5 |
| 10 | UNKNOWN | 141.9 | MVS | 72.0 |
| 11 | BENZENE | 40.98 | PPB | 87.3 |
| 12 | UNKNOWN | 77.65 | MVS | 99.2 |
| 13 | UNKNOWN | 63.48 | MVS | 118.2 |
| 14 | TOLUENE | 45.51 | PPB | 145.0 |
| 15 | UNKNOWN | 3.486 | MVS | 195.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-012BH
18.0-20.0 10G

ANALYSIS #19  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 13:29
SAMPLE TIME: MAY 17,95 13:21

METHOD

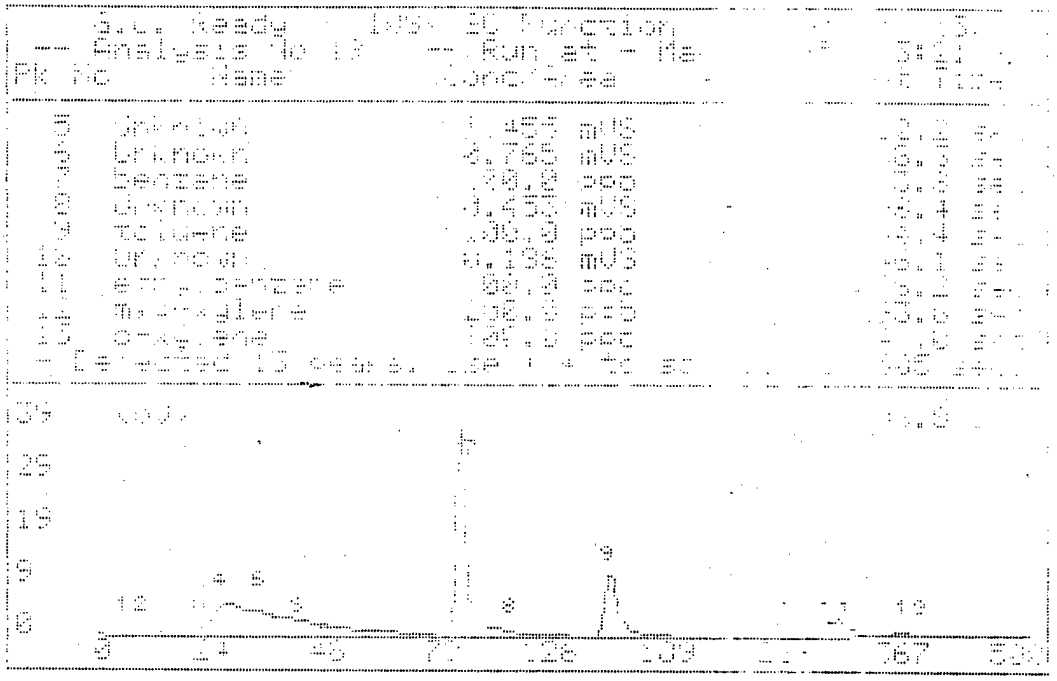
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

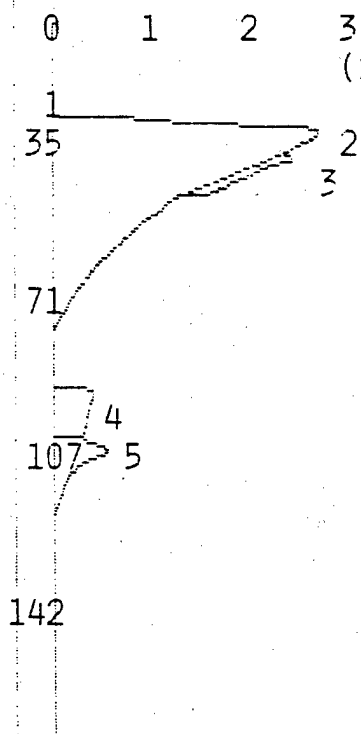
| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.889 | MVS | 5.2 |
| 2 | UNKNOWN | 2.797 | MVS | 9.2 |
| 3 | UNKNOWN | 0.411 | MVS | 20.2 |
| 4 | UNKNOWN | 126.7 | MVS | 25.2 |
| 5 | UNKNOWN | 1.455 | MVS | 32.2 |
| 6 | UNKNOWN | 0.765 | MVS | 38.3 |
| 7 | BENZENE | 76.67 | PPB | 83.8 |
| 8 | UNKNOWN | 0.453 | MVS | 98.4 |
| 9 | TOLUENE | 83.95 | PPB | 144.4 |
| 10 | UNKNOWN | 0.186 | MVS | 246.1 |
| 11 | ETHYLBENZENE | 79.82 | PPB | 276.2 |
| 12 | M,P-XYLENE | 151.3 | PPB | 293.8 |
| 13 | O-XYLENE | 78.02 | PPB | 347.0 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX



ANALYSIS #20  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 13:44
SAMPLE TIME: MAY 17,95 13:36

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 29 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

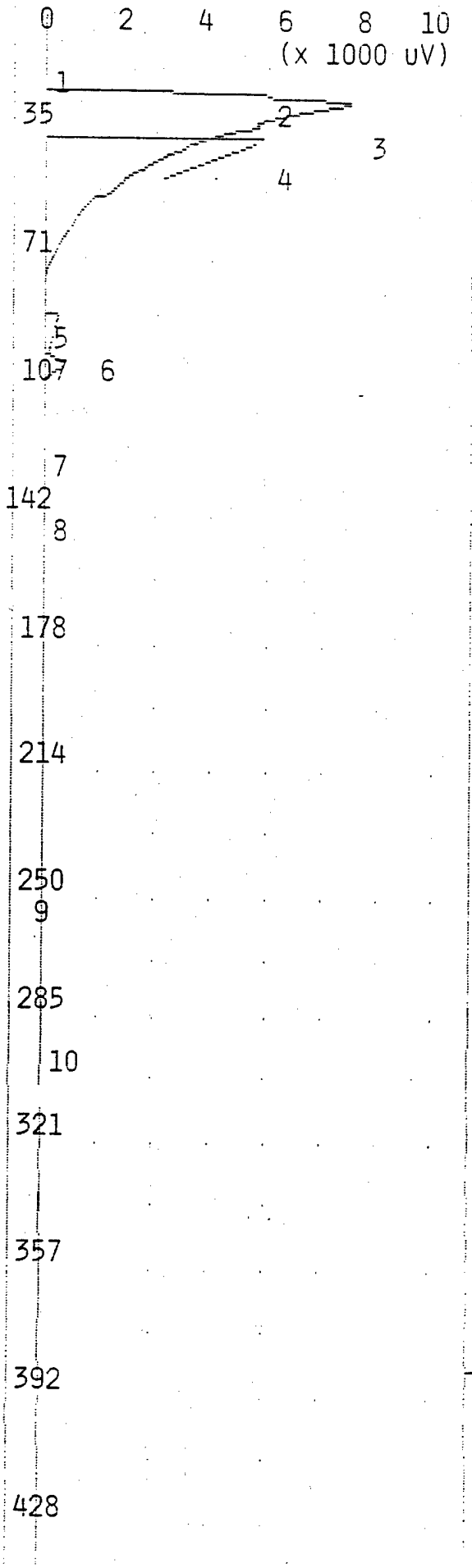
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.033 | MVS | 20.0 |
| 2 | UNKNOWN | 74.26 | MVS | 25.4 |
| 3 | UNKNOWN | 1.632 | MVS | 32.0 |
| 4 | BENZENE | 2.989 | PPB | 86.5 |
| 5 | UNKNOWN | 4.932 | MVS | 98.1 |
| 6 | ETHYLBENZENE | 0.816 | PPB | 251.4 |
| 7 | O-XYLENE | 73.16 | PPB | 349.0 |
| 8 | UNKNOWN | 4.197 | MVS | 414.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
~~025 C13BH~~
~~0.5 2.5 10C~~
AIR BLANK

ANALYSIS #21 10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 13:56
SAMPLE TIME: MAY 17,95 13:47

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

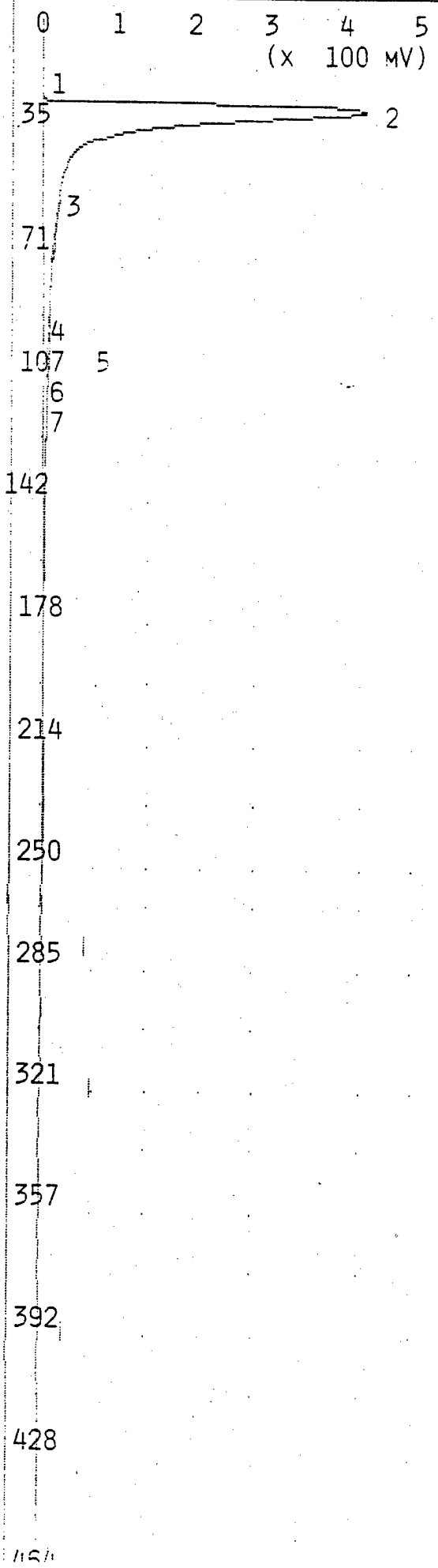
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.157 MVS | 20.1 |
| 2 | UNKNOWN | 9.574 MVS | 22.6 |
| 3 | UNKNOWN | 180.6 MVS | 25.0 |
| 4 | UNKNOWN | 0.528 MVS | 31.6 |
| 5 | BENZENE | 3.574 PPB | 84.9 |
| 6 | UNKNOWN | 17.75 MVS | 98.4 |
| 7 | UNKNOWN | 16.86 MVS | 119.3 |
| 8 | TOLUENE | 2.556 PPB | 142.9 |
| 9 | ETHYLBENZENE | 1.346 PPB | 251.2 |
| 10 | M,P-XYLENE | 3.317 PPB | 294.4 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH
0.5- 2.5 10G

ANALYSIS #26  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 15:18
SAMPLE TIME: MAY 17,95 15:09

METHOD

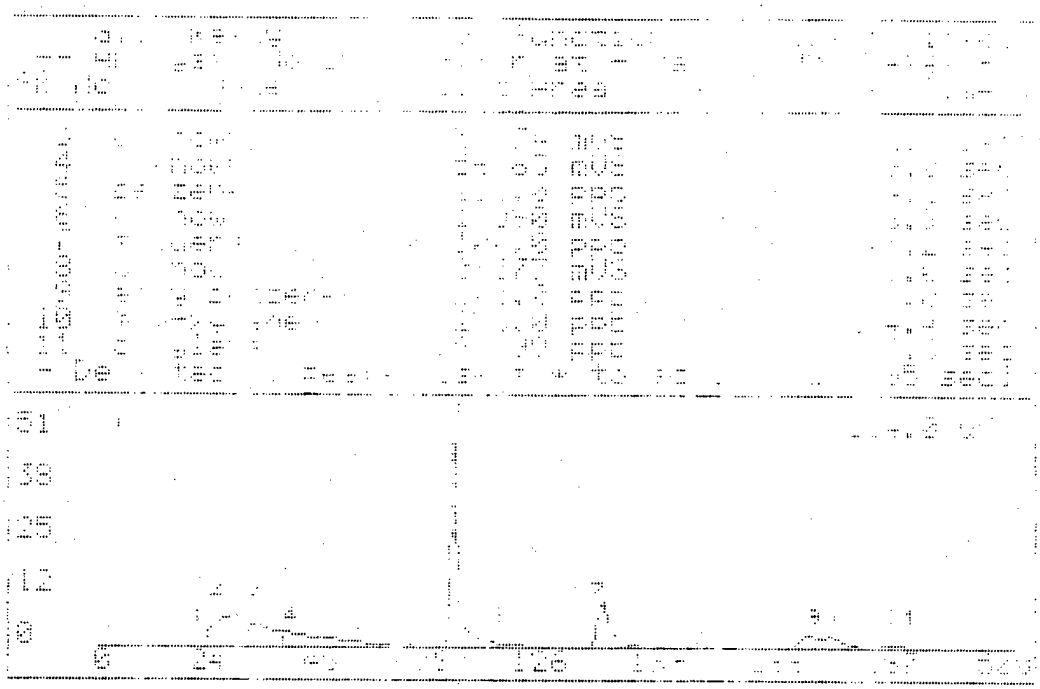
| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

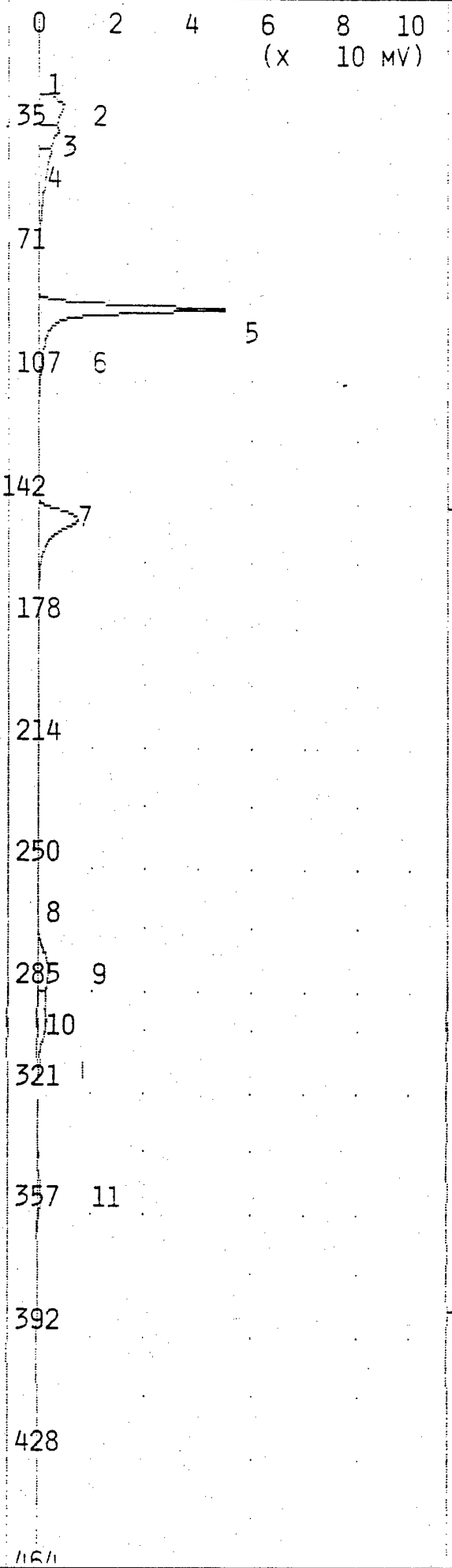
| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.025 MVS | 20.5 |
| 2 | UNKNOWN | 4.491 VSEC | 26.8 |
| 3 | UNKNOWN | 21.96 MVS | 54.2 |
| 4 | BENZENE | 1.045 PPB | 84.4 |
| 5 | UNKNOWN | 2.850 MVS | 91.8 |
| 6 | UNKNOWN | 3.364 MVS | 95.8 |
| 7 | UNKNOWN | 7.268 MVS | 100.5 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
AIR BLANK



ANALYSIS #25  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 14:49
SAMPLE TIME: MAY 17,95 14:41

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 31 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

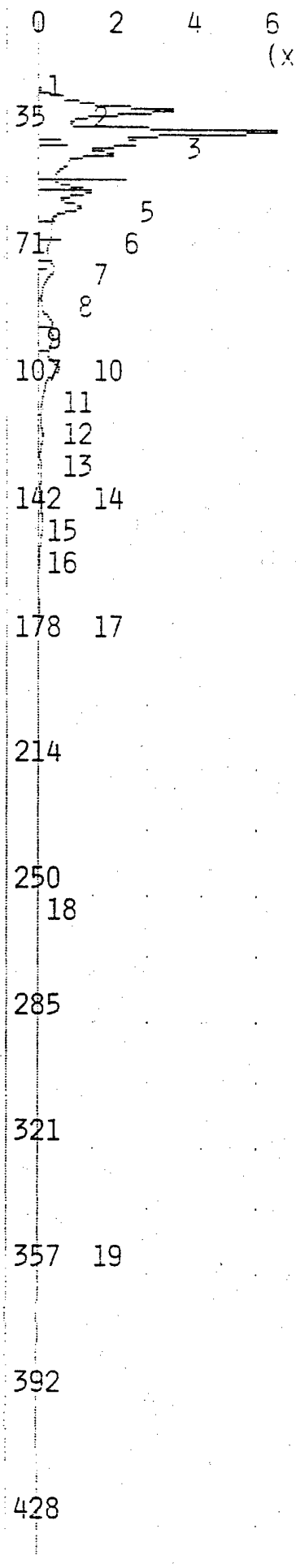
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.042 | MVS | 20.6 |
| 2 | UNKNOWN | 55.58 | MVS | 25.6 |
| 3 | UNKNOWN | 31.74 | MVS | 32.8 |
| 4 | UNKNOWN | 56.63 | MVS | 39.0 |
| 5 | BENZENE | 95.93 | PPB | 84.2 |
| 6 | UNKNOWN | 1.090 | MVS | 98.9 |
| 7 | TOLUENE | 91.85 | PPB | 145.2 |
| 8 | UNKNOWN | 0.577 | MVS | 253.0 |
| 9 | ETHYLBENZENE | 87.00 | PPB | 277.0 |
| 10 | M,P-XYLENE | 177.5 | PPB | 294.4 |
| 11 | O-XYLENE | 92.84 | PPB | 347.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
100 PPB BTEX

ANALYSIS #24  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 14:37
SAMPLE TIME: MAY 17,95 14:29

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

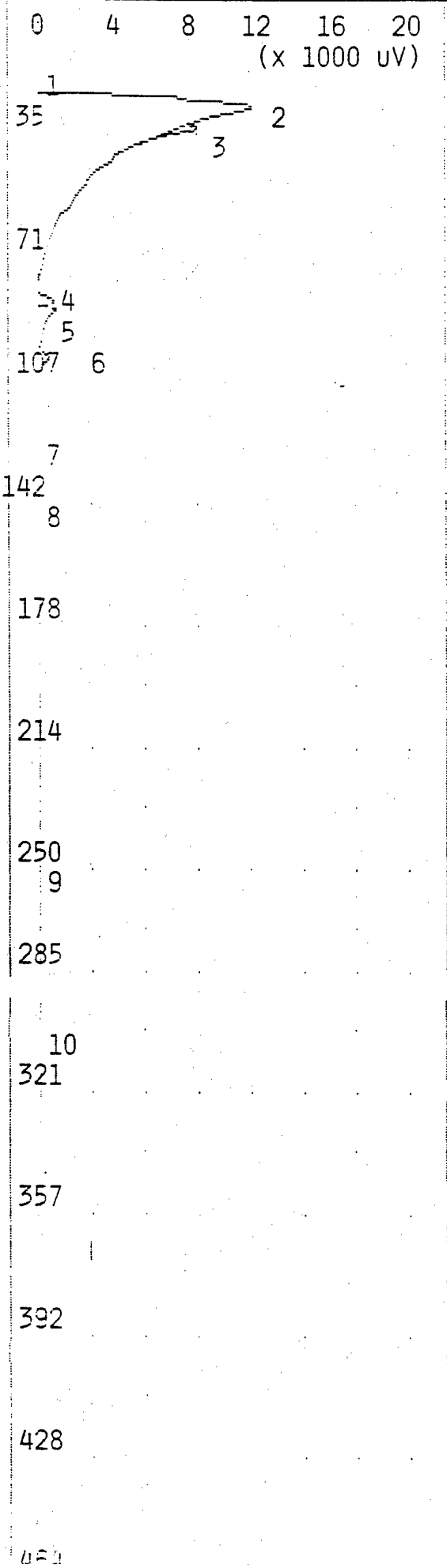
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 1.594 | MVS | 20.5 |
| 2 | UNKNOWN | 10.75 | MVS | 22.6 |
| 3 | UNKNOWN | 131.2 | MVS | 26.3 |
| 4 | UNKNOWN | 150.6 | MVS | 32.4 |
| 5 | UNKNOWN | 68.97 | MVS | 35.6 |
| 6 | UNKNOWN | 83.15 | MVS | 38.6 |
| 7 | UNKNOWN | 50.90 | MVS | 49.3 |
| 8 | UNKNOWN | 46.04 | MVS | 53.8 |
| 9 | UNKNOWN | 27.65 | MVS | 59.4 |
| 10 | UNKNOWN | 37.62 | MVS | 71.2 |
| 11 | BENZENE | 9.781 | PPB | 86.5 |
| 12 | UNKNOWN | 23.48 | MVS | 90.4 |
| 13 | UNKNOWN | 45.55 | MVS | 99.3 |
| 14 | UNKNOWN | 11.10 | MVS | 118.0 |
| 15 | UNKNOWN | 7.675 | MVS | 127.6 |
| 16 | TOLUENE | 16.38 | PPB | 143.0 |
| 17 | UNKNOWN | 3.007 | MVS | 166.4 |
| 18 | ETHYLBENZENE | 2.832 | PPB | 249.6 |
| 19 | O-XYLENE | 3.779 | PPB | 348.6 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH
13.0-20.0  10G

ANALYSIS #23  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 14:19
SAMPLE TIME: MAY 17,95 14:11

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

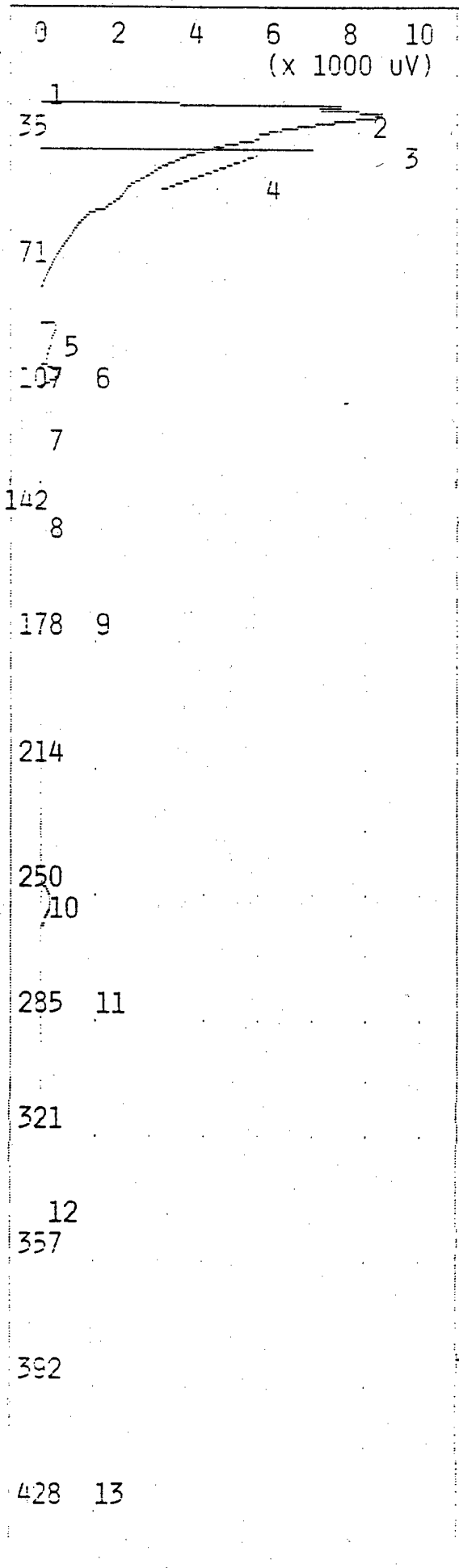
PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | R.T. |
|---|---|---|---|
| 1 | UNKNOWN | 0.243 MVS | 20.6 |
| 2 | UNKNOWN | 242.3 MVS | 25.2 |
| 3 | UNKNOWN | 2.060 MVS | 31.8 |
| 4 | UNKNOWN | 2.665 MVS | 82.1 |
| 5 | BENZENE | 3.515 PPB | 84.1 |
| 6 | UNKNOWN | 4.841 MVS | 98.2 |
| 7 | UNKNOWN | 0.440 MVS | 120.5 |
| 8 | TOLUENE | 2.497 PPB | 143.8 |
| 9 | ETHYLBENZENE | 3.962 PPB | 251.2 |
| 10 | M,P-XYLENE | 2.483 PPB | 299.2 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH
10.0-12.0  10G

ANALYSIS #22  10S+ GC FUNCTION ANALYSIS REPORT




TIME PRINTED: MAY 17,95 14:07
SAMPLE TIME: MAY 17,95 13:59

METHOD

| | | |
|---|---|---|
| SLOPE UP | 0.500 | MV/SEC |
| SLOPE DOWN | 1.500 | MV/SEC |
| MIN AREA | 0.000 | MVSEC |
| MIN HEIGHT | 0.000 | MV |
| ANALYSIS DELAY | 0.0 | SEC |
| WINDOW PERCENT | 10.0 | % |
| DET FLOW | 12 | ML/MIN |
| B/F FLOW | 12 | ML/MIN |
| AUX FLOW | 0 | ML/MIN |
| OVEN TEMP | 40 | C |
| AMB TEMP | 30 | C |
| MAX GAIN | 1000 | |
| ANALYSIS TIME | 500.0 | SEC |

PEAK REPORT

| PK | COMPOUND NAME | AREA/CONC | | R.T. |
|---|---|---|---|---|
| 1 | UNKNOWN | 0.106 | MVS | 19.8 |
| 2 | UNKNOWN | 13.53 | MVS | 22.4 |
| 3 | UNKNOWN | 169.6 | MVS | 25.0 |
| 4 | UNKNOWN | 0.441 | MVS | 31.6 |
| 5 | BENZENE | 2.935 | PPB | 85.4 |
| 6 | UNKNOWN | 4.997 | MVS | 98.6 |
| 7 | UNKNOWN | 0.426 | MVS | 117.2 |
| 8 | TOLUENE | 2.283 | PPB | 143.7 |
| 9 | UNKNOWN | 0.406 | MVS | 165.6 |
| 10 | UNKNOWN | 15.39 | MVS | 249.6 |
| 11 | ETHYLBENZENE | 19.64 | PPB | 274.9 |
| 12 | O-XYLENE | 105.9 | PPB | 342.0 |
| 13 | UNKNOWN | 6.306 | MVS | 414.3 |

NOTES

JOE BYRD, JR.
DULUTH ANGB
025-013BH
5.0- 7.0  10G

# APPENDIX C

# MONITOR WELL CONSTRUCTION RECORDS

## INTRODUCTION

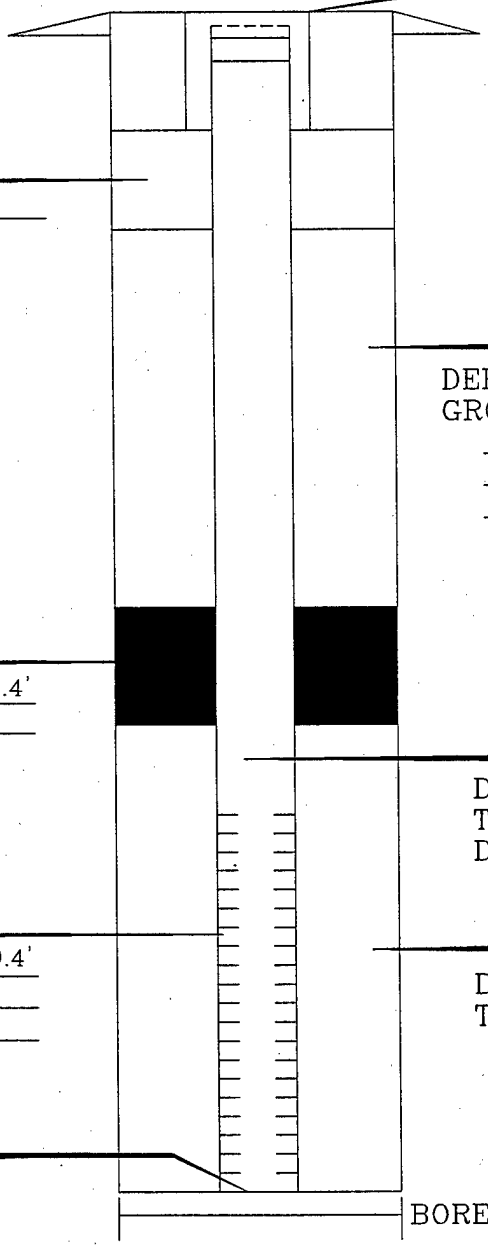
The monitor wells for IRP Sites No. 25 and No. 26 were constructed as specified in the Site Investigation Work Plan. The monitor well construction diagram displays the water level data and well construction information for the well. Monitor well construction information includes an outline of the monitor well and contains the depth of the borehole, the screened interval, and the sand packed and bentonite interval.

Also included in this appendix are copies of the well record for the Minnesota Department of Health.

THIS PAGE INTENTIONALLY LEFT BLANK

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____
KEY NO.: _____
BOLT SIZE: _____



ELEV.: 1422.56'
SURFACE ELEV.: 1422.59'

CONCRETE SEAL
DEPTH INTERVAL: 0–1'

GROUT SEAL
DEPTH INTERVAL: 1'–5'
GROUT TYPE:
Cement/Bentonite Grout
3% Bentonite
97% Cement

BENTONITE SEAL
DEPTH INTERVAL: 22.5'–27.4'
BENTONITE TYPE: Slurry

WELL CASING
DEPTH INTERVAL: 0–29.4'
TYPE: Sch 40
DIAMETER: 2"

WELL SCREEN
DEPTH INTERVAL: 29.4'–39.4'
TYPE: Sch 40
DIAMETER: 2"

FILTER PACK
DEPTH INTERVAL: 27.4'–39.8'
TYPE AND GRADE: 45/55
Red Flint

TD OF CASING: 39.8'

BORE HOLE DIAMETER: 9"

# 025–001MW
# MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

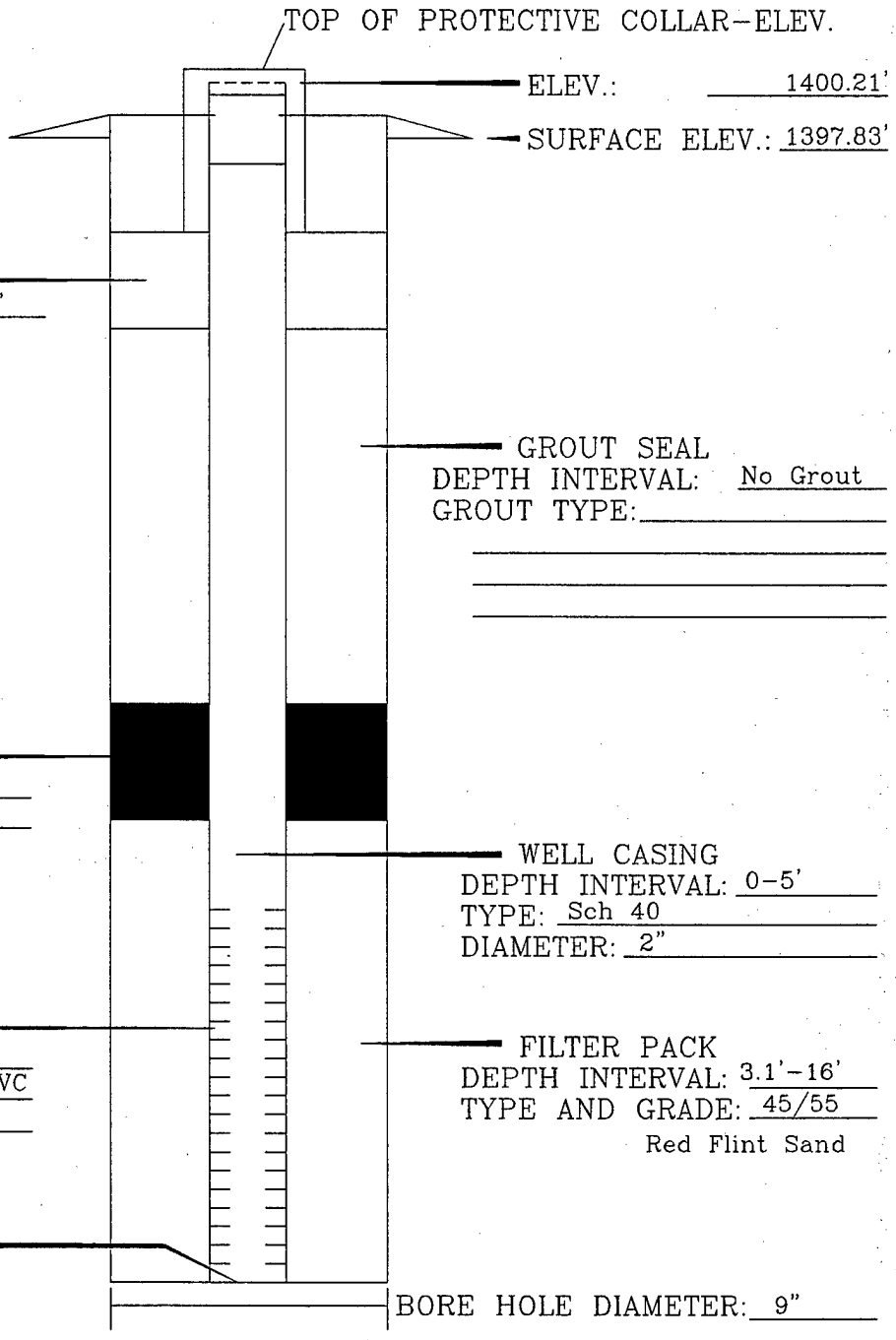
DULUTH\FLSHWELL

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____
KEY NO.: _____
BOLT SIZE: _____




# 025-002MW
# MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

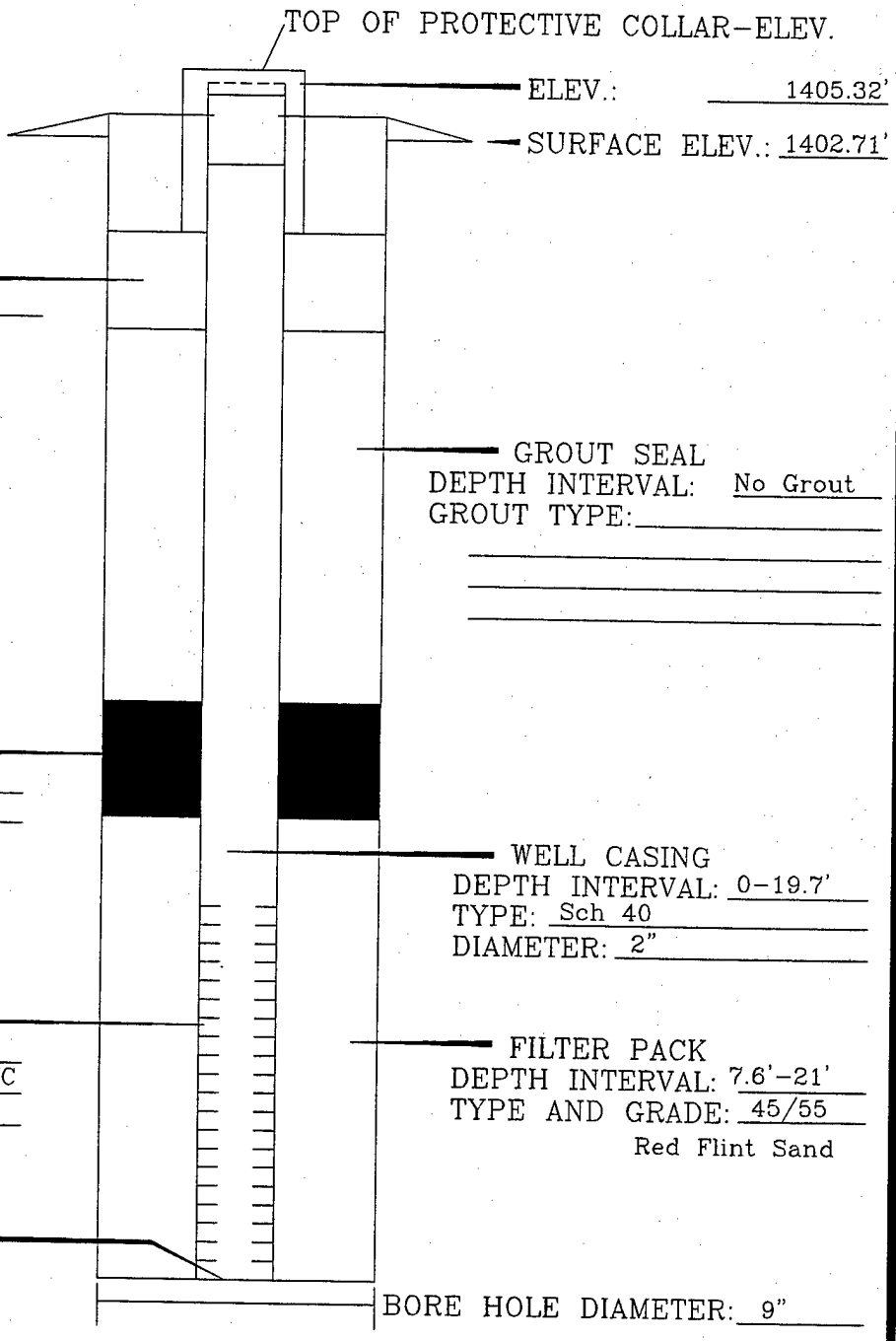
DULUTH\WELLDIAG

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____
KEY NO.: _____
BOLT SIZE: _____




# 025-003MW
# MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

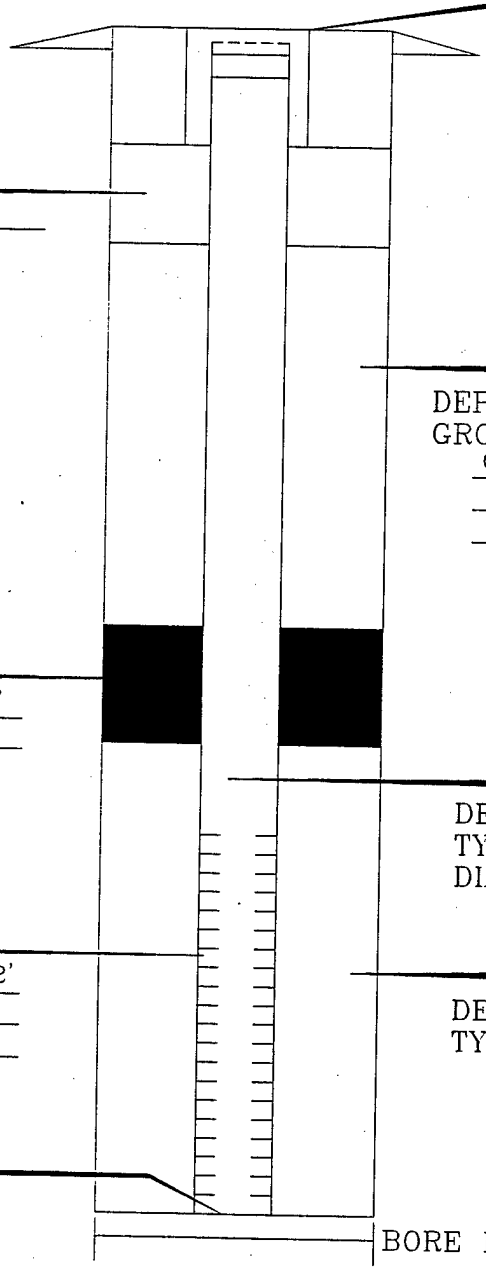
DULUTH\WELLDIAG

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____
KEY NO.: _____
BOLT SIZE: _____



ELEV.: 1424.62'

SURFACE ELEV.: 1424.69'

CONCRETE SEAL
DEPTH INTERVAL: 0-4'

GROUT SEAL
DEPTH INTERVAL: 4'-9.7'
GROUT TYPE: Cement/Bentonite Grout
3% Bentonite
97% Cement

BENTONITE SEAL
DEPTH INTERVAL: 9.7'-11.7'
BENTONITE TYPE: Slurry

WELL CASING
DEPTH INTERVAL: 0.5'-13.9'
TYPE: Sch 40
DIAMETER: 2"

WELL SCREEN
DEPTH INTERVAL: 14.2'-24.2'
TYPE: Sch 40
DIAMETER: 2"

FILTER PACK
DEPTH INTERVAL: 11.7'-26'
TYPE AND GRADE: 45/55
Red Flint

TD OF CASING: 26'

BORE HOLE DIAMETER: 9"

# 026-001MW
# MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

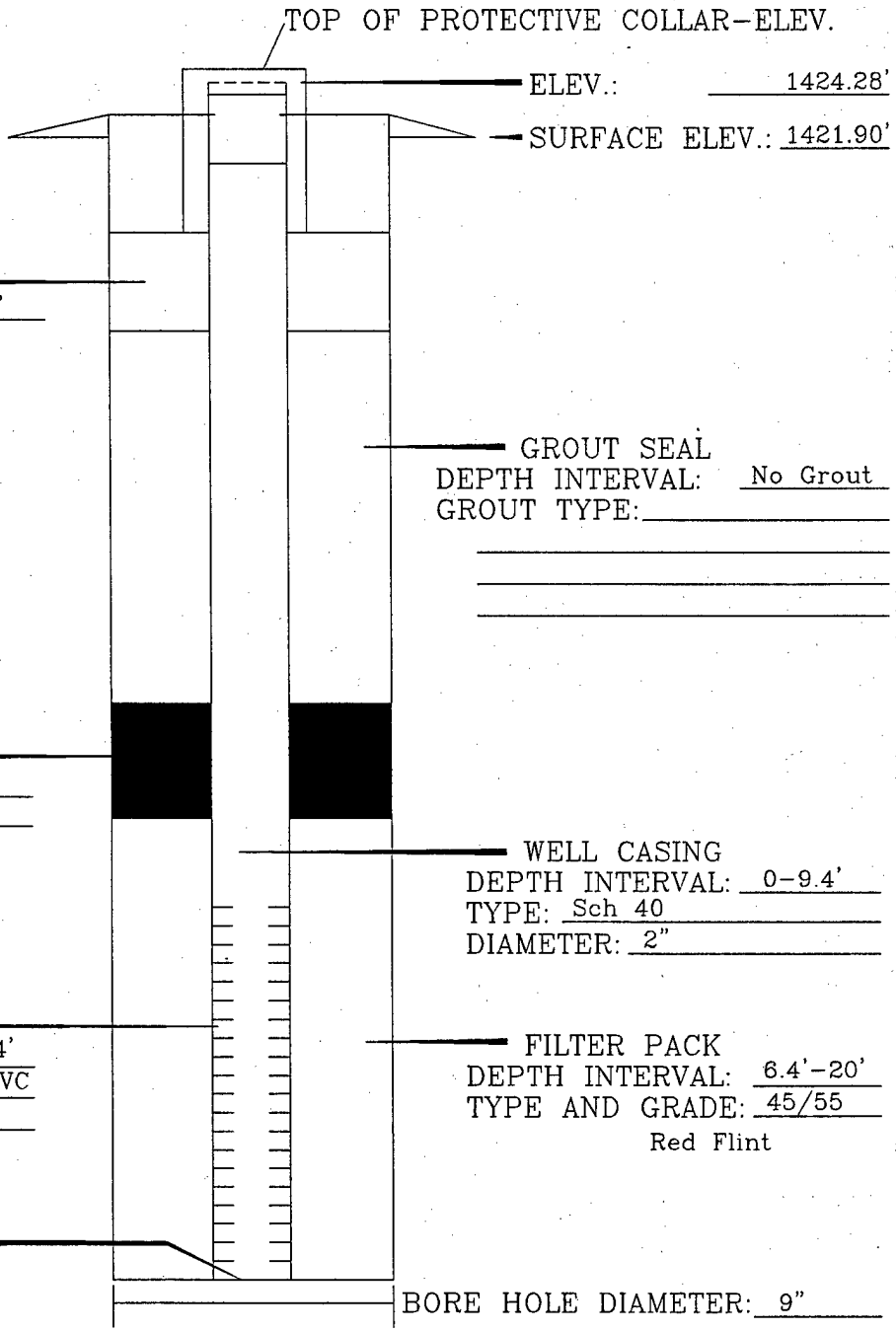
DULUTH\FLSHWELL

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____
KEY NO.: _____
BOLT SIZE: _____




# 026-002MW
# MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

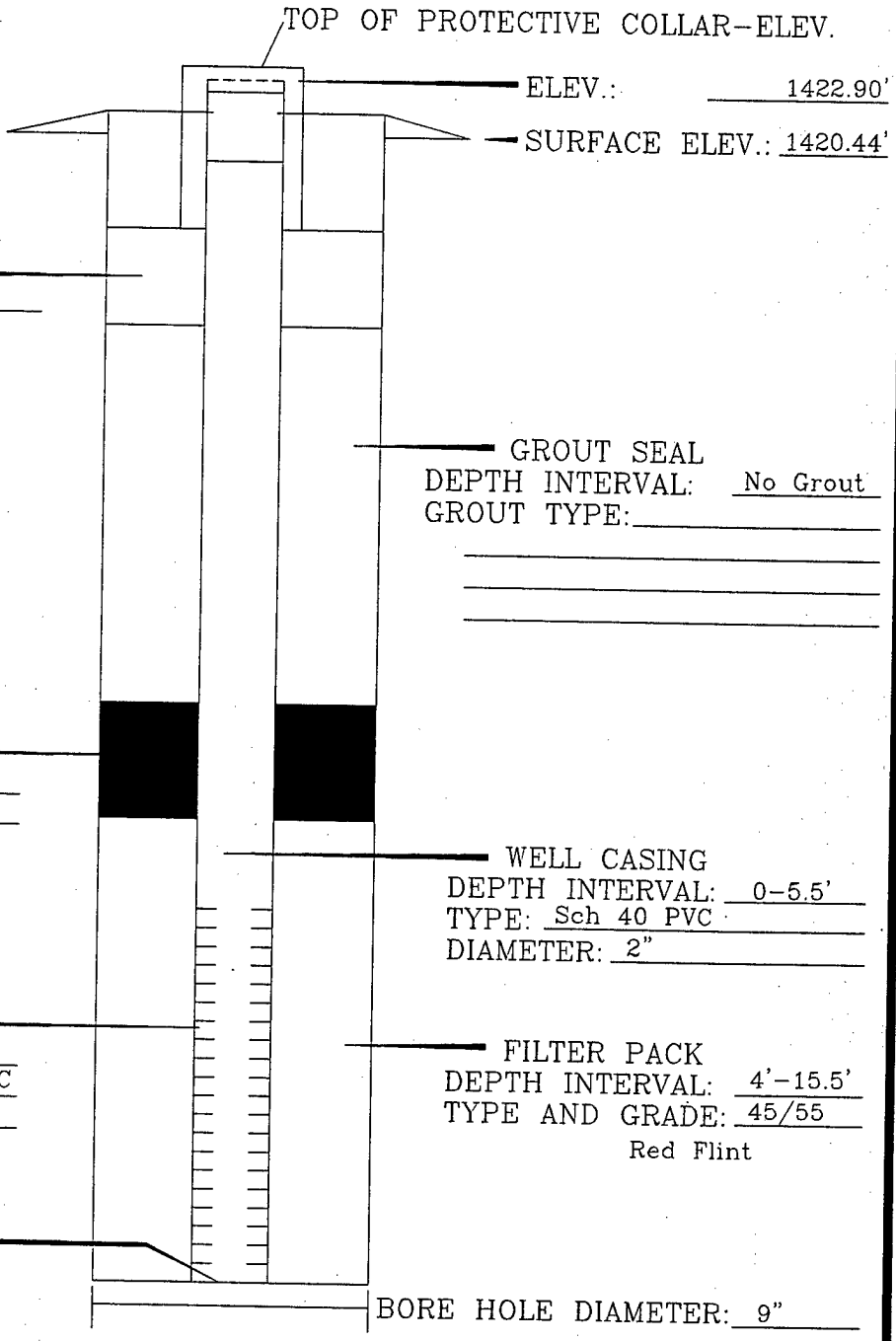
DULUTH\WELLDIAG

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

AUGUST 1995

TOP OF PROTECTIVE ENCASEMENT: _____

MANHOLE DIAMETER: _____
KEY NO.: _____
BOLT SIZE: _____




# 026–003MW
# MONITOR WELL CONSTRUCTION DIAGRAM

Duluth Air National Guard
Duluth, Minnesota

DULUTH\WELLDIAG

OPTECH
OPERATIONAL TECHNOLOGIES CORPORATION

AUGUST 1995

# MINNESOTA DEPARTMENT OF HEALTH
# WELL RECORD
*Minnesota Statutes Chapter 103I*

MINNESOTA UNIQUE WELL NO. 564549

**WELL LOCATION**

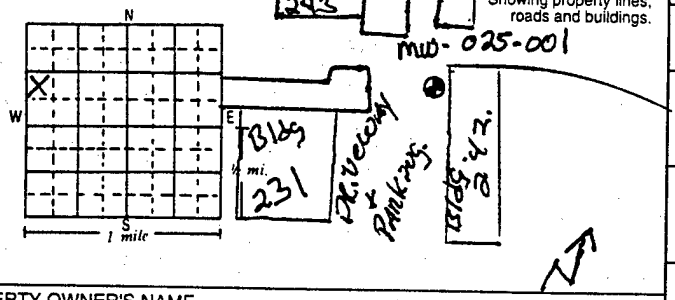
County Name: ST. LOUIS

| Township Name | Township No. | Range No. | Section No. | Fraction |
|---|---|---|---|---|
| Duluth | 50N | 14W | 6 | NW ¼ SW ¼ NW ¼ |

Numerical Street Address and City of Well Location: 4680 Viper St

or Fire Number:

Show exact location of well in section grid with "X". Sketch map of well location. Showing property lines, roads and buildings.




PROPERTY OWNER'S NAME: MN. A.R. National Guard.

Mailing address if different than property address indicated above.

4680 Viper Street
Duluth MN. 55811

| GEOLOGICAL MATERIALS | COLOR | HARDNESS OF MATERIAL | FROM | TO |
|---|---|---|---|---|
| Black Top. | | | 0 | .8 |
| Silty Sand w/some Gravel & cobble-Fill | Brown | Med Dense. | .8 | 11.0 |
| Sandy-Silty w/wood To 17' Gravel & cobbles | Brown | Vary Dense. | 11.0 | 23.5 |
| Water Bearing Sand & Gravel | Brown | Vary Dense. | 23.5 | 39.8 |

Use a second sheet, if needed

REMARKS, ELEVATION, SOURCE OF DATA, etc.

American Engineering. Job # 95-7091

El. By RREM Inc.
Top of Riser. El. 1422.56
Ground Surface El. 1422.56

MINN. DEPT. OF HEALTH COPY 564549

WELL DEPTH (completed): 39.4 ft. Date Work Completed: 5-10-95

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ _____

DRILLING FLUID: None.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Irrigation ☐ Public ☐ Industry/Commercial ☐ Test Well ☐ Dewatering ☐ Remedial ☐ _____

CASING: ☐ Steel ☒ Plastic — Drive Shoe? ☐ Yes ☒ No — ☒ Threaded ☐ Welded ☐ _____

CASING DIAMETER / WEIGHT

| | | | | HOLE DIAM. | |
|---|---|---|---|---|---|
| 2 in. to 29.4 ft. | | lbs./ft. | 8.0 in. to 39.8 ft. | | |
| ____ in. to ____ ft. | | lbs./ft. | ____ in. to ____ ft. | | |
| ____ in. to ____ ft. | | lbs./ft. | ____ in. to ____ ft. | | |

SCREEN: Make Johnson — Type Sch. 40 PVC — Slot/Gauze .010 — Diam. 2" — Length 10' — Set between 39.4 ft. and 29.4 ft. FITTINGS: W/FLUSH

OPEN HOLE: from ____ ft. to ____ ft.

STATIC WATER LEVEL: 32.4 ft. ☒ below ☐ above land surface Date measured 5-10-95

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping ____ g.p.m.

WELL HEAD COMPLETION: ☐ Pitless adapter manufacturer _____ Model _____

☒ Casing Protection 4' X 4' Concrete Pad w/ At-Grade Manhole. ☐ 12 in. above grade

GROUTING INFORMATION: Well grouted? ☒ Yes ☐ No

Grout Material: ☒ Neat cement ☐ Bentonite

| | | | | |
|---|---|---|---|---|
| Bentonite | from 27.0 | to 22.0 ft. | ____ | ☐ yds. ☐ bags |
| Neat Cement | from 22.0 | to ½ ft. | ____ | ☐ yds. ☐ bags |
| Concrete | from ½ | to ____ ft. | ____ | ☐ yds. ☐ bags |

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? ☐ Yes ☐ No

PUMP: ☒ Not installed Date installed _____

Manufacturer's name _____

Model number _____ HP _____ Volts _____

Length of drop pipe _____ ft. Capacity _____ g.p.m.

Pressure Tank Capacity _____

Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ _____

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

American Engineering Testing Inc. — Licensee Business Name — Lic. or Reg. No. M0063

Authorized Representative Signature — Date 6-12-95

Jamie Tourk — Name of Driller — Date 5-10-95

HE-01205-04 (Rev. 5/92)

WELL NOTIFICATION

MINNESOTA DEPARTMENT OF HEALTH

# WELL RECORD

*Minnesota Statutes Chapter 103I*

*MINNESOTA UNIQUE WELL NO.* 564550

**WELL LOCATION**

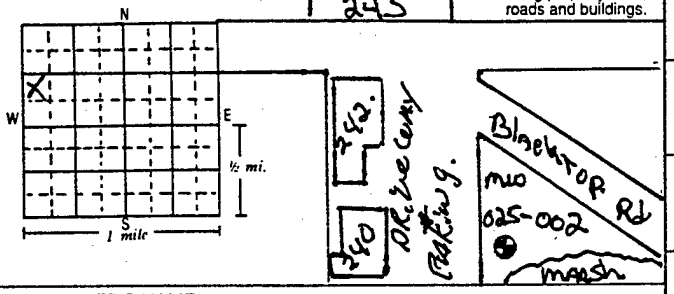
County Name: St. Louis.

| Township Name | Township No. | Range No. | Section No. | Fraction |
|---|---|---|---|---|
| Duluth | 50N | 14W | 6 | NW SW NW |

Numerical Street Address and City of Well Location: 4680 Viper Street — or Fire Number:

Show exact location of well in section grid with "X". Bldg 243

Sketch map of well location. Showing property lines, roads and buildings.




PROPERTY OWNER'S NAME: MN. A.R National Guard

Mailing address if different than property address indicated above.

4680 Viper Street
Duluth MN. 55811

| GEOLOGICAL MATERIALS | COLOR | HARDNESS OF MATERIAL | FROM | TO |
|---|---|---|---|---|
| Sod | Green | | 0 | .3 |
| Silty sand w/some Gravel + Boulders | Brown | | .3 | 7.0 |
| Organic sandy silt | Dark Brown | | 7.0 | 7.5 |
| ~~Sandy~~ Silty sand w/some Gravel Cobbles | Brown | | 7.5 | 17.0 |

Use a second sheet, if needed

REMARKS, ELEVATION, SOURCE OF DATA, etc.

American Engineering Job #95-7091
El. By RREM. Inc.
Top of Riser El. 1400.21
Ground surface El. 1397.83

MINN. DEPT. OF HEALTH COPY 564550

WELL DEPTH (completed): 15.0 ft. — Date Work Completed: 5-11-95

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ _____

DRILLING FLUID: None.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Irrigation ☐ Public ☐ Industry/Commercial ☐ Test Well ☐ Dewatering ☐ Remedial ☐ _____

CASING: ☐ Steel ☒ Plastic — Drive Shoe? ☐ Yes ☒ No — ☐ Threaded ☐ Welded ☐ _____

CASING DIAMETER / WEIGHT

| | | | |
|---|---|---|---|
| 2" in. to 5.0 ft. | lbs./ft. | 8.0 in. to 17.0 ft. |
| _____ in. to _____ ft. | lbs./ft. | _____ in. to _____ ft. |
| _____ in. to _____ ft. | lbs./ft. | _____ in. to _____ ft. |

HOLE DIAM.

SCREEN — OPEN HOLE from _____ ft. to _____ ft.

Make Johnson
Type sch 40 PVC — Diam. 2"
Slot/Gauze .010 — Length 10.'
Set between 15.0 ft. and 5.0 ft. FITTINGS: M/Fem. Flush

STATIC WATER LEVEL: 6.0 ft. ☒ below ☐ above land surface — Date measured 5-11-95

PUMPING LEVEL (below land surface): _____ ft. after _____ hrs. pumping _____ g.p.m.

WELL HEAD COMPLETION

☐ Pitless adapter manufacturer _____ Model _____

☒ Casing Protection 6" x 7' sch 40 steel 12 in. above grade
3" x 7' steel Guard Posts.

GROUTING INFORMATION

Well grouted? ☒ Yes ☐ No

Grout Material ☒ Neat cement ☐ Bentonite

| | | | |
|---|---|---|---|
| Bentonite Concrete | from 3½ to 2' ft. | _____ | ☐ yds. ☐ bags |
| | from 2' to 0' ft. | _____ | ☐ yds. ☐ bags |
| | from _____ to _____ ft. | _____ | ☐ yds. ☐ bags |

NEAREST KNOWN SOURCE OF CONTAMINATION: _____ feet _____ direction _____ type

Well disinfected upon completion? ☐ Yes ☐ No

PUMP

☒ Not installed — Date installed _____

Manufacturer's name _____

Model number _____ HP _____ Volts _____

Length of drop pipe _____ ft. Capacity _____ g.p.m.

Pressure Tank Capacity _____

Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ _____

ABANDONED WELLS

Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

American Engineering Testing 1006 3
*Licensee Business Name* — *Lic. or Reg. No.*

*Authorized Representative Signature* — 6-12-95 *Date*

Jamie Tourja — 5-11-95
*Name of Driller* — *Date*

HE-01205-04 (Rev. 5/92)

MINNESOTA DEPARTMENT OF HEALTH

# WELL RECORD

*Minnesota Statutes Chapter 103I*

*MINNESOTA UNIQUE WELL NO.* 564551

**WELL LOCATION**

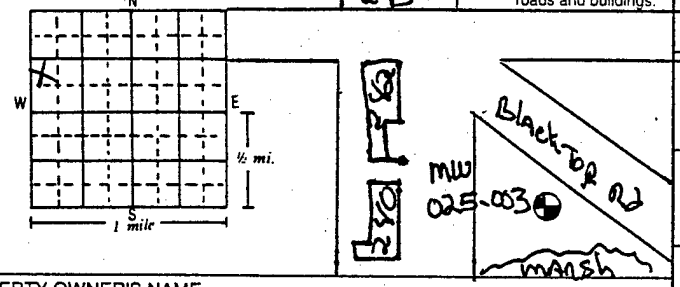
County Name: St. Louis

| Township Name | Township No. | Range No. | Section No. | Fraction |
|---|---|---|---|---|
| Duluth | 50N | 14W | 6 | NE¼ of SW¼ of NE¼ |

Numerical Street Address and City of Well Location: 4680 Viper Street — or Fire Number:

Show exact location of well in section grid with "X". B65 · 243

Sketch map of well location. Showing property lines, roads and buildings.




PROPERTY OWNER'S NAME: MN. AIR NATIONAL GUARD.

Mailing address if different than property address indicated above.

4680 Viper Street
Duluth MN. 55811

| GEOLOGICAL MATERIALS | COLOR | HARDNESS OF MATERIAL | FROM | TO |
|---|---|---|---|---|
| Sod & Top Soil | | | 0 | .3 |
| S.Fine Sand & some Cobbles & Boulders | Brown | Dense. | .3 | 13.0 |
| Peat | Brown | Med Dense. | 13.0 | 19.0 |
| Organic. S.H & Sand & Gravel | Grey. Sh Brown | Loose | 19.0 | 22.0 |

Use a second sheet, if needed

REMARKS, ELEVATION, SOURCE OF DATA, etc.

American Engineering Job #95-709
El. By RREM. Inc.
Top of Riser El. 1405.2.
Ground Surface El. 1402.7

MINN. DEPT. OF HEALTH COPY 564551

WELL DEPTH (completed): 17.2 ft. — Date Work Completed: 5-11-95

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ _____

DRILLING FLUID: None.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Irrigation ☐ Public ☐ Industry/Commercial ☐ Test Well ☐ Dewatering ☐ Remedial ☐ _____

CASING: ☐ Steel ☒ Plastic — Drive Shoe? ☐ Yes ☒ No — ☒ Threaded ☐ Welded ☐ _____

CASING DIAMETER / WEIGHT

| | |
|---|---|
| 2 in. to 7.2 ft. | _____ lbs./ft. |
| _____ in. to _____ ft. | _____ lbs./ft. |
| _____ in. to _____ ft. | _____ lbs./ft. |

HOLE DIAM.: 8.0 in. to 22.0 ft.

SCREEN: Make Johnson — Type Sch 40. PVC. — Slot/Gauze .010 — Set between 17.2 ft. and 7.2 ft.
Diam. 2" — Length 10.0 — FITTINGS: M/Fem. Flush.

OPEN HOLE: from _____ ft. to _____ ft.

STATIC WATER LEVEL: 12.7 ft. ☒ below ☐ above land surface — Date measured 5-11-95

PUMPING LEVEL (below land surface): _____ ft. after _____ hrs. pumping _____ g.p.m.

WELL HEAD COMPLETION: ☐ Pitless adapter manufacturer _____ Model _____
☒ Casing Protection 6"x7' Sch 40 Steel ☐ 12 in. above grade
3-4"x7' steel Guard Posts.

GROUTING INFORMATION: Well grouted? ☒ Yes ☐ No — Grout Material ☒ Neat cement ☐ Bentonite

| | | | |
|---|---|---|---|
| Bentonite | from 7.0 to 4.0 ft. | _____ | ☐ yds. ☐ bags |
| Cuttings | from 4.0 to 0 ft. | _____ | ☐ yds. ☐ bags |
| | from _____ to _____ ft. | _____ | ☐ yds. ☐ bags |

NEAREST KNOWN SOURCE OF CONTAMINATION: _____ feet _____ direction _____ type
Well disinfected upon completion? ☐ Yes ☐ No

PUMP: ☒ Not installed — Date installed _____
Manufacturer's name _____
Model number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Pressure Tank Capacity _____
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ _____

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

American Engineering Testing — MN0063
*Licensee Business Name* — *Lic. or Reg. No.*

_____ — 6-12-95
*Authorized Representative Signature* — *Date*

Jamie Tourja — 5-11-95
*Name of Driller* — *Date*

HE-01205-04 (Rev. 5/92)

MINNESOTA DEPARTMENT OF HEALTH

# WELL RECORD

*Minnesota Statutes Chapter 103I*

*MINNESOTA UNIQUE WELL NO.* 564552

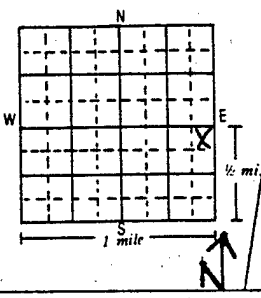
**WELL LOCATION**

County Name: St. Louis

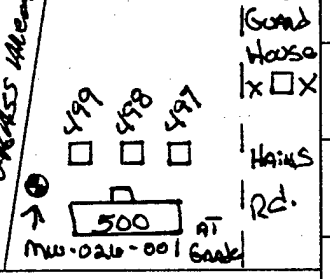
| Township Name | Township No. | Range No. | Section No. | Fraction |
|---|---|---|---|---|
| Duluth | 50N | 15W | 1 | NE ¼ NE ¼ SE |

Numerical Street Address and City of Well Location or Fire Number: MN. A.R NATIONAL GUARD BASE (Duluth)

Show exact location of well in section grid with "X"




Sketch map of well location. Showing property lines, roads and buildings.




PROPERTY OWNER'S NAME: MN. A.R NATIONAL GUARD.

Mailing address if different than property address indicated above.

4680 Viper Street
Duluth MN. 55811

| GEOLOGICAL MATERIALS | COLOR | HARDNESS OF MATERIAL | FROM | TO |
|---|---|---|---|---|
| Black Top | | | 0 | .4 |
| ~~Sandy Soil + Gravel~~ Fill to 3' change to Sandy S.-H. | Brown | Dense | .4 | - |
| | | | - | 17.0 |
| Sandy S.-H w/ some Gravel | Brown | Med Dense | 17.0 | 26.0 |

Use a second sheet, if needed

REMARKS, ELEVATION, SOURCE OF DATA, etc.

American Engineering Job #95-709
El. By. RREM Inc.
Top of Riser. El. 1424.62.
Ground surface. El. 1424.69

MINN. DEPT. OF HEALTH COPY 564552

WELL DEPTH (completed): 24.2 ft. | Date Work Completed: 5-5-95

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ ____

DRILLING FLUID: None.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Irrigation ☐ Public ☐ Industry/Commercial ☐ Test Well ☐ Dewatering ☐ Remedial ☐ ____

CASING: ☐ Steel ☒ Plastic | Drive Shoe? ☐ Yes ☒ No | ☒ Threaded ☐ Welded ☐ ____

HOLE DIAM.

CASING DIAMETER / WEIGHT

| | | | |
|---|---|---|---|
| 2.0 in. to 14.2 ft. | ____ lbs./ft. | 8.0 in. to 26.0 ft. |
| ____ in. to ____ ft. | ____ lbs./ft. | ____ in. to ____ ft. |
| ____ in. to ____ ft. | ____ lbs./ft. | ____ in. to ____ ft. |

SCREEN: Make Johnson; Type Sch 40 PVC.; Slot/Gauze .010; Set between 24.2 ft. and 14.2 ft.; Diam. 2"; Length 10'; FITTINGS: ~~M~~ / FWT. Flush

OPEN HOLE: from ____ ft. to ____ ft.

STATIC WATER LEVEL: 17.2 ft. ☒ below ☐ above land surface Date measured 5-5-95

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping ____ g.p.m.

WELL HEAD COMPLETION: ☐ Pitless adapter manufacturer ____ Model ____

☒ Casing Protection 4X4 Concrete Pad ☐ 12 in. above grade w/ AT-Grade Manhole.

GROUTING INFORMATION: Well grouted? ☒ Yes ☐ No

Grout Material: ☒ Neat cement ☒ Bentonite

| | | | |
|---|---|---|---|
| Bentonite | from 11.7 to 9.7 ft. | ____ | ☐ yds. ☐ bags |
| Neat Cement | from 9.7 to 4.0 ft. | ____ | ☐ yds. ☐ bags |
| Concrete | from 4.0 to 0 ft. | ____ | ☐ yds. ☐ bags |

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? ☐ Yes ☐ No

PUMP: ☒ Not installed Date installed ____

Manufacturer's name ____

Model number ____ HP ____ Volts ____

Length of drop pipe ____ ft. Capacity ____ g.p.m.

Pressure Tank Capacity ____

Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ ____

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

American Engineering Testing M0063
*Licensee Business Name* *Lic. or Reg. No.*

*Authorized Representative Signature* 6-12-95 *Date*

Jamie Toura 5-5-95
*Name of Driller* *Date*

HE-01205-04 (Rev. 5/92)

# MINNESOTA DEPARTMENT OF HEALTH
# WELL RECORD
*Minnesota Statutes Chapter 103I*

MINNESOTA UNIQUE WELL NO. 564553

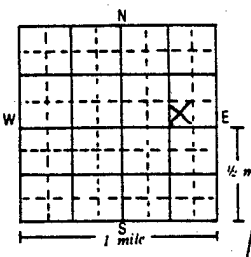
**WELL LOCATION**

County Name: ST. LOUIS

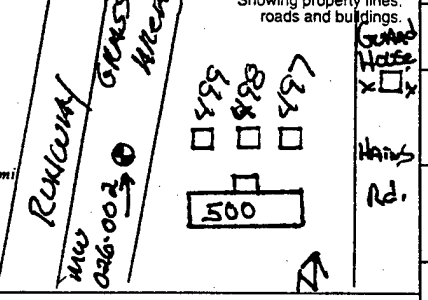
| Township Name | Township No. | Range No. | Section No. | Fraction |
|---|---|---|---|---|
| Duluth | 50N | 15W | 1 | SW SE NE |

Numerical Street Address and City of Well Location: MN. Air Guard Base. (Duluth) — or Fire Number:

Show exact location of well in section grid with "X"




Sketch map of well location. Showing property lines, roads and buildings.




**PROPERTY OWNER'S NAME**

MN. AIR NATIONAL GUARD

Mailing address if different than property address indicated above.

4686 VIPER STREET
DULUTH MN. 55811

| GEOLOGICAL MATERIALS | COLOR | HARDNESS OF MATERIAL | FROM | TO |
|---|---|---|---|---|
| SILTY LOAM. ORGANIC & SILT TOPSOIL | DARK BROWN | | 0 | .6 |
| SILT, SAND. U/GRAVEL + COBBLES - FEW BOULDERS | BROWN | | .6 | 22.0 |
| WET FROM 9' LAYER OF SAND & SOME SILT + | | | | |
| GRAVEL FROM 18' | | | | |

Use a second sheet, if needed

**REMARKS, ELEVATION, SOURCE OF DATA, etc.**

AMERICAN ENGINEERING JOB # 95-7091
EL. BY RREM INC.
TOP OF RISER EL. 1424.28
GROUND SURFACE EL. 1421.90

MINN. DEPT. OF HEALTH COPY 564553

WELL DEPTH (completed): 19.4 ft. — Date Work Completed: 5-8-95

**DRILLING METHOD**
☐ Cable Tool ☐ Driven ☐ Dug
☒ Auger ☐ Rotary ☐ Jetted
☐ _____

**DRILLING FLUID**: NONE.

**USE**
☐ Domestic ☒ Monitoring ☐ Heating/Cooling
☐ Irrigation ☐ Public ☐ Industry/Commercial
☐ Test Well ☐ Dewatering ☐ Remedial
☐ _____

**CASING** — Drive Shoe? ☐ Yes ☒ No
☐ Steel ☒ Threaded ☐ Welded
☒ Plastic ☐ _____

**HOLE DIAM.**

**CASING DIAMETER / WEIGHT**

| | | | |
|---|---|---|---|
| 2" in. to 9.4 ft. | _____ lbs./ft. | 8.0 in. to 22.0 ft. |
| _____ in. to _____ ft. | _____ lbs./ft. | ____ in. to ____ ft. |
| _____ in. to _____ ft. | _____ lbs./ft. | ____ in. to ____ ft. |

**SCREEN**
Make: JOHNSON
Type: SCH 40 PVC. Diam.: 2"
Slot/Gauze: .010 Length: 10'
Set between 19.4 ft. and 9.4 ft. FITTINGS: MJ FLUSH

**OPEN HOLE**
from _____ ft. to _____ ft.

**STATIC WATER LEVEL**
13.7 ft. ☒ below ☐ above land surface Date measured 5-8-95

**PUMPING LEVEL (below land surface)**
_____ ft. after _____ hrs. pumping _____ g.p.m.

**WELL HEAD COMPLETION**
☐ Pitless adapter manufacturer _____ Model _____
☒ Casing Protection 6" X 7' SCH 40 STEEL, 12 in. above grade
3- 4" X 7' STEEL GUARD POSTS.

**GROUTING INFORMATION**
Well grouted? ☒ Yes ☐ No
Grout Material: ☐ Neat cement ☒ Bentonite

| | | | |
|---|---|---|---|
| BENTONITE from 6.4 to 4.4 ft. | _____ | ☐ yds. ☐ bags |
| CONCRETE from 4.0 to 0 ft. | _____ | ☐ yds. ☐ bags |
| from _____ to _____ ft. | _____ | ☐ yds. ☐ bags |

**NEAREST KNOWN SOURCE OF CONTAMINATION**
_____ feet _____ direction _____ type
Well disinfected upon completion? ☐ Yes ☐ No

**PUMP**
☒ Not installed Date installed _____
Manufacturer's name _____
Model number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Pressure Tank Capacity _____
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ _____

**ABANDONED WELLS**
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

**WELL CONTRACTOR CERTIFICATION**

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

AMERICAN ENGINEERING TESTING, M0663
*Licensee Business Name* *Lic. or Reg. No.*

S. Z... 6-12-95
*Authorized Representative Signature* *Date*

JAMIE TURA 5-8-95
*Name of Driller* *Date*

HE-01205-04 (Rev. 5/92)

# MINNESOTA DEPARTMENT OF HEALTH
# WELL RECORD
*Minnesota Statutes Chapter 103I*

MINNESOTA UNIQUE WELL NO. 564554

**WELL LOCATION**

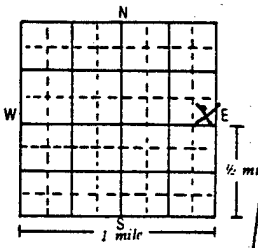
County Name: ST. LOUIS

| Township Name | Township No. | Range No. | Section No. | Fraction |
|---|---|---|---|---|
| Duluth | 50 N | 15 W | 1 | SE ¼ SE NE |

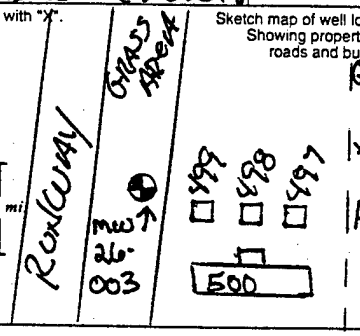
Numerical Street Address and City of Well Location: MN. A.R Guard Base (Duluth)

or Fire Number:

Show exact location of well in section grid with "X".




Sketch map of well location. Showing property lines, roads and buildings.




PROPERTY OWNER'S NAME: MN. AiR NATIONAL Guard

Mailing address if different than property address indicated above.
4680 V.PER. STREET
Duluth MN. 55811

| GEOLOGICAL MATERIALS | COLOR | HARDNESS OF MATERIAL | FROM | TO |
|---|---|---|---|---|
| Top Soil, Sandy Humous ORGN. | DARK BROWN | | 0 | .6 |
| Sandy Stratified Cobbles + Boulders @ 4" to 5" | BROWN | | .6 | 22.0 |

Use a second sheet, if needed

REMARKS, ELEVATION, SOURCE OF DATA, etc.
AMERICAN Engineering. Job #95-7091
El. By RREM INC.
Top of Riser. El 1422.90
Ground surface. El. 1420.44

MINN. DEPT. OF HEALTH COPY 564554

WELL DEPTH (completed): 15.5 ft. | Date Work Completed: 5-6-95

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ ____

DRILLING FLUID: NONE

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Irrigation ☐ Public ☐ Industry/Commercial ☐ Test Well ☐ Dewatering ☐ Remedial ☐ ____

CASING: ☐ Steel ☒ Plastic | Drive Shoe? ☐ Yes ☒ No | ☒ Threaded ☐ Welded ☐ ____

HOLE DIAM.: 8.0 in. to 7.0 ft.

CASING DIAMETER / WEIGHT:
2.0 in. to 5.5 ft. ____ lbs./ft.
____ in. to ____ ft. ____ lbs./ft.
____ in. to ____ ft. ____ lbs./ft.

SCREEN: Make Johnson; Type Sch 40 PVC.; Slot/Gauze .010; Set between 15.5 ft. and 6.5 ft. FITTINGS: M/FM Hosh
Diam. 2"; Length 10.1

OPEN HOLE: from ____ ft. to ____ ft.

STATIC WATER LEVEL: 6.2 ft. ☒ below ☐ above land surface Date measured 5-6-95

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping ____ g.p.m.

WELL HEAD COMPLETION
☐ Pitless adapter manufacturer ____ Model ____
☒ Casing Protection 6" x 7' Sch 40 Steel ☐ 12 in. above grade
3- 4" x 7' Steel Guard Posts

GROUTING INFORMATION
Well grouted? ☒ Yes ☐ No
Grout Material ☐ Neat cement ☒ Bentonite
Bentonite from 4.0 to 2.5 ft. ____ ☐ yds. ☐ bags
Cuttings from 2.5 to 0 ft. ____ ☐ yds. ☐ bags
from ____ to ____ ft. ____ ☐ yds. ☐ bags

NEAREST KNOWN SOURCE OF CONTAMINATION
____ feet ____ direction ____ type
Well disinfected upon completion? ☐ Yes ☐ No

PUMP
☒ Not installed Date installed ____
Manufacturer's name ____
Model number ____ HP ____ Volts ____
Length of drop pipe ____ ft. Capacity ____ g.p.m.
Pressure Tank Capacity ____
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ ____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

AMERICAN ENGINEERING TESTING INC 063
Licensee Business Name — Lic. or Reg. No.

J.K. S. 25 — 6-12-95
Authorized Representative Signature — Date

JAMIE TOORA — 5-6-95
Name of Driller — Date

HE-01205-04 (Rev. 5/92)

# APPENDIX D

# WELL DEVELOPMENT, PURGING, AND SAMPLING LOGS

## INTRODUCTION

This appendix contains the well development, purging, and sampling logs for the monitor wells installed during the Site Investigation for IRP Sites No. 25 and No. 26 at the Minnesota Air National Guard Base, Duluth, Minnesota.

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## Well Development Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 12 May 95
Sample End: (Date) 12 May 95
Developed By: J. Byrd, G. Wirtz
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 21.78'

Well No.: 025-001MW
Site: 25
(Time): 1030
(Time): 1236

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): 38.32'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (16.54') (0.1632) = 2.7 gal.

Volume of Water in Well x 3 = 8.1 gal.

Development method: PVC Bailer (1st 7.5 gal.) stainless-steel submersible pump thereafter.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: 70s, Sunny, Breezy.

Comments: Very silty, causing problems with stainless-steel submersible pump. Never did clear up.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (µS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1053 | 7.5 | 12° | 7.38 | 6.05 | | Cloudy |
| 1104 | 10.0 | 12° | 7.68 | 6.31 | | Cloudy |
| 1110 | 12.5 | 12° | 7.61 | 7.43 | | Cloudy |
| 1122 | 15.0 | 12° | 7.75 | 6.90 | | Cloudy |
| 1130 | 17.5 | 12° | 7.65 | 6.95 | | Cloudy |
| 1137 | 20.0 | 12° | 7.64 | 5.79 | | Cloudy |
| 1145 | 22.5 | 12° | 7.75 | 5.55 | | Cloudy |
| 1153 | 25.0 | 12° | 7.69 | 6.06 | | Cloudy |
| 1201 | 27.5 | 12° | 7.66 | 6.15 | | Cloudy |
| 1208 | 30.0 | 12° | 7.66 | 6.34 | | Cloudy |
| 1215 | 32.5 | 12° | 7.60 | 6.39 | | Cloudy |
| 1222 | 35.0 | 12° | 7.71 | 6.25 | | Cloudy |
| 1231 | 37.5 | 12° | 7.71 | 6.74 | 640,000 | Cloudy |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
µS/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Development Log

Installation: Duluth ANGB
Well No.: 025-002MW
Client/Project:
Site: 25
Sample Start: (Date) 12 May 95
(Time): 1308
Sample End: (Date) 12 May 95
(Time): 1513
Developed By: J. Byrd, G. Wirtz
Background PID Reading: 0.0 ppm
PID Reading: 0.0 ppm
Depth to Water (BTOC): 7.49'
Depth to Bottom of Well (BTOC): 15.98'
Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (8.49') (0.1632) = 1.4 gal.

Volume of Water in Well x 3 = 4.2 gal.

Development method: PVC Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Partly cloudy, windy, cool.

Comments: Recharges slowly.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1321 | 4 | 8° | 6.93 | 11.18 | | Very Cloudy |
| 1332 | 6 | 8° | 6.83 | 12.33 | | Clearing |
| 1345 | 8 | 8° | 6.65 | 12.27 | | Clearing |
| 1355 | 10 | 8° | 6.64 | 12.19 | 644,000 | Silty, Cloudy |
| 1405 | 12 | 8° | 6.60 | 12.16 | 657,000 | Silty, Cloudy |
| 1415 | 14 | 8° | 6.59 | 12.15 | | Silty, Cloudy |
| 1425 | 16 | 8° | 6.62 | 12.98 | 405,000 | Silty, Cloudy |
| 1435 | 18 | 8° | 6.67 | 12.22 | 683,000 | Silty, Cloudy |
| 1444 | 20 | 8° | 6.62 | 12.33 | | Silty, Cloudy |
| 1454 | 22 | 8° | 6.63 | 12.32 | | Silty, Cloudy |
| 1503 | 24 | 8° | 6.72 | 11.85 | | Silty, Cloudy |
| 1510 | 26 | 8° | 6.65 | 12.18 | | Silty, Cloudy |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
$\mu$S/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Development Log

Installation: Duluth ANGB
Well No.: 025-003MW
Client/Project:
Site: 25
Sample Start: (Date) 12 May 95
(Time): 1530
Sample End: (Date) 12 May 95
(Time): 1735
Developed By: J. Byrd, G. Wirtz
Background PID Reading: 0.0 ppm
PID Reading: 80.0 ppm
Depth to Water (BTOC): 10.10'
Depth to Bottom of Well (BTOC): 21.94'
Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (11.84') (0.1632) = 1.9 gal.

Volume of Water in Well x 3 = 5.8 gal.

Development method: PVC Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Partly cloudy, breezy (10-15 mph), cool.

Comments: Recharging slowly.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (µS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| | 6 | | | | | |
| 1547 | 8 | 9° | 6.64 | 14.72 | | Very Cloudy |
| 1559 | 10 | 9° | 6.48 | 15.20 | | Very Cloudy |
| 1610 | 12 | 9° | 6.47 | 15.10 | | Very Cloudy |
| 1617 | 14 | 9° | 6.37 | 15.03 | | Very Cloudy |
| 1627 | 16 | 9° | 6.47 | 14.87 | | Very Cloudy |
| 1638 | 18 | 9° | 6.33 | 15.08 | | Very Cloudy |
| 1650 | 20 | 9° | 6.44 | 15.32 | 180,000 | Clearing |
| 1701 | 22 | 9° | 6.37 | 15.26 | | Clearing |
| 1717 | 24 | 9° | 6.40 | 15.41 | | Clearing |
| 1729 | 26 | 9° | 6.39 | 15.89 | 175,000 | Clearing |

° C – Degrees Centigrade.
µS/cm – microSiemens per centimeter.
NTU – Nephelometer Turbidity Units.
pH – [p(otential) of H(ydrogen)].

## Well Development Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 10 May 95
Sample End: (Date)
Developed By: J. Byrd, Gary Wirtz
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 17.34'

Well No.: 026-001MW
Site: 25
(Time): 10:49 am
(Time): 11:55 am

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): (24.2') 23.89'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (6.55') (0.1632) = 1.07 gal. = 1.1 gal.

Volume of Water in Well x 3 = 3.3 gal.

Development method: PVC Bailer (1st 5 gals.) (Stainless-steel submersible pump thereafter).
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Cloudy, 45° F, Wind 10 mph N.

Comments: Water Level: 19.11' (BTOC) after development.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1057 | 3 | 7° | 8.06 | 4.18 | | Cloudy |
| 1103 | 4 | 7° | 7.91 | 4.51 | | Cloudy |
| 1105 | 5 | 7° | 7.72 | 4.74 | 698 | Cloudy |
| 1115 | 7 | 7° | 7.64 | 5.13 | | Cloudy |
| 1117 | 8 | 7° | 7.63 | 4.50 | | Cloudy |
| 1122 | 9 | 7° | 7.62 | 5.42 | 477 | Cloudy |
| 1134 | 10 | 7° | 7.41 | 5.51 | 688 | Cloudy |
| 1137 | 11 | 7° | 7.39 | 5.14 | | Cloudy |
| 1140 | 12 | 7° | 7.35 | 5.13 | 39 | Cloudy |
| 1143 | 13 | 7° | 7.34 | 5.38 | 522 | Cloudy |
| 1145 | 14 | 7° | 7.34 | 5.26 | 469 | Cloudy |
| 1147 | 15 | 7° | 7.31 | 5.13 | | Cloudy |
| 1150 | 16 | 7° | 7.32 | 5.31 | 236 | Cloudy |

*(Concluded on next page)*

**Well Development Log (Concluded)**
**Well No.: 026-001MW**
**Duluth ANGB**

Ending Water Level: 18.4 (BTOC) and Rising.

Comment: Stainless-steel submersible pumps dry in a matter of seconds on lowest setting. We pump, grab samples for peramiters, and allow to recharge. Reached two-hour limit.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (μS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1153 | 17 | 7° | 7.36 | 5.56 | 680 | Cloudy |
| 1330 | 18 | 7° | 7.83 | 5.33 | 694 | Cloudy |
| 1333 | 20 | 7° | 7.63 | 4.77 | | Cloudy |
| 1337 | 22 | 7° | 7.51 | 4.60 | 112 | Clearing |
| 1345 | 23 | 7° | 7.63 | 4.64 | 51 | Clearing |
| 1350 | 24 | 7° | 7.48 | 4.71 | 32 | Clearing |
| 1355 | 25 | 7° | 7.46 | 4.69 | 35 | |
| 1400 | 26 | 7° | 7.39 | 4.62 | 38 | |
| 1405 | 27 | 7° | 7.40 | 4.75 | 57 | |
| 1411 | 28 | 7° | 7.42 | 4.66 | 35 | |
| 1416 | 29 | 7° | 7.42 | 4.68 | 25.7 | NTU (x100) |
| 1421 | 30 | 7° | 7.41 | 4.71 | 21.1 | NTU (x100) |
| 1426 | 31 | 7° | 7.41 | 4.73 | 31.9 | NTU (x100) |
| 1431 | 32 | 7° | 7.33 | 4.81 | 32.5 | NTU (x100) |
| 1436 | 33 | 7° | 7.34 | 4.72 | 12.7 | NTU (x100) |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
μS/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Development Log

Installation: Duluth ANGB
Well No.: 026-002MW
Client/Project:
Site: 26
Sample Start: (Date) 10 May 95
(Time): 1506
Sample End: (Date) 10 May 95
(Time): 1710
Developed By: J. Byrd, Gary Wirtz
Background PID Reading: 0.0 ppm
PID Reading: 0.0 ppm
Depth to Water (BTOC): 11.07'
Depth to Bottom of Well (BTOC): (19.4') 21.40'
Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (10.33') (0.1632) = 1.7 gal.

Volume of Water in Well x 3 = 5.1 gal.

Development method: PVC Bailer (1st 15 gals.) (Stainless-steel submersible pump).
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Cloudy, 45° F, Wind 10 mph N.

Comments: Recal Hydac when pH drops below 7. Water level at 1710: 11.21' (BTOC) and rising.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (µS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1516 | 5 | 7° | 7.24 | 3.2 | | Very Cloudy |
| 1520 | 7 | 7° | 7.04 | 2.9 | | Very Cloudy |
| 1523 | 9 | 7° | 6.94 | 2.86 | | Very Cloudy |
| 1538 | 11 | 7° | 6.45 | 2.86 | | Very Cloudy |
| 1541 | 13 | 7° | 6.53 | 2.87 | | Very Cloudy |
| 1545 | 15 | 7° | 6.55 | 2.88 | | Very Cloudy |
| 1553 | 16.7 | 7° | 6.62 | 3.05 | 788,000 | Very Cloudy |
| 1557 | 18.4 | 7° | 6.73 | 3.13 | | Very Cloudy |
| 1601 | 20.1 | 7° | 6.65 | 2.99 | | Very Cloudy |
| 1604 | 21.8 | 7° | 6.65 | 2.98 | | Very Cloudy |
| 1609 | 23.5 | 7° | 6.80 | 3.16 | | Clearing |

*(Concluded on next page)*

## Well Development Log (Concluded)
## Well No.: 026-002MW
## Duluth ANGB

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (μS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1613 | 25.2 | 7° | 6.74 | 3.09 | 679,000 | Clearing |
| 1617 | 26.9 | 7° | 6.68 | 3.18 | 445,000 | Clearing |
| 1621 | 28.6 | 7° | 6.68 | 3.09 | 356,000 | |
| 1625 | 30.3 | 7° | 6.63 | 3.14 | 293,000 | |
| 1629 | 32.0 | 7° | 6.66 | 3.22 | 249,000 | |
| 1633 | 33.7 | 7° | 6.68 | 3.17 | 260,000 | |
| 1637 | 35.4 | 7° | 6.63 | 3.02 | 400,000 | |
| 1641 | 37.1 | 7° | 6.60 | 3.11 | 278,000 | |
| 1645 | 38.8 | 7° | 6.65 | 3.07 | 248,000 | |
| 1649 | 40.5 | 7° | 6.67 | 3.04 | 649,000 | |
| 1653 | 42.2 | 7° | 6.67 | 3.07 | 380,000 | |
| 1657 | 43.9 | 7° | 6.68 | 3.05 | 275,000 | |
| 1701 | 45.6 | 7° | 6.67 | 4.39 | 208,000 | |
| 1705 | 47.3 | 7° | 6.62 | 3.07 | 232,000 | |
| 1709 | 49.0 | 7° | 6.63 | 3.05 | 229,000 | |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
μS/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Development Log

Installation: Duluth ANGB
Well No.: 026-003MW
Client/Project:
Site: 26
Sample Start: (Date) 12 May 95
(Time): 0728
Sample End: (Date) 12 May 95
(Time): 0938
Developed By: J. Byrd, Gary Wirtz
Background PID Reading: 0.0 ppm
PID Reading: 0.0 ppm
Depth to Water (BTOC): 8.29'
Depth to Bottom of Well (BTOC): (15.5') 16.15'
Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (7.86') (0.1632) = 1.3 gal.

Volume of Water in Well x 3 = 3.9 gal.

Development method: PVC Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, High in the 70s, Breeze 10-15 mph 5.

Comments: Bails dry (almost) 5-6 bailers.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 0754 | 5 | 7° | 7.49 | 4.30 | | Cloudy |
| 0816 | 7.5 | 7° | 7.05 | 3.94 | | Clearing |
| 0829 | 10 | 7° | 6.84 | 3.83 | 699,000 | |
| 0844 | 12.0 | 7° | 6.39 | 3.99 | 201,000 | |
| 0850 | 13.0 | 7° | 6.56 | 3.68 | 85,000 | |
| 0856 | 14.0 | 7° | 6.48 | 3.88 | 112,000 | |
| 0902 | 15.0 | 7° | 6.48 | 3.69 | 110,000 | |
| 0908 | 16.0 | 7° | 6.46 | 3.64 | 184,000 | |
| 0914 | 17.0 | 7° | 6.42 | 3.70 | 61,000 | |
| 0920 | 18.0 | 7° | 6.47 | 3.71 | 199,000 | |
| 0926 | 19.0 | 7° | 6.48 | 3.71 | 109,000 | |
| 0934 | 20.0 | 7° | 6.49 | 3.71 | 119,000 | |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
$\mu$S/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Purging Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 19 May 95
Sample End: (Date) 19 May 95
Developed By: Byrd, Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 21.74'

Well No.: 025-001MW
Site: 25
(Time): 1315
(Time): 1420

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): 39.28'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (17.54') (0.1632) = 2.9 gal.

Volume of Water in Well x 3 = 8.6 gal.

Development method: Teflon™ Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, 70s.

Comments:

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1353 | 9 | 9° | 7.60 | 9.39 | | Cloudy |
| 1400 | 12 | 9° | 7.68 | 8.13 | | Cloudy |
| 1409 | 15 | 9° | 7.73 | 8.08 | | Cloudy |
| 1417 | 18 | 9° | 7.74 | 8.02 | | Cloudy |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
$\mu$S/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Purging Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Developed By: Byrd, Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 7.32'

Well No.: 025-002MW
Site: 25
(Time): 1530
(Time): 1628

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): 18.80'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (11.48') (0.1632) = 1.9 gal.

Volume of Water in Well x 3 = 5.6 gal.

Development method: Teflon™ Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, 60s.

Comments:

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (μS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1549 | 6 | 7° | 6.80 | 12.12 | | |
| 1602 | 8 | 7° | 7.22 | 11.57 | | Slow Recharge |
| 1613 | 10 | 7° | 7.25 | 11.54 | | |
| 1626 | 12 | 7° | 7.21 | 11.45 | | |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
μS/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Purging Log

Installation: Duluth ANGB
Well No.: 025-003MW
Client/Project:
Site: 25
Sample Start: (Date) 19 May 95
(Time): 1554
Sample End: (Date) 19 May 95
(Time): 1637
Developed By: Byrd, Greenway
Background PID Reading: 0.0 ppm
PID Reading: 17.0 ppm
Depth to Water (BTOC): 10.05'
Depth to Bottom of Well (BTOC): 22.35'
Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (12.30') (0.1632) = 2.0 gal.

Volume of Water in Well x 3 = 6.0 gal.

Development method: Teflon™ Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, 70s.

Comments:

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1612 | 6 | 6° | 6.65 | 16.17 | | Cloudy |
| 1618 | 8 | 6° | 6.64 | 14.12 | | Cloudy |
| 1628 | 10 | 6° | 6.67 | 14.07 | | Cloudy |
| 1634 | 12 | 6° | 6.61 | 14.13 | | Clearing |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
$\mu$S/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Purging Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Developed By: Byrd, Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 17.05'

Well No.: 026-001MW
Site: 26
(Time): 0840
(Time): 0932

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): 25.28'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (8.23') (0.1632) = 1.3 gal.

Volume of Water in Well x 3 = 4.0 gal.

Development method: Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, 50s, Breezy.

Comments: Depth at end: 17.2' (BTOC) and rising.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 0856 | 4 | 7° | 7.21 | 5.18 | | Cloudy |
| 0859 | 5 | 7° | 7.25 | 4.72 | | Cloudy |
| 0902 | 6 | 7° | 7.28 | 4.83 | | Cloudy |
| 0906 | 7 | 7° | 7.28 | 4.93 | | Cloudy |
| 0910 | 8 | 7° | 7.34 | 4.89 | | Cloudy |
| 0914 | 9 | 7° | 8.09 | 5.21 | | Cloudy |
| 0918 | 10 | 7° | 7.65 | 4.75 | | Cloudy |
| 0921 | 11 | 7° | 7.49 | 4.74 | | Cloudy |
| 0923 | 12 | 7° | 7.45 | 4.71 | | Cloudy |
| 0927 | 13 | 7° | 7.41 | 4.85 | | Cloudy |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
$\mu$S/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Purging Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Developed By: Byrd, Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 9.74'

Well No.: 026-002MW
Site: 26
(Time): 1044
(Time): 1125

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): 21.44'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (11.7') (0.1632) = 1.9 gal.

Volume of Water in Well x 3 = 5.7 gal.

Development method: Teflon™ Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, 50s, Breezy.

Comments: Depth at end: 9.72' (BTOC).

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity (μS/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1101 | 6 | 6° | 7.40 | 3.04 | | Cloudy |
| 1109 | 8 | 6° | 7.27 | 2.62 | | Cloudy |
| 1113 | 10 | 6° | 7.17 | 2.61 | | Cloudy |
| 1119 | 12 | 6° | 7.16 | 2.58 | | Cloudy |
| 1123 | 14 | 6° | 7.13 | 2.60 | | Cloudy |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
μS/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Purging Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Developed By: Byrd, Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 7.20'

Well No.: 026-003MW
Site: 26
(Time): 1220
(Time): 1309

PID Reading: 0.0 ppm
Depth to Bottom of Well (BTOC): 17.94'

Volume of Water in Well (gallons) = (0/0408) x (well diameter (feet)$^2$ x height of water column (feet) (10.74') (0.1632) = 1.8 gal.

Volume of Water in Well x 3 = 5.3 gal.

Development method: Teflon™ Bailer.
Development Water Containment: Plastic-lined, 55-gal. steel drum.
Average Rate of Removal of Water:
Weather: Sunny, 60s, Breezy.

Comments: Recharging slower than others.

| Time | Amount of Water Removed (gallons) | Temperature (° C) | pH | Conductivity ($\mu$S/cm) | Clarity (NTU) | Remarks |
|---|---|---|---|---|---|---|
| 1234 | 5 | 6° | 6.97 | 7.18 | | Clear |
| 1239 | 7 | 6° | 6.96 | 3.93 | | Clear |
| 1244 | 9 | 6° | 6.97 | 3.76 | | Clear |
| 1251 | 11 | 6° | 6.97 | 3.89 | | Clear |
| 1304 | 13 | 6° | 6.95 | 3.82 | | Clear |

° C – Degrees Centigrade.
NTU – Nephelometer Turbidity Units.
$\mu$S/cm – microSiemens per centimeter.
pH – [p(otential) of H(ydrogen)].

## Well Sampling Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 19 May 95
Sample End: (Date) 19 May 95
Sampled By: J. Byrd, D. Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 22.05'
Screen Interval:
Sampling Method: Teflon™ Bailer
Sampling Equipment Decontamination method: Liqui-Nox, Potable water rinse, DI Water Rinse.

Well No.: 025-001MW
Site: 25
(Time): 1503
(Time):

PID Reading: 0.0 ppm

**Lab Analyses:**

VOCs – SW8010/8020
Metals – SW7421, SW6010, SW7196, SW7470
SVOCs – SW8270

**QA/QC Samples:**

**Weather:** Sunny, 70s

**Comments:**

## Well Sampling Log

Installation: Duluth ANGB
Well No.: 025-002MW
Client/Project:
Site: 25
Sample Start: (Date) 18 May 95
(Time): 1654
Sample End: (Date) 18 May 95
(Time): 1705
Sampled By: J. Byrd, D. Greenway
Background PID Reading: 0.0 ppm
PID Reading: 0.0 ppm
Depth to Water (BTOC): 7.39'
Screen Interval:
Sampling Method: Teflon™ Bailer
Sampling Equipment Decontamination method: Liqui-Nox, Potable water rinse, DI Water Rinse.

**Lab Analyses:**

VOCs – SW8260
SVOCs – SW8270
Metals – SW7421, SW6010, SW7196, SW7470

**QA/QC Samples:**

**Weather:** Sunny, 60s, Breezy.

**Comments:**

## Well Sampling Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 19 May 95
Sample End: (Date) 19 May 95
Sampled By: J. Byrd, D. Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 14.01'
Screen Interval:
Sampling Method: Teflon™ Bailer
Sampling Equipment Decontamination method:

Well No.: 025-003MW
Site: 25
(Time): 1706
(Time): 1720

PID Reading: 8.0 ppm

**Lab Analyses:**

SVOCs – SW8270
VOCs – SW8010, SW8020
Metals – SW7421, SW6010, SW7196, SW7470

**QA/QC Samples:**

025-003RB @ 1532
025-003AMW @ 1715

**Weather:**

**Comments:**

## Well Sampling Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Sampled By: J. Byrd, D. Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 17.2'
Screen Interval:
Sampling Method: Teflon™ Bailer

Well No.: 026-001MW
Site: 26
(Time): 1012
(Time): 1020

PID Reading: 0.0 ppm

Sampling Equipment Decontamination method: Liqui-Nox, Rinse with Potable Water, Rinse with DI Water.

**Lab Analyses:**

SVOCs – SW8270
VOCs – SW8260

**QA/QC Samples:**

SI – 001FB

**Weather:** Sunny, Breezy, 50s.

**Comments:**

## Well Sampling Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Sampled By: J. Byrd, D. Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC): 9.74'
Screen Interval:
Sampling Method: Teflon™ Bailer

Well No.: 026-002MW
Site: 26
(Time): 1125
(Time): 1144

PID Reading: 0.0 ppm

Sampling Equipment Decontamination method: Liqui-Nox, Rinse with Potable Water, Rinse with DI Water.

**Lab Analyses:**

VOCs – SW8260
SVOCs – SW8270

**QA/QC Samples:**

None

**Weather:** Sunny, Breezy, 80s

**Comments:**

## Well Sampling Log

Installation: Duluth ANGB
Client/Project:
Sample Start: (Date) 18 May 95
Sample End: (Date) 18 May 95
Sampled By: J. Byrd, D. Greenway
Background PID Reading: 0.0 ppm
Depth to Water (BTOC):
Screen Interval:
Sampling Method: Teflon™ Bailer

Well No.: 026-003MW
Site: 26
(Time): 1333
(Time): 1355

PID Reading: 0.0 ppm

Sampling Equipment Decontamination method: Liqui-Nox, Potable water rinse, DI water rinse.

**Lab Analyses:**

VOCs – SW8260
SVOCs – SW8270

**QA/QC Samples:**

026-003RB – taken at 1212
026-003AMW – 6W01

**Weather:**

**Comments:**

# APPENDIX E

# AQUIFER SLUG TEST DATA ANALYSIS

## E.1 INTRODUCTION

Six aquifer slug tests on six monitor wells were performed to investigate the hydraulic properties of the unconsolidated glacial till. A detailed description of the data collection and analysis is presented in the following sections.

The slug test method is used to obtain data necessary to calculate the hydraulic conductivity of the subsurface material around the screened portion of a well. The technique is based on measurements of the water level as a function of time after withdrawing a slug of known volume from the monitor well. Both rising-head and falling-head test methods were run on each well. However, only rising-head test data is used to evaluate and interpret the hydraulic properties of the aquifer at both IRP sites.

## E.2 AQUIFER SLUG TEST PROCEDURE

The equipment used for slug testing included a Hermit Environmental Data Logger model 1000C manufactured by *In Situ*, Inc., of Laramie, Wyoming. Also used was a pressure transducer model PTX-161, manufactured by *In Situ*, Inc. An acrylic slug that was 1.25 inches in diameter and 4 feet in length was used to produce the initial water displacement.

Prior to testing, the well was developed and the water level allowed to stabilize. The slug was decontaminated using standard procedures prior to performing the slug test.

Immediately upon opening, the headspace of the well to be slug tested was tested for volatile organic vapors and lower explosive limit and oxygen percentages using a photoionization detector and explosimeter respectively. Next, the initial water level was measured and recorded in the field logbook and the pressure transducer was placed in the well and allowed to equilibrate. The proper operating parameters such as time, date, test number, sample rate, number of inputs, data type, and scale factor and offset values of the transducer were inserted to properly program the data logger for the slug test. The decontaminated slug was rapidly lowered into the well in such a manner as to minimize turbulence and splashing. The injection of the slug created a nearly instantaneous rise in the water level or hydraulic head as well as some transient oscillations (minimized by the smooth slug injection). After the initial rise, the water level of the well dropped as it returned to equilibrium. The water level altitudes were recorded by the data logger.

After equilibrium was attained, the slug was rapidly and smoothly removed from the well and the subsequent rise of the water level in the well versus the time since the start of the test was also recorded by the data logger.

After the slug test was completed, the data was downloaded onto a computer and printed out by a portable printer.

## E.3 SLUG TEST DATA ANALYSIS METHODS

The method used for analysis of the slug test data depends on the setting of the monitor well being tested. For monitor wells in unconfined conditions, the Bouwer and Rice (1976) method is the appropriate method to use for reduction of the slug test data to determine values of hydraulic conductivity. The Bouwer and Rice method can also be used for semi-confined and confined conditions (Bouwer, 1989). Because of the heterogeneous nature of the lenticular stratigraphy and discontinuous layers of intermixed clays, silts, sands, and gravel which are representative of glacial stratigraphy, some uncertainty exists whether the hydrologic unit is defined as an unconfined, semi-confined, or confined aquifer.

The data plots and data reduction for both methods discussed in the previous paragraph were accomplished using the AQTESOLV software package Version 2.0 developed by Geraghty & Miller (1994).

The slug test data analyses using Bouwer and Rice (1976) method is presented in this section. The slug test results are presented in Section E.4.

The method described by Bouwer and Rice (1976) is used to calculate the hydraulic conductivity of an aquifer or hydrologic unit in the vicinity of a well screen from the rate of rise or fall of the water level or hydraulic head in the well after a known volume or "slug" is suddenly injected or withdrawn. This particular method is based on the following assumptions: (1) drawdown of the water table around the well is negligible, (2) flow above the water table (in the capillary fringe) can be ignored, (3) head losses as water enters the well (well losses) are negligible, and (4) the aquifer is homogeneous and isotropic.

The rate of flow of groundwater into a well after the water level has been lowered a distance, y, below the static water table around the well is calculated using the Thiem equation (Equation 1).

$$Q = 2\pi KL \frac{y}{\ln(R_e/r_w)}, \text{ where} \quad (1)$$

Where:

| | | |
|---|---|---|
| Q | = | rate of flow into the well; |
| $\pi$ | = | 3.14159, the ratio of the circumference to the diameter of a circle. |
| K | = | hydraulic conductivity of the hydrologic unit in the vicinity of the well screen; |
| L | = | length of screened interval; |
| y | = | vertical difference between water level inside the well and the static water level outside the well; |
| $R_e$ | = | effective radial distance over which y is dissipated; and |
| $r_w$ | = | radial distance to the undisturbed portion of the hydrologic unit from the centerline of the well. |

The value of $r_w$ is the radius of the screened section of the well plus the thickness of the sand pack and the developed zone around the well. Because the take only the thickness of the sand pack into account (Bouwer, 1989).

The rate of rise of the water level (dy/dt) in the well after the water level has been quickly lowered can be regarded as:

$$\frac{dy}{dt} = \frac{-Q}{\pi r_c 2} \quad (2)$$

| | | |
|---|---|---|
| dy/dt | = | rate of rise of the water level within the well; |
| Q | = | volume rate of flow into well; |
| $\pi$ | = | 3.14159, the ratio of the circumference to the diameter of a circle; and |
| $r_c$ | = | radius of the casing. |

If the water level rises in the screened section of the well with a sand pack around it, then the thickness and porosity of the sand pack should be taken into account when calculating the equivalent value of $r_c$ for the rising water level. The equivalent value of $r_c$ is then calculated using Equation (3) if the water level is within the screened interval of the well.

$$r_c = [(1 - n)r_c^2]^{1/2}, \text{ where} \quad (3)$$

$n$ = porosity of the sand pack;
$r_c$ = radius of the casing;
$r_w$ = radius distance to the undisturbed portion of the aquifer from the centerline of the well.

By solving Equation (2) for Q, and using it in Equation (1), it is possible to integrate, and solve for hydraulic conductivity, K, in Equation (4).

$$K = r_c^2 \ln\frac{(R_e/r_w)}{2L} \frac{1}{t} \ln \frac{y_o}{y_t}, \text{ where} \quad (4)$$

$K$ = Hydraulic conductivity;
$r_c$ = radius of casing;
$R_e$ = effective radial distance over which y is dissipated;
$r_w$ = radial distance to the undisturbed portion of the aquifer from the centerline of the well;
$y_o$ = y at time zero; and
$y_t$ = y at time t.

This equation was used to calculate hydraulic conductivity of the sediments of Site 10.

Values of $R_e$, effective radius, for various system geometries are expressed in terms of the dimensionless ratio $\ln(R_e/r_w)$ and were determined empirically with an electrical resistance network analog for different values of $r_w$, L, length of water column in the well, H, and hydrologic unit thickness, b, (Bouwer and Rice, 1976). The data are used in one of two equations: Equation (5) is used when H is less than b, and Equation (6) when H is equal to b. These equations are:

$$\ln \frac{R_e}{r_w} = \left[\frac{1.1}{\ln(H/r_w)} + \frac{A + B\ln[(b - H)/r_w]}{L/r_w}\right]^{-1}, \text{ and} \quad (5)$$

$$\ln \frac{R_e}{r_w} = \left[ \frac{1.1}{\ln(H/r_w)} + \frac{C}{L/r_w} \right]^{-1}, \textit{ where} \qquad (6)$$

A, B, and C = dimensionless values as a function of $L/r_w$;

$R_e$ = Effective radial distance over which y is dissipated;

$r_w$ = Radial distance to the undisturbed portion of the aquifer from the center line of the well;

H = length of water column in the well;

b = hydrologic unit thickness; and

L = length of screened interval.

Because y and t are the only variables in Equation (4), a plot of ln $y_t$ versus t semilogarithmic paper may be used to determine $[\ln(y_o/y_t)]/t$. The straight line through the data points can also be used to select two values of y, namely $y_o$ and $y_t$, along the time interval t for substitution into Equation (4). Because drawdown of the groundwater table around the well increases exponentially and time increases linearly as the test progresses, the points begin to deviate from the straight line for large t and small y. Thus, only the linear portion of the curve should be used to evaluate $[\ln(y_o/y_t)]/t$ for the calculation of K using Equation (4) (Bouwer, 1989).

## E.4 SLUG TEST RESULTS

The graphs illustrating the plotted displacement values versus time are presented in this section. The computed hydraulic conductivity values for the monitor wells at IRP Sites No. 25 and No. 26 are presented in Table E.1.

## Table E.1
## Slug Test Results, IRP Sites No. 25 and No. 26
## 148th FW, Duluth ANGB, Duluth, Minnesota

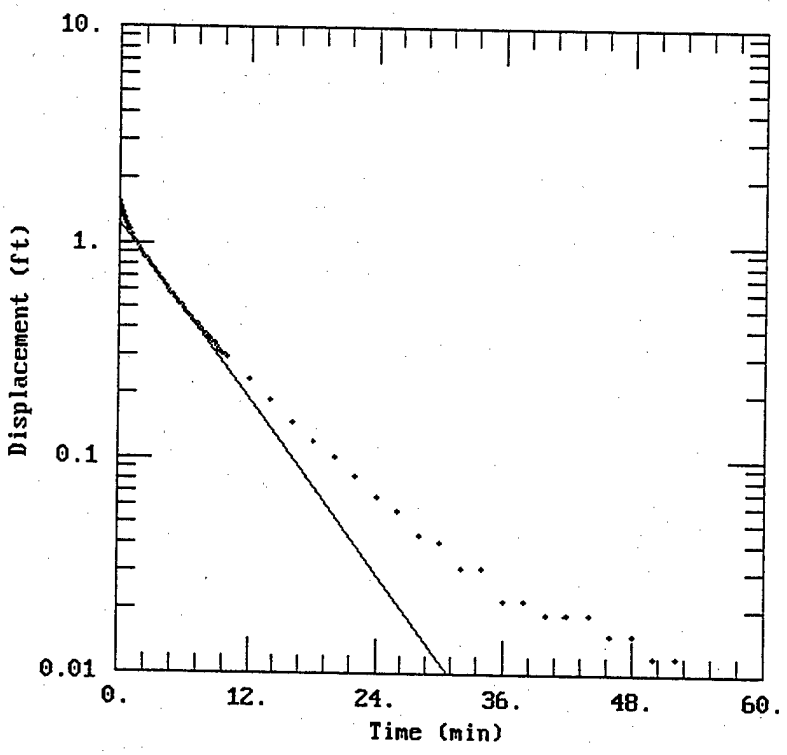
| Monitor Well | Hydraulic Conductivity (ft/min) | Hydraulic Conductivity ($gpd/ft^2$) |
|---|---|---|
| **IRP Site No. 25** | | |
| 025-001MW | $9.946 \times 10^{-4}$ | 10.9 |
| 025-002MW | $8.604 \times 10^{-4}$ | 9.26 |
| 025-003MW | $3.043 \times 10^{-4}$ | 3.28 |
| **IRP Site No. 26** | | |
| 026-001MW | $9.481 \times 10^{-3}$ | 102 |
| 026-002MW | $2.926 \times 10^{-2}$ | 315 |
| 026-003MW | $1.442 \times 10^{-3}$ | 15.5 |

ft/min – feet per minute.

$gpd/ft^2$ – gallons per day per square foot.

| | |
|---|---|
| CLIENT: HQ ANG/CEVR | COMPANY: OpTech |
| LOCATION: Duluth ANGB - Site 25 | PROJECT: 1315-197 |

# 025-001MW




DATA SET:
25-001MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

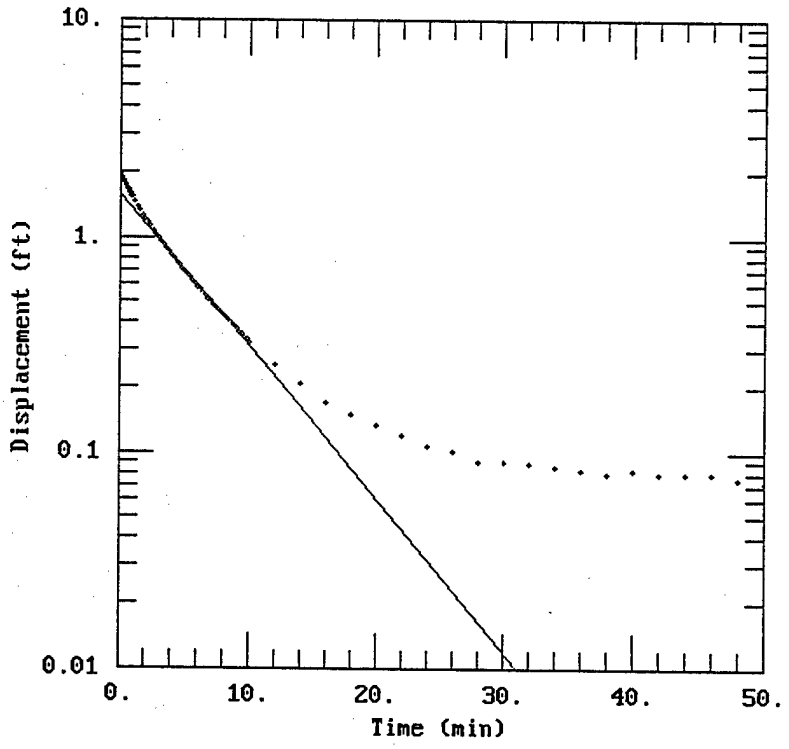
TEST DATA:
H0= 1.531 ft
$r_c$= 0.0833 ft
$r_w$= 0.375 ft
L = 10. ft
b = 17. ft
H = 16.76 ft

PARAMETER ESTIMATES:
K = 0.0009946 ft/min
y0 = 1.246 ft

AQTESOLV

| CLIENT: HQ ANG/CEVR | COMPANY: OpTech |
|---|---|
| LOCATION: Duluth ANGB - Site 25 | PROJECT: 1315-197 |

# 025-002MW




DATA SET:
25-002MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

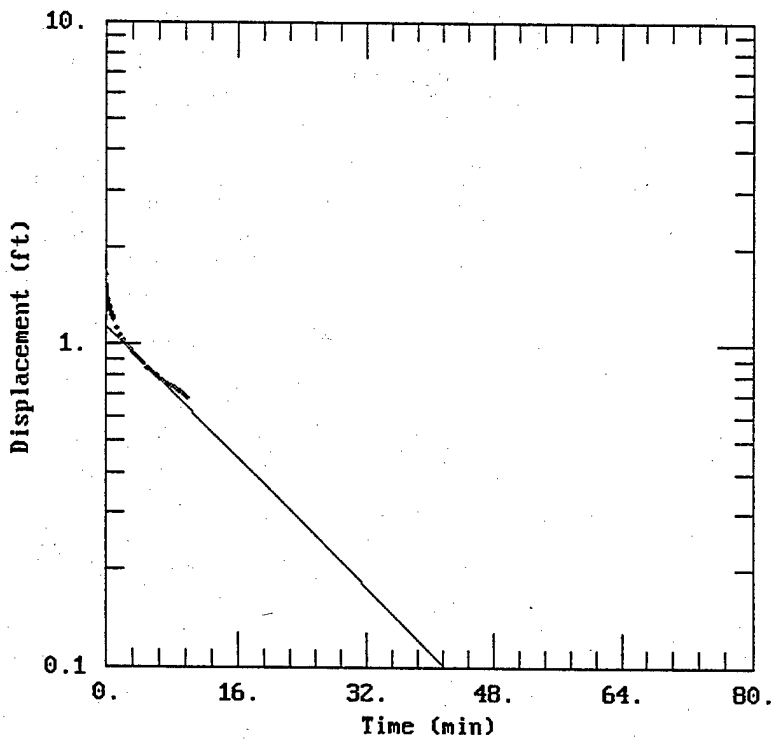
TEST DATA:
H0= 1.986 ft
$r_c$= 0.083 ft
$r_w$= 0.375 ft
L = 10. ft
b = 12. ft
H = 10.1 ft

PARAMETER ESTIMATES:
K = 0.0008604 ft/min
y0 = 1.559 ft

AQTESOL

| CLIENT: HQ ANG/CEVR | COMPANY: OpTech |
|---|---|
| LOCATION: Duluth ANGB - Site 25 | PROJECT: 1315-197 |

# 025-003MW




DATA SET:
25-003MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

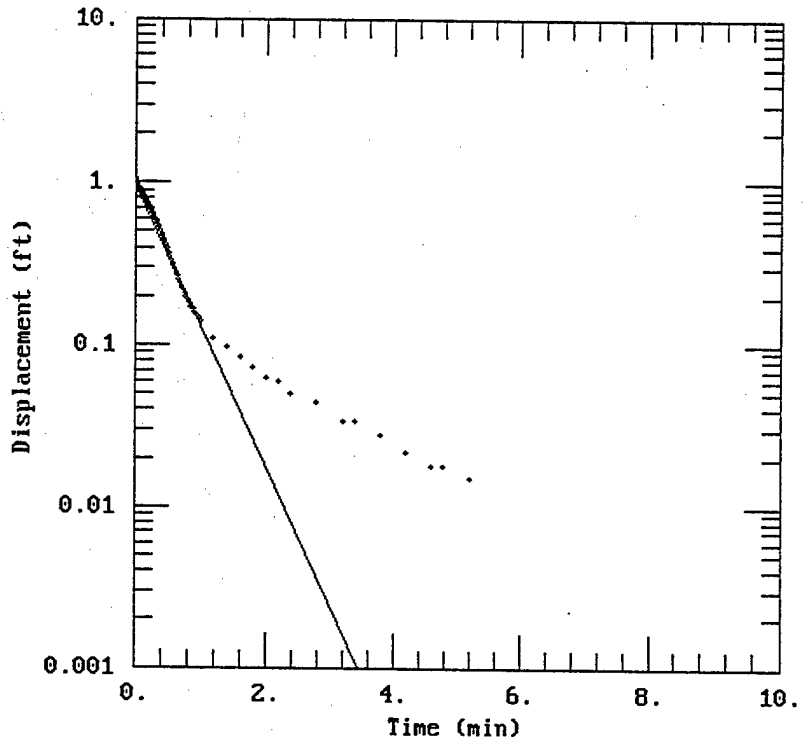
TEST DATA:
H0= 1.627 ft
$r_c$= 0.083 ft
$r_w$= 0.375 ft
L = 10. ft
b = 15. ft
H = 11.1 ft

PARAMETER ESTIMATES:
K = 0.0003043 ft/min
y0 = 1.126 ft

AQTESOLV

| CLIENT: HQ ANG/CEVR | COMPANY: OpTech |
|---|---|
| LOCATION: Duluth ANGB - Site 26 | PROJECT: 1315-197 |

# 026-001MW




DATA SET:
26-001MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

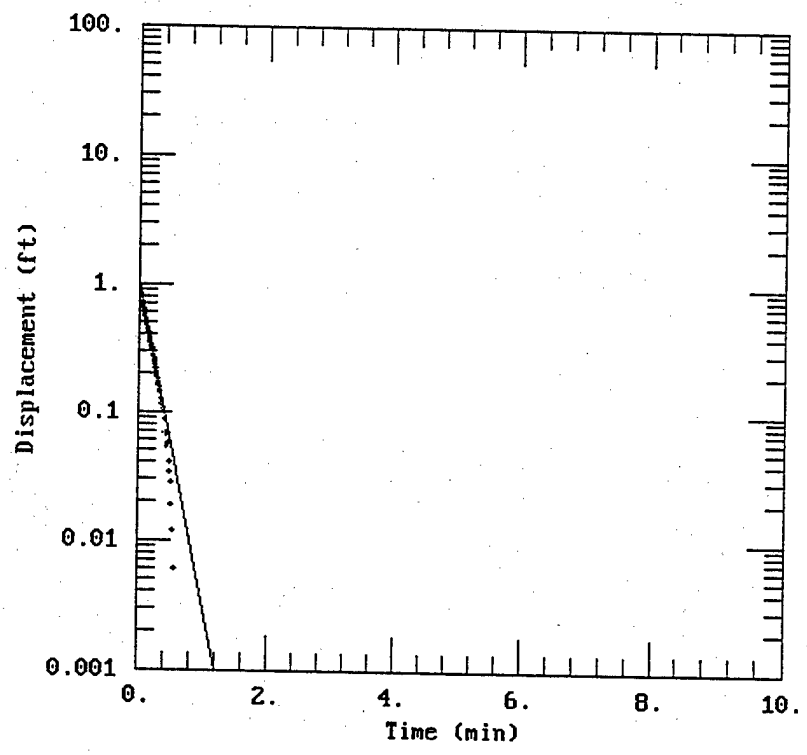
TEST DATA:
H0= 1.05 ft
$r_c$= 0.083 ft
$r_w$= 0.375 ft
L = 10. ft
b = 18. ft
H = 8.25 ft

PARAMETER ESTIMATES:
K = 0.009481 ft/min
y0 = 0.9395 ft

AQTESOL

| | |
|---|---|
| CLIENT: HQ ANG/CEVR | COMPANY: OpTech |
| LOCATION: Duluth ANGB - Site 26 | PROJECT: 1315-197 |

# 026-002MW




DATA SET:
26-002MW.DAT
08/18/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

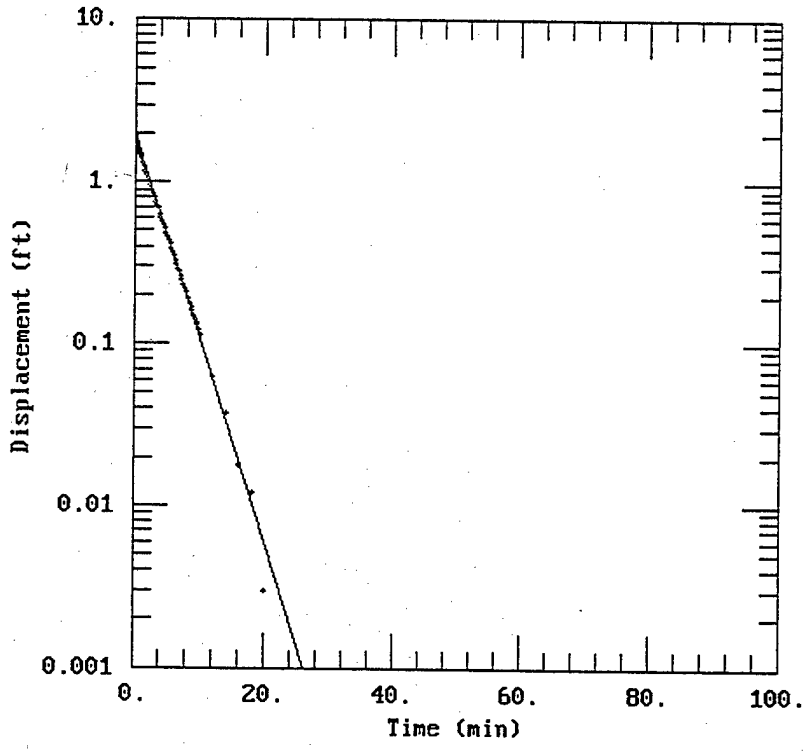
TEST DATA:
H0= 0.998 ft
$r_c$= 0.083 ft
$r_w$= 0.375 ft
L = 10. ft
b = 29. ft
H = 11.9 ft

PARAMETER ESTIMATES:
K = 0.02926 ft/min
y0 = 1.006 ft

AQTESOLV

| | |
|---|---|
| CLIENT: HQ ANG/CEVR | COMPANY: OpTech |
| LOCATION: Duluth ANGB - Site 26 | PROJECT: 1315-197 |

# 026-003MW




DATA SET:
26-003MW.DAT
08/17/95

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

TEST DATA:
H0= 1.947 ft
$r_c$= 0.083 ft
$r_w$= 0.375 ft
L = 10. ft
b = 29. ft
H = 10.6 ft

PARAMETER ESTIMATES:
K = 0.001442 ft/min
y0 = 1.902 ft

AQTESOLV

# APPENDIX F

# FIELD LOG BOOK DATA

## INTRODUCTION

Field logbooks were maintained by Operational Technologies Corporation (OpTech) personnel for documentation of the field activities for the Site Investigation at Duluth Air National Guard Base, Duluth, Minnesota. The field work was conducted between 1 May 1995 and 20 May 1995.

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Kathryn Pritchett

Duluth SJ
1315-197

CONTENTS

| PAGE | REFERENCE | DATE |
|---|---|---|

Monday 4/5 5/1/95 (1)

1245 Arrived to Duluth via Northwest Airlines — Kathryn Fairchild Kathleen Means

1330 Arrived at Duluth AVCS Headquarters to return Keys in Bldg 247. Per Capt Steve Gabrielson, he was going to have the Keys on his desk — he will be flying on Monday 1 May 1995. Keys were not his desk.

1345 Arrived at Base Civil Engineer Bldg to meet Bruce Berg. He informed me that all utilities that required outside assistance have been cleared, all base utilities will be cleared tomorrow. Site 1 will be staked tomorrow AM to security clearance agent

Kathryn Fairchild

(2) 5/1/95

1430 Arrived at Base Security. Talked to Capt. Kovach about schedule at Site 26.

1440 Joe Byrd, Jr. and Destiny Greenway arrived at Duluth ANGB.

1445 - 1620 Staked soil boring and monitor well locations

1630 left Duluth ANGB.

Kathy Pritchett

Tuesday 5/2/95 (3)

715 Depart hotel

730 Breakfast and morning meeting

830 Arrived at Duluth ANGB
Kathleen Marino
Joe Byrd, Jr.
Destiny Greenway
Kathryn Pritchett

840 Stopped by Base Civil Engineer - Bruce Berg in a meeting until 1015.

850 • Arrived at headquarter to meet Capt Steve Wabnitz to obtained key for Bldg. 247
• Phone calls to Op Tech office to acquire Airbill # for box sent out Friday from office. The box (Logs + forms, etc.) did not arrive at the hotel.
• Box did not leave the office until ~ noon yesterday.

Kathryn Pritchett

(4)

5/2/95

Airbill # 5344094103
· Call Fedex – should deliver at 900 today

9/0 · Staked Site 21
021-026BH
021-027BH
021-028BH
· marked stakes for Sites 26 & 17

1010 Arrived at Site 26
OpTech — Joe Sigel, Jr.
Kathleen Merino
Destiny Greenway
Kathryn Pittsley

Buze — Bruce Berg

1110 · Finished staking – 4/ Site 26
· Put up supplies.

1135 Lunch

1230 Returned to Duluth
ANG 13
Called American Engineering Testing (Dillers)
Left message

Kathryn Pittsley

5/2/95 (5)

1300–1330 Called Beth Leary (MPCA) to discuss the following:
· the criteria for TPH for Sites 17 & 21 is 100 ppm.
· she will check with Luke (GA/DC) about the Wisconsin GRO/DRO method for TPH.

1330–1430 walked over Sites 17 & 21 with Bruce Berg

1430 Called ~~Mark~~ Kp Mark Escabar (OpTech) to confirm that the contract for the geotechnical lab is in place and the contact person is Joe Pabo (218) 741-4290

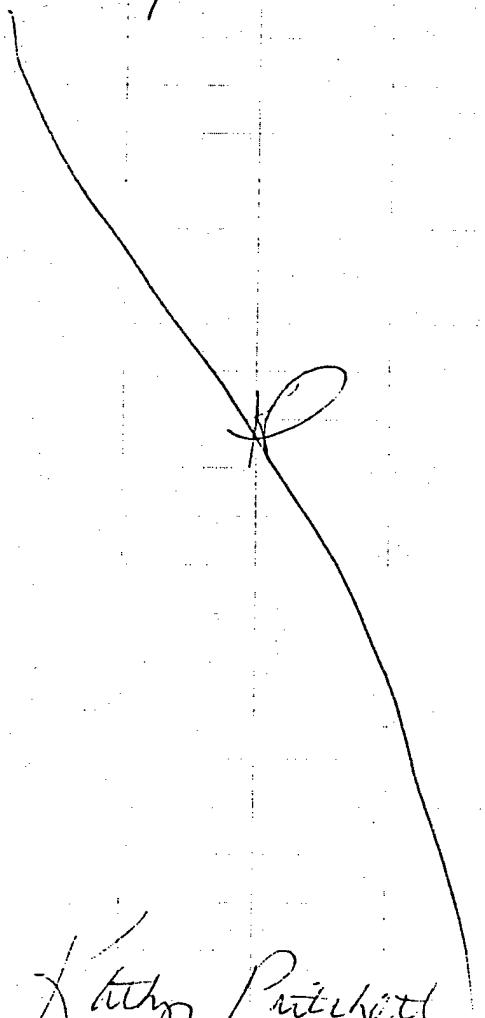
1445 Called Dillers to confirm meeting at the Buze by 730.

1525 Kathleen Merino & Kathryn arrived at Site 17 to stake borehole locations

Kathryn Pittsley

(6) 5/2/95

1625 Left Site 17
1640 Arrived at Duluth ANGB.
1700 Left Duluth ANGB.



Kathy Pritchett

Wednesday 5/3/95 (7)

645 Arrived at Duluth ANGB
Kathleen marine
Destiny Greenway
Joe Syrd, Jr.
Kathryn Pritchett
Weather: Cloudy, Temp: 60s
40s - 50s
700 Check with Bruce Berg (Base Civil Engineer) about Clearance for Site 26
→ all clear except 026-001/mw needs to be moved due to utilities.
705 Called Duluth Airport Authority talked to Rudy Wittann: inform them of our ~~project~~ project at Site 26 — we should be drilling at Site 26 from 3 May - 5 May 1995.
719 Calibrated PID's:
Determinator
49961-222
49962-222
Kathy Pritchett

(6) 5/3/95

Isobutylene 100 ppm
Lot # Y08302-41250 3-Y6
Environmental Instruments Co.
Explorometer II - Industrial
Scientific mX251
910/059-002

800 American Engineering Testing
Jamie Tuma
Gary Mantay
Jonathan Gabrielle.
arrived on site

830 Duties setting up
to decontaminate
drilling and augers
on side south of
Bldg 246.
~~Kathleen~~ Kathleen
Merino will document
decontamination procedures
of drill rig and augers

900-930 Arrived at Headquarters
to talked to Capt.
watanuty about drums.
The 24 drums that were
available are being used.
~ 12 drums are available

Kathy Pritchett near Bldg 244.

5/3/95 (7)

955 Drillers finished
decontaminating drill
rig and augers.
Lunch

1045-1125 Lunch

1200 Arrived at Site 26

1215-1225 Health & Safety
Meeting
Jamie Tuma
Gary Mantay
Jonathan Gabriel
Kathleen Merino
Danny Greenway
Joe Byrd Jr.
Kathy Pritchett

1240 Started 026-006 BH1

1250 Collected 0.5-2.5'

1255 Encountered boulder
at 3.5' BLS - moved 1.5' South

BG PID → 0 LEL 20.8 % O2
0 ppm

1252 Borehole 0 LEL 20.9 % O2
0 ppm

1300 Collected 5-7' interval
0 ppm

Kathy Pritchett

(10)

5/3/95

Backhole ~~LEL~~ 0 LEL
20.8% O2
0 ppm
Poor Recovery on 8-10'
1319 Collected 10-12' Interval
0 LEL 20.8% O2
0 ppm
Photo facing East Kathleen moving collecting a soil sample at 11.5-12' Interval
1326 Moving Drill rig to 026-005BH
1342 Started 026-005BH
1344 Collected 0.5-2.5'
Backhole 0 LEL 20.8% O2
0 ppm
Photo Collecting 0.5-2.5' Interval
1350 Collected 5-7' Interval
0 LEL 20.8% O2
0 ppm
1355 Collected 8-10' Interval
0 ppm

Kathryn Pritchett

(11)

5/3/95

1415 Move to 026-004BH
Started 026-004BH
1430 Collected 0.5-2.5'
0 LEL 20.8% O2
0 ppm
1438 Collected 5-7'
1448 Collected 8-10'
0 LEL 20.8% O2
0 ppm
1510 Moved to 026-001BH
1518 Collected 0.5-2.5'
0 LEL 20.8% O2
0 ppm
1525 Collected 5-7'
0 LEL 20.8% O2
0 ppm
0% Recovery on 0.5-2.5' & 5-7'
1530 Collected 8-10'
1538 Collected 0.5-2.5' next to 026-001BH
1542 Collected 5-7'
0 LEL 20.8% O2
0 ppm

Kathryn Pritchett

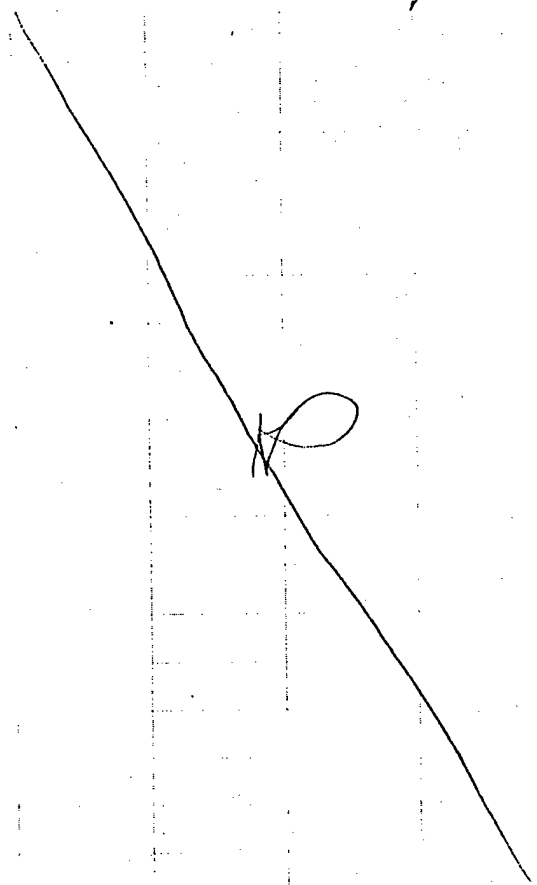
(12)

5/3/95

1615 Drillers depart Site 26

1623 Depart Site 26

1745 ~~Arrive~~ Depart from Federal Express



Kathy Puttkett

Thursday 5/4/95 (13)

Weather: Cloudy, low 40's thunderstorms expected in afternoon.

645 Arrived Duluth ANGB
Joe Byrd, Jr.
Kathleen Marino
Destry Greenway
Kathryn Puttkett

715 Calibrated PID same procedure as stated on pages 7-8 of this field logbook

725 Arrived at headquarters to discuss with Capt. Walkowitz and Paul Wheeler (ANG/CEVR) about TD of soil borings at Site 26. Work Plan states to drill to water table or 10 feet BLS. We drill to 10 feet BLS yesterday without encountering saturated soil (moist soils).

Kathy Puttkett

(14)

5/4/95

We have two soil borings remaining — we will drill ~15' to search for water (believe to be ~12' BLS) on the next soil boring. If we fail to encounter water — then we will start 026-001MW to determine water level.

730 Drillers arrived.

800 Drillers at fire department to fill up 200-gallon water tank

815 Drillers decontaminating the augers. Destry Greenway is documenting the procedures.

~~830~~ 842 Called Base Security to meet us at FOD area.

848 arrived at Site 26

855 Health & Safety Meeting

Kathy Pritchett

5/4/95

(15)

OpTech
- Kathleen Marine
- Joe Byrd, Jr.
- Destry Greenway
- Kathryn Pritchett

American Engineering Testing
- Jamie Tuma
- ~~Gary Montieth~~
- Jonathan Gabriel

914 checked water in boreholes

No water 026-006BH
026-005BH
026-004BH
6.80' BLS 026-001BH

920 Drillers spotted at 026-002BH

922 Started Drilling

930 Collected 0.5-2.5' 5% Recovery

935 Collected 5-7' OLEL 20.5% $O_2$ 0 ppm W.L. 6.70' BLS Only 50% Recovery

Kathy Pritchett

(16)

5/4/95

We will recollect 0.5-2.5' ~~and~~ and 4-6' interval due to poor recovery.

950 Collected 0.5-2.5' poor recovery

955 Collected 4-6' 35%
OLEL 20.8% $O_2$
0 ppm

1005 Collected 0.5-2.5'
OLEL 20.8% $O_2$
0 ppm

~1020 Called Russ Cason (OpTech) about the drillers using Diamond Drilling to cut pad from asphalt — 026-001MW
Russ will check with norma & John morris.

1055 Drillers moved to 026-003 ~~MW~~ BH
Started drilling 11/95

Kathy Pittsett

5/4/95

(17)

1115 Collected 0.5-2.5'
0 ppm
OLEL 20.8% $O_2$
Collected 5-7'
0 ppm
OLEL 20.8% $O_2$

1105 Per Russ Cason, John morris, & Norma Gayle — the drillers can have Diamond Drill for cutting pad area for 026-001MW as long as there is proof of insurance.

1130 stopped Drilling
1200 left Site ~~#~~ 26
1215 left Duluth ~~SP~~ ANGB
1220 — lunch
1315
1318 arrived at Duluth ANGB
1325 contacted Base Security for escort to Site 26
1335 Arrived at Site 26
Destry Greenway
Kathleen Merino
Kathryn Pittsett

Kathy Pittsett

(18) 5/4/95

- Diamond Drill had arrived at 1215 and stayed on Site 26 until 1245.
- Drillers were starting to grout boreholes with 97% Neat Cement 3% Bentonite Powder mixed with potable water a 7 gallons per 100 lb mixture.

1450 Depart Site 26

1435 Re-Collected 0.5 – 2.5 at 026-003BH

1500 Drillers decontaminating drill rig & augers

1515 Collected equipment rinseate blank (split-spoon sampler)

VOC (8240) (3) 40-ml VOA vials HCl

SVOC (8270) (1) SVOC amber 1 L

metals Cr Cd Pb (6010) (1) 1 L poly $HNO_3$

Kathy Pitchett

5/4/95 (19)

1525 Arrived at Site 26
Desty Greenway
Kathleen Marino
Kathy Pitchett
~~Started drilling~~
026 – 001MW

1535 Drillers inform us that they need a part for drilling the borehole for the monitor wells

1545 Drillers depart Site 26

1602 Depart Site 26

1710 Arrived at Fedex

1725 Depart FedEx

Kathy Pitchett

(20) Friday 5/5/95

Weather: cloudy; windy (NW gusty); 40's; wind chill mid 20. to 30's.

645 Arrived at Duluth ANGB
Joe Byrd, Jr.
Destry Greenway
Kathleen Merino
Kathryn Pritchett

700 Calibrated PID
Serial # stated on page 7 of this field logbook.
Isobutylene 100 ppm
Lot # 418809-426301-24
Environmental Instruments

715 Calibrated Industrial Scientific Model MX251 # 910159-002
Hexane 50.0% LEL
Pentane Lot 41780

740 Drillers arrived

800 Arrived at Site 26
American Engineering Testing
Jamie Tuura
Jonathan Gabriel
Kathryn Pritchett

5/5/95 (21)

815 Health & Safety Meeting
Joe Byrd
Kathleen Merino
Destry Greenway
Kathryn Pritchett
American Engineering Testing
Jamie Tuura
Jonathan Gabriel

820 Started Drilling
026-001mcd

823 Collected 0-2'
0 ppm

Borehole 0 LEL 20.7% O2
0 ppm

BG 0 LEL 20.7% O2
0 ppm

825 Collected 5-7'
0 ppm

840 Collected 10-12'
0 ppm
0 LEL 20.8% O2
Collected ~~12 TAP~~
0 ppm 12.5-14.5'
0 LEL 20.8% O2
Kathryn Pritchett

(22) 5/5/95

900 Collected 15-17'
0 ppm 0 LEL 20.8% $O_2$

930 Collected 20-22'
0 ppm
Saturated
encountered boulder
~ 16.5' BLS

940 WL ~ 17.2 BLS

948 W.C. ~ 17.2 BLS.
Decided to set
bottom of screen at
25' BLS ; TD = 26'

1005 Collected 24-26' BLS
0 ppm

1015 Depart Site 26
Joe Byrd, Jr.
Kathryn Pritchett

1025 arrived at headquarters
to discuss schedule

1105 Arrived at Site 26

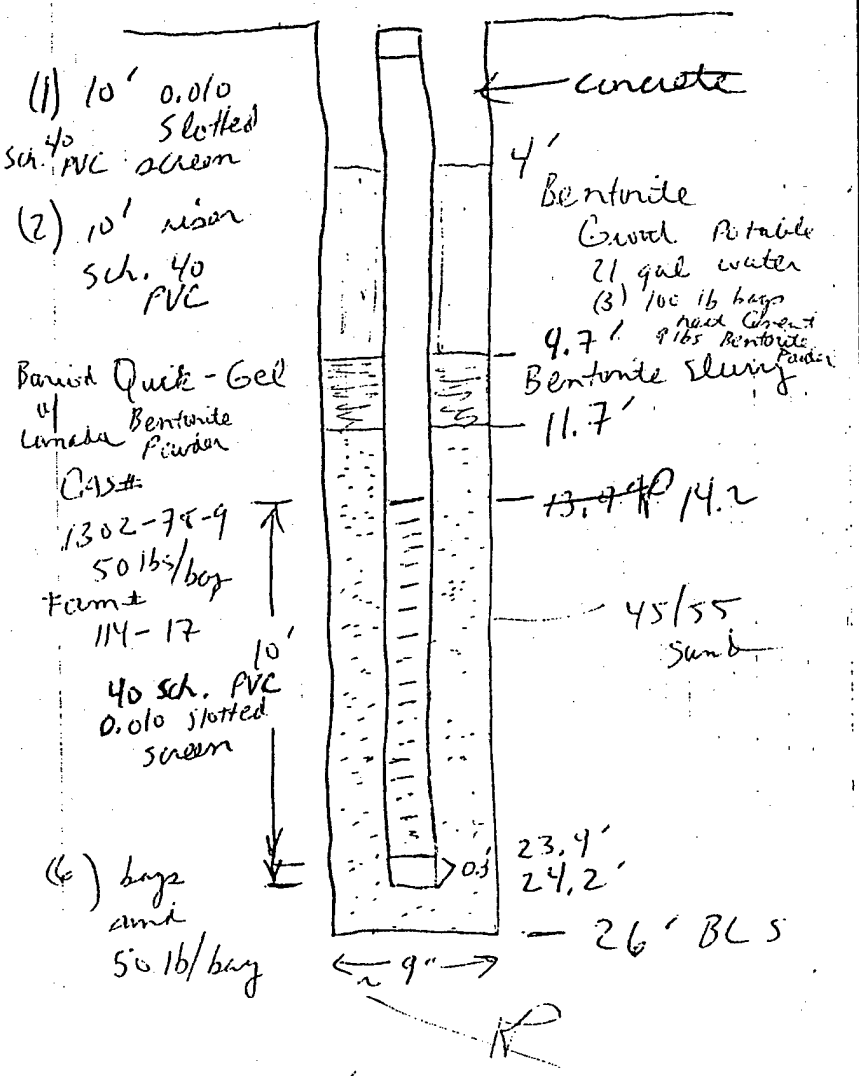
1115 Started construction
of monitor well
026-001/mw

~ Screened interval 15'-25'

Kathy Pritchett

5/5/95 (23)

026-001/mw




Kathryn Pritchett

5/5/95

1215 Sand at 14.5' BLS
1225 Depart Site 26 for lunch
Destry Greenway
Kathleen Meiners
Kathryn Pritchett
1330 Returned to Site 26
Destry Greenway
Kathleen Meiners
Kathryn Pritchett
1335 Drillers started again with installing filter pack.
1450 Drillers finished grouting 026-001/mw
1505 Depart Site 26
Drillers decontaminated drill rig + augers by the following procedures; steam clean with Liquinox TM and potable water; and rinse with potable water
1600 finished decontaminating drill rig + augers
Kathryn Pritchett



5/5/95

1605 Mobilized drill rig on Site 26
Kathryn Pritchett
Jamie Tuura-
1610 Depart Site 26
1615 Depart Duluth ANGB
1630 Stopped at Target to purchase supplies

Kathy Pritchett

(26) Saturday 5/6/95

Weather: Sunny; 40's; gentle winds

645 Arrived at Duluth ANG-B
Joe Byrd, Jr.
Kathleen Merino
Destry Greenway
Kathryn Pritchett

650 Calibrated PID
same procedures as stated on pg 20 of field logbook

701 Calibrated MX251
same procedures as stated on pg 20 of field logbook

720 Arrived at Site 26
Joe Byrd, Jr.
Kathleen Merino
Destry Greenway
Kathryn Pritchett

750 Drillers arrived at Site 26
American Engineering Testing
Jamie Tuura
Randy Wolf
Kathy Pritchett

5/6/95 (27)

tremie pipe (PVC) was steam cleaned yesterday afternoon

BG OLEL 20.6% O2
0 ppm

815 Started Health & Safety ~~Meeting~~ Meeting
Jamie Tuura
Randy Wolf
Kathleen Merino
Joe Byrd, Jr.
Destry Greenway
Kathy Pritchett

818 Started Drilling

822 Collected 0.5 - 2.5'
Poor recovery

832 Collected 5 - 7'
0 ppm

831 Photo 026 - 003NW
- hammering split-spoon sample.

Borehole OLEL
20.7% O2
0 ppm
- water encountered

Kathryn Pritchett

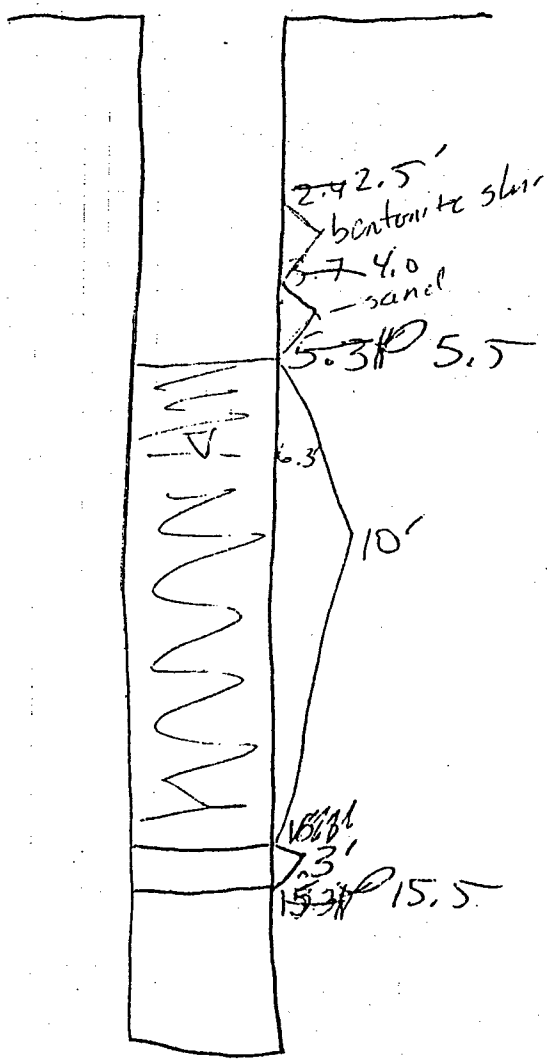
(26) 5/6/95

837 Re-Collected 0.5-2.5'
Poor Recovery
840 W.L. 4.8' BLS
842 W.L. 026-001/MW 17.1' BLS
852 Collected 10-12'
0 ppm
0 LEL 20.7% $O_2$
900 W.L. 8.7' BLS
904 Re-Collected 0.5-2.5
need to recover at least
75% for geotechnical
sample
910 Collected 15-17'
W.L. 11.2' BLS
920 W.L. 6.3' BLS
929 W.L. 6.4' BLS
W.L 6.3 BLS
950 5' sand in auger
TD Auger at 15' BLS

Note: Schedule PVC screen & riser
40 ~~wall~~ Precleaned at
manufactor and prewrapped.
• Screen will be set from
5.5'-15.5' BLS.

Kathy Pritchett

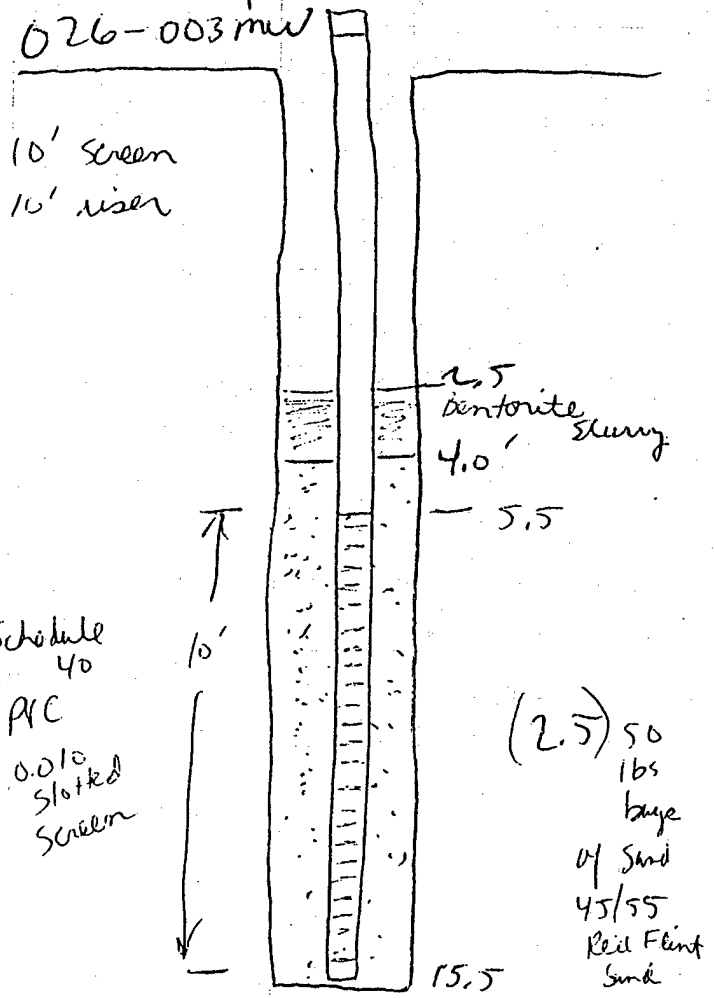
5/6/95 (27)




Kathy Pritchett

(30) 5/6/95

026-003 mw




1044 finished construction
1109 depart Site 26 for decontaminating drilling & auger and tremie pipe
Kathy Pritchett

5/6/95 (31)

by procedures stated on pg 24 of this field logbook.

1135 Called Northeast Technical about pick up for geotechnical samples — Dale tech. needs to contact Joe Palo — need to call back in 15 minutes

Northeast Technical
315 Chestnut St.
Virginia, MN 55792
Attn: Joe Palo
(218) 741-4290
Joe Palo Home (218) 741-1442
Duluth Brian Hayden
(218) 724-3114

1145 Drillers finished decontaminating

1210 arrived Site 26

1225 Started 026-002mw
Collected 0.5-2.5'
0 ppm
0 LEL 20.7% $O_2$

Kathy Pritchett

(32)

5/6/95

1238 Collected 5-7'
0 ppm
Collected 10-12'
0 ppm

1248 W.L. 10.3' BLS
Recollected 0.5-2.5

1255 W.L. 9.4' BLS

1300 W.L 9.1 BLS

1305 Collected 15-17'
0 ppm

W.L. 14.1' BLS.

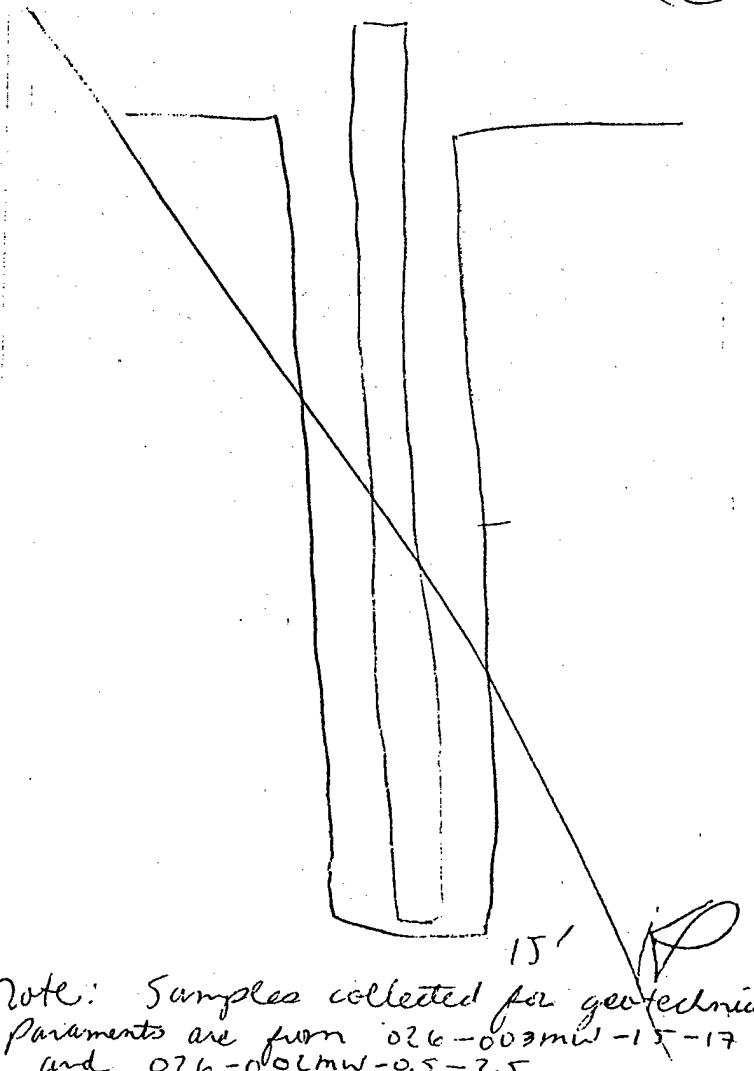
1345 W.L. 14.1' BLS
Shut down for day to wait for water to rise in borehole 026-002MW
- Drillers placed head on augers

1357 Drillers depart Site 26
Joe Byrd depart Site 26

1425 Depart Site 26
Destry Greenway
Kathleen Merino
Kathryn Pritchett

Kathryn Pritchett

5/6/95 (33)




Note: Samples collected for geotechnical parameters are from 026-003MW-15-17 and 026-002MW-0.5-2.5

1450 Depart Duluth ANGIS
Joe Byrd, Jr. remain to finish screening samples.

Kathryn Pritchett

(34) monday 5/8/95

Weather: Cloudy / 40's / gentle wind / NE

650 arrived Duluth ANGB
Destry Greenway
Kathleen Merino
Joe Byrd, Jr.
Kathryn Pritchett

700 Joe Byrd, Jr. is calibrating PID & MX251
~~PIDs MP wood MP~~
The batteries in the PIDs were drain down - left pin in (but it was in sleep mode).

740 arrived Site 26
Kathleen Merino
Kathyn Pritchett

747 Drillers arrived
Jamie Tuura
Jonathan Gabriel

750 Health & Safety Meeting
Jamie Tuura
Jonathan Gabriel
Kathleen merino
Kathyn Pritchett

Kathy Pritchett

5/8/95 (35)

755 026-002mw W.L. 13.4'

825 Collected 20-22'
BG & O LEL 20.8% O2
Borehole W.L. 11.3' BLS
830 →
840 W.L. 11.3' BLS

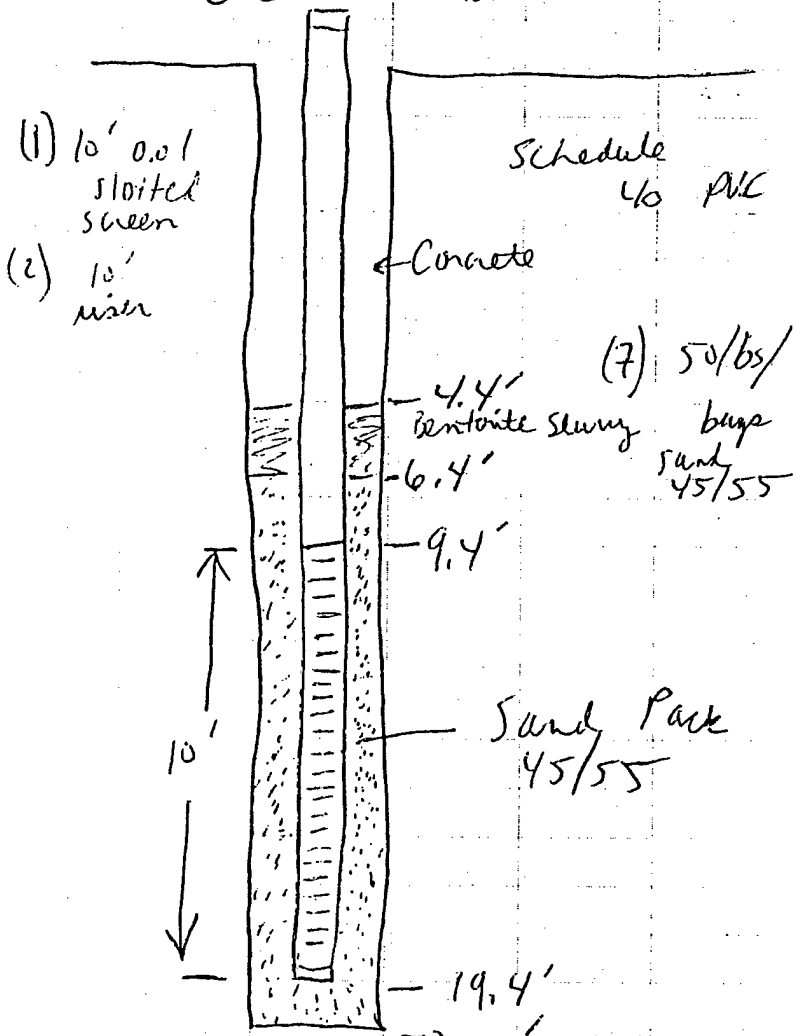
850 Started construction of 026-002mw
Screen interval 9-19' BLS.
TD 20'

Kathyn Pritchett

(36)

5/8/95

026-002 mw




1130 Finished Construction

Kathy Pittsett

(37)

5/8/95

1135 Depart Site 26

1200-1300 lunch

Called for - Site about shipment of Hermit for 17 may delivery! Jeff Davis is out to lunch - talked to Steve Amino Order # 0495225

1800-446-7488

1301 Called office to obtain mastercard # for Hermit (for - Site does not take American Express)

Matt Alexander - not in office or John Morris

1305 Called Beth Gourry about Wisconsin GRO/DRO for TPH → okay with MPCA

1315 Per Russ Lasor Bank one mastercard 5347-1118-0006-6694 Earl E. Parker II 6/96

Kathy Pittsett

(38)

5/8/95

1345 Arrived at Site 26
Kathleen Merino
Kathyn Pittlett
Drillers are finishing surface completion.
Rain - steady, cold

1505 Depart Site 26
- concrete pads are complete.
- guard post will be installed tomorrow and development should start tomorrow if weather permits

1530 depart Duluth ANGB

Kathyn Pittlett

(39)

Tuesday 5/9/95

Weather: Windy, Low 40's, rain

645 Arrived at Duluth ANGB
Joe Byrd, Jr.
Destry Greenway
Kathleen Merino
Kathyn Pittlett

800 Left Duluth ANGB

805 Returned Ford Explorer to exchange for another (Budget request)

819 Drillers arrived at Duluth ANGB

824 Drillers decontaminated all-terrain drill rig as per procedures stated on page 24 of this field logbook. The all-terrain drill rig will be used for Sites 25, 21 & 17

930 finished ~~decontaminated~~ decontaminating

Kathyn Pittlett

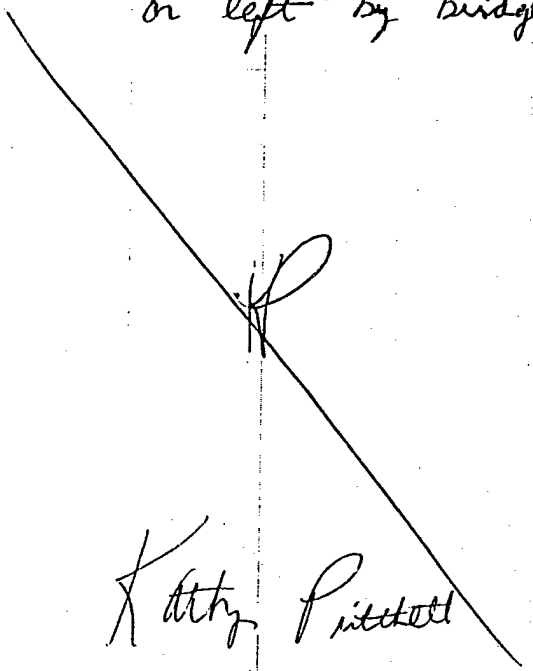
(40)

5/9/95

935 Started decontaminating drill rig (truck mounted) before departing Duluth ANGB as per procedures stated on page 24 of this field logbook.

1005 finished decontaminating

1015 Called Tim Buck with Twin Port Testing (218) 722-1911 West on Superior St. TL Garfield ~ ½ mile on left by bridge



Kathy Pittelt

Wednesday 5/10/95 (41)

Weather: Cloudy; low 40's Calm wind; 40% chance of rain

645 Arrived at Duluth ANGB
Joe Byrd, Jr.
Destry Greenway
Kathleen Merino
Kathryn Pittelett

650 • Calibrating (Joe Byrd, Jr.) PIDs as per procedures stated on pg 20 of this field logbook
• new tips & calibration gas arrived yesterday for PIDs.

700 Calibrated MX251 as per procedures stated on page 20 of this field logbook.

W.L. 11.68' BTOC
021-009mw

tdP 740 Drillers arrived at Duluth ANGB

Kathy Pittelett

(42)

5/10/95

810 Health + Safety meeting - Site 25
Jamie Tuma
Jonathan Gabriel
Destry Greenway
Kathleen Merino
Joe Byrd, Jr.
Kathyn Pittard

822 Started Drilling
025 - 001 mw

825 Collected 0.5 - 2.5'
0 ppm
0 LEL 20.5% O2

830 Collected 5-7'
0 ppm
Collected 10-12'.

840 0 ppm
Borehole 0 ppm
Drillers stopped to retrieve shovel at Site 26

915 Continued drilling
Fill from 0 - 11' BLS

920 Collected 15-17'
Kathyn Pittard

5/10/95

(43)

925 Gary Wirtz
American Engineering Testing
arrived at Site 25

930 Gary Wirtz
Joe Byrd, Jr.
to Site 26 to develop monitor wells at Site 26

932 Collected 15-17'
0 ppm

BG + Borehole 0 LEL 20.6% O2

~937 Collected 20-22'
0 ppm

944 collected 25-27'
0 ppm
0 LEL 20.6% O2
0 ppm

23.5 W.L. 23.8' BLS
2.0'
31.5 Sand + Gravel len
~22.5 - 25'

21.0 W.L. 23.6' BLS
21.0' Driller (Jamie) ~23.5' BLS

1000 W.L. 23.5' BLS

1023 W.L. 23.2' BLS
+1010

Kathyn Pittard

(44) 5/10/95

1040 Collected 30-32
0 ppm
OLEL 20.6% $O_2$

1055 W.L. no water
lens sealed off
with augers
instructed drillers to
collect 35-37'
could have encountered
perched conditions

1104 Collected 35-37'
0 ppm
OLEL 20.6% $O_2$

1112 W.L. 32.4' BLS.
advancing augers
to 40' BLS then
allow to set for
water level to rise
in borehole
~39.8' BLS
auger refusal

W.L. 34.9' BLS.

1130 lunch

1230 Return to Duluth ANGB

Kathy Pritchett

5/10/95 (45)

1231 W.L. 34.7' BLS.

39.8
34.7
5.1

Screen interval; 29-39' BLS

1235 started construction
of 025-001MW

1530 finished construction

1531 Drillers decontaminating
drill rig, augers,
& tremie pipe as per
procedures stated on
page 24 of this
field logbook

1600 finish decontaminating

1602 moved to 025-002MW

1615 Collected 0.5-2.5'
BG 0 ppm
OLEL 20.6% $O_2$

1620 Collected 5-7' BLS
0 ppm

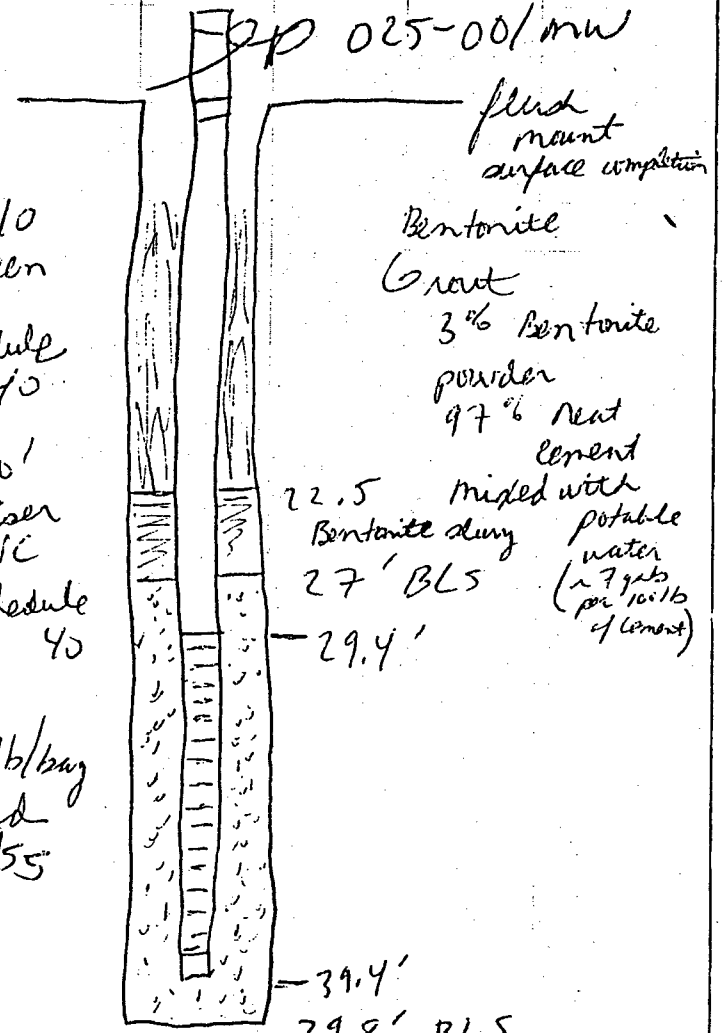
1630 Collected 10-12'
0 ppm

K Kathy Pritchett

(46)

5/10/95

026-001/mw




(1) 10' 0.010 Screen PVC Schedule 40

(3) 10' riser PVC Schedule 40

(6) 50 lb/bag Sand 45/55

Kathy Pritchett

5/10/95

(47)

Borehole O LEL 20.6% O2
O ppm
Advancing augers to 15' BLS

1637 Collected 15-17'.
O ppm

1641 W.L. 14.3' BLS
allowing water to rise

1645 Drillers depart Site 26 for Duluth ANGB.

1725 Escorted to rear Bldg. 500 to check on Joe Byrd, Jr. and Gary Wintz on development
026-001/mw
026-002/mw

1750 Depart Site 26

1800 Depart Duluth ANGB

Kathy Pritchett

(48) Thursday 5/11/95

Weather: Sunny ~45°F highs 60's; light NW winds

645 Arrived at Duluth ANGB
Joe Byrd, Jr.
Destry Greenway
Kathleen Merino
Kathy Puttkett

700 Calibrated PID as per procedures stated on page 20 of this field logbook.
Calibrated MX251 as per procedures stated on page 20 of this field logbook

730 Drillers arrived
Jamie Tuura
Jonathan Gabriel

740 Health & Safety Meeting
Jamie Tuura
Jonathan Gabriel
Kathleen Merino
Kathryn Puttkett
Destry Greenway
Joe Byrd, Jr.

Kathryn Puttkett

5/11/95 (49)

025-002mw W.L. 6.0' BLS
021-012PM 7.11' BTOC
Stickup ~ 2.1'
~40' North of 025-002mw

TD 16.9' BTOC
021-012PM

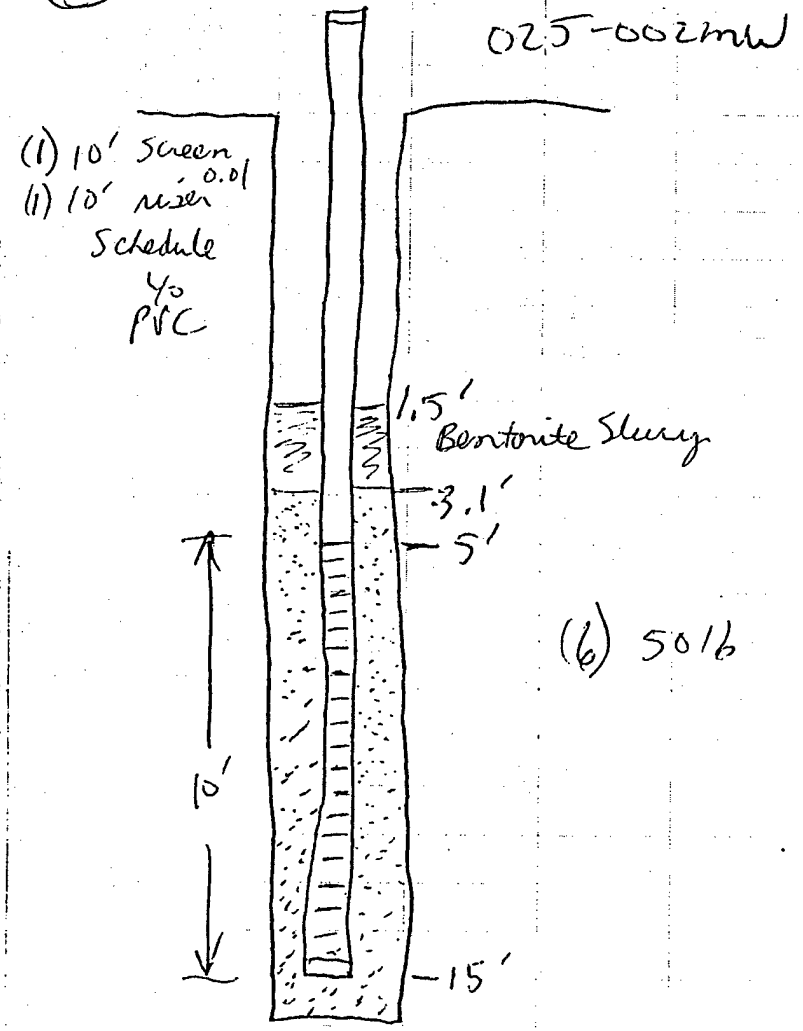
025-002mw Screen interval
5-15'
TD ≠ 16'

815 ~~decontamination~~

Kathy Puttkett

5/11/95

025-002mw




1039 finished construction

Kathy Pittelkow



5/11/95

1040 Surface completion

1100-1200 lunch

1205 Arrived at Site 17 to walk over site

1225 Arrived at Duluth ANGB.

1230 Drillers decontaminating drill rig, augers, & tremie pipe as per procedures stated on page 24 of this field logbook.

1310 finished ~~decontaminated~~ decontaminating

1315 at 025-003mw
BG OLEL 20.5% $O_2$
0 ppm
moved 025-003mw due to Soft Grounds
→ approved new location by Bruce Berg

1400 ~~S/S~~ Collected 0.5-2.5' OL
0 ppm

1408 Collected [illegible]'
0 ppm
OLEL 20.6% $O_2$

5.2

5/11/95

1420 Collected 10-12' BLS

Borehole
- 0 ppm
- 0 LEL
- 20.5% $O_2$
- 0.8 ppm split spoon

1428 Collected 15-17'
15 ppm

Peat unit - ~~slow~~ NP

Collected 20-22'
0 ppm

Borehole
- 3.2 ppm
- 0 LEL
- 20.5% $O_2$

1440 W.L. 12.7 ' BLS

| 12.5 | 20.0 |
|---|---|
| 8 | 12.5 |
| 20.5 | 7.5 |

Screen interval 10-20' BLS

TD 21 ' BLS

Borehole 4.7 ppm
0 LEL 20.5% $O_2$

- Informed drillers of borehole PID & LEL readings

slight fuel odor 40 ppm PID tremie Pipe

Breathing zone 0 ppm

Kathryn Pritchett

5/11/95

5.3

025-003 mW

(1) 10' Screen 0.01

(1) 10' riser Schedule 40 PVC

5.75 50lb/bag Sand 45/55

← Concrete

4.0' BLS Bentonite Slurry

7.6' BLS

9.7' BLS

19.7'

TD ⇒ 21' BLS

1615 finished construction

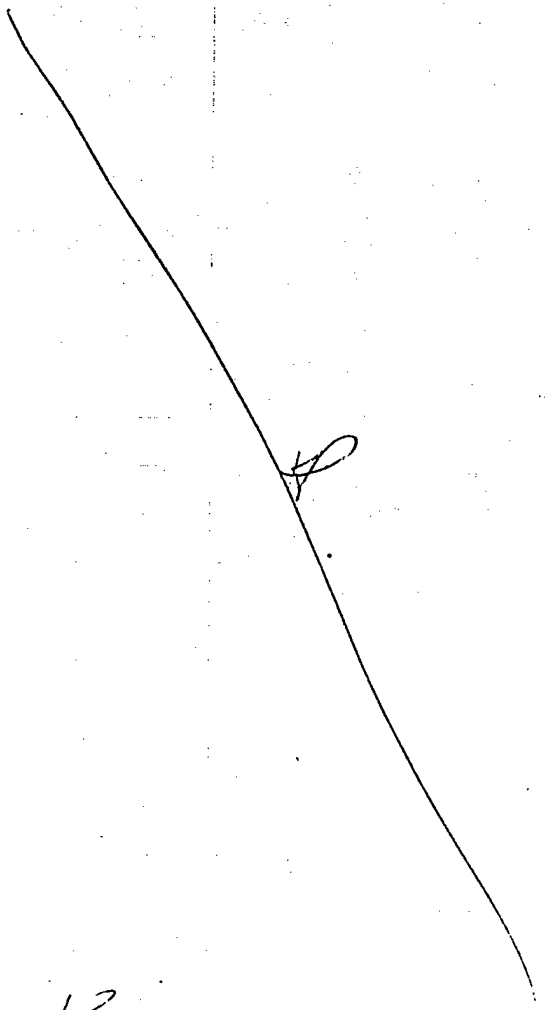
1625 Drillers departed Duluth AN 6 B

Kathryn Pritchett

(54)

5/11/95

Borehole PID 0.3 ppm
1700 Depart Duluth ANGB



Kathy Pritchett

5/12/95 (55)

Weather: Sunny; 60's — highs 70's. slight wind (from the West)

647 Arrived at Duluth ANGB
Joe Syd, Jr.
Kathleen Merino
Destry Greenway
Kathy Pritchett

To develop monitor wells < Gary Wirtz

655 Calibrated PID as per procedures stated on page 20 of this field logbook.

710 ~~Calib~~ Calibrated MX251 as per procedures stated on page 20 of this field logbook.

~~734~~ 725 Drillers arrived
Jamie Taura
Jonathan Gabrial

735 Health & Safety meeting
Jamie Taura
Jonathan Gabrial
Kathleen Merino
Destry Greenway

Kathy Pritchett

(56)

5/12/95

Drillers are augering guard post holes at 025-003 MW

935 Drillers are decontaminating drill rig and augers as per procedures stated on page 24 of this field logbook

1000 finished decontaminating

1005 Moved to 025-008 BH

1015 Started drilling

1025 Collected 0.5-2.5'
0 ppm

1030 Collected 5-7'
~~0 ppm~~ 0% Recovery
BG 0 ppm
OLEL 20.6% $O_2$

1035 Collected 7-9'
2.0 ppm
Poor recovery 10%
collected screening

Collected 9-11'
0.5 ppm

Borehole 0 ppm OLEL
20.6% MW

Kathy Pritchett

5/12/95 (57)

1100 Collected 13-15' BLS
0 ppm

1130 Moved to 025-001 BH

1230 Returned from lunch

1250 Collected 0.5-~~0~~25'
0 ppm

Borehole 0 ppm OLEL 20.6% $O_2$

1300 Collected 5-7' BLS
0 ppm

1305 moved to 025-~~00~~010 BH

1323 Collected 0.5-2.5'
0 ppm

Borehole 0 ppm OLEL 20.5% $O_2$

1332 Collected 5-7'
0 ppm

Borehole 0 ppm OLEL 20.6% $O_2$

1340 Recollected 0.5-2.5' BLS
0 ppm

1400 Moved to 025-009 BH

1350 Richard Baxter (MPCA) arrived at Site 26

1415 Collected 0.5-2.5'

Borehole 0 ppm OLEL 20.5% $O_2$

Kathy Pritchett

(58)

5/12/95

1423 Collected 5-7' BLS
0 ppm
1432 Collected 10-12' BLS
0 ppm
Borehole 0 ppm 0 LEL 20.6% O2
Duplicate collected
10-12' BLS
(11-12 - sample) (10-11 dup)
1439 Collected 13-15'
0 ppm
1507 Moved to 025-006BH
1515 Collected 0.5-2.5'
0 ppm
1518 Collected 5-7'
0 ppm
0 LEL 20.6% O2
1523 Collected 10-12'
0 ppm
1535 Collected 18-20'
0 ppm
0% Recovery
1544 Collected 20-22'
0.7 ppm
Drillers grout soil borings

Kathy Privett

5/12/95

(59)

1625 Collected equipment rinsate 025-001RB

| | | |
|---|---|---|
| VOC (8240) | (3) | 40-ml VOA HCl |
| SVOC (8270) | (1) | 1 L amber |
| Pb (7421) | (1) | 1 L poly HNO3 |
| Cd (6010) | | |
| Cr (7196) | | |
| Ni (6010) | | |
| Hg (7470) | | |

1630 Drillers depart Duluth ANGB
1730 Depart Duluth ANGB for Federal Express
Joe Byrd, Jr and Gary Witt are developing the last monitor well 025-003MW
1750 Depart Federal Express

Kathy Privett

(60) Monday 5/15/95

Weather: Sunny : high 60's - winds — from the West, gentle

640 arrived at Duluth ANGB
Joe Byrd, Jr.
Deotra Greenaway
Kathleen Meirbo
Kathy Pritchett

715 Calibrated PID & MX251 as per procedures stated on page 20 of this field logbook.

745 Drillers arrived
Jamie Tuura
Jonathan Gabrial

815 Drillers decontaminated augers as per procedures stated on page 24 of field logbook.

845 Report Duluth ANGB to clean Site 17

930 Arrived at Site 25

940 moved to 025-003BH

BG 20.6% O2 0 LEL
0 ppm

Kathy Pritchett

5/15/95 (61)

950 Collected 0.5-2.5
0 ppm
Borehole 0 LEL 20.6% O2
0 ppm

955 Collected 5-7' BLS
0 ppm

9P1000 Collected 10-12' BLS
273 ppm
Borehole 333 ppm
~~LEL~~ MX251 — low on batteries
Breathing zone 0 ppm

1008 Left Site 25 to buy batteries for MX251

1023 Borehole 0 LEL 20.5% O2
15 ppm

1030 Collected 15-17' BLS
Borehole 296 ppm ← 133 ppm
5 LEL 20.5% O2

1045 Collected 18-20'
9.5 ppm
Borehole 296 ppm
1 LEL 20.5% O2
317 ppm
5 LEL 20.5% O2

Kathy Pritchett

(62)

5/15/95

1055 Collected 23-25'
0% Recovery
Borehole 205 ppm
2 LEL 20.5% $O_2$
290 ppm
6 LEL 20.5% $O_2$

1110 Re-Collected ~~23-27~~ 24-25
Water encountered ~22' BLS
hole collapsed —
24-25' sidewall from
that interval — screening
only
TD 25'

1130-1225 lunch

1230 Moved to OLS-002BH

1245 Collected 0.5-2.5'
0 ppm
Borehole 0 ppm
0 LEL 20.5% $O_2$
Borehole 72 ppm
augers 5' BLS 0 LEL 20.5% $O_2$

1250 Collected 5-7'
541 ppm

Kathy Pritchett

5/15/95 (63)

Borehole 69 ppm
Breathing zone 0 ppm
1305 Collected 10-12'
330 ppm
Boulder ~7.5-8.5'
Borehole 342 ppm
1312 7 LEL 20.5%
421 ppm
12 LEL 20.5%
1315 Shut down drilling
1324 Called Russell Cason & Jon Williamson
→ informed of LEL reading of 12 — per Jon Williams needs to be 10 LEL in breathing zone
— can stop drilling if driller feels unsafe about drilling
1345 Informed driller of conversation with Opteq's Health & Safety manager (Jon Williams) — stating of low chance of ignition or explosion during

Kathy Pritchett

5/15/95

due to low oxygen downhole — driller (Jamie Tuura) informed us that he had experienced explosions downhole in the past and he felt unsafe with drilling deeper. He recommend grouting borehole before pulling augers to cut down on fumes. I recommended that ~~the drilling~~ drilling should cease until soil boring 025-002BH.

Everyone felt unsafe & uneasy about advancing the augers.

1415 Drillers decontaminating drill rig and augers as per procedures stated on page 24 of this field logbook.

1520 finished decontaminating

1525 moved to 025-001BH

1530 Collected 0.5 - 2.5'

0 ppm

Kathy Pritchett



5/15/95

Borehole 0 ppm

0 LEL 20.5% $O_2$

1540 augers at 5' 0 ppm

0 LEL 20.5% $O_2$

1541 Collected 5-7'

742 ppm

Borehole 33 ppm

0 LEL 20.5% $O_2$

Collected 10-12'

1547 Borehole 250 ppm

11 LEL 20.7%

Breathing zone 20 ppm

1605 Drager tube benzene reads 0 ppm

pumped 15 times & remain for 5 mins for conservative reading

TD = 10'

Shut down drilling on this soil boring.

— strong petroleum fumes

— will grout ASAP.

1630 Borehole after augers have been removed — 192 ppm

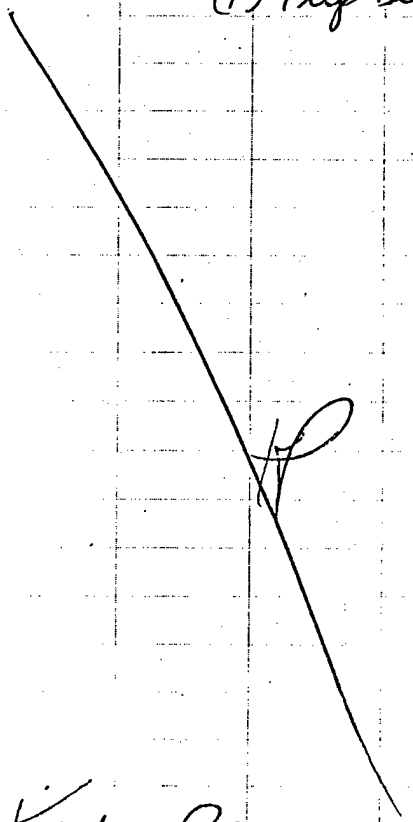
over borehole → 25 ppm breathing zone

Kathy Pritchett

(66)

5/15/95

1635 Drillers depart Site 25
1730 Kathleen Merino and Destry Greenway depart Duluth ANGB for Federal Express (3) soil samples & (1) duplicate (1) Trip Blank



Katty Pritchett

(67)

Tuesday 5/16/95

Weather: Cloudy, showers earlier, showers expected this morning (?); 50's; gentle wind — foggy on the hill

645 arrived at Duluth ANGB
Joe Byrd, Jr
Kathleen Merino
Destry Greenway
Kathryn Pritchett

700 Calibrated PID & MX251 as per procedures stated on pg 20 of this field logbook

745 Health & Safety meeting
Destry Greenway
Kathleen ~~Merino~~ Merino
Kathryn Pritchett
Jamie Tuura
Jonathan Gabriel

Jamie Tuura informed us that he felt ill into the night. He felt fine this morning

Katty Pritchett

(68)

5/16/95

Jonathan Gabrial said that the fumes smelled nauseated but he felt fine last night & this morning.

Everyone else felt fine.

Try to contact Paul Wheeler (ANGRC) at 715 in Michigan) with Capt. Wabrowetz — left message.

815 Located at 025-007 BH

817 Collected 0.5-2.5'
0 ppm
Borehole 0 ppm
+BG 0 LEL 20.5% $O_2$

825 Collected 5-7'
0 ppm
Borehole 0 ppm
0 LEL 20.5% $O_2$

835 Collected 10-12'
0 ppm
Borehole 0 ppm
0 LEL 20.5%

Kathy Pittsett.

5/16/95 (69)

840 Collected 15-17'
0 ppm
Borehole 0 ppm
LEL out — batteries
Dieter believe he may have encountered water at ~ 14.5' BLS

852 Collected 20-22'
0.5 ppm
borehole 0 ppm
0 LEL 20.4% $O_2$

900 Move to 025-005 BH

903 Called Russell Cason (Opteck) informed him

931 Collected 0.5-2.5'
1.5 ppm BG 1.5 ppm
Borehole 0 ppm
0 LEL 20.5% $O_2$

938 Collected 5-7'
O'Reavey 1.5 ppm 1.5 ppm BG
Borehole 0 ppm
0 LEL 20.4% $O_2$

950 Collected 10-12'
1.5 ppm BG 1.5 ppm
Borehole 0 ppm
0 LEL 20.4% $O_2$

Kathy Pittsett

5/16/95

— Mud advancing to the surface ~ 15' BLS → may be perched water (?)

1000 Collected 18-20'
0% Recovery

Borehole 0 ppm
OLEL 20.4% $O_2$

~~1315~~ 1015 Collected 20-22'
0 ppm

Borehole 0 ppm OLEL
20.5% $O_2$

1030 Drillers decontaminating augers as per procedures stated on page 24 of field logbook.

1117 Moved to SLS-004BH

1125 Collected 0.5-2.5
0 ppm

1135 Collected 5-7'
0 ppm

1140 Collected 10-12'
0 ppm

Borehole 0 ppm
OLEL 20.4% $O_2$

Kathy Pritchett



5/16/95

Borehole 0 ppm
OLEL 20.4% $O_2$

1150 Collected 18-20' BLS
0 ppm

Borehole 0 ppm
OLEL 20.4% $O_2$

1330 Moved 021-026BH

1350 Collected 0.5-2.5
9.1 ppm

1355 Collected 4-6'
2.8 ppm

1405 Collected 8-10'
0 ppm

Borehole 0 ppm
OLEL 20.5% $O_2$

1415 Recollecting 0.5-2.5
0 ppm

1425 moved to 021-027BH

1438 Collected 0.5-2.5
0 ppm

Borehole 0 ppm
OLEL 20.5% $O_2$

1448 Collected 4-6' 0 ppm

Borehole 0 ppm
OLEL 20.5% $O_2$

Kathy Pritchett

(72)

5/16/95

1458 Collected 8-10' BLS
0 ppm
duplicate collected

1515 Moved 021-028BH

1522 Collected 0.5-2.5'
0 ppm

1538 Collected 4-6'
0 ppm
water encountered

1545 Called Paul Wheeler (ANGRC) to discuss an additional soil boring west of MOGAS area
— yes → just drill 2.0' less at site 17 for adjustment of cost.

1610 Drillers grouting boreholes as per work plan

1700 Arrived at Federal express

airbill # 453073579O (1) equipment rinsate
(4) Soil Samples

Kathy Pritlow

(73)

5/16/95

1717 Arrived at Lake Superior Laboratories
(6) Soil Samples
(1) Duplicate
(1) MS/MSD
COC No. 12592

Kathy Pritlow

(74) Wednesday 5/17/95

Weather: Sunny, cool — high 50's; low 40's; wind chill ~30°F; windy; NW 10-15 mph.

645 Arrived at Duluth ANG

arrived at 600 — Destry Greenway, Kathleen Merino, Joe Byrd, Jr., Kathryn Pritchett

700 Calibrated PID & MX251 as per procedures stated on page 20 of this field logbook.

730 Drillers arrived: Jamie Tuura, Jonathan Gabrial

745 Drillers decontaminating augers as per procedures stated on page 24 of this field logbook.

820 finished decontaminating; Health & Safety meeting: Jamie Tuura, Jonathan Gabrial

5/17/95 (75)

Destry Greenway, Kathleen Merino, Kathryn Pritchett

630 Moved to 025-012 BH (north of mocas area)

838 Collected 0.5-2.5'
0 ppm

843 Collected 5-7'
9.6 ppm

Borehole & BG 0 ppm, 0 LEL, 20.5% $O_2$

850 Collected 10-12'
7.5 ppm

Borehole 8.5 ppm before sample, 0 ppm after sample, 0 LEL, 20.5% $O_2$

900 Collected 15-20'
4.5 ppm

Borehole 3.5 ppm, 2 LEL, 20.5% $O_2$

919 (west of USTs) Moved to 025-03BH

926 Collected 0.5-2.5'
0 ppm

Borehole 0 ppm, 0 LEL, 20.5% $O_2$

Kathryn Pritchett

(76)

5/17/95

935 Collected 5-7'
0 ppm
Borehole 0 ppm
OLEL 20.5% $O_2$
1004 Collected 10-12'
0 ppm
Borehole 0 ppm
OLEL 20.4% $O_2$
1015 Collected 16-20'
0 ppm
Borehole 0 ppm
OLEL 20.5% $O_2$
1100 Drillers decontaminating drilling augers as per procedures stated on page 24 of this field logbook
1020-1100 Drillers grouted boreholes
Setting up at Site 17
1100-1130
1145 Drillers left Duluth ARCO to mobilize to Site 17

Kathy Pritchett

5/17/95 (77)

1315 017-024BH
1330 Collected 0.5-2.5'
0 ppm
1337 Collected 4-6'
0 ppm
Borehole 0 ppm
& BG OLEL 20.5% $O_2$
Peat / Silt 0-6.5'
6.5-10'
↳ Silt w/ little sand
1350 Moved to 017-025BH
1400 Collected 0.5-2.5' Silt & Peat
0 ppm
1405 Collected 4-6' Peat
0 ppm Water encountered
Borehole 0 ppm
OLEL 20.5% $O_2$
1415 Moved to 017-022BH
1420 Collected 0.5-2.5
0 ppm
1430 Collected 4-6'
water at 3.5' BGS 20% Recovery
Borehole 0 ppm
OLEL 20.5% $O_2$

Kathy Pritchett

(78) 5/17/95

1445 Moved to 017-023 BH

1458 Collected 0.5-2.5'
0 ppm

1507 Collected 4-6'
0 ppm
water encountered at ~4' BLS

1520 Moved to 017-028 BH

1535 Collected 0.5-2.5
0 ppm

1544 Collected 4-6'
water encountered 0 ppm

note; It was a pussy-willow day at Site 17

1600 Collected equipment rinsate - split spoon Site 17

WDNR GRO/DRO (3) 40-ml w/ HCl
SVOC (8270) (1) 1l amber
Hg (7470) (1) 1l Poly $HNO_3$

1645 meet Lake Superior Lab at Duluth ANG'D

WDNR GRO/DRO (9) Soil Samples
(1) Equipment Rinsate

Kathy Pritchett

(79) 5/17/95

1715 Arrived at Federal Express

1745 Arrived at Site 17 to load supplies

1830 Depart Duluth ANG'D

Kathy Pritchett

(80) Thursday 5/18/95

Weather: Sunny, 60's

645 Arrived at Duluth ANGB
Joe Byrd, Jr.
Desty Greenway
Kathleen Merino
Kathyn Pritchett

715 PID were calibrated by Joe Byrd, Jr. as per procedures stated on page 20 of this field logbook

~830 Called (Kathleen) Lake Superior Lab (Tim Buck) to confirm obtaining analytical results for soil samples delivered Tuesday + Wednesday — Stated that these were a 24-hour turnaround

Called Russell Cason about the above — he will inform Mark Escobar (Optech)

Kathyn Pritchett

5/18/95 (81)

940 Arrived at 025-001mw
Kathleen Merino
Kathyn Pritchett

~815 Joe Byrd, Jr and Desty Greenway at Site 26 collecting groundwater samples

1018 PID 22.6 0 ppm
W.L. = 22.11' BTOC +10
TD = 39.81' BTOC +10
Transducer 17.10

1146 Start slug test — injection at 025-001mw

1240 stopped test

~~1241~~ Started withdrawal

1242 test on 025-001mw

1337 stopped test

1345 Stopped to cool down — been in sun too long.

1515 025-003mw
53.0 ppm
W.L. ~~10.07~~ 10.92' BTOC
TD: 22.00' BTOC

Kathyn Pritchett

5/15/95

1531 11.65' Transducer static

1534 Start injection test — 025-003 mm

1638 stopped test

1640 Started withdraw test

1800 stopped test

1845 Depart Duluth ANG 13

Kathy Pritchett

Friday 5/19/95



Weather: Sunny; 50-60's light winds

645 Arrived at Duluth ANGB
Destry Greenway
Kathleen Merino
Joe Byrd / Jr.
Kathy Pritchett

715 Calibrated PIDs & MX 51 as per procedure stated on page 20 of this field logbook

825 Called KREN — will meet them at 1530 at Site 5

830 Driller arrived with drill rig

835 Health & Safety meeting
Destrey Greenway
Kathleen Merino
Jayne Tuura
Jonathan Gabriel
Kathy Pritchett

844 Moved to 017-051 SH

853 Collected 0.5-2.5
25% Recovery
Kathy Pritchett

(84)

5/19/95

858 Collected 4-6' + BG
Water encountered 0 ppm Borehole 0 ppm
0 LEL 20.5% $O_2$
903 Recollected 0.5-2.5'
25% Recovery
0 ppm
910 Recollected 0.5-2.5'
0 ppm
915 Moved to 017-021 BH
920 Collected 0.5-2.5'
0 ppm
925 Collected 4-6'
water encountered 0 ppm
935 Moved to 017-032BH
942 Collected 0.5-2.5'
0 ppm
water encountered
957 moved to 017-030 BH
1004 Collected 0.5-2.5'
0 ppm water encountered
1010 Collected 4-6' KP
0 ppm
Duplicate collected for
TPH GRO/DRO
1020 Moved 017-029 BH
Kathy Pittsett

5/19/95

(85)

1027 Collected 0.5-2.5
water encountered 45% Recovery
1035 Recollected 0.5-2.5'
0 ppm
Duplicate collected
for SVOC, Hg (SPL)
& TPH (Lake Superior Lab)
1040- Drillers grouting
1110 soil boring with
3% bentonite powder &
97% neat cement
1130-1230 lunch
1240 Collected equipment
rinsate - split
spoon
WDNR GRO/DRO (3) 40 ml Vial HCl
SVOC (8270) (1) 1 l amber
Hg (7470) (1) 1 l Poly $HNO_3$
1330 Meet Lake Superior Lab
at Duluth ANGB Gate
to relinquish:
(7) Soil Samples
(2) Duplicate
(1) MS/MSD
(1) Equipment Rinsate
- split spoon
Kathy Pittsett

(86)

5/19/95

1340 Arrived at 025-002mw to slug test
W.L. 7.32' BTOC
10.33 Transducer T.D. 17.45' BTOC
1406 Started injection test at 025-002mw
~1450 Stopped test
1505 Started withdraw test
1530 Bill Anderson with RREM arrived at Site 25 to walk over Sites 25, 21, 26 & 17 for surveying
1630 Return to Duluth ANGB to pack samples
1730 Depart Duluth ANGB for Federal express
1815 Return to Duluth ANGB
1830 Depart Duluth ANGB
1810 Dropped Kathleen ~~Mott~~ Merino at the airport

Kathy Pritchett

Saturday 5/20/95 (87)

Weather: Sunny; 40-50's; Wind from the west - cool!

645 arrived at Duluth ANGB
Destry Greenway
Joe Byrd, Jr.
Kathy Pritchett
730 arrived at Site 26
Destry Greenway
Kathy Pritchett
to slug test monitor wells
026-001mw
W.L. 17.03' BTOC
T.D. 25.28' BTOC
~814 Started slug injection test at 026-001mw
833 Stopped test
835 Started withdraw test
~845 Stopped test
Moved to 026-003mw
W.L. 7.36' BTOC
T.D. 17.92' BTOC

Kathy Pritchett

(88)

5/20/95

935
~~937~~ Started injection test at 026-003 MW

1007 Stopped test

1009 Started withdrawn test

1049 Stopped test

1125 Depart Site 26

1145-1230 lunch

1245 Arrived at Site 26
Destry Greenway
Kathryn Pritchett
— Joe Byrd, Jr. at Bldg 247 running water samples on GC

1255 Moved to 026-002 MW
W.L. 9.50'
T.D. 21.40'

1318 Started injection test at 026-002 MW

1334 Stopped test

1335 Started withdrawn test

1350 Stopped test

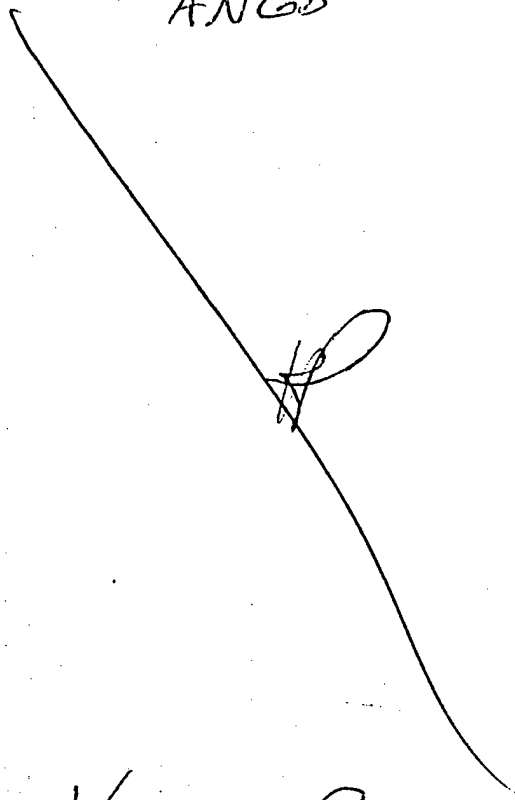
1415 Depart Site 26

1620 Arrived at Federal Express
Kathryn Pritchett

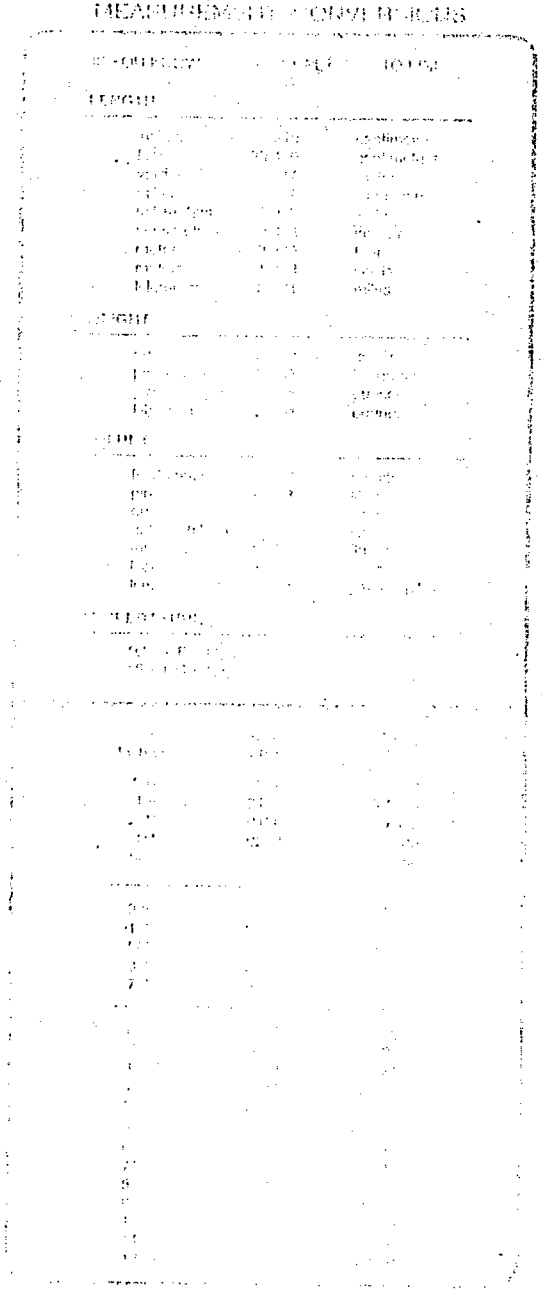
5/20/95 (89)

1640 Arrived at Duluth ANGB — dock site 25 — marked drum — ol to hold GW until analytical results

1730 Depart Duluth ANGB



Kathryn Pritchett



Destry Greenway with
Operational Technologies
4100 NW Loop 410 STe. 230
San Antonio, TX 78229
1-800-677-8072

Duluth ANG 1315-197

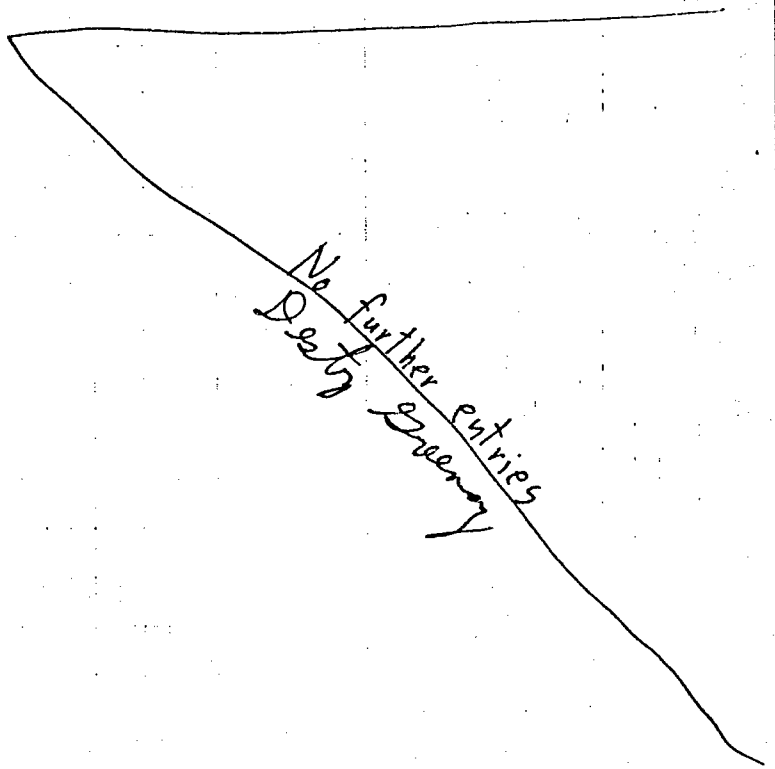
CONTENTS

| PAGE | REFERENCE | DATE |
|---|---|---|
| 1 | Decon procedure | |



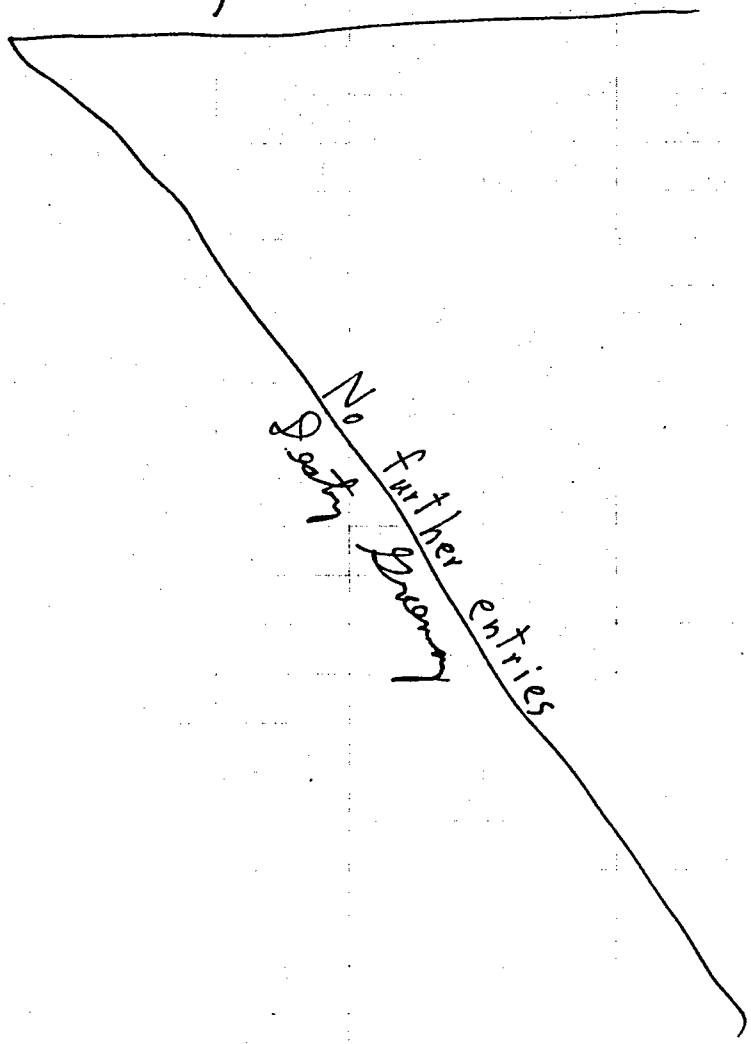
# Decon Procedure

1. Wash with mix of potable water and Liquinox. Scrub with brush
2. Rinse with potable water
3. Rinse with deionized water
4. Allow to air dry completely
5. Wrap with aluminun foil (shiny side out.)



Friday 4-28-95

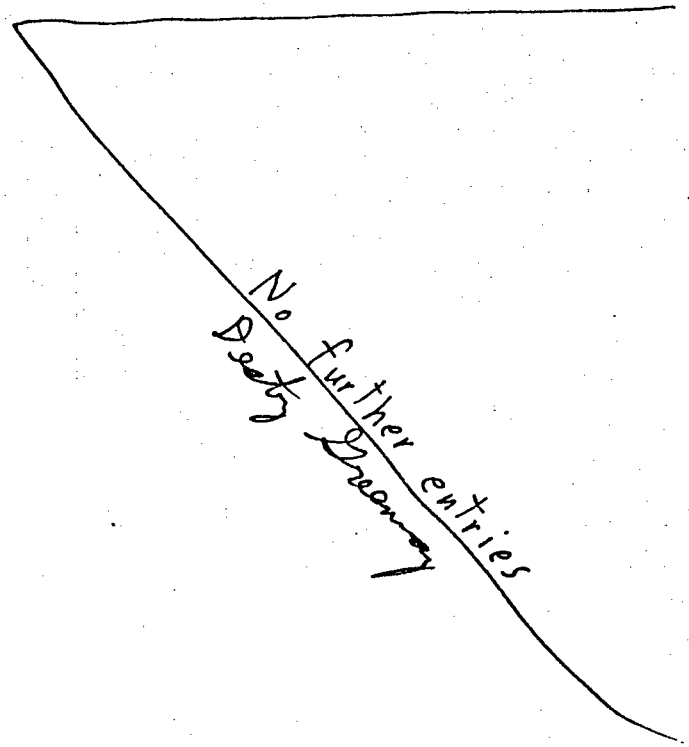
16:15 Pre-mob meeting for Duluth ANG
17:30 Meeting over






Monday ~~4~~ 5-1-95

04:30 Depart for Duluth
14:40 Arrive in Duluth
14:50 Begin unloading equip., etc.
15:25 Begin staking locations for site 25.
16:20 Leave base
17:00 Arrive at motel to check in.



## Tuesday 5-2-95

07:15 Leave motel
08:00 Breakfast meeting
08:40 Arrive at base
09:20 Called Fedex to track packages
09:30 Prepare stakes for Site 26 & Site 17.
10:20 Head to Site 26 to stake BH's.
11:10 Site 26 completed
12:30 Return from lunch. Unload GC stuff
13:25 Go to store to get supplies
14:50 Return from store
15:10 Begin helping Joe with GC set-up and cutting squares (teflon & foil)
16:20 Put visqueen on sample table & decon table
16:50 Leave base

No further entries
Dusty Greaney



## Wednesday 5-3-95

05:50 Leave motel
06:40 Depart breakfast
06:45 Arrive at base. Load equip. for moving to Site 26.
07:25 Calibrated PIDs. to 100 PPM
10:30 Break for lunch
11:20 Return from lunch
11:45 Arrive at Site 26. Set up decon.
12:15 Health and Safety meeting with drillers and Optech team.
12:25 Begin decon 026-006BH
13:35 026-006BH completed
13:40 Begin decon 026-005BH
14:15 026-005BH completed
16:20 Leave Site 26. Go to bldg 247 to prepare ~~for~~ samples.
17:35 Leave base

No further entries
Dusty Greaney

Thursday 5-4-95

0550 Leave motel
0640 Depart breakfast
0650 Arrive at base. Load equip. to return to Site 26.
0800 Go to fire dept.
0810 Return from fire dept.
0815 Drillers deconning equip (augers) (start)
Decon procedure is as follows.
1. Steam clean with mix of potable water and Liquinox
2. Steam ~~clean~~ rinse with potable water
3. Augers wrapped in visqueen
0835 Decon of augers complete
0850 Arrive at Site 26
0855 Health and Safety meeting with drillers and Optech crew.
0900 Set up decon and sample prep tables.
0910 Begin decon (procedure explained on page 1.) on Site 26
1205 Break for lunch
1330 Return from lunch



Thursday 5-4-95 (continued)

1350 Take pictures of grouting by drillers.
1435 Resume decon at Site 26
1445 Leave Site 26
1515 Equip. blank
1520 Return to Site 26
1555 Leave Site 26
1600 Return to bldg 247. Unload equip. Prepare for next day.
18:30 Leave base

No further entries
Dusty Bruny

## Friday 5-5-95

0550 Leave motel
0640 Depart breakfast
0650 Arrive at base. Begin to ~~unload~~ load equip.
0800 Arrive at Site 26. Set up decon.
0810 Health + Safety meeting with drillers + Optech crew.
0820 Begin decon (see p. 1)
1015 Decon complete
1215 Leave Base for lunch
1330 Return from lunch. Observe drillers completing well.
1530 Leave Site 26
~~1530~~ 16:15 Leave base

No further entries
Dusty Greeney



## Saturday 5-6-95

0550 Leave motel
0640 Depart breakfast
0645 Arrive at base. Load equip. for the day
0720 Arrive at site 26 Set up decon
0805 Health and Safety meeting ~~0805~~ with drillers and Optech crew.
0810 Begin decon. (See pg. 1)
0925 Decon complete. Observe drillers completing well.
1110 Break for lunch
1200 Return from lunch
1215 Arrive at Site 26. Begin decon
1345 Decon complete
1425 Leave Site 26
1440 Leave base

No further entries
Dusty Greeney

Monday 5-8-95

0555 Leave base
0640 Depart breakfast
0650 Arrive at base
0720 Set up and take count of sample kits.
0830 Programmed GC + built all 3 standards under supervision of Joe Byrd - GC operator

| | |
|---|---|
| Gain | 1,000 |
| Carrier Gas Flow | 14 ml/min |
| Injection vol. | 100 µl |
| GC Oven temp. | 40°C |
| Analysis time | 400 sec. |

0954 100 PPB BTEX standard - Missed shot
1010 100 PPB BTEX standard Good run. Set library
1029 1 PPM BTEX standard Good run. Set library
1045 10 PPM BTEX standard Good run. Set library
1059 Air blank

*



Monday 5-8-95

| | | |
|---|---|---|
| * Benzene | 12 | ppb |
| * Toluene | 30 | ppb |
| * Ethylbeneene | 79 | ppb |
| * m,p-xylene | 155 | ppb |
| * o-xylene | 76 | ppb |

unusally high values. Shoot air blank again

1113 Air blank

| | | |
|---|---|---|
| * Benzene | 5 | ppb |
| * Toluene | 16 | ppb |
| * Ethylbenzene | 41 | ppb |
| * m,p-xylene | 92 | ppb |
| * o-xylene | 185 | ppb |

1124 Printer malfunction. Need to reprint
1135 Break for lunch
1240 Return from lunch

* 026-002 MW 20'-22' 10g.

| | | |
|---|---|---|
| * Benzene | 4 | ppb |
| * Toluene | 6 | ppb |
| * Ethylbenzene | 1 | ppb |
| * m,p-xylene | 13 | ppb |
| * o-xylene | 11 | ppb |

(12)

1307 100 ppb BTEX Standard

| | | | cal |
|---|---|---|---|
| Benzene | 99 | ppb | ppb |
| Toluene | 80 | ppb | ppb |
| Ethylbenzene | 72 | ppb | ppb |
| m,p-xylene | 133 | ppb | ppb |
| o-xylene | 47 | ppb | ppb |

1319 Shut down GC.
Return to decon brass sleeves at bldg. 247 (See pg. 13)
1425 Decon complete. Wrap tables for next day.
1530 Leave base

No further entries Daily Diary

(13)

Tuesday 5-9-95

0605 Leave motel
0700 Depart breakfast
0705 Arrive at base. Wrap brass sleeves
Recharge PIDs.
0740 Leave base. No work due to very rainy weather.

No further entries Daily Diary

## Wednesday 5-10-95

0555 Leave motel
0640 Depart breakfast
0645 Arrive at base. Set up decon, get ready for drilling at Site 25.
0740 Begin decon (see pg. 1)
0810 Health and Safety meeting with drillers and Optech crew.
0815 Resume decon
1130 Decon complete. Break for lunch
1230 Return from lunch. Observe drillers completing well. Move decon equip. to next well.
1420 Begin decon
1700 Decon complete. Check on Joe at Site 26.
1755 Leave base

No further entries
Dusty Dreamy



## Thursday 5-11-95

0550 Leave motel
0640 Depart breakfast
0645 Arrive at base. Set up decon. prepare for day's drilling.
0740 Health and Safety meeting with drillers and Optech crew.
0815 Copy log forms and field notebooks
0900 Copying complete. Observe Joe and GC work.
1100 Break for lunch
1205 Arrive at Site 17 to check stakes
1225 Arrive at base. Prepare for 025-003 MW.
1400 Begin decon (see pg. 1)
1505 Decon complete. Break down everything.
1650 Leave base

No further entries
Dusty Dreamy

(16)

Friday 5-12-95

0550 Leave motel
0640 Depart breakfast
0650 Arrive at base. Calibrate Hydacs and turbidity meters.
0710 ~~Calib~~ Set up decon.
0725 Health and Safety meeting with drillers and Optech crew.
1015 Begin decon (see pg. 1) on Site 25 boreholes
1130 Break for lunch
1240 Return from lunch. Begin decon.
1600 Decon complete. Break down equip. Prepare for Monday.
1725 Leave base
1730 Arrive at Fedex
1740 Leave Fedex

No further entries
Daily Diary

(17)

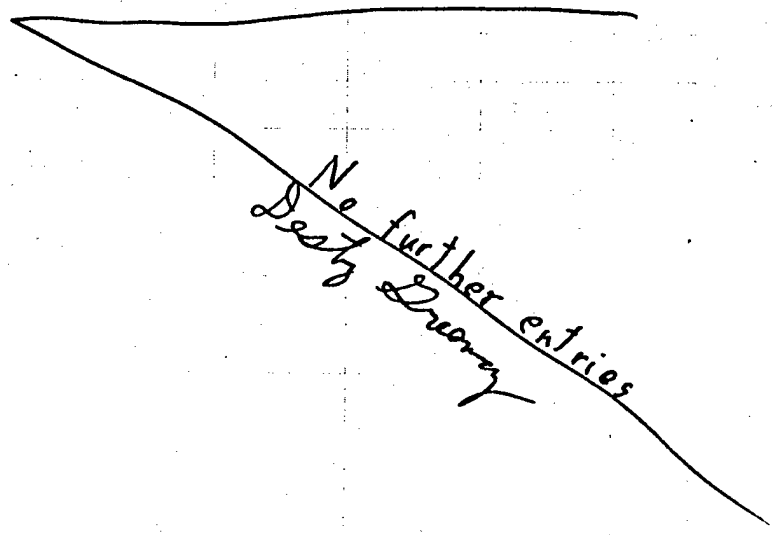
Monday 5-15-95

0550 Leave motel
0640 Depart breakfast
0645 Arrive at base. Set up decon, other equip.
0800 Begin decon (see pg. 1)
0930 Health and Safety meeting
0935 Resume decon
1130 Break for lunch
1220 Return from lunch. ~~Resume decon~~
1225 Go to store to get supplies.
1300 Return to base. Resume decon
1430 Decon complete. 025-002BH was discontinued because of LEL alarm after confering with drillers.
1520 Resume decon
1655 Decon complete. Break down equip.
1735 Leave base
1740 Arrive at Fedex
1750 Leave Fedex

No further entries
Daily Diary

## Tuesday 5-16-95

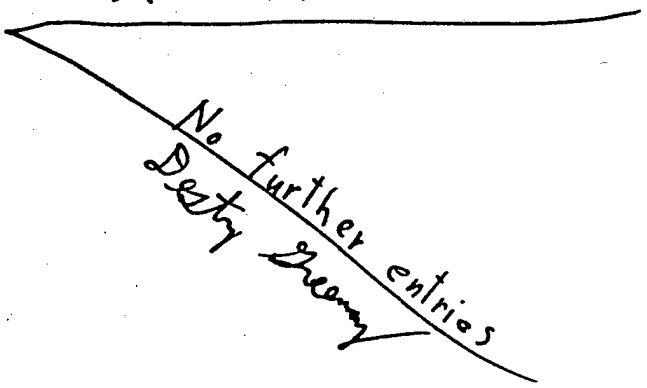
0550 Leave motel
0640 Depart breakfast
0645 Arrive at base. Set up decon. Prepare for day.
0745 Health and Safety meeting with drillers and Optech crew.
0810 Begin decon (see pg. 1)
1200 Decon complete. Break for lunch
1320 Return from lunch. Resume decon
1605 Decon complete. Break down equip.
1740 Leave base






## Wednesday 5-17-95

0555 Leave motel
0620 Arrive at base
0730 Begin decon (see pg. 1)
0825 Health and Safety meeting
1020 Decon complete. Break down equip.
1055 Leave Site 25
1115 Arrive at Site 17. Set up equip. for sampling.
1155 Break for lunch
1310 Return from lunch
1325 Begin decon
1705 Decon complete, Pack up equip.
1800 Leave Site 17
1810 Arrive at Base
1825 Leave base



Thursday 5-18-95

0550 Leave motel
0650 Depart breakfast
0655 Arrive at ~~breakfast~~ base. Load equip. for sampling wells.
0715 Calibrated Hydacs
0755 Arrive at Site 26
0800 Decon bailers and $H_2O$ ~~level~~ level meter.
0840 Set up at ~~we~~ 026-001MW
0845 Begin purging
0935 Purging completed.
0953 Feild blank taken.
~~Rinsate blank taken~~
1015 026-001MW sampling begins
1020 Sampling complete. Decon bailer
1040 Arrive at ~~026~~ and set up at 026-002MW.
1045 Begin purging.
1125 Purging completed
1130 Begin sampling
1140 Sampling completed. Decon bailer
1205 Arrive and set up at 026-003MW
~~Begin purging.~~



1215 Rinsate blank taken
1225 Begin purging
1310 Purging completed.
1335 Begin sampling
1355 Sampling completed.
1410 Leave Site 26.
1430 Set up decon at Bldg 247.
1440 Begin decon
1449 Decon complete
1500 Break for lunch
1515 Lunch over
1520 Arrive at Site 25. Set up for 025-002MW
1525 Began Purging
1628 Purging completed
1700 Begin Sampling
1710 Sampling completed. Break down equip.
1725 Leave base
1730 Arrive at Fedex
1750 Leave Fedex
1800 Arrive back at base
1825 Leave base

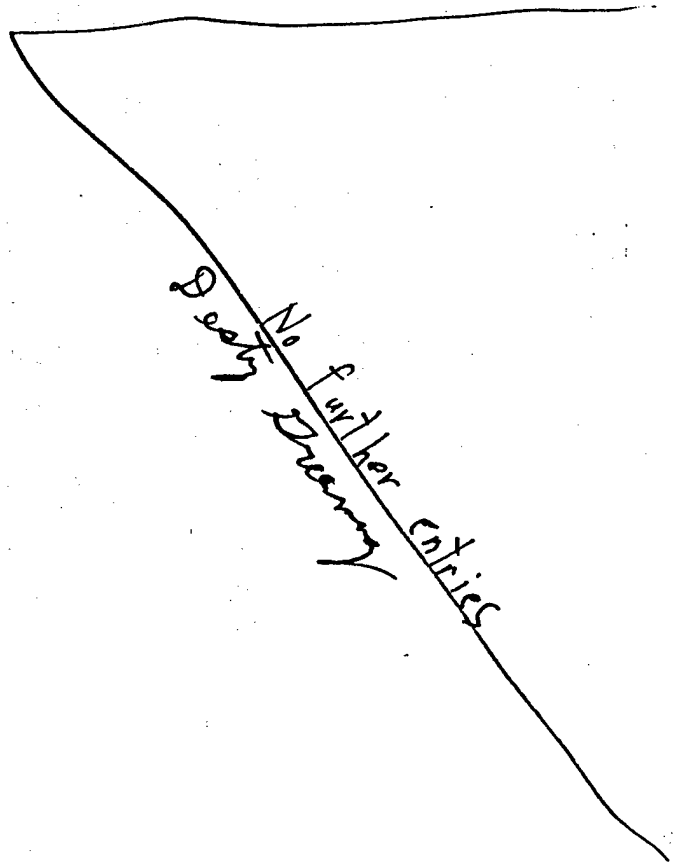
No further entries
Betty Greene

Friday 5-19-95

0555 Leave motel
0640 Depart breakfast
0645 Arrive at base. Load equip. for site 17.
0725 Arrive at Site 17. Set up equip.
0830 Health and Safety meeting with drillers and OpTech crew.
0850 Begin decon (see pg. 1)
1045 Decon complete. Break down equip.
1130 Break ~~down~~ for lunch
1230 Return from lunch
1245 Take rinsate blank
1310 Arrive at 025-001MW. Set up equip.
1315 Begin purging
1420 Purging completed.
1425 Take potable water field blank while waiting for 025-001MW to recharge.
1520 Sampling complete
1530 Take rinsate blank.
1550 Arrive at 025-003MW to set up.
1555 Begin purging



1635 ~~Done~~ Done purging completed. Waiting for recharge
1705 Sampling begins
1730 Sampling complete. Move GC equip.
1835 Leave base.

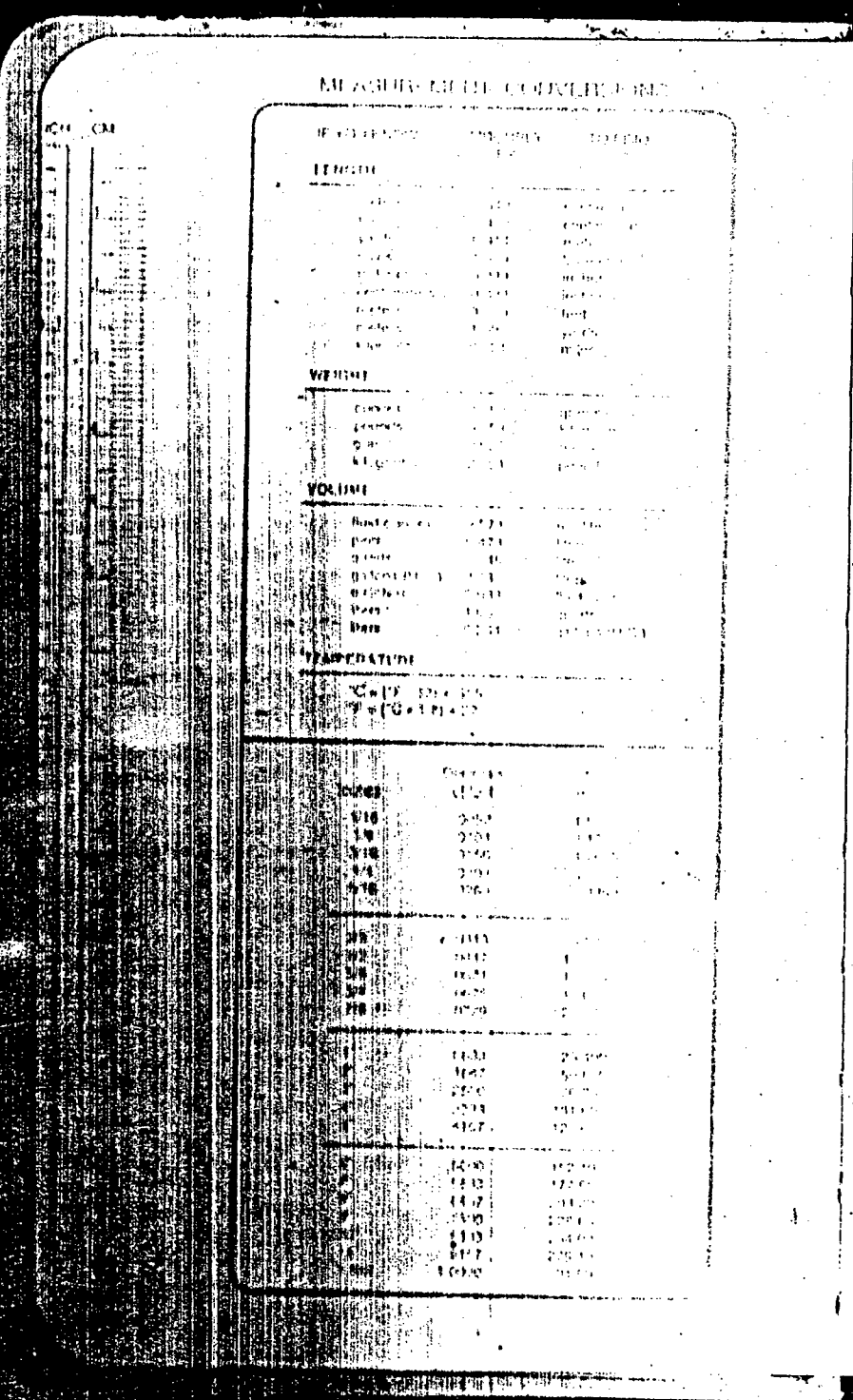


(24)

Saturday 5-20-95

0555 Leave motel
0645 Depart breakfast
0655 Arrive at base. Load truck for slug testing
0730 Arrive at 026-001MW. Set up equipt o slug test.
0910 Arrive at 026-003MW. Set up equip. to slug test.
1120 Left Site 26.
1145 Lunch break
1230 Lunch over
1255 Arrive at Site 26. Arrive at 026-002 MW. Set up equip. to slug test.
1415 Leave Site 26.
1420 Arrive at Bldg 247 to pack up to leave Duluth.
1605 Leave base to go to Fedex.
1620 Arrive at Fedex
1635 Depart Fedex
1640 Arrive at Base. Marked drums.
1725 Leave base

No further entries
Dusty Dreaney



A. Kathleen Merino (K.M.)

4100 NW Loop 410, Ste 230
San Antonio, TX 78229
(210) 731-0000 1-800-677-8072

Duluth SI Sites 26, & 25

Radisson Motel (218) 727-8981

CONTENTS

REFERENCE DATE

K.M. Kathleen Merino

K.P. Kathryn Prittedt

D.G. Destry Greenway

J.B. Joe Byrd



6 May 95

0515 Depart for SM Airport

0620 Flight departs for Duluth, MN

1245 Arrived at Duluth Airport

1315-1400 LUNCH

1400 Arrived at Base met w/ Bruce Berg

1430 Met with base security - Capt Kovach

1515-1615 Staked locations at Site 25

1630 Left base

END OF DAY

no entry
A. Jones



2 May 95

| | |
|---|---|
| 0700 | Met Hotel lobby |
| 0715-0830 | Breakfast and Planning meeting for days events |
| 0845-1115 | Organized supplies and stake Site 26 locations |
| 1130-1230 | LUNCH |
| 1203-1315 | K.M. organized and inventoried sample bottles form lab. |
| 1315-1525 | Prepared labels for samples |
| 1525-1630 | Staked locations at site 17 and returned to base. |
| 1645 | Left base. END OF DAY |

A. Jones

no entry
A. Ferguson



3 May 95

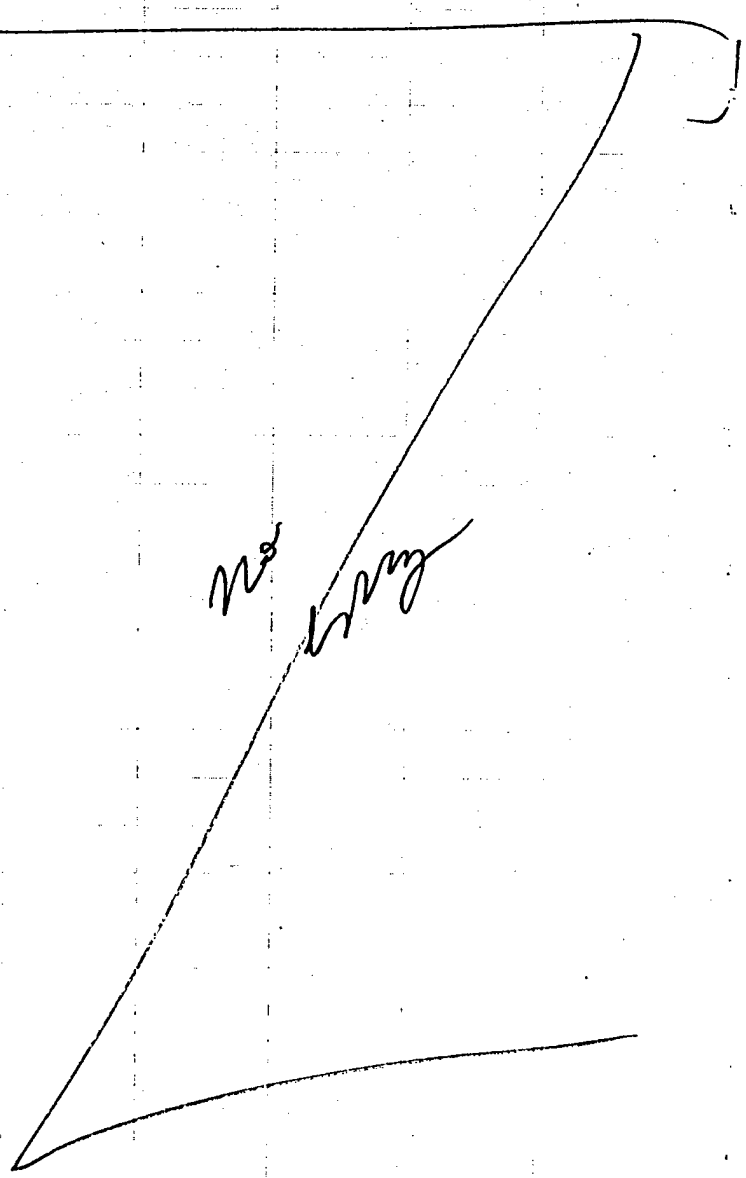
0545 Met in hotel lobby and departed for breakfast

0600-0645 Breakfast and planning meeting for day.

0700 Prepared supplies for drilling.

0800-0930 Drillers arrive and begin decon augers, etc. at area south of hill (at site 25). Decon was accomplished by preparing site with pallets w/ plastic on top and bottom and placing auger flights on top of plastic covered pallets. Water source was tank on truck with water from the City of Duluth. Water (steamer) was clear from truck tank. Truck & driller rig decon w/ steamer

A. Ferguson





3 MAY 95

0930-0985 Drillers rinse truck, auger w/ liquinox soap.

1030-1720 LUNCH

1130 Prepared site 26 for soil boring drilling

1215 Site Safety Meeting

1230 Began drilling 026-006 BH9

7/9/9/7 0.5-2.5 BLS

1245 sample @ 2.0-2.5 ~~1245~~ 1140

11/13/19/10 5-7 BLS

1300 sample @ 6.5-7

12/14/17/21 8-10 BLS

sample @ not collected

no recovery

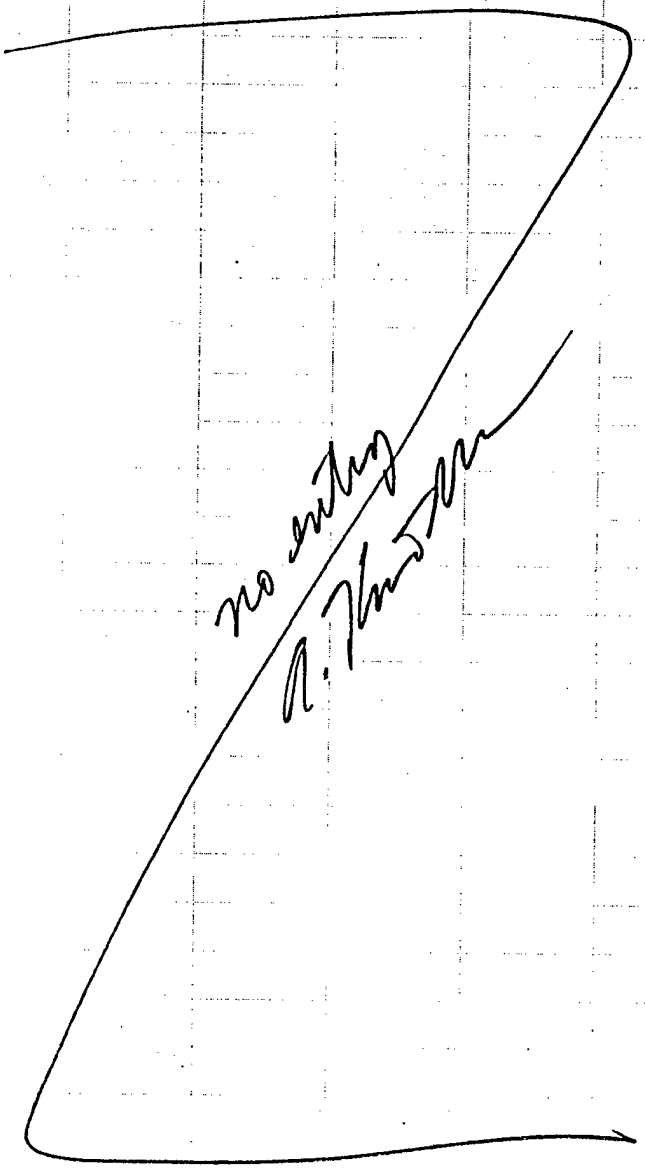
9/15/20/21 10-12 BLS

sample @ 11.5-12 1320

TD = 12' BLS

A. [illegible]

8




3 MAY 95 9

1335 Moved to 026-005BH
1340 drove 1st spoon 0.5-2.5'
~~3 MAY 95 5-7~~ ' a.m. 0.5-2.5 BLS
1345 sample @ 2.0-2.5 (1.5-2.5)*
1348 dup sample @ 1.5-2 (.5-1.5)*
* Lab designation
1356 6.5-7 sample @ collected for lab
1400 9.5-10 sample collected for lab
TD = 10' BLS
1420 Moved to 026-004BH
1432 sample @ 2.0-2.5 BLS
Poor recovery at 5-7 BLS
1447 sample @ 9.5-10 BLS
Auger 2½ ID
Borehole diameter 6"
Geologist: Kathleen Merino
1535 ~~BS~~ 026-001BM
sample @ 9.5-10.0
sample @ 7.0-9.5 MS/MSD

10

no entry after this

3 MAY 95 11

1540 second hole at 026-001 BH sample @ 2.0-2.5 BLS

1545 second hole at 026-001 BH sample @ 6.5-7.0 BLS

1550 Began cleaning up site

1650 collected equip sample blank @

1655 Prepare COC and organize samples

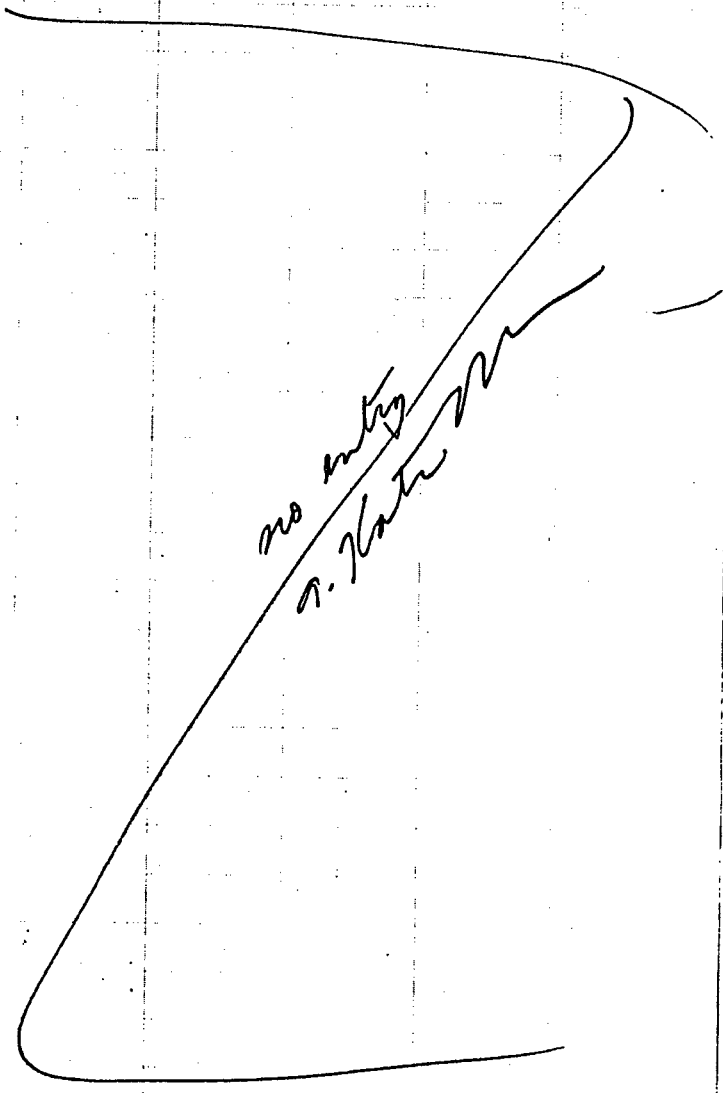
1800 Dropped samples off at Fed-Ex

Airbill #453073512 3

Samples sent:

| | | B240 B270 6010 7196 7421 |
|---|---|---|
| 026-001 BH | 2-2.5 | |
| 026-001 BH | 9.5-10 | |
| 026-004 BH | 2-2.5 | |
| 026-004 BH | 9.5-10 | |
| 026-005 BH | 1.5-2.5 | |
| 026-005 BH | 9.5-10 | |
| 026-006 BH | 11.5-12 | |
| 026-006 BH | 2.0-2.5 | |
| 026-005 BH | 0.5-1.5 | |
| 026-001 BH | 9-9.5 MS/MSD | |
| EB JVOA | | 8240 |
| EB LL | | 8270 |
| EB .5L | | 6010 7196 7421 |

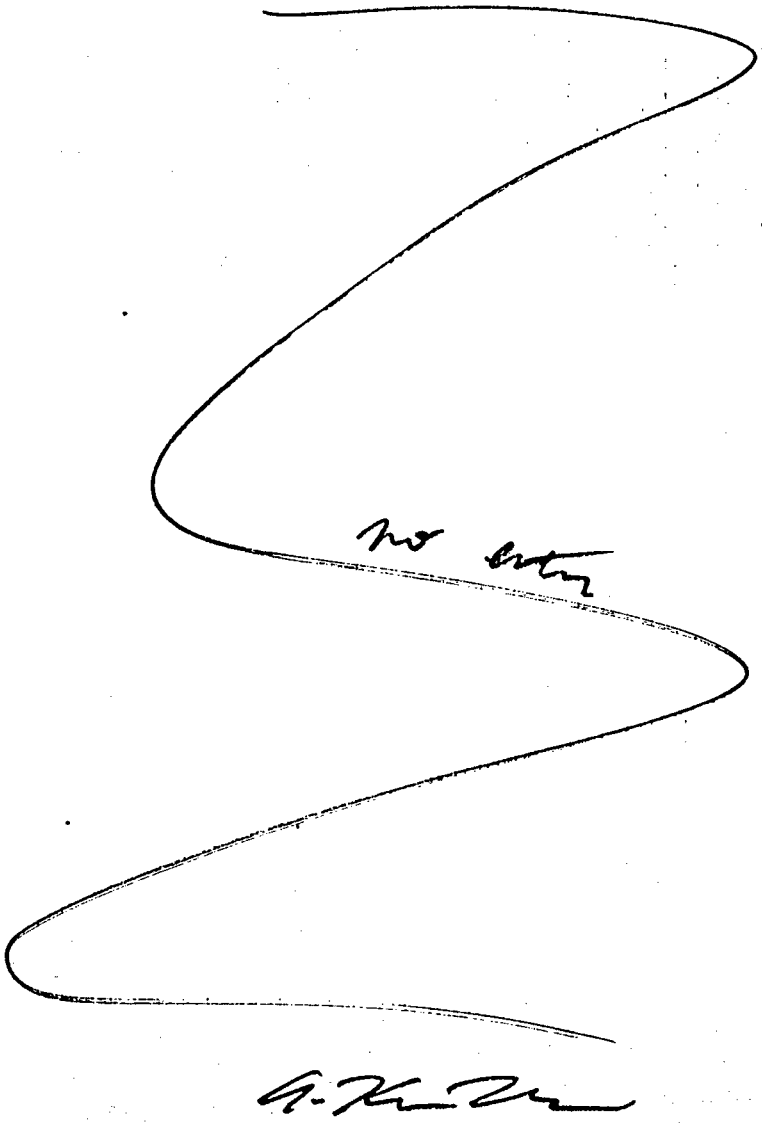
12




3 MAY 95 13

1815 Arrive back at Hotel

END OF DAY



no entry



4 May 95

0545 Met lobby, breakfast
-0640 planning meeting

0655-0715 Arrived at site, loaded van. Waiting for drillers.

0715-0815 Contacted fire dept. for water supply for drillers truck tank.

0815-0845 Drillers decon'ed auger flights

0900 Arrive site 26 begin site prep

0900-0910 Health & Safety Meeting

0915 Drillers mob to 026-002 BH

0920 ~~Fo[illegible]~~ water level = 6.8' from ground surface

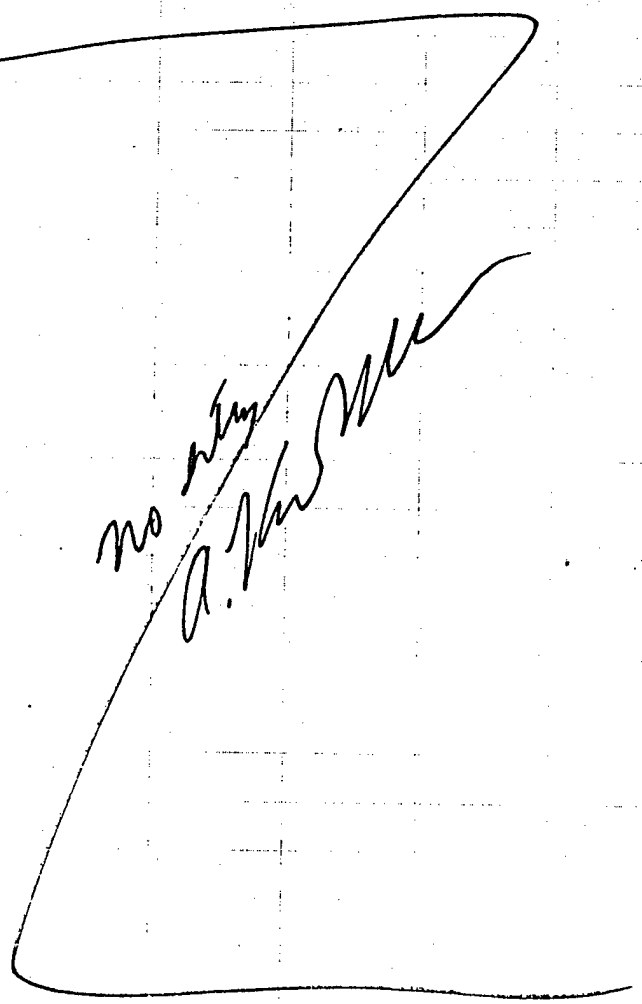
0922 Began drilling 026-002 BH

A. Thomas

no entry



| | |
|---|---|
| 3/3/5/00 | 0.5 – 2.5 BLS No recovery. Sample |
| 0945 | collected @ 5-7'. Water |
| ~~0945~~ am | encountered ~5' BLS. Recovery problem on .5-2.5 (moved hole over) 4-6 |
| | Moved hole again |
| 1007 | 0.5-2.0 BLS Sample @ 2.5-2.0 |
| 1120 | Sample @ 2.5-2.0 from 026-003 BH |
| 1125 | Sample @ 6.5 – 7.0 |
| 1130 | Clean up site |
| 1145- | LUNCH |
| 1245 | Break |
| 1425 | Waited for drillers to grout, redrilling 026-003 BH to collect duplicate sample for 026-003 BH |
| 1435 | Sample @ 2.0-2.5 (mark 1.5-2.5 cd on COC) |
| | Sample @ 1.5 -2.0 (marked 0.5-1.5 (OC) |





4 MAY 95

1445 Returned to Bldg 247 to watch drillers decon rig & truck

1515 Collect equip blanks.

1530 Return to site 26 to begin drilling MWs

~~1630~~ akm Driller needing rig equipment cannot proceed.

1630 Load Truck and

-1700 leave site. Pack sample cooler. Take samples to FedEx

1800- Go to store for

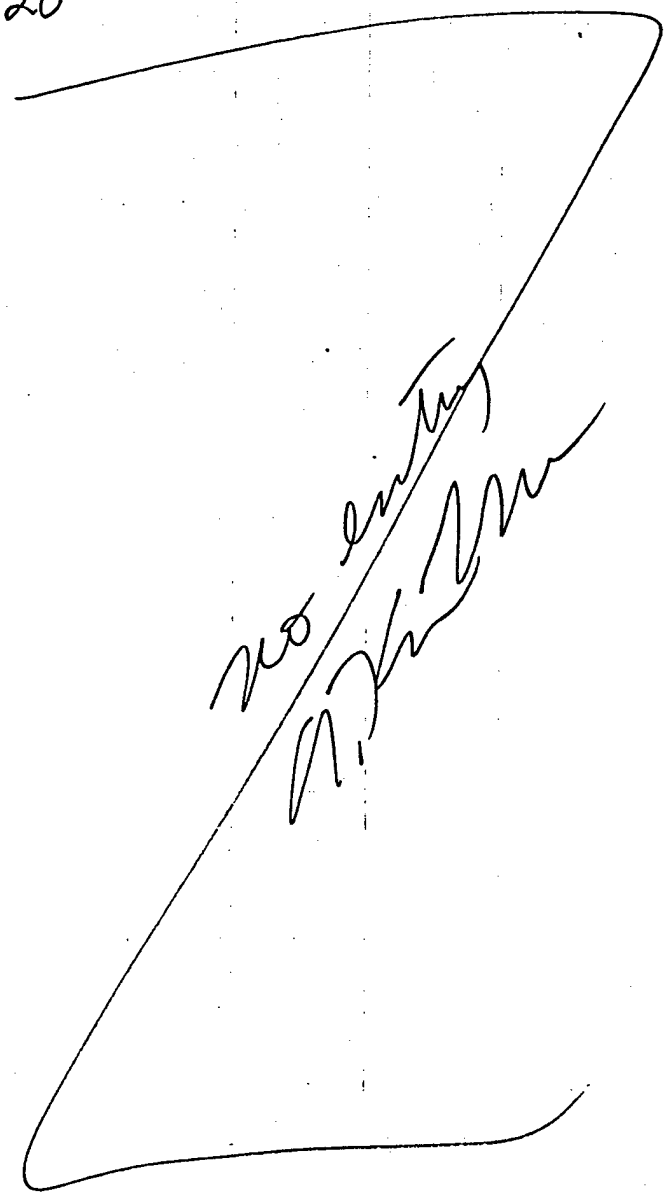
1830 supplies

1845 Arrive back at hotel

Samples sent:

SOIL 026-002 BH 2-2.5
026-002 BH 6.5-7
026-003 BH 0.5-1.5 actually (1.5-2.0)
026-003 BH 1.5-2.5 actually (2.0-2.5)
026-003 BH 6.5-7.0
026-002-RB (3 VOA)
026-002-RB (1 L Amb)
026-002-RB (5 Plas)

END OF JOB





5 May 95

0545 Meet lobby Hotel go
-0630 to breakfast + planning meeting

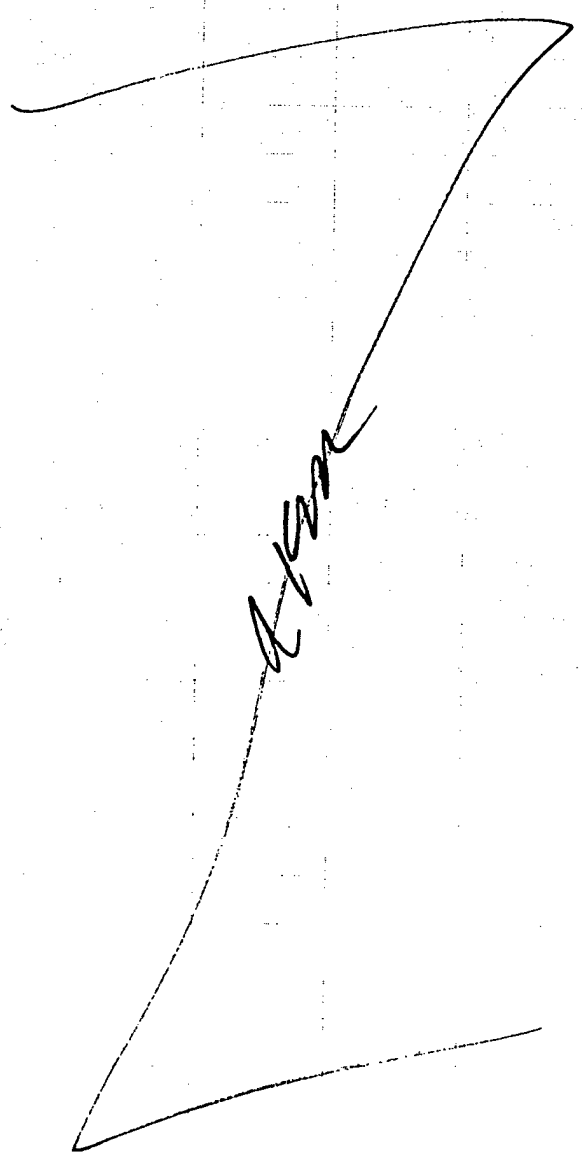
0635 Arrive at base
-0745 load supplies

0800 Arrive site 26
Begin drilling 026-001MW

0935 Drilled down 22'
water ~ 17.2'

0945 water 17.2' BLS
well constr: 026-001MW
15-25' BLS screen
13-26' BLS sand
11-13' BLS bent
4-11' BLS grout
0-4' cement

1045 Randy Wolff arrived on site from AET, Inc to bring well const. equipment.
Wheelabrator® Screens Sch 40 Slot #10
Johnson # 29578C
# 29594C
Sand Red Flint #5/55



5 May 95



1115 - 10 screen down hole
- [redacted] (10' sections) + cap
fill
650lb bags of sand down hole

1230-130 LUNCH

- 24.2 Bottom of screen

1430 - Bentonite seal installed

1445 - Well casing left in hole w/ bentonite seal, cement & flushmounting will be done at a later time

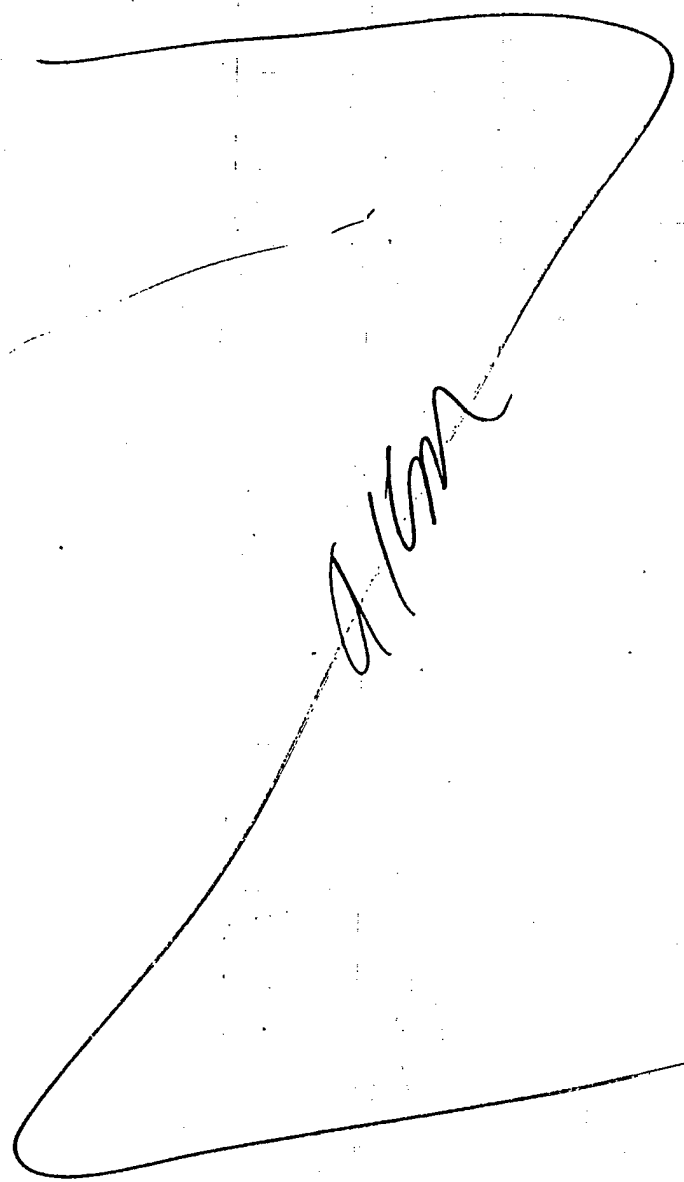
1500 Return to BLDG 247 to pack up supplies.

1615 Left site to go to Target for supplies

1645 Returned to hotel

END OF DAY!

[redacted]

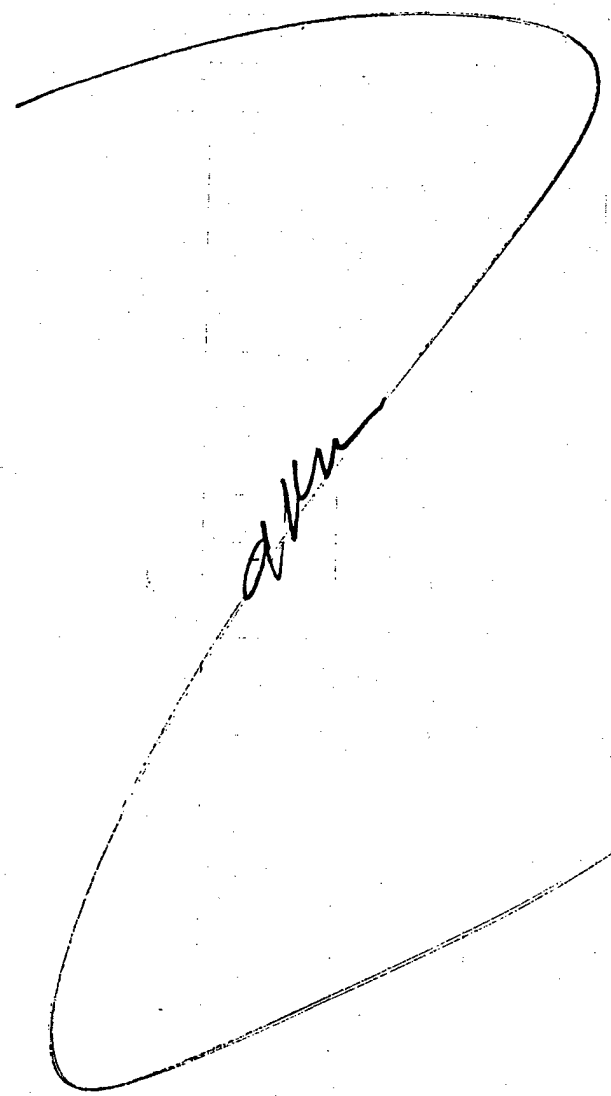




6 May 95

| | |
|---|---|
| 0545 | Met for breakfast & planning meeting |
| 0645 | Arrived on base loaded truck. |
| 0750 | Drillers arrive |
| 0800 | Decon split spoons |
| 0805 | Health & Safety briefing. |
| 0832 | ~~collected~~ @ 5-7 from 026-003MW |
| 0837 | ~~rette~~ recollected 6.5-2.5 again collected poor recovery. 15-17* |
| 0900 | wl = 8.7 BLS |
| 0904 | recollect 0.5-2.5 no recovery |
| 0920 | wl = 6.3' BLS |
| 0929 | wl = 6.3' BLS |
| 1000 | set bottom screen at 15.5' BLS |

*Geotechnical sample

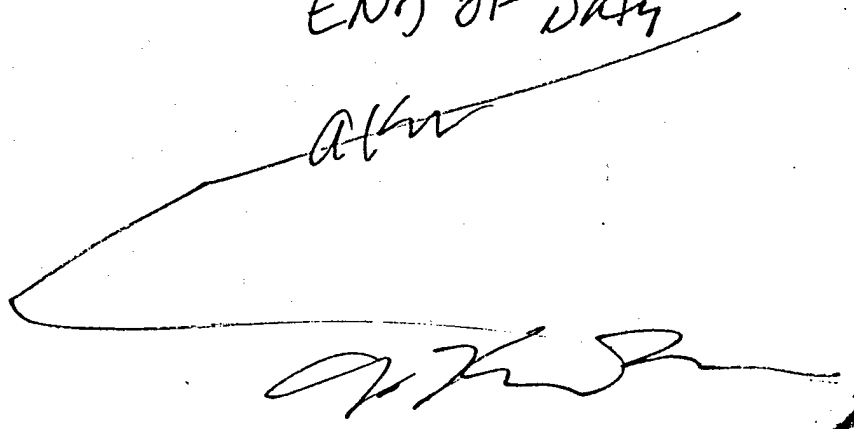


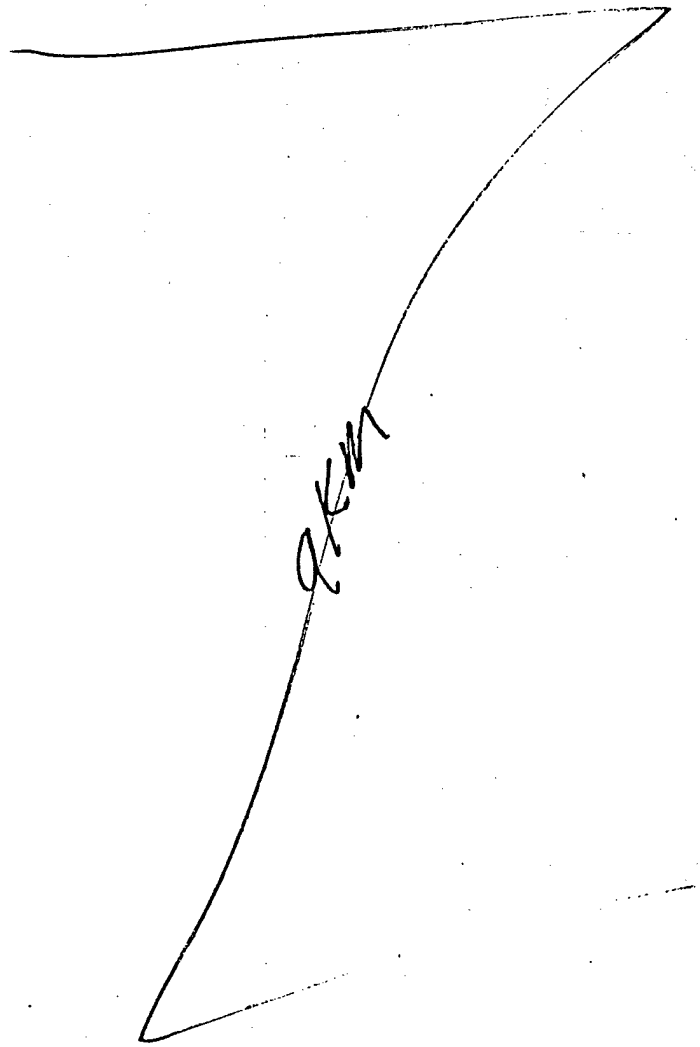


6 MAY 95

| | |
|---|---|
| 1100 | LUNCH |
| 1200 | Returned to site |
| 1230 | Begun drilling 026-002MW |
| 1300 | sample @ 15-17 for geotechnical |
| 1330 | well construction left augers in ground to allow water to stablize |
| 1500 | Return to BLDG 247 unload supplies |
| 1530 | left site |

END OF DAY







8 May 95

0545 Met lobby

0600 Breakfast
-0645

0850 Arrive on site load supplies in truck

0745 Drillers arrive on-site H&S meetin

0800 Check water level at 026-002 MW wl = 13.4' BLS

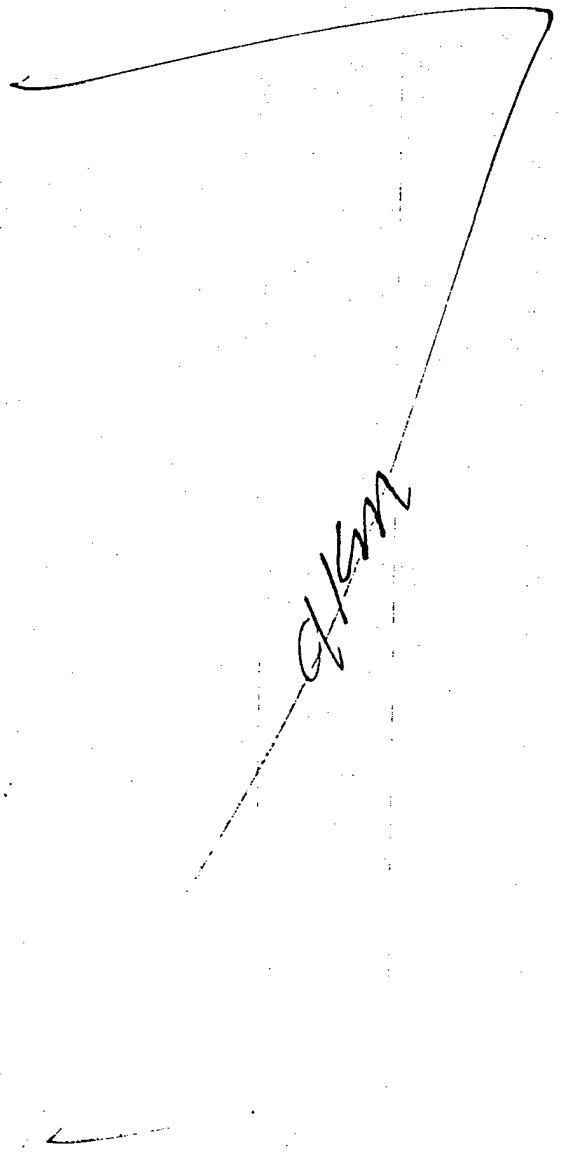
0820 Drilling down to 22' due to wl measurement.

0830 25 Alg Lith sample from 20-22 collected

0830 wl = 11.3 BLS Begin well const.

1015 Top of sand 6.4' BLS

Bits 45/55 Red C-L silt sand

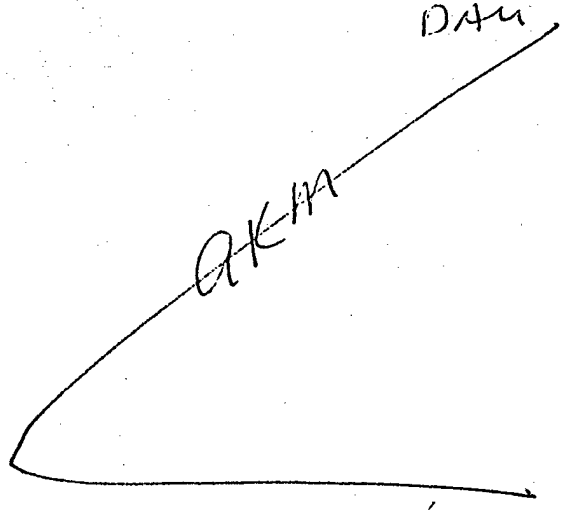


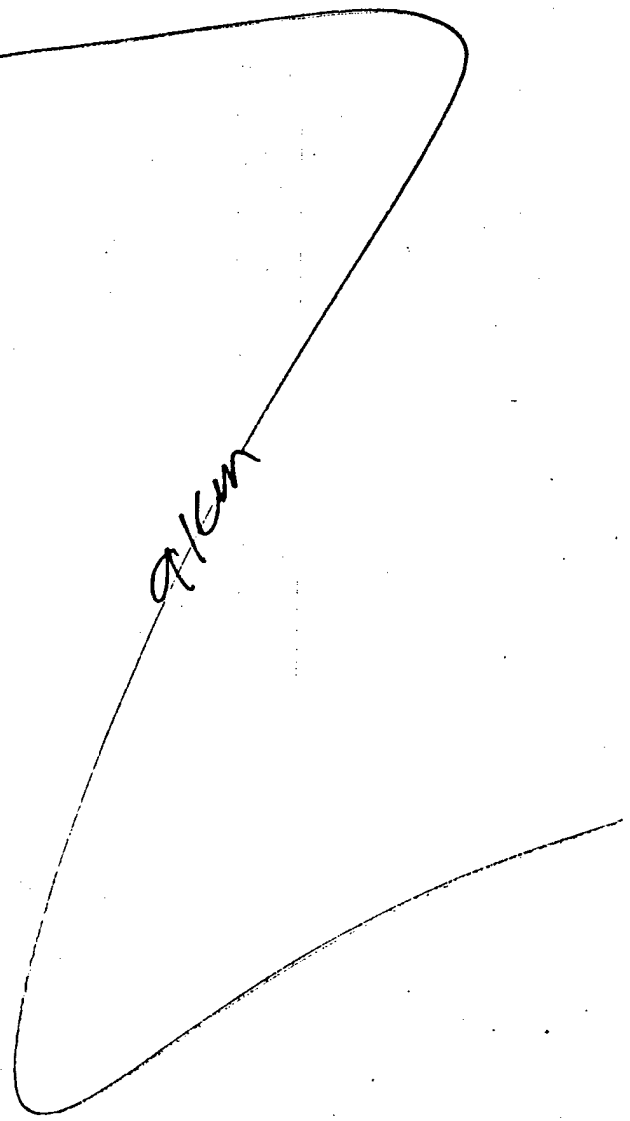


8 MAY 95

| | |
|---|---|
| 1030 | Bottom of screen 47.4' BLS TD: 20' |
| 1130 | Finish constr. |
| 1135 | LUNCH |
| 1345- | Arrive site 26- |
| 1505 | surface completion of wells leave site due to weather |
| 1530 | Depart Duluth |

END OF DAY



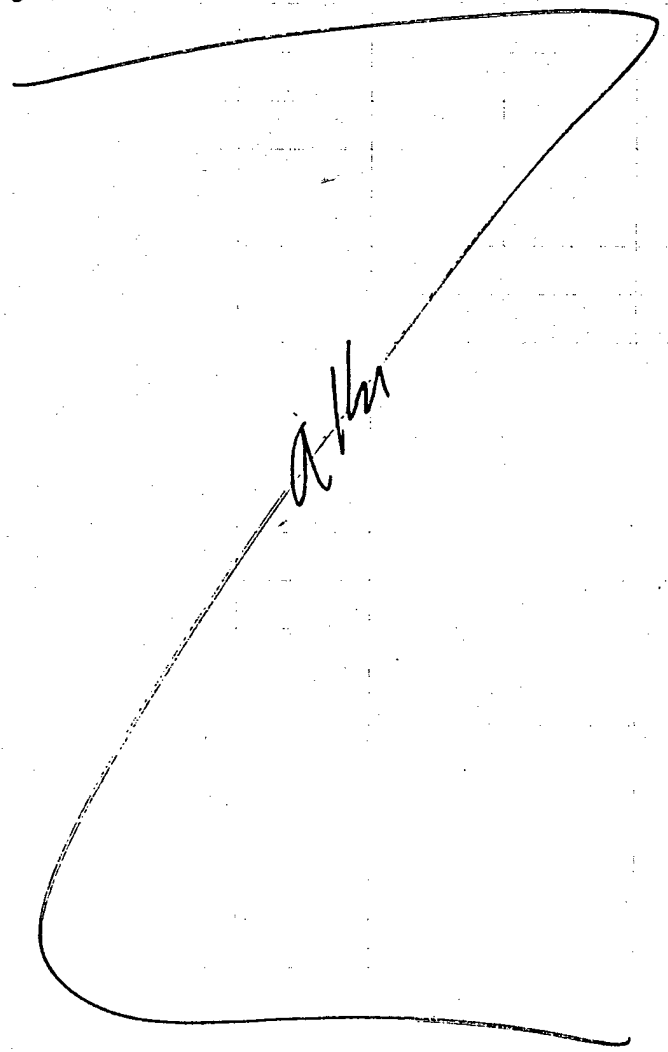




9 May 95

| | |
|---|---|
| 0545 -0630 | Met Lobby, check-out hotel. Breakfast and planning meeting |
| 0645 | Arrived on base. Weather: raining cold temp 40°F, wind chill 16°F |
| 0700 | Call drillers |
| 0800 -1000 | Driller steam clean drill rig (all terrain rig) and clean other rig |
| 1030- 1100 | Return to Hotel |

END OF DAY





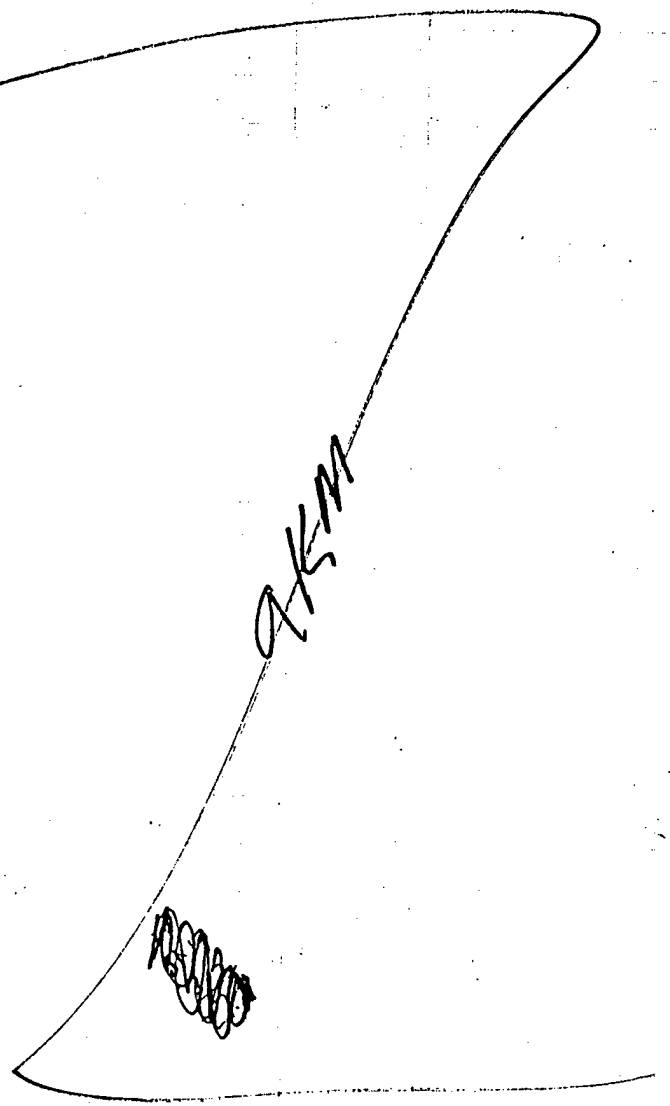
10 May 95

0545 Met lobby, breakfast,
0630 planning meeting
0645 Arrive on base
-0730 set up at site 25
025-001MW
0735- Measure w/l at 021-004MW
0740 wl = ~~9KM~~ 11.68' BTOC

0745 Drillers arrive -
025-001MW

0810 H2S meeting
0820 Began drilling
0950 Drilled to 27', hit water ~22' BLS

0955 wl = 23.8' BLS
1000 wl = 23.5 BLS
1010 wl = 23.2 BLS
1020 wl = 23.2 BLS
1110 Drilled to 35'
~~35~~ 32.5
1120 Drilled to 40' BLS hit bedrock ~39.8' according to rig response



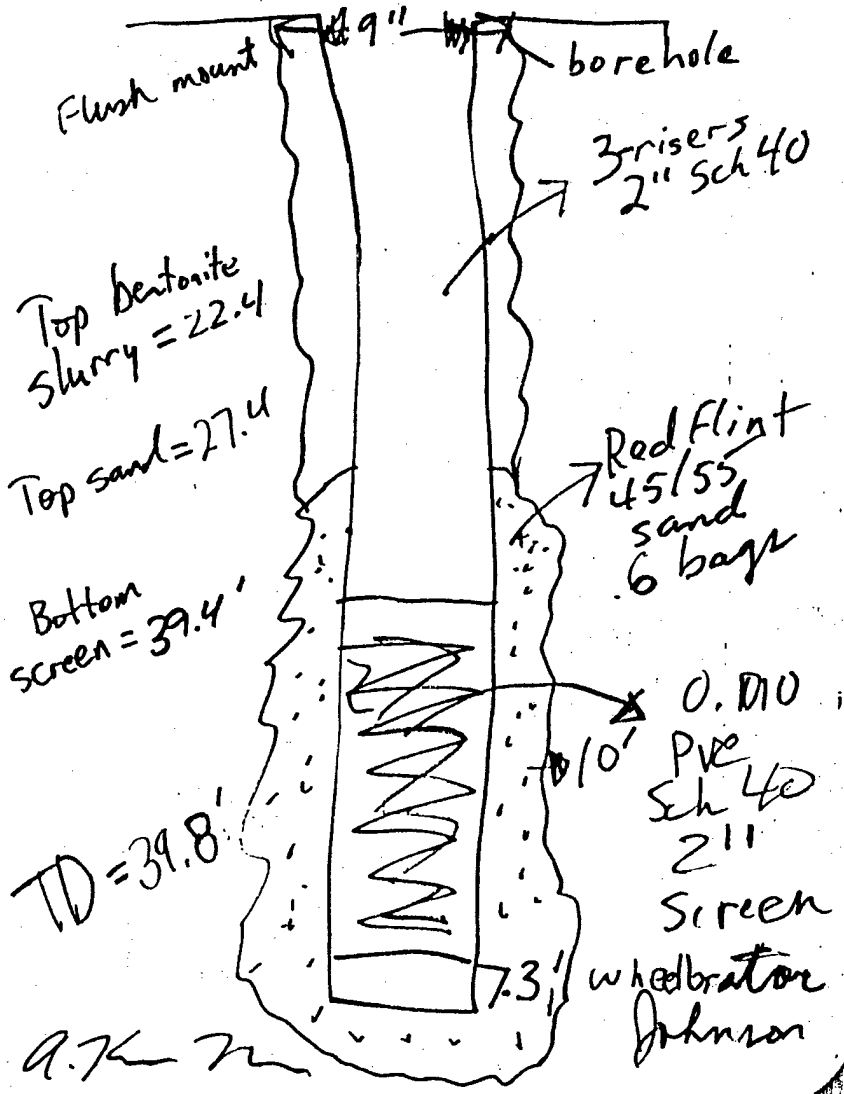


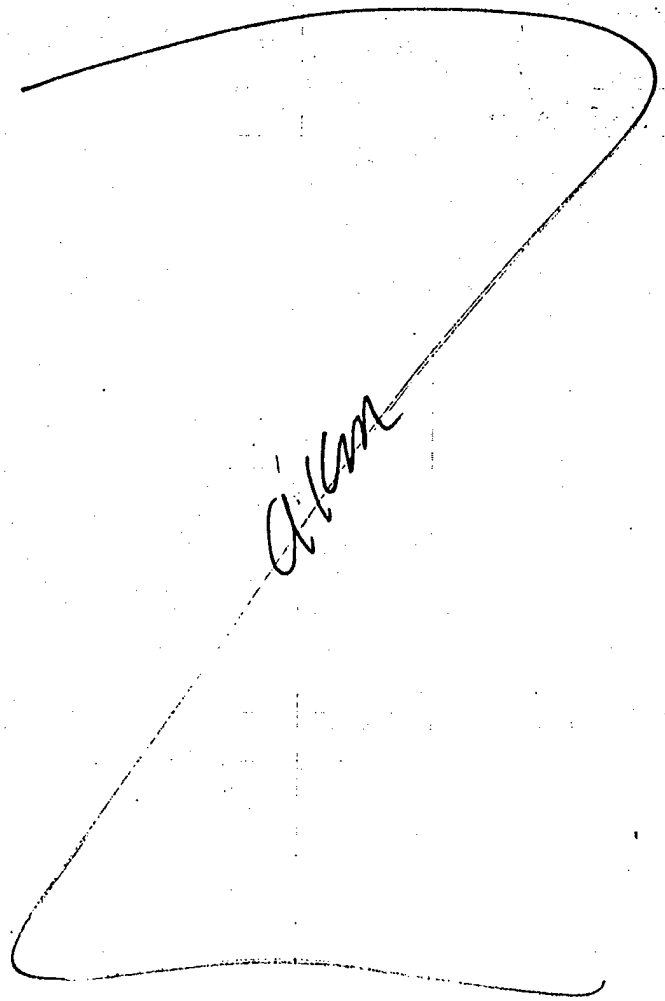
10 MAY 95
1130
1230

025-001 MW

LUNCH

WL = 34.65' BLS








| | |
|---|---|
| 1235 | Screen & Riser pipe inserted |
| 1250 | • Sand tremied down borehole (tremie pipe decon w/ steam cleaner) |
| 1406 | Sand at 27.4' BLS |
| 1435 | Slurry at 22.5' BLS |
| 1500 | Removing final augers |
| 1530 | Bottom of screen = 39.4' BLS |
| 1535 | Drillers start decon flights & truck |
| 1600 | Set up over 025-002MW |
| 1605 1610 AKM | Begin drilling ~~AKM 0.5-2.5 sample~~ |
| 1612 | 0.5-2.5 collected |
| 1620 | 5-7 collected |
| 1630 | 10-12 " |
| 1635 | 15-17 " |

AKM

10 MAY 95

1645-1715 Loaded supplies in Bldg 247

1720-1600 Arrived at Site 26 to meet JB. who has been developing site 26 monitor wells

Returned to hotel

akm



11 MAY 95 Weather: sunny 40-65°F

0545 Met Hotel, breakfast, planning mtg

0645-0720 Arrive on base, set up for drilling at decon near BLDG 247 (South of)

0730 Drillers arrive at Site 25. H&S meeting

0745 wl at 025-002MW
wl = 6.0' BLS
wl at 025-012PM
wl = 7.11' BTOC
TOC ≈ 2.2' above LS
wl ≈ 5.89' BLS
TD = 16.90' BTOC

0755 025-002MW
-Drillers advanced augers to ~~15.9'~~ 16.0' BLS

0815 Began well constr.
10' Sch 40 PVC Screen
Wheelabrator Johnson

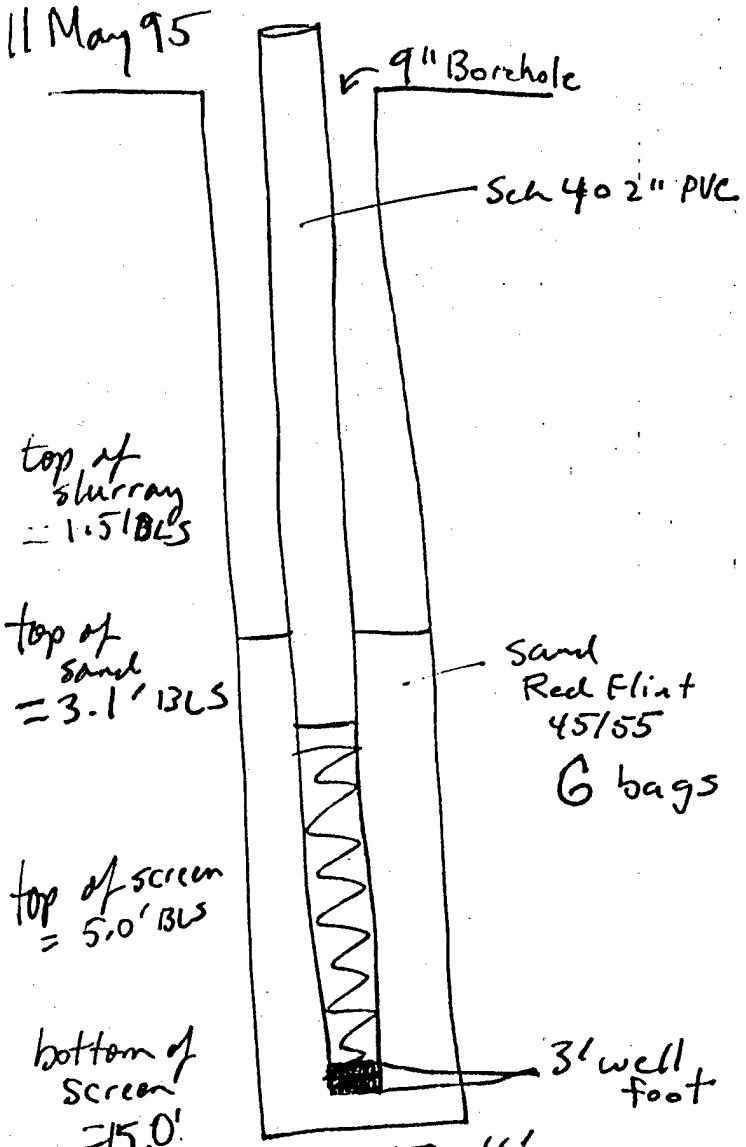
0820-0835 Driller's steamcleaned tremie pipe

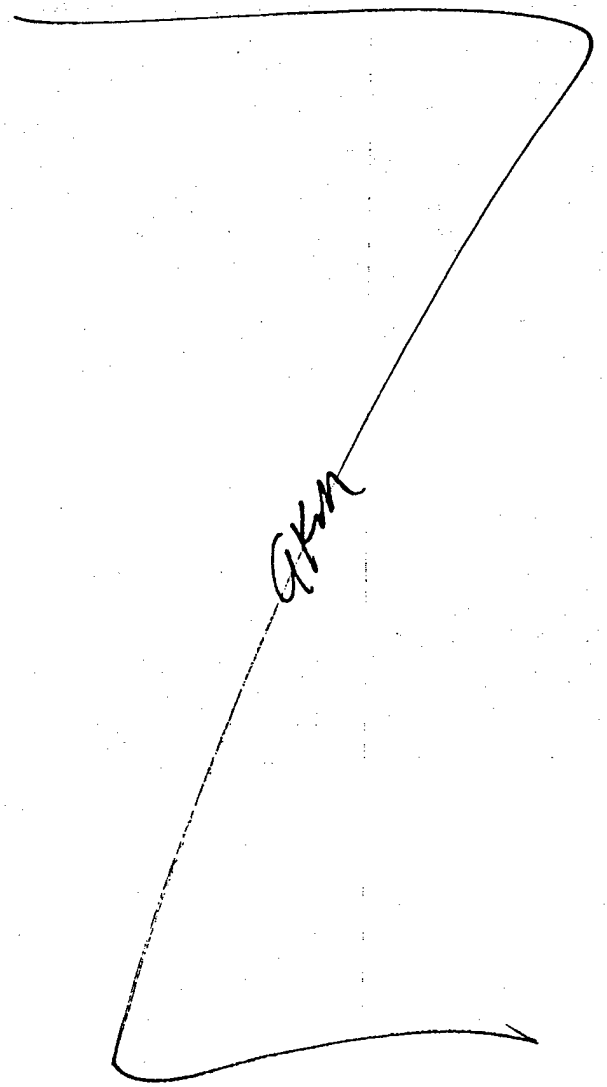
akm

AFM



11 May 95


9" Borehole
Sch 40 2" PVC
top of slurray = 1.5' BLS
top of sand = 3.1' BLS
Sand Red Flint 45/55
6 bags
top of screen = 5.0' BLS
bottom of screen = 15.0' BLS
3' well foot
TD = 16'





11 MAY 95

| | |
|---|---|
| 0840 | Began treming sand down borehole |
| 0922 | Top ~~stadt~~ sand = 3.1' BLS<br>Bottom of screen = 15.0' BLS |
| 0950 | Began preparing concrete |
| 1050 | Installed riser pipe and guard posts |
| 1115 - 1230 | LUNCH |
| 1230 | Drillers begin decon of augers & truck |
| 1300 | Finish decon |
| 1310 | Set up over 025-003MW, stabilizing rig on hill. |
| 1345 | Moved hole over ~50' north to a more stable location<br>Began preparing for drilling. |

G. K. M

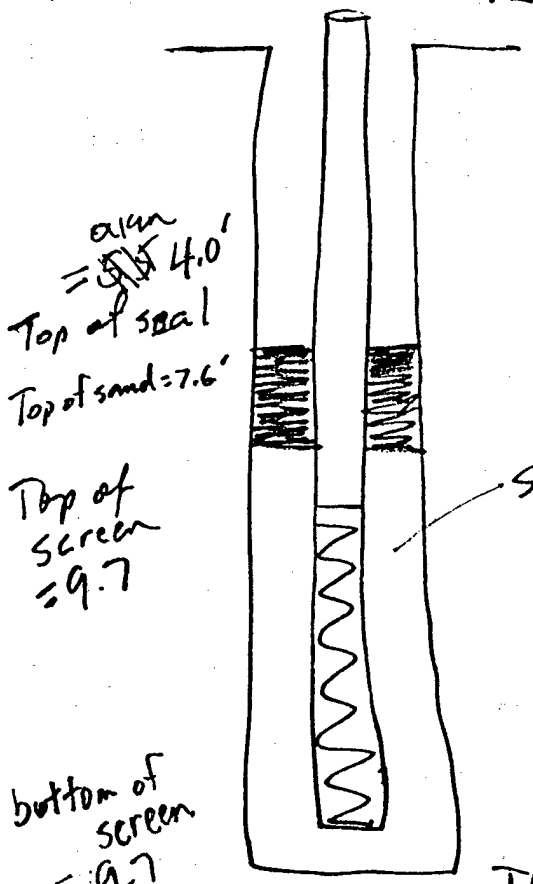
48

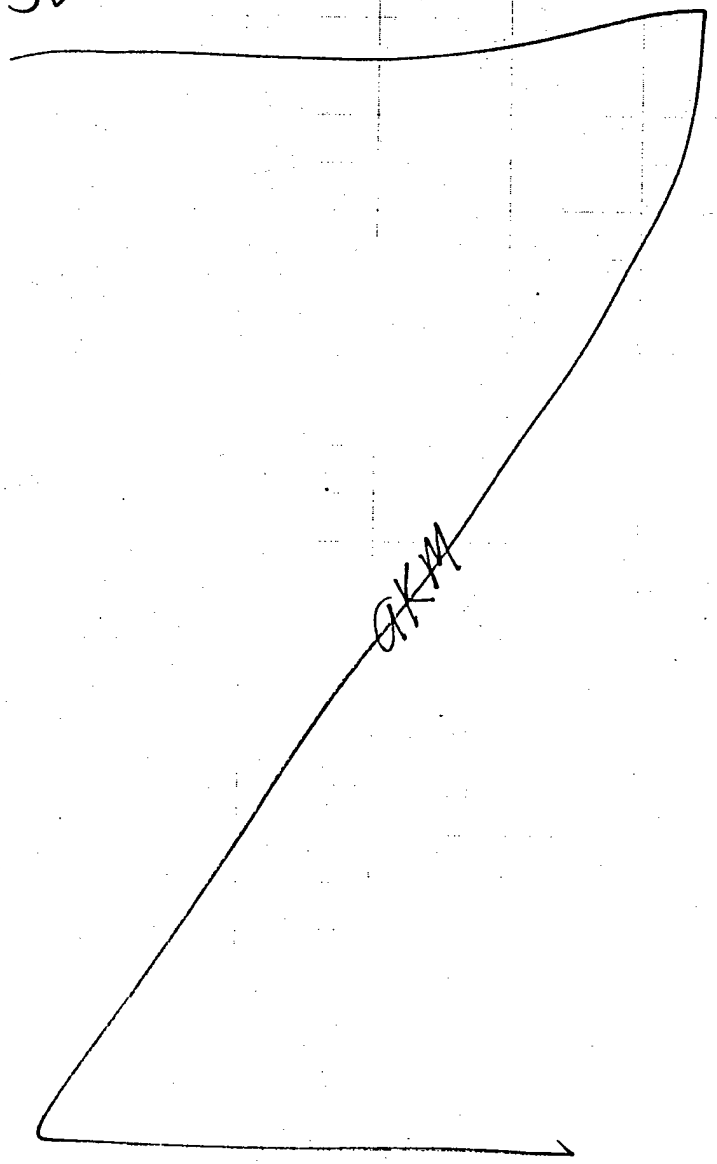
49

025-003MW

1400 collected 0.2-2.5'
1415 " 5-7'
1420 " 8-10'
1425 " 15-17'
1435 " 20-22'
1440

wl = 12.7' BLS



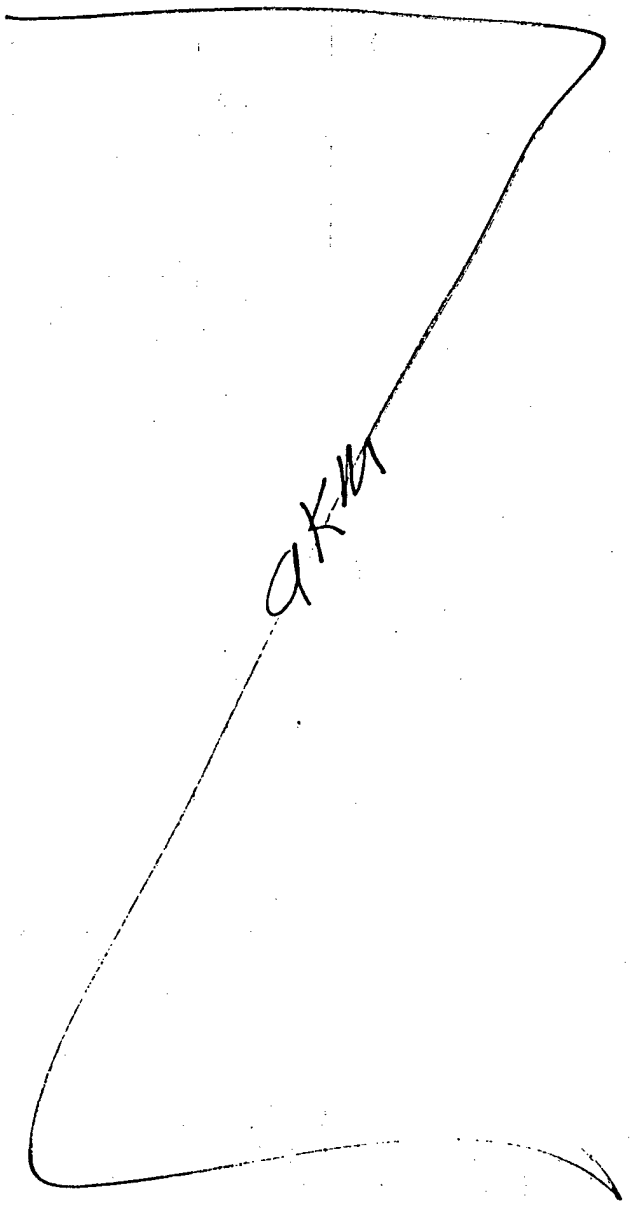





| | |
|---|---|
| 1450 | Drillers begin well constr. |
| 1500 | Drillers begin sand tremie |
| | PID = 40 ppm at top bh |
| 1510 | Borehole opening |
| | PID = 6.0 ppm |
| | Breathing zone |
| | PID = 0.0 ppm |
| 1520 | Borehole opening |
| | PID = 8.3 ppm |
| 1530 | Top of sand = 7.6' |
| 1540 | Bottom of screen = 19.7' |
| 1550 | Top of bentonit = 5.5' |
| 1554 | " = 4.0' |
| 1615- | Finish loading supplies |
| 1625 | in BLDG 247. Drillers |
| | installed riser casing |
| | Drillers leave site |
| 1630 | Leave for Motel |

END OF DAY

G. Kamm






12MAY95 Weather sunny, warm 80-70°F

0545 Met hotel lobby, breakfast, planning meeting

0630 Arrive at base

0635 Set up at Site 25. Drillers completing guard post and surface completion of 001-003 wells

~~293~~

0930 Drillers begin decon of rig & flights

1000 Finish decon move to 025-008BH

1020 sample @ 0.5-2.5 screening only

1027 sample @ 5-7 - no recovery

1035 sample @ 7-9 screen only

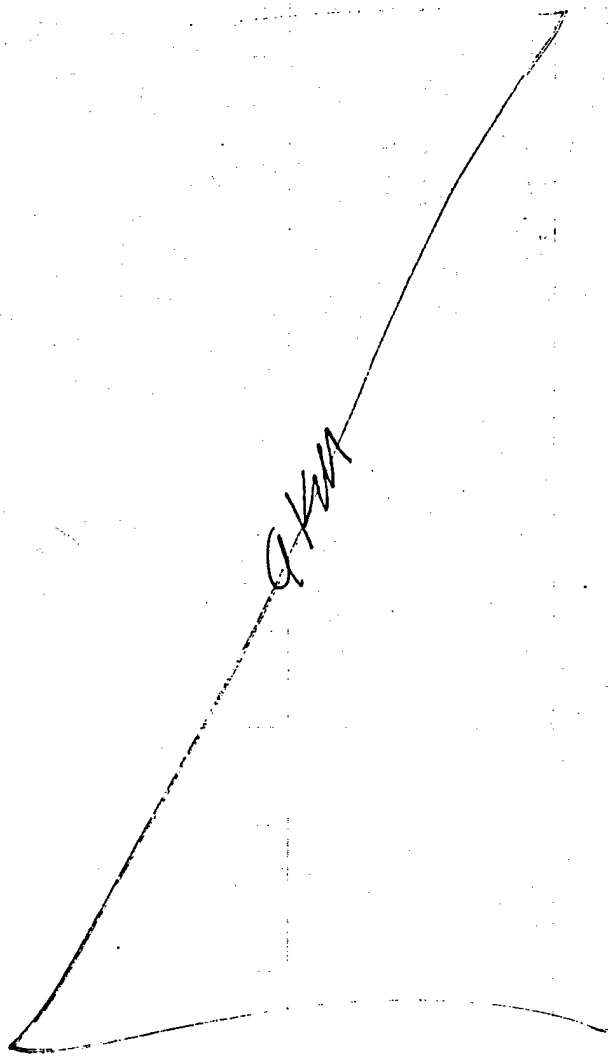
1046 sample @ 9-11 lab+screen

1100 sample @ 13-15 lab+screen

- 6" Borehole diameter
- 2¼ auger

1125 Broke down for lunch

A-Kn





1240 Return to site prepare for 025-011 BH

1250 Sample @ 0.5-2.5 lab

1300 Sample @ 5-7 lab

Moved to 025-010BH

1320 Sample @ .5-2.5 no rec.

1330 Sample @ 5-7 (lab)

1340 Sample @ .5-2.5 (lab)

1345 moves to 025-009BH

1410 Begin drilling on auger

1415 sample @ 0.5-2.5 lab

1420 sample @ 5-7 lab

1430 Sample @ 11.5-12 (marked 11-12)

(1440) Dup sample @ 11-11.5 (marked 10-11)

1435 Sample @ ~~14.0-15~~ 14.5-15.0 lab

MS/MSD sample @ ~~14.5-15.0~~ 14.5-15.0

1500 Begin drilling 025-006 BH

1505 sample @ 0.5-2.5 no lab

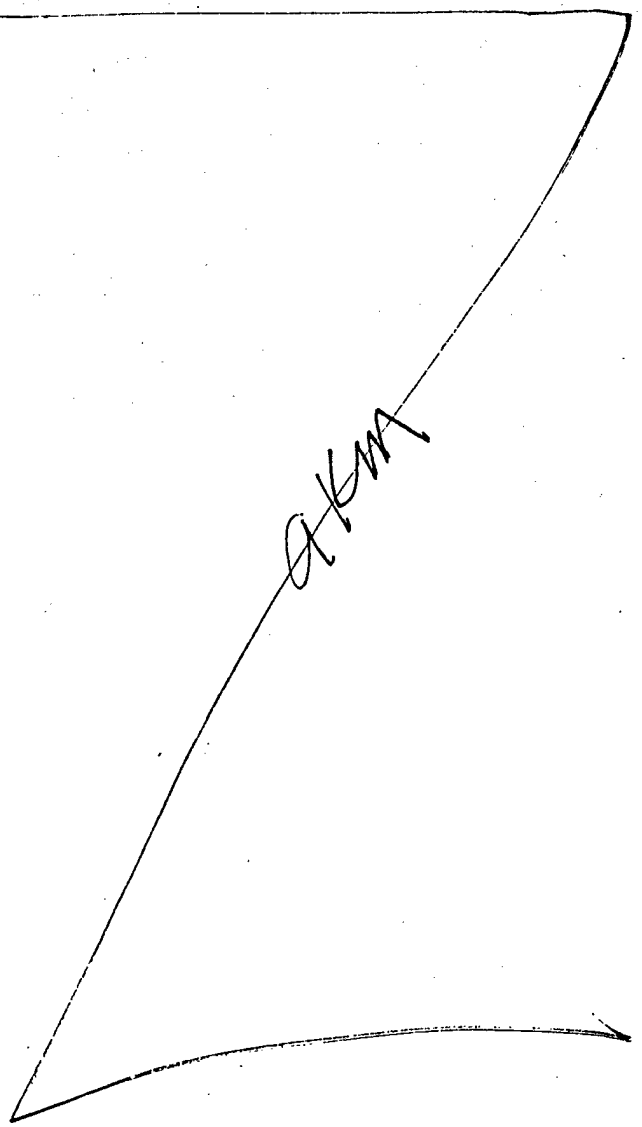
1510 Sample @ 5-7 no lab

1520 " 10-12 no lab

1535 " 18-20 no recovery

1545 " 20-22 lab

1550 Pull augers





12 MAY 95

1600 Samples to lab:

- 025-008 BM 10.5-11'
- 025-008 BM 14.5-15'
- 025-010 BM 2.0-2.5'
- 025-010 BM 6-6.5'
- 025-011 BM ~~6.5-7.0~~ 20-2.5

~~025-011 BM 6.5-7~~

- 025-011 BM 6.5-7
- 025-006 BM ~~20~~ 21.5-22'
- 025-009 BM 11-12
- 025-009 BM 10-12 (DUP)
- 025-009 BM 14.0-14.5
- 025-009 BM 14.5-15 MS/MSD

Equip blank:
3 VOC 8240
1 LAmb 8270
1 Plas Metals

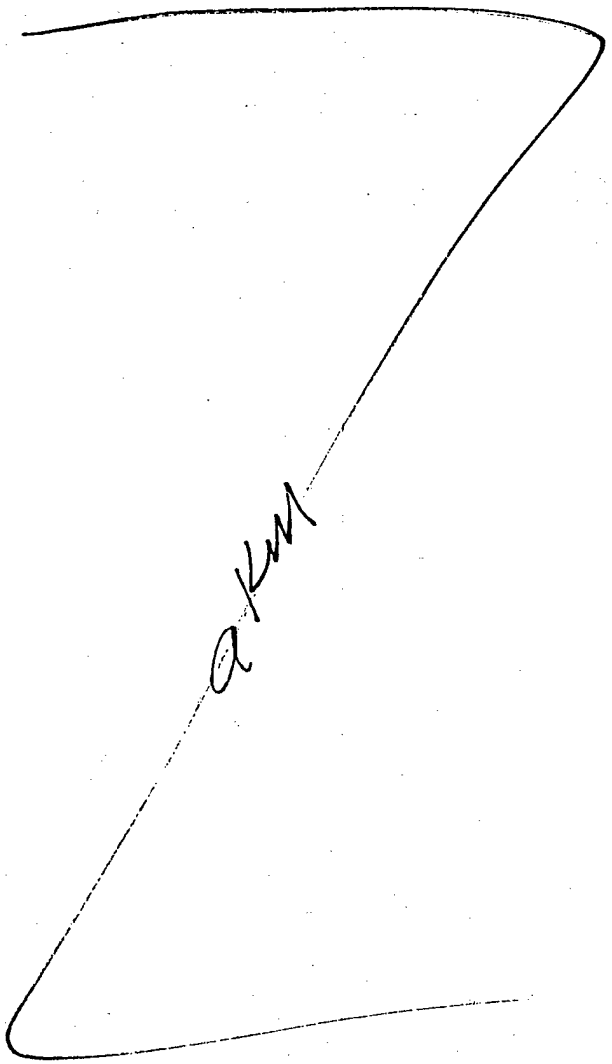
1625 Prepared equip blank (025-001 RB)

1630 Load sample cooler
1730 & ship to FedEx
1810 Arrived at hotel

15 MAY 95

| | |
|---|---|
| 0545 | Meet Lobby, breakfast & planning meeting |
| 0630 | Arrive at base |
| 0635 | Go to store for supplies |
| 0645-~~730~~ 0815 | Prepare Site 25 for drilling. Drillers obtaining water. |
| 0930 | Health & Safety meeting |
| 0935 | Set up over drill rig on 025-003 BH |
| 0948 | sample @ .5-2.5 |
| 0952 | " 5-7 |
| 1000 | sample @ 11.5-12 marked (11-12) |
| 1000 (1005) | " 11.0-11.5 (10-11) marks |
| 1032 | " 16.5-17 (16-17) |
| 1032 (1040) | " 16.0-16.5 (16-17) |
| 1040 | " 20-22 |
| 1052 | " 23-25 no recovery |

~~TD = 25' on 025-003 BH~~
GKm






15 May 95 Sunny, cool, breezy 40-60°F.

~~025-003 BH drilled to 27'~~ ~~TD = 27'~~

1105 Sample at ~~25-27~~ 24-25 also screening only

(24-25' sample represented slough from 24-25')

TD = 25' on 025-003 BH

1120 Decon site for next hole, drillers greating 025-003 BH.

1220 Return from lunch ~~and setup over~~ 025-002 BH

1245 ~~sample @~~ .5-2.5

1250 " 5-7

1305 " 10-12

1310 LEL = 12

PID at bottom 42 ppm

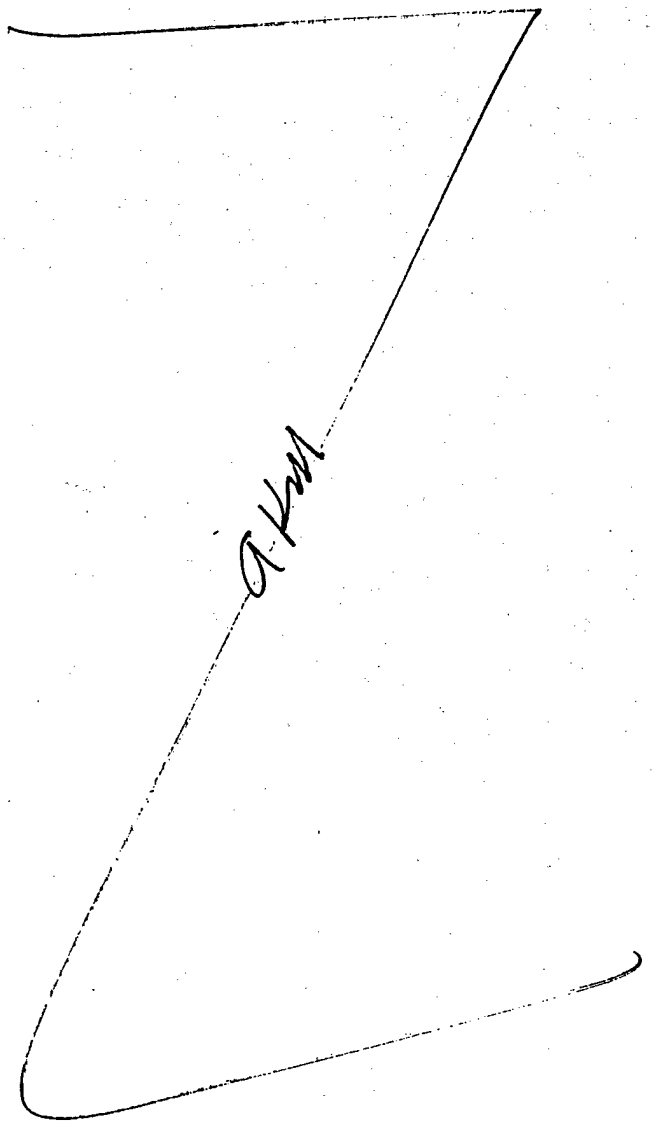
stopped drilling

1320 K.P. calling office

borehole opening = 12 ppm

1325 " " = 11 ppm

LEL = 0



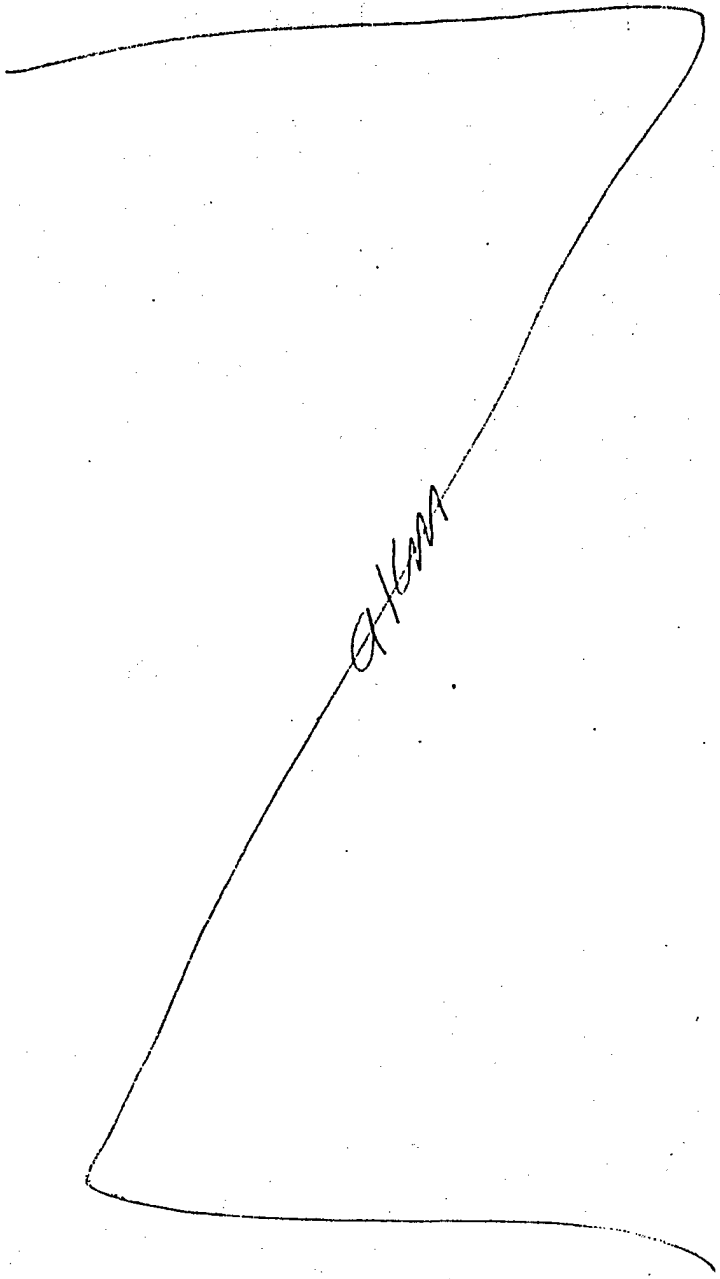
15 MAY 95

| | |
|---|---|
| 1430 | Moved to 025-04BH |
| 1500 | Sample @ .5-2.5 |
| 1542 | " 5-7 |
| | LEL = 11, shut down bore hole |
| 1600 - 1740 | Began cleaning up site and selecting samples & send to lab. Pack cooler |
| | Dropped samples at Fed EX |
| 1750 | Stopped for supplies |
| 1630 | Arrived at hotel |
| | END OF DAY |

AKM

AKM

✓



16 May 95

0545 Met hotel, breakfast planning meeting

0630 Left for base and

0645 arrived at base

0800 Set up for safe and H & S briefing

820 collected .5-2.5 at OBS-007B1-1

0827 Sample @ 5-7

0835 " 10-12 LAB 11.5 12

0840 " 15-17

0850 " 20-22

TD = 22'

0900 Moved to OBS-005 B4

0935 Sample @ 0.5-2.5

0940 " 5-7 no rec.

0950 " 10-12 LAB 11.5 12

1001 " 18-20 no rec.

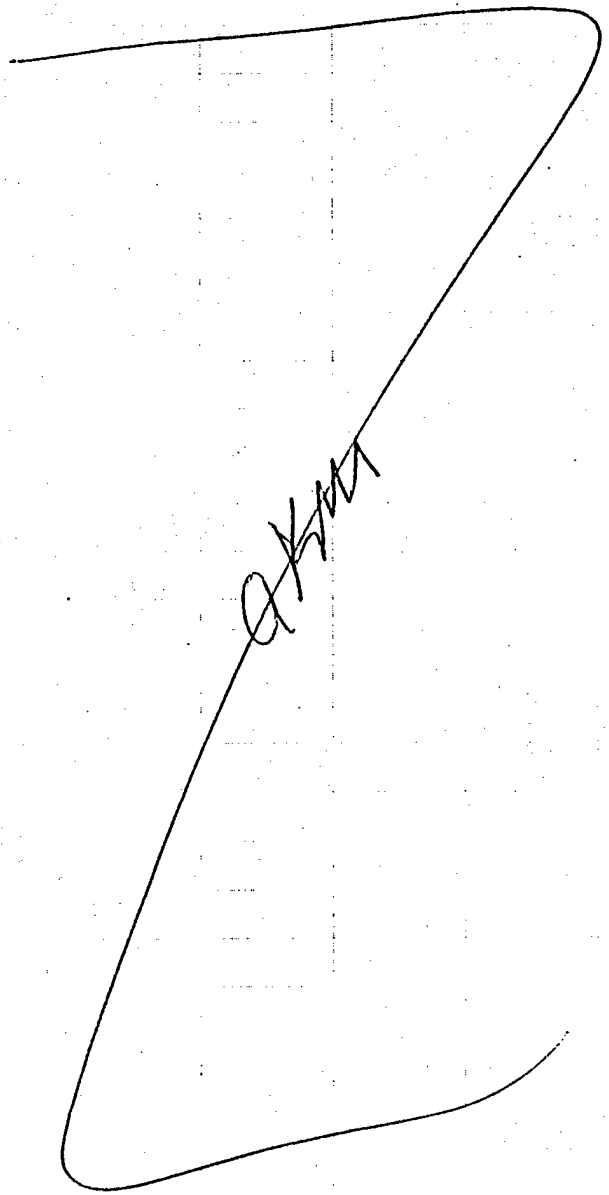
1015 " 20-22.

TD = 22'

1020 Drillers remove augers

1025-1110 Drillers decon augers

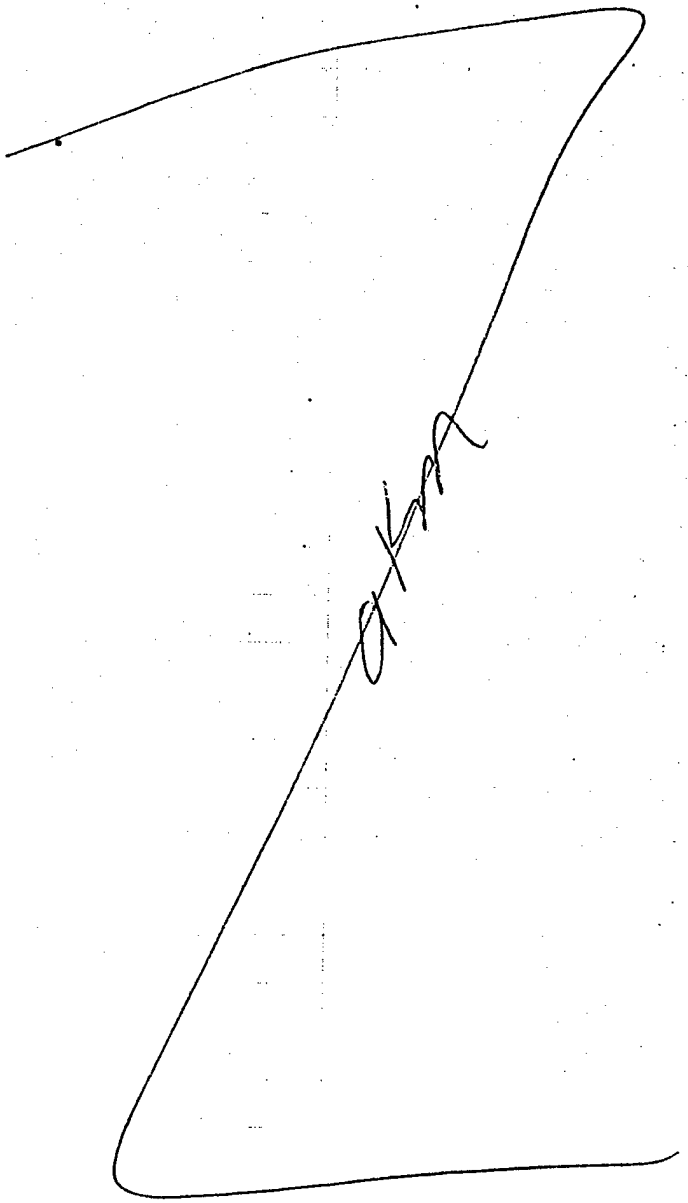
A. K



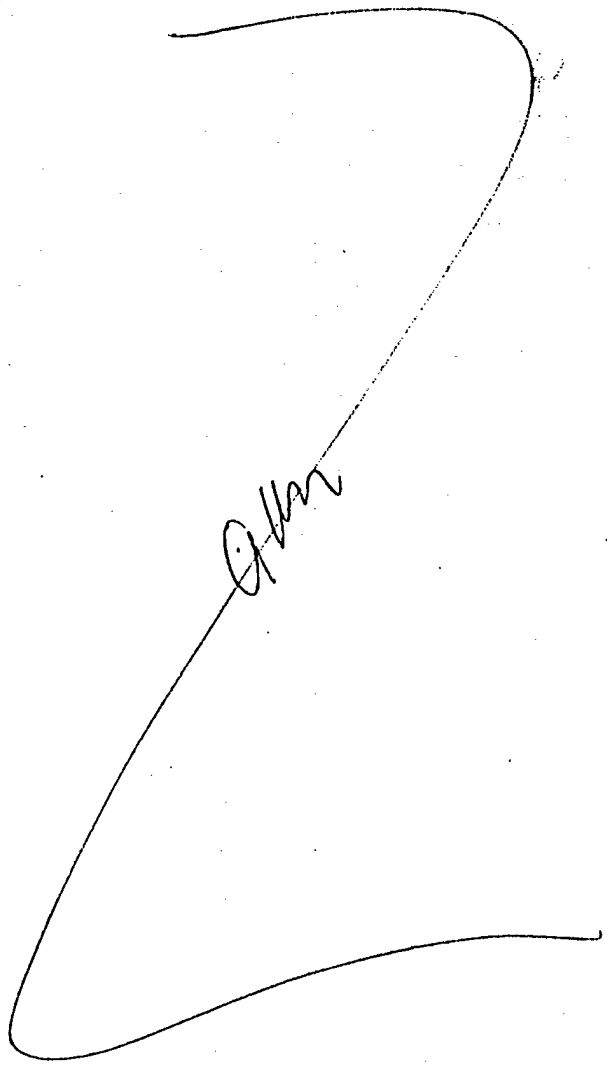
| | |
|---|---|
| 1115 | Setup at 025-004BH |
| 1125 | Sample @ .5-2.5 |
| 1135 | " 5-7 |
| 1140 | " 10-12 LAB 11.5-12 |
| 1150 | " 18-20 LAB 19.5-20 |
| 1200 | LUNCH |
| 1300- | ~~Set up at site 21~~ |
| 1330 | setup 21-026 BH |
| 1355 | Sample @ .5-2.5 no recovery |
| 1400 | " 4-6 |
| 1405 | " 8-10 LAB 9.0-9.5 |
| 1415 | " .5-2.5 LAB 2.0-2.5 |
| 1430- | Move To 21-027 BH |
| 1435 | |
| 1440 | Sample @ .5-2.5 |
| 1450 | " 4-6 LAB (5.5-6.0 |
| 1458 | " 8-10 LAB |
| | Sample 9.5-10 marked 9-10 |
| | Sample 7.0-9.5 marked 8-9 |
| 1510 | Move to 026-028BH |
| 1525 | Sample @ .5-2.5 |
| ~~1535~~ Lunch | LAB 2.0-2.5 MS/MSD 1.5-2.0 |
| 1535 | Sample @ ~~8-10~~ LAB 4-6 |
| TD=61 | LAB 5.5-6.0 |

16 May 95
1400 -
1800

Packed sample cooler, unloaded supplies, took equip blanks, shipped samples from Site 25 at Fed Ex and dropped Site 21 Sample @ Lake Superior lab
END OF DAY



17 May 95 Sunny, cool 35-60
0545 Met Bobby, D.G & K.M to site
-0615
0630- Set up at site
0730 25
0730- Drillers set up
0815 and decon
0830 Health & Safety Meeting
Set up at 025-012BH
0835
0837 Sample @ .5-2.5
0842 " 5-7 LAB 6.5-7.0
0850 " 10-12 LAB 11.5-12
0900 " 18-20 LAB 19.5-20
0905 Move to 025-013BH
0910 Driller decon drill in liquidnox tub and rinse w/deionized water, this procedure has been followed throughout the S.I.
0928 Sample @ .5-2.5
0935 " 5-7
0940 Check QC results for 025-MW-1 (clean) MW-2 (clean) 025.003MW (dirty)



11 May 95
K.P & C.M collected drum

1005 Sample @ 10-12 11.5-12 LAB
1015 " 18-20
1030- Broke down site
1330 Setup at site 17, Lu NHC

1333 Sample @ .5-2.5 1.5-2 2-2.5 LAB
1340 " 4-6 5-5.5 5.5-6 LAB
1345 " 8-10 no lab

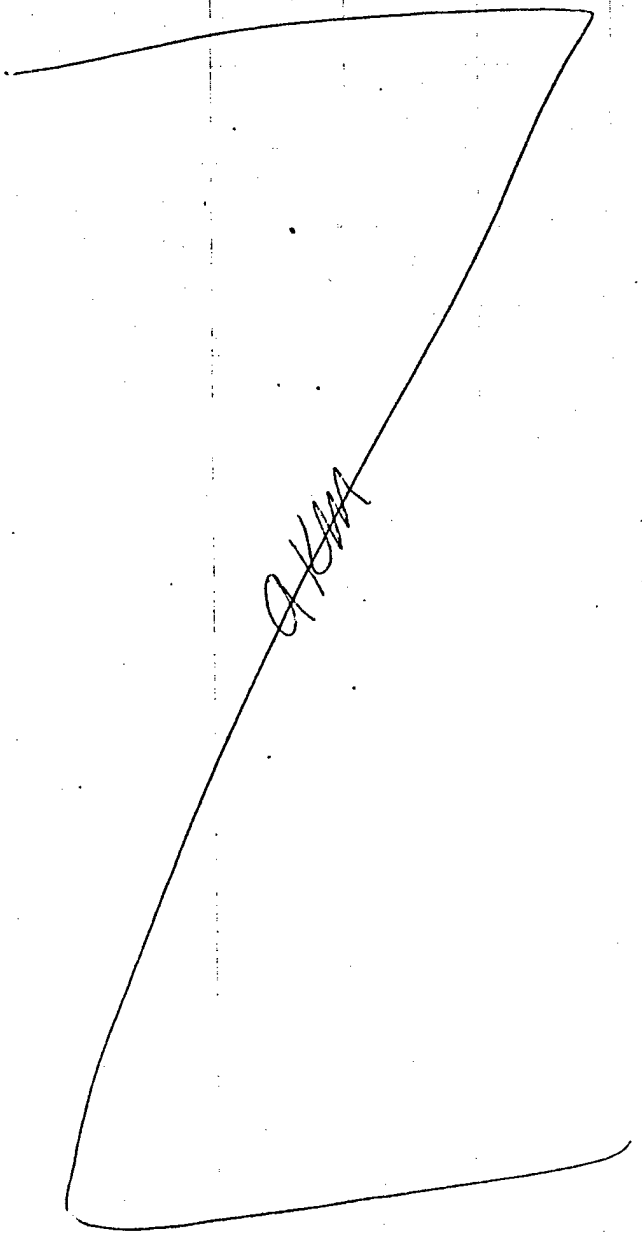
from 017-024 BH

1355 Moved to 017-025 BH
1400 Sample @ .5-2.5 1.5-2 2-2.5 LAB
1405 " 4-6 5.5-6 5-5.5 LAB
1410 Moved to 017-022 BH
1425 Sample @ .5-2.5 2-2.5 1.5-2 LAB
1430 " 4-6 NO LAB
1450 More to 017-023 BH
1455 Sample @ .5-2.5 1.5-2 2-2.5 LAB
1502 " 4-6 5.5-6 5-5.5 LAB
1500 Moved to 017-028 BH
1535 Sample @ .5-2.5 1.5-2 2-2.5 LAB
1545 " 4-6 5-5.5 5.5-6 LAB

17 May 95
1600 L
1845

1845

Pack coolers, clean-up site, went to Fed EX to drop off Samples return to Site. 17. packed supplies Returned to Hotel
END OF DAY



18 May Weather: sunny, warm h. 70's!

0545 Met in lobby, breakfast planning meeting

0630 Arrived Bore and prepared for sampling and ~~mon~~ also slug testing.

0745-0815 Went to hardware store for supplies

0830 Called Lake Superior Lab. Tim will send GRO results now, and DRO will come later. Results from yesterday are to be fax tonight

0835 K.P. calling office

0915 Finish packing supplies and preparing sample bottles.

1000 Tracked down drillers to obtain ~~sample~~ also monitor well keys for sampling

A. Kerr

1015 Started slug test for 025-001 MW

1337 Stopped test

1545 - Obtained lunch and

1515 bought supplies

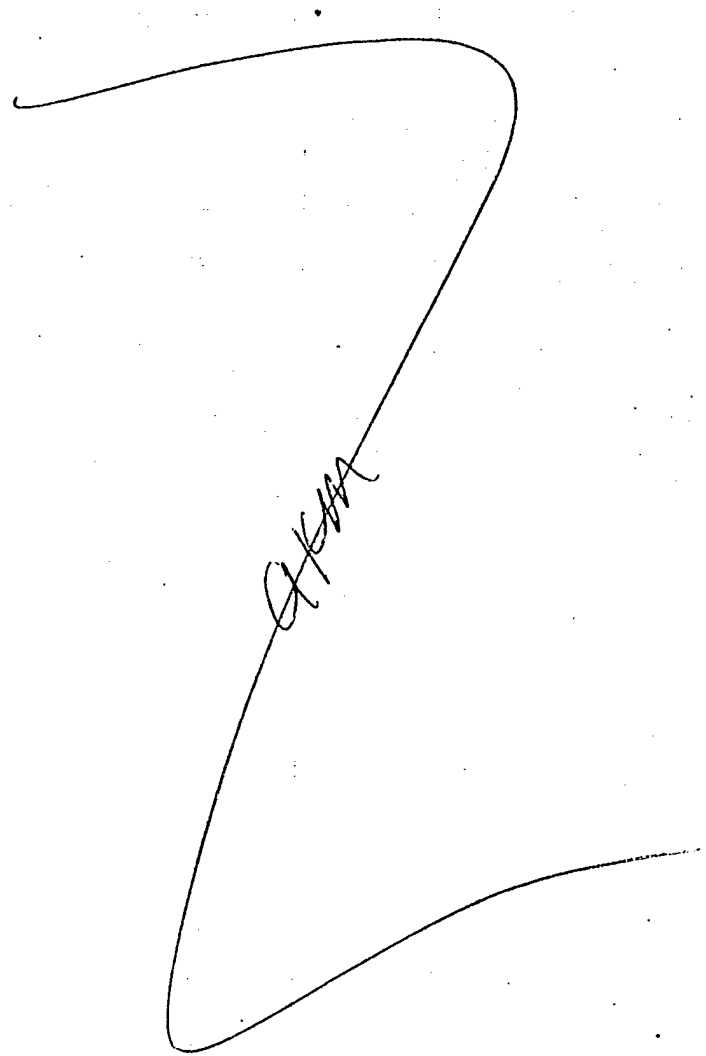
1530 Started test for 025-003 MW

1800 Stopped test

1830 Left base

1900 Arrived back at hotel

END OF DAY



Weather:

19 May 95 Sunny, warm, 70°F ☺

0645 Arrive at base and load supplies

0715-0800 Move to Site 17 and prepare for drilling

0835 Setup on 017-31BH

0845 Sample @ .5-2.5 no lab

0858 " 4-6 (5.5-6 / 5-5.5)

0901 " .5-2.5 no lab

0910 " .5-2.5 (2-2.5 / 1.5-2)

Move to 017-021 BH

0920 Sample @ .5-2.5 (2.0-2.5 / 1.5-2)

0925 " 4-6 (5.5-6 / 5-5.5)

Move to 017-032 BH

0945 Sample @ .5-2.5 (2-2.5 / 1.5-2)

~~1008~~ 1008 Move to 017-030 BH.

1000 Sample @ .5-2.5 (2-2.5 / 1.5-2)

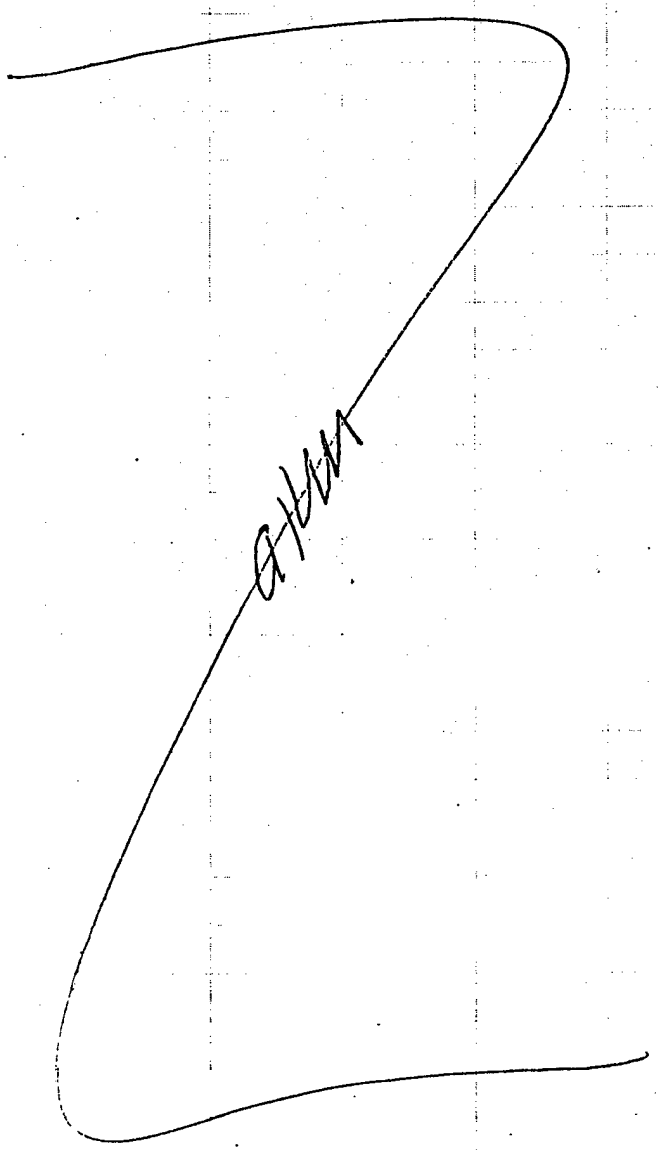
1015 " 4-6 (4.5-5 / 5-5.5 / 5.5-5.5)

1020 Move to 017-029 BH

Sample @ .5-2.5 (no recovery)

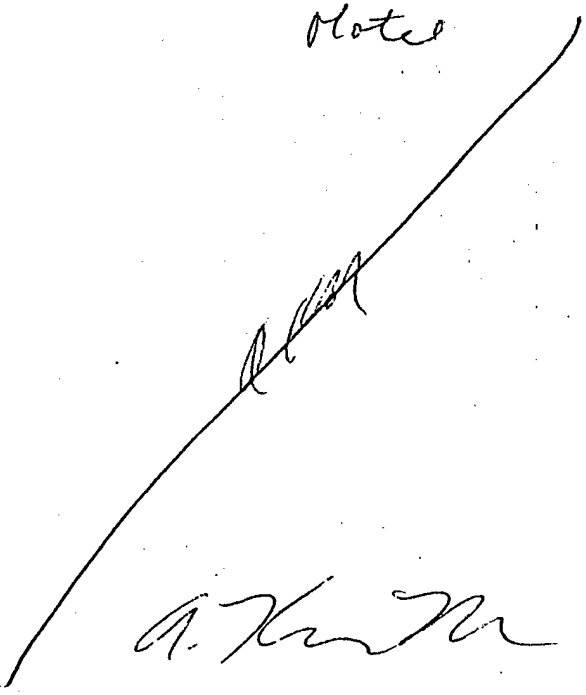
~~4-6~~ 4-6 qns

1032 Sample @ .5-2.5 (2-2.5 / 1.5-2)

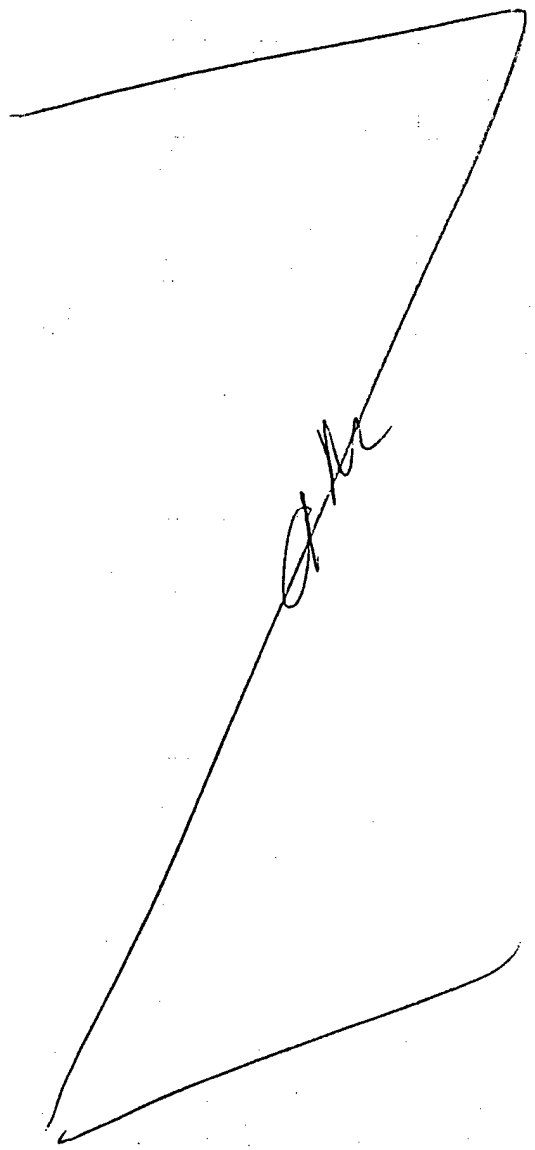


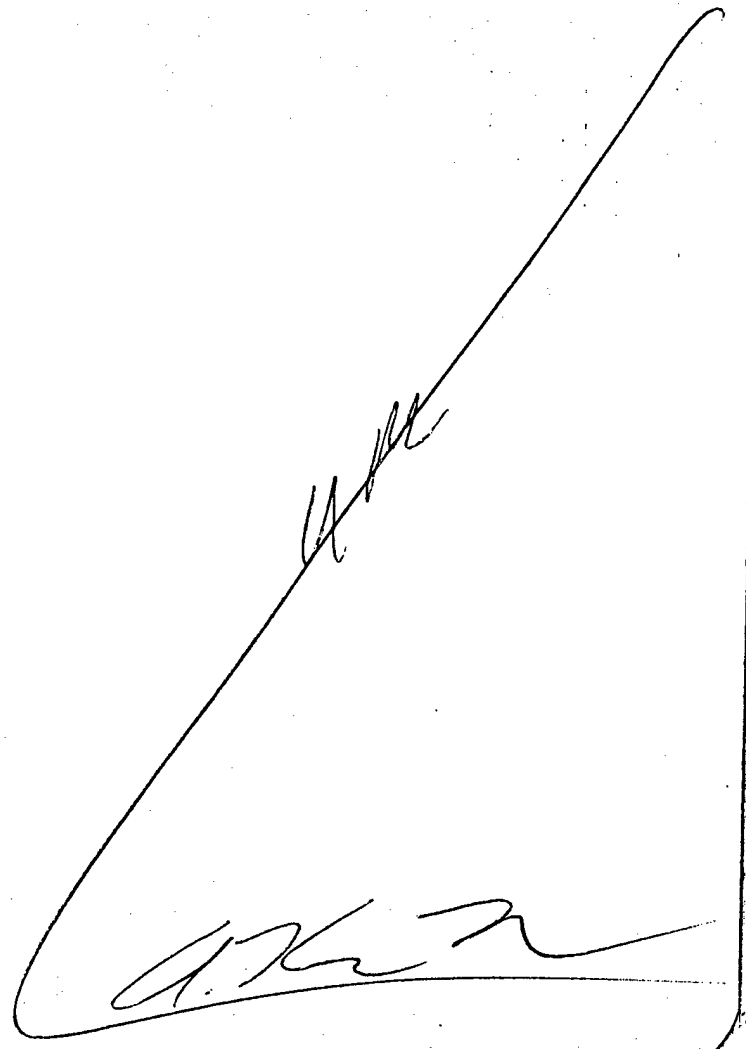
19 May 95

| | |
|---|---|
| 1100-1200 | LUNH Slug Test 025-002MW |
| 1200-~~1345~~ 1500 | Pack supplies and samples decon slug equipment |
| 1500-1800 | Drop samples at Fed Ex |
| 1800-1830 | Flight cancelled return to Radisson Motel |
| 1830-1900 | |



20 May 95
900 Flight leaves for SA
@ 1645 Arrive at SA





800-937-6MAN

3

Joe Byrd, JR.
Project Scientist
4100 NW Loop 410, #230
SAN Antonio, TX 78229
(210) 731-0000 1-800-677-8072

DULUTH 1315-197
c/o Capt. Stephen WABROWETZ
148 FG/LGPT, Bldg. 240
4625 Deuce, Duluth, MN 55811
(218) 723-7475
(218) 723-7476 (FAX)

RADISSON Hotel - DuLuth
505 W. SuperIOR STReet
DuLUTH, MN 55802
(218) 727-8981

CONTENTS

| REFERENCE | DATE |
|---|---|

FEDEX 1342-6486-1 (1-800-238-5355)
HAZCO 1-800-332-0435
Air Products 1-800-224-2724 (T5509)
EIS 1-800-532-7474

1-800-741-9000 / 0+ # / 210731 0001 0192879

Burlington Exp. (210) 402-1212 (531444410)

Duluth Airport Authority (218) 727-2968
∴ Hank Storms

Pentane P.O. # 5641
HAZCO
Confirm 554657

(1)

# TRAVEL DAY
## MONDAY 1 MAY 1995

0447 Leave home
1440 At Duluth. Go to ANGB & meet up w/ KP-KM UA pack stuff & go stake site. 25
1620 Leave base
1700 At Hoyol & checked in

6
11.0
4.8
12.2

12.2 hrs

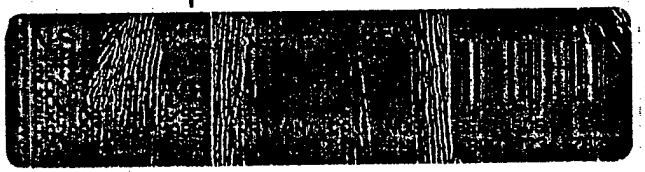
J Byrd JR

2 MAY 95

(2)

TUESDAY DAY 1

0708 Leave for base
Breakfast. (0.7)
0835 On Base
Meet w/ Wabbewetz & Berg
They are in meeting
Goto BZ47 & pref for
staking out sites.
1016 Bruce is here. Go to
Site ZC
1115 Done. Goto BZ52
Scope out GC Room
1124 Goto lunch
1224 Back on base. Haul
stuff to GC room
1321 Goto store to get supplies
1446 Back on base
Set up GC Room



1648 Leave base
1705 At hotel

8.3 hr

7.8
8.8
6.
17.1
8.8
8.3

DAY 2

(3)

WEDNESDAY 3 MAY 1995

0515 Leave Hotel
BREAKFAST (0.7)

0645 ON BASE
Set-up GC.
BUILD 10PPM, 1PPM, & 100 PPB
BTEX STDS.

0801 100 PPB BTEX. PRINTER not PRINTING
~~SET LIBRARY~~ JB

— — ~~JB~~ — — — — —

| | |
|---|---|
| GAIN | 1,000 |
| CARRIER GAS FLOW | 12 µl/min |
| INJECTION VOL | 100 µl |
| GC OVEN TEMP | 40°C |
| ANALYSIS TIME | 500 sec |

— — — — — — — — — —

~~CALL~~ JB
CALL M. ALEXANDER.

0836 SHUT DOWN GC & RE PROGRAM
to TRY & UNLOCK PRINTER.

0955 TALK to C. HAYWARD. PRINTER
is TOTALLY OUT. M. ESCOBAR
IS SENDING me A NEW ONE.
Prep. PRINTER for shipment
BACK TO OPTECH

JB

5.7
.7
6.4

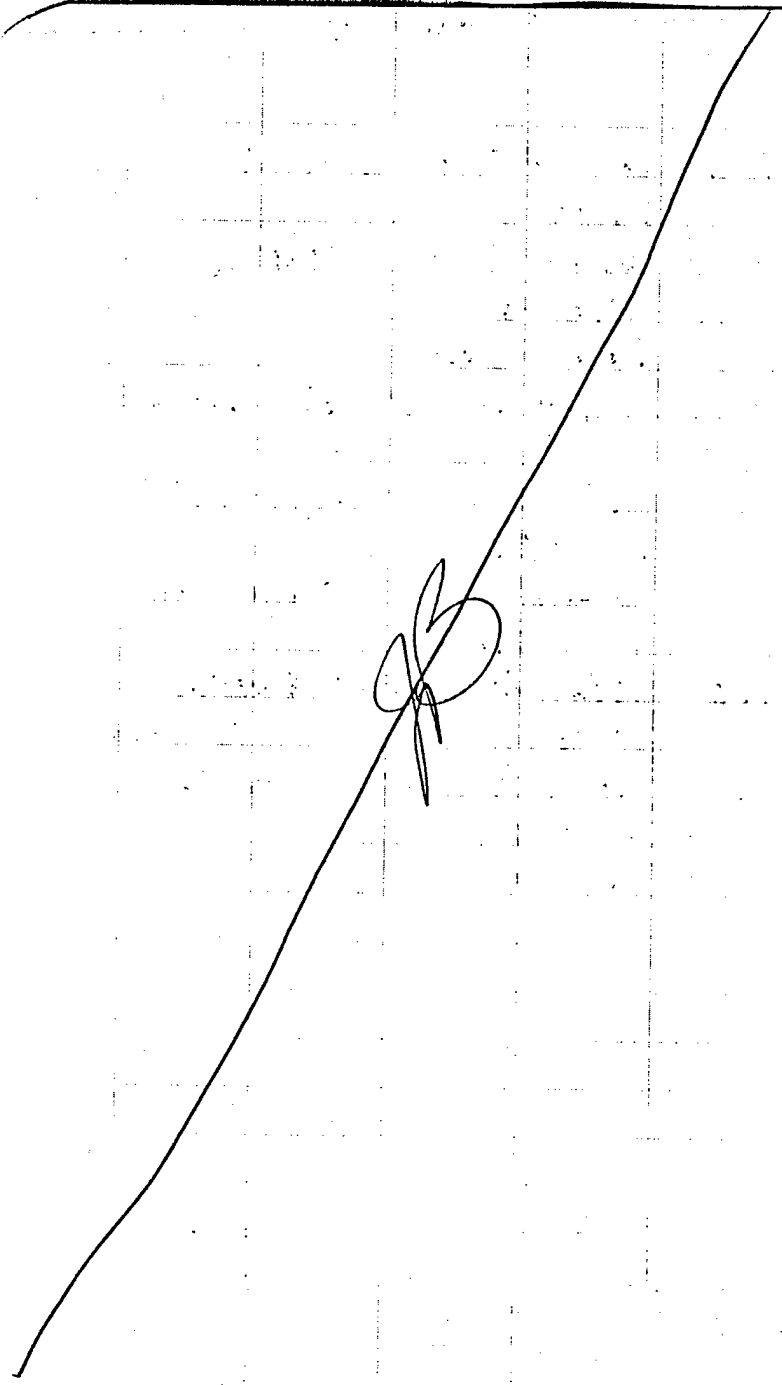
3 MAY 95

(4)

1020 Goto FEDEX to ship printer.
1040 BACK from FEDEX waiting
1130 Goto Site 26.
1147 Begin setup at Site 26
1616 Leave Site 26
1621 at B252. Plug in PIDS
1630 At B247.
UNLOAD CARS. PREP FOR TOMORROW.
1650 TAKE EQUIPMENT BLANK.
Goto store to get ICE.
1730 KP-KM Goto FEDEX.
1734 LEAVE BASE
1754 At Hotel

17.9
6.4
11.5

11.5



DAY 3



THURSDAY 4 MAY 1995

0545 Leave Hotel
BREAK FAST (0.7)
0645 ON BASE
Pack vehicles for day
0710 CALIBRATE both PIDs to 100 ppm w/ Isobutylene
0757 Goto Fire Dept. to get WATER.
0715 DRILLERS decon Augers
0841 Goto Site 26
0851 HEALTH & SAFETY Mtg
- JB, DG, KM, JAMIE, JONATHON KP MC's.
- EMERGENCY #
- DRILLERS Phone
- JET BLAST
- TRIPPING HAZARD

0855 Set-up for drilling
DRILLING
1049 Leave Site 26. Go get PRINTER & CAL GAS
Goto B252 & set up GC

4 MAY 95

(6)

Build 10 PPM, 1 PPM, 100 PPB BTEX STD's.

| | |
|---|---|
| GAIN | 1,000 |
| CARRIER GAS FLOW | 12 µl/mm |
| INJECTION VOL. | 100 µl |
| GC OVEN TEMP | 40°C |
| ANALYSIS TIME | 500 sec |

1155 100 PPB BTEX STD.
Good RUN. Set LIBRARY

1214 1 PPM BTEX STD
GOOD RUN. Set LIBRARY,

1230 10 PPM BTEX STD.
GOOD RUN. SET LIBRARY.

1246 AIR BLANK

- BENZENE 10 ppb
- TOLUENE 4 ppb
- E-BENZENE 8 ppb
- M,P-XYLENE 14 ppb
- O-XYLENE 9 ppb

1257 026-004 BH 0.5'-2.5' 10 g

- BENZENE 11 ppb
- TOLUENE 4 ppb
- E-BENZENE 5 ppb
- M-P-XYLENE 9 ppb

4 MAY 95

(7)

- O-Xylene 4 ppb

1310 026-004BH 5'-7' 10g
- Benzene 7 ppb
- Toluene 3 ppb
- E-Benzene 2 ppb
- m-p-Xylene 5 ppb
- O-Xylene 2 ppb

1322 026-004BH 8'-10' 10g
- Benzene 1 ppb
- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-xylene 4 ppb
- O-Xylene 3 ppb

1334 026-001BH 0.5'-2.5' 10g
- Benzene 7 ppb
- Toluene 1 ppb
- E-Benzene 3 ppb
- MP-xylene 17 ppb
- O-Xylene 26 ppb

1346 026-001BH 5'-7' 10g
- Toluene 2 ppb

4 MAY 95

(8)

1358 100 PPB BTEX STD

| | | | CAL |
|---|---|---|---|
| Benzene | 100 | ppb | 1ppb |
| Toluene | 102 | ppb | 2ppb |
| E-Benzene | 101 | ppb | 1ppb |
| mp-xylene | 211 | ppb | 2ppb |
| o-xylene | 105 | ppb | 1ppb |

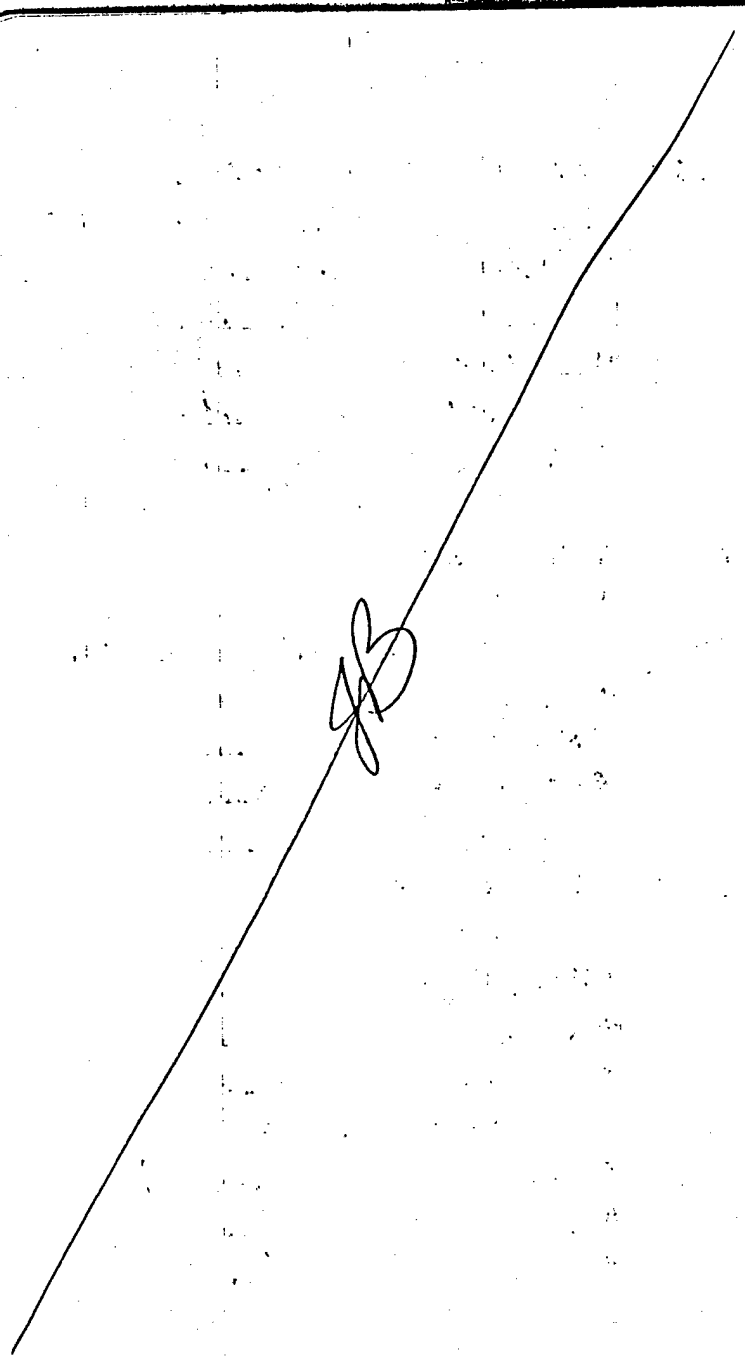
- - - - J B J B J B -

1410 AIR BLANK
- Toluene 1 ppb

1422 026-004 05'-2.5' 10g Reshot
- Toluene 2 ppb
- E-Benzene 1 ppb
- mp-xylene 14 ppb
- o-xylene 11 ppb

J3 1834 026-001BH 8'-10' 10g
- Toluene 2ppb
- E-Benzene 2 ppb
- mp-xylene 11 ppb
- o-xylene 5 ppb

1446 026-005BH 1.0'-1.5' 10g
J3 ~~1446~~
- Toluene 2ppb
- mp-xylene 5 ppb
- o-xylene 3 ppb



4 MAY 95



1458 026-005BH 6'-6.5' 10g
- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-Xylene 5 ppb

1510 026-005BH 10.0' 10g
- Toluene 1 ppb
- MP-xylene 2 ppb
- O-xylene 1 ppb

1522 100 PPB BTEX STD

| | | | CAL | |
|---|---|---|---|---|
| Benzene | 93 | ppb | 100 | ppb |
| Toluene | 89 | ppb | 100 | ppb |
| E-Benzene | 83 | ppb | 100 | ppb |
| MP-Xylene | 171 | ppb | 200 | ppb |
| O-Xylene | 95 | ppb | 100 | ppb |

1538 AIR BLANK
- E-Benzene 1 ppb

1556 026-006BH 0.5'-2.5' 10g
- Benzene 7 ppb
- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-Xylene 4 ppb
- O-Xylene 4 ppb

J Byrdzik

4 MAY 95

(10)

| | | | |
|---|---|---|---|
| 1615 | 026-006BH | 6.0'-6.5' | 10g |
| | • Toluene | 1 ppb | |
| | • EMP-Xylene | 3 ppb | |
| 1627 | 026-006BH | 11.0'-11.5 | 10g |
| | • Benzene | 5 ppb | |
| | • Toluene | 2 ppb | |
| | • MP-Xylene | 4 ppb | |
| | • O-Xylene | 2 ppb | |
| 1639 | 026-002BH | 0.5'-2.5' | 10g |
| | • Toluene | 2 ppb | |
| | • E-Benzene | 1 ppb | |
| | • MP-Xylene | 2 ppb | |
| 1651 | 026-002BH | 5'-7' | 10g |
| | • Toluene | 1 ppb | |

1704 100 PPB BTEX STD

| | | CAL |
|---|---|---|
| Benzene | 90 ppb | 100 ppb |
| Toluene | 81 ppb | 100 ppb |
| E-Benzene | 81 ppb | 100 ppb |
| MP-Xylene | 159 ppb | 200 ppb |
| O-Xylene | 73 ppb | 100 ppb |

1719 AIR BLANK

• E-Benzene 1 ppb

JBy

4 MAY 95

(11)

1731 026-003BH 0.5'-2.5' 10g
- Toluene 2 ppb
- E-Benzene 1 ppb
- MP-xylene 8 ppb
- O-xylene 2 ppb

1743 026-003BH 5'-7' 10g
- Toluene 2 ppb
- MP-xylene 4 ppb

1756 100 PPB BTEX

| | | | CAL |
|---|---|---|---|
| Benzene | 109 | ppb | ppb |
| Toluene | 96 | ppb | ppb |
| EBenzene | 95 | ppb | ppb |
| MP-xylene | 181 | ppb | ppb |
| O-xylene | 88 | ppb | ppb |

1809 Begin GC shut-down
Secure B252
Secure B247
1829 Leave Base
1848 At Hotel

18.8
6.4
12.4

12.4 hr

DAY 4



FRIDAY 5 MAY 95

0545 Leave hotel
Breakfast (0.6)
0643 On base
Goto B252 & calibrate
PIDs
Load vehicles to goto
Site 26.
0715 Waiting for drillers.
0745 Goto Site 26. set up
0810 Safety mtg.
JB, DG, KP, KM, Jamie, Jonath
• Be Safe
• Cold
• Jet blast.
0815 Start drilling MW-026-001
1015 Goto B252
1020 At B252. Perform GC maint.
Build 10PPM, 1 PPM, 100 PPB
BTEX STDs. Program GC
GAIN 1,000
Carrier Gas Flow 12 ml/min
Injection Vol 100 µl
GC Oven Temp 40°

5.7
.6
6.3

5 MAY 95

(13)

ANALYSIS TIME 440 sec

1133 100 PPB BTEX STD
Good Run. Set LIBRARY.
Screw-up on LIBRARY entry

1201 100 PPB BTEX STD
Good Run. Set LIBRARY.

1222 1 PPM BTEX STD
Good Run. Set LIBRARY.

1238 10 PPM BTEX STD
GOOD RUN. Set LIBRARY

1302 1 PPM BTEX STD.
--- Recorded M,P-XYLENE at
~~B+1317~~ 1PPM IN CAL. RUN. Reshot
& Reenter in LIBRARY

1317 AIR BLANK
- BENZENE 4 ppb
- TOLUENE 4 ppb
- E-BENZENE 6 ppb
- MP-XYLENE 13 ppb

1328 026-001 MW 1.0'-2.0' 10g
- TOLUENE 3 ppb

1339 026-001 MW 5'-7' 10g
- BENZENE 4 ppb
- TOLUENE 3 ppb

JBryden

- E-BENZENE 3 ppb
- MP-XYLENE 36 ppb

1350 026-001MW 10'-12' 10g
- BENZENE 3 ppb
- TOLUENE 3 ppb
- E-BENZENE 2 ppb
- MP-XYLENE 6 ppb
- O-XYLENE 5 ppb

1401 026-001MW 12.5'-14.5' 10g
- BENZENE 3 ppb
- TOLUENE 3 ppb
- E-BENZENE 3 ppb
- MP-XYLENE 9 ppb
- O-XYLENE 8 ppb

1412 026-001 MW 15'-17' 10g
- E-BENZENE 6 ppb
- MP-XYLENE 13 ppb

1423 100 PPB BTEX STD

| | | | CAL |
|---|---|---|---|
| BENZENE | 100 | ppb | 100 ppb |
| TOLUENE | 96 | ppb | 100 ppb |
| E-BENZENE | 106 | ppb | 100 ppb |
| MP-XYLENE | 216 | ppb | 200 ppb |
| O-XYLENE | 115 | ppb | 100 ppb |

J Byerly

5 MAY 95

(15)

1435 AIR BLANK
- Toluene 1 ppb

1445 026-001MW 20'-22' 10g
- Toluene 2 ppb
- E-Benzene 1 ppb
- MP-xylene 4 ppb

1456 026-001MW 24'-26' 10g
- Toluene 2 ppb
- E-Benzene 1 ppb
- MP-xylene 3 ppb

WAITING ON MORE SAMPLES.

1525 KP is here. There are no more samples for today.
~~shut down GC~~ SS

1536 100 PPB BTEX STD
- Benzene 84 ppb
- Toluene 90 ppb
- E-Benzene 102 ppb
- MP-xylene 215 ppb
- O-xylene 174 ppb

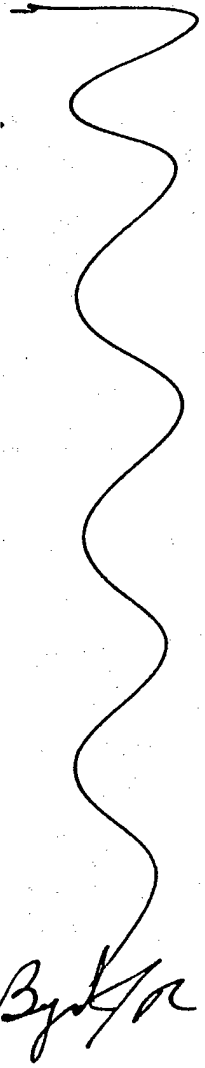
1548 SHUT DOWN GC.
GO TO BZ47 to AIDE IN SET UP FOR TOMORROW

5 MAY 95

(16)

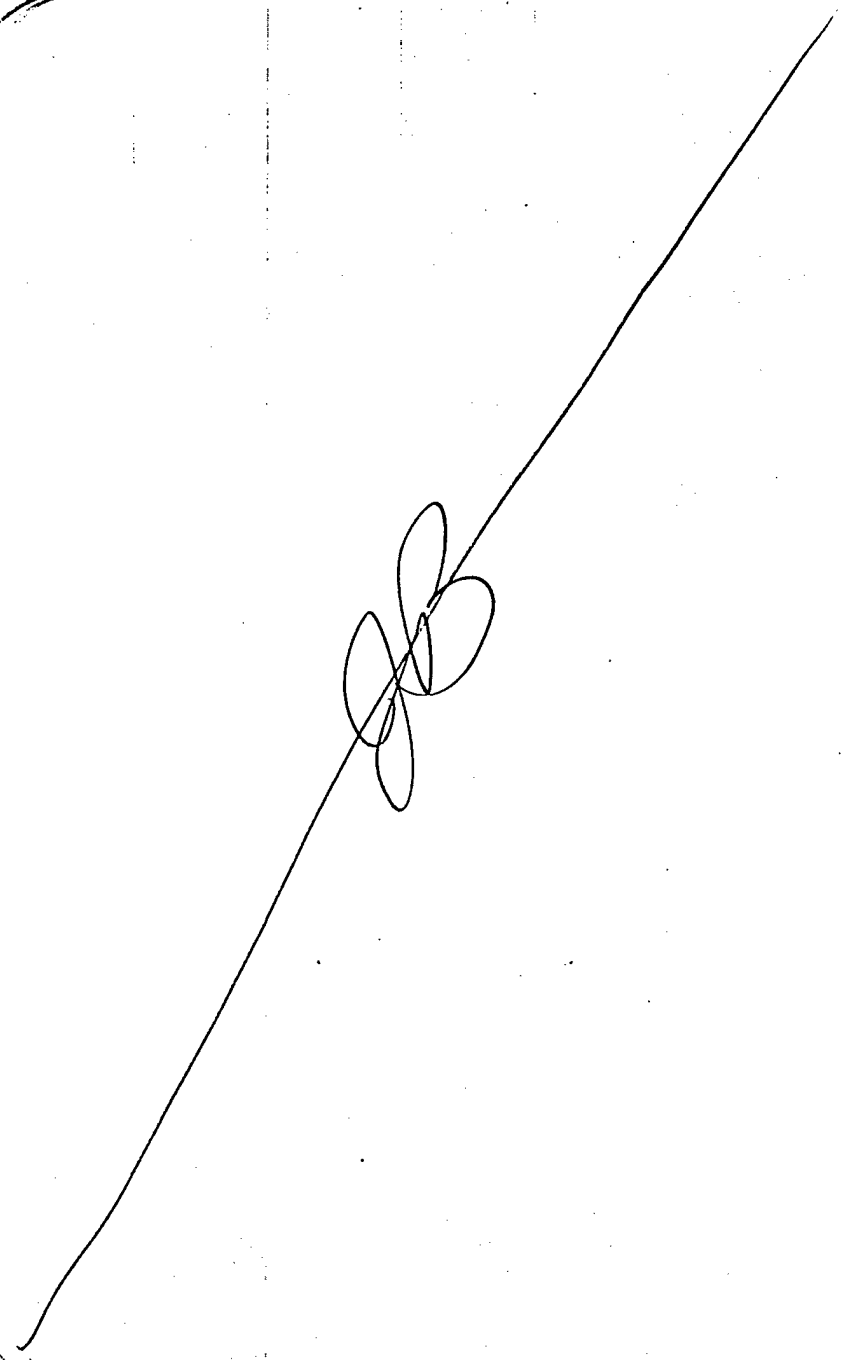
1615 Leave base. Go to store to get supplies

1641 At hotel



16.7
6.3
10.4

10.4 HR



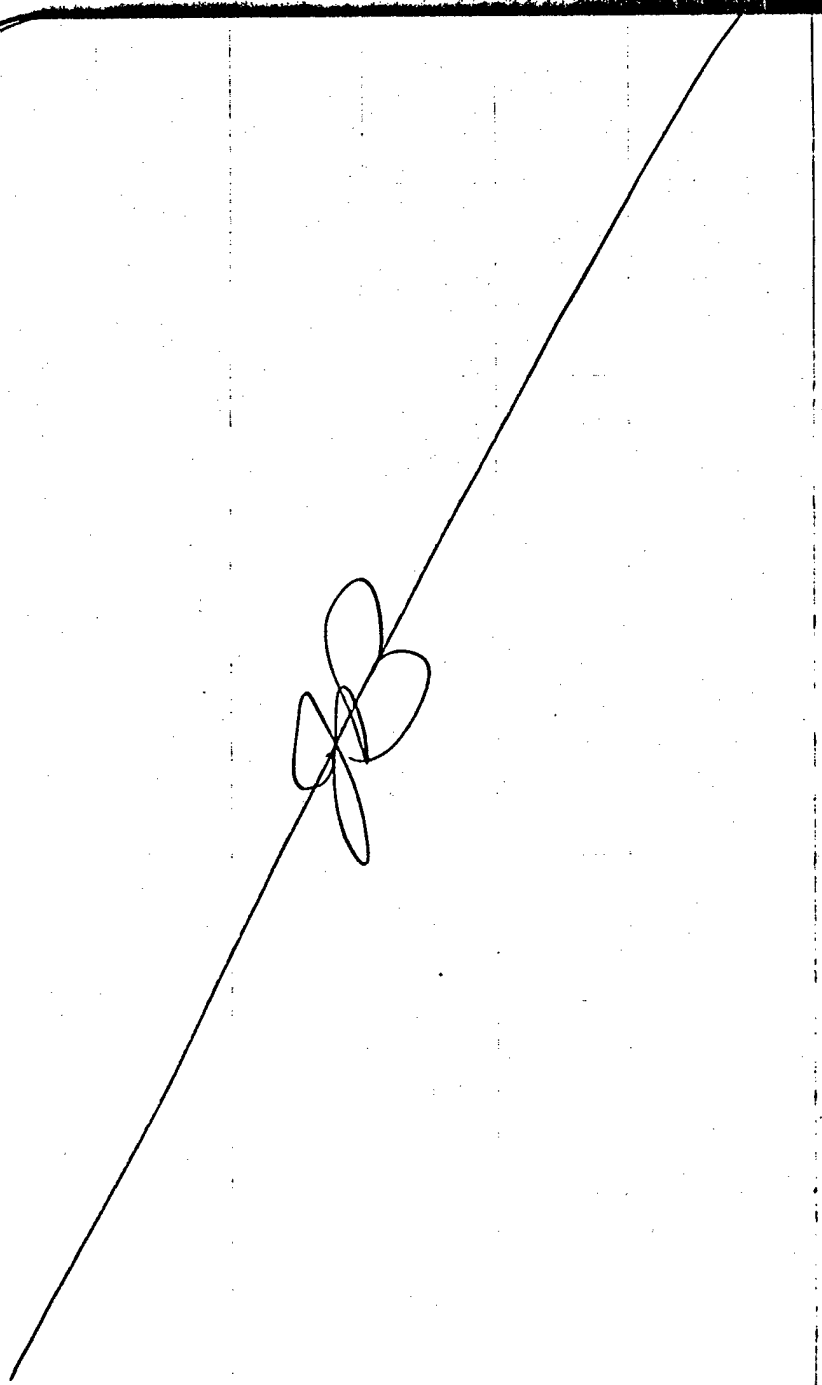
DAY 5



SATURDAY 6 MAY 95

0545 Leave hotel
Breakfast (0.6)
0640 On base
Load vehicles for Field
0650 CALIBRATE Both PIDs to
100 PPM ISOBUTYLENE
0718 Goto site 26
0721 Set up. for drilling
WAiting on drillers
0748 Drillers here.
0808 Safety Meeting
JB, DG, KP, KM, Jamie, Wolf
• Tripping
• Dont eat dirt
• Rt. to hospital.
0810 Drilling start
1105 Leave Site 26. Goto B252
1110 At B252.
Begin GC set-up.
Build 10 PPM BTCX STD.
1200 Rig is deconned. Ready to back
to site 26.

JBgrate



6 MAY 95



1211 At Site 26.
Get Ready to drill Last MW
1345 Goto B252. Continue
GC Setup & STD
Building 100 PPB & 1 PPM

| | |
|---|---|
| GAIN | 1,000 |
| CARRIER GAS FLO | 12 ml/min |
| INJECTION VOL | 100 µl |
| GC OVEN TEMP | 40°C |
| ANALYSIS TIME | 450 sec |

1404 100 PPB BTEX STD
GOOD RUN. Set LIBRARY
1422 1 PPM BTEX STD
1425 Goto FRONT GATE to hand-off
GEO-TECH samples
1430 SAMPLES ARE handed off
1435 BACK AT B252.
Good Run. Set LIBRARY.
1441 10 PPM BTEX STD.
GOOD RUN. Set LIBRARY
1456 AIR BLANK

| | |
|---|---|
| • BENZENE | 4 ppb |
| • TOLUENE | 3 ppb |
| • E-BENZENE | 8 ppb |

J Byrd

| | | | |
|---|---|---|---|
| | • M,P-Xylene | | 21 ppb |
| 1507 | 026-003MW | 0.5'-2.5' | 10g |
| | • Benzene | | 5 ppb |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 6 ppb |
| | • MP-Xylene | | 26 ppb |
| | • O-Xylene | | 5 ppb |
| 151B | 026-003MW | 5'-7' | 10g |
| | • Benzene | | 3 ppb |
| | • Toluene | | 3 ppb |
| | • E-Benzene | | 10 ppb |
| | • MP-Xylene | | 25 ppb |
| | • O-Xylene | | 27 ppb |
| 1529 | 026-003MW | 10'-12' | 10g |
| | • Benzene | | 3 ppb |
| | • Toluene | | 3 ppb |
| | • E-Benzene | | 11 ppb |
| | • MP-Xylene | | 32 ppb |
| | • O-Xylene | | 28 ppb |
| 1540 | 026-002MW | 0.5'-2.5' | 10g |
| | • Toluene | | 3 ppb |
| | • E-Benzene | | 12 ppb |
| | • MP-Xylene | | 31 ppb |
| | • O-Xylene | | 32 ppb |

6 MAY 1995

(20)

1551 026-002MW 5'-7' 10g
- Toluene 2 ppb
- E-Benzene 3 ppb
- MP-Xylene 15 ppb
- O-Xylene 17 ppb

1602 100 PPB BTEX STD

| | | CAL |
|---|---|---|
| Benzene | 100 ppb | 100 ppb |
| Toluene | 90 ppb | 100 ppb |
| E-Benzene | 86 ppb | 100 ppb |
| MP-Xylene | 169 ppb | 200 ppb |
| O-Xylene | 78 ppb | 100 ppb |

1616 AIR BLANK
- Toluene 1 ppb

1627 026-002MW 10'-12' 10g
- Benzene 1 ppb
- Toluene 3 ppb
- E-Benzene 3 ppb
- MP-Xylene 9 ppb
- O-Xylene 7 ppb

1638 026-002MW 15'-17' 10g
- Benzene 3 ppb
- Toluene 3 ppb

J Bridge

6 MAY 95

(21)

| | |
|---|---|
| ● ET-Benzene | 2 ppb |
| ● MP-Xylene | 7 ppb |
| ● O-Xylene | 4 ppb |

1649 100 PPB BTEX STD

| | |
|---|---|
| * Benzene | 100 ppb |
| * Toluene | 94 ppb |
| * Et-Benzene | 91 ppb |
| * MP-Xylene | 185 ppb |
| * O-Xylene | 97 ppb |

1659 Shut down GC.

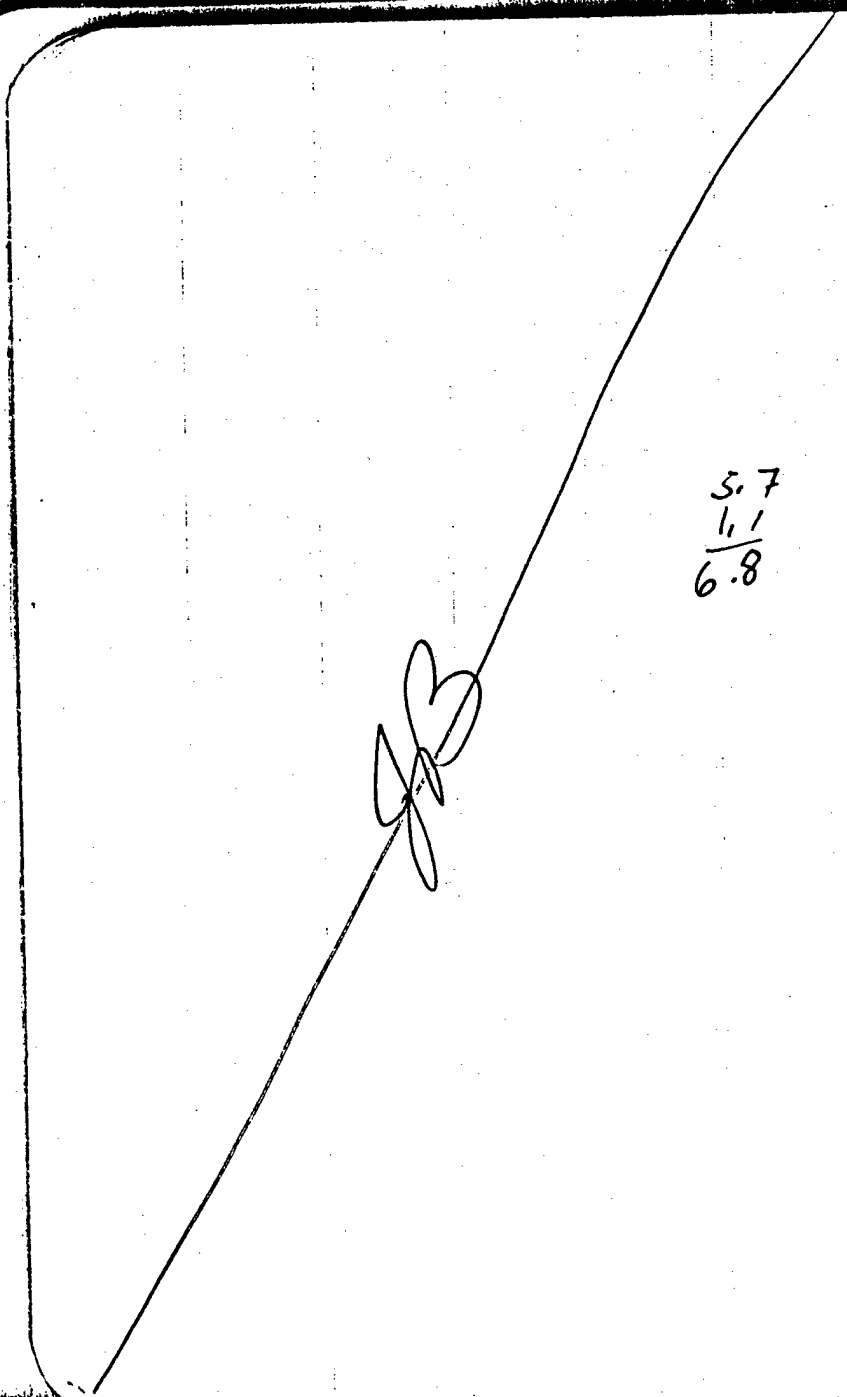
1705 Leave base

1723 At hotel

17.4
6.3
11.1

11.1 hrs

J Byrd Jr




DAY 7



MONDAY 8 MAY 1995

0545 Leave hotel
Breakfast (0.6)

0645 On Base

0650 Goto B252. Calibrate PID to 100 PPM Isobutylene & LEL to 50% Pentane
-- Both PIDs were left on over the weekend. 100% NO CHARGE on either one.

0700 Check equipment, get bottle & brass sleeve counts. ORGANIZE stuff.

0810 Goto B252. Set up D.G. on GC. He will do daily PREP & set-up today

0815 CALL SPL to order ICE chests & bottles.
--Talk to KAREN.

0830 CALL OPTECH. Talk to M. Ecobar about Lab Get P.O.# from P. Kobelenski.

0850 CALL Enviro. Inst. But it is 0700 in California.

J Byrdsong

0900 Monitor D. GREENWAY as he Programs GC. and Builds 10 PPM, 1 PPM, & 100 ppb BTEX STD's

0954 100 PPB BTEX STD. Missed shot.

1010 100 PPB BTEX STD. Good Run. Set LIBRARY,

1029 1 PPM BTEX STD Good Run. Set LIBRARY

1045 10 PPM BTEX STD. Good Run. Set LIBRARY

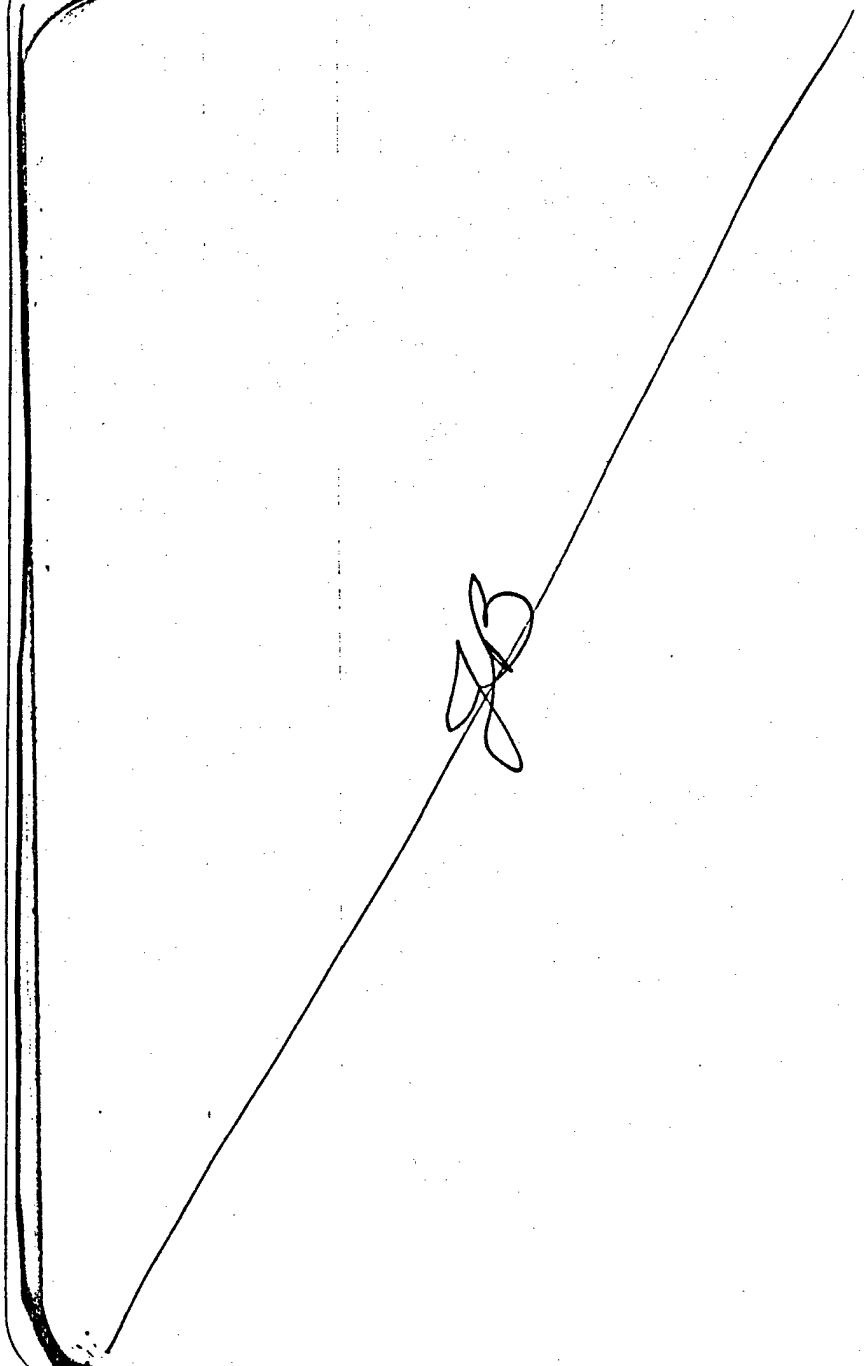
1059 AIR BLANK

- BENZENE 12 ppb
- TOLUENE 30 ppb
- ETHYLBENZENE 79 ppb
- MP-XYLENE 155 ppb
- O-XYLENE 76 ppb

-- UNUSUALLY high READINGS.

1113 AIR BLANK

- BENZENE 5 ppb
- TOLUENE 16 ppb
- E-BENZENE 41 ppb
- MP-XYLENE 92 ppb





- O-XYLENE 185 ppb.

-- PRINTER MALFUNCTION. NEED TO REPRINT.

1132 KP-KM-DG ~~go~~ to LUNCH.
LUNCH (0.5)

1200 AIR BLANK.

- BENZENE 2 ppb
- TOLUENE 8 ppb
- E-BENZENE 7 ppb
- MP-XYLENE 13 ppb
- O-XYLENE 14 ppb

1213 METHANOL (500 µl INJECTION) (÷5)

- BENZENE 12 ppb → 2ppb
- TOLUENE 22 ppb → 4ppb
- E-BENZENE 6 ppb → 1 ppb
- TMP-XYLENE 9 ppb → 2 ppb

1225 GO TO B247 ~~got~~. SET UP
DECON STUFF TO CLEAN
BRASS SLEEVES.

1235 KP-KM-DG RETURN.
GO TO B252 TO CONTINUE GC.
THEY HAVE SOIL FROM THIS AM.

JBydalek

8 MAY 95



1256 026-002MW 20.0'-22.0' 10g

- Benzene 4 ppb
- Toluene 6 ppb
- E-Benzene 7 ppb
- MP-Xylene 13 ppb
- O-Xylene 11 ppb

1307 100 PPB BTEX STD

| | | | CAL |
|---|---|---|---|
| Benzene | 99 | ppb | ppb |
| Toluene | 80 | ppb | ppb |
| E-Benzene | 72 | ppb | ppb |
| MP-XYLENE | 133 | ppb | ppb |
| O-XYLENE | 47 | ppb | ppb |

1319 Shut down GC.
Go to 0247 & continue decon of brass sleeves
Set-up equipment for tomorrow.

1500 Meet w/ B Berg.
He ok's ALL sites at 25 for tomorrows drilling except 025-001MW. It is moved 8'-10' south.

JB Byrd Jr

8 MAY 95

(26)

GL PROCEDURES

1515 KM-KP ARC back
Discuss schedule.
1530 Leave base
1548 At Hotel

15.8
6.8
9.0

9.0 hrs

DAY 8

(27)

TUESDAY 9 MAY 1995

0600 LEAVE hotel
BREAKFAST (0.7)
0700 ON BASE
--- WEATHER: 40's (Lo)
RAINING HARD
NO JOB RELATED ACTIVITIES
TODAY DUE TO WEATHER
0740 LEAVE BASE
FUEL CAR.
0800 AT HOTEL

1,3 hr.

GC PROCEDURES

DAY 9

(28)

WEDNESDAY 10 MAY 1995

0545 Leave hotel
Breakfast (0.6)
0645 On Base
0650 CALIBRATE Both PIDs to 100 PPM Isobutylene.
0710 Set-up on 025-001MW
Decon equipment
0730 Drillers on site
0810 Safty meeting
- JB, DG, KV, KM, Jamie, Joe
- Kill switches
- TRAFFIC AREA
- Eye, Toe Protection

0815 Go CALIBRATE pH, Temp, Cond, & Turbidity meter.
0850 Goto Store to get batteries for LEL
0905 Back on base. Combine CALIBRATION
0930 GARY is here. Goto Site 26.
0943 on Site. Set-up & Decon equipment.
Set-up on 026-001MW

5.7
1.1
6.8

1205 Done w/ 026-001MW
CALL SP for escort off
Flight Line
1217 Drilling Crew @ Lunch
1220 Leave Base for Lunch (0.5)
1250 ON BASE.
Meet w/ KP. We need
to continue developement of
026-001 MW for 1 more hour.
1305 CALL Security for escort.
Goto Site 26.
Continue w/ development of
026-001 MW
1447 2-hR time table is done. Rig
down equipment, decon, and move
to 026-002MW & set up.
1710 Done @ 026-002 MW
Pump Developed 30 well volumes
BREAK down & move to
026-003 MW
1711 KP-KM-DG on Site. Will
develope 026-003MW on FRIDAY.
1748 Leave Site 26.

10 May 95

(30)

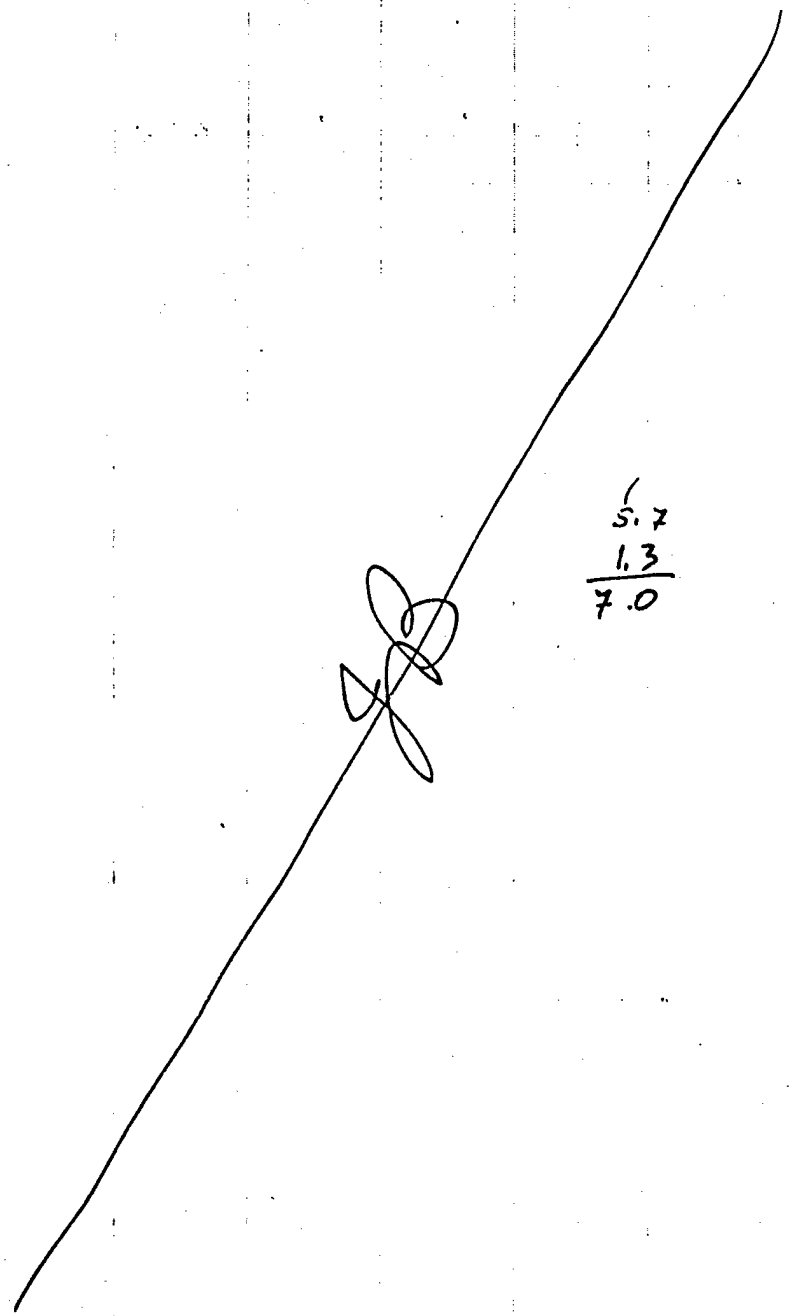
Plug in PIDs for charging

1757 Leave base

1818 At hotel

7.
18.3
6.8
11.5

11.5 hrs



5.7
1.3
7.0

DAY 10



THURSDAY 11 MAY 1995

0545 Leave hotel
Breakfast (0.6)

0640 On Base
Prep truck for day.
CALIBRATE PID w/ 100 PPM Iso Butylene.

0700 START-up & Program, & Baild 50 PPM, 1 PPM, and 100 PPB BTEX STDs.

0731 Goto Safety Mtg
SB, DG, KP, KM, JAMie, Jonathon
- Sunscreen
- PPE
- Be Safe
- Tripping.

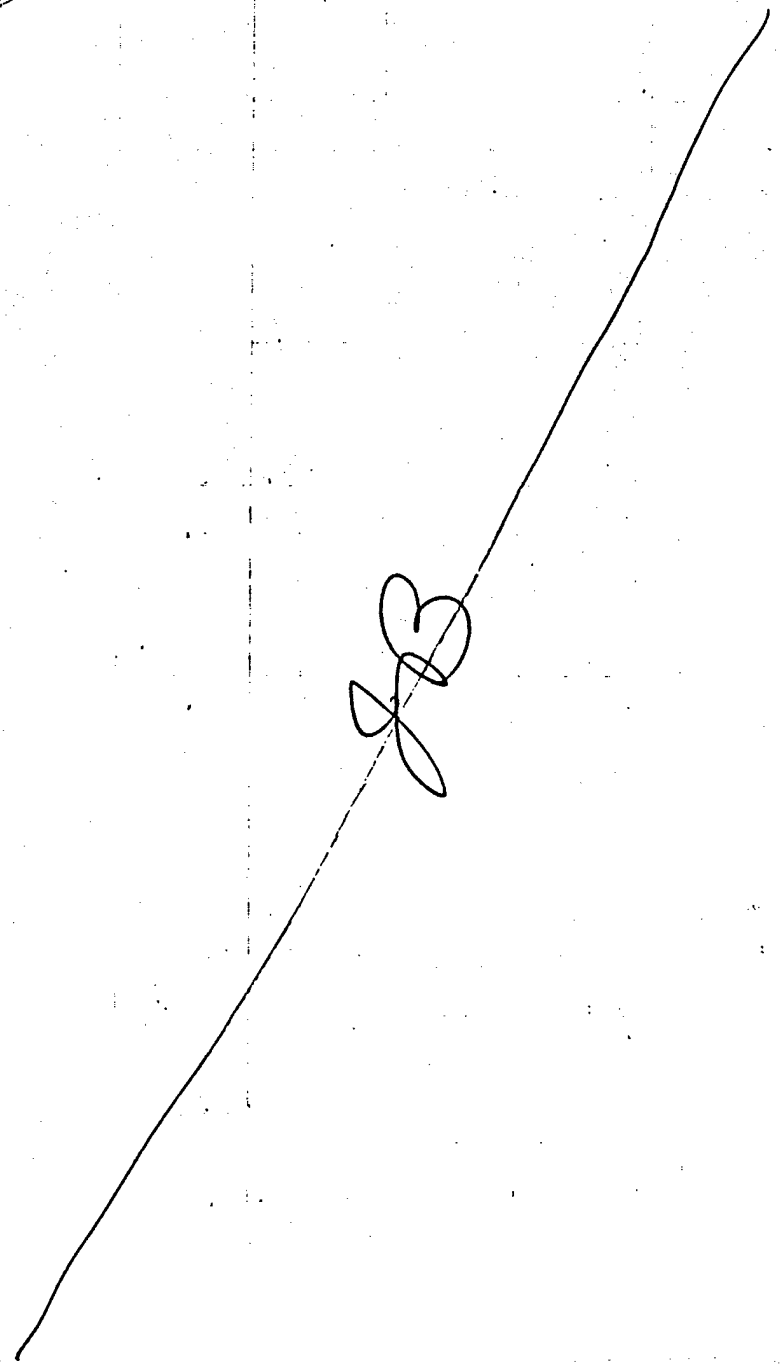
0740 Continue GC set-up.

0754 100 PPB BTEX STD.
Good Picture. Set LibRARY

0810 1 PPM BTEX STD
Good Run. Set Library.

0824 10 PPM BTEX STD
Good Run. Set LibRARY

JBrandt



11 MAY 95



0837 AIR BLANK
- Benzene 8 ppb
- Toluene 18 ppb
- E-Benzene 22 ppb
- MP-Xylene 51 ppb
- O-Xylene 21 ppb

0847 025-001MW 0.5'-2.5' 10g
- Benzene 6 ppb
- Toluene 6 ppb
- E-Benzene 8 ppb
- MP-Xylene 18 ppb

0857 025-001MW 5'-7' 10g
- Benzene 1 ppb
- Toluene 4 ppb
- E-Benzene 8 ppb
- MP-XYLENE 21 ppb

0907 025-001MW 10'-12' 10g
- Benzene 2 ppb
- Toluene 4 ppb
- E-Benzene 13 ppb
- MP-XyLene 19 ppb

0917 025-001MW 15'-17' 10g
- Benzene 1 ppb
- Toluene 4 ppb

J Byrd Jr

| | | | |
|---|---|---|---|
| | • E-Benzene | | 3 ppb |
| | • MP-Xylene | | 11 ppb |
| 0928 | 025-001MW | 20'-22' | 10g |
| | • Benzene | | 1 ppb |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 3 ppb |
| | • MP-Xylene | | 8 ppb |

0938 100 PPB BTEX STD

| | | CAL |
|---|---|---|
| Benzene | 91 ppb | 100 ppb |
| Toluene | 87 ppb | 100 ppb |
| E-Benzene | 89 ppb | 100 ppb |
| MP-Xylene | 193 ppb | 200 ppb |
| O-Xylene | 87 ppb | 100 ppb |

| | | | |
|---|---|---|---|
| 0950 | AIR BLANK | | |
| | • Toluene | | 2 ppb |
| | • E-Benzene | | 2 ppb |
| 1002 | 025-001MW | 25'-27' | 10g |
| | • Benzene | | 3 ppb |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 2 ppb |
| | • MP-Xylene | | 5 ppb |

11 MAY 95

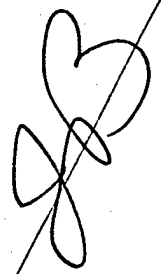


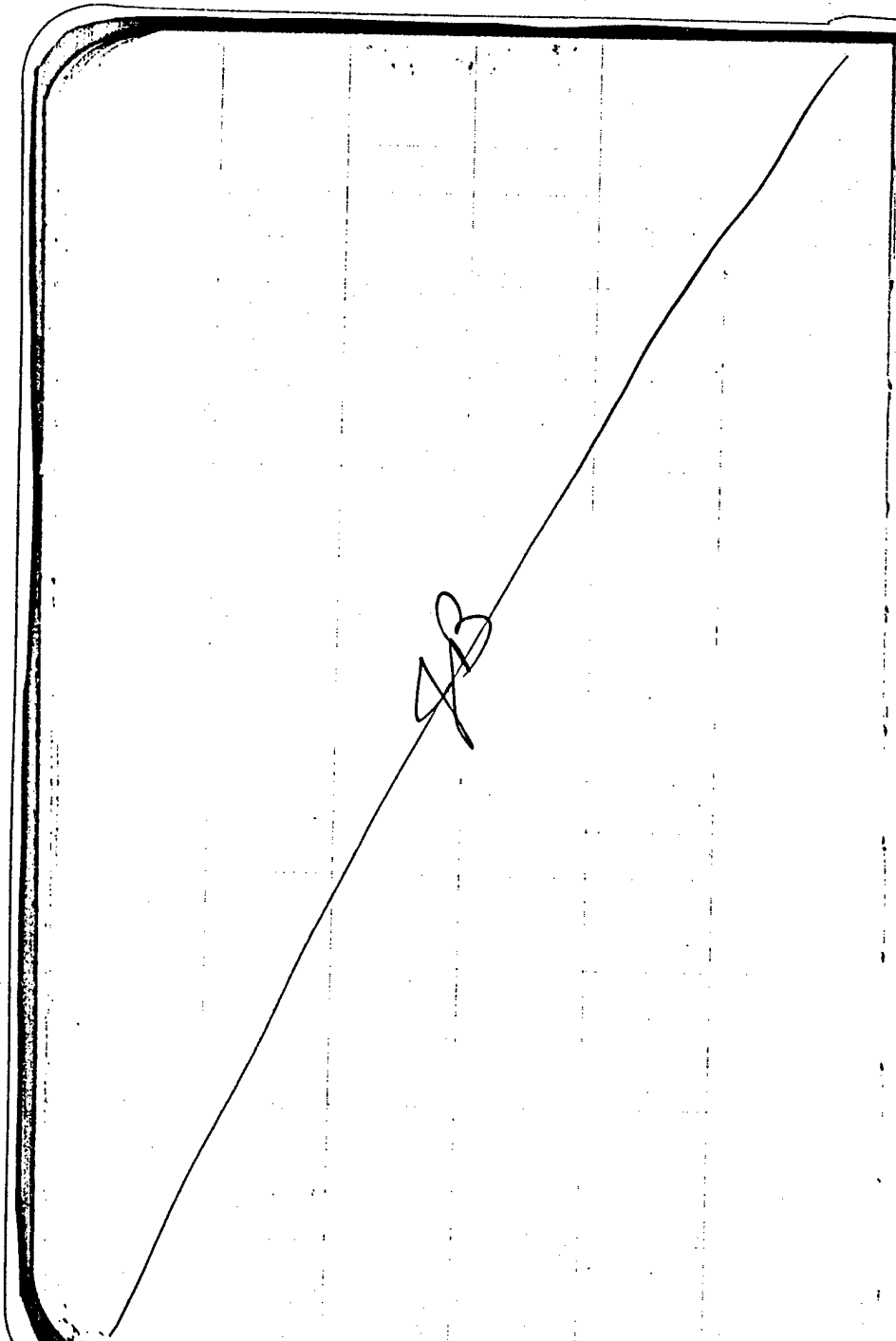
| | | | |
|---|---|---|---|
| 1012 | 025-001MW | 30'-32' | 10g |
| | • Benzene | | 3 ppb |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 5 ppb |
| | • MP-Xylene | | 9 ppb |
| 1022 | 025-001MW | 35'-37' | 10g |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 18 ppb |
| | • MP-Xylene | | 29 ppb |
| 1032 | 025-002MW | 0.5'-2.5' | 10g |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 2 ppb |
| | • MP-Xylene | | 7 ppb |
| 1042 | 025-002MW | 5-7' | 10g |
| | • Benzene | | 3 ppb |
| | • Toluene | | 4 ppb |
| | • E-Benzene | | 1 ppb |
| | • MP-Xylene | | 3 ppb |

1052 100 PPB BTEX STD

CAL

| | | | |
|---|---|---|---|
| Benzene | 108 | ppb | ppb |
| Toluene | 104 | ppb | ppb |
| E-Benzene | 104 | ppb | ppb |
| MP-Xylene | 212 | ppb | ppb |
| O-Xylene | 108 | ppb | ppb |





11 MAY 95



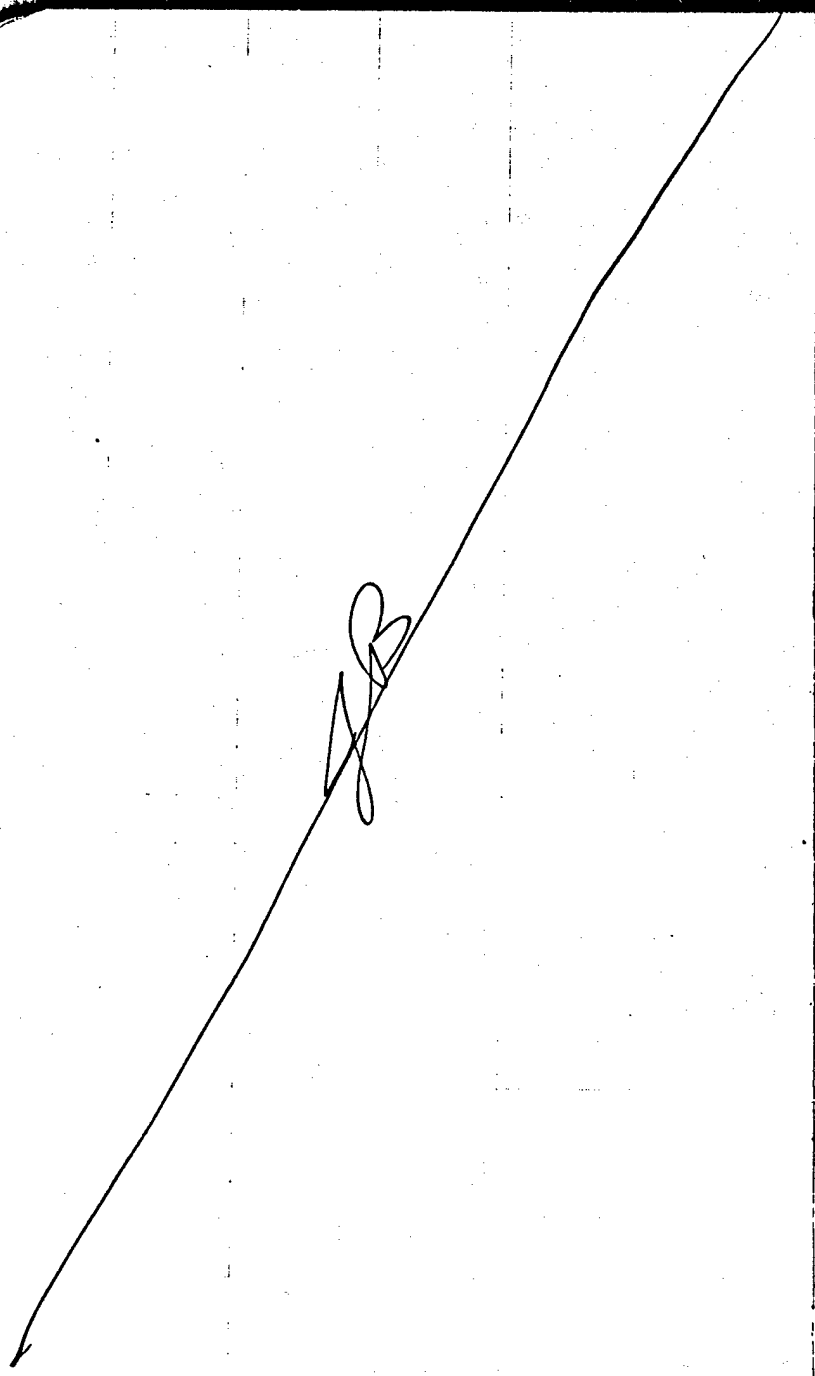
1108 Goto lunch (0.7)
1151 At Site 17 to walk site
1220 ON BASE
1226 AIR BLANK
- Toluene 1 ppb
- E-Benzene 1 ppb

1241 025-002MW @ 10'-12' 10g
- Benzene 4 ppb
- Toluene 4 ppb
- E-Benzene 2 ppb
- MP-Xylene 7 ppb
- O-Xylene 4 ppb

1252 025-002MW 15'-17' 10g
- Toluene 4 ppb
- E-Benzene 1 ppb
- MP-Xylene 4 ppb
- O-Xylene 3 ppb

1305 Out of samples. Goto site 25 to get more.
1404 BACK @ GC
Prep. Sample

J Byrd



11 MAY 95



| | | | | CAL | |
|---|---|---|---|---|---|
| 1407 | 100 PPB BTEX STD | | | | |
| | Benzene | 86 | ppb | 100 | ppb |
| | Toluene | 85 | ppb | 100 | ppb |
| | E-Benzene | 81 | ppb | 100 | ppb |
| | MP-xylene | 166 | ppb | 200 | ppb |
| | O-xylene | 83 | ppb | 100 | ppb |
| 1421 | AIR BLANK | | | | |
| | • Toluene | | | 1 | ppb |
| | • MP-xylene | | | 27 | ppb |
| 1431 | 025-003MW | 0.5'-2.5' | | 10g | |
| B ~~1431~~ | • Toluene | | | 5 | ppb |
| | • E-Benzene | | | 3 | ppb |
| | • MP-xylene | | | 13 | ppb |
| | • O-xylene | | | 9 | ppb |
| 1441 | 025-003MW | 5'-7' | | 10g | |
| | • Benzene | | | 25 | ppb |
| | • Toluene | | | 4 | ppb |
| | • E-Benzene | | | 2 | ppb |
| | • MP-xylene | | | 15 | ppb |
| 1451 | 025-003MW | 10'-12' | | 10g | |
| | • Benzene | | | 774 | ppb |
| | • Toluene | | | 350 | ppb |

J Byrd Jr

| | | | | |
|---|---|---|---|---|
| | • E-Benzene | | 297 ppb | |
| | • MP-Xylene | | 1,838 ppb | |
| | • O-Xylene | | 827 ppb | |
| 1511 | 025-003MW | 10'-12' | 10g (-5X) | |
| | • Benzene | | 133 ppb | 20µl INJECTION |
| | • Toluene | | 103 ppb | |
| | • E-Benzene | | 108 ppb | |
| | • MP-Xylene | | 443 ppb | |
| | • O-Xylene | | 197 ppb | |
| 1531 | 025-003MW | 15'-17' | 10g (-10X) | |
| | • Benzene | | 222 | 10µl INJECTION |
| | • Toluene | | 14 | |
| | • E-Benzene | | ND | |
| | • MP-Xylene | | ND | |
| | • O-Xylene | | ND | |

1545 1 PPM BTEX STD

| | | | CAL |
|---|---|---|---|
| Benzene | 696 | ppb | 1,000 ppb |
| Toluene | 679 | ppb | 1,000 ppb |
| E-Benzene | 658 | ppb | 1,000 ppb |
| MP-xylene | 1,389 | ppb | 2,000 ppb |
| O-xylene | 586 | ppb | 1,000 ppb |

J Bjerde Jr

11 MAY 95

38

1601 AIR BLANK
- Toluene 1 ppb
- E-Benzene 1 ppb
- MP-Xylene 3 ppb

1612 025-003MW 20'-22' 10g
- Benzene 149 ppb
- Toluene 15 ppb
- E-Benzene 9 ppb
- MP-Xylene 25 ppb
- O-Xylene 16 ppb

1627 AIR BLANK
- Toluene 1 ppb
- E-Benzene 1 ppb
- MP-XYLENE 2 ppb

1638 Shut down GC.
1648 Leave base
1705 At hotel

17.1
7.0
10.1

10.1 hr

FRIDAY MAY 12 1995

0545 Leave Hotel
BREAKFAST (0.7

0645 On base
CALIBRATE PID's & HydAc meter.

0710 Call security for escort to Site 26.

0717 On Site. Set up for development of 026-003MW

0940 Done. CALL security for escort. WAITing for F-16 to Leave hanger.

0951 OFF Site 26. Go to BZ17 to decon for development of 025-001MW.

1020 At 025-001 MW.

1236 Done
Decon equipment. Move to 025-002MW

1518 Done. Decon & Go to 025-003MW.

1735 DONE. Decon equipment

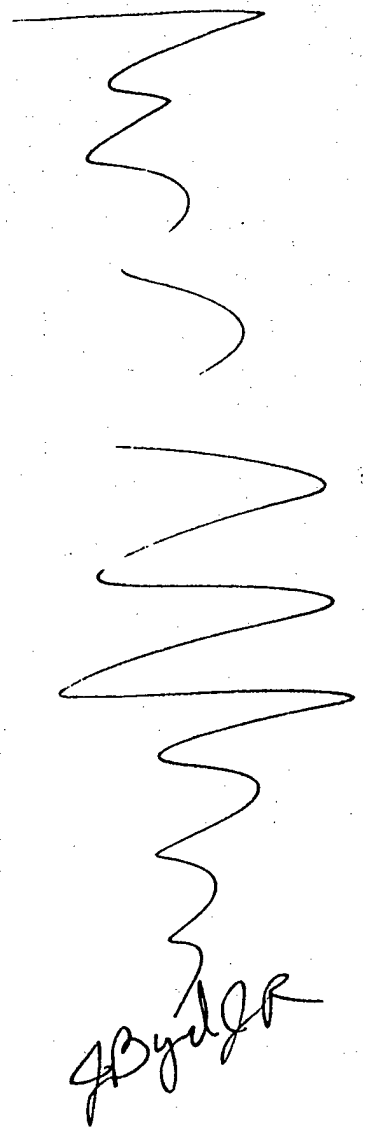
5.7
.7
6.4

12 MAY 95

(40)

1750 Leave base
1805 At Hotel

7.
18.1
6.4
11.7



11.7 hrs

DAY 12

SATURDAY 13 MAY 1995

0730 LEAVE HOTEL
BREAKFAST (0.3)
0810 ON BASE
SET-UP GC. BUILD 10 PPM,
1 PPM, 100 PPB BTEX STDs.
GAIN 1,000
CARRIER GAS FLOW 14 ml/min
INJECTION VOL 100 µl
GC OVEN TEMP 40°C
ANALYSIS TIME 400 sec
0848 100 PPB BTEX STD
GOOD RUN. SET LIBRARY
0904 1 PPM BTEX STD
GOOD RUN. SET LIBRARY
0918 10 PPM BTEX STD.
GOOD RUN. SET LIBRARY
0931 AIR BLANK
J3 0937 • BENZENE 4 ppb
• TOLUENE 3 ppb
• E-BENZENE 8 ppb
• MP-XYLENE 14 ppb
0941 025-009BH 0.5'-2.5' 10J
• BENZENE 4 ppb

7.5
.3
7.8

| | | | |
|---|---|---|---|
| | ● Toluene | | 4 ppb |
| | ● E-Benzene | | 4 ppb |
| | ● MP-Xylene | | 9 ppb |
| 0952 | 025-009BH | 5'-7' | 10g |
| | ● Benzene | | 3 ppb |
| | ● Toluene | | 4 ppb |
| | ● E-Benzene | | 3 ppb |
| | ● MP-Xylene | | 2 ppb |
| 1003 | 025-009BH | 10'-12' | 10g |
| | ● Benzene | | 3 ppb |
| | ● Toluene | | 3 ppb |
| 1013 | 025-011BH | 0.5'-2.5' | 10g |
| | ● Benzene | | 2 ppb |
| | ● Toluene | | 3 ppb |
| | ● E-Benzene | | 1 ppb |
| | ● MP-Xylene | | 4 ppb |
| 1023 | 025-011BH | 5'-7' | 10g |
| | ● Toluene | | 4 ppb |
| | ● E-Benzene | | 2 ppb |
| | ● MP-Xylene | | 5 ppb |

13 MAY 95

(43)

1033 100 PPB BTEX STD

| | | | CAL |
|---|---|---|---|
| Benzene | 106 | ppb | 1 ppb |
| Toluene | 100 | ppb | 3 ppb |
| E-Benzene | 101 | ppb | 1 ppb |
| MP-Xylene | 207 | ppb | 3 ppb |
| O-Xylene | 99 | ppb | 1 ppb |

1043 AIR BLANK
- Toluene 1 ppb
- MP-Xylene 3 ppb

1005 025-00BBH 05'-2.5' 10g
- Toluene 3 ppb
- E-Benzene 1 ppb
- MP-Xylene 3 ppb

1104 025-00BBH 7'-9' 20g
- Benzene 72 ppb
- Toluene 184 ppb
- E-Benzene 1,270 ppb
- MP-Xylene 1,290 ppb
- O-Xylene 18,900 ppb

1121 025-008BH 7'-9' 20g
--- 10µl injection
- Benzene 7 ppb

J Byrd

13 MAY 95

(44)

- Toluene 22 ppb
- E-Benzene 126 ppb
- MP-Xylene 158 ppb
- O-Xylene 806 ppb

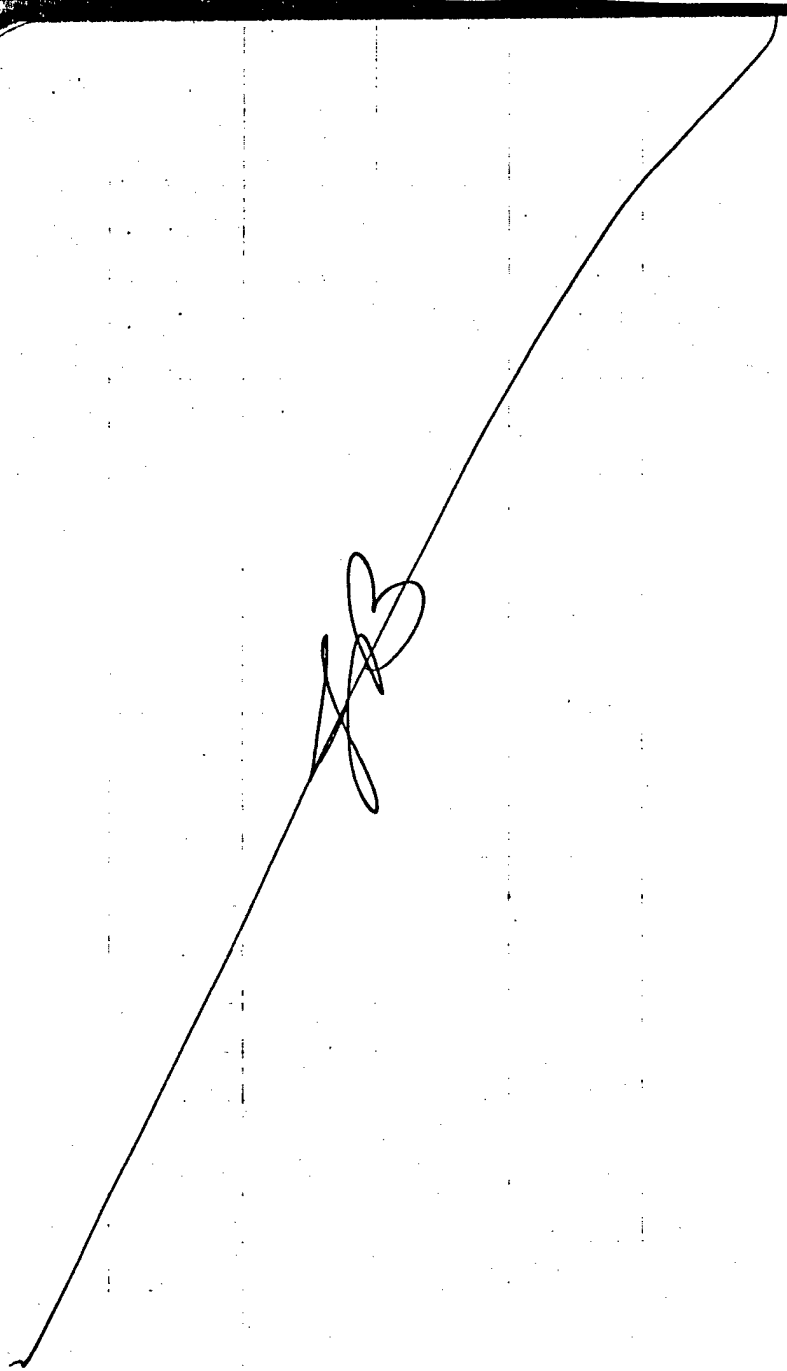
1136 025-00BBH 9'-11' 10g
--- 10 MICROLITER INJECTION
- ALL ND's

1147 025-00BBH 9'-11' 10g
--- Reshot 50µl INJECTION
- Benzene 2 ppb
- Toluene 2 ppb
- E-Benzene 6 ppb
- O-Xylene 30 ppb

1158 100 PPB BTEX STD

| | | | QA | |
|---|---|---|---|---|
| Benzene | 108 | ppb | 100 | ppb |
| Toluene | 95 | ppb | 100 | ppb |
| E-Benzene | 101 | ppb | 100 | ppb |
| MP-Xylene | 214 | ppb | 200 | ppb |
| O-Xylene | 144 | ppb | 100 | ppb |

1210 AIR BLANK
- Benzene 1 ppb
- Toluene 2 ppb

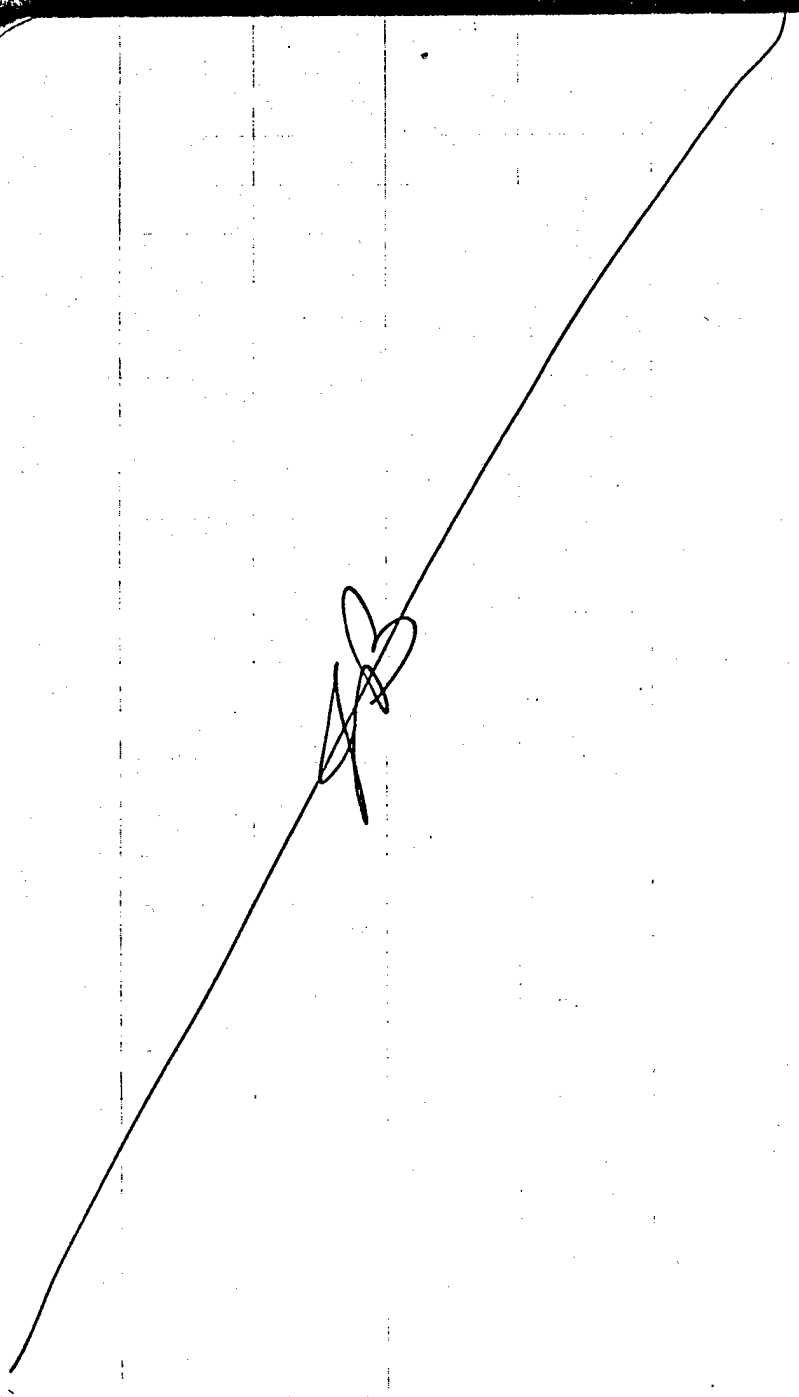


13 MAY 95



| | | | |
|---|---|---|---|
| | ● E-Benzene | | 1 ppb |
| | ● MP-Xylene | | 2 ppb |
| 1221 | 025-008BH | 13'-15' | 10g |
| | ● Toluene | | 3 ppb |
| | ● E-Benzene | | 2 ppb |
| 1231 | 025-010BH | 0.5'-2.5' | 10g |
| | ● Toluene | | 3 ppb |
| | ● E-Benzene | | 7 ppb |
| | ● MP-Xylene | | 17 ppb |
| | ● O-Xylene | | 9 ppb |
| 1242 | 025-010BH | 5'-7' | 10g |
| ~~D 1242~~ | ● Benzene | | 3 ppb |
| | ● Toluene | | 3 ppb |
| | ● E-Benzene | | 1 ppb |
| | ● MP-Xylene | | 3 ppb |
| | ● O-Xylene | | 2 ppb |
| 1300 | 025-006BH | 0.5'-2.5' | 10g |
| | ● Toluene | | 3 ppb |
| | ● E-Benzene | | 1 ppb |
| | ● MP-Xylene | | 3 ppb |
| | ● O-Xylene | | 1 ppb |
| 1310 | 025-006BH | 5'-7' | 10g |
| | ● Toluene | | 3 ppb |
| | ● E-Benzene | | 1 ppb |

JByrdfc



13 MAY 95



- MP-Xylene 3 ppb
- O-Xylene 1 ppb

1320 100 PPB BTEX STD

| | | CAL |
|---|---|---|
| Benzene | 89 ppb | 100 ppb |
| Toluene | 97 ppb | 100 ppb |
| E-Benzene | 88 ppb | 100 ppb |
| MP-Xylene | 159 ppb | 200 ppb |
| O-Xylene | 34 ppb | 100 ppb |

1333 AIR BLANK
- Toluene 12 ppb
- MP-Xylene 3 ppb

~~BRS~~ JB

1343 025-006BH 10'-12' 10g
- Toluene 5 ppb
- E-Benzene 5 ppb
- O-Xylene 14 ppb

1353 025-006BH 20'-22' 10g
- Benzene 3 ppb
- Toluene 32 ppb
- E-Benzene 35 ppb
- O-Xylene 78 ppb

JBrodsky

13 MAY 95

(47)

1404 100 PPB BTEX STD

| | |
|---|---|
| • Benzene | 93 ppb |
| • Toluene | 92 ppb |
| • E-Benzene | 96 ppb |
| • MP-Xylene | 193 ppb |
| • O-Xylene | 101 ppb |

Shut down GC.
Secure BZ52.
1420 Leave base.
1440 At hotel

J Byrd JR

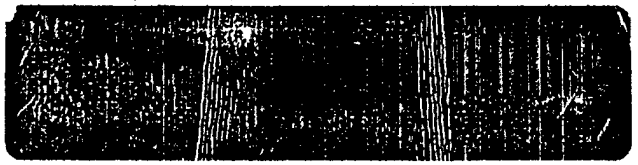
6.9 ho

3
14.7
7.8
6.9

MONDAY 15 MAY 95

0545 Leave hotel. Get GAS.
BREAKFAST (0.3)

0645 ON BASE
Set-up & PROGRAM GC.
CALIBRATE Both PIDs to
100 PPM Isobutylene
CALIBRATE LEL to 50% Pentane.
Build 10 PPM, 1 PPM, & 100 PPB BTEX STD's.



0812 100 PPB BTEX STD.
Good Run. Set LIBRARY.

0839 1 PPM BTEX STD.
Good Run. Set library

0855 10 PPM BTEX STD
Good Run. Set LIBRARY

0912 AIR BLANK
- BENZENE 2 ppb
- TOLUENE 1 ppb

5.7
.3
6.0

10.9
9.6
1.3

15 MAY 95



- E-Benzene 3 ppb
- MP-Xylene 4 ppb

0925 Goto Site to get samples.

0930 Safety Meeting
- JB, KL, KM, DG, Jamie, Jon
- Weather – chance o' rain?
- PPE
- Don't eat Dirt.

0935 Have not begun yet. Goto Site 17 to meet w/ people to get underground clearances

1023 Person from Gopher 1 here. He had been here earlier to check site for drillers. He is from the City of Duluth.

1045 Have given Anybody else 30 min. Return to base.

1051 On base Gather samples. Prep. samples

~~too p~~ JB

1103 1 PPM BTEX STD. | CAL

| | | | | |
|---|---|---|---|---|
| • Benzene | 827 | ppb | 1,000 | ppb |
| • Toluene | 778 | ppb | 1,000 | ppb |
| • E-Benzene | 664 | ppb | 1,000 | ppb |

JBynbjr

15 MAY 95

50

| | | | CAL | |
|---|---|---|---|---|
| • MP-Xylene | 1,300 | ppb | 2,000 | ppb |
| • O-Xylene | 632 | ppb | 1,000 | ppb |

1117 AIR BLANK
- Benzene 1 ppb
- Toluene 2 ppb
- E-Benzene 3 ppb
- MP-Xylene 3 ppb

1127 025-003BH 0.5'-2.5' 10g
- Benzene 7 ppb
- Toluene 10 ppb
- E-Benzene 41 ppb
- O-Xylene 82 ppb

1137 025-003BH 5'-7' 10g
- E-Benzene 3,620 ppb
- MP-Xylene 35,650 ppb
- O-Xylene 15,050 ppb

1149 025-003BH 5'-7' 10g Reshot
--- 10 µl injection
- ALL ND's
- ~~O~~ JB
- JB

1201 025-003BH 5'-7' 10g ReReshot
--- 20 µl injection

JByrd

- Toluene 4,790 ppb
- E-Benzene 747 ppb
- MP-Xylene 2,740 ppb
- O-Xylene 4,030 ppb

1215 025-003BH 10'-12' 10g

---20µl injection

- Toluene 9,510 ppb
- E-Benzene 1,040 ppb
- MP-Xylene 7,290 ppb
- O-Xylene 5,400 ppb

1229 10 PPM BTEX STD

| | | | CAL | |
|---|---|---|---|---|
| Benzene | 8,720 | ppb | 10,000 | ppb |
| Toluene | 8,470 | ppb | 10,000 | ppb |
| E-Benzene | 5,510 | ppb | 10,000 | ppb |
| MP-Xylene | 11,620 | ppb | 20,000 | ppb |
| O-Xylene | 5,810 | ppb | 10,000 | ppb |

1243 AIR BLANK

- Benzene 11 ppb
- Toluene 5 ppb
- E-Benzene 11 ppb
- MP-Xylene 25 ppb

---JB---

JByrd/jk

1255 025-003 BH 15'-17' 10g
--- 20 µl injection
- Benzene 28 ppb
- Toluene 43 ppb
- E-Benzene 41 ppb
- MP-Xylene 228 ppb
- O-Xylene 84 ppb

1306 025-003BH 20'-22' 10g
--- 50 µl injection
- Benzene 138 ppb
- Toluene 157 ppb
- E-Benzene 123 ppb
- MP-Xylene 916 ppb
- O-Xylene 553 ppb

1317 GoLo Rig to get more samples

1339 025-003BH 25' 10g
--- 20 µl injection
- ALL NDs (NO READ-OUT)

1351 025-003BH 25' 10g Reshot
--- 100 µl injection
- Benzene 20 ppb
- Toluene 276 ppb
- E-Benzene 42 ppb

JBy

15 MAY 95



- MP-Xylene 364 ppb
- O-Xylene 47 ppb

1402 025-002BH 0.5'-2.5' 10g

- Benzene 13 ppb
- Toluene 152 ppb
- E-BENZENE 12 ppb
- MP-Xylene 31 ppb

1418 1 PPM BTEX

| | | | CAL | |
|---|---|---|---|---|
| Benzene | 900 | ppb | 1,000 | ppb |
| Toluene | 828 | ppb | 1,000 | ppb |
| E-Benzene | 718 | ppb | 1,000 | ppb |
| MP-Xylene | 1,440 | ppb | 2,000 | ppb |
| O-Xylene | 824 | ppb | 1,000 | ppb |

1432 AIR BLANK

- Toluene 2 ppb
- E-Benzene 3 ppb
- MP-Xylene 6 ppb

1442 025-002BH 5'-7' 50µl inject 10g

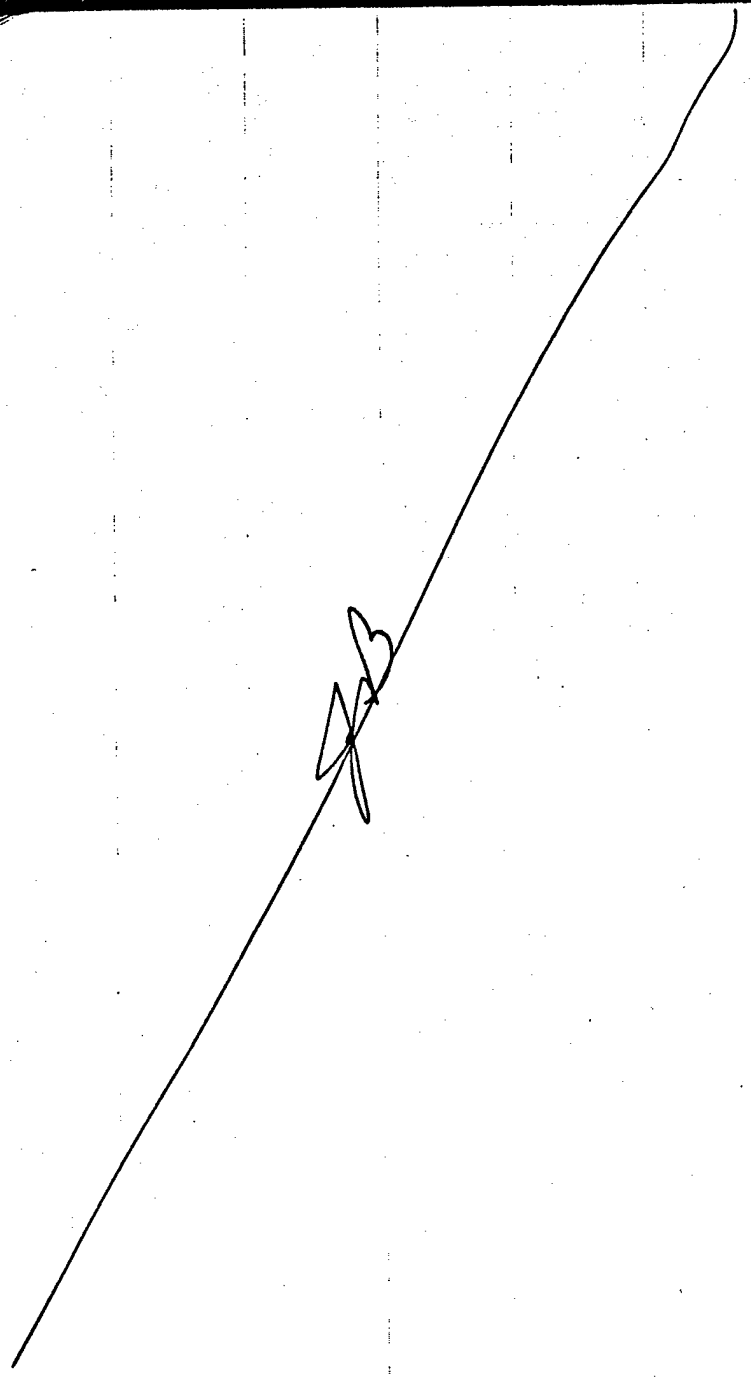
- SIXOT messed up

1454 025-002BH 5'-7' 10g

--- 20µl injection

- Benzene 1,160,000 ppb

JBridge



15 MAY 95



- Toluene 52,510 ppb
- E-Benzene 5,100 ppb
- MP-Xylene 41,000 ppb
- O-Xylene 22,700 ppb

1505 Go to site to talk to KP about concentrations.

1541 025-002BH 5'-7' 10g
--- 5µl injection
- Benzene 1,010 ppb
- Toluene 10,700 ppb
- E-Benzene 135 ppb
- MP-Xylene 7,810 ppb
- O-Xylene 5,190 ppb

1557 025-002BH 5'-7' 10g
--- 5µl injection --- Re-Reshot
- Benzene 3,690 ppb
- Toluene 10,450 ppb
- E-Benzene 168 ppb
- MP-Xylene 7,230 ppb
- O-Xylene 4,650 ppb

1613 Go to site to get samples. Prep. Samples

J Byrd Jr

15 MAY 95

55

1638 10 PPM BTEX STD

| | | | CAL | |
|---|---|---|---|---|
| Benzene | 9,050 | ppb | 10,000 | ppb |
| Toluene | 8,790 | ppb | 10,000 | ppb |
| E-Benzene | 8,290 | ppb | 10,000 | ppb |
| MP-Xylene | 16,840 | ppb | 20,000 | ppb |
| O-Xylene | 8,390 | ppb | 10,000 | ppb |

1652 AIR BLANK

- Benzene 11 ppb
- Toluene 38 ppb
- E-Benzene 41 ppb
- MP-Xylene 521 ppb
- O-Xylene 103 ppb

1702 AIR BLANK (400 µl injection)

- Benzene 10 ppb
- Toluene 14 ppb
- E-Benzene 4 ppb
- MP-Xylene 13 ppb

1713 025-001 BH 0.5'-2.5' ~~40g~~ 3g

--- 50 µl injection

- Benzene ~~3 ppb~~ 9 ppb
- Toluene ~~3 ppb~~ 31 ppb
- E-Benzene 4 ppb

JBycroft

15 MAY 95

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- MP-Xylene 16 ppb

1723 025-001BH 5'-7' 3g

- ~~Benzene~~ TB
- Toluene 18,380 ppb
- E-Benzene 190 ppb
- MP-Xylene 11,620 ppb
- O-Xylene 5,410 ppb

1736 10 PPM BTEX STD

- Benzene 10,940 ppb
- Toluene 9,800 ppb
- E-Benzene 8,540 ppb
- MP-Xylene 16,560 ppb
- O-Xylene 7,750 ppb

Shut down GC.

Secure B252

1754 Leave base

1816 At Hotel

1.3 - 213
11.0 - 197

12.3 hr

18.3
6.0
12.3

TUESDAY 16 MAY 95

0545 LEAVE HOTEL
BREAKFAST (0.6)

0645 ON BASE
PROGRAM GC. BUILD 10 PPM, 1 PPM, & 100 PPB BTEX STD's.
~~100 PPB BTEX~~ JB.
GAIN 1,000
CARRIER GAS FLOW JB 400 11.3 ml/min
INJECTION VOL. 100 µl
GC OVEN TEMP 40°C
ANALYSIS TIME JB ~~500~~ 450 sec

0803 100 PPB BTEX STD.
GOOD RUN. SET LIBRARY

0820 1 PPM BTEX STD.
GOOD RUN. SET LIBRARY

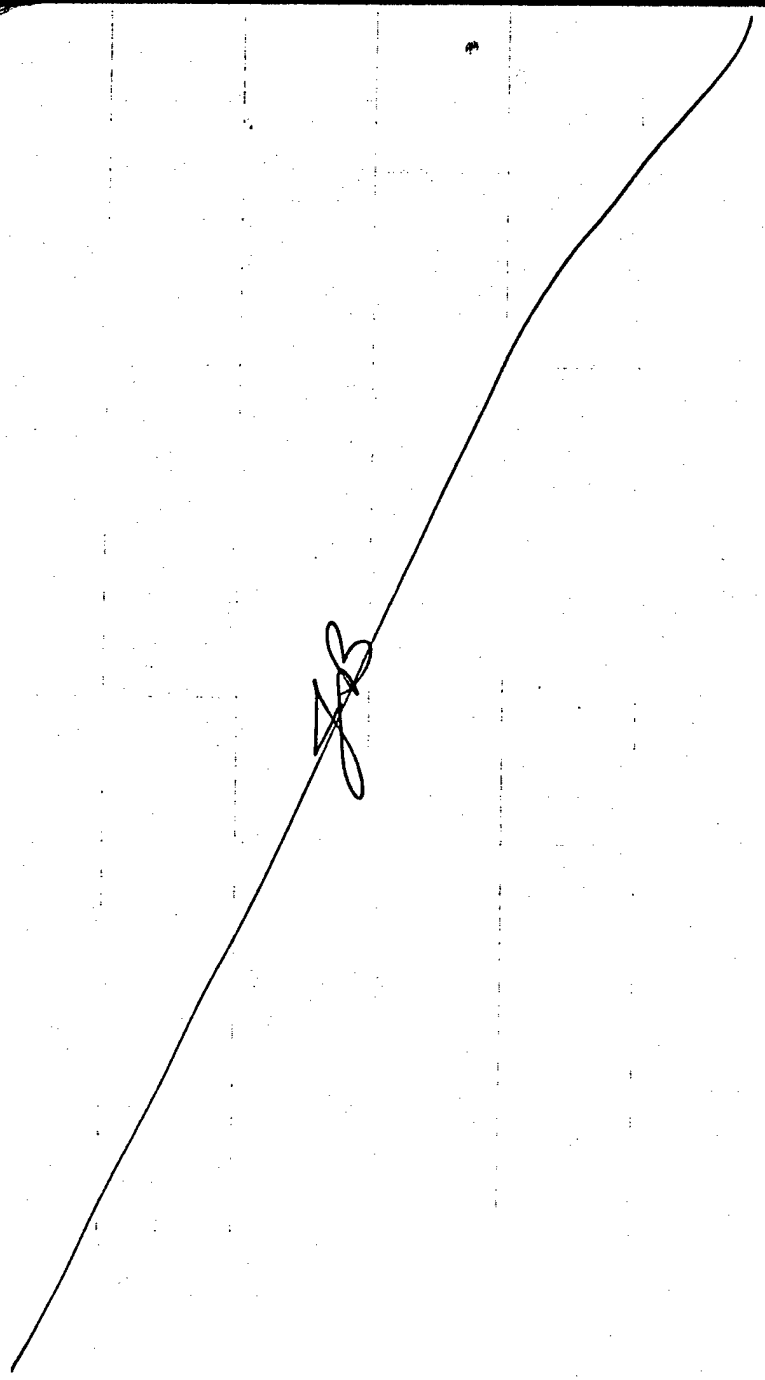
0834 10 PPM BTEX STD
GOOD RUN. SET LIBRARY

0850 AIR BLANK
- TOLUENE 9 ppb
- E-BENZENE 5 ppb
- MP-XYLENE 6 ppb

0900 GOTO SITE TO GET SAMPLES.
PREPARE SAMPLES

JB GR

1
5.7
1.6
7.3

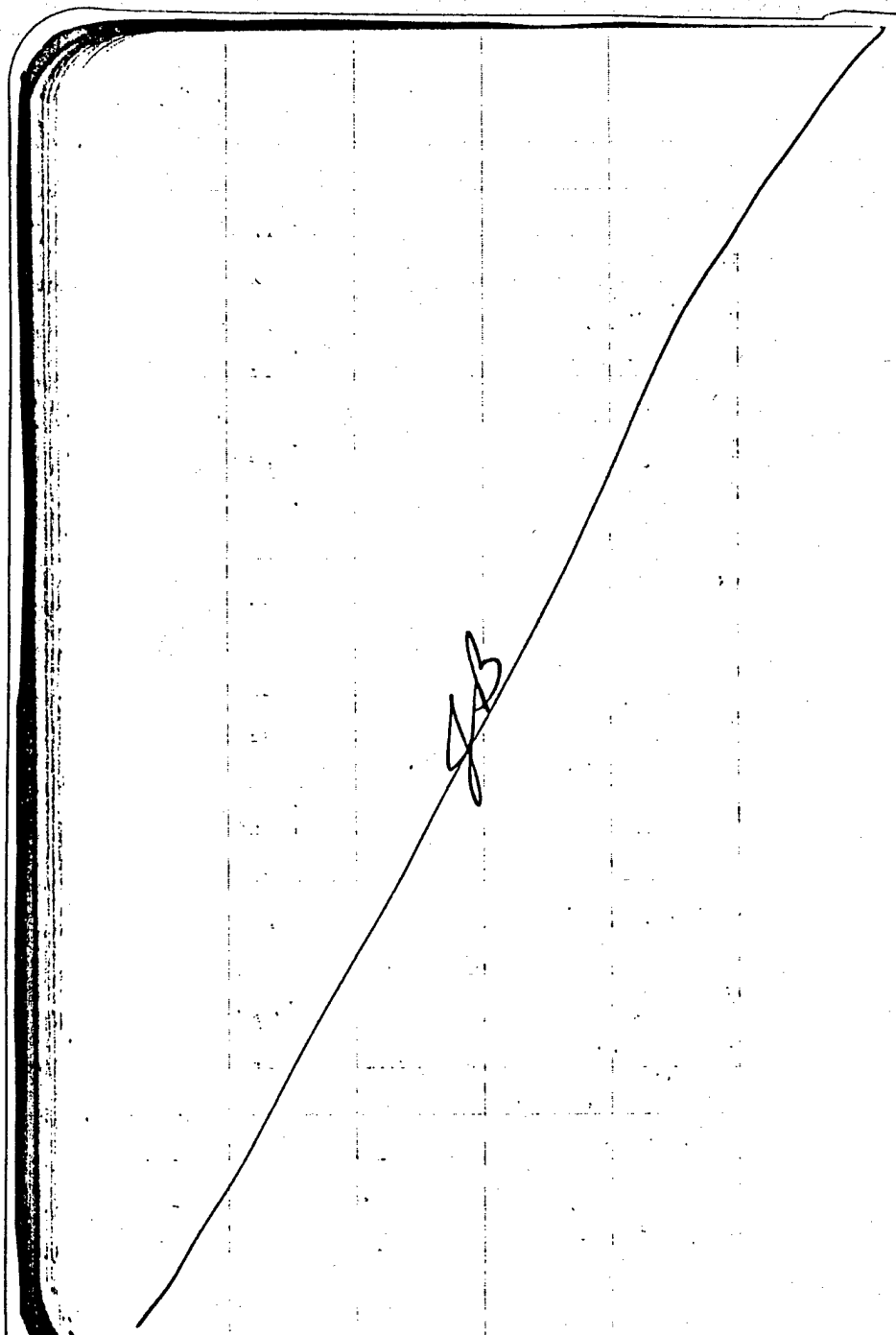


16 MAY 95

(58)

| | | | | |
|---|---|---|---|---|
| 0923 | 025-007BH | 0.5'-2.5' | | 10g |
| | • Benzene | | 2 | ppb |
| | • Toluene | | 6 | ppb |
| | • E-Benzene | | 1 | ppb |
| | • MP-Xylene | | 3 | ppb |
| 0935 | 025-007BH | 5'-7' | | 10g |
| | • Benzene | | 5 | ppb |
| | • Toluene | | 12 | ppb |
| | • E-Benzene | | 5 | ppb |
| | • MP-Xylene | | 14 | ppb |
| 0946 | 025-007BH | 10'-12' | | 10g |
| | • Benzene | | 4 | ppb |
| | • Toluene | | 4 | ppb |
| 0957 | 025-007BH | 15'-17' | | 10g |
| | • Benzene | | 4 | ppb |
| | • Toluene | | 11 | ppb |
| | • E-Benzene | | 1 | ppb |
| 1008 | 025-007BH | 20'-22' | | 10g |
| | • Toluene | | 4 | ppb |
| | • E-Benzene → ZINC | | 1 | ppb |
| | • O-XYLENE | | | |
| 1019 | 100 PPB BTEX STD | | | |
| | BENZENE | 101 | ppb | 100 ppb |
| | TOLUENE | 83 | ppb | 100 ppb |
| | E-BENZENE | 54 | ppb | 100 ppb |

J Byrd



16 MAY 95



| | | | | | |
|---|---|---|---|---|---|
| | MP-XYLENE | 75 | ppb | 100 | ppb |
| | O-XYLENE | 1 | ppb | 100 | ppb |

1033 AIR BLANK
- Toluene 5 ppb

1044 025-005BH 0.5'-2.5' 10g
- Benzene 2 ppb
- Toluene 4 ppb
- MP-XYLENE 9 ppb

1055 025-005BH 10'-12' 10g
- Toluene 4 ppb
- E-Benzene 2 ppb

1106 025-005BH 20'-22' 10g
- Benzene 3 ppb
- Toluene 4 ppb
- E-Benzene 1 ppb
- MP-XYLENE 9 ppb

1118 Go to Site to get samples.
Prepare samples

1142 025-004BH 0.5'-2.5' 10g
- Toluene 4 ppb

1153 025-004BH 5'-7' 10g
- Benzene 2 ppb
- Toluene 4 ppb

JBydalyk

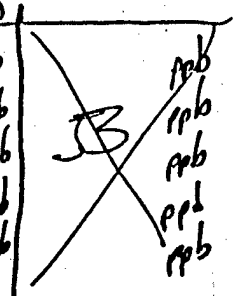
- E-Benzene 10 ppb
- MP-Xylene 178 ppb
- O-Xylene 157 ppb

1208 lunch (1.0 hr)

1308 Back on base.
Prep Samples.

1331 100 PPB BTEX STD

| | | |
|---|---|---|
| Benzene | 88 | ppb |
| Toluene | 87 | ppb |
| E-Benzene | 58 | ppb |
| MP-Xylene | 78 | ppb |
| O-Xylene | ~~0~~ | ppb |




Go to Rig to help them set up & move.

1415 100 PPB BTEX
----- Standard is FLAT.
Rebuild 1 PPM & 100 PPB BTEX STDs.

1439 ERASE Library

1442 100 PPB BTEX STD.
——— No O-Xylene Peak.
Reset Carrier Gas Flow to 12 ml/min

16 MAY 95



1530 100 PPB BTEX STD
Good Run. Set library.

1548 1 PPM BTEX STD.
Good Run. Set library.

1602 10 PPM BTEX STD.
Good Run. Set Library.

1617 AIR BLANK
- Benzene 1 ppb
- Toluene 1 ppb
- E-Benzene 6 ppb
- MP-Xylene 9 ppb

1630 025-004BH 10'-12' 10g
- Benzene 1 ppb
- Toluene 4 ppb
- E-Benzene 4 ppb
- MP-Xylene 8 ppb

1643 025-004BH 18'-20' 10g
- Benzene 1 ppb
- Toluene 3 ppb

1655 021-026BH 9'-10' 10g
- Benzene 1 ppb
- Toluene 3 ppb

1707 021-026BH 4'-6' 10g
- Benzene 1 ppb

- Toluene 2 ppb
- E-Benzene 4 ppb
- MP-xylene 5 ppb

1719 · 025-004BH 5'-7' Reshot 10g

- Benzene 1 ppb
- Toluene 3 ppb
- E-Benzene 2 ppb
- MP-xylene 6 ppb

1731 100 PPB BTEX STD

- Benzene 106 ppb
- Toluene 103 ppb
- E-Benzene 98 ppb
- MP-xylene 188 ppb
- O-xylene 68 ppb

Shut down GC

Secure B252

Secure B247

1748 Leave base

1805 At Hotel

7.1
14.1
7.3
10.8

J Byd Jr

213 / 0.5 — 197 / 10.3

10.8 hrs.

DAY 16



WEDNESDAY 17 MAY 95

0545 Leave hotel
Breakfast (0.5)

0635 On base
Set up & Program GC.
Build 10 PPM, 1PPM, & 100 PPB BTEX STD's.

| | |
|---|---|
| GAIN | 1,000 |
| CARRIER GAS FLOW | 12 µl/min |
| Injection Vol | 100 µl |
| GC OVEN Temp | 40°C |
| ANALYSIS Time | 460 sec |

0726 100 PPB BTEX STD.
~~Good Run, Set Library.~~ JB
NO O-XYLENE. INCREASE RUN TIME TO 500 sec.

0742 100 PPB BTEX STD
NO O-XYLENE.
---- Adjust DRV 3 & DRV 4 to (5 + 4/6)

0757 100 PPB BTEX STD
Good Run. Set Library

0815 1 PPM BTEX STD
Good Run. Set Library
~~JBrydon~~

17 MAY 95



0830 10 PPM BTEX STD
Good Run. Set LIBRARY

0845 AIR BLANK
- Benzene 1 ppb
- Toluene 12 ppb
- MP-Xylene 83 ppb
- O-Xylene 20 ppb

0858 021-027BH 4'-6' 10g
- Benzene 1 ppb
- Toluene 3 ppb
- MP-Xylene 31 ppb
- O-Xylene 11 ppb

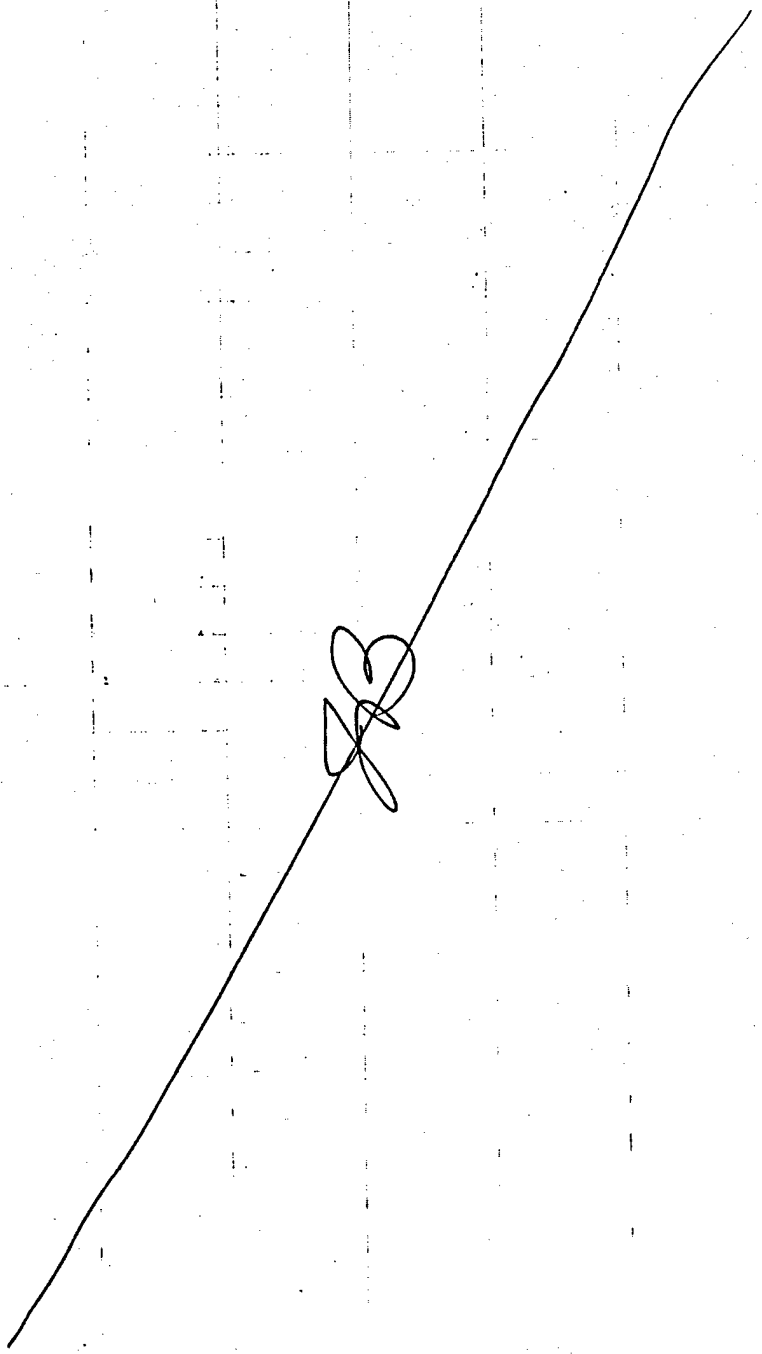
0910 021-027BH 8'-10' 10g
- Toluene 3ppb
- E-Benzene 3 ppb
- MP-Xylene 8 ppb
- O-Xylene 4 ppb

0921 AIR BLANK
- Benzene 2 ppb
- Toluene 1 ppb

0934 021-028BH 25'-27.5' 10g
- Toluene 2 ppb
- E-Benzene 2 ppb
- MP-Xylene 3 ppb

| | | | | |
|---|---|---|---|---|
| | ● O-Xylene | 2 ppb | | |
| 0946 | 021-028BH | | | |
| | ● Toluene | 2 ppb | | |
| | ● E-Benzene | 3 ppb | | |
| | ● MP-Xylene | 5 ppb | | |
| | ● O-Xylene | 5 ppb | | |
| 0958 | 100 PPB BTEX STD | | | CAL |
| | Benzene | 97 | ppb | 100 ppb |
| | Toluene | 70 | ppb | 100 ppb |
| | E-Benzene | 62 | ppb | 100 ppb |
| | MP-Xylene | 119 | ppb | 200 ppb |
| | O-Xylene | 51 | ppb | 100 ppb |
| 1013 | AIR BLANK | | | |
| | ● Benzene | 3 ppb | | |
| | ● E-Benzene | 1 ppb | | |
| 1034 | 025-012BH | 0.5'-2.5' | | 10g |
| | ● Benzene | 3 ppb | | |
| | ● Toluene | 21 ppb | | |
| | ● E-Benzene | 17 ppb | | |
| | ● O-Xylene | 39 ppb | | |
| 1040 | 025-012BII | 5'-7' | | 10g |
| | ● A lot of Peaks, NO Readings | | | |

J Reynolds Jr



17 MAY 95



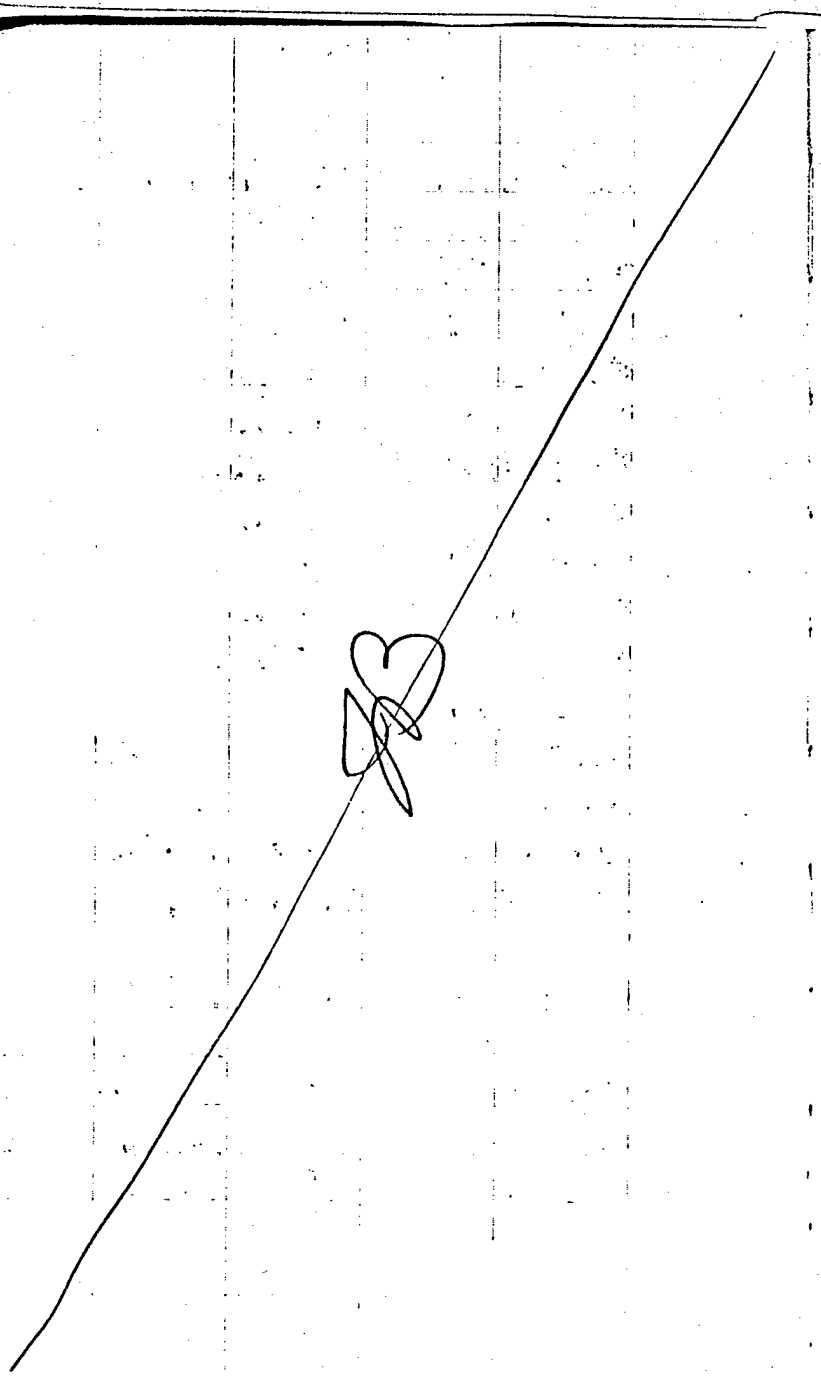


1101 025-012BH 5'-7' Reshot 10g
--- 20µl INJECTION
● ALL NDs
1112 025-012BH 10'-12' 10g
● Benzene 48 ppb
● Toluene 31 ppb
● E-Benzene 4 ppb
● O-xylene 14 ppb
1124 025-012BH 18'-20' 10g
● Benzene 41 ppb
● Toluene 46 ppb
CLEAN AREA
1145 ~~lunch~~ JB Goto Site 17.
1200 Lunch (1.0)
1300 At Site 17. Goto B252
1321 100 PPB BTEX STD.

| | | | CAL | |
|---|---|---|---|---|
| Benzene | 77 | ppb | 100 | ppb |
| Toluene | 84 | ppb | 100 | ppb |
| E-Benzene | 80 | ppb | 100 | ppb |
| MP-Xylene | 151 | ppb | 200 | ppb |
| O-Xylene | 78 | ppb | 100 | ppb |

JB

J Byrd JR



17 MAY 95





| | | | |
|---|---|---|---|
| 1336 | AIR BLANK | | |
| | • Benzene | 3 ppb | |
| | • E-Benzene | 1 ppb | |
| | • O-Xylene | 73 ppb | |
| 1347 | 025-013BH | 0.5'-2.5' | 10g |
| | • Benzene | 4 ppb | |
| | • Toluene | 3 ppb | |
| | • E-Benzene | 1 ppb | |
| | • MP-Xylene | 3 ppb | |
| 1359 | 025-013BH | 5'-7' | 10g |
| | • Benzene | 3 ppb | |
| | • Toluene | 2 ppb | |
| | • E-Benzene | 20 ppb | |
| | • O-Xylene | 106 ppb | |
| 1411 | 025-013BH | 10'-12' | 10g |
| | • Benzene | 4 ppb | |
| | • Toluene | 2 ppb | |
| | • E-Benzene | 4 ppb | |
| | • MP-Xylene | 2 ppb | |
| 1429 | 025-013BH | 18'-20' | 10g |
| | • Benzene | 10 ppb | |
| | • Toluene | 17 ppb | |
| | • E-Benzene | 3 ppb | |
| | • O-Xylene | 4 ppb | |

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17 MAY 95



| | | | | CAL | |
|---|---|---|---|---|---|
| 1441 | 100 PPB BTEX STD | | | | |
| | Benzene | 96 | ppb | 100 | ppb |
| | Toluene | 92 | ppb | 100 | ppb |
| | E-Benzene | 87 | ppb | 100 | ppb |
| | MP-Xylene | 178 | ppb | 200 | ppb |
| | O-Xylene | 93 | ppb | 100 | ppb |
| 1509 | AIR BLANK | | | | |
| | • Benzene | 1 | ppb | | |
| 1521 | 017-024BH | 0.5'-2.5' | | 6g | |
| | • Benzene | 1 | ppb | | |
| | • E-Benzene | 8 | ppb | | |
| | • O-Xylene | 13 | ppb | | |
| 1533 | 017-024BH | 4'-6' | | 10g | |
| | • Benzene | 4 | ppb | | |
| | • Toluene | 1 | ppb | | |
| | • MP-Xylene | 44 | ppb | | |
| ~~1546~~ | ~~017-024BH~~ | ~~8'-10'~~ | | ~~15g~~ | |
| | • | 5 | | | |
| 1546 | 017-024BH | 0.5'-2.5' | | 10g | |
| | • Benzene | 6 | ppb | | |
| | • Toluene | 1 | ppb | | |
| | • E-Benzene | 4 | ppb | | |

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| | | | |
|---|---|---|---|
| | •MP-XYLENE | 9 ppb | |
| 1558 | 017-024BH | 8'-10' | 15g |
| | •BENZENE | 11 ppb | |
| | •E-BENZENE | 16 ppb | |
| | •O-XYLENE | 4 ppb | |
| 1610 | 017-025BH | 4'-6' | 10g |
| | •BENZENE | 6 ppb | |
| | •TOLUENE | 1 ppb | |
| | •E-BENZENE | 4 ppb | |

1622 100 PPB BTEX STD

| | | | CAL | |
|---|---|---|---|---|
| BENZENE | 96 | ppb | 100 | ppb |
| TOLUENE | 81 | ppb | 100 | ppb |
| E-BENZENE | 64 | ppb | 100 | ppb |
| MP-XYLENE | 115 | ppb | 200 | ppb |
| O-XYLENE | 108 | ppb | 100 | ppb |

JB

| | | | |
|---|---|---|---|
| 1636 | AIR BLANK | | |
| | •BENZENE | 5 ppb | |
| | •~~TOLUENE~~ E-BENZENE JB | 4 ppb | |
| | •O-XYLENE | 4 ppb | |
| 1648 | 017-022BH | 0.5'-2.5' | 10g |
| | •BENZENE | 5 ppb | |
| | •TOLUENE | 3 ppb | |

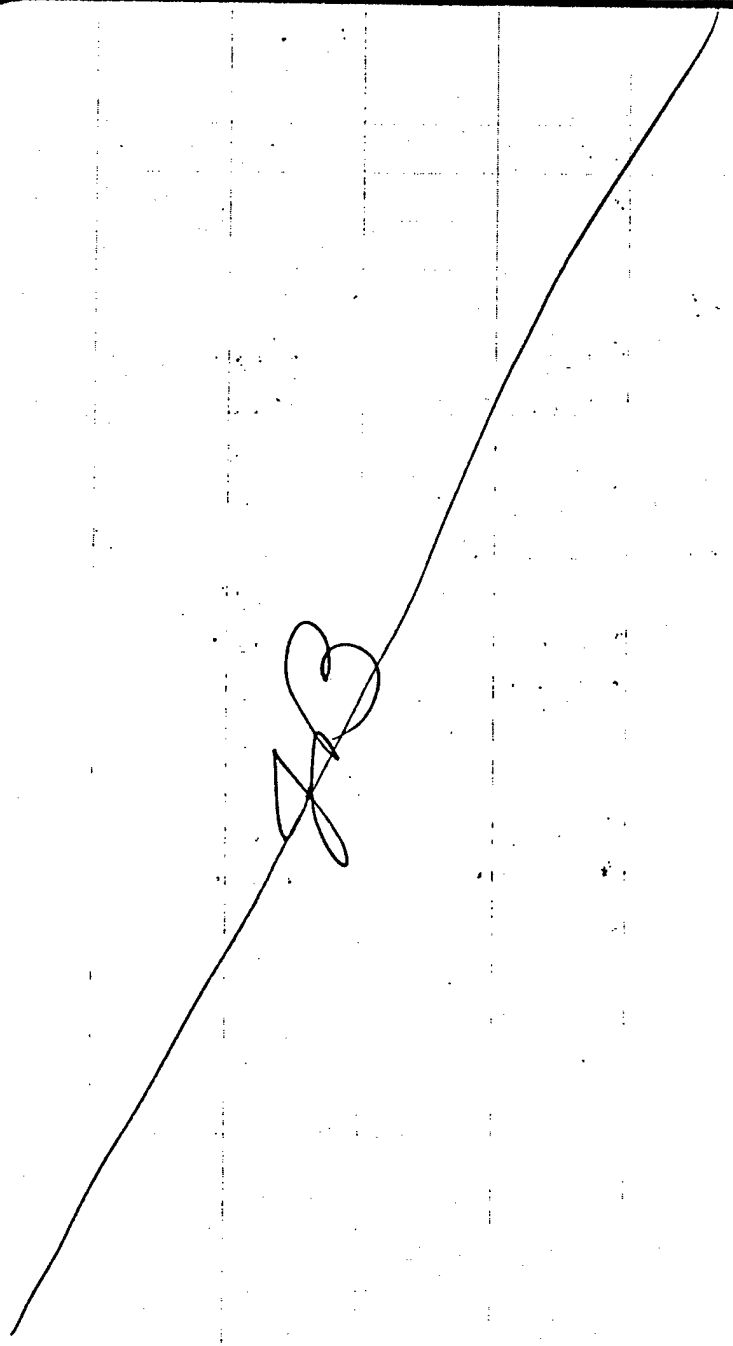
JB

| | | | |
|---|---|---|---|
| | • E-Benzene | 7 ppb | |
| | • MP-Xylene | 12 ppb | |
| | • O-Xylene | 1 ppb | |
| 1659 | 017-023BH | 0.5'-2.5' | 10g |
| | • Benzene | 3 ppb | |
| | • Toluene | 3 ppb | |
| | • E-Benzene | 7 ppb | |
| | • MP-Xylene | 9 ppb | |
| 1713 | 017-023BH | 4'-6' | 10g |
| | • Benzene | 10 ppb | |
| | • Toluene | 3 ppb | |
| | • E-Benzene | 37 ppb | |
| | • MP-Xylene | 98 ppb | |
| 1724 | 017-028BH | 0.5'-2.5' | 10g |
| | • Benzene | 13 ppb | |
| | • Toluene | 3 ppb | |
| | • E-Benzene | 4 ppb | |
| 1736 | 017-028BH | 4'-6' | 6g |
| | • Benzene | 3 ppb | |
| | • E-Benzene | 5 ppb | |

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Continued in Book 2

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GC Procedures

## SUMMARY OF GC ANALYSIS PROCEDURE

**Calibration** Prepare 100-ppb, 1-ppm, and 10-ppm working standards fresh each day according to the GC CALIBRATION section. Create a 3-point calibration with these three standards, according to the GC CALIBRATION and GC ANALYSIS sections. Be sure that correct standard concentration values are used for peaks representing more than one component, as recognized by the GC (e.g., 2 ppm for m,p-xylene peak).

**Sample Analysis** Prepare and analyze headspace from soil and water samples according to SOIL AND WATER SAMPLE PREPARATION. All samples will be consistently warmed in the water bath before headspace injection. If sample results are significantly greater than the 10-ppm standard (e.g., greater than 60 ppm for total BTEX), then the sample must be reanalyzed with dilution as needed to bring it into range of the standard used. Diluted samples are achieved either by injecting smaller gas volumes onto the GC or using less soil in preparing the headspace sample, as detailed in the GC ANALYSIS section. After analysis of every five samples (or after a lapse in GC operation of more than 2 hours), a QA/QC check must be performed, consisting of a calibration check and an air blank check.

**QA/QC Check** Perform a calibration check by analyzing an appropriate working standard again. If, after shooting a working standard, correct identification of all standard compounds and concentrations within the range of 80-120% of the specified calibration concentration is not achieved, then restore the standard compounds, peak numbers, and calibration concentrations in the library as detailed in GC CALIBRATION CHECK.

Perform an air blank check by injecting an open air sample into the GC. If the results are not "clean" (close to or less than 10 ppb for all analytes), then perform more stringent decontamination procedures on the syringe used for sample injection or evaluate whether there are significant volatiles present in the ambient air. Once a successful QA/QC check has been completed, proceed with analysis of samples again.

**Data Reporting** All injections, including successful and unsuccessful QA/QC checks, must be reported on the FIELD GC DATA SUMMARY. Changes in flowrate and other GC operating parameters must also be recorded as analyses progress. All concentrations reported on the SUMMARY should be recorded with no more than three significant digits, with the last digit reported being the ppb singles digit (e.g., record 5,673 ppb as 5,670 ppb, and record 24,856 ppb as 25 ppb).

## INSTRUMENT AND ASSOCIATED EQUIPMENT

- Photovac 10S+ with a dot matrix printer, electrical power cords (GC main cord and GC oven cord with wall transformer), and printer serial cable.
- Photovac-provided replacement injection port septa.
- Single stage (dual gauge) regulator with tubing, quick disconnect fitting, and tee with valve for gas syringe decontamination.

- Cylinder of zero-grade compressed air for use as the carrier gas
- Photovac digital (bubble) flowmeter or Photovac dual gas rotameters. If digital flowmeter is used, a soap solution is also required.
- 2000-ppm stock standard solution of BTEX and/or other chemicals (in methanol), contained in small, 1.5-mL vials with little or no headspace.
- 10-$\mu$L, 100-$\mu$L, and 500-$\mu$L gas syringes for gas headspace injection and working standard preparation.
- Electronic balance.
- 10-mL glass pipettes and rubber pipette bulb.
- 40-mL VOA vials (to prepare soil samples and working standards).
- 100% Nitrile gloves and safety glasses.
- Small ice chest for storage of samples and standards.
- Deionized water (10 mL to 10 grams of soil).
- Methanol (lab grade).
- Brush for decontamination of VOA vials.
- Small plastic tub, aquarium heater, and thermometer.
- All references herein refer to the Photovac 10S+ GC manual.

## GC SETUP PROCEDURE

**Location** Place the GC upwind from the drilling locations and any other nearby engine exhaust sources. The GC should also be within reach of a 110 VAC power source. Refer to Figure 1 for setting up the GC.

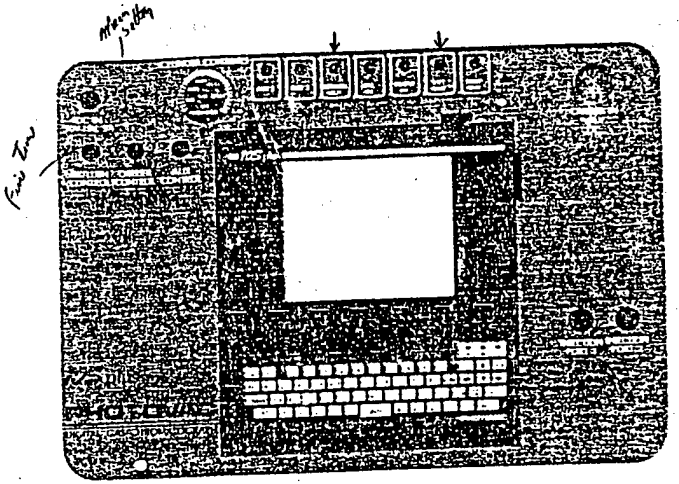
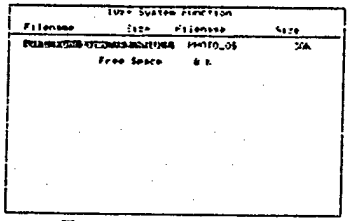


Figure 1 10S+ Top Panel.

**Power & Software Loading** Connect AC line power to the 10S+ GC at the DC IN port on the upper left corner of the GC, and then turn the unit on by pressing the ON button on the computer keyboard. The 10S+ SYSTEM FUNCTION screen will be showing, with a message that a RAM card is not present. At this time, the APPLICATIONS CARD (blue with red dots) should be inserted into the lower right side of the computer, in order to load the GC software which is used for headspace analyses. Using the LOAD command, load the file GC FUNCTION (see Figure 2).

While still in the 10S+ SYSTEM FUNCTION, use the TIME/SETUP command to set the correct time and date, as shown in Figure 3. After this is correctly set, switch to the GC operation software by pressing the FCN button. The screen which appears is

referred to as the results screen, and is titled 10S+ GC FUNCTION. This screen shows current GC operation, and the chromatogram and detected peaks of the last analysis (see Figure 4.



GC Function

GCSYS. BIN

Figure 2 Loading GC Software.

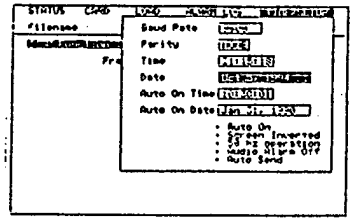


Figure 3 Setting Time and Date.

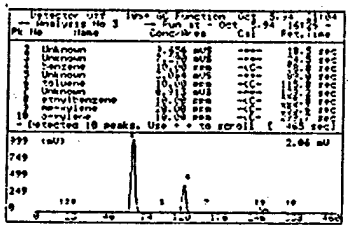


Figure 4 10S+ GC Function.

NOT: 10S+ ~~GC~~ VOC FUNCTION



**Printer**

Connect the dot matrix printer to the GC using the serial output cable. The cable connects to the GC at the upper right corner of the video screen. Connect AC power to the printer, turn it on and be sure it is on-line. Communication between the GC and the printer can be tested by using the PRINT SCRN key to print out a copy of the current video screen display.

**Gas Cylinder**

The carrier gas for the GC is provided by continuous supply through direct connection to the air cylinder. The connection of gas to the GC follows this procedure (see pages 4-6 to 4-7):

DIRECT CONNECTION TO AIR CYLINDER: Attach regulator with two pressure gauges to the air cylinder, using teflon tape on the cylinder adapter threads to insure a good seal. Attach the quick connect coupling to the CARRIER IN port on the GC. Open the valve on the cylinder several full turns, and then adjust the large valve on the regulator so that the second pressure gauge reads 40 psi. Open the small on/off valve on the regulator to supply air to the GC.

**Gas Flow**

The carrier gas flowrate through the GC column affects the retention time of peaks and thus the correct chemical identification of those peaks. Therefore, the accurate setting and close monitoring of the flowrate is of utmost importance. Once set, the flowrate must never be altered during a GC run. If the flowrate is altered in the midst of a series of analyses, then a recalibration must be performed to correctly reset the retention times of the components in the standard.

The carrier gas flowrate is adjusted with the use of a flowmeter provided with the instrument. The flowmeter may be either a digital bubble flowmeter (requires a dilute soap solution in the pipette bulb) or dual rotameters. Use the following procedure (refer to page 4-7):

With the dual rotameter, attach the left flowmeter to the DET OUT and the right flowmeter to the BK FLUSH OUT using the 1/8" Swagelok fittings and lines provided (see Figure 1 for location of fittings). If the digital bubble flowmeter is used, then switching the line between DET OUT and BK FLUSH OUT is required. With gas flowing to the GC, observe the flowrate readings on both of these lines. Both of these flowrates must be adjusted to the same value, in the range of 10-15 mL/min. The adjustment is made using two valves, the CARRIER CONTROL and the BK FLUSH CONTROL. These valves interact with each other, so adjustments will have to be made iteratively. Once the flowrates are set, they should not have to be changed. The DET OUT flowrates should be checked regularly during operation. After checking the flowrates, be sure the sample loop connector is reattached between the BK FLUSH OUT and SAMPLE IN ports. Completely invalid chromatograms will be obtained if this loop connector is not in place.

**PID Lamp & GC Oven**

The final step in setup of the 10S+ is to turn on the PID lamp and the oven. NEVER TURN ON THE PID LAMP BEFORE BEING SURE AIR IS FLOWING THROUGH THE UNIT. Turn on the lamp and oven by selecting and checking GC DETECTOR ON under the STATUS command (see Figure 5). Once this is done, lamp status will change

to STARTUP AND TUNING for several minutes. If the lamp does not come on after approximately 10 minutes, then it may be overheating. Turn the whole unit off, allow to cool for 15-20 minutes, and then turn it on and try again. Once the lamp is tuned and ready, successful gas chromatograms will be obtained only if OFFSET LEVEL is less than 100.0 mV and DETECTOR VOLTAGE is greater than 300 V (under STATUS command).

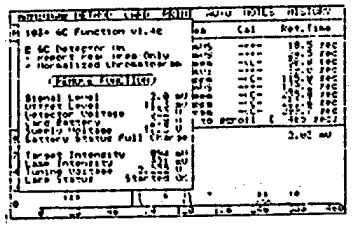


Figure 5 PID Lamp Status.

Selecting GC DETECTOR ON under the STATUS command also turns on the GC oven. The oven temperature is set by selecting the OVEN SET parameter (see Figure 6) under the METHOD/SETUP commands and entering an appropriate temperature (see page 4-2). The difference between the AMB TEMP and the oven temperature setting can be no greater than 25 °C. 40 °C is a suitable oven temperature to select, as long as the ambient temperature is not below 15 °C (59 °F). It will take about 20 minutes to insure the oven is at constant temperature. The GC oven warmup can be monitored by viewing the OVEN TEMP versus OVEN SET values under the METHOD/SETUP command.

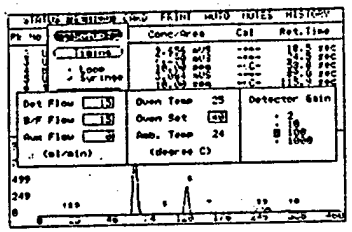


Figure 6 Setting GC Oven.



## GC PROGRAMMING FOR ANALYSIS

1. Before carrying out analyses, certain operating parameters must be set (or their values checked) for proper and efficient operation of the GC to occur. The important parameters, their suggested values, and the command under which they are accessed are given in Table 1.

Table 1
GC Operating Parameter Values

| Command | Parameter | Value |
|---|---|---|
| STATUS | Normalized Chromatogram | Yes (checked) |
| METHOD/SETUP | Detector Flow | 10-15 mL/min (notation only) |
| METHOD/SETUP | B/F Flow | 10-15 mL/min (notation only) |
| METHOD/SETUP | Oven Set | 40-50° C |
| METHOD/SETUP | Gain | 1,000 |
| METHOD | Loop or Syringe | Syringe (checked) |
| METHOD/TIMING | Inject Volume | 0.100 mL = 100 µl |
| METHOD/TIMING | Analysis Time | 400-600 secs |
| METHOD/INTEGRATION METHOD | Integration | Auto (checked) |
| NOTES | Notepad Entry | Enter standard information, such as GC operator name, ANG Base/Station, and sample ID. |

2. Use the commands specified in Table 1 to set the required values, including gain, syringe injection, injection volume, analysis time, and integration method. If auto integration is selected, the window and minimum area parameters do not need to be set. If manual integration is selected, enter a window value of 10% under METHOD/INTEGRATION METHOD. When the GAIN is set to 1000 and the Normalized Chromatogram is selected, the computer will automatically select the best gain value for the current chromatogram.

3. User-supplied data can be entered for record purposes using the NOTES command. This will be used to keep track of samples on ANG field projects. Simply enter the desired information using the keyboard on the computer. The following information should be entered:

<name of GC operator>
<name of National Guard Base or Station>
<monitoring well or borehole designation, depth of sample interval (feet)>

The last line of information will be changed appropriately for each soil or water sample analyzed. These data lines must be filled out correctly for each sample and standard analyzed for record purposes. As shown in Figure 7, there is a large area available for further information in this NOTEPAD.

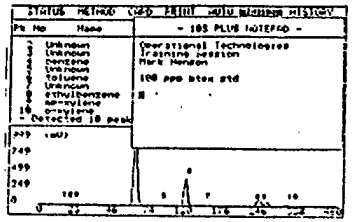


Figure 7 GC Notepad.

## GC ANALYSIS OF SAMPLES OR STANDARDS

1. Headspace from samples or working standards are analyzed on the GC to determine the presence and concentration of BTEX or other compounds of interest. Before injecting headspace from a sample or working standard into the GC, the working standard VOA vial must be warmed to room temperature. This will be accomplished by placing the VOA vial containing the standard or sample in the water bath for 15 minutes prior to vapor sample injection. The temperature of the water in this bath will be kept constant, at anywhere from 25° to 30° C, using the small aquarium heater and a thermometer.

2. To perform a GC analysis or GC run, push RUN AUTO and select SAMPLE. Take a 100-$\mu$L or 500-$\mu$L sample syringe and draw in 100 $\mu$L of clean air. Insert the needle through the septa in the vial and repeatedly purge and draw 100 $\mu$L (0.100 mL) of headspace into the syringe 10-15 times. Then draw exactly 100 $\mu$L of headspace into the syringe.

3. Push ENTER on the GC. Now quickly extract the syringe from the working standard vial and insert it into the INJECTION PORT 1. Let the needle go down until you feel the resistance of the septa in the injection port. Once the alarm begins to sound, push the syringe through the septa and all the way down into the injection port. IMMEDIATELY after the alarm goes off, QUICKLY inject the contents of the syringe into the GC and pull the syringe out of the injection port.

4. The GC will now analyze the sample or standard. The duration of the analysis will be that time, in seconds, which was entered for ANALYSIS TIME during the GC programming steps. Peaks will appear representing the compounds in the sample. To stop the run before it is complete (e.g., if an obvious error has been made), press the RUN AUTO button. After a run is complete, the compounds detected and their concentrations will be printed in a table format above the chromatogram on the video screen.



5. During a GC analysis, information identifying the sample should be entered in the notes. This is done by simply typing information in the screen using the NOTES command. When an analysis is complete, be sure to always print out a hard copy of it for project records by using the PRINT/ANALYSIS command. If any keyboard keys are hit during the time that the Analysis Report is printing, the printer is stopped, and the process will have to be started over again.

6. One method for dilution of samples for analysis is to inject a smaller volume of gas onto the GC column. For example, if the standard injection volume is 100 $\mu$L, then the injection of only 20 $\mu$L on sample headspace represents a dilution of 1 to 5. A second method of dilution is to use a mass of soil less than ten grams in preparation of the headspace sample. Thus, using a 1 gram sample would represent a dilution of 1 to 10.

7. The 500-$\mu$L syringe is decontaminated after each sample and standard injection by removing the plunger and putting the syringe barrel onto the plastic hose coming from the tee of the air supply line. Slightly open the valve on the tee line to allow air to strip BTEX and other compounds out of the syringe barrel for several minutes.

8. The FIELD GC DATA SUMMARY form (attached to this SOP) should be used to keep track of sampling activities and results in the field. For each injection (all samples, standards, and air blanks), the following information should be entered on the form:

   - The depth of the soil sample in feet, or appropriate identification of the injection.
   - GC results (concentrations) of all individual analytes and of total BTEX (ppb). All concentrations should be reported in ppb, and with no more than three significant digits (last digit reported is single ppb digit).
   - Actual weight of the soil determined by difference (approximately 10 grams).
   - Any dilution of the sample required for analysis.

   Additionally, important GC operating parameters should be recorded on the form, both initial values used and any changes made during analyses, including:

   - Temperature of GC oven.
   - Analysis time and gain settings.
   - Carrier gas flowrate.
   - Injection volume.

   Finally, once the entire 3-point calibration has been initially established for the day, the response factor values (under LIBRARY STORE WINDOW (see Figure 9)) and retention times (under METHOD/LIBRARY) for each analyte should be recorded in the bottom table of the Field GC Summary Data.

## GC CALIBRATION WITH HEADSPACE STANDARDS

1. Daily working standards are prepared in a clean 40-mL glass VOA vial with teflon septa following the formula below.

$$C = \frac{(SV)}{(WV)} \times SC$$

Where:

C = Working standard concentration (ppm);
SV = Volume of stock solution (in microliters);
WV = Volume of deionized water (in microliters) – 10,000 µL typical (10 mL); and
SC = Stock solution concentration (ppm).

Three standards will be prepared and used each day (0.1- (100 ppb), 1.0- and 10.0-ppm standards) to create a 3-point calibration. A standard is prepared by putting 10 mL of DI water in a 40-mL VOA vial, and then adding the required amount of concentrated standard from the stock solution. Preparation of the 100-ppb standard is performed by taking liquid (not headspace) from the 1-ppm calibration standard and diluting it with 10 mL of water in a second 40-mL VOA vial. Table 2 outlines the volumes and final concentrations for these three standards (as calculated by the above formula).

**Table 2**
**Working Standards Preparation**

| Working Standard Concentration | Stock Solution | Volume Taken from Stock |
|---|---|---|
| 10 ppm | 2000 ppm stock solution | 50 µL |
| 1 ppm | 2000 ppm stock solution | 5 µL |
| 100 ppb | 1 ppm working standard | 1000 µL (1.0 mL) |

Always use the appropriate syringe for dispensing very small volumes accurately (e.g., use 500-µL syringe to dispense 500 µL; use 10-µL syringe to dispense 5 µL or less). Shake the vial vigorously to mix after adding all components. Both the stock solution and working standards must always be stored inverted in a refrigerator or an ice chest. New working standards MUST be made fresh daily.

If other components are to be analyzed in addition to BTEX (such as trichloroethylene), then the 10- or 1-ppm standards are prepared by adding the specified volume (50 or 5 µL) from each separate stock solution. Never mix any separate 2000-ppm stock solutions directly together.

2. Analyze standards as described in the GC ANALYSIS section. An example chromatogram of a BTEX working standard is shown in Figure 8, including typical peaks for all of the components. Note that m,p-xylene is actually two components represented by one peak. If this is a 1-ppm standard, then this particular peak represents 2 ppm of those components.

3. If additional analytes (trichloroethylene, etc.) are being employed, the peaks are identified amongst the recognizable BTEX peaks and the order of analytes on the chromatogram established as follows: (a) analyze standards containing each analyte separately, and compare retention times to those obtained for the BTEX standard; (b) compare the order of analytes established in (a) to the order (as given by relative retention times) given in Table 3.

**Table 3**
**Characteristic Retention Times**

| Compound | Retention Times (Normalized to Benzene) | | | |
|---|---|---|---|---|
| | Ambient 20° C | 30° C | 40° C | 50° C |
| Vinyl Chloride | 0.288 | 0.306 | 0.361 | 0.413 |
| Freon 11 | 0.365 | 0.379 | 0.428 | 0.448 |
| Methylene Chloride | 0.475 | 0.489 | 0.539 | 0.585 |
| trans-1,2-Dichloroethylene | 0.517 | 0.529 | 0.563 | 0.580 |
| 1,1-Dichloroethane | 0.550 | 0.557 | 0.611 | 0.669 |
| Chloroform | 0.715 | 0.720 | 0.742 | 0.752 |
| 1,2-Dichloroethane | 0.840 | 0.851 | 0.868 | 0.872 |
| 1,1,1-Trichloroethane | 0.948 | 0.950 | 0.959 | 1.000 |
| Benzene | 1.000 | 1.000 | 1.000 | 1.000 |
| Carbon Tetrachloride | 1.095 | 1.050 | 1.048 | 1.086 |
| 1,2-Dichloropropane | 1.266 | 1.254 | 1.214 | 1.192 |
| Trichloroethylene | 1.413 | 1.396 | 1.342 | 1.361 |
| 2-Chloroethyl Vinyl Ether | 1.667 | 1.644 | 1.551 | 1.539 |
| 1,1,2-Trichloroethane | 2.293 | 2.211 | 1.976 | 1.860 |
| Toluene | 2.693 | 2.621 | 2.358 | 2.339 |
| Tetrachloroethylene | 3.985 | 3.853 | 3.314 | 3.272 |
| Chlorobenzene | 5.153 | 4.962 | 4.148 | 4.076 |
| Ethyl Benzene | 6.223 | 5.985 | 4.882 | 4.743 |
| Bromoform | 6.282 | 5.261 | 4.713 | 4.351 |
| m-xylene | 6.767 | 6.490 | 5.247 | 5.071 |
| o-xylene | 8.145 | 7.826 | 6.234 | 5.979 |
| 1,1,2,2-Tetrachloroethane | 8.311 | 7.190 | 5.943 | 5.345 |

4. The ANALYSIS TIME, DRV3, and DRV4 times can be adjusted to obtain a suitable chromatogram of the working standard, if one like that in Figure 8 is not initially obtained. If the chromatogram does not show any of the last peaks (xylenes or ethylbenzene), the following adjustments should be made in order. After each adjustment, reinject a headspace sample of the working standard and watch for the latter peaks to appear on the new chromatogram.

   Adjustment I. Increase ANALYSIS TIME, to 600 or 700 seconds. As an alternative, carefully adjust the carrier gas flowrate upwards to 15 mL/min.

   Adjustment II. Adjust the DRV3 and DRV4 off times (under METHOD/TIMING/CONFIG command) to the formula 5 + A/6 (A represents the analysis time).

5. The 3-point calibration is initially created by analyzing the three standards in succession, starting with the lowest concentration, and storing the calibration information (using METHOD/LIBRARY/STORE) for each analyte after each chromatogram is obtained. The process is performed as follows: select METHOD/LIBRARY, select STORE, press ENTER for each compound you wish to store, then fill in the appropriate entries in the LIBRARY STORE WINDOW (peak #, compound name, and Conc.) for each compound (see Figure 9). THIS PROCESS CAN BE SUCCESSFULLY COMPLETED ONLY AFTER THE CHROMATOGRAPHIC ANALYSIS OF A WORKING STANDARD APPEARS IN THE RESULTS WINDOW. The 100-ppb standard is entered as Conc.1 (as 0.1 ppm), the 1.0-ppm standard as Conc. 2, and the 10-ppm standard as Conc. 3, as each standard is analyzed. Also, Alarm 1 and 2 values should be set to 50 ppm. After the correct concentration is entered for the current analysis, press ENTER. At this time, the GC calculates and stores the correct response factor and retention time for that peak. Repeat this process for each peak or analyte in the current standard, then move on to the analysis and library storing of the next higher standard. Figure 9 shows the library information for benzene after all calibrations are complete while Figure 10 shows the 3-point calibration which has been created.

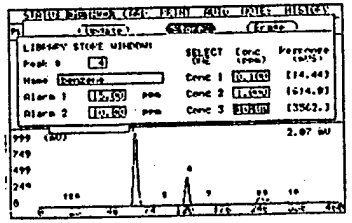



Figure 9 Library Store Window.

After all compound peak numbers and standard concentrations have been entered in the library, select METHOD and REINTEGRATE to reanalyze the last chromatogram and set all compounds to the specified concentrations. Finally, to obtain a hard copy, print out the standard chromatogram by selecting the PRINT/ANALYSIS command.

## GC CALIBRATION CHECK

1. The calibration must be checked after analysis of every five samples. Only one of the three standards is used to check the calibration, namely that standard whose nominal concentration is closest to but greater than the concentrations of recent sample results (see ranges shown on calibration curve of Figure 10). For example, if most sample results are running around 300 to 700 ppb, then the 1-ppm standard (medium range) would be used for the calibration check.

2. A calibration check includes performing a repeated analysis of the chosen working standard headspace and reviewing the results printed out. If the compounds are not correctly identified and/or if the concentrations are not close to the nominal standard concentration (80-120% of

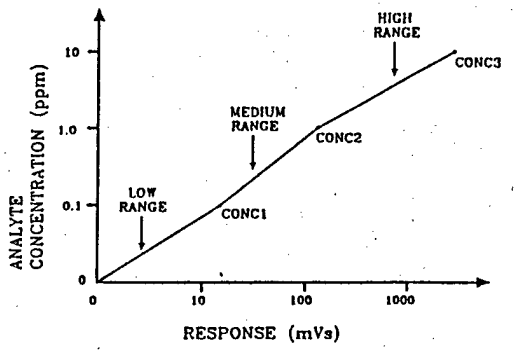



Figure 10 3-Point Calibration.

specified value), then a recalibration is necessary. This is done by storing again the peak numbers and concentrations of the chosen standard in the LIBRARY STORE WINDOW under the METHOD/LIBRARY/STORE command. Finally, REINTEGRATE and use PRINT/ANALYSIS to provide a hard copy record of the updated calibration.

## SOIL AND WATER SAMPLE PREPARATION AND ANALYSIS

**Consistency is very important in the preparation of soil samples. Collection and preparation of all soil samples should follow exact and consistent procedures in order to obtain meaningful results.**

1. The soil samples are collected in glass jars and placed in a cooler of ice which should be maintained at 4° C (± 2° C). Dispense 10 mL of DI water to each 40-mL VOA vial by use of a 10-mL pipet and an aspirator bulb. Approximately 10 grams of soil is collected from the glass jar and added to the 10 mL of DI water already in the 40-mL VOA vial. The weight of the soil added is determined by difference using the small electronic balance (water plus soil wt. - water wt. = soil wt.). The sample is capped with a teflon cap and is shaken for 30 seconds to mix and volatilize the BTEX or similar compounds. All samples must be warmed in the water bath for 15 minutes before injection of headspace onto the GC.

2. Water samples are prepared by simply dispensing 10 mL of aqueous sample, using a 10-mL pipet and an aspirator bulb, into a 40-mL VOA vial, and shaking for 30 seconds to volatilize the components present. All samples must be warmed in the water bath for 15 minutes before injection of headspace onto the GC.

3. Analyze headspace from prepared soil or water samples according to the procedures given in the GC ANALYSIS section. Be careful not to inject any liquid water into the GC, as it will SEVERELY DAMAGE the column and render the instrument unusable. Remember to update the NOTEPAD with sample ID information. This can be done while the GC is performing an analysis.

4. Once the peak and concentration information is obtained from the analysis printout, the concentration of the compounds in the soil can be calculated using the formula below:

$$X = \frac{(PR)\ (WV)}{(SS)} \qquad \text{(assume for water: 1 gram = 1 ml)}$$

Where:
X = Contaminant concentration in soil sample (in ppm);
PR = Plotter reading (in ppm);
WV = Weight of deionized water solution (in grams); and
SS = Exact weight of soil sample (in grams).

Note: WV = 10 mL or 10 grams.
SS should be as close to 10 grams as possible.
1 ppm = 1 µg/mL.

If the soil sample is exactly 10 grams, then X = PR and no calculation is required.

## SHUTDOWN

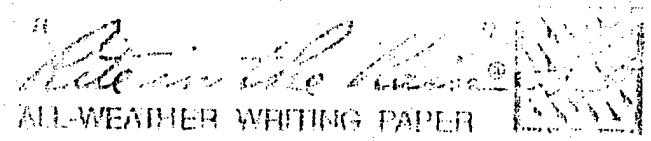
1. Shut down the 10S+ GC by first selecting GC DETECTOR OFF under the STATUS command. This will turn off the PID lamp and the GC oven. Then select REMOVE FUNCTION under the STATUS command in order to clear out the GC for the next analysis session. The computer will prompt "Data will be lost," to which you can answer "Yes."

2. Press OFF. Replace the injection port septum every day or every other day (see page 8-7). Be sure the Teflon face of the septum is down and that the septum retainer is not over tightened upon replacement.

## TROUBLESHOOTING

1. The instrument has been known to completely freeze up electronically, that is, no response occurs upon pressing any of the keys. To remedy this situation, open the computer module to reveal the column and electronics inside. In the upper left corner of the inside chamber, there is a red and black RESET switch. Press this switch to completely reset the instrument electronics. Close the computer module cover, and restart by pressing the main ON button. All setup and library information will have to be reprogrammed.

2. In the instance that a working standard is injected and the chromatogram comes out completely flat, check that carrier gas flow is on and set correctly, and that the DRV3 and DRV4 off times have not been accidently reset to 0.



3. The septum in the INJECTION PORT I needs replacement if it loses resistance when the syringe is pushed through it. See page 8-7 for instructions on replacement.

4. Figure 11 presents some example problem chromatograms.

   A. The latter standard peaks (ethylbenzene, m,p-xylene, and o-xylene) do not come out. The ANALYSIS TIME or DRV3 or DRV4 time off operating parameters need to be adjusted as described in step 4 of GC CALIBRATION.

   B. The methanol peak is obscuring the benzene and toluene peaks. Too much methanol is being carried over from decontamination activities. Allow methanol to dry off of the injection syringe before use.

   C. Multiple peaks go significantly off the chromatogram right edge. Reduce the gain value to bring all of each peak within the chromatogram width.

   D. Benzene or other component saturates the entire chromatogram for an extended period of time. Dilute and reanalyze sample until separate (though perhaps overlapping) peaks appear on the chromatogram.

Chapter 9 provides a helpful table of other problem conditions and instructions for remedying the situation.

For other difficult problems, call Matt Alexander at the OpTech corporate office (1-800-677-8072) or a HAZCO representative (preferably Scott Robinson or Jeff Rogers) at 1-800-332-0435. When calling either OpTech or HAZCO, have available a clear description of the problem and example chromatograms. Also be prepared to receive instructions for conducting troubleshooting on-site.

## REFERENCE


10S plus Digital Gas Chromatograph User's Manual. Photovac, Inc., 25-B Jefryn Blvd. West, Deer Park, NY, (516) 254-4199.





17 MAY 95

(71)

1748 100 PPB BTEX STD

- Benzene 2 ppb
- Toluene 91 ppb
- E-Benzene 96 ppb
- mp-xylene 138 ppb
- o-xylene 31 ppb

Shut down GC

1805 KP-KM-DG show up. UNLOAD TRUCK

1821 Leave base

1841 On Base

| 197 | 213 |
|---|---|
| 1.5 | 10.0 |

11.5 HRS

5.7
0.5
6.2

213 - 4.3

10.5
6.2
4.3

197 - 1.05

18.7
13.0
5.7
4.3
10.0

DAY 17



THURSDAY 18 MAY 95

0650 Leave hotel
BREAKFAST (0.6)

0650 ON BASE
PREPARE TRUCK FOR WATER SAMPLING
CALIBRATE PIDs ~~FOR~~ TO 100 PPM Isobutylene

0747 CALL SECURITY FOR ESCORT to Site 26.
Set up DECON AREA
DECON equipment

0820 WRONG Keys. DRILLERS HAVE only set.

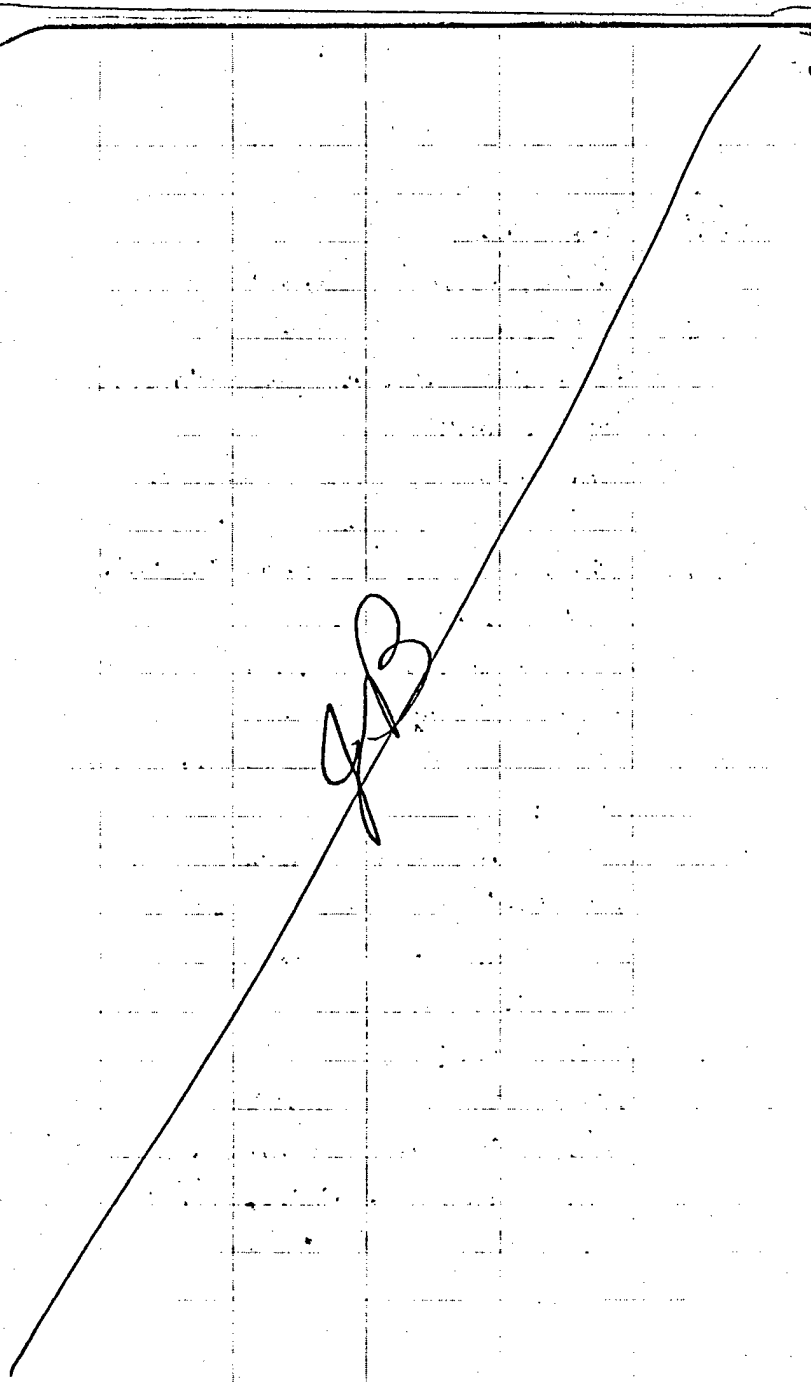
0830 Go to B247. Advise KP.
Return to Site 26.
set-up ON 026-001MW.

0840 Begin Purging

0932 END Purging
PREPARE FOR SAMPLING.
WAITING for Well to Recover

0953 TAKE Field BLANK, SI-001FB
WAITING FOR well to Recover

5.8
.6
6.4



18 MAY 95



~~1010 TAKE JB~~

1012 Sample 026-001 MW
Done
Decon EQUIPMENT
MOVE to 026-002 MW

1044 Begin ~~BAM~~ JB Purging.

1125 Done

1125 Begin Sampling

1144 ~~BJB~~ JB END Sampling
Rig Down. Decon.

1204 At 026-003 MW
Set-up.

1212 TAKE 026-003RB

1220 Begin Purging

1309 Done Purging
WAITING FOR Recharge

1315 DRILLERS move in to set
GUARD Posts.

1333 START SAMPLING 026-003MW

1345 SAMPLE 026-BQ39 MW
Rig down.

1410 Escorted off 26

1418 At B247.
Set up Decon & clean stuff

JBydalek

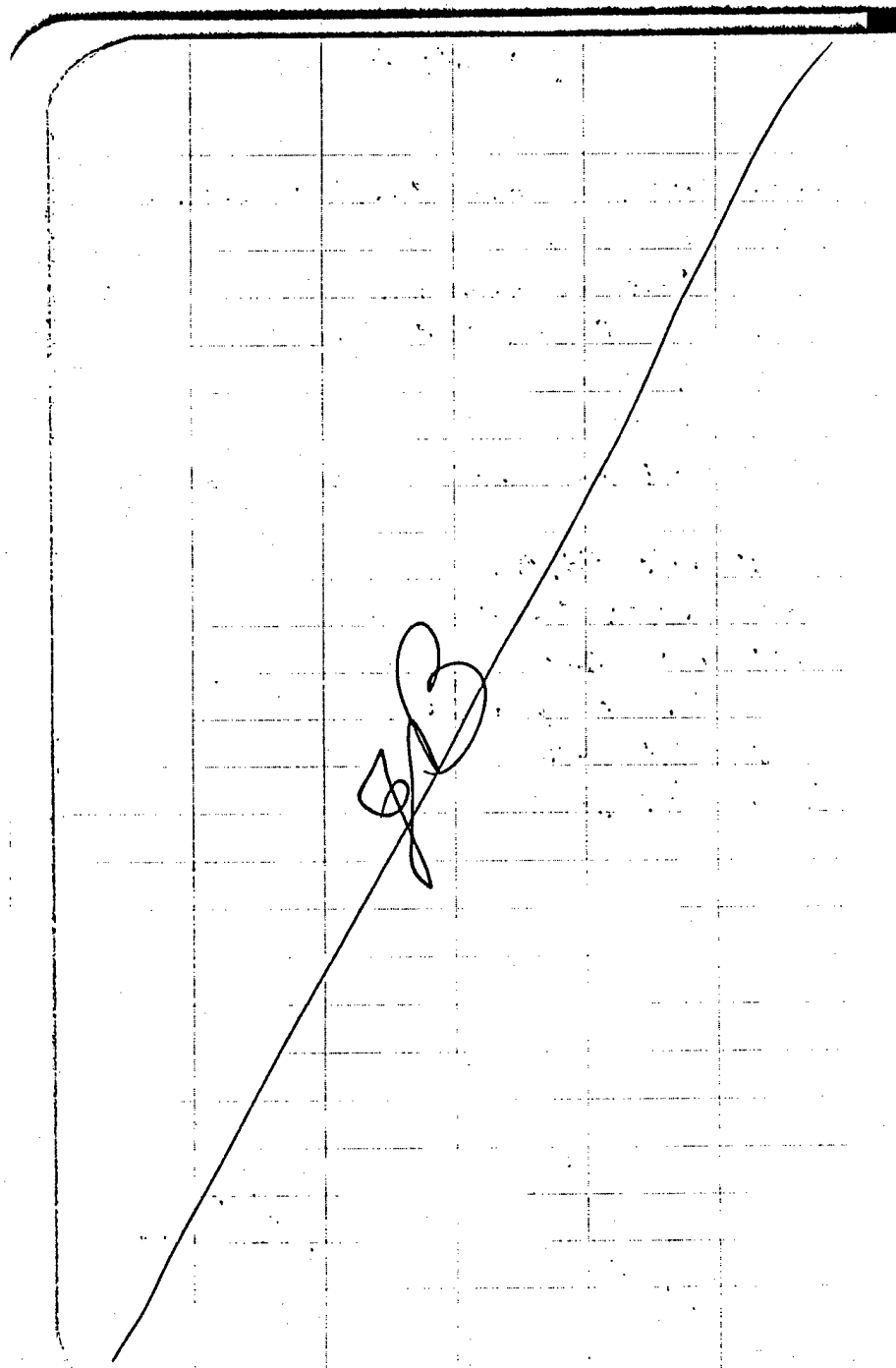
18 MAY 95

(74)

1515 Set up on 025-002MW
1628 Done purging
Prepare sample bottles
Wait on Recharge
1700 SAMPLE
1710 Done
Prepare Ice chests for FEDEX
1725 Goto FEDEX
1750 Leave FEDEX
1800 On Base
Clean up stuff
1823 Leave base
1841 At Hotel

18.7
6.4
12.3

12.3 LRS



DAY 12



FRIDAY 19 MAY 95

0545 leave hotel
Breakfast (0.6)
0645 On Base
load truck
0710 Fire-up GC. Build 10 PPM, 1 PPM, & 100 PPB BTEX STDs
0740 AIR FLOW IS not working Right. CALL EIS to see if they can troubleshoot.
0757 DRIVE KP to Site 17.
0825 BACK @ B252.
TALK to M. ALEXANDER.
Fiddle w/ GC.
It wont go. CALL EIS.
Ron is out. WAiting on his call back
0912 Goto Site 17 to apprise KP of situation
0945 BACK @ B252
CALL EIS.
Attempt to backflush.

19 MAY 95



1000 AFTER DISCUSSIONS w/ M. ALEXANDER AND EIS, WILL set both AIRflows And RUN STANDARDS. A VERY cLOSE MONITORING of Retention times will be done.

1056 100 PPB BTEX STD
---NO Good

1109 1 PPM BTEX STD.
----this is not working.
CALL EIS. Order New GC.
Pack-up GC.

1202 Go to FEDEX

1215 Done at FEDEX. Go to Site 17.

1220 NO one here. Return to 0247.
Prepare truck for sampling

1309 ON 025-001MW for ~~sampling~~ Purging

1420 Done Purging

1425 TAKE SI-802FB (Potable WTR)
WAITING for 025-001MW to Recharge.

1503 Sample 025-001MW

1518 Done Sampling

J Byerly Jr

19 MAY 95

(77)

1520 Go to B247 to Decon
1530 TAKE sample 025-003RB
1545 Go to 025-003MW
1554 Begin purging
1637 Done purging
Waiting for recharge.
1651 CALL Air Products.
Schedule bottle pickup for next week
1655 CALL Burlington Express
Schedule pick up for Monday w/ Wed. delivery
1706 Sample 025-003MW
1715 Sample 025-003AMW
1720 Done. Breakdown and decon
Move GC stuff from B252 to B247
1835 Leave Base
1858 AL Hotel

JB Gyldyk

12.7 hrs

8
10.0
6.3
12.7

DAY 19



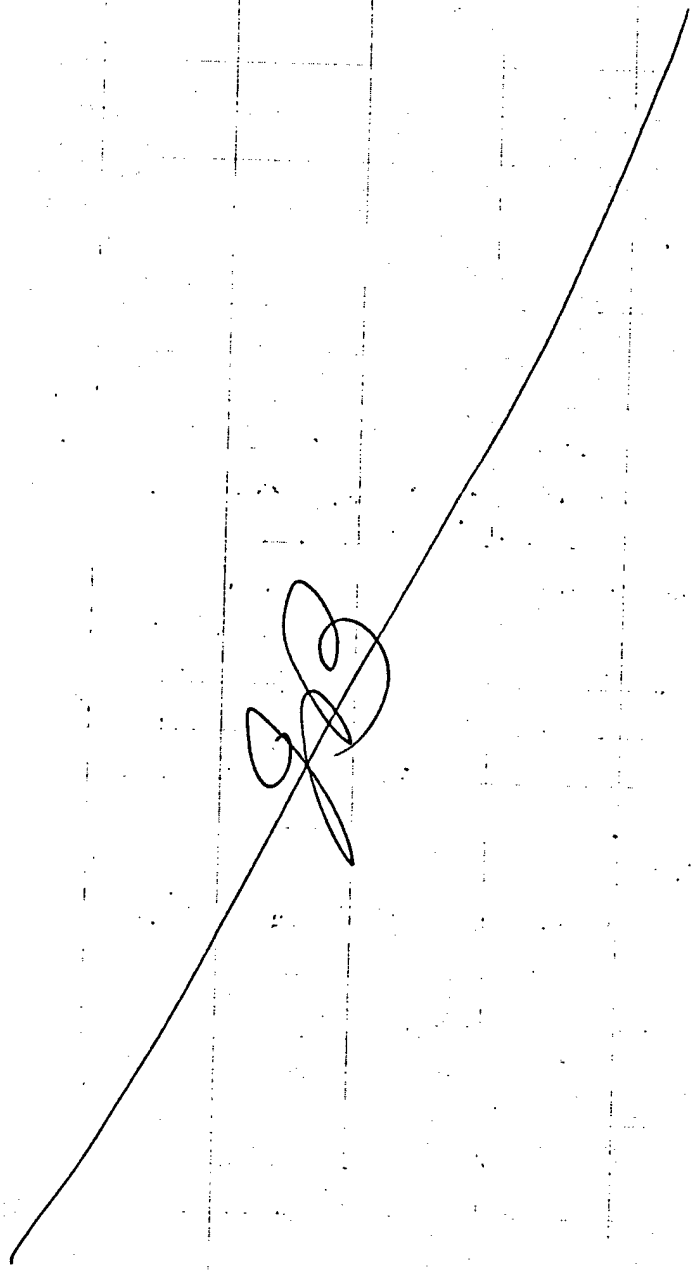
SATURDAY 20 MAY 95

0548 Leave hotel
Breakfast (0.6)
0645 On Base
Set up new GC AREA.
Seperate & pack stuff
Pack ICE chests (empty bottles) for Return to SPL.
Pack LEL/$O_2$ meter for Return to HAZCO
0745 Build 10 PPM, 1 PPM & 100 PPB BTEX STDs
0805 Continue Packing & Sorting
0840 Goto FEDEX to ship HAZCO and SPL. Pick up GC.
0905 Leave FEDEX
0910 On Base
Set up new GC, # 139
- GAIN 1,000
- CARRIER GAS FLOW 12 ml/min
- Injection Vol 100 ml
- Oven Temp 40°C
- Analysis time 450 sec

0920 Printer is not printing

J Byrd

5.8
.6
6.4



20 MAY 95



0955 CALL M. ALEXANDER to find out if a hardcopy is needed. He OK's running ANALYSIS without print out of Results.

1019 100 PPB BTEX STD
MISSED SHOT

1030 100 PPB BTEX STD
Good Run. Set LIBRARY.

1046 1 PPM BTEX STD.
RT's OFF. START ALL OVER

1109 100 PPB BTEX STD
Good Run. Set LIBRARY

1122 1 PPM BTEX STD.
Good Run. Set LIBRARY

1135 10 PPM BTEX STD
Good Run. Set LIBRARY.

1145 AIR BLANK

- BENZENE 13 ppb
- Toluene 5 ppb
- E-BENZENE 28 ppb
- MP-xylene 40 ppb
- O-xylene 95 ppb

20 MAY 95



1157 026-001MW 10ml water
- Benzene 10 ppb
- Toluene 2 ppb
- E-Benzene 3ppb

1207 026-002MW 10ml water
- Benzene 1 ppb

1218 026-003MW 10ml water
- ALL NDs

1227 025-001MW 10ml water
- ALL NDs

1236 025-002MW 10ml water
- Benzene 4 ppb

1245 100 PPB BTEX STD

| CALIBRANT | PPb | RT |
|---|---|---|
| Benzene | 109 | 62.3 |
| Toluene | 97 | 126.5 |
| E-Benzene | 92 | 262.6 |
| mp-xylene | 178 | 281.6 |
| O-Xylene | 77 | 328.8 |

--- Recal to 100, 100, 100, 200, 100

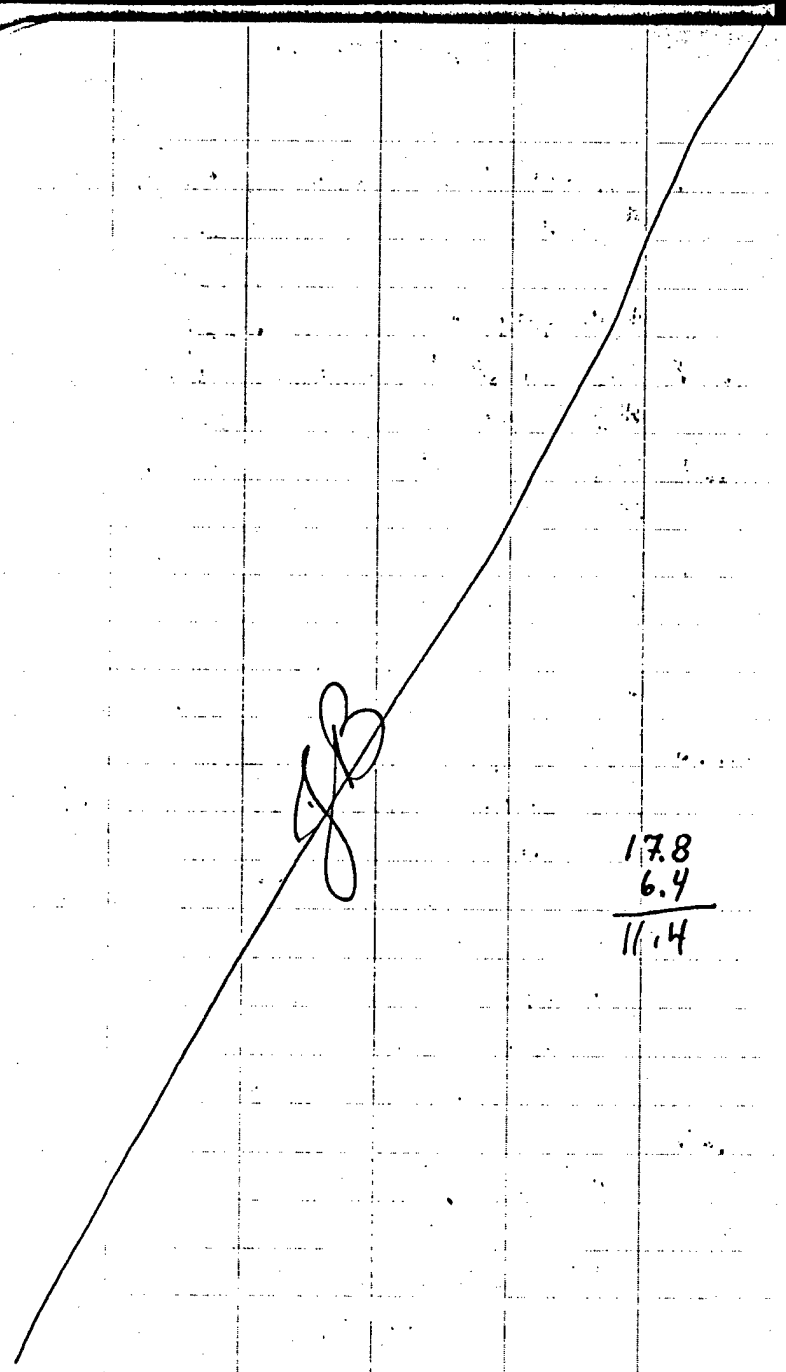
1255 AIR BLANK
- ALL NDs

1304 025-003MW 10ml water
- Benzene 1,920 ppb

JR Boyd JR

20 MAY 95





17.8
6.4
11.4

- Toluene 963 ppb
- E-Benzene 318 ppb
- MP-Xylene 1,400 ppb
- O-Xylene 1,090 ppb

1315 1 PPM BTEX STD
- Benzene 1,020 ppb
- Toluene 1,040 ppb
- E-Benzene 1,110 ppb
- MP-Xylene 2,300 ppb
- O-Xylene 1,130 ppb

1328 Shut down GC.
Start Packing

1723 Leave base

1749 At hotel

J Byrd Jr

11.4 hrs

21 MAY 95

(82)

TRAVEL DAY

0830 Leave hotel. Refuel CAR.

1800 Home

9.5hr

# APPENDIX G

# SURVEY REPORTS

## INTRODUCTION

This appendix contains the survey report for the SI on soil borings and monitor wells at IRP Sites No. 25 and No. 26, and includes information such as elevation, depth and Minnesota State plane coordinates. The elevations for monitor wells were taken at the top of the well casings on the north side of the well. This appendix also includes surveyors' reports for wells and boreholes at IRP Sites No. 25 and No. 26.

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## Table G.1
## Summary of Elevations and Coordinates for Monitor Wells and Boreholes at IRP Sites No. 25 and No. 26 148th FW, Duluth ANGB, Duluth, Minnesota

| Location IRP Site No. 25 | North | East | Surface Elevation | Top of Casing Monitor Wells only |
|---|---|---|---|---|
| **Soil Borings** | | | | |
| 025-01BH | 406,337.47 | 432,901.10 | 1,421.34 | NA |
| 025-02BH | 406,391.88 | 432,901.10 | 1,421.24 | NA |
| 025-03BH | 406,264.35 | 432,897.70 | 1,420.98 | NA |
| 025-04BH | 406,273.70 | 432,754.82 | 1,423.53 | NA |
| 025-05BH | 406,228.64 | 432,745.46 | 1,423.87 | NA |
| 025-06BH | 406,143.67 | 432,877.29 | 1,421.05 | NA |
| 025-07BH | 406,271.15 | 432,698.68 | 1,425.96 | NA |
| 025-08BH | 406,108.76 | 432,921.52 | 1,421.97 | NA |
| 025-09BH | 406,092.61 | 432,909.61 | 1,417.29 | NA |
| 025-010BH | 406,003.34 | 432,939.38 | 1,398.19 | NA |
| 025-011BH | 406,107.06 | 432,988.71 | 1,397.29 | NA |
| 025-012BH | 406,386.78 | 432,897.70 | 1,421.29 | NA |
| 025-013BH | 406,301.76 | 432,850.92 | 1,421.97 | NA |
| **Monitor Wells** | | | | |
| 025-001MW | 406,482.33 | 432,810.44 | 1,422.59 | 1,422.56 |
| 025-002MW | 406,024.17 | 432,953.32 | 1,397.83 | 1,400.21 |
| 025-003MW | 406,246.50 | 432,982.35 | 1,402.71 | 1,405.32 |
| **Location IRP Site No. 26** | **North** | **East** | **Elevation** | **Top of Casing Monitor Wells only** |
| **Soil Borings** | | | | |
| 026-001BH | 3,775.61 | 10,876.74 | 1,422.28 | NA |
| 026-002BH | 3,692.45 | 10,873.01 | 1,421.61 | NA |
| 026-003BH | 3,621.55 | 10,873.01 | 1,422.21 | NA |
| 026-004BH | 3,775.61 | 10,978.40 | 1,423.90 | NA |
| 026-005BH | 3,687.66 | 10,972.20 | 1,424.77 | NA |
| 026-006BH | 3,614.09 | 10,968.46 | 1,425.43 | NA |
| **Monitor Wells** | | | | |
| 026-001MW | 3,568.25 | 10,933.27 | 1,424.69 | 1,424.62 |
| 026-002MW | 3,801.20 | 10,863.84 | 1,421.90 | 1,424.28 |
| 026-003MW | 3,670.70 | 10,767.12 | 1,420.44 | 1,422.90 |

BH – Borehole.
NA – Not Applicable.
MW – Monitor Well.

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# APPENDIX H

# INVESTIGATION DERIVED WASTE MANAGEMENT

## INTRODUCTION

This appendix concerns the contents of the five drums of investigation derived waste which was generated during the SI at the 148th Fighter Wing, Minnesota ANGB, Duluth, Minnesota. Four of these drums contain soil cuttings and one contains monitor well development and purge water. Attached Table H.1 is a summary of the recommended disposition for each of these drums. Attached Table H.2 is a summary of the maximum concentrations of analytes contained in each drum containing soil from drill cuttings. Attached Table H.3 is a summary of the maximum concentrations of analytes contained in the drum containing well development and purge water.

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## Table H.1
## Recommended Disposition of Investigation Derived Waste
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Drum Identification | Origin | Recommended Disposition | Rationale |
|---|---|---|---|
| 025-001BH<br>025-003BH | Drill cuttings<br>Soil | Soil cuttings should be treated as petroleum-contaminated soil before returning to the site. | Based on analytical results, BTEX concentrations are greater than 5 ppm. |
| 025-002BH<br>025-013BH | Drill cuttings<br>Soil | Soil cuttings should be treated as petroleum-contaminated soil before returning to the site. | Based on analytical results, BTEX concentrations are greater than 5 ppm. |
| 025-006BH | Drill cuttings<br>Soil | The soil cuttings can be returned to the site. | Based on analytical results, BTEX concentration is 0.005 ppm. |
| 025-003MW | Drill cuttings<br>Soil | Soil cuttings should be treated as petroleum-contaminated soil before returning to the site. | Based on GC screening results, BTEX concentrations are greater than 5 ppm. |
| 025-003MW | Development and Purge Water | Determine whether City of Duluth Waste-Water Management will allow BTEX-contaminated water to be disposed of in the City sewer system. | Based on analytical results, BTEX concentrations exceeded the Federal and State ARARs. |

BH – Borehole.
MW – Monitor Well.
ppm – parts per million.
GC – Gas Chromatograph.
BTEX – Benzene, Toluene, Ethylbenzene, and Xylenes.
ARARs – Applicable or Relevant and Appropriate Requirements.

## Table H.2
## Site Investigation Derived Waste – Drums Containing Soil Cuttings
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Analyte | Maximum Concentrations (µg/kg) | Action Level Concentrations (µg/kg*) | Standards Used |
|---|---|---|---|
| **BTEX** | | | |
| Benzene | 84,000 | NA | – |
| Ethylbenzene | 140,000 | NA | – |
| Toluene | 460,000 | NA | – |
| Xylenes | 680,000 | NA | – |
| **SVOCs** | | | |
| 2-methylnaphtalene | 12,000 | NA | – |
| Naphthalene | 14,000 | NA | – |
| Pyrene | 360 | NA | – |
| Flouranthene | 420 | NA | – |
| **Metals** | | | |
| Nickel | 25 | NA | – |

* – There are no State cleanup levels for the above analytes
µg/L – micrograms per liter.

## Table H.3
## Site Investigation Derived Waste – Drum Containing Development and Purge Water
## 148th FW, Duluth ANGB, Duluth, Minnesota

| Analyte | Maximum Concentrations in Development an Purge Water (µg/L) | Action Level Concentration (µg/L) | Standard Used |
|---|---|---|---|
| **BTEX** | | | |
| Benzene | 2,600 | 10 | HRL |
| Ethylbenzene | 1,300 | 700 | HRL |
| Xylenes (total) | 1,450 | 10,000 | HRL |
| **SVOCs** | | | |
| 4-Methylphenol | 8 | 3 | HRL |

µg/L – micrograms per liter.

# APPENDIX I

# GEOTECHNICAL REPORT

## INTRODUCTION

This appendix presents geotechnical data for soil samples from the Site Investigation at IRP Site No. 26. On the following pages are grain-size distribution reports for soil samples collected from monitor wells 026-002MW and 026-003MW. Also presented in this appendix are permeability test lab data (vertical hydraulic conductivity) and information on pH cation exchange capacity for soil samples collected from monitor wells. The chain-of-custody forms for these soil samples are also included in this appendix. Grain size ranged from clay-sized particles to fine gravel, with silt and fine sand making up the majority of the soil constituents.

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NORTHEAST TECHNICAL SERVICES, INC.
P.O. Box 1142
315 Chestnut Street
Virginia, Minnesota 55792
(218) 741-4290 Fax (218) 741-4291

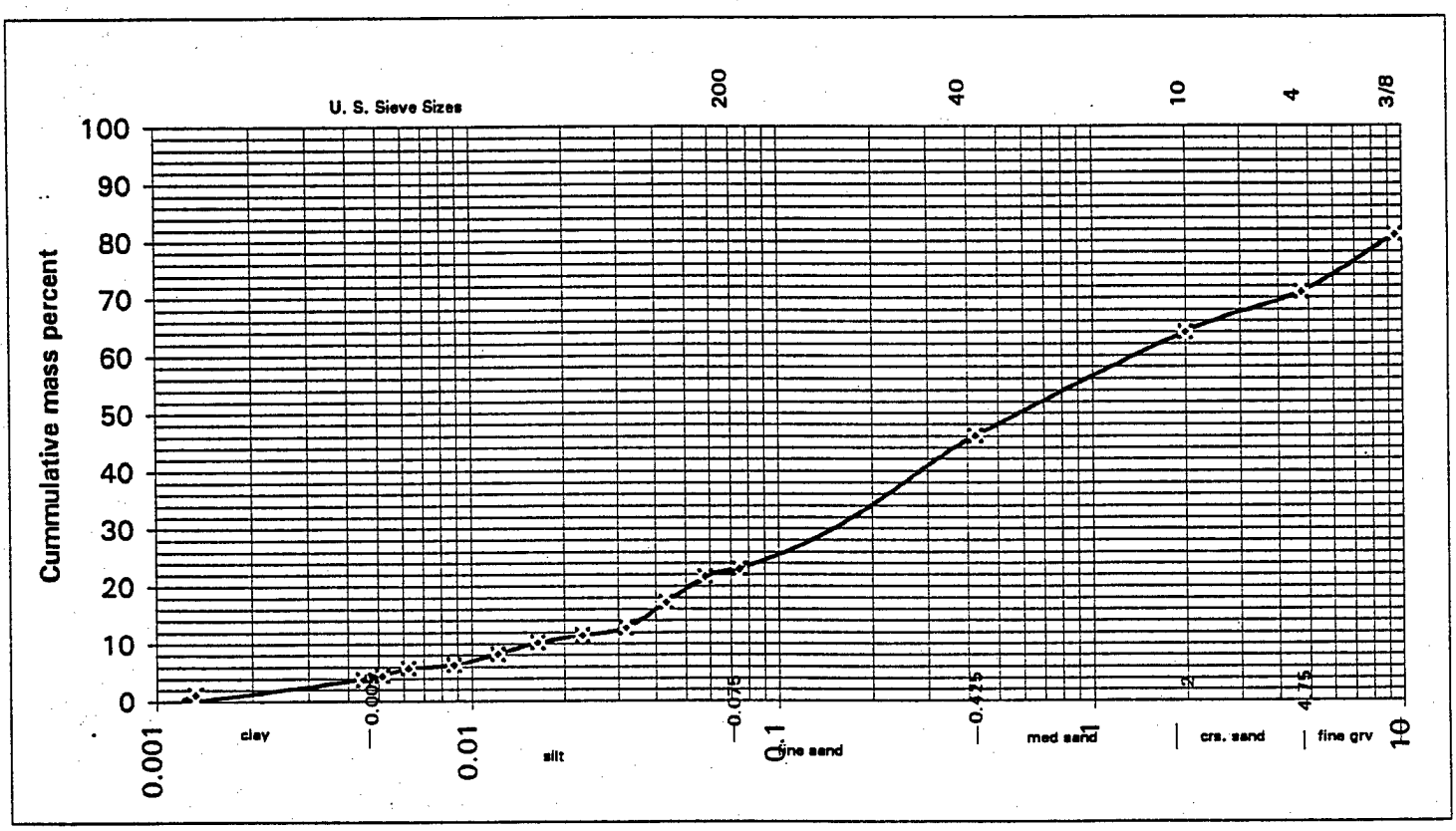
# GRAIN SIZE DISTRIBUTION REPORT

Project: OTC - Duluth Air Base

Job # 3482.09

Sample #: #1 226-002MW 0.5' - 2.5'

Date: 24-May-95



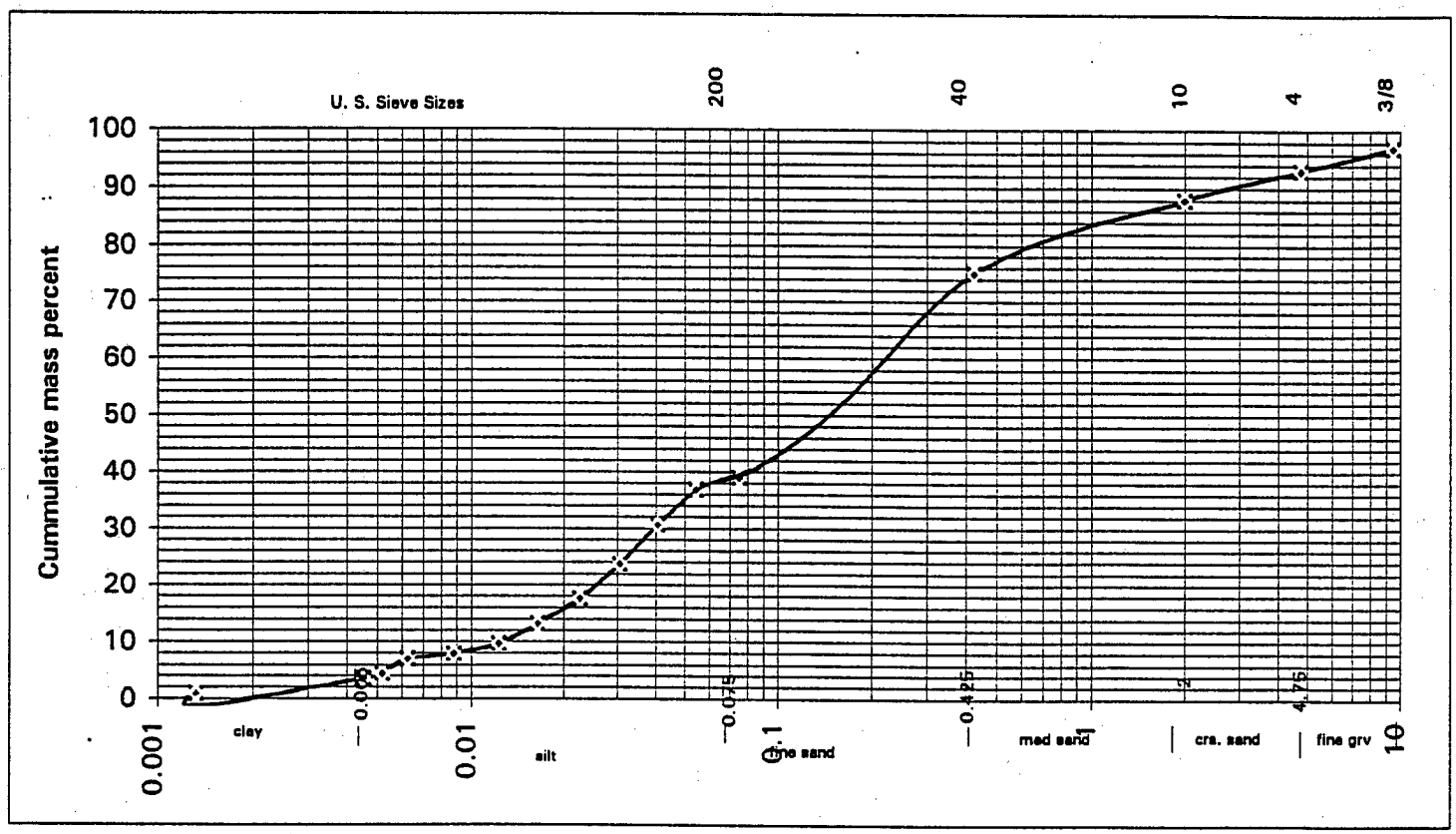

| Size | Percentages | Classification | Percent Moisture | | Organic Content | |
|---|---|---|---|---|---|---|
| Clay | 4 | SM silty sand | 17.8 | | 0% | |
| Silt | 18 | with gravel | | | | |
| Fine Sand | 24 | | | | | |
| Medium Sand | 18 | | | | | |
| Coarse Sand | 7 | | | | | |
| Fine Gravel | 29 | | | | | |

NORTHEAST TECHNICAL SERVICES, INC.
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315 Chestnut Street
Virginia, Minnesota 55792
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# GRAIN SIZE DISTRIBUTION REPORT

Project: OTC - Duluth Air Base Job # 3482.09

Sample #: #2 026-003MW 15-17 Date: 24-May-95




| Size | Percentages | Classification | Percent Moisture | | Organic Content | |
|---|---|---|---|---|---|---|
| Clay | 5 | SM silty sand | 14.8 | | 13.80% | |
| Silt | 34 | | | | | |
| Fine Sand | 36 | | | | | |
| Medium Sand | 13 | | | | | |
| Coarse Sand | 5 | | | | | |
| Fine Gravel | 7 | | | | | |

## PERMEABILITY TEST LAB DATA

**DATE:** 5/17/95 **PROJECT #:** 3482.09
Permeability Tests on Brass Sleeve Samples from the Duluth Air Base IRP Site 26 Duluth, MN

**REPORT** Operational Technologies Corp.
4100 NW Loop, Suite 230
San Antonio, TX 78229-4253

---

| | | |
|---|---|---|
| **Sample Number:** | #1 026-002MW | #2 026-003MW |
| **Sample Location:** | 0.5 - 2.5 | 15 - 17 |
| **Soil Classification:** | SM silty sand w/gravl | SM silty sand |
| **Elevation:** | | |
| **Type of Sample:** | Brass liner sample | Brass liner sample |
| **Specimen Height (cm):** | 14.5 | 13.35 |
| **Specimen Diameter (cm):** | 3.5 | 3.5 |
| **Water Content %:** | 8.4 | 14.8 |
| **Dry Unit Weight (lbs/cf)** | 106.2 | 123.3 |
| **Max. Head Differential (ft):** | 4.00 | 4.00 |
| **Confining Pressure (psi):** | 2.00 | 2.00 |
| **Coefficient of Permeability K @ 20 C (cm/sec)** | 1.10 x 10 -3 | 3.55 x 10 -6 |
| **Permeant Liquid Used** | distilled water | distilled water |

# Northeast Technical Services, Inc.

315 CHESTNUT STREET • P.O. BOX 1142 • VIRGINIA, MINNESOTA 55792 • (218) 741-4290 • FAX (218) 741-4291

Lab Number: 95-3701

TO: Duluth Ang/Duth SI

MN Environmental Lab No:
#027-137-157

Date Collected: 05/06/95
Date Received: 05/08/95
Date Reported: 05/23/95

Sample Description: 026-002-MW-0.5-2.5

| Parameter | Result | |
|---|---|---|
| pH | 6.56 | SU |

Cation Exchange Capacity 127 meg/100 grams

Report approved by:
JOHN H. SEURER
ANALYTICAL SERVICES

Analyses were performed by methods approved by the U.S. Environmental Protection Agency and the Minnesota Department of Health.

Northeast Technical Services, Inc. makes no warranty except that the analysis has been made upon the samples received in accordance with generally accepted testing laboratory principles and practices. The results of the analysis may not be characteristic of the whole from which the sample was taken. This warranty is in lieu of all other warranties, either expressed or implied.

# Northeast Technical Services, Inc.

315 CHESTNUT STREET • P.O. BOX 1142 • VIRGINIA, MINNESOTA 55792 • (218) 741-4290 • FAX (218) 741-4291

Lab Number: 95-3700

TO: Duluth Ang/Duth SI

MN Environmental Lab No:
#027-137-157

Date Collected: 05/06/95
Date Received: 05/08/95
Date Reported: 05/23/95

Sample Description: 026-003MW-15-17

| Parameter | Result | |
|---|---|---|
| pH | 7.54 | SU |

Cation Exchange Capacity 45.6 meq/100 grams

Report approved by:
JOHN H. SEURER
ANALYTICAL SERVICES

Analyses were performed by methods approved by the U.S. Environmental Protection Agency and the Minnesota Department of Health.

Northeast Technical Services, Inc. makes no warranty except that the analysis has been made upon the samples received in accordance with generally accepted testing laboratory principles and practices. The results of the analysis may not be characteristic of the whole from which the sample was taken. This warranty is in lieu of all other warranties, either expressed or implied.

Environmental Laboratory
9880 Interchange Drive
Houston, Texas 77054
713/660-0901

# Analysis Request and Chain of Custody Record

| Project No. | Client/Project Name | Project Location |
|---|---|---|
| 1315-197 | Duluth ANG/Duth SI #1 | IRP Site 26 |

| Field Sample No./ Identification | Date and Time | Grab | Comp | Sample Container (Size/Mat'l) | Sample Type (Liquid, Sludge, Etc.) | Preservative | ANALYSIS REQUESTED | LABORATORY REMARKS |
|---|---|---|---|---|---|---|---|---|
| -15-17 026-003MW | 6 MAY 0845 | X | | BRASS SLEEVE (3) | SOIL | NONE | ASTM Method for pH, ration exchange, soil organic matter content, capasity, density, vadosezone vert.cal hyd conductivity | particle size distribution |
| -15-17 | 0847 | X | | | | | | |
| -15-17 | 0847 | X | | | | | | |
| 026-002MW .5-2.5 | 1300 | X | | (2) | | | | |
| | | X | | | | | | |
| | | X | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| Samplers: (Signature) | Relinquished by: (Signature) | Date: 6 MAY 95 Time: 14:30 | Received by: (Signature) | Date: Time: | Intact |
|---|---|---|---|---|---|
| R. Le Mer | J Byrd JR (OPTECH) | | Brian T Hayden (NTS) | | Yes |
| Affiliation | Relinquished by: (Signature) | Date: 5-7-95 Time: 8:30 | Received by: (Signature) | Date: 5-8-95 Time: 0800 | Intact |
| OPTECH NTS (106) | Brian T Hayden | | A. Zelenyuk NTS | | |
| | Relinquished by: (Signature) | Date: Time: | Received by: (Signature) | Date: Time: | Intact |
| | | | | | |
| SAMPLER REMARKS: 3701 | Sample 026-003MW-15-17 contains 3 Brass Sleeves<br>Sample 026-002MW-05-2.5 contains 2 Brass Sleeves | | Received for laboratory: (Signature) | Date: Time: | Laboratory No. |
| Seal # | | | Data Results to: | | |

# APPENDIX J

# HAZARDOUS RANKING SYSTEM DATA PACKAGE

## INTRODUCTION

This appendix presents information needed by personnel performing a Hazardous Ranking System (HRS) study.

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# SITE INVESTIGATION (SI)
# DATA REQUIREMENTS FOR FEDERAL FACILITY DOCKET SITES

## DULUTH AIR NATIONAL GUARD STATION
## DULUTH, MINNESOTA

1. **Supply copies of all previous sampling data, on-site and off-site, including location map, detection limits, raw data sheets, QA/QC documents, date(s) sampled, analytical method(s) used, well or boring logs, and sampling technique(s).**

   On-site and off-site sampling data, detection limits, and sampling techniques are found in Section 5 of this SI Report. Location maps are found in several sections of the SI Report including Section 1, Figure 1.1, Section 2, Figures 2.1 and 2.2. Raw data sheets, dates of sampling, and analytical methods are found in Appendix M of the SI. Well and boring logs can be found in Appendices C and A respectively. QA/QC documents are found in Appendix L.

2. **Locate and identify on a map all known or suspected sources. Supply all information about source(s) such as: dates of operation, use, or spillage, amounts of material deposited, stored, or spilled, dimensions of source(s), known or suspected hazardous substances, etc.**

   A map of IRP Site No. 25 is shown on Figure 2.1 of this SI. The source of contamination for the site is the old motor pool building which has been used for vehicle refueling, repair, storage, and maintenance. The source of suspected contamination is the outfall of the floor drains from the motor pool location. The old motor pool was in use from the late 1940s until the new motor pool was built in 1986. Known hazardous substances in use include unleaded and leaded gasoline, diesel fuel, waste solvents, and detergents.

   As shown in Figure 2.2 of this SI, IRP Site No. 26, Ramp Disposal Area, is located to the west of Building (Bldg.) 500, which was built in 1952. The building has been in continuous use as an aircraft hangar and maintenance facility since that time. The aircraft parking ramp in front of Bldg. 500 has also been in continuous use since the earliest days of Duluth ANGB. Unknown quantities of contaminated aviation fuels and waste solvents were stored or disposed of on the soil adjacent to the ramp, according to information gathered from interviewees and aerial photography.

3. **Provide a description of all aquifers beneath the site, including a description of overlying materials, depth first encountered, thickness, and composition.**

A description of groundwater and soil conditions is included in Section III of the Preliminary Assessment (PA) conducted for Duluth ANGB by OpTech in 1993. A Generalized Stratigraphic Column and a Diagrammatic Geologic Cross-Section of the Duluth Complex are shown in Figures III-1 and III-2 of the 1993 PA, respectively. The U. S. Geological Survey (USGS) publishes Water Resources of the Lake Superior Watershed, Northeastern Minnesota, Hydrologic Investigations Atlas HA-582 and Water Resources of the St. Louis River Watershed, Northeastern Minnesota, Hydrogeologic Investigations Atlas HA-586, both of which may be obtained from USGS.

4. **For each source, choose one description from Table 1 that describes the groundwater contaminant. Provide complete documentation (i.e., engineering diagrams, original photos, etc.) as to why the source meets that description.**

IRP Site No. 25 source: Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures); no liner.

Rationale: As noted in the RCRA Facility Investigation by OpTech in August 1992 free product was detected downgradient from the old motor pool area. Interviewee information provided information that the 10,000-gallon (gal.) motor vehicle gasoline (MOGAS) underground storage tank (UST) in the old motor pool had been abandoned and filled with water in 1990. However, in the Spring of 1992, the tank was discovered with only 9 inches of water in it, leading the interviewee to conclude that the tank had a leak in it. BTEX and SVOCs in the naphthalene group, were detected in high concentrations in the soil samples taken near the former diesel and MOGAS USTs and waste solvent UST, respectively. BTEX, SVOCs, and 1,2 dichloroethane were detected in groundwater samples taken downgradient from the former diesel and MOGAS USTs.

IRP Site No. 26 source: Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures); no liner.

Rationale: The non-paved area adjacent to the aircraft ramp west of Bldg. 500 and extending up to the area west of Bldg. 499 was used to store unknown numbers of 55-gal. drums containing contaminated jet fuel. In addition, buckets of contaminated fuel were poured on the ground along the edge of the ramp. Discoloration of soil was visible

on aerial photos and soil staining was reported by former aircraft maintenance personnel. VOCs were detected in a duplicate, but not in the original soil sample. Polyaromatic hydrocarbons (PAHs) were detected in a near-surface soil sample taken near the aircraft ramp.

5. **Provide the location of all drinking water wells in all aquifers beneath the site in a 4-mile radius from the site (property boundary) by HRS distance ring and locate the wells within a one mile radius on a 7.5-minute topographic map. Provide information on depth of wells, screening intervals, depth of aquifers encountered, population served for multiple wells (i.e., municipal system), the number of wells, location of all wells (regardless of 4-mile limit), average annual pumpage from each well (regardless of 4-mile limit), and total population served by the system. Include information on all standby wells.**

A map with all drinking water wells within a 1-mile radius of Duluth ANGB is shown in Figure 3.1 of this SI. Additional private wells are located between two and four miles of the Duluth International Airport. All water well logs for these 63 privately-owned wells within this area are shown in Section Q of the appendices of the 1993 PA. The City of Duluth and nearby townships draw their drinking water from Lake Superior. Population figures are included in the response to Question 13. According to local agencies, no standby wells exist.

6. **Provide information and location (on a 7.5-minute topographic map) of wells within 4 miles that are used to irrigate 5 or more acres of commercial food or forage crops, or watering of commercial livestock, or ingredient in commercial food preparation, or supply for aquaculture, or supply for a major or designated water recreation area, excluding drinking water use.**

Two factors rule out well water being used extensively to support the commercial food chain in the Duluth area: (1) water for the irrigation of local crops and the watering of livestock is drawn from abundant surface water sources, and (2) commercial agriculture in the Duluth area is negligible. Literally hundreds of small creeks and ponds surround the Duluth ANGB; the water table is very high. An annotated topographic map, showing wetlands is shown in Section Q of the appendices of the 1993 PA, as well as an annotated topographic map showing local agricultural activity.

7. **What is the average number of persons per residence for the county (or counties) that the site is located in per the U. S. Census Bureau?**

According to 1990 Census data, the population of St. Louis County is 2.43 persons per residence.

8. **Identify and locate all surface water bodies within 2 miles of the site, marking off on the drainage routes (shown on a 7.5-minute topographic map) from each source to applicable surface water bodies. Provide the average annual cubic feet per second flow for each surface water body within 15 miles downriver, or 15-mile radius from the point of probable entry into surface water. For lakes, provide information on inflow and outflow.**

Miller Creek, which flows past the eastern perimeter of Duluth ANGB, is a minimally flowing water body, especially during the winter months, according the City of Duluth Area Hydrologist. The creek flow is not officially measured by local officials. Beaver Creek flows north from a north-south drainage ditch and eventually empties into Wild Rice Lake, north of Duluth International Airport. The annual cubic flow is not measured. Both creeks and the reservoir are shown on Figures III-3 and III-4 of the 1993 PA.

9. **What is the number of acres in each drainage basin?**

Miller Creek drains approximately 1,200 acres before it empties into Lake Superior. The creek traverses a broader plain as it passes Duluth ANGB and then becomes more channelized as it flows southeastward and eventually empties into Lake Superior. Beaver Creek drains both the 2,000-acre Duluth International Airport and an area of approximately 1,300 acres as it flows northward into Wild Rice Lake.

10. **Choose the predominant soil group (surface soil) which comprises the largest total area within each drainage area.**

The area within a 2-mile radius of Duluth ANGB is classified as Highland Moraine. Five major soil groups are found in this area. Soil Interpretations Records for the five major soil groups (Ahmeek, Hermantown, Twig, Cathro, and Rifle) are found in the Q Section of the appendices of the 1993 PA.

**11. What is the 2-year, 24-hour rainfall?**

The 2-year, 24-hour rainfall is 2.5 inches, according to the State of Minnesota Department of Natural Resources Area Hydrologist.

**12. Choose the floodplain category for each source (supply FEMA floodplain map) and determine if each source meets the selected floodplain criteria.**

Because Duluth ANGB is located on an elevated hill above the level of any flood sources, the Base is not located within any historic floodplains. Additionally, the Federal Emergency Management Agency has elected not to map either Duluth International Airport or the ANGB because of the non-existent flood threat.

**13. Provide the location of all drinking water intakes within 15 miles downstream (for rivers) or 15-mile radius (lakes, bays, etc.). Provide information on the population served. For multiple intakes (i.e., municipal systems) provide information on the number of intakes, the location of all intakes (regardless of the 15-mile limit), and the total population served by the system. Include information on all standby intakes.**

A map of the location of the single drinking water intake on Lake Superior that serves as the City of Duluth municipal water supply is found in the Q Section of the appendices of the 1993 PA. Section Q also provides a cross-section schematic of the City of Duluth municipal water supply. According to the Chief Engineer of the City of Duluth Water and Gas Department, the system averages 13 million gallons per day during the year, with summer peaks rising to 30 million gallons per day. The municipal water system serves approximately 105,000 people in the greater Duluth area, including the Duluth ANGB.

**14. Provide information and the location of all water intakes within 15 miles downriver (radius in lake or bay) that are used to irrigate 5 or more acres of commercial food or forage crops, or watering of commercial livestock, or ingredient in commercial food preparation, or supply for aquaculture, or supply for a major or designated water recreation area, excluding drinking water use.**

As discussed in Question 13, only one water intake serves the greater Duluth area. Abundant surface water augments City Water supplies for the resident population.

15. **Is any surface water body 15 miles downriver (radius in lakes or bay) used for drinking water?**

Lake Superior is within 15 miles of Duluth ANGB. It is the major surface water body that provides drinking water to the Duluth population.

16. **What is the average human food chain production (pounds per year) for each surface water body 15 miles downriver or 15-mile radius in lake?**

Not applicable. Source: Minnesota Department of Natural Resources.

17. **Within a 4-mile radius from the site and 15 miles downriver or radius in a lake, identify all sensitive environments that exist. Provide original documentation (USF&W, Natural Heritage Database, State agencies, NOAA, etc.) and locate each area by HRS distance ring. Note that there could be multiple sensitive environments within a sensitive environment.**

Sensitive environments are discussed in Section 3.0 of this SI Report. Figure 3.4 of the SI includes the locations of all sensitive environments in the vicinity of the Base. The Base itself does not include any sensitive environments.

18. **What is the linear frontage of all wetlands 15 miles downriver or within a 15-mile radius from a lake?**

To determine extent of wetland frontage, a National Wetlands Inventory Map overlay, dated November 1978, showing wetlands within the Duluth Heights 7.5-minute topographic map was utilized. Literally hundreds of wetlands, seasonal and permanent, exist within a 15-mile radius of the Base, and on all sides of the Base. The linear frontage, as a result, may be expressed in hundreds of miles. A topographic map of the Duluth ANGB area with the National Wetlands Inventory Map overlay is provided in Section Q of the appendices for the 1993 PA.

19. **What is the location and number of persons residing, working, attending school or day care within 200 feet of each source?**

No schools or day care centers are located on Duluth ANGB. The nearest schools, Kenwood Elementary (population: 252), Home Craft Elementary (population: 445), and Central High School (population: 1,700) are located two miles or more from the Base.

IRP Site No. 25, Old Motor Pool: Bldgs. 240 and 242 are located in the old motor pool area. Four personnel work between both buildings. Across the street adjacent to the abandoned unleaded gasoline UST, 23 personnel work in Bldg. 231 and 2 people work in Bldg. 230. A map showing the 200-foot radius and population information is found Section Q of the appendices for the 1993 PA.

IRP Site No. 26, Ramp Disposal Area: A variety of aircraft maintenance facilities are located within 200 feet of Bldg. 500. A total of 32 personnel work in Bldgs. 203, 204, 199, 497, 498, and 214. A map showing the 200-foot radius and population information is found in Section Q of the appendices for the 1993 PA.

In all cases, on-Base population figures represent normal, daily use of the facilities. On guard weekends, the Base population greatly expands. Figures for Guard weekends are unavailable from Duluth ANGB sources.

20. **Identify all terrestrial sensitive environments that exist on-site. Provide original documentation (USF&W, Natural Heritage Database, State agencies, NOAA, etc.) and locate each on a 7.5-minute topographic map. Note that there could be multiple sensitive environments within a sensitive environment.**

No terrestrial sensitive environments exist on-site.

21. **For each source, choose one description from Table 8 that describes the accessibility of the site to a human population. Provide complete documentation (i.e., engineering diagrams, photographs (originals)) as to why the source meets that description.**

IRP Site No. 25, Old Motor Pool: Physically inaccessible to the public, with no evidence of public recreation use. Figure IV-1 of the 1993 PA shows the motor pool in a fenced area within the confines of the Duluth ANGB.

IRP Site No. 26, Ramp Disposal Area: Physically inaccessible to the public, with no evidence of public recreation use. Figure IV-2 of the 1993 PA shows the area adjacent to active aircraft taxiway/aircraft parking and maintenance area, which, at present, is also restricted from Base personnel.

22. **What is the total number of people in the following distance rings from source(s)?**

| Distance | Ring Total | Aggregate Total |
|---|---|---|
| **0-1/4 mile:** | 126 | 126 |
| **1/4-1/2 mile:** | 41 | 167 |
| **1/2-1 mile:** | 750 | 917 |
| **1-2 miles:** | 2,058 | 2,975 |
| **2-3 miles:** | 13,046 | 16,021 |
| **3-4 miles:** | 4,495 | 20,516 |

**Use 1990 Census data and/or actual house counts. Document how calculated.**

Raw 1990 Census data was gathered from the Arrowhead Regional Development Commission, Duluth, Minnesota. Data from Duluth and the townships of Canosia, Hermantown, and Rice Lake were included in computations. Mileage circles were used as overlays on 1990 Census tract maps, which were subdivided into Census blocks. All census blocks that fell within the mileage circles were included in their entirety. Partial blocks were interpolated for the percentage of the total census that was included. Direct computational involvement by the Arrowhead Regional Development Commission ensured accuracy in 1990 Census figures. A copy of the 1990 Census Tract Map is attached for informational purposes.

23. **For each source, choose one description from Table 9 that describes the gaseous containment. Provided complete documentation (i.e., engineering diagrams, photographs (originals)) as to why the source meets that description. From Table 10, choose the appropriate description of each source type. For each source, choose one description from Table 11 that describes the particulate containment.**

**Provide complete documentation (i.e., engineering diagrams, photographs (originals)) as to why the source meets the description.**

IRP Site No. 25, Old Motor Pool: Source covered with essentially impermeable, regularly inspected, maintained cover.

Rationale: The old motor pool facility is fully paved with an asphalt surface. Metal hatches are used to access the USTs. There are no open pathways for volatile gases to escape from the USTs. Figure IV-1 shows the configuration of the old motor pool area – the configuration is taken from current Base Civil Engineering drawings.

IRP Site No. 26, Ramp Disposal Area: Uncontaminated soil cover > 3 feet: Source substantially vegetated with little exposed soil.

24. **What is the location and area (in acres) of all wetlands within a 4-mile radius of the site?**

See response to Question 18. According to the U. S. Fish and Wildlife Service National Wetlands Inventory Map dated November 1978, there are hundreds of acres of wetlands within a 4-mile radius of Duluth ANGB. The maximum HRS rating for this item should be used. The topographic map which includes wetlands is found in Section Q of the appendices of the 1993 PA.

25. **Contact the United States Environmental Protection Agency (USEPA) Regional Office immediately if any radionuclides are present or suspected at a site and supply all radiological information known to date.**

No radioactivity has been recorded at IRP Sites No. 25 and No. 26.

26. **For all of the above information, use primary data sources and supply 2 copies or specify where copies may be obtained.**

See 1993 PA Report.

**27. Have any removals or remedial actions taken place at the site(s)?**

IRP Site No. 25, Old Motor Pool: The USTs at the old motor pool were emptied and abandoned in 1986 when the new motor pool area was constructed. Actions were not taken as environmentally-focused remedial or removal actions, but as a normal part of the transition to the new motor pool facility.

IRP Site No. 26, Ramp Disposal Area: Remedial actions are under review at Duluth ANGB.

# APPENDIX K

# SUMMARY OF ANALYTICAL RESULTS FOR SOIL AND GROUNDWATER SAMPLES

## INTRODUCTION

The following is a list of analytical results for soil and groundwater samples collected at IRP Sites No. 25 and No. 26.

## IRP SITE NO. 25

SOIL SAMPLES

K.1 – Volatile Soil Analytical Results for IRP Site No. 25
K.2 – Semivolatile Soil Analytical Results for IRP Site No. 25
K.3 – Metals Soil Analytical Results for IRP Site No. 25

GROUNDWATER SAMPLES

K.4 – Halogenated Volatile Groundwater Analytical Results for IRP Site No. 25
K.5 – Semivolatile Groundwater Analytical Results for IRP Site No. 25
K.6 – Metals Groundwater Analytical Results for IRP Site No. 25

## IRP SITE NO. 26

SOIL SAMPLES

K.7 – Volatile Soil Analytical Results for IRP Site No. 26
K.8 – Semivolatile Soil Analytical Results for IRP Site No. 26
K.9 – Metals Soil Analytical Results for IRP Site No. 26

GROUNDWATER SAMPLES

K.10 – Volatile Groundwater Analytical Results for IRP Site No. 26
K.11 – Semivolatile Groundwater Analytical Results for IRP Site No. 26

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# Volatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 025-001BH 6.5-7 | 025-002BH 11.5-12 | 025-003BH 11-12 | 025-003BH 11-12 Dup | 025-004BH 11.5-12 | 025-004BH 19.5-20 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/15/95 | 05/15/95 | 05/15/95 | 05/15/95 | 05/16/95 | 05/16/95 |
| Lab Sample No.: | 9505556-02 | 9505556-03 | 9505556-04 | 9505556-05 | 9505612-05 | 9505612-06 |
| VOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acetone | 250000 U | 25000 U | 500 U | 25000 U | 100 U | 100 U |
| Benzene | 84000 | 1700 | 25 U | 1200 U | 5 U | 5 U |
| Bromodichloromethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Bromoform | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Bromomethane | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| 2-Butanone | 50000 U | 5000 U | 100 U | 5000 U | 20 U | 20 U |
| Carbon Disulfide | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Carbon Tetrachloride | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Chlorobenzene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Chloroethane | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| Chloroform | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Chloromethane | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| Dibromochloromethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 1,1-Dichloroethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 1,1-Dichloroethene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 1,2-Dichloroethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 1,2-Dichloropropane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Ethylbenzene | 140000 | 9700 | 120 | 5300 | 5 U | 5 U |
| 2-Hexanone | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| Methylene Chloride | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| Styrene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Tetrachloroethene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Toluene | 460000 | 26000 | 25 U | 1200 U | 5 U | 5 U |
| 1,1,1-Trichloroethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Trichloroethene | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Trichlorofluoromethane | 12000 U | 1200 U | 25 U | 1200 U | 5 U | 5 U |
| Vinyl Acetate | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| Vinyl Chloride | 25000 U | 2500 U | 50 U | 2500 U | 10 U | 10 U |
| Xylenes (total) | 680000 | 52000 | 800 | 29000 | 5 U | 5 U |

BH - Borehole
VOC - Volatile Organic Compounds

U - Indicates compound was analyzed for but not detected

# Appendix K.1
## Volatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 025-005BH 11.5-12 | 025-006BH 21.5-22 | 025-007BH 11.5-12 | 025-008BH 10.5-11.0 | 025-008BH 14.5-15.0 | 025-009BH 11-12 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/16/95 | 05/12/95 | 05/16/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505612-04 | 9505512-08 | 9505612-03 | 9505512-02 | 9505512-03 | 9505512-10 |
| VOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U | 100 U | 100 U | 100 U |
| Benzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloromethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U | 5 U | 30 | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | 5 U | 5 U | 5 U | 5 U | 29 | 5 U |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Xylenes (total) | 5 U | 5 | 5 U | 5 U | 230 | 5 U |

BH - Borehole

# Volatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 025-009BH 11-12 Dup | 025-009BH 14-14.5 | 025-010BH 2-2.5 | 025-010BH 6-6.5 | 025-011BH 2-2.5 | 025-011BH 6.5-7 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505512-09 | 9505512-11 | 9505512-04 | 9505512-05 | 9505512-06 | 9505512-07 |
| VOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U | 100 U | 100 U | 100 U |
| Benzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloromethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U | 7 | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | 5 U | 5 U | 5 U | 17 | 5 U | 5 U |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Xylenes (total) | 5 U | 8 | 5 U | 5 | 5 U | 6 |

BH - Borehole
VOC - Volatile Organic Compounds

U - Indicates compound was analyzed for but not detected

# Appendix K.1
## Volatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-012BH 11.5-12 | 025-012BH 19.5-20 | 025-013BH 11.5-12 |
|---|---|---|---|
| Sample Date: | 5/17/95 | 5/17/95 | 5/17/95 |
| Lab Sample No.: | 9505673-02 | 9505673-03 | 9505673-04 |
| VOCs Matrix | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U |
| Benzene | 29 | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 U | 5 U |
| Chloromethane | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U |
| Toluene | 8 | 5 U | 5 U |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U |
| Xylenes (total) | 11 | 5 U | 5 U |

**BH - Borehole**

**VOC - Volatile Organic Compounds** **U - Indicates compound was analyzed for but not detected**

# Appendix K.2
## Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-001BH 6.5-7 | 025-002BH 11.5-12 | 025-003BH 11-12 | 025-003BH 11-12 Dup | 025-004BH 11.5-12 | 025-004BH 19.5-20 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/15/95 | 05/15/95 | 05/15/95 | 05/15/95 | 05/16/95 | 05/16/95 |
| Lab Sample No.: | 9505556-02 | 9505556-03 | 9505556-04 | 9505556-05 | 9505612-05 | 9505612-06 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acenaphthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Acenaphthylene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Aniline | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(b)Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(k)Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzoic Acid | 1600 U | 1600 U | 1600 U | 1600 U | 1600 U | 1600 U |
| Benzo(g,h,i)Perylene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzyl alcohol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Bromophenylphenyl ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Butylbenzylphthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| di-n-Butyl phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Carbazole | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chloroaniline | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethoxy)Methane | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethyl)Ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chloro-3-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Chloronaphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Chlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chlorophenylphenyl ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Chrysene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Dibenz(a,h)Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Dibenzofuran | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,2-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,3-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,4-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 3,3'-Dichlorobenzidine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dichlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Diethylphthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dimethylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Dimethyl Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

# Appendix K.2
## Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-001BH 6.5-7 | 025-002BH 11.5-12 | 025-003BH 11-12 | 025-003BH 11-12 Dup | 025-004BH 11.5-12 | 025-004BH 19.5-20 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/15/95 | 05/15/95 | 05/15/95 | 05/15/95 | 05/16/95 | 05/16/95 |
| Lab Sample No.: | 9505556-02 | 9505556-03 | 9505556-04 | 9505556-05 | 9505612-05 | 9505612-06 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,6-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,2-Diphenylhydrazine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Fluorene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobutadiene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachloroethane | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorocyclopentadiene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Isophorone | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Methylnaphthalene | 12000 | 2300 | 330 U | 330 | 330 U | 330 U |
| 2-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Naphthalene | 14000 | 2100 | 330 U | 330 U | 330 U | 330 U |
| 2-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 3-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 4-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| Nitrobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Nitrophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Nitrophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| N-Nitrosodiphenylamine (1) | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| N-Nitroso-Di-n-Propylamine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Di-n-Octyl Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Pentachlorophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| Phenanthrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Phenol | 350 | 330 U | 330 U | 330 U | 330 U | 330 U |
| Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Pyridine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,2,4-Trichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,4,5-Trichlorophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 2,4,6-Trichlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

# Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-005BH 11.5-12 | 025-006BH 21.5-22 | 025-07BH 11.5-12 | 025-008BH 10.5-11.0 | 025-008BH 14.5-15.0 | 025-009BH 11-12 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/16/95 | 05/12/95 | 05/16/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505612-04 | 9505512-08 | 9505612-03 | 9505512-02 | 9505512-03 | 9505512-10 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acenaphthene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Acenaphthylene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Aniline | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Anthracene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Anthracene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(b)Fluoranthene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(k)Fluoranthene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Pyrene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Benzoic Acid | 1600 U | 4800 U | 1600 U | 1600 U | 1600 U | 1600 U |
| Benzo(g,h,i)Perylene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Benzyl alcohol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 4-Bromophenylphenyl ether | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Butylbenzylphthalate | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| di-n-Butyl phthalate | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Carbazole | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chloroaniline | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethoxy)Methane | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethyl)Ether | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chloro-3-Methylphenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2-Chloronaphthalene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2-Chlorophenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chlorophenylphenyl ether | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Chrysene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Dibenz(a,h)Anthracene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Dibenzofuran | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 1,2-Dichlorobenzene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 1,3-Dichlorobenzene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 1,4-Dichlorobenzene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 3,3'-Dichlorobenzidine | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dichlorophenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Diethylphthalate | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dimethylphenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Dimethyl Phthalate | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

# Appendix K.2
## Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-005BH 11.5-12 | 025-006BH 21.5-22 | 025-07BH 11.5-12 | 025-008BH 10.5-11.0 | 025-008BH 14.5-15.0 | 025-009BH 11-12 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/16/95 | 05/12/95 | 05/16/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505612-04 | 9505512-08 | 9505612-03 | 9505512-02 | 9505512-03 | 9505512-10 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrophenol | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrotoluene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2,6-Dinitrotoluene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 1,2-Diphenylhydrazine | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Fluoranthene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Fluorene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobenzene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobutadiene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Hexachloroethane | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorocyclopentadiene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Isophorone | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2-Methylnaphthalene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2-Methylphenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 4-Methylphenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Naphthalene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2-Nitroaniline | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| 3-Nitroaniline | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| 4-Nitroaniline | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| Nitrobenzene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2-Nitrophenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 4-Nitrophenol | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| N-Nitrosodiphenylamine (1) | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| N-Nitroso-Di-n-Propylamine | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Di-n-Octyl Phthalate | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Pentachlorophenol | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| Phenanthrene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Phenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Pyrene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| Pyridine | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 1,2,4-Trichlorobenzene | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |
| 2,4,5-Trichlorophenol | 800 U | 2400 U | 800 U | 800 U | 800 U | 800 U |
| 2,4,6-Trichlorophenol | 330 U | 990 U | 330 U | 330 U | 330 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

Appendix K.2

# Semivolatile Soil Analytical Results for Site No. 25
# Duluth Air National Guard Base, Duluth, Minnesota

**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-009BH 11-12 Dup | 025-009BH 14-14.5 | 025-010BH 2-2.5 | 025-010BH 6-6.5 | 025-011BH 2-2.5 | 025-011BH 6.5-7 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505512-09 | 9505512-11 | 9505512-04 | 9505512-05 | 9505512-06 | 9505512-07 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acenaphthene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Acenaphthylene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Aniline | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Benzo(a)Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Benzo(b)Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Benzo(k)Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Benzo(a)Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Benzoic Acid | 1600 U | 1600 U | 1600 U | 1600 U | 1600 U | 16000 U |
| Benzo(g,h,i)Perylene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Benzyl alcohol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 4-Bromophenylphenyl ether | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Butylbenzylphthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| di-n-Butyl phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Carbazole | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 4-Chloroaniline | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| bis(2-Chloroethoxy)Methane | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| bis(2-Chloroethyl)Ether | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 4-Chloro-3-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2-Chloronaphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2-Chlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 4-Chlorophenylphenyl ether | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Chrysene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Dibenz(a,h)Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Dibenzofuran | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 1,2-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 1,3-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 1,4-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 3,3'-Dichlorobenzidine | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2,4-Dichlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Diethylphthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2,4-Dimethylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Dimethyl Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |

**BH - Borehole**

**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

# Appendix K.2
## Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 025-009BH 11-12 Dup | 025-009BH 14-14.5 | 025-010BH 2-2.5 | 025-010BH 6-6.5 | 025-011BH 2-2.5 | 025-011BH 6.5-7 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505512-09 | 9505512-11 | 9505512-04 | 9505512-05 | 9505512-06 | 9505512-07 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| 2,4-Dinitrophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| 2,4-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2,6-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 1,2-Diphenylhydrazine | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Fluoranthene | 330 U | 330 U | 420 | 330 U | 330 U | 3300 U |
| Fluorene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Hexachlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Hexachlorobutadiene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Hexachloroethane | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Hexachlorocyclopentadiene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Isophorone | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2-Methylnaphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 4-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Naphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| 3-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| 4-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| Nitrobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2-Nitrophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 4-Nitrophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| N-Nitrosodiphenylamine (1) | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| N-Nitroso-Di-n-Propylamine | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Di-n-Octyl Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Pentachlorophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| Phenanthrene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Phenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| Pyrene | 330 U | 330 U | 360 | 330 U | 330 U | 3300 U |
| Pyridine | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 1,2,4-Trichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |
| 2,4,5-Trichlorophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 8000 U |
| 2,4,6-Trichlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 3300 U |

BH - Borehole

SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

# Appendix K.2

## Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota

**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-012BH 11.5-12 | 025-012BH 19.5-20 | 025-013BH 11.5-12 |
|---|---|---|---|
| Sample Date: | 5/17/95 | 5/17/95 | 5/17/95 |
| Lab Sample No.: | 9505673-02 | 9505673-03 | 9505673-04 |
| SVOCs Matrix | Soil | Soil | Soil |
| Acenaphthene | 330 U | 330 U | 330 U |
| Acenaphthylene | 330 U | 330 U | 330 U |
| Aniline | 330 U | 330 U | 330 U |
| Anthracene | 330 U | 330 U | 330 U |
| Benzo(a)Anthracene | 330 U | 330 U | 330 U |
| Benzo(b)Fluoranthene | 330 U | 330 U | 330 U |
| Benzo(k)Fluoranthene | 330 U | 330 U | 330 U |
| Benzo(a)Pyrene | 330 U | 330 U | 330 U |
| Benzoic Acid | 1600 U | 1600 U | 1600 U |
| Benzo(g,h,i)Perylene | 330 U | 330 U | 330 U |
| Benzyl alcohol | 330 U | 330 U | 330 U |
| 4-Bromophenylphenyl ether | 330 U | 330 U | 330 U |
| Butylbenzylphthalate | 330 U | 330 U | 330 U |
| di-n-Butyl phthalate | 330 U | 330 U | 330 U |
| Carbazole | 330 U | 330 U | 330 U |
| 4-Chloroaniline | 330 U | 330 U | 330 U |
| bis(2-Chloroethoxy)Methane | 330 U | 330 U | 330 U |
| bis(2-Chloroethyl)Ether | 330 U | 330 U | 330 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 330 U | 330 U |
| 4-Chloro-3-Methylphenol | 330 U | 330 U | 330 U |
| 2-Chloronaphthalene | 330 U | 330 U | 330 U |
| 2-Chlorophenol | 330 U | 330 U | 330 U |
| 4-Chlorophenylphenyl ether | 330 U | 330 U | 330 U |
| Chrysene | 330 U | 330 U | 330 U |
| Dibenz(a,h)Anthracene | 330 U | 330 U | 330 U |
| Dibenzofuran | 330 U | 330 U | 330 U |
| 1,2-Dichlorobenzene | 330 U | 330 U | 330 U |
| 1,3-Dichlorobenzene | 330 U | 330 U | 330 U |
| 1,4-Dichlorobenzene | 330 U | 330 U | 330 U |
| 3,3'-Dichlorobenzidine | 330 U | 330 U | 330 U |
| 2,4-Dichlorophenol | 330 U | 330 U | 330 U |
| Diethylphthalate | 330 U | 330 U | 330 U |
| 2,4-Dimethylphenol | 330 U | 330 U | 330 U |
| Dimethyl Phthalate | 330 U | 330 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

# Appendix K.2
## Semivolatile Soil Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-012BH 11.5-12 | 025-012BH 19.5-20 | 025-013BH 11.5-12 |
|---|---|---|---|
| Sample Date: | 5/17/95 | 5/17/95 | 5/17/95 |
| Lab Sample No.: | 9505673-02 | 9505673-03 | 9505673-04 |
| SVOCs Matrix | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 800 U | 800 U |
| 2,4-Dinitrophenol | 800 U | 800 U | 800 U |
| 2,4-Dinitrotoluene | 330 U | 330 U | 330 U |
| 2,6-Dinitrotoluene | 330 U | 330 U | 330 U |
| 1,2-Diphenylhydrazine | 330 U | 330 U | 330 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 330 U | 330 U |
| Fluoranthene | 330 U | 330 U | 330 U |
| Fluorene | 330 U | 330 U | 330 U |
| Hexachlorobenzene | 330 U | 330 U | 330 U |
| Hexachlorobutadiene | 330 U | 330 U | 330 U |
| Hexachloroethane | 330 U | 330 U | 330 U |
| Hexachlorocyclopentadiene | 330 U | 330 U | 330 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 330 U | 330 U |
| Isophorone | 330 U | 330 U | 330 U |
| 2-Methylnaphthalene | 330 U | 330 U | 330 U |
| 2-Methylphenol | 330 U | 330 U | 330 U |
| 4-Methylphenol | 330 U | 330 U | 330 U |
| Naphthalene | 330 U | 330 U | 330 U |
| 2-Nitroaniline | 800 U | 800 U | 800 U |
| 3-Nitroaniline | 800 U | 800 U | 800 U |
| 4-Nitroaniline | 800 U | 800 U | 800 U |
| Nitrobenzene | 330 U | 330 U | 330 U |
| 2-Nitrophenol | 330 U | 330 U | 330 U |
| 4-Nitrophenol | 800 U | 800 U | 800 U |
| N-Nitrosodiphenylamine (1) | 330 U | 330 U | 330 U |
| N-Nitroso-Di-n-Propylamine | 330 U | 330 U | 330 U |
| Di-n-Octyl Phthalate | 330 U | 330 U | 330 U |
| Pentachlorophenol | 800 U | 800 U | 800 U |
| Phenanthrene | 330 U | 330 U | 330 U |
| Phenol | 330 U | 330 U | 330 U |
| Pyrene | 330 U | 330 U | 330 U |
| Pyridine | 330 U | 330 U | 330 U |
| 1,2,4-Trichlorobenzene | 330 U | 330 U | 330 U |
| 2,4,5-Trichlorophenol | 800 U | 800 U | 800 U |
| 2,4,6-Trichlorophenol | 330 U | 330 U | 330 U |

**BH - Borehole**

**SVOC - Semivolatile Organic Compound**

# Appendix K.3
## Metals Soil Analytical Results for Site No.25
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in milligrams per kilogram unless otherwise noted)

| Location No.: | 025-001BH 6.5-7 | 025-002BH 11.5-12 | 025-003BH 11-12 | 025-003BH 11-12 Dup | 025-004BH 11.5-12 |
|---|---|---|---|---|---|
| Sample Date: | 05/15/95 | 05/15/95 | 05/15/95 | 05/15/95 | 05/16/95 |
| Lab Sample No.: | 9505556-02 | 9505556-03 | 9505556-04 | 9505556-05 | 9505612-05 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Mercury, Total | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Cadmium, Total | 0.4 U | 0.4 U | 0.4 U | 0.5 | 0.5 U |
| Chromium, Total | 9 | 6 | 15 | 11 | 9 |
| Nickel, Total | 25 | 21 | 22 | 26 | 17 |
| Lead, Total | 3.2 | 1.7 | 3.0 | 2.6 | 2.0 |

| Location No.: | 025-004BH 19.5-20 | 025-005BH 11.5-12 | 025-006BH 21.5-22 | 025-007BH 11.5-12 | 025-008BH 10.5-11.0 |
|---|---|---|---|---|---|
| Sample Date: | 05/16/95 | 05/16/95 | 05/12/95 | 05/16/95 | 05/12/95 |
| Lab Sample No.: | 9505612-06 | 9505612-04 | 9505512-08 | 9505612-03 | 9505512-02 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Mercury, Total | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Cadmium, Total | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| Chromium, Total | 18 | 6 | 16 | 6 | 18 |
| Nickel, Total | 23 | 17 | 18 | 16 | 26 |
| Lead, Total | 4.5 | 1.9 | 7.6 | 6.1 | 4.6 |

BH - Borehole

U - Indicates element was analyzed for but not detected

# Appendix K.3
## Metals Soil Analytical Results for Site No.25
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in milligrams per kilogram unless otherwise noted)

| Location No.: | 025-008BH 14.5-15.0 | 025-009BH 11-12 | 025-009BH 11-12 Dup | 025-009BH 14-14.5 | 025-010BH 2-2.5 |
|---|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 | 05/12/95 |
| Lab Sample No.: | 9505512-03 | 9505512-10 | 9505512-09 | 9505512-11 | 9505512-04 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Mercury, Total | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Cadmium, Total | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| Chromium, Total | 12 | 18 | 24 | 17 | 15 |
| Nickel, Total | 27 | 19 | 22 | 18 | 20 |
| Lead, Total | 6.8 | 5.5 | 5.8 | 3.8 | 4.6 |

| Location No.: | 025-010BH 6-6.5 | 025-011BH 2-2.5 | 025-011BH 6.5-7 | 025-012BH 11.5-12 | 025-012BH 19.5-20 |
|---|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 5/12/95 | 5/17/95 | 5/17/95 |
| Lab Sample No.: | 9505512-05 | 9505512-06 | 9505512-07 | 9505673-02 | 9505673-03 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Mercury, Total | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| Cadmium, Total | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| Chromium, Total | 19 | 19 | 17 | 11 | 13 |
| Nickel, Total | 25 | 21 | 18 | 15 | 9 |
| Lead, Total | 3.6 | 5.2 | 6.3 | 4.3 | 5.3 |

| Location No.: | 025-013BH 11.5-12 |
|---|---|
| Sample Date: | 5/17/95 |
| Lab Sample No.: | 9505673-04 |
| Metals Matri | Soil |
| Mercury, Total | 0.1 U |
| Cadmium, Total | 0.5 U |
| Chromium, Total | 6 |
| Nickel, Total | 16 |
| Lead, Total | 3.2 |

BH - Borehole

U - Indicates element was analyzed for but not detected

# Appendix K.4
## Halogenated Volatile Groundwater Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Result in micrograms per liter unless otherwise noted)**

| Location No.: | 025-001MW-GW01 | 025-002MW-GW1 | 025-003MW-GW01 | 025-003MW-GW01 Dup |
|---|---|---|---|---|
| Sample Date: | 05/19/95 | 05/18/95 | 05/19/95 | 05/19/95 |
| Lab Sample No.: | 9505767-03 | 9505714-08 | 9505767-05 | 9505767-06 |
| VOC'S (8010) Matrix | Water | Water | Water | Water |
| Dichlorodifluoromethane | 1 U | 1 U | 25 U | 25 U |
| Chloromethane | 1 U | 1 U | 25 U | 25 U |
| Vinyl chloride | 1 U | 1 U | 25 U | 25 U |
| Bromomethane | 1 U | 1 U | 25 U | 25 U |
| Chloroethane | 1 U | 1 U | 25 U | 25 U |
| Trichlorofluoromethane | 1 U | 1 U | 25 U | 25 U |
| 1,1-Dichloroethene | 1 U | 1 U | 25 U | 25 U |
| Methylene chloride | 1 U | 1 U | 30 | 25 U |
| Trans-1,2-Dichloroethene | 1 U | 1 U | 25 U | 25 U |
| 1,1-Dichloroethane | 1 U | 1 U | 25 U | 25 U |
| chloroform | 1 U | 1 U | 25 U | 25 U |
| 1,1,1-Trichloroethane | 1 U | 1 U | 25 U | 25 U |
| carbon tetrachlorode | 1 U | 1 U | 25 U | 25 U |
| 1,2-Dichloroethane | 1 U | 11 | 25 U | 25 U |
| 2-Chloroethylvinyl ether | 1 U | 1 U | 25 U | 25 U |
| Trichloroethene | 1 U | 1 U | 25 U | 25 U |
| 1,2-Dichloropropane | 1 U | 1 U | 25 U | 25 U |
| Bromodichloromethane | 1 U | 1 U | 25 U | 25 U |
| cis-1,3-Dichloropropene | 1 U | 1 U | 25 U | 25 U |
| trans-1,3-Dichloropropene | 1 U | 1 U | 25 U | 25 U |
| 1,1,2-Trichloroethane | 1 U | 1 U | 25 U | 25 U |
| Tetrachloroethene | 1 U | 1 U | 25 U | 25 U |
| Dibromochloromethane | 1 U | 1 U | 25 U | 25 U |
| Chlorobenzene | 1 U | 1 U | 25 U | 25 U |
| Bromoform | 1 U | 1 U | 25 U | 25 U |
| 1,1,2,2-Tetrachloroethane | 1 U | 1 U | 25 U | 25 U |
| 1,3-Dichlorobenzene | 1 U | 1 U | 25 U | 25 U |
| 1,4-Dichlorobenzene | 1 U | 1 U | 25 U | 25 U |
| 1,2-Dichlorobenzene | 1 U | 1 U | 25 U | 25 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
PAH-8010 - Polynuclear Aromatic Hydrocarbon Compounds

# Appendix K.4
## Aromatic Volatile Groundwater Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | | 025-001MW-GW01 | 025-002MW-GW1 | 025-003MW-GW01 | 025-003MW-GW01 Dup |
|---|---|---|---|---|---|
| Sample Date: | | 05/19/95 | 05/18/95 | 05/19/95 | 05/19/95 |
| Lab Sample No.: | | 9505767-03 | 9505714-08 | 9505767-05 | 9505767-06 |
| BTEX(8020) | Matri | Water | Water | Water | Water |
| Benzene | | 1 U | 1 | 2600 | 2300 |
| Toleune | | 1 U | 1 U | 1300 | 1300 |
| Ethylbenzene | | 1 U | 1 U | 570 | 540 |
| Xylenes (total) | | 1 U | 1 U | 1450 | 1390 |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
BTEX 8020 - Volatile Organic Compounds-Method 8020

# Semivolatile Groundwater Analytical Results for Site No. 25
# Duluth Air National Guard Base, Duluth, Minnesota

**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 025-001MW-GW01 | 025-002MW-GW1 | 025-003MW-GW01 | 025-003MW-GW01 Dup |
|---|---|---|---|---|
| Sample Date: | 05/19/95 | 05/18/95 | 05/19/95 | 05/19/95 |
| Lab Sample No.: | 9505767-03 | 9505714-08 | 9505767-05 | 9505767-06 |
| SVOCs Matrix | Water | Water | Water | Water |
| Acenaphthene | 5 U | 5 U | 5 U | 5 U |
| Acenaphthylene | 5 U | 5 U | 5 U | 5 U |
| Aniline | 5 U | 5 U | 5 U | 5 U |
| Anthracene | 5 U | 5 U | 5 U | 5 U |
| Benzo(a)Anthracene | 5 U | 5 U | 5 U | 5 U |
| Benzo(b)Fluoranthene | 5 U | 5 U | 5 U | 5 U |
| Benzo(k)Fluoranthene | 5 U | 5 U | 5 U | 5 U |
| Benzo(a)Pyrene | 5 U | 5 U | 5 U | 5 U |
| Benzoic Acid | 25 U | 25 U | 25 U | 25 U |
| Benzo(g,h,i)Perylene | 5 U | 5 U | 5 U | 5 U |
| Benzyl alcohol | 5 U | 5 U | 5 U | 5 U |
| 4-Bromophenylphenyl ether | 5 U | 5 U | 5 U | 5 U |
| Butylbenzylphthalate | 5 U | 5 U | 5 U | 5 U |
| di-n-Butyl phthalate | 5 U | 5 U | 5 U | 5 U |
| Carbazole | 5 U | 5 U | 5 U | 5 U |
| 4-Chloroaniline | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroethoxy)Methane | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroethyl)Ether | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroisopropyl)Ether | 5 U | 5 U | 5 U | 5 U |
| 4-Chloro-3-Methylphenol | 5 U | 5 U | 5 U | 5 U |
| 2-Chloronaphthalene | 5 U | 5 U | 5 U | 5 U |
| 2-Chlorophenol | 5 U | 5 U | 5 U | 5 U |
| 4-Chlorophenylphenyl ether | 5 U | 5 U | 5 U | 5 U |
| Chrysene | 5 U | 5 U | 5 U | 5 U |
| Dibenz(a,h)Anthracene | 5 U | 5 U | 5 U | 5 U |
| Dibenzofuran | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 1,3-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 1,4-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 3,3'-Dichlorobenzidine | 5 U | 5 U | 5 U | 5 U |
| 2,4-Dichlorophenol | 5 U | 5 U | 5 U | 5 U |
| Diethylphthalate | 5 U | 5 U | 5 U | 5 U |
| 2,4-Dimethylphenol | 5 U | 5 U | 5 U | 5 U |
| Dimethyl Phthalate | 5 U | 5 U | 5 U | 5 U |
| 4,6-Dinitro-2-Methylphenol | 25 U | 25 U | 25 U | 25 U |
| 2,4-Dinitrophenol | 25 U | 25 U | 25 U | 25 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
SVOC - Semivolatile Organic Compounds

# Appendix K.5
## Semivolatile Groundwater Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 025-001MW-GW01 | 025-002MW-GW1 | 025-003MW-GW01 | 025-003MW-GW01 Dup |
|---|---|---|---|---|
| Sample Date: | 05/19/95 | 05/18/95 | 05/19/95 | 05/19/95 |
| Lab Sample No.: | 9505767-03 | 9505714-08 | 9505767-05 | 9505767-06 |
| SVOCs Matrix | Water | Water | Water | Water |
| 2,4-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U |
| 2,6-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U |
| 1,2-Diphenylhydrazine | 5 U | 5 U | 5 U | 5 U |
| bis(2-Ethylhexyl)Phthalate | 5 U | 5 U | 5 U | 5 U |
| Fluoranthene | 5 U | 5 U | 5 U | 5 U |
| Fluorene | 5 U | 5 U | 5 U | 5 U |
| Hexachlorobenzene | 5 U | 5 U | 5 U | 5 U |
| Hexachlorobutadiene | 5 U | 5 U | 5 U | 5 U |
| Hexachloroethane | 5 U | 5 U | 5 U | 5 U |
| Hexachlorocyclopentadiene | 5 U | 5 U | 5 U | 5 U |
| Indeno(1,2,3-cd)Pyrene | 5 U | 5 U | 5 U | 5 U |
| Isophorone | 5 U | 5 U | 5 U | 5 U |
| 2-Methylnaphthalene | 5 U | 5 U | 11 | 8 |
| 2-Methylphenol | 5 U | 5 U | 5 U | 5 U |
| 4-Methylphenol | 5 U | 5 U | 9 | 8 |
| Naphthalene | 5 U | 5 U | 75 | 51 |
| 2-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| 3-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| 4-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| Nitrobenzene | 5 U | 5 U | 5 U | 5 U |
| 2-Nitrophenol | 25 U | 25 U | 25 U | 25 U |
| 4-Nitrophenol | 25 U | 25 U | 25 U | 25 U |
| N-Nitrosodiphenylamine (1) | 5 U | 5 U | 5 U | 5 U |
| N-Nitroso-Di-n-Propylamine | 5 U | 5 U | 5 U | 5 U |
| Di-n-Octyl Phthalate | 5 U | 5 U | 5 U | 5 U |
| Pentachlorophenol | 25 U | 25 U | 25 U | 25 U |
| Phenanthrene | 5 U | 5 U | 5 U | 5 U |
| Phenol | 51 | 51 | 15 | 12 |
| Pyrene | 5 U | 5 U | 5 U | 5 U |
| Pyridine | 5 U | 5 U | 5 U | 5 U |
| 1,2,4-Trichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 2,4,5-Trichlorophenol | 10 U | 10 U | 10 U | 10 U |
| 2,4,6-Trichlorophenol | 5 U | 5 U | 5 U | 5 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
SVOC - Semivolatile Organic Compounds

# Appendix K.6
## Metals Groundwater Analytical Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in milligrams per liter unless otherwise noted)**

| Location No.: | 025-001MW-GW01 | 025-002MW-GW1 | 025-003MW-GW01 | 025-003MW-GW01 Dup |
|---|---|---|---|---|
| Sample Date: | 05/19/95 | 05/18/95 | 05/19/95 | 05/19/95 |
| Lab Sample No.: | 9505767-03 | 9505174-08 | 9505767-05 | 9505767-06 |
| Metals Matri | Water | Water | Water | Water |
| Mercury, Total | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U |
| Cadmium, Total | 0.005 U | 0.005 U | 0.005 U | 0.005 U |
| Chromium, Total | 0.036 | 0.011 | 0.015 | 0.019 |
| Nickel, Total | 0.07 | 0.03 | 0.03 | 0.04 |
| Lead, Total | 0.008 | 0.004 U | 0.005 | 0.007 |

MW - Monitoring Well
GW - Groundwater

U - Indicates element was analyzed for but not detected

# Appendix K.7
## Volatile Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 026-001BH 2-2.5 | 026-001BH 9.5-10 | 026-001BH 9.5-10 Dup | 026-002BH 2-2.5 | 026-002BH 6.5-7 | 026-003BH 1.5-2.5 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 | 05/04/95 | 05/04/95 | 05/04/95 |
| Lab Sample No.: | 9505164-01 | 9505164-02 | 9505164-10 | 9505209-04 | 9505209-05 | 9505209-02 |
| VOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U | 100 U | 100 U | 100 U |
| Benzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloromethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Xylenes (total) | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

BH - Borehole

# Volatile Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 026-003BH 1.5-2.5 Dup | 026-003BH 6.5-7 | 026-004BH 2-2.5 | 026-004BH 9.5-10 | 026-005BH 1.5-2.5 | 026-005BH 1.5-2.5 Dup |
|---|---|---|---|---|---|---|
| Sample Date: | 05/04/95 | 05/04/95 | 05/03/95 | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505209-01 | 9505209-03 | 9505164-03 | 9505164-04 | 9505164-05 | 9505164-09 |
| VOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U | 100 U | 100 U | 100 U |
| Benzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloromethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | 5 U | 5 U | 5 U | 5 U | 5 U | 7 |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Xylenes (total) | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

BH - Borehole
VOC - Volatile Organic Compounds

U - Indicates compound was analyzed for but not detected

# Appendix K.7
## Volatile Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 026-005BH 9.5-10 | 026-006BH 2-2.5 | 026-006BH 11.5-12 |
|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505164-06 | 9505164-08 | 9505164-07 |
| VOCs Matrix | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U |
| Benzene | 5 U | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 U | 5 U |
| Chloromethane | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U |
| Toluene | 5 U | 5 U | 5 U |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U |
| Xylenes (total) | 5 U | 5 U | 5 U |

BH - Borehole

# Semivolatile Soil Analytical Results for Site No. 26
# Duluth Air National Guard Base, Duluth, Minnesota

**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 026-001BH 2-2.5 | 026-001BH 9.5-10 | 026-001BH 9.5-10 Dup | 026-002BH 2-2.5 | 026-002BH 6.5-7 | 026-003BH 1.5-2.5 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 | 05/04/95 | 05/04/95 | 05/04/95 |
| Lab Sample No.: | 9505164-01 | 9505164-02 | 9505164-10 | 9505209-04 | 9505209-05 | 9505209-02 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acenaphthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Acenaphthylene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Aniline | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(b)Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(k)Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzoic Acid | 1600 U | 1600 U | 1600 U | 1600 U | 1600 U | 1600 U |
| Benzo(g,h,i)Perylene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Benzyl alcohol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Bromophenylphenyl ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Butylbenzylphthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| di-n-Butyl phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Carbazole | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chloroaniline | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethoxy)Methane | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethyl)Ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chloro-3-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Chloronaphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Chlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Chlorophenylphenyl ether | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Chrysene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Dibenz(a,h)Anthracene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Dibenzofuran | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,2-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,3-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,4-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 3,3'-Dichlorobenzidine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dichlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Diethylphthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dimethylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Dimethyl Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |

BH - Borehole
SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

# Appendix K.8
## Semivolatile Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 026-001BH 2-2.5 | 026-001BH 9.5-10 | 026-001BH 9.5-10 Dup | 026-002BH 2-2.5 | 026-002BH 6.5-7 | 026-003BH 1.5-2.5 |
|---|---|---|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 | 05/04/95 | 05/04/95 | 05/04/95 |
| Lab Sample No.: | 9505164-01 | 9505164-02 | 9505164-10 | 9505209-04 | 9505209-05 | 9505209-02 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,6-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,2-Diphenylhydrazine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Fluoranthene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Fluorene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobutadiene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachloroethane | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Hexachlorocyclopentadiene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Isophorone | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Methylnaphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Methylphenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Naphthalene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 3-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 4-Nitroaniline | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| Nitrobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2-Nitrophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 4-Nitrophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| N-Nitrosodiphenylamine (1) | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| N-Nitroso-Di-n-Propylamine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Di-n-Octyl Phthalate | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Pentachlorophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| Phenanthrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Phenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Pyrene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| Pyridine | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 1,2,4-Trichlorobenzene | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |
| 2,4,5-Trichlorophenol | 800 U | 800 U | 800 U | 800 U | 800 U | 800 U |
| 2,4,6-Trichlorophenol | 330 U | 330 U | 330 U | 330 U | 330 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds** **U - Indicates compound was analyzed for but not detected**

# Semivolatile Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in micrograms per kilogram unless otherwise noted)

| Location No.: | 026-003BH 1.5-2.5 Dup | 026-003BH 6.5-7 | 026-004BH 2-2.5 | 026-004BH 9.5-10 | 026-005BH 1.5-2.5 | 026-005BH 1.5-2.5 Dup |
|---|---|---|---|---|---|---|
| Sample Date: | 05/04/95 | 05/04/95 | 05/03/95 | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505209-01 | 9505209-03 | 9505164-03 | 9505164-04 | 9505164-05 | 9505164-09 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| Acenaphthene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Acenaphthylene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Aniline | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Anthracene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Benzo(a)Anthracene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Benzo(b)Fluoranthene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Benzo(k)Fluoranthene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Benzo(a)Pyrene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Benzoic Acid | 3200U | 1600 U | 1600 U | 1600 U | 1600 U | 4800 U |
| Benzo(g,h,i)Perylene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Benzyl alcohol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 4-Bromophenylphenyl ether | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Butylbenzylphthalate | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| di-n-Butyl phthalate | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Carbazole | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 4-Chloroaniline | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| bis(2-Chloroethoxy)Methane | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| bis(2-Chloroethyl)Ether | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| bis(2-Chloroisopropyl)Ether | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 4-Chloro-3-Methylphenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2-Chloronaphthalene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2-Chlorophenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 4-Chlorophenylphenyl ether | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Chrysene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Dibenz(a,h)Anthracene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Dibenzofuran | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 1,2-Dichlorobenzene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 1,3-Dichlorobenzene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 1,4-Dichlorobenzene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 3,3'-Dichlorobenzidine | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2,4-Dichlorophenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Diethylphthalate | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2,4-Dimethylphenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Dimethyl Phthalate | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |

BH - Borehole
SVOC - Semivolatile Organic Compounds

U - Indicates compound was analyzed for but not detected

# Appendix K.8
## Semivolatile Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 026-003BH 1.5-2.5 Dup | 026-003BH 6.5-7 | 026-004BH 2-2.5 | 026-004BH 9.5-10 | 026-005BH 1.5-2.5 | 026-005BH 1.5-2.5 Dup |
|---|---|---|---|---|---|---|
| Sample Date: | 05/04/95 | 05/04/95 | 05/03/95 | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505209-01 | 9505209-03 | 9505164-03 | 9505164-04 | 9505164-05 | 9505164-09 |
| SVOCs Matrix | Soil | Soil | Soil | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| 2,4-Dinitrophenol | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| 2,4-Dinitrotoluene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2,6-Dinitrotoluene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 1,2-Diphenylhydrazine | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| bis(2-Ethylhexyl)Phthalate | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Fluoranthene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Fluorene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Hexachlorobenzene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Hexachlorobutadiene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Hexachloroethane | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Hexachlorocyclopentadiene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Indeno(1,2,3-cd)Pyrene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Isophorone | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2-Methylnaphthalene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2-Methylphenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 4-Methylphenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Naphthalene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2-Nitroaniline | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| 3-Nitroaniline | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| 4-Nitroaniline | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| Nitrobenzene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2-Nitrophenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 4-Nitrophenol | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| N-Nitrosodiphenylamine (1) | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| N-Nitroso-Di-n-Propylamine | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Di-n-Octyl Phthalate | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Pentachlorophenol | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| Phenanthrene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Phenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Pyrene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| Pyridine | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 1,2,4-Trichlorobenzene | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |
| 2,4,5-Trichlorophenol | 1600 U | 800 U | 800 U | 800 U | 800 U | 2400 U |
| 2,4,6-Trichlorophenol | 660 U | 330 U | 330 U | 330 U | 330 U | 990 U |

BH - Borehole

U - Indicates compound was analyzed for but not detected

# Semivolatile Soil Analytical Results for Site No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 026-005BH 9.5-10 | 026-006BH 2-2.5 | 026-006BH 11.5-12 |
|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505164-06 | 9505164-08 | 9505164-07 |
| SVOCs Matrix | Soil | Soil | Soil |
| Acenaphthene | 330 U | 660 U | 330 U |
| Acenaphthylene | 330 U | 660 U | 330 U |
| Aniline | 330 U | 660 U | 330 U |
| Anthracene | 330 U | 660 U | 330 U |
| Benzo(a)Anthracene | 330 U | 660 U | 330 U |
| Benzo(b)Fluoranthene | 330 U | 660 U | 330 U |
| Benzo(k)Fluoranthene | 330 U | 660 U | 330 U |
| Benzo(a)Pyrene | 330 U | 660 U | 330 U |
| Benzoic Acid | 1600 U | 3200U | 1600 U |
| Benzo(g,h,i)Perylene | 330 U | 660 U | 330 U |
| Benzyl alcohol | 330 U | 660 U | 330 U |
| 4-Bromophenylphenyl ether | 330 U | 660 U | 330 U |
| Butylbenzylphthalate | 330 U | 660 U | 330 U |
| di-n-Butyl phthalate | 330 U | 660 U | 330 U |
| Carbazole | 330 U | 660 U | 330 U |
| 4-Chloroaniline | 330 U | 660 U | 330 U |
| bis(2-Chloroethoxy)Methane | 330 U | 660 U | 330 U |
| bis(2-Chloroethyl)Ether | 330 U | 660 U | 330 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 660 U | 330 U |
| 4-Chloro-3-Methylphenol | 330 U | 660 U | 330 U |
| 2-Chloronaphthalene | 330 U | 660 U | 330 U |
| 2-Chlorophenol | 330 U | 660 U | 330 U |
| 4-Chlorophenylphenyl ether | 330 U | 660 U | 330 U |
| Chrysene | 330 U | 660 U | 330 U |
| Dibenz(a,h)Anthracene | 330 U | 660 U | 330 U |
| Dibenzofuran | 330 U | 660 U | 330 U |
| 1,2-Dichlorobenzene | 330 U | 660 U | 330 U |
| 1,3-Dichlorobenzene | 330 U | 660 U | 330 U |
| 1,4-Dichlorobenzene | 330 U | 660 U | 330 U |
| 3,3'-Dichlorobenzidine | 330 U | 660 U | 330 U |
| 2,4-Dichlorophenol | 330 U | 660 U | 330 U |
| Diethylphthalate | 330 U | 660 U | 330 U |
| 2,4-Dimethylphenol | 330 U | 660 U | 330 U |
| Dimethyl Phthalate | 330 U | 660 U | 330 U |

**BH - Borehole**
**SVOC - Semivolatile Organic Compounds**

**U - Indicates compound was analyzed for but not detected**

# Appendix K.8
## Semivolatile Soil Analytical Results for Site No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 026-005BH 9.5-10 | 026-006BH 2-2.5 | 026-006BH 11.5-12 |
|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505164-06 | 9505164-08 | 9505164-07 |
| SVOCs Matrix | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 1600 U | 800 U |
| 2,4-Dinitrophenol | 800 U | 1600 U | 800 U |
| 2,4-Dinitrotoluene | 330 U | 660 U | 330 U |
| 2,6-Dinitrotoluene | 330 U | 660 U | 330 U |
| 1,2-Diphenylhydrazine | 330 U | 660 U | 330 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 660 U | 330 U |
| Fluoranthene | 330 U | 870 | 330 U |
| Fluorene | 330 U | 660 U | 330 U |
| Hexachlorobenzene | 330 U | 660 U | 330 U |
| Hexachlorobutadiene | 330 U | 660 U | 330 U |
| Hexachloroethane | 330 U | 660 U | 330 U |
| Hexachlorocyclopentadiene | 330 U | 660 U | 330 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 660 U | 330 U |
| Isophorone | 330 U | 660 U | 330 U |
| 2-Methylnaphthalene | 330 U | 660 U | 330 U |
| 2-Methylphenol | 330 U | 660 U | 330 U |
| 4-Methylphenol | 330 U | 660 U | 330 U |
| Naphthalene | 330 U | 660 U | 330 U |
| 2-Nitroaniline | 800 U | 1600 U | 800 U |
| 3-Nitroaniline | 800 U | 1600 U | 800 U |
| 4-Nitroaniline | 800 U | 1600 U | 800 U |
| Nitrobenzene | 330 U | 660 U | 330 U |
| 2-Nitrophenol | 330 U | 660 U | 330 U |
| 4-Nitrophenol | 800 U | 1600 U | 800 U |
| N-Nitrosodiphenylamine (1) | 330 U | 660 U | 330 U |
| N-Nitroso-Di-n-Propylamine | 330 U | 660 U | 330 U |
| Di-n-Octyl Phthalate | 330 U | 660 U | 330 U |
| Pentachlorophenol | 800 U | 1600 U | 800 U |
| Phenanthrene | 330 U | 800 | 330 U |
| Phenol | 330 U | 660 U | 330 U |
| Pyrene | 330 U | 710 | 330 U |
| Pyridine | 330 U | 660 U | 330 U |
| 1,2,4-Trichlorobenzene | 330 U | 660 U | 330 U |
| 2,4,5-Trichlorophenol | 800 U | 1600 U | 800 U |
| 2,4,6-Trichlorophenol | 330 U | 660 U | 330 U |

BH - Borehole

U - Indicates compound was analyzed for but not detected

# Appendix K.9
## Metals Soil Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
(Results in milligrams per kilogram unless otherwise noted)

| Location No.: | 026-001BH 2-2.5 | 026-001BH 9.5-10 | 026-001BH 9.5-10 Dup | 026-002BH 2-2.5 | 026-002BH 6.5-7 |
|---|---|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 | 05/04/95 | 05/04/95 |
| Lab Sample No.: | 9505164-01 | 9505164-02 | 9505164-10 | 9505209-04 | 9505209-05 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Cadmium, Total | 8 U | 8 U | 8 U | 8 U | 8 U |
| Chromium, Total | 13 | 10 | 6 | 3.1 | 3.8 |
| Lead, Total | 2.8 | 2.4 | 2.5 | 3.2 | 1.5 |

| Location No.: | 026-003BH 1.5-2.5 | 026-003BH 1.5-2.5 Dup | 026-003BH 6.5-7 | 026-004BH 2-2.5 | 026-004BH 9.5-10 |
|---|---|---|---|---|---|
| Sample Date: | 05/04/95 | 05/04/95 | 05/04/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505209-02 | 9505209-01 | 9505209-03 | 9505164-03 | 9505164-04 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Cadmium, Total | 8 U | 8 U | 8 U | 8 U | 8 U |
| Chromium, Total | 18 | 6 | 3.2 | 9 | 7 |
| Lead, Total | 5.9 | 3.2 | 4.6 | 5.3 | 2.5 |

| Location No.: | 026-005BH 1.5-2.5 | 026-005BH 1.5-2.5 Dup | 026-005BH 9.5-10 | 026-006BH 2-2.5 | 026-006BH 11.5-12 |
|---|---|---|---|---|---|
| Sample Date: | 05/03/95 | 05/03/95 | 05/03/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505164-05 | 9505164-09 | 9505164-06 | 9505164-08 | 9505164-07 |
| Metals Matri | Soil | Soil | Soil | Soil | Soil |
| Cadmium, Total | 8 U | 8 U | 8 U | 8 U | 8 U |
| Chromium, Total | 7 | 8 | 3 | 5 | 4 |
| Lead, Total | 4.6 | 4.2 | 2.4 | 2.4 | 2.6 |

BH - Borehole

U - Indicates element was analyzed for but not detected

# Appendix K.10
## Volatile Groundwater Analytical Results For Site No. 26
## Duluth Air National Guard Base, Duluth. Minnesota
(Results in micrograms per liter unless otherwise noted)

| Location No.: | 026-001MW-GW1 | 026-002MW-GW1 | 026-003MW-GW1 | 026-003MW-GW1 Dup |
|---|---|---|---|---|
| Sample Date: | 05/18/95 | 05/18/95 | 05/18/95 | 05/18/95 |
| Lab Sample No.: | 9505714-03 | 9505714-01 | 9505714-04 | 9505714-02 |
| VOCs (8260) Matrix | Water | Water | Water | Water |
| Benzene | 1 U | 1 U | 1 U | 1 U |
| Bromobenzene | 1 U | 1 U | 1 U | 1 U |
| Bromochloromethane | 1 U | 1 U | 1 U | 1 U |
| Bromodichloromethane | 1 U | 1 U | 1 U | 1 U |
| Bromoform | 1 U | 1 U | 1 U | 1 U |
| Bromomethane | 2 U | 2 U | 2 U | 2 U |
| n-Butylbenzene | 1 U | 1 U | 1 U | 1 U |
| sec-Butylbenzene | 1 U | 1 U | 1 U | 1 U |
| tert-Butylbenzene | 1 U | 1 U | 1 U | 1 U |
| Carbon tetrachloride | 1 U | 1 U | 1 U | 1 U |
| Chlorobenzene | 1 U | 1 U | 1 U | 1 U |
| Chlorodibromomethane | 1 U | 1 U | 1 U | 1 U |
| Chloroethane | 4 U | 4 U | 4 U | 4 U |
| Chloroform | 1 U | 1 U | 1 U | 1 U |
| Chloromethane | 1 U | 1 U | 1 U | 1 U |
| 2-Chlorotoluene | 1 U | 1 U | 1 U | 1 U |
| 4-Chlorotoluene | 1 U | 1 U | 1 U | 1 U |
| 1,2-Dibromo-3-chloropropane | 1 U | 1 U | 1 U | 1 U |
| 1,2-Dibromoethane | 1 U | 1 U | 1 U | 1 U |
| Dibromomethane | 1 U | 1 U | 1 U | 1 U |
| 1,2-Dichlorobenzene | 1 U | 1 U | 1 U | 1 U |
| 1,3-Dichlorobenzene | 1 U | 1 U | 1 U | 1 U |
| 1,4-Dichlorobenzene | 1 U | 1 U | 1 U | 1 U |
| Dichlorodifluoromethane | 1 U | 1 U | 1 U | 1 U |
| 1,1-Dichloroethane | 1 U | 1 U | 1 U | 1 U |
| 1,2-Dichloroethane | 1 U | 1 U | 1 U | 1 U |
| 1,1-Dichloroethene | 1 U | 1 U | 1 U | 1 U |
| 1,2-Dichloropropane | 1 U | 1 U | 1 U | 1 U |
| 1,3-Dichloropropane | 1 U | 1 U | 1 U | 1 U |
| 2,2-Dichloropropane | 1 U | 1 U | 1 U | 1 U |
| 1,1-Dichloropropene | 1 U | 1 U | 1 U | 1 U |
| Ethylbenzene | 1 U | 1 U | 1 U | 1 U |
| Hexachlorobutadiene | 1 U | 1 U | 1 U | 1 U |
| Isopropylbenzene | 1 U | 1 U | 1 U | 1 U |
| p-Isopropyltoluene | 1 U | 1 U | 1 U | 1 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected

VOC-8260 - Volatile Organic Compounds-USEPA-SW-846/8260

# Volatile Groundwater Analytical Results For Site No. 26
## Duluth Air National Guard Base, Duluth. Minnesota
(Results in micrograms per liter unless otherwise noted)

| Location No.: | 026-001MW-GW1 | 026-002MW-GW1 | 026-003MW-GW1 | 026-003MW-GW1 Dup |
|---|---|---|---|---|
| Sample Date: | 05/18/95 | 05/18/95 | 05/18/95 | 05/18/95 |
| Lab Sample No.: | 9505714-03 | 9505714-01 | 9505714-04 | 9505714-02 |
| VOCs (8260) Matrix | Water | Water | Water | Water |
| Methylene chloride | 1 U | 1 U | 1 U | 1 U |
| Naphthalene | 1 U | 1 U | 1 U | 1 U |
| n-Propylbenzene | 1 U | 1 U | 1 U | 1 U |
| Styrene | 1 U | 1 U | 1 U | 1 U |
| 1,1,1,2-Tetrachloroethane | 1 U | 1 U | 1 U | 1 U |
| 1,1,2,2-Tetrachloroethane | 1 U | 1 U | 1 U | 1 U |
| Tetrachloroethene | 1 U | 1 U | 1 U | 1 U |
| Toluene | 1 U | 1 U | 1 U | 1 U |
| 1,2,3-Trichlorobenzene | 1 U | 1 U | 1 U | 1 U |
| 1,2,4-Trichlorobenzene | 1 U | 1 U | 1 U | 1 U |
| 1,1,1-Trichloroethane | 1 U | 1 U | 1 U | 1 U |
| 1,1,2-Trichloroethane | 1 U | 1 U | 1 U | 1 U |
| Trichloroethene | 1 U | 1 U | 1 U | 1 U |
| Trichlorofluoromethane | 1 U | 1 U | 1 U | 1 U |
| 1,2,3-Trichloropropane | 1 U | 1 U | 1 U | 1 U |
| 1,2,4-Trimethylbenzene | 1 U | 1 U | 1 U | 1 U |
| 1,3,5-Trimethylbenzene | 1 U | 1 U | 1 U | 1 U |
| Vinyl chloride | 1 U | 1 U | 1 U | 1 U |
| Xylenes (total) | 1 U | 1 U | 1 U | 1 U |
| 1,2-Dichloroethene (total) | 1 U | 1 U | 1 U | 1 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
VOC-8260 - Volatile Organic Compounds-USEPA SW-846/8260

# Appendix K.11
## Semivolatile Groundwater Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 026-001MW-GW1 | 026-002MW-GW1 | 026-003MW-GW1 | 026-003MW-GW1 Dup |
|---|---|---|---|---|
| Sample Date: | 05/18/95 | 05/18/95 | 05/18/95 | 05/18/95 |
| Lab Sample No.: | 9505714-03 | 9505714-01 | 9505714-04 | 9505714-02 |
| SVOCs Matrix | Water | Water | Water | Water |
| Acenaphthene | 5 U | 5 U | 5 U | 5 U |
| Acenaphthylene | 5 U | 5 U | 5 U | 5 U |
| Aniline | 5 U | 5 U | 5 U | 5 U |
| Anthracene | 5 U | 5 U | 5 U | 5 U |
| Benzo(a)Anthracene | 5 U | 5 U | 5 U | 5 U |
| Benzo(b)Fluoranthene | 5 U | 5 U | 5 U | 5 U |
| Benzo(k)Fluoranthene | 5 U | 5 U | 5 U | 5 U |
| Benzo(a)Pyrene | 5 U | 5 U | 5 U | 5 U |
| Benzoic Acid | 25 U | 25 U | 25 U | 25 U |
| Benzo(g,h,i)Perylene | 5 U | 5 U | 5 U | 5 U |
| Benzyl alcohol | 5 U | 5 U | 5 U | 5 U |
| 4-Bromophenylphenyl ether | 5 U | 5 U | 5 U | 5 U |
| Butylbenzylphthalate | 5 U | 5 U | 5 U | 5 U |
| di-n-Butyl phthalate | 5 U | 5 U | 5 U | 5 U |
| Carbazole | 5 U | 5 U | 5 U | 5 U |
| 4-Chloroaniline | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroethoxy)Methane | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroethyl)Ether | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroisopropyl)Ether | 5 U | 5 U | 5 U | 5 U |
| 4-Chloro-3-Methylphenol | 5 U | 5 U | 5 U | 5 U |
| 2-Chloronaphthalene | 5 U | 5 U | 5 U | 5 U |
| 2-Chlorophenol | 5 U | 5 U | 5 U | 5 U |
| 4-Chlorophenylphenyl ether | 5 U | 5 U | 5 U | 5 U |
| Chrysene | 5 U | 5 U | 5 U | 5 U |
| Dibenz(a,h)Anthracene | 5 U | 5 U | 5 U | 5 U |
| Dibenzofuran | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 1,3-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 1,4-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 3,3'-Dichlorobenzidine | 5 U | 5 U | 5 U | 5 U |
| 2,4-Dichlorophenol | 5 U | 5 U | 5 U | 5 U |
| Diethylphthalate | 5 U | 5 U | 5 U | 5 U |
| 2,4-Dimethylphenol | 5 U | 5 U | 5 U | 5 U |
| Dimethyl Phthalate | 5 U | 5 U | 5 U | 5 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected

# Semivolatile Groundwater Analytical Results for Site No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 026-001MW-GW1 | 026-002MW-GW1 | 026-003MW-GW1 | 026-003MW-GW1 Dup |
|---|---|---|---|---|
| Sample Date: | 05/18/95 | 05/18/95 | 05/18/95 | 05/18/95 |
| Lab Sample No.: | 9505714-03 | 9505714-01 | 9505714-04 | 9505714-02 |
| SVOCs Matrix | Water | Water | Water | Water |
| 4,6-Dinitro-2-Methylphenol | 25 U | 25 U | 25 U | 25 U |
| 2,4-Dinitrophenol | 25 U | 25 U | 25 U | 25 U |
| 2,4-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U |
| 2,6-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U |
| 1,2-Diphenylhydrazine | 5 U | 5 U | 5 U | 5 U |
| bis(2-Ethylhexyl)Phthalate | 5 U | 5 U | 5 U | 5 U |
| Fluoranthene | 5 U | 5 U | 5 U | 5 U |
| Fluorene | 5 U | 5 U | 5 U | 5 U |
| Hexachlorobenzene | 5 U | 5 U | 5 U | 5 U |
| Hexachlorobutadiene | 5 U | 5 U | 5 U | 5 U |
| Hexachloroethane | 5 U | 5 U | 5 U | 5 U |
| Hexachlorocyclopentadiene | 5 U | 5 U | 5 U | 5 U |
| Indeno(1,2,3-cd)Pyrene | 5 U | 5 U | 5 U | 5 U |
| Isophorone | 5 U | 5 U | 5 U | 5 U |
| 2-Methylnaphthalene | 5 U | 5 U | 5 U | 5 U |
| 2-Methylphenol | 5 U | 5 U | 5 U | 5 U |
| 4-Methylphenol | 5 U | 5 U | 5 U | 5 U |
| Naphthalene | 5 U | 5 U | 5 U | 5 U |
| 2-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| 3-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| 4-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| Nitrobenzene | 5 U | 5 U | 5 U | 5 U |
| 2-Nitrophenol | 25 U | 25 U | 25 U | 25 U |
| 4-Nitrophenol | 25 U | 25 U | 25 U | 25 U |
| N-Nitrosodiphenylamine (1) | 5 U | 5 U | 5 U | 5 U |
| N-Nitroso-Di-n-Propylamine | 5 U | 5 U | 5 U | 5 U |
| Di-n-Octyl Phthalate | 5 U | 5 U | 5 U | 5 U |
| Pentachlorophenol | 25 U | 25 U | 25 U | 25 U |
| Phenanthrene | 5 U | 5 U | 5 U | 5 U |
| Phenol | 51 | 51 | 51 | 51 |
| Pyrene | 5 U | 5 U | 5 U | 5 U |
| Pyridine | 5 U | 5 U | 5 U | 5 U |
| 1,2,4-Trichlorobenzene | 5 U | 5 U | 5 U | 5 U |
| 2,4,5-Trichlorophenol | 10 U | 10 U | 10 U | 10 U |
| 2,4,6-Trichlorophenol | 5 U | 5 U | 5 U | 5 U |

MW - Monitoring Well
GW - Groundwater

U - Indicates compound was analyzed for but not detected
SVOC - Semivolatile Organic Compounds

# APPENDIX L

# SUMMARY OF THE QA/QC ANALYTICAL RESULTS

## INTRODUCTION

The following is a list of analytical results for QA/QC samples collected at IRP Sites No. 25 and No. 26.

## IRP SITES NO. 25 AND NO. 26

SOIL SAMPLES

L.1 – Volatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
L.2 – Semivolatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
L.3 – Metals QA/QC Summary Results for IRP Sites No. 25 and No. 26

GROUNDWATER SAMPLES

L.4 – Volatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
L.5 – Semivolatile QA/QC Summary Results for IRP Sites No. 25 and No. 26
L.6 – Metals QA/QC Summary Results for IRP Sites No. 25 and No. 26

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# Volatile QA/QC Summary Results for Sites No.25 and No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-009BH 14-14.5 MS | 025-009BH 14-14.5MSD | 026-001BH 9-9.5 MS | 026-001BH 9-9.5 MSD |
|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505512-12 | 9505512-13 | 9505164-12 | 9505164-13 |
| VOCs Matrix | Soil | Soil | Soil | Soil |
| Acetone | 100 U | 100 U | 100 U | 100 U |
| Benzene | 46 | 46 | 47 | 49 |
| Bromodichloromethane | 42 | 43 | 5 U | 5 U |
| Bromoform | 37 | 39 | 5 U | 5 U |
| Bromomethane | 31 | 31 | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 38 | 39 | 5 U | 5 U |
| Chlorobenzene | 43 | 42 | 41 | 43 |
| Chloroethane | 35 | 35 | 10 U | 10 U |
| 2-Chloroethylvinylether | 47 | 48 | 10 U | 10 U |
| Chloroform | 48 | 48 | 5 U | 5 U |
| Chloromethane | 34 | 34 | 10 U | 10 U |
| Dibromochloromethane | 41 | 42 | 5 U | 5 U |
| 1,1-Dichloroethane | 49 | 48 | 5 U | 5 U |
| 1,1-Dichloroethene | 36 | 35 | 44 | 46 |
| 1,2-Dichloroethane | 46 | 47 | 5 U | 5 U |
| total-1,2-Dichloroethene | 84 | 83 | 5 U | 5 U |
| 1,2-Dichloropropane | 48 | 48 | 5 U | 5 U |
| cis-1,3-Dichloropropene | 38 | 40 | 5 U | 5 U |
| trans-1,3-Dichloropropene | 42 | 43 | 5 U | 5 U |
| Ethylbenzene | 44 | 42 | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 40 | 42 | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 44 | 46 | 5 U | 5 U |
| Tetrachloroethene | 40 | 38 | 5 U | 5 U |
| Toluene | 47 | 46 | 43 | 45 |
| 1,1,1-Trichloroethane | 46 | 46 | 5 U | 5 U |
| 1,1,2-Trichloroethane | 43 | 46 | 5 U | 5 U |
| Trichloroethene | 38 | 43 | 44 | 46 |
| Trichlorofluoromethane | 5 U | 37 | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 33 | 33 | 10 U | 10 U |
| Xylenes (total) | 35 | 34 | 5 U | 5 U |

**MS - Matrix Spike**
**MSD - Matrix Spike Duplicate**
**VOC - Volatile Organic Compounds**

**BH - Borehole**
**U - Indicates compound was analyzed for but not detected**
**QA/QC - Quality Assurance/Quality Control**

# Appendix L.2
## Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-008BH 10.5-11MS | 025-008BH 10.5-11 MSD | 026-001BH 9-9.5 MS | 026-001BH 9-9.5 MSD |
|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505512-14 | 9505512-15 | 9505164-12 | 9505164-13 |
| SVOCs Matrix | Soil | Soil | Soil | Soil |
| Acenaphthene | 1300 | 1300 | 1200 | 1200 |
| Acenaphthylene | 330 U | 330 U | 330 U | 330 U |
| Aniline | 330 U | 330 U | 330 U | 330 U |
| Anthracene | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Anthracene | 330 U | 330 U | 330 U | 330 U |
| Benzo(b)Fluoranthene | 330 U | 330 U | 330 U | 330 U |
| Benzo(k)Fluoranthene | 330 U | 330 U | 330 U | 330 U |
| Benzo(a)Pyrene | 330 U | 330 U | 330 U | 330 U |
| Benzoic Acid | 1600 U | 1600 U | 1600 U | 1600 U |
| Benzo(g,h,i)Perylene | 330 U | 330 U | 330 U | 330 U |
| Benzyl alcohol | 330 U | 330 U | 330 U | 330 U |
| 4-Bromophenylphenyl ether | 330 U | 330 U | 330 U | 330 U |
| Butylbenzylphthalate | 330 U | 330 U | 330 U | 330 U |
| di-n-Butyl phthalate | 330 U | 330 U | 330 U | 330 U |
| Carbazole | 330 U | 330 U | 330 U | 330 U |
| 4-Chloroaniline | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethoxy)Methane | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroethyl)Ether | 330 U | 330 U | 330 U | 330 U |
| bis(2-Chloroisopropyl)Ether | 330 U | 330 U | 330 U | 330 U |
| 4-Chloro-3-Methylphenol | 2000 | 2000 | 2100 | 2200 |
| 2-Chloronaphthalene | 330 U | 330 U | 330 U | 330 U |
| 2-Chlorophenol | 2200 | 2100 | 1500 | 1600 |
| 4-Chlorophenylphenyl ether | 330 U | 330 U | 330 U | 330 U |
| Chrysene | 330 U | 330 U | 330 U | 330 U |
| Dibenz(a,h)Anthracene | 330 U | 330 U | 330 U | 330 U |
| Dibenzofuran | 330 U | 330 U | 330 U | 330 U |
| 1,2-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U |
| 1,3-Dichlorobenzene | 330 U | 330 U | 330 U | 330 U |
| 1,4-Dichlorobenzene | 1100 | 1100 | 1100 | 1200 |
| 3,3'-Dichlorobenzidine | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dichlorophenol | 330 U | 330 U | 330 U | 330 U |
| Diethylphthalate | 330 U | 330 U | 330 U | 330 U |
| 2,4-Dimethylphenol | 330 U | 330 U | 330 U | 330 U |
| Dimethyl Phthalate | 330 U | 330 U | 330 U | 330 U |

MS - Matrix Spike
MSD - Matrix Spike Duplicate

BH - Borehole
U - Indicates compound was analyzed for but not detected
QA/QC - Quality Assurance/ Quality Control

# Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per kilogram unless otherwise noted)**

| Location No.: | 025-008BH 10.5-11MS | 025-008BH 10.5-11 MSD | 026-001BH 9-9.5 MS | 026-001BH 9-9.5 MSD |
|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505512-14 | 9505512-15 | 9505164-12 | 9505164-13 |
| SVOCs Matrix | Soil | Soil | Soil | Soil |
| 4,6-Dinitro-2-Methylphenol | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrophenol | 800 U | 800 U | 800 U | 800 U |
| 2,4-Dinitrotoluene | 1300 | 1300 | 1600 | 1600 |
| 2,6-Dinitrotoluene | 330 U | 330 U | 330 U | 330 U |
| 1,2-Diphenylhydrazine | 330 U | 330 U | 330 U | 330 U |
| bis(2-Ethylhexyl)Phthalate | 330 U | 330 U | 330 U | 330 U |
| Fluoranthene | 330 U | 330 U | 330 U | 330 U |
| Fluorene | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobenzene | 330 U | 330 U | 330 U | 330 U |
| Hexachlorobutadiene | 330 U | 330 U | 330 U | 330 U |
| Hexachloroethane | 330 U | 330 U | 330 U | 330 U |
| Hexachlorocyclopentadiene | 330 U | 330 U | 330 U | 330 U |
| Indeno(1,2,3-cd)Pyrene | 330 U | 330 U | 330 U | 330 U |
| Isophorone | 330 U | 330 U | 330 U | 330 U |
| 2-Methylnaphthalene | 330 U | 330 U | 330 U | 330 U |
| 2-Methylphenol | 330 U | 330 U | 330 U | 330 U |
| 4-Methylphenol | 330 U | 330 U | 330 U | 330 U |
| Naphthalene | 330 U | 330 U | 330 U | 330 U |
| 2-Nitroaniline | 800 U | 800 U | 800 U | 800 U |
| 3-Nitroaniline | 800 U | 800 U | 800 U | 800 U |
| 4-Nitroaniline | 800 U | 800 U | 800 U | 800 U |
| Nitrobenzene | 330 U | 330 U | 330 U | 330 U |
| 2-Nitrophenol | 330 U | 330 U | 330 U | 330 U |
| 4-Nitrophenol | 1600 | 1800 | 3300 | 3700 |
| N-Nitrosodiphenylamine (1) | 330 U | 330 U | 330 U | 330 U |
| N-Nitroso-Di-n-Propylamine | 1300 | 1300 | 1500 | 1700 |
| Di-n-Octyl Phthalate | 330 U | 330 U | 330 U | 330 U |
| Pentachlorophenol | 1800 | 1700 | 2400 | 2400 |
| Phenanthrene | 330 U | 330 U | 330 U | 330 U |
| Phenol | 2000 | 2000 | 1200 | 1200 |
| Pyrene | 1300 | 1300 | 1100 | 1000 |
| Pyridine | 330 U | 330 U | 330 U | 330 U |
| 1,2,4-Trichlorobenzene | 1300 | 1300 | 1200 | 1400 |
| 2,4,5-Trichlorophenol | 800 U | 800 U | 800 U | 800 U |
| 2,4,6-Trichlorophenol | 330 U | 330 U | 330 U | 330 U |

MS - Matrix Spike
MSD - Matrix Spike Duplicate
SVOC - Semivolatile Organic Compounds

BH - Borehole
U - Indicates compound was analyzed for but not detected
QA/QC - Quality Assurance/ Quality Control

# Appendix L.3
## Metals QA/QC Summary Results for Sites No. 25 and No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in milligrams per kilogram unless otherwise noted)**

| Location No.: | 025-009BH 14-14.5 MS | 025-009BH 14-14.5 MSD | 026-001BH 9-9.5 MS | 026-001BH 9-9.5 MSD |
|---|---|---|---|---|
| Sample Date: | 05/12/95 | 05/12/95 | 05/03/95 | 05/03/95 |
| Lab Sample No.: | 9505512-12 | 9505512-13 | 9505164-12 | 9505164-13 |
| Metals Matrix | Soil | Soil | Soil | Soil |
| Mercury, Total | 1.1 | 1.0 | N/A | N/A |
| Cadmium, Total | 89.5 | 88.7 | 102 | 101 |
| Chromium, Total | 118 | 114 | 11 | 12 |
| Nickel, Total | 114 | 112 | N/A | N/A |
| Lead, Total | 7.8 | 7.8 | 6.5 | 6.5 |

MS - Matrix Spike
MSD - Matrix Spike Duplicate
BH - Borehole

U - Indicates compound was analyzed for but not detected
QA/QC - Quality Assurance/Quality Control
N/A - Not Analyzed

# Volatile QA/QC Summary Results for Sites No.25 and No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | SI-001-FB | SI-002FB | SI-001-TB | 026-003-RB |
|---|---|---|---|---|
| Sample Date: | 05/18/95 | 05/19/95 | 05/08/95 | 05/18/95 |
| Lab Sample No.: | 9505714-05 | 9505767-02 | 9505714-06 | 9505714-07 |
| VOCs (8260) Matrix | Water | Water | Water | Water |
| Benzene | 1 U | 5 U | 1 U | 1 U |
| Bromobenzene | 1 U | 5 U | 1 U | 1 U |
| Bromochloromethane | 1 U | 5 U | 1 U | 1 U |
| Bromodichloromethane | 1 U | 5 U | 1 U | 1 U |
| Bromoform | 1 U | 5 U | 1 U | 1 U |
| Bromomethane | 2 U | 10 U | 2 U | 2 U |
| n-Butylbenzene | 1 U | 5 U | 1 U | 1 U |
| sec-Butylbenzene | 1 U | 5 U | 1 U | 1 U |
| tert-Butylbenzene | 1 U | 5 U | 1 U | 1 U |
| Carbon tetrachloride | 1 U | 5 U | 1 U | 1 U |
| Chlorobenzene | 1 U | 5 U | 1 U | 1 U |
| Chlorodibromomethane | 1 U | 5 U | 1 U | 1 U |
| Chloroethane | 4 U | 10 U | 4 U | 4 U |
| Chloroform | 5 | 6 | 1 U | 4 |
| Chloromethane | 1 U | 10 U | 1 U | 1 U |
| 2-Chlorotoluene | 1 U | 5 U | 1 U | 1 U |
| 4-Chlorotoluene | 1 U | 5 U | 1 U | 1 U |
| 1,2-Dibromo-3-chloropropane | 1 U | 5 U | 1 U | 1 U |
| 1,2-Dibromoethane | 1 U | 5 U | 1 U | 1 U |
| Dibromomethane | 1 U | 5 U | 1 U | 1 U |
| 1,2-Dichlorobenzene | 1 U | 5 U | 1 U | 1 U |
| 1,3-Dichlorobenzene | 1 U | 5 U | 1 U | 1 U |
| 1,4-Dichlorobenzene | 1 U | 5 U | 1 U | 1 U |
| Dichlorodifluoromethane | 1 U | 10 U | 1 U | 1 U |
| 1,1-Dichloroethane | 1 U | 5 U | 1 U | 1 U |
| 1,2-Dichloroethane | 1 U | 5 U | 1 U | 1 U |
| 1,1-Dichloroethene | 1 U | 5 U | 1 U | 1 U |
| 1,2-Dichloropropane | 1 U | 5 U | 1 U | 1 U |
| 1,3-Dichloropropane | 1 U | 5 U | 1 U | 1 U |
| 2,2-Dichloropropane | 1 U | 5 U | 1 U | 1 U |
| 1,1-Dichloropropene | 1 U | 5 U | 1 U | 1 U |
| Ethylbenzene | 1 U | 5 U | 1 U | 1 U |
| Hexachlorobutadiene | 1 U | 5 U | 1 U | 1 U |
| Isopropylbenzene | 1 U | 5 U | 1 U | 1 U |
| p-Isopropyltoluene | 1 U | 5 U | 1 U | 1 U |

**FB - Field Blank**
**SI - Site Investigation**
**TB - Trip Blank**

**U - Indicates compound was analyzed for but not detected**
**VOC 8260 - Volatile Organic Compounds-Meth. 8260**
**QA\QC - Quality Assurance\Quality Control**

# Appendix L.4
## Volatile QA/QC Summary Results for Sites No.25 and No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | SI-001-FB | SI-002FB | SI-001-TB | 026-003-RB |
|---|---|---|---|---|
| Sample Date: | 05/18/95 | 05/19/95 | 05/08/95 | 05/18/95 |
| Lab Sample No.: | 9505714-05 | 9505767-02 | 9505714-06 | 9505714-07 |
| VOCs (8260) Matrix | Water | Water | Water | Water |
| Methylene chloride | 4 | 5 U | 1 U | 3 |
| Naphthalene | 1 U | 5 U | 1 U | 1 U |
| n-Propylbenzene | 1 U | 5 U | 1 U | 1 U |
| Styrene | 1 U | 5 U | 1 U | 1 U |
| 1,1,1,2-Tetrachloroethane | 1 U | 5 U | 1 U | 1 U |
| 1,1,2,2-Tetrachloroethane | 1 U | 5 U | 1 U | 1 U |
| Tetrachloroethene | 1 U | 5 U | 1 U | 1 U |
| Toluene | 1 U | 5 U | 1 U | 1 U |
| 1,2,3-Trichlorobenzene | 1 U | 5 U | 1 U | 1 U |
| 1,2,4-Trichlorobenzene | 1 U | 5 U | 1 U | 1 U |
| 1,1,1-Trichloroethane | 1 U | 5 U | 1 U | 1 U |
| 1,1,2-Trichloroethane | 1 U | 5 U | 1 U | 1 U |
| Trichloroethene | 1 U | 5 U | 1 U | 1 U |
| Trichlorofluoromethane | 1 U | 5 U | 1 U | 1 U |
| 1,2,3-Trichloropropane | 1 U | 5 U | 1 U | 1 U |
| 1,2,4-Trimethylbenzene | 1 U | 5 U | 1 U | 1 U |
| 1,3,5-Trimethylbenzene | 1 U | 5 U | 1 U | 1 U |
| Vinyl chloride | 1 U | 10 U | 1 U | 1 U |
| Xylenes (total) | 1 U | 5 U | 1 U | 1 U |
| 1,2-Dichloroethene (total) | 1 U | 5 U | 1 U | 1 U |

**FB - Field Blank**
**SI - Site Investigation**

**U - Indicates compound was analyzed for but not detected**
**VOC 8260 - Volatile Organic Compounds-Meth. 8260**
**QA\QC - Quality Assurance\Quality Control**

# Volatile QA/QC Summary Results for Sites No.25 and No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 025-001-RB | 025-002-RB | 026-002-RB | 025-001 TB | 025-003-TB | Trip Blank | Equipment Blank |
|---|---|---|---|---|---|---|---|
| Sample Date: | 05/11/95 | 05/16/95 | 05/04/95 | 05/15/95 | 05/16/95 | 04/26/95 | 05/03/95 |
| Lab Sample No.: | 9505512-01 | 9505612-02 | 9505209-06 | 9505556-01 | 9505612-01 | 9505209-07 | 9505164-11 |
| VOCs Matrix | Water | Water | Water | Water | Water | Water | Water |
| Acetone | 100 U | 100 U | 100 U | 100 U | 100 U | 100 U | 100 U |
| Benzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromodichloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromoform | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Bromomethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Butanone | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U |
| Carbon Disulfide | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Carbon Tetrachloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chloroethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2-Chloroethylvinylether | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Chloroform | 5 U | 5 | 5 | 5 U | 5 U | 5 U | 5 |
| Chloromethane | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Dibromochloromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| total-1,2-Dichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichloropropane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| cis-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| trans-1,3-Dichloropropene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Methylene Chloride | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Methyl-2-Pentanone | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Styrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2,2-Tetrachloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Tetrachloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,1-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,1,2-Trichloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichloroethene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Trichlorofluoromethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Vinyl Acetate | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| Xylenes (total) | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

**RB - Rinsate Blank**
**FB - Field Blank**
**TB - Trip Blank**

**QA/QC - Quality Assurance/Quality Control**
**U - Indicates compound was analyzed for but not detected**
**VOC - Volatile Organic Compounds**

# Appendix L.4
## Aromatic Volatile QA\QC Summary Results for Site No. 25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | | 025-003-RB | 025-TB |
|---|---|---|---|
| Sample Date: | | 05/19/95 | 05/19/95 |
| Lab Sample No.: | | 9505767-01 | 9505767-04 |
| BTEX(8020) | Matrix | Water | Water |
| Benzene | | 1 U | 1 U |
| Toleune | | 1 U | 1 U |
| Ethylbenzene | | 1 U | 1 U |
| Xylenes (total) | | 1 U | 1 U |

RB - Rinsate Blank
TB - Trip Blank
QA\QC - Quality Assurance\Quality Control

U - Indicates compound was analyzed for but not detected
BTEX 8020 - Volatile Organic Compounds Method 8020

# Appendix L.4
## Halogenated Volatile QA\QC Summary Results for Site No.25
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 025-003-RB | 025-TB |
|---|---|---|
| Sample Date: | 05/19/95 | 05/19/95 |
| Lab Sample No.: | 9505767-01 | 9505767-04 |
| VOC's (8010) Matrix | Water | Water |
| Dichlorodifluoromethane | 1 U | 1 U |
| Chloromethane | 1 U | 1 U |
| Vinyl chloride | 1 U | 1 U |
| Bromomethane | 1 U | 1 U |
| Chloroethane | 1 U | 1 U |
| Trichlorofluoromethane | 1 U | 1 U |
| 1,1-Dichloroethene | 1 U | 1 U |
| Methylene chloride | 4 | B 3 |
| Trans-1,2-Dichloroethene | 1 U | 1 U |
| 1,1-Dichloroethane | 1 U | 1 U |
| chloroform | 5 | 1 U |
| 1,1,1-Trichloroethane | 1 U | 1 U |
| carbon tetrachlorode | 1 U | 1 U |
| 1,2-Dichloroethane | 1 U | 1 U |
| 2-Chloroethylvinyl ether | 1 U | 1 U |
| Trichloroethene | 1 U | 1 U |
| 1,2-Dichloropropane | 1 U | 1 U |
| Bromodichloromethane | 1 U | 1 U |
| cis-1,3-Dichloropropene | 1 U | 1 U |
| trans-1,3-Dichloropropene | 1 U | 1 U |
| 1,1,2-Trichloroethane | 1 U | 1 U |
| Tetrachloroethene | 1 U | 1 U |
| Dibromochloromethane | 1 U | 1 U |
| Chlorobenzene | 1 U | 1 U |
| Bromoform | 1 U | 1 U |
| 1,1,2,2-Tetrachloroethane | 1 U | 1 U |
| 1,3-Dichlorobenzene | 1 U | 1 U |
| 1,4-Dichlorobenzene | 1 U | 1 U |
| 1,2-Dichlorobenzene | 1 U | 1 U |

B - Indicates compound was detected in the Method Blank
RB - Rinsate Blank
TB - Trip Blank

U - Indicates compound was analyzed for but not detected
PAH 8010-Polynuclear Aromatic Hydrocarbon Compounds

# Appendix L.5
## Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 025-001-RB | 025-002-RB | 025-003-RB | 026-002-RB | 026-003-RB | Equipment Blank | SI-001-FB |
|---|---|---|---|---|---|---|---|
| Sample Date: | 05/11/95 | 05/16/95 | 05/19/95 | 05/04/95 | 05/18/95 | 05/03/95 | 05/18/95 |
| Lab Sample No.: | 9505512-01 | 9505612-02 | 9505767-01 | 9505209-06 | 9505714-07 | 9505164-11 | 9505714-05 |
| SVOCs Matrix | Water | Water | Water | Water | Water | Water | Water |
| Acenaphthene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Acenaphthylene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Aniline | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Anthracene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Benzo(a)Anthracene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Benzo(b)Fluoranthene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Benzo(k)Fluoranthene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Benzo(a)Pyrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Benzoic Acid | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| Benzo(g,h,i)Perylene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Benzyl alcohol | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Bromophenylphenyl ether | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Butylbenzylphthalate | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| di-n-Butyl phthalate | 5 U | 5 | 5 U | 5 U | 5 U | 5 U | 5 |
| Carbazole | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Chloroaniline | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroethoxy)Methane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroethyl)Ether | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| bis(2-Chloroisopropyl)Ether | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Chloro-3-Methylphenol | 5 U | 5 U | 5 U | 8 | 5 U | 5 U | 5 U |
| 2-Chloronaphthalene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Chlorophenol | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Chlorophenylphenyl ether | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Chrysene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Dibenz(a,h)Anthracene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Dibenzofuran | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,3-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,4-Dichlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 3,3'-Dichlorobenzidine | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2,4-Dichlorophenol | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Diethylphthalate | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4,6-Dinitro-2-Methylphenol | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| 2,4-Dinitrophenol | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |

**RB - Rinsate Blank**
**FB - Field Blank**
**QA/QC - Quality Assurance/ Quality Control**

**U - Indicates compound was analyzed for but not detected**
**SVOC - Semivolatile Organic Compounds**
**SI - Site Investigation**

# Semivolatile QA/QC Summary Results for Sites No. 25 and No. 26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in micrograms per liter unless otherwise noted)**

| Location No.: | 025-001-RB | 025-002-RB | 025-003-RB | 026-002-RB | 026-003-RB | Equipment Blank | SI-001-FB |
|---|---|---|---|---|---|---|---|
| Sample Date: | 05/11/95 | 05/16/95 | 05/19/95 | 05/04/95 | 05/18/95 | 05/03/95 | 05/18/95 |
| Lab Sample No.: | 9505512-01 | 9505612-02 | 9505767-01 | 9505209-06 | 9505714-07 | 9505164-11 | 9505714-05 |
| SVOCs Matrix | Water | Water | Water | Water | Water | Water | Water |
| 2,4-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2,6-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2,4-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2,6-Dinitrotoluene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2-Diphenylhydrazine | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| bis(2-Ethylhexyl)Phthalate | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Fluoranthene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Fluorene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Hexachlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Hexachlorobutadiene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Hexachloroethane | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Hexachlorocyclopentadiene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Indeno(1,2,3-cd)Pyrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Isophorone | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Methylnaphthalene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Methylphenol | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 4-Methylphenol | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Naphthalene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Nitroaniline | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| 3-Nitroaniline | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| 4-Nitroaniline | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| Nitrobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2-Nitrophenol | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| 4-Nitrophenol | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| N-Nitrosodiphenylamine (1) | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| N-Nitroso-Di-n-Propylamine | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Di-n-Octyl Phthalate | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Pentachlorophenol | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |
| Phenanthrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Phenol | 51 | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Pyrene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Pyridine | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 1,2,4-Trichlorobenzene | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 2,4,5-Trichlorophenol | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| 2,4,6-Trichlorophenol | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

**RB - Rinsate Blank**
**FB - Field Blank**
**QA/QC - Quality Assurance/ Quality Control**

**U - Indicates compound was analyzed for but not detected**
**SVOC - Semivolatile Organic Compounds**
**SI - Site Investigation**

# Appendix L.6
## Metals QA/QC Summary Results for Sites No.25 and No.26
## Duluth Air National Guard Base, Duluth, Minnesota
**(Results in milligrams per liter unless otherwise noted)**

| Location No.: | 025-001-RB | 025-002-RB | 025-003-RB | 026-002-RB |
|---|---|---|---|---|
| Sample Date: | 05/11/95 | 05/16/95 | 05/19/95 | 05/04/95 |
| Lab Sample No.: | 9505512-01 | 9505612-02 | 9505767-01 | 9505209-06 |
| Metals Matrix | Water | Water | Water | Water |
| Mercury, Total | 0.0004 U | 0.0004 U | 0.0004 U | N/A |
| Cadmium, Total | 0.004 U | 0.004 U | 0.005 U | 0.004 U |
| Chromium, Total | 0.01 U | 0.002 U | 0.002 U | 0.01 U |
| Nickel, Total | 0.02 U | 0.02 U | 0.02 U | N/A |
| Lead, Total | 0.006 | 0.006 | 0.004 U | 0.004 U |

| Location No.: | Equipment Blank | SI-001-FB | SI-002FB |
|---|---|---|---|
| Sample Date: | 05/03/95 | 05/18/95 | 05/19/95 |
| Lab Sample No.: | 9505164-11 | 9505174-05 | 9505767-02 |
| Metals Matrix | Water | Water | Water |
| Mercury, Total | N/A | N/A | 0.0004 U |
| Cadmium, Total | 0.004 U | 0.005 U | 0.005 U |
| Chromium, Total | 0.01 U | 0.002 U | 0.002 U |
| Nickel, Total | N/A | 0.02 U | 0.02 U |
| Lead, Total | 0.004 U | 0.004 U | 0.004 U |

RB - Rinsate Blank
FB - Field Blank
N/A - Not Analyzed

QA/QC - Quality Assurance\Quality Conrtol
U - Indicates compound was analyzed for but not detected

OPTECH

# OPERATIONAL TECHNOLOGIES
CORPORATION

## Minnesota Air National Guard Remedial Investigation/Feasible Study
## Duluth, Minnesota 1315-197/1315-213
## Southern Petroleum Laboratories Inc.
## Houston, Texas
## Data Evaluation Review

SAMPLE: SOIL

026-001BH 2-2.5 Lab ID# H9-9505164-01

Date Sampled: 05/03/95 Date Received: 05/04/95

*Sample Identification needs to be corrected to read from 026-00BH 2-2.5 to 026-001BH 2-2.5.

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.8 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No sample results were reported for Chromium-SW7191.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No sample results were reported for Cadmium-SW6010.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

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**SAMPLE:** **SOIL**

**026-001BH 9.5-10** Lab ID# H9-9505164-02

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.4 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 10 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-004BH 2-2.5** Lab ID# H9-9505164-03

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 5.3 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 9 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-004BH 9.5-10** Lab ID# H9-9505164-04

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 = *No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 = *No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 2.5 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 7 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

**026-005BH 1.5-2.5** Lab ID# H9-9505164-05

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 7 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-005BH 9.5-10** Lab ID# H9-9505164-06

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.4 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 3 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

026-006BH 11.5-12 Lab ID# H9-9505164-07

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 4 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

026-006BH 2-2.5 Lab ID# H9-9505164-08

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hits was detected on Fluoranthene at 870 ug/kg, Phenanthrene at 800 ug/kg, and Pyrene at 710 ug/kg with detection limits of 660 ug/kg.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.4 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 5 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

026-005BH .5-1.5 Lab ID# H9-9505164-09

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*Hit was detected on Toluene at 7 ug/kg with the detection limit of 5 ug/kg.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits. Why was a 3x dilution was performed?
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 4.2 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 8 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-001BH 9-9.5** Lab ID# H9-9505164-10

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.5 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **WATER**

**EQUIPMENT BLANK** Lab ID# H9-9505164-11

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*Hit was detected on Chloroform at 5 ug/l with the detection limit of 5 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*No hit was detected above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No hit was detected above the assigned detection limit of 0.01 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

026-001BH 9-9.5 MS Lab ID# H9-9505164-12

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*Spiked compounds were all recovered within acceptable QA/QC Criteria.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Spiked compounds were all recovered within acceptable QA/QC Criteria.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Spiked compound was recovered within QC Limits.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Spiked compound was recovered within QC Limits.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*Spiked compound was recovered within QC Limits.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

**026-001BH 9-9.5 MSD** Lab ID# H9-9505164-13

Date Sampled: 05/03/95 Date Received: 05/04/95

**Volatiles**

SW846-8240 =

*Spiked compounds were all recovered within acceptable QA/QC Criteria. All RPD's were within QC Limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Spiked compounds were all recovered within acceptable QA/QC Criteria. All RPD's were within QC Limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Spiked compound was recovered within QC Limits. RPD was within QC Limits.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Spiked compound was recovered within QC Limits. RPD was within QC Limits.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*Spiked compound was recovered within QC Limits. RPD was within QC Limits.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-003BH 0.5-1.5** Lab ID# H9-9505209-01

Date Sampled: 05/04/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits. A dilution factor of 2x was applied but was not stated as to what reason it was performed?
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-003BH 1.5-2.5** Lab ID# H9-9505209-02

Date Sampled: 05/04/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 = *No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 = *No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 5.9 mg/kgwith the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-003BH 6.5-7.0** Lab ID# H9-9505209-03

Date Sampled: 05/04/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 3.2 mg/kg with the detection limit of 0.2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-002BH 2-2.5** Lab ID# H9-9505209-04

Date Sampled: 05/04/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 3.1 mg/kg with the detection limit of 0.2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**026-002BH 6.5-7** Lab ID# H9-9505209-05

Date Sampled: 05/04/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits but Percent Difference was greater than 20% on a few internal standards.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 1.5 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 3.8 mg/kg with the detection limit of 0.2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 8 mg/kg. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 8 mg/kg as opposed to what was requested in the SOW at 0.5 mg/kg. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **WATER**

**026-002 RB** Lab ID# H9-9505209-06

Date Sampled: 05/04/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 =

*Hit was detected on Chloroform at 5 ug/l with the detection limit of 5 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hit was detected on 4-Chloro-3-Methylphenol at 8 ug/l above the detection limit of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*No hit was detected above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No hit was detected above the assigned detection limit of 0.01 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: WATER

TRIP BLANK Lab ID# H9-9505209-07

Date Sampled: 4/26/95 Date Received: 05/05/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: WATER

025-001 RB Lab ID# H9-9505512-01

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*No hit was detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hit was detected on Phenol at 51 ug/l with the detection limit of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 0.006 mg/l above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No hit was detected above the assigned detection limit of 0.01 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-008BH 10.5-11 Lab ID# H9-9505512-02

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 26 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

<u>*Need Metals Raw data for all analytes run.</u>

SAMPLE: SOIL

025-008BH 14.5-15 Lab ID# H9-9505512-03

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*Hits were detected on Ethylbenzene at 30 ug/kg, Toluene at 29 ug/kg, and Xylenes (Total) at 230 ug/kg with detection limits of 5 ug/kg.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits. One RPD was not within limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 6.8 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 12 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 27 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-010BH 2-2.5 Lab ID# H9-9505512-04

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hits on Fluoranthene at 420 ug/kg and Pyrene at 360 ug/kg with detection limits 330 ug/kg.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits. One RPD was not within limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 4.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 15 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 20 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-010BH 6-6.5** Lab ID# H9-9505512-05

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 = *Hits were detected on Ethylbenzene at 7 ug/kg, Toluene at 17 ug/kg, and Xylenes (Total) at 5 ug/kg with detection limits of 5 ug/kg.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 = *No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits. One RPD was not within limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 3.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 19 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 25 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-011BH 2-2.5** Lab ID# H9-9505512-06

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 5.2 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 19 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 21 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-011BH 6.5-7 Lab ID# H9-9505512-07

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*Hit was detected on Xylenes (Total) at 6 ug/kg with the detection limit of 5 ug/kg. Please confirm why Acetone at 53 ug/kg and 2-Butanone at 15 ug/kg were not quantitated on the report forms.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits. A 10x dilution was noted as being performed but the accompanying raw data displays only a 1x dilution. Also, the Quantitation Report does not display surrogate on the listing, only the internal standards.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were diluted outside acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 6.3 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 17 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-006BH 21.5-22** Lab ID# H9-9505512-08

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 = *Hit was detected on Xylenes (Total) at 5 ug/kg with the detection limit of 5 ug/kg. Please confirm why Acetone at 36 ug/kg and 2-Butanone at 12 ug/kg were not quantitated on the report forms.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 = *No hits were detected above the assigned detection limits. A 3x dilution was noted as being performed but the accompanying raw data displays only a 1x dilution.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 7.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 16 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-009BH 10-11** Lab ID# H9-9505512-09

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits. Two Internal Standard % Differences were greater than 20% in ratio but were within QC Area Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 5.8 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 24 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 22 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-009BH 11-12 Lab ID# H9-9505512-10

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 5.5 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 18 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 19 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-009BH 14-14.5 Lab ID# H9-9505512-11

Date Sampled: 05/12/95 Date Received: 05/13/95

**Volatiles**

SW846-8240 =

*Hit was detected on Xylenes (Total) at 8 ug/kg with the detection limit of 5 ug/kg. Please confirm why Acetone at 54 ug/kg and 2-Butanone at 17 ug/kg were not quantitated on the report forms.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 3.8 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 17 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 18 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-009BH 14.5-15 MS Lab ID# H9-9505512-12

Date Sampled: 05/12/95 Date Received: 05/13/95

***Sample ID Name needs to read 025-009BH 14.5-15 from 025-009BH 14-14.5 MS. Please Correct.**

**Volatiles**

SW846-8240 = *All spiked compounds were recovered within QC acceptance criteria.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Spiked amount was recovered within QC acceptable criteria.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Spiked amount was recovered within QC acceptance criteria.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW7610= *Spiked amount was recovered within QC acceptance criteria.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Spiked amount was recovered within QC acceptance criteria.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *Spiked amount was recovered within QC acceptance criteria.
*Met 6 month holding times.
*COC information verified.

<u>*Need Metals Raw data for all analytes run.</u>

SAMPLE: SOIL

025-009BH 14.5-15 MSD Lab ID# H9-9505512-13

Date Sampled: 05/12/95 Date Received: 05/13/95

***Sample ID Name needs to read 025-009BH 14.5-15 from 025-009BH 14-14.5 MSD. Please Correct.**

**Volatiles**

SW846-8240 = *All spiked compounds were recovered within QC acceptance criteria. All RPD's are within QC Criteria.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Spiked amount was recovered within QC acceptable criteria. All RPD's are within QC Criteria.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *Spiked amount was recovered within QC acceptance criteria. All RPD's are within QC Criteria.
*Met 6 month holding times.
*COC information verified.

<u>*Need Metals Raw data for all analytes run.</u>

SAMPLE: SOIL

025-008BH 10.5-11 MS Lab ID# H9-9505512-14

Date Sampled: 05/12/95 Date Received: 05/13/95

**Semivolatiles**
SW846-8270 =-

*All spiked compounds were recovered within QC acceptable criteria.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits. Internal Standard RPD's were not within QC Criteria but with areas remaining within.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: SOIL

**025-008BH 10.5-11** Lab ID# H9-9505512-15

Date Sampled: 05/12/95 Date Received: 05/13/95

**Semivolatiles**

SW846-8270 =

*All spiked compounds were recovered within QC acceptable criteria. All RPD's were within QC Criteria.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits. Internal Standard RPD's were not within QC Criteria but with areas remaining within.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**SAMPLE:** **WATER**

**025-001 TB** Lab ID# H9-9505556-01

Date Sampled: 05/15/95 Date Received: 05/16/95

**Volatiles**
SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: SOIL

025-001BH 6.5-7.0 Lab ID# H9-9505556-02

Date Sampled: 05/15/95 Date Received: 05/16/95

**Volatiles**

SW846-8240 =

*Hits were detected on Benzene at 84,000 ug/kg, Ethylbenzene at 140,000 ug/kg, Toluene at 460,000 ug/kg, and Xylenes (Total) at 680,000 ug/kg with detection limits of 12,000 ug/kg. Dilution Factor of 2,500x was applied for analysis.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits. All surrogate recoveries for the Diluted analysis were recovered outside of QC Range.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hits were detected on 2-Methylnaphthalene at 12,000 ug/kg, Naphthalene at 14,000 ug/kg with detection limits of 3,300 ug/kg and Phenol at 350 ug/kg with the detection limit of 330 ug/kg. A 10x dilution was performed for this analysis.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits. All surrogates for the 10x dilution were diluted out of QC Range.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 9 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 25 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

<u>*Need Metals Raw data for all analytes run.</u>

SAMPLE: SOIL

025-002BH 11.5-12.0 Lab ID# H9-9505556-03

Date Sampled: 05/15/95 Date Received: 05/16/95

**Volatiles**

SW846-8240 =

*Hits were detected on Benzene at 1,700 ug/kg, Ethylbenzene at 9,700 ug/kg, Toluene at 26,000 ug/kg, and Xylenes (Total) at 52,000 ug/kg with detection limits of 12,000 ug/kg. Dilution Factor of 250x was applied for analysis.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits. All surrogates were diluted out of QC Range for the diluted sample.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hits were detected on 2-Methylnaphthalene at 2,300 ug/kg and Naphthalene at 2,100 ug/kg with detection limits of 330 ug/kg
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 1.7 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 21 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-003BH 11-12 Lab ID# H9-9505556-04

Date Sampled: 05/15/95 Date Received: 05/16/95

**Volatiles**

SW846-8240 =

*Hits were detected on Ethylbenzene at 120 ug/kg and Xylenes (Total) at 800 ug/kg with detection limits of 25 ug/kg. Dilution Factor of 5x was applied for analysis.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 3.0 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 15 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 22 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-003BH 10'-11' Lab ID# H9-9505556-05

Date Sampled: 05/15/95 Date Received: 05/16/95

**Volatiles**

SW846-8240 =

*Hits were detected on Ethylbenzene at 5,300 ug/kg and Xylenes (Total) at 29,000 ug/kg with detection limits of 1,200 ug/kg. Dilution Factor of 250x was applied for analysis.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits. Surrogates that were applied to the dilution were diluted out of QC Range.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hit was detected on 2-Methylnapthalene at 330 ug/kg with the detection limit of 330 ug/kg.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*One RPD's was outside QC Limits; Initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 2.6 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 11 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *Hit was detected at 0.5 mg/kg with a detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 26 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

<u>*Need Metals Raw data for all analytes run.</u>

**SAMPLE:** **WATER**

**025-003 TB** Lab ID# H9-9505612-01

Date Sampled: 05/16/95 Date Received: 05/17/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: WATER

025-002 RB Lab ID# H9-9505612-02

Date Sampled: 05/16/95 Date Received: 05/17/95

**Volatiles**

SW846-8240 =

*Hit was detected on Chloroform at 5 ug/l with the detection limit of 5 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*Hit was detected on Di-n-butylphthalate at 5 ug/l with the detection limit of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 0.006 mg/l above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No hit was detected above the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.004 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.004 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-007BH 11.5'-12' Lab ID# H9-9505612-03

Date Sampled: 05/16/95 Date Received: 05/17/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 6.1 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 16 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-005BH 11.5'-12'** Lab ID# H9-9505612-04

Date Sampled: 05/16/95 Date Received: 05/17/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 1.9 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 17 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-004BH 11.5'-12'** Lab ID# H9-9505612-05

Date Sampled: 05/16/95 Date Received: 05/17/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 2.0 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 9 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 17 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471=

*No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: SOIL

025-004BH 19.5'-20' Lab ID# H9-9505612-06

Date Sampled: 05/16/95 Date Received: 05/17/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 4.5 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 18 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 23 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: WATER

025-003 RB Lab ID# H9-9505767-01

Date Sampled: 05/19/95 Date Received: 05/20/95

**Volatiles**

SW846-8010 =

*Hits were detected on Chloroform at 5 ug/l a nd Methylene Chloride at 4 ug/l with the detection limit of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing BTEX raw data and chromatograms for this sample.

**Volatiles**

SW846-8020 =

*No hits were detected above the assigned detection limits of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms for this sample.

**Semivolatiles**

SW846-8270 =

*Hit was detected on Di-n-butylphthalate at 5 ug/l with the detection limit of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*No hit was detected above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No hit was detected above the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: WATER

SI-002FB Lab ID# H9-9505767-02

Date Sampled: 05/19/95 Date Received: 05/20/95

**Volatiles**

SW846-8260 = *Hit was detected on Chloroform at 6 ug/l with the detection limit of 5 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 = *It was noted on the COC to perform a Semi-volatile analysis but the laboratory received the sample broken and informed us to not being able to perform the analysis. But, Raw data was accompanied with the sample report forms and not documented on the report forms.

**Metals**

Lead-SW7421= *No hit was detected above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *No hit was detected above the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *No hit was detected above the assigned detection limit of 0.02 mg/l. Detection limit for this element should be at 0.01 mg/l as compared to 0.02 mg/l. Please provide an explanation for detection variance.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470= *No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **WATER**

**025-001-MW-GW01** Lab ID# H9-9505767-03

Date Sampled: 05/19/95 Date Received: 05/20/95

**Volatiles**

SW846-8010 =

*No hits were detected above the assigned detection of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing BTEX raw data and chromatograms for this sample.

**Volatiles**

SW846-8020 =

*No hits were detected above the assigned detection limits of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms for this sample.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms.

**Metals**

Lead-SW7421=

*Hit was detected at 0.008 mg/l above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 0.036 mg/l above the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 0.07 mg/l above the assigned detection limit of 0.02 mg/l.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: WATER

**025-TB** Lab ID# H9-9505767-04

Date Sampled: 05/19/95 Date Received: 05/20/95

**Volatiles**
SW846-8010 =

*No hits were detected above the assigned detection of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing BTEX raw data and chromatograms for this sample.

**Volatiles**
SW846-8020 =

*Hit was detected at Methylene Chloride at 3 ug/l above the assigned detection limits of 1 ug/l. Hit was confirmed to be detected in the method blank.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms for this sample.

SAMPLE: WATER

**025-003 MW-GW04** Lab ID# H9-9505767-05
Date Sampled: 05/19/95 Date Received: 05/20/95

**Volatiles**
SW846-8010 =

*Hit was detected on Methylene Chloride at 30 ug/l with the detection limit of 25 ug/l. A 25x dilution factor was applied.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing BTEX raw data and chromatograms for this sample.

**Volatiles**
SW846-8020 =

*Hits were detected for Total BTEX at 5,920 ug/l above the assigned detection limits of 5 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms for this sample.

**Semivolatiles**
SW846-8270 =

*Hit was detected on 2-Methylnaphthalene at 11 ug/l, 4-Methylphenol at 9 ug/l, Naphthalene at 75 ug/l, and Phenol at 15 ug/l with the detection limits of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 0.005 mg/l above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 0.015 mg/l with the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 0.03 ug/l above the assigned detection limit of 0.02 mg/l.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: WATER

**025-003A-GW01** Lab ID# H9-9505767-06
Date Sampled: 05/19/95 Date Received: 05/20/95

**Volatiles**
SW846-8010 =

*No hits were detected above the assigned detection limits. A 25x dilution was performed on this analysis but no hits were encountered, what was the reason for the dilution?
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing BTEX raw data and chromatograms for this sample.

**Volatiles**
SW846-8020 =

*Hits were detected for Total BTEX at 5,530 ug/l above the assigned detection limits of 5 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms for this sample.

**Semivolatiles**
SW846-8270 =

*Hit was detected on 2-Methylnaphthalene at 8 ug/l, 4-Methylphenol at 8 ug/l, Naphthalene at 51 ug/l, and Phenol at 12 ug/l with the detection limits of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*Hit was detected at 0.007 mg/l above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 0.019 mg/l with the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 0.04 ug/l above the assigned detection limit of 0.02 mg/l.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

SAMPLE: WATER

026-002-MW-GW1 Lab ID# H9-9505714-01

Date Sampled: 05/18/95 Date Received: 05/19/95

**Volatiles**
SW846-8260 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**
SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: WATER

026-003A-MW-GW1 Lab ID# H9-9505714-02

Date Sampled: 05/18/95 Date Received: 05/19/95

**Volatiles**
SW846-8260 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**
SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: WATER

026-001-MW-GW1 Lab ID# H9-9505714-03

Date Sampled: 05/18/95 Date Received: 05/19/95

**Volatiles**
SW846-8260 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**
SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**SAMPLE:** WATER

**SI-001-FB** Lab ID# H9-9505714-05

Date Sampled: 05/18/95 Date Received: 05/19/95

**Volatiles**
SW846-8260 =

*Hit on Chloroform at 5 ug/l was detected with a detection limit of 1 ug/l .
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**
SW846-8270 =

*Hit was detected on Di-n-butylphthalate at 5 ug/l with the detection limit of 5 ug/l.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*No hit was detected above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*No hit was detected above the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*No hit was detected above the assigned detection limit of 0.02 mg/l. The limit for Nickel as stated in the SOW is to be at 0.01 mg/l but is reported at 0.02 mg/l. Please explain the variance in the detection limits.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **WATER**

**SI-001-TB** Lab ID# H9-9505714-06

Date Sampled: 05/8/95 Date Received: 05/19/95

**Volatiles**

SW846-8260 =

*No hits were detected above the assigned detection limits .
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

SAMPLE: WATER

026-003-RB Lab ID# H9-9505714-07

Date Sampled: 05/18/95 Date Received: 05/19/95

**Volatiles**
SW846-8260 =

*Hit was detected on Chloroform at 4 ug/l and Methylene Chloride at 3 ug/l with detection limits of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**
SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**SAMPLE:** **WATER**

**025-002-MW-GW1** Lab ID# H9-9505714-08
Date Sampled: 05/18/95 Date Received: 05/19/95

**Volatiles**
SW846-8010 =

*Hit was detected on 1,2-Dichloroethane at 11 ug/l with the detection limit of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing raw data and chromatograms for this sample.

**Volatiles**
SW846-8020 =

*Hits were detected for Total BTEX at 1 ug/l above the assigned detection limits of 1 ug/l.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.
*Missing BTEX raw data and chromatograms for this sample.

**Semivolatiles**
SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 7 day extraction holding time and 40 day extract holding time.
*COC information verified.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits..
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421=

*No hit was detected above the assigned detection limit of 0.004 mg/l.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191=

*Hit was detected at 0.011 mg/l with the assigned detection limit of 0.002 mg/l.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010=

*No hit was detected above the assigned detection limit of 0.005 mg/l. The detection limit for Cadmium for this batch analyzed had an elevated detection limit of 0.005 mg/l as opposed to what was requested in the SOW at 0.0006 mg/l. Usability of the data is questionable without a valid explanation of the elevated detection limit.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010=

*Hit was detected at 0.03 ug/l above the assigned detection limit of 0.02 mg/l.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7470=

*No hit was detected above the assigned detection limit of 0.0004 mg/l.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-012BH 11.5'-12'** Lab ID# H9-9505673-02

Date Sampled: 05/17/95 Date Received: 05/18/95

**Volatiles**

SW846-8240 =

*Hits were detected on Benzene at 29 ug/kg, Toluene at 8 ug/kg, and Xylenes (Total) at 11 ug/kg with detection limits of 5 ug/kg.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 4.3 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 11 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 15 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-012BH 19.5'-20'** Lab ID# H9-9505673-03

Date Sampled: 05/17/95 Date Received: 05/18/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 5.3 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 13 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 9 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.

**SAMPLE:** **SOIL**

**025-013BH 11.5'-12'** Lab ID# H9-9505673-04

Date Sampled: 05/17/95 Date Received: 05/18/95

**Volatiles**

SW846-8240 =

*No hits were detected above the assigned detection limits.
*All met 14 day holding time.
*COC information verified.
*All initial and continuing calibrations were within acceptable QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Semivolatiles**

SW846-8270 =

*No hits were detected above the assigned detection limits.
*Met 14 day extraction holding time and 40 day extract holding time.
*COC information verified.
*All RPD's, initial and continuing calibrations were within acceptable QC Limits.
*Initial and continuing calibrations had % Differences that were outside QC Ranges but within area QC Limits.
*All surrogate recoveries were within acceptable QC limits.
*Blanks were clean of any contamination.

**Metals**

Lead-SW7421= *Hit was detected at 3.2 mg/kg with the detection limit of 0.4 mg/kg.
*Met 6 month holding times.
*COC information verified.

Chromium-SW7191= *Hit was detected at 6 mg/kg with the detection limit of 1 mg/kg.
*Met 6 month holding times.
*COC information verified.

Cadmium-SW6010= *No hit was detected above the assigned detection limit of 0.5 mg/kg.
*Met 6 month holding times.
*COC information verified.

Nickel-SW6010= *Hit was detected at 16 mg/kg with the detection limit of 2 mg/kg.
*Met 6 month holding times.
*COC information verified.

Mercury-SW7471= *No hit was detected above the assigned detection limit of 0.1 mg/kg.
*Met 6 month holding times.
*COC information verified.

*Need Metals Raw data for all analytes run.