

GW - 32

## REPORTS

YEAR(S):

1991- RCRA Book #2

INVESTIGATION

RECEIVED

OCT 23 1991

OIL CONSERVATION DIV.  
SANTA FE

RCRA FACILITY INVESTIGATION  
PHASE II - DRAFT  
GIANT REFINING COMPANY  
GALLUP, NEW MEXICO  
OCTOBER 21, 1991

BOOK 2

SECTION 7.0  
ORIGINAL ANALYTICAL DATA



Analytical **Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105855

July 8, 1991

Giant Refining Company  
Route 3, P.O. Box 7  
Gallup, NM 87301

Project Name/Number: Phase II RFI

Attention: Claud Rosendale

On 05/22/91, Analytical Technologies, Inc. received a request to analyze soil and aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Spike recoveries for Barium, Antimony and Zinc are outside ATI acceptable criteria, due to matrix interferences. J indicates an estimated value.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt  
Senior Project Manager

Lorraine Davis  
QA Coordinator

Robert V. Woods  
Laboratory Manager

RVW:sdd  
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/22/91

REPORT DATE : 06/29/91

ATI I.D. : 105855

| ATI # | CLIENT DESCRIPTION | MATRIX  | DATE COLLECTED |
|-------|--------------------|---------|----------------|
| 01    | RFI 0101 V 4.0     | SOIL    | 05/20/91       |
| 02    | RFI 0101 V 9.0     | SOIL    | 05/20/91       |
| 03    | RFI 0101 V 11.0    | SOIL    | 05/20/91       |
| 04    | RFI 0101 V 14.0    | SOIL    | 05/20/91       |
| 05    | RFI 0102 A 4.0     | SOIL    | 05/20/91       |
| 06    | RFI 0102 A 9.0     | SOIL    | 05/20/91       |
| 07    | RFI 0102 A 11.0    | SOIL    | 05/20/91       |
| 08    | RFI 0102 A 14.0    | SOIL    | 05/20/91       |
| 09    | RFI 0103 V 4.0     | SOIL    | 05/20/91       |
| 10    | RFI 0103 V 9.0     | SOIL    | 05/20/91       |
| 11    | RFI 0103 V 11.0    | SOIL    | 05/20/91       |
| 12    | RFI 0103 V 14.0    | SOIL    | 05/20/91       |
| 13    | RFI 0103 D 14.0    | SOIL    | 05/20/91       |
| 14    | RFI 0104 V 4.0     | SOIL    | 05/21/91       |
| 15    | RFI 0104 V 9.0     | SOIL    | 05/21/91       |
| 16    | RFI 0104 E 9.0     | AQUEOUS | 05/21/91       |
| 17    | RFI 0104 V 11.0    | SOIL    | 05/21/91       |
| 18    | RFI 0104 V 14.0    | SOIL    | 05/21/91       |
| 19    | TRIP BLANK         | AQUEOUS | 05/21/91       |
| 20    | TRIP BLANK         | AQUEOUS | 05/21/91       |

----- TOTALS -----

| MATRIX  | # SAMPLES |
|---------|-----------|
| SOIL    | 17        |
| AQUEOUS | 3         |

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

# GENERAL CHEMISTRY RESULTS

ATI I.D. : 105855

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/22/91

REPORT DATE : 06/29/91

|           |       |      |
|-----------|-------|------|
| PARAMETER | UNITS | 16   |
| PH        | UNITS | 5.41 |



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

ATI I.D. : 105855

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE CONC | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|--------------------|------------|-------|
| PH        | UNITS | 10587910 | 5.32          | 5.27        | 1   | NA                 | NA         | NA    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$



## METALS RESULTS

ATI I.D. : 105855

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/22/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 01    | 02    | 03    | 04    | 05    |
|-----------|-------|-------|-------|-------|-------|-------|
| ARSENIC   | MG/KG | <3    | <3    | <3    | <3    | <3    |
| BARIUM    | MG/KG | 513   | 95.4  | 254   | 140   | 194   |
| BERYLLIUM | MG/KG | 1.8   | 3.0   | 2.1   | 2.0   | 2.8   |
| CADMIUM   | MG/KG | 0.3   | 0.4   | 0.3   | <0.3  | <0.3  |
| COBALT    | MG/KG | 2.8   | 4.2   | 3.6   | 3.3   | 3.8   |
| CHROMIUM  | MG/KG | 14.8  | 4.2   | 5.1   | 2.7   | 4.4   |
| COPPER    | MG/KG | 4.6   | 3.6   | 4.0   | 3.1   | 4.0   |
| MERCURY   | MG/KG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| POTASSIUM | MG/KG | 563   | 921   | 723   | 647   | 1020  |
| NICKEL    | MG/KG | 4.5   | 6.9   | 6.0   | 5.2   | 6.8   |
| LEAD      | MG/KG | 7     | 7     | 6     | 7     | 6     |
| ANTIMONY  | MG/KG | <3    | <3    | <3    | <3    | <3    |
| SELENIUM  | MG/KG | <0.3  | <0.3  | <3    | <3    | <3    |
| VANADIUM  | MG/KG | 14.7  | 11.4  | 9.6   | 9.1   | 11.0  |
| ZINC      | MG/KG | 9.0   | 10.5  | 9.9   | 8.0   | 10.7  |



Analytical Technologies, Inc.

## METALS RESULTS

ATI I.D. : 105855

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/22/91

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 06    | 07    | 08    | 09    | 10    |
|-----------|-------|-------|-------|-------|-------|-------|
| ARSENIC   | MG/KG | <3    | <3    | <3    | <3    | 11    |
| BARIUM    | MG/KG | 818   | 404   | 416   | 295   | 244   |
| BERYLLIUM | MG/KG | 2.8   | 1.8   | 2.0   | 2.6   | 2.6   |
| CADMIUM   | MG/KG | 0.4   | 0.4   | 0.5   | 0.3   | 0.4   |
| COBALT    | MG/KG | 4.9   | 3.0   | 3.1   | 3.1   | 3.4   |
| CHROMIUM  | MG/KG | 4.5   | 2.5   | 2.8   | 2.5   | 4.0   |
| COPPER    | MG/KG | 3.2   | 1.3   | <0.5  | 3.9   | 3.5   |
| MERCURY   | MG/KG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| POTASSIUM | MG/KG | 1820  | 1660  | 1450  | 450   | 697   |
| NICKEL    | MG/KG | 7.5   | 6.0   | 6.1   | 4.9   | 5.3   |
| LEAD      | MG/KG | 8     | 5     | <5    | 7     | 7     |
| ANTIMONY  | MG/KG | <3    | <3    | <3    | <3    | <3    |
| SELENIUM  | MG/KG | <3    | <0.3  | <0.3  | <0.3  | <3    |
| VANADIUM  | MG/KG | 11.8  | 4.7   | 6.0   | 12.3  | 14.2  |
| ZINC      | MG/KG | 16.4  | 10.6  | 9.9   | 6.2   | 8.5   |



Analytical Technologies, Inc.

## METALS RESULTS

ATI I.D. : 105855

CLIENT : GIANT REFINING CO.  
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PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/22/91

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 11    | 12    | 13    | 14    | 15    |
|-----------|-------|-------|-------|-------|-------|-------|
| ARSENIC   | MG/KG | <3    | <3    | <3    | <3    | <3    |
| BARIUM    | MG/KG | 321   | 234   | 229   | 103   | 634   |
| BERYLLIUM | MG/KG | 2.4   | 2.9   | 4.2   | 2.7   | 3.7   |
| CADMIUM   | MG/KG | 0.4   | 0.4   | 0.4   | <0.3  | 0.4   |
| COBALT    | MG/KG | 3.0   | 3.4   | 4.3   | 3.9   | 3.9   |
| CHROMIUM  | MG/KG | 2.6   | 3.1   | 4.2   | 3.8   | 5.1   |
| COPPER    | MG/KG | 4.0   | 3.8   | 4.4   | 3.9   | 3.8   |
| MERCURY   | MG/KG | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| POTASSIUM | MG/KG | 561   | 623   | 965   | 1030  | 1260  |
| NICKEL    | MG/KG | 5.0   | 5.5   | 7.2   | 6.3   | 6.8   |
| LEAD      | MG/KG | 8     | 7     | 8     | 6     | 6     |
| ANTIMONY  | MG/KG | <3    | <3    | <3    | <3    | <3    |
| SELENIUM  | MG/KG | <0.3  | <3    | <3    | <0.3  | <3    |
| VANADIUM  | MG/KG | 10.0  | 10.6  | 12.2  | 10.8  | 12.4  |
| ZINC      | MG/KG | 7.2   | 8.2   | 10.6  | 13.0  | 16.7  |



Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 105855

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/22/91

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 16      |
|-----------|-------|---------|
| ARSENIC   | MG/L  | <0.005  |
| BARIUM    | MG/L  | <0.010  |
| BERYLLIUM | MG/L  | <0.005  |
| CADMIUM   | MG/L  | <0.005  |
| COBALT    | MG/L  | <0.010  |
| CHROMIUM  | MG/L  | <0.010  |
| COPPER    | MG/L  | <0.010  |
| MERCURY   | MG/L  | <0.0002 |
| POTASSIUM | MG/L  | <1.0    |
| NICKEL    | MG/L  | <0.020  |
| LEAD      | MG/L  | <0.002  |
| ANTIMONY  | MG/L  | <0.05   |
| SELENIUM  | MG/L  | <0.005  |
| VANADIUM  | MG/L  | <0.010  |
| ZINC      | MG/L  | <0.010  |



Analytical Technologies, Inc.

## METALS RESULTS

ATI I.D. : 105855

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/22/91

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 17    | 18    |
|-----------|-------|-------|-------|
| ARSENIC   | MG/KG | <3    | <3    |
| BARIUM    | MG/KG | 249   | 275   |
| BERYLLIUM | MG/KG | 4.0   | 4.9   |
| CADMIUM   | MG/KG | 0.5   | 0.4   |
| COBALT    | MG/KG | 4.8   | 4.4   |
| CHROMIUM  | MG/KG | 3.6   | 5.0   |
| COPPER    | MG/KG | 3.4   | 3.9   |
| MERCURY   | MG/KG | <0.02 | <0.02 |
| POTASSIUM | MG/KG | 738   | 1650  |
| NICKEL    | MG/KG | 5.5   | 7.6   |
| LEAD      | MG/KG | 8     | 8     |
| ANTIMONY  | MG/KG | <3    | <3    |
| SELENIUM  | MG/KG | <0.3  | <3    |
| VANADIUM  | MG/KG | 12.5  | 12.8  |
| ZINC      | MG/KG | 9.0   | 14.2  |



Analytical Technologies, Inc.

## METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
 PROJECT # : (NONE)  
 PROJECT NAME : PHASE II RFI

ATI I.D. : 105855

| PARAMETER | UNITS | ATI I.D. | SAMPLE<br>RESULT | DUP.<br>RESULT | RPD | SPIKED<br>SAMPLE | SPIKE<br>CONC | %<br>REC |
|-----------|-------|----------|------------------|----------------|-----|------------------|---------------|----------|
| ARSENIC   | MG/L  | 10583601 | 0.013            | 0.012          | 8   | 0.055            | 0.050         | 84       |
| ARSENIC   | MG/KG | 10581722 | <3               | <3             | NA  | 23               | 25            | 92       |
| ARSENIC   | MG/KG | 10585508 | <3               | <3             | NA  | 24               | 25            | 96       |
| ARSENIC   | MG/KG | 10585509 | <3               | <3             | NA  | 25               | 25            | 100      |
| ARSENIC   | MG/KG | 10594502 | 3.3              | 3.3            | 0   | 27.3             | 25.0          | 96       |
| BARIUM    | MG/L  | 10585516 | <0.010           | <0.010         | NA  | 0.104            | 0.100         | 104      |
| BARIUM    | MG/KG | 10585506 | 818              | 790            | 3   | 827              | 50.0          | 18*      |
| BARIUM    | MG/KG | 10585514 | 103              | 95.4           | 8   | 147              | 50.0          | 88       |
| BERYLLIUM | MG/L  | 10585516 | <0.005           | <0.005         | NA  | 0.092            | 0.100         | 92       |
| BERYLLIUM | MG/KG | 10585506 | 2.8              | 3.2            | 13  | 24.2             | 25.0          | 86       |
| BERYLLIUM | MG/KG | 10585514 | 2.7              | 3.1            | 14  | 25.0             | 25.0          | 89       |
| CADMIUM   | MG/L  | 10585516 | <0.005           | <0.005         | NA  | 0.098            | 0.100         | 98       |
| CADMIUM   | MG/KG | 10585506 | 0.4              | 0.4            | 0   | 22.1             | 25.0          | 87       |
| CADMIUM   | MG/KG | 10585514 | <0.3             | <0.3           | NA  | 22.8             | 25.0          | 91       |
| COBALT    | MG/L  | 10585516 | <0.010           | <0.010         | NA  | 0.101            | 0.100         | 101      |
| COBALT    | MG/KG | 10585506 | 4.9              | 4.5            | 8   | 47.7             | 50.0          | 86       |
| COBALT    | MG/KG | 10585514 | 3.9              | 4.0            | 2   | 50.6             | 50.0          | 93       |
| CHROMIUM  | MG/L  | 10585516 | <0.010           | <0.010         | NA  | 0.106            | 0.100         | 106      |
| CHROMIUM  | MG/KG | 10585506 | 4.5              | 4.5            | 0   | 48.5             | 50.0          | 88       |
| CHROMIUM  | MG/KG | 10585514 | 3.8              | 3.9            | 3   | 51.6             | 50.0          | 96       |
| COPPER    | MG/L  | 10583601 | <0.010           | <0.010         | NA  | 0.091            | 0.100         | 91       |
| COPPER    | MG/KG | 10585506 | 3.2              | 3.1            | 3   | 26.7             | 25.0          | 94       |
| COPPER    | MG/KG | 10585514 | 3.9              | 3.9            | 0   | 27.7             | 25.0          | 95       |
| MERCURY   | MG/L  | 10583601 | <0.0002          | <0.0002        | NA  | 0.0048           | 0.0050        | 96       |
| MERCURY   | MG/KG | 10683609 | <0.02            | <0.02          | NA  | 0.48             | 0.50          | 96       |
| MERCURY   | MG/KG | 10585506 | <0.02            | <0.02          | NA  | 0.50             | 0.50          | 100      |
| MERCURY   | MG/KG | 10585514 | <0.02            | <0.02          | NA  | 0.49             | 0.50          | 98       |
| POTASSIUM | MG/L  | 10583601 | 8.4              | 8.6            | 2   | 58.0             | 50.0          | 99       |
| POTASSIUM | MG/KG | 10585506 | 1820             | 1770           | 3   | 4460             | 2500          | 106      |
| POTASSIUM | MG/KG | 10585514 | 1030             | 1020           | 1   | 3630             | 2500          | 104      |
| NICKEL    | MG/L  | 10585516 | <0.020           | <0.020         | NA  | 0.095            | 0.100         | 95       |
| NICKEL    | MG/KG | 10585506 | 7.5              | 7.5            | 0   | 49.3             | 50.0          | 84       |
| NICKEL    | MG/KG | 10585514 | 6.3              | 6.3            | 0   | 51.9             | 50.0          | 91       |
| LEAD      | MG/L  | 10586501 | <0.002           | <0.002         | NA  | 0.049            | 0.050         | 98       |
| LEAD      | MG/KG | 10585506 | 8                | 8              | 0   | 50               | 50            | 84       |
| LEAD      | MG/KG | 10585514 | 6                | 5              | 18  | 52               | 50            | 92       |
| ANTIMONY  | MG/L  | 10585516 | <0.05            | <0.05          | NA  | 1.00             | 1.00          | 100      |
| ANTIMONY  | MG/KG | 10585506 | <3               | <3             | NA  | 20               | 50            | 40*      |
| ANTIMONY  | MG/KG | 10585514 | <3               | <3             | NA  | 19               | 50            | 38*      |
| SELENIUM  | MG/L  | 10583601 | <0.005           | <0.005         | NA  | MSA              | CC=           | .99      |
| SELENIUM  | MG/KG | 10581712 | <3               | <3             | NA  | MSA              | CC=           | .99      |
| SELENIUM  | MG/KG | 10581722 | <3               | <3             | NA  | MSA              | CC=           | .99      |
| SELENIUM  | MG/KG | 10585508 | <0.3             | <0.3           | NA  | MSA              | CC=           | .99      |
| SELENIUM  | MG/KG | 10585509 | <0.3             | <0.3           | NA  | MSA              | CC=           | .99      |
| VANADIUM  | MG/L  | 10585516 | <0.010           | <0.010         | NA  | 0.104            | 0.100         | 104      |

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Analytical Technologies, Inc.

## METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

ATI I.D. : 105855

| PARAMETER | UNITS | ATI I.D. | SAMPLE<br>RESULT | DUP.<br>RESULT | RPD | SPIKED<br>SAMPLE | SPIKE<br>CONC | %<br>REC |
|-----------|-------|----------|------------------|----------------|-----|------------------|---------------|----------|
| VANADIUM  | MG/KG | 10585506 | 11.8             | 10.0           | 17  | 55.0             | 50.0          | 86       |
| VANADIUM  | MG/KG | 10585514 | 10.8             | 11.2           | 4   | 59.7             | 50.0          | 98       |
| ZINC      | MG/L  | 10585516 | <0.010           | <0.010         | NA  | 0.119            | 0.100         | 119      |
| ZINC      | MG/KG | 10585506 | 16.4             | 19.9           | 19  | 34.5             | 25.0          | 72*      |
| ZINC      | MG/KG | 10585514 | 13.0             | 14.5           | 11  | 35.8             | 25.0          | 91       |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$

\* Result out of limits due to sample matrix interference



## GCMS - RESULTS

ATI I.D. : 10585516

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 E 9.0  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : N/A  
DATE ANALYZED : 05/28/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                             |      |
|-----------------------------|------|
| CHLOROMETHANE               | <5   |
| VINYL CHLORIDE              | <0.5 |
| CHLOROETHANE                | <0.5 |
| METHYLENE CHLORIDE          | <3   |
| ACETONE                     | 33   |
| CARBON DISULFIDE            | <5   |
| 1,1-DICHLOROETHENE          | <5   |
| 1,1-DICHLOROETHANE          | <5   |
| 1,2-DICHLOROETHENE (TOTAL)  | <5   |
| CHLOROFORM                  | <5   |
| 1,2-DICHLOROETHANE          | <5   |
| 2-BUTANONE (MEK)            | <5   |
| 1,1,1-TRICHLOROETHANE       | <5   |
| CARBON TETRACHLORIDE        | <5   |
| VINYL ACETATE               | <5   |
| BROMODICHLOROMETHANE        | <5   |
| 1,1,2,2-TETRACHLOROETHANE   | <5   |
| 1,2-DICHLOROPROPANE         | <5   |
| TRANS-1,3-DICHLOROPROPENE   | <5   |
| TRICHLOROETHENE             | <5   |
| DIBROMOCHLOROMETHANE        | <5   |
| 1,1,2-TRICHLOROETHANE       | <5   |
| BENZENE                     | <5   |
| CIS-1,3-DICHLOROPROPENE     | <5   |
| BROMOFORM                   | <3   |
| 2-HEXANONE (MBK)            | <5   |
| 4-METHYL-2-PENTANONE (MIBK) | <5   |
| TETRACHLOROETHENE           | <5   |
| TOLUENE                     | 1 J  |
| CHLOROBENZENE               | <5   |
| ETHYLBENZENE                | <5   |
| STYRENE                     | <5   |
| TOTAL XYLENES               | <5   |
| ACROLEIN                    | <10  |
| ACRYLONITRILE               | <5   |
| DIBROMOMETHANE              | <5   |
| DICHLORODIFLUOROMETHANE     | <5   |
| METHYL IODIDE               | <2.5 |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5 |
| TRICHLOROMONOFUOROMETHANE   | <5   |
| 1,2,3-TRICHLOROPROPANE      | <5   |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <2.5    |
| ETHANOL                  | <100    |
| BROMOMETHANE             | <10     |
| 2-CHLOROETHYL VINYLETHER | <5      |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |    |
|---------------------------|----|
| 1,2-DICHLOROETHANE-D4 (%) | 99 |
| BFB (%)                   | 94 |
| TOLUENE-D8 (%)            | 95 |



## GCMS - RESULTS

ATI I.D. : 10585519

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : TRIP BLANK  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : N/A  
DATE ANALYZED : 05/28/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <5      |
| VINYL CHLORIDE              | <0.5    |
| CHLOROETHANE                | <0.5    |
| METHYLENE CHLORIDE          | <3      |
| ACETONE                     | <10     |
| CARBON DISULFIDE            | <5      |
| 1,1-DICHLOROETHENE          | <5      |
| 1,1-DICHLOROETHANE          | <5      |
| 1,2-DICHLOROETHENE (TOTAL)  | <5      |
| CHLOROFORM                  | <5      |
| 1,2-DICHLOROETHANE          | <5      |
| 2-BUTANONE (MEK)            | <5      |
| 1,1,1-TRICHLOROETHANE       | <5      |
| CARBON TETRACHLORIDE        | <5      |
| VINYL ACETATE               | <5      |
| BROMODICHLOROMETHANE        | <5      |
| 1,1,2,2-TETRACHLOROETHANE   | <5      |
| 1,2-DICHLOROPROPANE         | <5      |
| TRANS-1,3-DICHLOROPROPENE   | <5      |
| TRICHLOROETHENE             | <5      |
| DIBROMOCHLOROMETHANE        | <5      |
| 1,1,2-TRICHLOROETHANE       | <5      |
| BENZENE                     | <5      |
| CIS-1,3-DICHLOROPROPENE     | <5      |
| BROMOFORM                   | <3      |
| 2-HEXANONE (MBK)            | <5      |
| 4-METHYL-2-PENTANONE (MIBK) | <5      |
| TETRACHLOROETHENE           | <5      |
| TOLUENE                     | <5      |
| CHLOROBENZENE               | <5      |
| ETHYLBENZENE                | <5      |
| STYRENE                     | <5      |
| TOTAL XYLENES               | <5      |
| ACROLEIN                    | <10     |
| ACRYLONITRILE               | <5      |
| DIBROMOMETHANE              | <5      |
| DICHLORODIFLUOROMETHANE     | <5      |
| METHYL IODIDE               | <2.5    |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5    |
| TRICHLOROMONOFUOROMETHANE   | <5      |
| 1,2,3-TRICHLOROPROPANE      | <5      |

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## GCMS - RESULTS

ATI I.D. : 10585519

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <2.5    |
| ETHANOL                  | <100    |
| BROMOMETHANE             | <10     |
| 2-CHLOROETHYL VINYLETHER | <5      |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |    |
|---------------------------|----|
| 1,2-DICHLOROETHANE-D4 (%) | 98 |
| BFB (%)                   | 93 |
| TOLUENE-D8 (%)            | 95 |



## GCMS - RESULTS

ATI I.D. : 10585520

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : TRIP BLANK  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : N/A  
DATE ANALYZED : 05/28/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <5      |
| VINYL CHLORIDE              | <0.5    |
| CHLOROETHANE                | <0.5    |
| METHYLENE CHLORIDE          | <3      |
| ACETONE                     | <10     |
| CARBON DISULFIDE            | <5      |
| 1,1-DICHLOROETHENE          | <5      |
| 1,1-DICHLOROETHANE          | <5      |
| 1,2-DICHLOROETHENE (TOTAL)  | <5      |
| CHLOROFORM                  | <5      |
| 1,2-DICHLOROETHANE          | <5      |
| 2-BUTANONE (MEK)            | <5      |
| 1,1,1-TRICHLOROETHANE       | <5      |
| CARBON TETRACHLORIDE        | <5      |
| VINYL ACETATE               | <5      |
| BROMODICHLOROMETHANE        | <5      |
| 1,1,2,2-TETRACHLOROETHANE   | <5      |
| 1,2-DICHLOROPROPANE         | <5      |
| TRANS-1,3-DICHLOROPROPENE   | <5      |
| TRICHLOROETHENE             | <5      |
| DIBROMOCHLOROMETHANE        | <5      |
| 1,1,2-TRICHLOROETHANE       | <5      |
| BENZENE                     | <5      |
| CIS-1,3-DICHLOROPROPENE     | <5      |
| BROMOFORM                   | <3      |
| 2-HEXANONE (MBK)            | <5      |
| 4-METHYL-2-PENTANONE (MIBK) | <5      |
| TETRACHLOROETHENE           | <5      |
| TOLUENE                     | <5      |
| CHLOROBENZENE               | <5      |
| ETHYLBENZENE                | <5      |
| STYRENE                     | <5      |
| TOTAL XYLENES               | <5      |
| ACROLEIN                    | <10     |
| ACRYLONITRILE               | <5      |
| DIBROMOMETHANE              | <5      |
| DICHLORODIFLUOROMETHANE     | <5      |
| METHYL IODIDE               | <2.5    |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5    |
| TRICHLOROMONOFUOROMETHANE   | <5      |
| 1,2,3-TRICHLOROPROPANE      | <5      |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <2.5    |
| ETHANOL                 | <100    |
| BROMOMETHANE            | <10     |
| 2-CHLOROETHYLVINYLETHER | <5      |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 100 |
| BFB (%)                   | 94  |
| TOLUENE-D8 (%)            | 94  |



## GCMS - RESULTS

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105855  
DATE EXTRACTED : 05/28/91  
DATE ANALYZED : 05/28/91  
UNITS : UG/L  
DILUTION FACTOR : N/A

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                             |      |
|-----------------------------|------|
| CHLOROMETHANE               | <5   |
| VINYL CHLORIDE              | <0.5 |
| CHLOROETHANE                | <0.5 |
| METHYLENE CHLORIDE          | <3   |
| ACETONE                     | <10  |
| CARBON DISULFIDE            | <5   |
| 1,1-DICHLOROETHENE          | <5   |
| 1,1-DICHLOROETHANE          | <5   |
| 1,2-DICHLOROETHENE (TOTAL)  | <5   |
| CHLOROFORM                  | <5   |
| 1,2-DICHLOROETHANE          | <5   |
| 2-BUTANONE (MEK)            | <5   |
| 1,1,1-TRICHLOROETHANE       | <5   |
| CARBON TETRACHLORIDE        | <5   |
| VINYL ACETATE               | <5   |
| BROMODICHLOROMETHANE        | <5   |
| 1,1,2,2-TETRACHLOROETHANE   | <5   |
| 1,2-DICHLOROPROPANE         | <5   |
| TRANS-1,3-DICHLOROPROPENE   | <5   |
| TRICHLOROETHENE             | <5   |
| DIBROMOCHLOROMETHANE        | <5   |
| 1,1,2-TRICHLOROETHANE       | <5   |
| BENZENE                     | <5   |
| CIS-1,3-DICHLOROPROPENE     | <5   |
| BROMOFORM                   | <3   |
| 2-HEXANONE (MBK)            | <5   |
| 4-METHYL-2-PENTANONE (MIBK) | <5   |
| TETRACHLOROETHENE           | <5   |
| TOLUENE                     | <5   |
| CHLOROBENZENE               | <5   |
| ETHYLBENZENE                | <5   |
| STYRENE                     | <5   |
| TOTAL XYLENES               | <5   |
| ACROLEIN                    | <10  |
| ACRYLONITRILE               | <5   |
| DIBROMOMETHANE              | <5   |
| DICHLORODIFLUOROMETHANE     | <5   |
| METHYL IODIDE               | <2.5 |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5 |
| TRICHLOROMONOFUOROMETHANE   | <5   |
| 1,2,3-TRICHLOROPROPANE      | <5   |
| ETHYL METHACRYLATE          | <2.5 |
| ETHANOL                     | <100 |

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Analytical Technologies, Inc.

# GCMS - RESULTS

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ATI I.D. : 105855

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| BROMOMETHANE            | <10  |
| 2-CHLOROETHYLVINYLETHER | <5   |
| 1,4-DICHLORO-2-BUTANE   | <0.5 |

## SURROGATE PERCENT RECOVERIES

|                           |    |
|---------------------------|----|
| 1,2-DICHLOROETHANE-D4 (%) | 93 |
| BFB (%)                   | 90 |
| TOLUENE-D8 (%)            | 92 |



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105855

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699914

DATE ANALYZED : 05/28/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED | % SPIKED | DUP.   |      | RPD |
|--------------------|--------------|--------|--------|----------|--------|------|-----|
|                    | RESULT       | SPIKED |        |          | SAMPLE | REC. |     |
| 1,1-DICHLOROETHENE | <5           | 50     | 41     | 82       | 43     | 86   | 5   |
| TRICHLOROETHENE    | <5           | 50     | 47     | 94       | 48     | 96   | 2   |
| CHLOROBENZENE      | <5           | 50     | 45     | 90       | 46     | 92   | 2   |
| TOLUENE            | <5           | 50     | 44     | 88       | 44     | 88   | 0   |
| BENZENE            | <5           | 50     | 41     | 82       | 42     | 84   | 2   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10585516

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 E 9.0  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/28/91  
DATE ANALYZED : 06/06/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                             |     |
|-----------------------------|-----|
| N-NITROSODIMETHYLAMINE      | <5  |
| PHENOL                      | <5  |
| ANILINE                     | <5  |
| BIS(2-CHLOROETHYL)ETHER     | <5  |
| 2-CHLOROPHENOL              | <5  |
| 1,3-DICHLOROBENZENE         | <5  |
| 1,4-DICHLOROBENZENE         | <5  |
| BENZYL ALCOHOL              | <5  |
| 1,2-DICHLOROBENZENE         | <5  |
| 2-METHYLPHENOL              | <5  |
| BIS(2-CHLOROISOPROPYL)ETHER | <5  |
| 4-METHYLPHENOL              | <5  |
| N-NITROSO-DI-N-PROPYLAMINE  | <5  |
| HEXACHLOROETHANE            | <5  |
| NITROBENZENE                | <5  |
| ISOPHORENE                  | <5  |
| 2-NITROPHENOL               | <5  |
| 2,4-DIMETHYLPHENOL          | <5  |
| BENZOIC ACID                | <25 |
| BIS(2-CHLOROETHOXY)METHANE  | <5  |
| 2,4-DICHLOROPHENOL          | <5  |
| 1,2,4-TRICHLOROBENZENE      | <5  |
| NAPHTHALENE                 | <5  |
| 4-CHLOROANILINE             | <5  |
| HEXACHLOROBUTADIENE         | <5  |
| 4-CHLORO-3-METHYLPHENOL     | <5  |
| 2-METHYLNAPHTHALENE         | <5  |
| HEXACHLOROCYCLOPENTADIENE   | <5  |
| 2,4,6-TRICHLOROPHENOL       | <5  |
| 2,4,5-TRICHLOROPHENOL       | <25 |
| 2-NITROANILINE              | <25 |
| DIMETHYLPHTHALATE           | <5  |
| ACENAPHTHYLENE              | <5  |
| 3-NITROANILINE              | <25 |
| ACENAPHTHENE                | <5  |
| 2,4-DINITROPHENOL           | <25 |
| 4-NITROPHENOL               | <25 |
| 2,4-DINITROTOLUENE          | <5  |
| 2,6-DINITROTOLUENE          | <5  |
| DIETHYLPHTHALATE            | <5  |
| 4-CHLOROPHENYL-PHENYLETHER  | <5  |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <5      |
| 4-NITROANILINE             | <25     |
| 4,6-DINITRO-2-METHYLPHENOL | <25     |
| N-NITROSODIPHENYLAMINE     | <5      |
| 4-BROMOPHENYL-PHENYLETHER  | <5      |
| HEXACHLOROBENZENE          | <5      |
| PENTACHLOROPHENOL          | <25     |
| PHENANTHRENE               | <5      |
| ANTHRACENE                 | <5      |
| DI-N-BUTYLPHTHALATE        | <5      |
| FLUORANTHENE               | <5      |
| BENZIDINE                  | <50     |
| PYRENE                     | <5      |
| BUTYLBENZYLPHTHALATE       | <5      |
| 3,3'-DICHLOROBENZIDINE     | <10     |
| BENZO(a)ANTHRACENE         | <5      |
| BIS(2-ETHYLHEXYL)PHTHALATE | <5      |
| CHRYSENE                   | <5      |
| BENZO(b)FLUORANTHENE       | <5      |
| BENZO(k)FLUORANTHENE       | <5      |
| BENZO(a)PYRENE             | <5      |
| INDENO(1,2,3-cd)PYRENE     | <5      |
| DIBENZO(a,h)ANTHRACENE     | <5      |
| BENZO(g,h,i)PERYLENE       | <5      |
| 1-CHLORONAPHTHANE          | <5      |
| 2-CHLORONAPHTHANE          | <5      |
| DIBENZO(A,J)ACRIDINE       | <5      |
| DI-N-OCTYLPHTHALATE        | <5      |
| 1,2-DIPHENYLHYDRAZINE      | <5      |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 96 |
| 2-FLUOROBIPHENYL (%)     | 93 |
| TERPHENYL (%)            | 98 |
| PHENOL-D6 (%)            | 84 |
| 2-FLUOROPHENOL (%)       | 85 |
| 2,4,6-TRIBROMOPHENOL (%) | 90 |



## GCMS - RESULTS

ATI I.D. : 10585516

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 E 9.0  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/28/91  
DATE ANALYZED : 06/06/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                                 |     |
|---------------------------------|-----|
| ACETOPHENONE                    | <5  |
| a,a-DIMETHYLPHENETHYLAMINE      | <5  |
| 4-AMINOBIIPHENYL                | <5  |
| 2,6-DICHLOROPHENOL              | <5  |
| p-(DIMETHYLAMINO)AZOBENZENE     | <5  |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <5  |
| DIPHENYLAMINE                   | <5  |
| ETHYL METHANESULFONATE          | <5  |
| 3-METHYLCHOLANTHRENE            | <5  |
| METHYL METHANESULFONATE         | <5  |
| 3-METHYLPHENOL (m-CRESOL)       | <5  |
| 1-NAPHTHYLAMINE                 | <5  |
| 2-NAPHTHYLAMINE                 | <5  |
| N-NITROSO-DI-BUTYLAMINE         | <5  |
| N-NITROSOPIPERIDINE             | <5  |
| PENTACHLOROBENZENE              | <5  |
| PENTACHLORONITROBENZENE         | <25 |
| PHENACETIN                      | <5  |
| 2-PICOLINE                      | <5  |
| PRONAMIDE                       | <5  |
| 1,2,4,5-TETRACHLOROBENZENE      | <5  |
| 2,3,4,6-TETRACHLOROPHENOL       | <25 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105855   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/28/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/06/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <5      |
| PHENOL                       | <5      |
| ANILINE                      | <5      |
| BIS(2-CHLOROETHYL) ETHER     | <5      |
| 2-CHLOROPHENOL               | <5      |
| 1,3-DICHLOROBENZENE          | <5      |
| 1,4-DICHLOROBENZENE          | <5      |
| BENZYL ALCOHOL               | <5      |
| 1,2-DICHLOROBENZENE          | <5      |
| 2-METHYLPHENOL               | <5      |
| BIS(2-CHLOROISOPROPYL) ETHER | <5      |
| 4-METHYLPHENOL               | <5      |
| N-NITROSO-DI-N-PROPYLAMINE   | <5      |
| HEXACHLOROETHANE             | <5      |
| NITROBENZENE                 | <5      |
| ISOPHORENE                   | <5      |
| 2-NITROPHENOL                | <5      |
| 2,4-DIMETHYLPHENOL           | <5      |
| BENZOIC ACID                 | <25     |
| BIS(2-CHLOROETHOXY) METHANE  | <5      |
| 2,4-DICHLOROPHENOL           | <5      |
| 1,2,4-TRICHLOROBENZENE       | <5      |
| NAPHTHALENE                  | <5      |
| 4-CHLOROANILINE              | <5      |
| HEXACHLOROBUTADIENE          | <5      |
| 4-CHLORO-3-METHYLPHENOL      | <5      |
| 2-METHYLNAPHTHALENE          | <5      |
| HEXACHLOROCYCLOPENTADIENE    | <5      |
| 2,4,6-TRICHLOROPHENOL        | <5      |
| 2,4,5-TRICHLOROPHENOL        | <25     |
| 2-NITROANILINE               | <25     |
| DIMETHYLPHTHALATE            | <5      |
| ACENAPHTHYLENE               | <5      |
| 3-NITROANINLINE              | <25     |
| ACENAPHTHENE                 | <5      |
| 2,4-DINITROPHENOL            | <25     |
| 4-NITROPHENOL                | <25     |
| 2,4-DINITROTOLUENE           | <5      |
| 2,6-DINITROTOLUENE           | <5      |
| DIETHYLPHTHALATE             | <5      |
| 4-CHLOROPHENYL-PHENYLETHER   | <5      |
| FLUORENE                     | <5      |
| 4-NITROANILINE               | <25     |

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## GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| 4,6-DINITRO-2-METHYLPHENOL | <25     |
| N-NITROSODIPHENYLAMINE     | <5      |
| 4-BROMOPHENYL-PHENYLETHER  | <5      |
| HEXACHLOROBENZENE          | <5      |
| PENTACHLOROPHENOL          | <25     |
| PHENANTHRENE               | <5      |
| ANTHRACENE                 | <5      |
| DI-N-BUTYLPHTHALATE        | <5      |
| FLUORANTHENE               | <5      |
| BENZIDINE                  | <50     |
| PYRENE                     | <5      |
| BUTYLBENZYLPHTHALATE       | <5      |
| 3,3'-DICHLOROBENZIDINE     | <10     |
| BENZO(a)ANTHRACENE         | <5      |
| BIS(2-ETHYLHEXYL)PHTHALATE | <5      |
| CHRYSENE                   | <5      |
| BENZO(b)FLUORANTHENE       | <5      |
| BENZO(k)FLUORANTHENE       | <5      |
| BENZO(a)PYRENE             | <5      |
| INDENO(1,2,3-cd)PYRENE     | <5      |
| DIBENZO(a,h)ANTHRACENE     | <5      |
| BENZO(g,h,i)PERYLENE       | <5      |
| 1-CHLORONAPHTHANE          | <5      |
| 2-CHLORONAPHTHANE          | <5      |
| DIBENZO(A,J)ACRIDINE       | <5      |
| DI-N-OCTYLPHTHALATE        | <5      |
| 1,2-DIPHENYLHYDRAZINE      | <5      |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 60 |
| 2-FLUOROBIPHENYL (%)     | 56 |
| TERPHENYL (%)            | 54 |
| PHENOL-D6 (%)            | 46 |
| 2-FLUOROPHENOL (%)       | 49 |
| 2,4,6-TRIBROMOPHENOL (%) | 45 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105855   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/28/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/06/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : N/A      |

## COMPOUNDS

## RESULTS

|                                 |     |
|---------------------------------|-----|
| ACETOPHENONE                    | <5  |
| a,a-DIMETHYLPHENETHYLAMINE      | <5  |
| 4-AMINOBIIPHENYL                | <5  |
| 2,6-DICHLOROPHENOL              | <5  |
| p-(DIMETHYLAMINO)AZOBENZENE     | <5  |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <5  |
| DIPHENYLAMINE                   | <5  |
| ETHYL METHANESULFONATE          | <5  |
| 3-METHYLCHOLANTHRENE            | <5  |
| METHYL METHANESULFONATE         | <5  |
| 3-METHYLPHENOL (m-CRESOL)       | <5  |
| 1-NAPHTHYLAMINE                 | <5  |
| 2-NAPHTHYLAMINE                 | <5  |
| N-NITROSO-DI-BUTYLAMINE         | <5  |
| N-NITROSOPIPERIDINE             | <5  |
| PENTACHLOROBENZENE              | <5  |
| PENTACHLORONITROBENZENE         | <25 |
| PHENACETIN                      | <5  |
| 2-PICOLINE                      | <5  |
| PRONAMIDE                       | <5  |
| 1,2,4,5-TETRACHLOROBENZENE      | <5  |
| 2,3,4,6-TETRACHLOROPHENOL       | <25 |



Analytical Technologies, Inc.

# QUALITY CONTROL DATA

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699907

DATE ANALYZED : 06/07/91

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP. SPIKED |        | RPD |
|-----------------------------|--------------|--------|------------------|-----------|-------------|--------|-----|
|                             | RESULT       | SPIKED |                  |           | SAMPLE      | % REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <5           | 50     | 30               | 60        | 31          | 62     | 3   |
| ACENAPHTHENE                | <5           | 50     | 30               | 60        | 29          | 58     | 3   |
| 2,4-DINITROTOLUENE          | <5           | 50     | 29               | 58        | 28          | 56     | 4   |
| PYRENE                      | <5           | 50     | 26               | 52        | 25          | 50     | 4   |
| N-NITROSO-DI-N-PROPYL AMINE | <5           | 50     | 36               | 72        | 33          | 66     | 9   |
| 1,4-DICHLOROBENZENE         | <5           | 50     | 29               | 58        | 27          | 54     | 7   |
| PENTACHLOROPHENOL           | <25          | 100    | 92               | 92        | 92          | 92     | 0   |
| PHENOL                      | <5           | 100    | 57               | 57        | 58          | 58     | 2   |
| 2-CHLOROPHENOL              | <5           | 100    | 58               | 58        | 60          | 60     | 3   |
| 4-CHLORO-3-METHYLPHENOL     | <5           | 100    | 62               | 62        | 65          | 55     | 5   |
| 4-NITROPHENOL               | <25          | 100    | 74               | 74        | 72          | 72     | 3   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10585501

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10585501

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 93  |
| BFB (%)                   | 102 |
| TOLUENE-D8 (%)            | 98  |



## GCMS - RESULTS

ATI I.D. : 10585502

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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## GCMS - RESULTS

ATI I.D. : 10585502

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 97  |
| BFB (%)                   | 104 |
| TOLUENE-D8 (%)            | 99  |



## GCMS - RESULTS

ATI I.D. : 10585503

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 95  |
| BFB (%)                   | 104 |
| TOLUENE-D8 (%)            | 99  |



## GCMS - RESULTS

ATI I.D. : 10585504

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 92  |
| BFB (%)                   | 104 |
| TOLUENE-D8 (%)            | 98  |



## GCMS - RESULTS

ATI I.D. : 10585505

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX.

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 91  |
| BFB (%)                   | 101 |
| TOLUENE-D8 (%)            | 98  |



## GCMS - RESULTS

ATI I.D. : 10585506

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

(CONTINUED NEXT PAGE)



TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 99  |
| BFB (%)                   | 101 |
| TOLUENE-D8 (%)            | 102 |



## GCMS - RESULTS

ATI I.D. : 10585507

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 101 |
| BFB (%)                   | 111 |
| TOLUENE-D8 (%)            | 106 |



## GCMS - RESULTS

ATI I.D. : 10585508

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 100 |
| BFB (%)                   | 105 |
| TOLUENE-D8 (%)            | 103 |



## GCMS - RESULTS

ATI I.D. : 10585509

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/30/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10585515

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 102 |
| BFB (%)                   | 104 |
| TOLUENE-D8 (%)            | 100 |



## GCMS - RESULTS

ATI I.D. : 10585517

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/31/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 104 |
| BFB (%)                   | 100 |
| TOLUENE-D8 (%)            | 97  |



## GCMS - RESULTS

ATI I.D. : 10585518

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 05/31/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                             |       |
|-----------------------------|-------|
| CHLOROMETHANE               | <0.50 |
| VINYL CHLORIDE              | <0.05 |
| CHLOROETHANE                | <0.05 |
| METHYLENE CHLORIDE          | <0.3  |
| ACETONE                     | <1.0  |
| CARBON DISULFIDE            | <0.5  |
| 1,1-DICHLOROETHENE          | <0.5  |
| 1,1-DICHLOROETHANE          | <0.5  |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5  |
| CHLOROFORM                  | <0.5  |
| 1,2-DICHLOROETHANE          | <0.5  |
| 2-BUTANONE (MEK)            | <0.50 |
| 1,1,1-TRICHLOROETHANE       | <0.5  |
| CARBON TETRACHLORIDE        | <0.5  |
| VINYL ACETATE               | <0.50 |
| BROMODICHLOROMETHANE        | <0.5  |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5  |
| 1,2-DICHLOROPROPANE         | <0.5  |
| TRANS-1,3-DICHLOROPROPENE   | <0.5  |
| TRICHLOROETHENE             | <0.5  |
| DIBROMOCHLOROMETHANE        | <0.5  |
| 1,1,2-TRICHLOROETHANE       | <0.5  |
| BENZENE                     | <0.5  |
| CIS-1,3-DICHLOROPROPENE     | <0.5  |
| BROMOFORM                   | <0.3  |
| 2-HEXANONE (MBK)            | <0.50 |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5  |
| TETRACHLOROETHENE           | <0.5  |
| TOLUENE                     | <0.5  |
| CHLOROBENZENE               | <0.5  |
| ETHYLBENZENE                | <0.5  |
| STYRENE                     | <0.5  |
| TOTAL XYLENES               | <0.5  |
| ACROLEIN                    | <1    |
| ACRYLONITRILE               | <0.50 |
| DIBROMOMETHANE              | <0.5  |
| DICHLORODIFLUOROMETHANE     | <0.5  |
| METHYL IODIDE               | <0.25 |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25 |
| TRICHLOROMONOFUOROMETHANE   | <0.5  |
| 1,2,3-TRICHLOROPROPANE      | <0.5  |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10585518

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 102 |
| BFB (%)                   | 103 |
| TOLUENE-D8 (%)            | 98  |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105855   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/30/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 05/30/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : MG/KG    |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |
| ETHYL METHACRYLATE          | <0.25   |
| ETHANOL                     | <10     |

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## GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105855

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 98  |
| BFB (%)                   | 109 |
| TOLUENE-D8 (%)            | 103 |



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QUALITY CONTROL DATA

ATI I.D. : 105855

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10699919

DATE ANALYZED : 05/30/91

SAMPLE MATRIX : NON-AQUEOUS

UNITS : MG/KG

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED | % SPIKED | DUP.   |      | RPD |
|--------------------|--------------|--------|--------|----------|--------|------|-----|
|                    | RESULT       | SPIKED |        |          | SAMPLE | REC. |     |
| 1,1-DICHLOROETHENE | <0.5         | 2.5    | 2.1    | 84       | 2.1    | 84   | 0   |
| TRICHLOROETHENE    | <0.5         | 2.5    | 2.2    | 88       | 2.3    | 92   | 4   |
| CHLOROBENZENE      | <0.5         | 2.5    | 2.3    | 92       | 2.4    | 96   | 4   |
| TOLUENE            | <0.5         | 2.5    | 2.3    | 92       | 2.5    | 100  | 8   |
| BENZENE            | <0.5         | 2.5    | 1.9    | 76       | 2.2    | 88   | 15  |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10585501

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

(CONTINUED NEXT PAGE)



## GCMS - RESULTS

ATI I.D. : 10585501

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 62 |
| 2-FLUOROBIPHENYL (%)     | 64 |
| TERPHENYL (%)            | 55 |
| PHENOL-D6 (%)            | 50 |
| 2-FLUOROPHENOL (%)       | 47 |
| 2,4,6-TRIBROMOPHENOL (%) | 50 |



## GCMS - RESULTS

ATI I.D. : 10585501

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/20/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/22/91 |
| PROJECT NAME  | : PHASE II RFI       | DATE EXTRACTED  | : 05/24/91 |
| CLIENT I.D.   | : RFI 0101 V 4.0     | DATE ANALYZED   | : 06/05/91 |
| SAMPLE MATRIX | : SOIL               | UNITS           | : MG/KG    |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585502

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLORO BENZENE         | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLORO BENZIDINE    | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 61 |
| 2-FLUOROBIPHENYL (%)     | 61 |
| TERPHENYL (%)            | 49 |
| PHENOL-D6 (%)            | 56 |
| 2-FLUOROPHENOL (%)       | 56 |
| 2,4,6-TRIBROMOPHENOL (%) | 49 |



## GCMS - RESULTS

ATI I.D. : 10585502

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585503

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

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## GCMS - RESULTS

ATI I.D. : 10585503

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 60 |
| 2-FLUOROBIPHENYL (%)     | 63 |
| TERPHENYL (%)            | 54 |
| PHENOL-D6 (%)            | 57 |
| 2-FLUOROPHENOL (%)       | 54 |
| 2,4,6-TRIBROMOPHENOL (%) | 53 |



## GCMS - RESULTS

ATI I.D. : 10585503

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

ATI I.D. : 10585504

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0101 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |



## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOOROBENZIDINE    | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 98 |
| 2-FLUOROBIPHENYL (%)     | 88 |
| TERPHENYL (%)            | 74 |
| PHENOL-D6 (%)            | 90 |
| 2-FLUOROPHENOL (%)       | 89 |
| 2,4,6-TRIBROMOPHENOL (%) | 70 |



## GCMS - RESULTS

ATI I.D. : 10585504

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/20/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/22/91 |
| PROJECT NAME  | : PHASE II RFI       | DATE EXTRACTED  | : 05/24/91 |
| CLIENT I.D.   | : RFI 0101 V 14.0    | DATE ANALYZED   | : 06/05/91 |
| SAMPLE MATRIX | : SOIL               | UNITS           | : MG/KG    |
|               |                      | DILUTION FACTOR | : 1.       |

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLORO BENZENE             | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLORO BENZENE     | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585505

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

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COMPOUNDS RESULTS

---

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

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## GCMS - RESULTS

ATI I.D. : 10585505

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 109 |
| 2-FLUOROBIPHENYL (%)     | 102 |
| TERPHENYL (%)            | 86  |
| PHENOL-D6 (%)            | 96  |
| 2-FLUOROPHENOL (%)       | 91  |
| 2,4,6-TRIBROMOPHENOL (%) | 84  |



## GCMS - RESULTS

ATI I.D. : 10585505

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

ATI I.D. : 10585506

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

(CONTINUED NEXT PAGE)



TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOOROBENZIDINE    | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 117 |
| 2-FLUOROBIPHENYL (%)     | 109 |
| TERPHENYL (%)            | 89  |
| PHENOL-D6 (%)            | 106 |
| 2-FLUOROPHENOL (%)       | 105 |
| 2,4,6-TRIBROMOPHENOL (%) | 93  |

## GCMS - RESULTS

ATI I.D. : 10585506

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585507

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| N-NITROSODIMETHYLAMINE      | <0.17   |
| PHENOL                      | <0.17   |
| ANILINE                     | <0.17   |
| BIS(2-CHLOROETHYL)ETHER     | <0.17   |
| 2-CHLOROPHENOL              | <0.17   |
| 1,3-DICHLOROBENZENE         | <0.17   |
| 1,4-DICHLOROBENZENE         | <0.17   |
| BENZYL ALCOHOL              | <0.17   |
| 1,2-DICHLOROBENZENE         | <0.17   |
| 2-METHYLPHENOL              | <0.17   |
| BIS(2-CHLOROISOPROPYL)ETHER | <0.17   |
| 4-METHYLPHENOL              | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE  | <0.17   |
| HEXACHLOROETHANE            | <0.17   |
| NITROBENZENE                | <0.17   |
| ISOPHORENE                  | <0.17   |
| 2-NITROPHENOL               | <0.17   |
| 2,4-DIMETHYLPHENOL          | <0.17   |
| BENZOIC ACID                | <0.85   |
| BIS(2-CHLOROETHOXY)METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL          | <0.17   |
| 1,2,4-TRICHLOROBENZENE      | <0.17   |
| NAPHTHALENE                 | <0.17   |
| 4-CHLOROANILINE             | <0.17   |
| HEXACHLOROBUTADIENE         | <0.17   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17   |
| 2-METHYLNAPHTHALENE         | <0.17   |
| HEXACHLOROCYCLOPENTADIENE   | <0.17   |
| 2,4,6-TRICHLOROPHENOL       | <0.17   |
| 2,4,5-TRICHLOROPHENOL       | <0.85   |
| 2-NITROANILINE              | <0.85   |
| DIMETHYLPHTHALATE           | <0.17   |
| ACENAPHTHYLENE              | <0.17   |
| 3-NITROANINLINE             | <0.85   |
| ACENAPHTHENE                | <0.17   |
| 2,4-DINITROPHENOL           | <0.85   |
| 4-NITROPHENOL               | <0.85   |
| 2,4-DINITROTOLUENE          | <0.17   |
| 2,6-DINITROTOLUENE          | <0.17   |
| DIETHYLPHTHALATE            | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER  | <0.17   |

(CONTINUED NEXT PAGE)



TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOOROBENZIDINE    | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 112 |
| 2-FLUOROBIPHENYL (%)     | 102 |
| TERPHENYL (%)            | 85  |
| PHENOL-D6 (%)            | 100 |
| 2-FLUOROPHENOL (%)       | 95  |
| 2,4,6-TRIBROMOPHENOL (%) | 89  |



## GCMS - RESULTS

ATI I.D. : 10585507

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585508

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

(CONTINUED NEXT PAGE)



## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE.              | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 102 |
| 2-FLUOROBIPHENYL (%)     | 95  |
| TERPHENYL (%)            | 80  |
| PHENOL-D6 (%)            | 93  |
| 2-FLUOROPHENOL (%)       | 90  |
| 2,4,6-TRIBROMOPHENOL (%) | 81  |



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10585508

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0102 A 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |

## GCMS - RESULTS

ATI I.D. : 10585509

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANILINE               | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

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## GCMS - RESULTS

ATI I.D. : 10585509

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 105 |
| 2-FLUOROBIPHENYL (%)     | 101 |
| TERPHENYL (%)            | 82  |
| PHENOL-D6 (%)            | 85  |
| 2-FLUOROPHENOL (%)       | 75  |
| 2,4,6-TRIBROMOPHENOL (%) | 74  |



## GCMS - RESULTS

ATI I.D. : 10585509

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585510

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

(CONTINUED NEXT PAGE)



## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 110 |
| 2-FLUOROBIPHENYL (%)     | 107 |
| TERPHENYL (%)            | 87  |
| PHENOL-D6 (%)            | 102 |
| 2-FLUOROPHENOL (%)       | 97  |
| 2,4,6-TRIBROMOPHENOL (%) | 92  |



## GCMS - RESULTS

ATI I.D. : 10585510

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585511

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY)METHANE   | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

(CONTINUED NEXT PAGE)



## GCMS - RESULTS

ATI I.D. : 10585511

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 107 |
| 2-FLUOROBIPHENYL (%)     | 104 |
| TERPHENYL (%)            | 89  |
| PHENOL-D6 (%)            | 108 |
| 2-FLUOROPHENOL (%)       | 103 |
| 2,4,6-TRIBROMOPHENOL (%) | 98  |



## GCMS - RESULTS

ATI I.D. : 10585511

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/20/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/22/91 |
| PROJECT NAME  | : PHASE II RFI       | DATE EXTRACTED  | : 05/24/91 |
| CLIENT I.D.   | : RFI 0103 V 11.0    | DATE ANALYZED   | : 06/05/91 |
| SAMPLE MATRIX | : SOIL               | UNITS           | : MG/KG    |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585512

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

## GCMS - RESULTS

ATI I.D. : 10585512

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| FLUORENE                    | <0.17   |
| 4-NITROANILINE              | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL  | <0.85   |
| N-NITROSODIPHENYLAMINE      | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER  | <0.17   |
| HEXACHLOROBENZENE           | <0.17   |
| PENTACHLOROPHENOL           | <0.85   |
| PHENANTHRENE                | <0.17   |
| ANTHRACENE                  | <0.17   |
| DI-N-BUTYLPHTHALATE         | <0.17   |
| FLUORANTHENE                | <0.17   |
| BENZIDINE                   | <0.17   |
| PYRENE                      | <0.17   |
| BUTYLBENZYLPHTHALATE        | <0.17   |
| 3,3'-DICHLOROBENZIDINE      | <0.34   |
| BENZO(a)ANTHRACENE          | <0.17   |
| BIS(2-ETHYLHEXYL) PHTHALATE | <0.17   |
| CHRYSENE                    | <0.17   |
| BENZO(b)FLUORANTHENE        | <0.17   |
| BENZO(k)FLUORANTHENE        | <0.17   |
| BENZO(a)PYRENE              | <0.17   |
| INDENO(1,2,3-cd)PYRENE      | <0.17   |
| DIBENZO(a,h)ANTHRACENE      | <0.17   |
| BENZO(g,h,i)PERYLENE        | <0.17   |
| 1-CHLORONAPHTHANE           | <0.17   |
| 2-CHLORONAPHTHANE           | <0.17   |
| DIBENZO(A,J)ACRIDINE        | <0.17   |
| DI-N-OCTYLPHTHALATE         | <0.17   |
| 1,2-DIPHENYLHYDRAZINE       | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 102 |
| 2-FLUOROBIPHENYL (%)     | 100 |
| TERPHENYL (%)            | 81  |
| PHENOL-D6 (%)            | 97  |
| 2-FLUOROPHENOL (%)       | 93  |
| 2,4,6-TRIBROMOPHENOL (%) | 90  |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10585512

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

### COMPOUNDS

### RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



Analytical Technologies, Inc.

## GCMS - RESULTS

ATI I.D. : 10585513

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 D 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | 0.19  |
| 4-CHLOROPHENYL-PHENYLEETHER  | <0.17 |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 107 |
| 2-FLUOROBIPHENYL (%)     | 100 |
| TERPHENYL (%)            | 89  |
| PHENOL-D6 (%)            | 102 |
| 2-FLUOROPHENOL (%)       | 103 |
| 2,4,6-TRIBROMOPHENOL (%) | 92  |



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10585513

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0103 D 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/20/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |

## GCMS - RESULTS

ATI I.D. : 10585514

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

(CONTINUED NEXT PAGE)



TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 106 |
| 2-FLUOROBIPHENYL (%)     | 100 |
| TERPHENYL (%)            | 84  |
| PHENOL-D6 (%)            | 99  |
| 2-FLUOROPHENOL (%)       | 97  |
| 2,4,6-TRIBROMOPHENOL (%) | 90  |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10585514

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBEZENE               | <0.17   |
| PENTACHLORONITROBEZENE          | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBEZENE       | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585515

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

---

COMPOUNDS RESULTS

---

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

(CONTINUED NEXT PAGE)



## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 102 |
| 2-FLUOROBIPHENYL (%)     | 95  |
| TERPHENYL (%)            | 80  |
| PHENOL-D6 (%)            | 100 |
| 2-FLUOROPHENOL (%)       | 98  |
| 2,4,6-TRIBROMOPHENOL (%) | 93  |



## GCMS - RESULTS

ATI I.D. : 10585515

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |

## GCMS - RESULTS

ATI I.D. : 10585517

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/21/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/22/91 |
| PROJECT NAME  | : PHASE II RFI       | DATE EXTRACTED  | : 05/24/91 |
| CLIENT I.D.   | : RFI 0104 V 11.0    | DATE ANALYZED   | : 06/05/91 |
| SAMPLE MATRIX | : SOIL               | UNITS           | : MG/KG    |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANILINE               | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

(CONTINUED NEXT PAGE)



TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 106 |
| 2-FLUOROBIPHENYL (%)     | 102 |
| TERPHENYL (%)            | 82  |
| PHENOL-D6 (%)            | 104 |
| 2-FLUOROPHENOL (%)       | 97  |
| 2,4,6-TRIBROMOPHENOL (%) | 95  |



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10585517

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10585518

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/21/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/22/91 |
| PROJECT NAME  | : PHASE II RFI       | DATE EXTRACTED  | : 05/24/91 |
| CLIENT I.D.   | : RFI 0104 V 14.0    | DATE ANALYZED   | : 06/05/91 |
| SAMPLE MATRIX | : SOIL               | UNITS           | : MG/KG    |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                             |       |
|-----------------------------|-------|
| N-NITROSODIMETHYLAMINE      | <0.17 |
| PHENOL                      | <0.17 |
| ANILINE                     | <0.17 |
| BIS(2-CHLOROETHYL)ETHER     | <0.17 |
| 2-CHLOROPHENOL              | <0.17 |
| 1,3-DICHLOROBENZENE         | <0.17 |
| 1,4-DICHLOROBENZENE         | <0.17 |
| BENZYL ALCOHOL              | <0.17 |
| 1,2-DICHLOROBENZENE         | <0.17 |
| 2-METHYLPHENOL              | <0.17 |
| BIS(2-CHLOROISOPROPYL)ETHER | <0.17 |
| 4-METHYLPHENOL              | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE  | <0.17 |
| HEXACHLOROETHANE            | <0.17 |
| NITROBENZENE                | <0.17 |
| ISOPHORENE                  | <0.17 |
| 2-NITROPHENOL               | <0.17 |
| 2,4-DIMETHYLPHENOL          | <0.17 |
| BENZOIC ACID                | <0.85 |
| BIS(2-CHLOROETHOXY)METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL          | <0.17 |
| 1,2,4-TRICHLOROBENZENE      | <0.17 |
| NAPHTHALENE                 | <0.17 |
| 4-CHLOROANILINE             | <0.17 |
| HEXACHLOROBUTADIENE         | <0.17 |
| 4-CHLORO-3-METHYLPHENOL     | <0.17 |
| 2-METHYLNAPHTHALENE         | <0.17 |
| HEXACHLOROCYCLOPENTADIENE   | <0.17 |
| 2,4,6-TRICHLOROPHENOL       | <0.17 |
| 2,4,5-TRICHLOROPHENOL       | <0.85 |
| 2-NITROANILINE              | <0.85 |
| DIMETHYLPHTHALATE           | <0.17 |
| ACENAPHTHYLENE              | <0.17 |
| 3-NITROANINLINE             | <0.85 |
| ACENAPHTHENE                | <0.17 |
| 2,4-DINITROPHENOL           | <0.85 |
| 4-NITROPHENOL               | <0.85 |
| 2,4-DINITROTOLUENE          | <0.17 |
| 2,6-DINITROTOLUENE          | <0.17 |
| DIETHYLPHTHALATE            | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER  | <0.17 |

(CONTINUED NEXT PAGE)



## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| FLUORENE                    | <0.17   |
| 4-NITROANILINE              | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL  | <0.85   |
| N-NITROSODIPHENYLAMINE      | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER   | <0.17   |
| HEXACHLOROBENZENE           | <0.17   |
| PENTACHLOROPHENOL           | <0.85   |
| PHENANTHRENE                | <0.17   |
| ANTHRACENE                  | <0.17   |
| DI-N-BUTYLPHTHALATE         | <0.17   |
| FLUORANTHENE                | <0.17   |
| BENZIDINE                   | <0.17   |
| PYRENE                      | <0.17   |
| BUTYLBENZYLPHTHALATE        | <0.17   |
| 3,3'-DICHLOROBENZIDINE      | <0.34   |
| BENZO(a)ANTHRACENE          | <0.17   |
| BIS(2-ETHYLHEXYL) PHTHALATE | <0.17   |
| CHRYSENE                    | <0.17   |
| BENZO(b)FLUORANTHENE        | <0.17   |
| BENZO(k)FLUORANTHENE        | <0.17   |
| BENZO(a)PYRENE              | <0.17   |
| INDENO(1,2,3-cd)PYRENE      | <0.17   |
| DIBENZO(a,h)ANTHRACENE      | <0.17   |
| BENZO(g,h,i)PERYLENE        | <0.17   |
| 1-CHLORONAPHTHANE           | <0.17   |
| 2-CHLORONAPHTHANE           | <0.17   |
| DIBENZO(A,J)ACRIDINE        | <0.17   |
| DI-N-OCTYLPHTHALATE         | <0.17   |
| 1,2-DIPHENYLHYDRAZINE       | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 96 |
| 2-FLUOROBIPHENYL (%)     | 89 |
| TERPHENYL (%)            | 69 |
| PHENOL-D6 (%)            | 89 |
| 2-FLUOROPHENOL (%)       | 85 |
| 2,4,6-TRIBROMOPHENOL (%) | 86 |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10585518

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0104 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/21/91  
DATE RECEIVED : 05/22/91  
DATE EXTRACTED : 05/24/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



Analytical Technologies, Inc.

## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105855   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/24/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/03/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : MG/KG    |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANILINE               | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |
| FLUORENE                     | <0.17   |
| 4-NITROANILINE               | <0.85   |

(CONTINUED NEXT PAGE)



## GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | 0.7     |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 64 |
| 2-FLUOROBIPHENYL (%)     | 61 |
| TERPHENYL (%)            | 57 |
| PHENOL-D6 (%)            | 59 |
| 2-FLUOROPHENOL (%)       | 59 |
| 2,4,6-TRIBROMOPHENOL (%) | 46 |



Analytical Technologies, Inc.

# GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105855   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/24/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/03/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : MG/KG    |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105855   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/29/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/05/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : MG/KG    |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |
| FLUORENE                     | <0.17 |
| 4-NITROANILINE               | <0.85 |

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 101 |
| 2-FLUOROBIPHENYL (%)     | 99  |
| TERPHENYL (%)            | 83  |
| PHENOL-D6 (%)            | 97  |
| 2-FLUOROPHENOL (%)       | 94  |
| 2,4,6-TRIBROMOPHENOL (%) | 81  |



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105855  
DATE EXTRACTED : 05/29/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : N/A

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10585503

DATE ANALYZED : 06/05/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP.             | DUP.      | RPD |
|-----------------------------|--------------|--------|------------------|-----------|------------------|-----------|-----|
|                             | RESULT       | SPIKED |                  |           | SPIKED<br>SAMPLE | %<br>REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <0.17        | 1.7    | 1.0              | 59        | 1.0              | 59        | 0   |
| ACENAPHTHENE                | <0.17        | 1.7    | 1.0              | 59        | 1.1              | 65        | 10  |
| 2,4-DINITROTOLUENE          | <0.17        | 1.7    | 1.0              | 59        | 1.1              | 65        | 10  |
| PYRENE                      | <0.17        | 1.7    | 0.9              | 53        | 0.9              | 53        | 0   |
| N-NITROSO-DI-N-PROPYL AMINE | <0.17        | 1.7    | 1.1              | 65        | 1.2              | 71        | 9   |
| 1,4-DICHLOROBENZENE         | <0.17        | 1.7    | 0.9              | 53        | 1.0              | 59        | 11  |
| PENTACHLOROPHENOL           | <0.85        | 3.3    | 2.6              | 79        | 2.8              | 85        | 7   |
| PHENOL                      | <0.17        | 3.3    | 2.0              | 61        | 2.3              | 70        | 14  |
| 2-CHLOROPHENOL              | <0.17        | 3.3    | 2.0              | 61        | 2.2              | 67        | 10  |
| 4-CHLORO-3-METHYLPHENOL     | <0.17        | 3.3    | 2.1              | 64        | 2.3              | 70        | 9   |
| 4-NITROPHENOL               | <0.85        | 3.3    | 2.2              | 67        | 2.6              | 79        | 17  |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
REF I.D. : 10585509

DATE ANALYZED : 06/06/91  
SAMPLE MATRIX : SOIL  
UNITS : MG/KG

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP.             | DUP.      | RPD |
|-----------------------------|--------------|--------|------------------|-----------|------------------|-----------|-----|
|                             | RESULT       | SPIKED |                  |           | SPIKED<br>SAMPLE | %<br>REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <0.17        | 1.7    | 1.0              | 59        | 1.1              | 65        | 10  |
| ACENAPHTHENE                | <0.17        | 1.7    | 0.9              | 53        | 1.0              | 59        | 11  |
| 2,4-DINITROTOLUENE          | <0.17        | 1.7    | 1.0              | 59        | 1.0              | 59        | 0   |
| PYRENE                      | <0.17        | 1.7    | 0.9              | 53        | 0.9              | 53        | 0   |
| N-NITROSO-DI-N-PROPYL AMINE | <0.17        | 1.7    | 1.1              | 65        | 1.2              | 71        | 9   |
| 1,4-DICHLOROBENZENE         | <0.17        | 1.7    | 0.9              | 53        | 1.0              | 59        | 11  |
| PENTACHLOROPHENOL           | <0.85        | 3.3    | 2.8              | 85        | 3.1              | 94        | 10  |
| PHENOL                      | <0.17        | 3.3    | 1.7              | 52        | 1.9              | 58        | 11  |
| 2-CHLOROPHENOL              | <0.17        | 3.3    | 1.9              | 58        | 2.0              | 61        | 5   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17        | 3.3    | 1.4              | 42        | 1.6              | 48        | 13  |
| 4-NITROPHENOL               | <0.85        | 3.3    | 2.4              | 73        | 2.3              | 70        | 4   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.

## QUALITY CONTROL DATA

ATI I.D. : 105855

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

DATE ANALYZED : 06/06/91

PROJECT NAME : PHASE II RFI

SAMPLE MATRIX : NON-AQUEOUS

REF I.D. : 10699919

UNITS : MG/KG

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | % SPIKED<br>REC. | DUP.             | DUP.      | RPD |
|-----------------------------|--------------|--------|------------------|------------------|------------------|-----------|-----|
|                             | RESULT       | SPIKED |                  |                  | SPIKED<br>SAMPLE | %<br>REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <0.17        | 1.7    | 1.1              | 65               | 1.0              | 59        | 10  |
| ACENAPHTHENE                | <0.17        | 1.7    | 1.0              | 59               | 0.9              | 53        | 11  |
| 2,4-DINITROTOLUENE          | <0.17        | 1.7    | 1.1              | 65               | 1.0              | 59        | 10  |
| PYRENE                      | <0.17        | 1.7    | 0.9              | 53               | 0.8              | 47        | 12  |
| N-NITROSO-DI-N-PROPYL AMINE | <0.17        | 1.7    | 1.2              | 71               | 1.1              | 65        | 9   |
| 1,4-DICHLOROBENZENE         | <0.17        | 1.7    | 1.1              | 65               | 1.0              | 59        | 10  |
| PENTACHLOROPHENOL           | <0.85        | 3.3    | 3.2              | 97               | 3.0              | 91        | 6   |
| PHENOL                      | <0.17        | 3.3    | 2.2              | 67               | 2.1              | 64        | 5   |
| 2-CHLOROPHENOL              | <0.17        | 3.3    | 2.2              | 67               | 2.2              | 67        | 0   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17        | 3.3    | 2.3              | 70               | 2.2              | 67        | 4   |
| 4-NITROPHENOL               | <0.85        | 3.3    | 2.8              | 85               | 2.5              | 76        | 11  |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.  
Phoenix, Arizona

# Chain of Custody

DATE 5-20-91 PAGE 1 OF 3

|                                                                                                                                                                              |  |                                          |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------|--|
| PROJECT MANAGER: <u>FRANK C ROSENDALE</u>                                                                                                                                    |  | ANALYSIS REQUEST                         |  |
| COMPANY: <u>GIANT REFINING CO.</u>                                                                                                                                           |  | SDWA Primary Standards                   |  |
| ADDRESS: <u>Rt 3 BOX 7</u>                                                                                                                                                   |  | SDWA Secondary Standards                 |  |
| ADDRESS: <u>GALLUP, NM 87301</u>                                                                                                                                             |  | Volatile Organics GC/MS (8240)           |  |
| BILL TO: <u>SAFNE</u>                                                                                                                                                        |  | Base/Neutral/Acid Compounds GC/MS (8270) |  |
| COMPANY: <u>SAFNE</u>                                                                                                                                                        |  | Herbicides (615/8150)                    |  |
| ADDRESS: <u>SAFNE</u>                                                                                                                                                        |  | Pesticides/PCB (608/8080)                |  |
| SAMPLES: (Signature) <u>Lynn Shelton</u>                                                                                                                                     |  | MTBE                                     |  |
| PHONE NUMBER <u>(505) 722-0227</u>                                                                                                                                           |  | Aromatic Hydrocarbons (602/8020)         |  |
| LABORATORY: <u>ATI</u>                                                                                                                                                       |  | Chlorinated Hydrocarbons (601/8010)      |  |
| PROJECT NO: <u>24</u>                                                                                                                                                        |  | BTX (8020)                               |  |
| PROJECT NAME: <u>PHASE II RFI</u>                                                                                                                                            |  | Diesel/Gasoline/BTX (MOD 8015/8020)      |  |
| P.O. NO: <u>01909</u>                                                                                                                                                        |  | (MOD 8015) Gas/Diesel                    |  |
| SHIPPED VIA: <u>FED EXPRESS</u>                                                                                                                                              |  | Petroleum Hydrocarbons (418.1)           |  |
| SAMPLE DISPOSAL INSTRUCTIONS: <u>RETURN</u>                                                                                                                                  |  |                                          |  |
| PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS                                                                                                                            |  |                                          |  |
| TAT: (NORMAL) <input checked="" type="checkbox"/> (RUSH) <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 72 <input type="checkbox"/> 1 WEEK |  |                                          |  |
| Comments: <u>SEE ATTACHED LIST FOR PARAMETERS</u>                                                                                                                            |  |                                          |  |

| PROJECT INFORMATION                                                                                                                                                          |                          | SAMPLE RECEIPT           |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------|
| PROJECT NO:                                                                                                                                                                  | 24                       | TOTAL NO. OF CONTAINERS  | 24     |
| PROJECT NAME: <u>PHASE II RFI</u>                                                                                                                                            | CHAIN OF CUSTODY SEALS   | CHAIN OF CUSTODY SEALS   | Y      |
| P.O. NO: <u>01909</u>                                                                                                                                                        | INTACT?                  | INTACT?                  | Y      |
| SHIPPED VIA: <u>FED EXPRESS</u>                                                                                                                                              | RECEIVED GOOD COND./COLD | RECEIVED GOOD COND./COLD | Y      |
| SAMPLE DISPOSAL INSTRUCTIONS: <u>RETURN</u>                                                                                                                                  | LAB NUMBER               | LAB NUMBER               | 105855 |
| PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS                                                                                                                            |                          |                          |        |
| TAT: (NORMAL) <input checked="" type="checkbox"/> (RUSH) <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 72 <input type="checkbox"/> 1 WEEK |                          |                          |        |
| Comments: <u>SEE ATTACHED LIST FOR PARAMETERS</u>                                                                                                                            |                          |                          |        |

| RELINQUISHED BY: 1.               |                      | RELINQUISHED BY: 2.                           |                 | RELINQUISHED BY: 3. |                 |
|-----------------------------------|----------------------|-----------------------------------------------|-----------------|---------------------|-----------------|
| Signature: <u>Lynn Shelton</u>    | Time: <u>2:00</u>    | Signature:                                    | Time:           | Signature:          | Time:           |
| Printed Name: <u>Lynn Shelton</u> | Date: <u>5-21-91</u> | Printed Name:                                 | Date:           | Printed Name:       | Date:           |
| Company: <u>GIANT REFINING CO</u> |                      | Company:                                      |                 | Company:            |                 |
| RECEIVED BY: 1.                   | RECEIVED BY: 2.      | RECEIVED BY: (LAB)                            | RECEIVED BY: 3. | RECEIVED BY: (LAB)  | RECEIVED BY: 3. |
| Signature:                        | Signature:           | Signature: <u>Linda Eskelmen</u>              | Signature:      | Signature:          | Signature:      |
| Time:                             | Time:                | Time: <u>10:15</u>                            | Time:           | Time:               | Time:           |
| Date:                             | Date:                | Date:                                         | Date:           | Date:               | Date:           |
| Printed Name:                     | Printed Name:        | Printed Name: <u>Linda Eskelmen</u>           | Printed Name:   | Printed Name:       | Printed Name:   |
| Company:                          | Company:             | Company: <u>Analytical Technologies, Inc.</u> | Company:        | Company:            | Company:        |



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**7.126**



DATE 5-21-91 PAGE 3 OF 3

|                                                                                                                                                                                                                                                                                                             |  |                                                          |                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------|-----------------------------------------------------|
| ANALYSIS REQUEST                                                                                                                                                                                                                                                                                            |  |                                                          |                                                     |
| PROJECT MANAGER: <u>Ed Moore PPH C. ROSENDALE</u><br>COMPANY: <u>GIANT REFINING CO.</u><br>ADDRESS: <u>Rt 3 BOX 7</u><br><u>GALLUP, NM 87301</u><br>BILL TO: <u>same</u><br>COMPANY: <u>same</u><br>ADDRESS: <u>same</u>                                                                                    |  |                                                          |                                                     |
| SAMPLE ID: <u>REF0104V14.0</u><br>TRIP BLANK<br>TRIP BLANK                                                                                                                                                                                                                                                  |  | DATE: <u>5-21-91</u><br><u>5-21-91</u><br><u>5-21-91</u> | TIME: <u>11:45 AM</u><br><u>2:00</u><br><u>2:00</u> |
| MATRIX: <u>SOIL</u><br><u>water</u><br><u>water</u>                                                                                                                                                                                                                                                         |  | LAB ID: <u>18</u><br><u>19</u><br><u>20</u>              |                                                     |
| PHONE NUMBER: <u>505 722-0227</u>                                                                                                                                                                                                                                                                           |  |                                                          |                                                     |
| ANALYSIS REQUEST                                                                                                                                                                                                                                                                                            |  |                                                          |                                                     |
| (MOD 8015) Gas/Diesel<br>Diesel/Gasoline/BTXE (MOD 8015/8020)<br>BTXE (8020)<br>Chlorinated Hydrocarbons (601/8010)<br>Aromatic Hydrocarbons (602/8020)<br>MTBE<br>Pesticides/PCB (608/8080)<br>Herbicides (615/8150)<br>Base/Neutral/Acid Compounds GC/MS (626/8270)<br>Volatile Organics GC/MS (624/8240) |  |                                                          |                                                     |
| SDWA Primary Standards<br>SDWA Secondary Standards<br>SDWA Volatiles (502.1/503.1)                                                                                                                                                                                                                          |  |                                                          |                                                     |
| The 13 Priority Pollutant Metals<br>The 8 EP Tox Metals by EP Tox Prep. (1310)<br>The 8 EP Tox Metals by Total Digestion<br>The 8 EP Tox Metals by TCLP (1311)                                                                                                                                              |  |                                                          |                                                     |
| (SEE ATTACHED LIST)                                                                                                                                                                                                                                                                                         |  |                                                          |                                                     |
| NUMBER OF CONTAINERS                                                                                                                                                                                                                                                                                        |  |                                                          |                                                     |

|                                                                                                                                                                              |                                                   |                |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------|--|
| PROJECT INFORMATION                                                                                                                                                          |                                                   | SAMPLE RECEIPT |  |
| PROJECT NO:                                                                                                                                                                  | TOTAL NO. OF CONTAINERS                           | 5              |  |
| PROJECT NAME: <u>PHASE II REE</u>                                                                                                                                            | CHAIN OF CUSTODY SEALS                            | Y              |  |
| P.O. NO. <u>01909</u>                                                                                                                                                        | INTACT?                                           | Y              |  |
| SHIPPED VIA: <u>FED EXPRESS</u>                                                                                                                                              | RECEIVED GOOD COND /COLD                          | Y              |  |
| SAMPLE DISPOSAL INSTRUCTIONS                                                                                                                                                 | LAB NUMBER                                        | 105855         |  |
| <input checked="" type="checkbox"/> ATI <input type="checkbox"/> RETURN                                                                                                      | PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS |                |  |
| TAT: (NORMAL) <input checked="" type="checkbox"/> (RUSH) <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 72 <input type="checkbox"/> 1 WEEK |                                                   |                |  |
| Comments: <u>SEE ATTACHED LIST FOR PARAMETERS</u>                                                                                                                            |                                                   |                |  |

|                             |                 |                     |       |                     |       |
|-----------------------------|-----------------|---------------------|-------|---------------------|-------|
| RELINQUISHED BY: 1.         |                 | RELINQUISHED BY: 2. |       | RELINQUISHED BY: 3. |       |
| Signature:                  | Time:           | Signature:          | Time: | Signature:          | Time: |
| <u>Lynn Shelton 200</u>     |                 |                     |       |                     |       |
| Printed Name:               | Date:           | Printed Name:       | Date: | Printed Name:       | Date: |
| <u>Lynn Shelton 5-21-91</u> |                 |                     |       |                     |       |
| Company:                    |                 | Company:            |       | Company:            |       |
| <u>GIANT REFINING CO</u>    |                 |                     |       |                     |       |
| RECEIVED BY: 1.             | RECEIVED BY: 2. | RECEIVED BY: 3.     |       |                     |       |
| Signature:                  | Signature:      | Signature:          |       |                     |       |
| <u>Lynn Shelton 5-21-91</u> |                 |                     |       |                     |       |
| Printed Name:               | Printed Name:   | Printed Name:       |       |                     |       |
| <u>Lynn Shelton 5-21-91</u> |                 |                     |       |                     |       |
| Company:                    | Company:        | Company:            |       |                     |       |
| <u>GIANT REFINING CO</u>    |                 |                     |       |                     |       |
| RECEIVED BY: 1.             | RECEIVED BY: 2. | RECEIVED BY: 3.     |       |                     |       |
| Signature:                  | Signature:      | Signature:          |       |                     |       |
| <u>Lynn Shelton 5-21-91</u> |                 |                     |       |                     |       |
| Printed Name:               | Printed Name:   | Printed Name:       |       |                     |       |
| <u>Lynn Shelton 5-21-91</u> |                 |                     |       |                     |       |
| Company:                    | Company:        | Company:            |       |                     |       |
| <u>GIANT REFINING CO</u>    |                 |                     |       |                     |       |

|                                                                                  |                                                                                  |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. - Pink - ORIGINATOR. |                                                                                  |
| Distribution: White, Canary - ANALYTICAL TECHNOLOGIES, INC. - Pink - ORIGINATOR. | Distribution: White, Canary - ANALYTICAL TECHNOLOGIES, INC. - Pink - ORIGINATOR. |

TABLE -1  
BACKGROUND METALS

Total Metals

| <u>Parameter</u> | <u>Analytical Method</u> | <u>Reporting Limit mg/kg</u> |
|------------------|--------------------------|------------------------------|
| Antimony         | 6010                     | 6.0                          |
| Arsenic          | 7060                     | 0.5                          |
| Barium           | 6010                     | 1.0                          |
| Beryllium        | 6010                     | 0.2                          |
| Cadmium          | 6010                     | 0.5                          |
| Chromium         | 6010                     | 1.0                          |
| Cobalt           | 6010                     | 1.0                          |
| Copper           | 6010                     | 2.0                          |
| Lead             | 6010                     | 5.0                          |
| Mercury          | 7471                     | 0.2                          |
| Nickel           | 6010                     | 4.0                          |
| Potassium        | 6010                     | 500                          |
| Selenium         | 7740                     | 0.5                          |
| Vanadium         | 6010                     | 1.0                          |
| Zinc             | 6010                     | 2.0                          |

TABLE-2  
PRIORITY POLLUTANT VOLATILES

Method 8240

| <u>Parameter</u>                              | <u>Reporting Limits ug/kg</u> |
|-----------------------------------------------|-------------------------------|
| Acetone                                       | 5,000                         |
| Acrolein                                      | 10,000                        |
| Acrylonitrile                                 | 10,000                        |
| Benzene                                       | 500                           |
| Bromodichloromethane                          | 500                           |
| Bromoform                                     | 500                           |
| Bromomethane(methyl bromide)                  | 1,000                         |
| Carbon disulfide                              | 500                           |
| Carbon tetrachloride                          | 500                           |
| Chlorobenzene                                 | 500                           |
| Chlorodibromoethane                           | 500                           |
| Chloroethane                                  | 1,000                         |
| 2-Chloroethylvinyl ether                      | 1,000                         |
| Chloroform                                    | 500                           |
| Chloromethane                                 | 1,000                         |
| Dibromomethane                                | 500                           |
| 1,4 - Dichloro-2-butane                       | -                             |
| trans-1,4-Dichloro-2-butene                   | 500                           |
| Dichlorodifluoromethane                       | 2,000                         |
| 1,1-Dichloroethane                            | 500                           |
| 1,2-Dichloroethane                            | 500                           |
| 1,1-Dichloroethylene                          | 500                           |
| trans-1,2-Dichloroethylene                    | 500                           |
| 1,2-Dichloropropane                           | 500                           |
| cis-1,3-Dichloropropene                       | 500                           |
| trans-1,3-Dichloropropene                     | 500                           |
| Ethanol                                       | 10,000                        |
| Ethyl benzene                                 | 500                           |
| Ethyl methacrylate                            | 1,000                         |
| 2-Hexanone                                    | 1,000                         |
| Iodomethane                                   | 500                           |
| Methylene Chloride                            | 500                           |
| Methyl ethyl ketone (2-Butanone)              | 1,000                         |
| Methyl isobutyl ketone (4-methyl-2-pentanone) | 1,000                         |
| Styrene                                       | 500                           |
| 1,1,2,2,-Tetrachloroethane                    | 500                           |
| Tetrachloroethylene                           | 500                           |
| Toluene                                       | 500                           |
| 1,1,1-Trichloroethane                         | 500                           |
| 1,1,2-Trichloroethane                         | 500                           |
| Trichloroethylene                             | 500                           |
| Trichlorofluoromethane                        | 500                           |
| 1,2,3-Trichloropropane                        | 500                           |
| Vinyl acetate                                 | 1,000                         |
| Vinyl chloride                                | 1,000                         |
| Xylenes                                       | 500                           |

TABLE-3  
PRIORITY POLLUTANT SEMIVOLATILES

| <u>Parameter</u>                                     | <u>Method 8270</u> | <u>Reporting Limits ug/kg</u> |
|------------------------------------------------------|--------------------|-------------------------------|
| Acenaphthene                                         |                    | 5,000                         |
| Acenaphthylene                                       |                    | 5,000                         |
| Acetophenone                                         |                    | 5,000                         |
| 4-Aminobiphenyl                                      |                    | -                             |
| Aniline                                              |                    | 5,000                         |
| Anthracene                                           |                    | 5,000                         |
| Benzidine                                            |                    | 50,000                        |
| Benzoic Acid                                         |                    | 5,000                         |
| Benzo(a)anthracene                                   |                    | 5,000                         |
| Benzo(b)fluoranthene                                 |                    | 5,000                         |
| Benzo(k)fluoranthene                                 |                    | 5,000                         |
| Benzo(g,h,i)perylene                                 |                    | 5,000                         |
| Benzo(a)pyrene                                       |                    | 5,000                         |
| Benzyl alcohol                                       |                    | 5,000                         |
| Bis(2-chloroethoxy)methane                           |                    | 5,000                         |
| Bis(2-chloroethyl)ether                              |                    | 5,000                         |
| Bis(2-chloroisopropyl)ether                          |                    |                               |
| [bis(2-chloro-1 methylethyl)ether]                   |                    | 5,000                         |
| Bis(2-ethylhexyl)phthalate                           |                    | 5,000                         |
| 4-Bromophenyl phenyl ether                           |                    | 5,000                         |
| Butyl benzyl phthalate                               |                    | 5,000                         |
| 4-Chloroaniline                                      |                    | 5,000                         |
| 4-Chloro-3-methylphenol                              |                    | 5,000                         |
| 1-Chloronaphthene                                    |                    | 5,000                         |
| 2-Chloronaphthene                                    |                    | 5,000                         |
| 2-Chlorophenol                                       |                    | 5,000                         |
| 4-Chlorophenyl phenyl ether                          |                    | 5,000                         |
| Chrysene                                             |                    | 5,000                         |
| Dibenzo(a,j)acridine                                 |                    | -                             |
| Dibenzo(a,h) anthracene                              |                    | 5,000                         |
| Dibenzo furans(tetrachloro, pentachloro, hexachloro) |                    | -                             |
| Di-n-butylphthalate                                  |                    | 5,000                         |
| 1,2-Dichlorobenzene                                  |                    | 5,000                         |
| 1,3-Dichlorobenzene                                  |                    | 5,000                         |
| 1,4-Dichlorobenzene                                  |                    | 5,000                         |
| 3,3-Dichlorobenzidine                                |                    | 10,000                        |
| 2,4-Dichlorophenol                                   |                    | 5,000                         |
| 2,6-Dichlorophenol                                   |                    | 5,000                         |
| Diethyl phthalate                                    |                    | 5,000                         |
| p(Dimethylamino)azobenzene                           |                    | 5,000                         |
| 7,12-Dimethylbenz(a)anthracene                       |                    | 5,000                         |
| aa-Dimethylphenethylamine                            |                    | 5,000                         |
| 2,4-Dimethylphenol                                   |                    | 5,000                         |
| Dimethyl phthalate                                   |                    | 5,000                         |
| 4,6-Dinitro-2-methylphenol                           |                    | 25,000                        |
| 2,4-Dinitrophenol                                    |                    | 25,000                        |
| 2,4-Dinitrotoluene                                   |                    | 5,000                         |

TABLE-3 Continued

|                            |        |
|----------------------------|--------|
| 2,6-Dinitrotoluene         | 5,000  |
| Di-n-octyl phthalate       | 5,000  |
| Diphenylamine              | 5,000  |
| 1,2-Diphenylhydrazine      | 5,000  |
| Ethyl methanesulfonate     | 5,000  |
| Fluoranthene               | 5,000  |
| Flourene                   | 5,000  |
| Hexachlorobenzene          | 5,000  |
| Hexachloro-1,3-butadiene   | 5,000  |
| Hexachlorocyclopentadiene  | 5,000  |
| Hexachloroethane           | 5,000  |
| Indeno(1,2,3-cd)pyrene     | 5,000  |
| Isophorene                 | 5,000  |
| 3-Methylcholanthrene       | 5,000  |
| Methyl methanesulfonate    | 5,000  |
| 2-Methylnaphthalene        | 5,000  |
| 2-Methylphenol             | 5,000  |
| 3-Methylphenol             | 5,000  |
| 4-Methylphenol             | 5,000  |
| Naphthalene                | 5,000  |
| 1-Naphthylamine            | 5,000  |
| 2-Naphthylamine            | 5,000  |
| 2-Nitroaniline             | 25,000 |
| 3-Nitroaniline             | 25,000 |
| 4-Nitroaniline             | 25,000 |
| Nitrobenzene               | 5,000  |
| 2-Nitrophenol              | 5,000  |
| 4-Nitrophenol              | 25,000 |
| N-Nitrosodimethylamine     | 5,000  |
| N-Nitroso-di-n-butylamine  | 5,000  |
| N-Nitroso-di-n-propylamine | 5,000  |
| N-Nitrosopiperidine        | 5,000  |
| N-Nitrosodiphenylamine     | 5,000  |
| Pentachlorobenzene         | 5,000  |
| Pentachloronitrobenzene    | 25,000 |
| Pentachlorophenol          | 25,000 |
| Phenacetin                 | 5,000  |
| Phenanthrene               | 5,000  |
| Phenol                     | 5,000  |
| 2-Picoline                 | 5,000  |
| Pronamide                  | 5,000  |
| Pyrene                     | 5,000  |
| 1,2,4,5-Tetrachlorobenzene | 5,000  |
| 2,3,4,6-Tetrachlorophenol  | 25,000 |
| 1,2,4-Trichlorobenzene     | 5,000  |
| 2,4,5-Trichlorophenol      | 25,000 |
| 2,4,6-Trichlorophenol      | 5,000  |



Analytical **Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105879

July 8, 1991

Giant Refining Company  
Route 3, P.O. Box 7  
Gallup, NM 87301

Project Name/Number: Phase II RFI

Attention: Claud Rosendale

On 05/23/91, Analytical Technologies, Inc. received a request to analyze soil and aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Spike recoveries are outside ATI criteria for Ba, K, Sb, V, and Zn due to matrix interferences. The RPD for duplicate results for Be, Co, Cr, K, and V are outside ATI criteria, because the samples are not homogeneous.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt  
Senior Project Manager

Lorraine Davis  
QA Coordinator

RVW:sdd  
Enclosure

Robert V. Woods  
Laboratory Manager



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/23/91

REPORT DATE : 06/29/91

ATI I.D. : 105879

| ATI # | CLIENT DESCRIPTION | MATRIX  | DATE COLLECTED |
|-------|--------------------|---------|----------------|
| 01    | RFI 0105 V 4.0     | SOIL    | 05/22/91       |
| 02    | RFI 0105 V 9.0     | SOIL    | 05/22/91       |
| 03    | RFI 0105 V 11.0    | SOIL    | 05/22/91       |
| 04    | RFI 0105 V 14.0    | SOIL    | 05/22/91       |
| 05    | RFI 0105 D 14.0    | SOIL    | 05/22/91       |
| 06    | RFI 0106 A 4.0     | SOIL    | 05/22/91       |
| 07    | RFI 0106 A 9.0     | SOIL    | 05/22/91       |
| 08    | RFI 0106 A 11.0    | SOIL    | 05/22/91       |
| 09    | RFI 0106 A 14.0    | SOIL    | 05/22/91       |
| 10    | RFI 0106 E 14.0    | AQUEOUS | 05/22/91       |
| 11    | TRIP BLANK         | AQUEOUS | 05/22/91       |

----- TOTALS -----

| MATRIX  | # SAMPLES |
|---------|-----------|
| SOIL    | 9         |
| AQUEOUS | 2         |

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105879

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/23/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

-----  
PARAMETER UNITS 10  
-----

PH UNITS 5.32  
-----



Analytical Technologies GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

ATI I.D. : 105879

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| PH        | UNITS | 10587910 | 5.32          | 5.27        | 1   | NA            | NA         | NA    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$



Analytical Technologies, Inc.

## METALS RESULTS

ATI I.D. : 105879

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/23/91

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 01   | 02    | 03    | 04    | 05    |
|-----------|-------|------|-------|-------|-------|-------|
| ARSENIC   | MG/KG | <3   | <3    | <3    | <3    | <3    |
| BARIUM    | MG/KG | 206  | 168   | 767   | 364   | 525   |
| BERYLLIUM | MG/KG | 3.5  | 2.7   | 4.7   | 3.1   | 6.5   |
| CADMIUM   | MG/KG | 0.4  | <0.3  | <0.3  | <0.3  | 0.3   |
| COBALT    | MG/KG | 3.9  | 3.5   | 5.1   | 4.6   | 6.9   |
| CHROMIUM  | MG/KG | 52.1 | 3.3   | 5.8   | 4.4   | 8.2   |
| COPPER    | MG/KG | 7.6  | 1.2   | <0.5  | 0.9   | <0.5  |
| MERCURY   | MG/KG | 0.16 | <0.02 | <0.02 | <0.02 | <0.02 |
| POTASSIUM | MG/KG | 1500 | 571   | 2200  | 1440  | 2770  |
| NICKEL    | MG/KG | 6.5  | 5.2   | 10.4  | 9.2   | 12.7  |
| LEAD      | MG/KG | 8    | 5     | 7     | <5    | 8     |
| ANTIMONY  | MG/KG | <3   | <3    | <3    | <3    | <3    |
| SELENIUM  | MG/KG | <0.3 | <3    | <3    | <3    | <3    |
| VANADIUM  | MG/KG | 12.0 | 11.5  | 10.3  | 7.3   | 10.7  |
| ZINC      | MG/KG | 34.6 | 9.7   | 13.9  | 12.5  | 18.7  |



ATI I.D. : 105879

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/23/91

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 06    | 07   | 08    | 09    |
|-----------|-------|-------|------|-------|-------|
| ARSENIC   | MG/KG | <3    | <3   | <3    | <3    |
| BARIUM    | MG/KG | 529   | 531  | 282   | 155   |
| BERYLLIUM | MG/KG | 3.4   | 3.9  | 3.6   | 4.3   |
| CADMIUM   | MG/KG | <0.3  | <0.3 | 0.3   | 0.4   |
| COBALT    | MG/KG | 3.9   | 2.9  | 3.1   | 2.9   |
| CHROMIUM  | MG/KG | 4.8   | 14.5 | 3.3   | 2.5   |
| COPPER    | MG/KG | 5.4   | 4.3  | 2.1   | 2.6   |
| MERCURY   | MG/KG | <0.02 | 0.05 | <0.02 | <0.02 |
| POTASSIUM | MG/KG | 494   | 652  | 973   | 474   |
| NICKEL    | MG/KG | 5.5   | 4.5  | 5.0   | 4.3   |
| LEAD      | MG/KG | 5     | 7    | 6     | 7     |
| ANTIMONY  | MG/KG | <3    | <3   | <3    | <3    |
| SELENIUM  | MG/KG | <3    | <0.3 | <0.3  | <3    |
| VANADIUM  | MG/KG | 14.8  | 13.3 | 9.1   | 11.9  |
| ZINC      | MG/KG | 8.0   | 19.9 | 9.3   | 7.3   |



ATI I.D. : 105879

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI

DATE RECEIVED : 05/23/91

REPORT DATE : 06/29/91

| PARAMETER | UNITS | 10      |
|-----------|-------|---------|
| ARSENIC   | MG/L  | <0.005  |
| BARIUM    | MG/L  | <0.010  |
| BERYLLIUM | MG/L  | <0.005  |
| CADMIUM   | MG/L  | <0.005  |
| COBALT    | MG/L  | <0.010  |
| CHROMIUM  | MG/L  | <0.010  |
| COPPER    | MG/L  | <0.010  |
| MERCURY   | MG/L  | <0.0002 |
| POTASSIUM | MG/L  | <1.0    |
| NICKEL    | MG/L  | <0.020  |
| LEAD      | MG/L  | <0.002  |
| ANTIMONY  | MG/L  | <0.05   |
| SELENIUM  | MG/L  | <0.005  |
| VANADIUM  | MG/L  | <0.010  |
| ZINC      | MG/L  | <0.010  |



Analytical Technologies, Inc.

## METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
 PROJECT # : (NONE)  
 PROJECT NAME : PHASE II RFI

ATI I.D. : 105879

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| ARSENIC   | MG/L  | 10588801 | <0.005        | <0.005      | NA  | 0.048         | 0.050      | 96    |
| ARSENIC   | MG/KG | 10587904 | <3            | <3          | NA  | 21            | 25         | 84    |
| BARIUM    | MG/L  | 10587302 | 0.240         | 0.241       | 0.4 | 0.344         | 0.100      | 104   |
| BARIUM    | MG/KG | 10587903 | 767           | 629         | 20  | 781           | 50.0       | 28*   |
| BARIUM    | MG/KG | 10587904 | 364           | 352         | 3   | 399           | 50.0       | 70*   |
| BERYLLIUM | MG/L  | 10587302 | <0.005        | <0.005      | NA  | 0.095         | 0.100      | 95    |
| BERYLLIUM | MG/KG | 10587903 | 4.7           | 6.4         | 31* | 25.7          | 25.0       | 84    |
| BERYLLIUM | MG/KG | 10587904 | 3.1           | 3.3         | 6   | 23.8          | 25.0       | 83    |
| CADMIUM   | MG/L  | 10587302 | <0.005        | <0.005      | NA  | 0.102         | 0.100      | 102   |
| CADMIUM   | MG/KG | 10587903 | <0.3          | <0.3        | NA  | 22.3          | 25.0       | 89    |
| CADMIUM   | MG/KG | 10587904 | <0.3          | 0.3         | NA  | 22.2          | 25.0       | 89    |
| COBALT    | MG/L  | 10587302 | <0.010        | <0.010      | NA  | 0.100         | 0.100      | 100   |
| COBALT    | MG/KG | 10587903 | 5.1           | 6.3         | 21* | 48.7          | 50.0       | 87    |
| COBALT    | MG/KG | 10587904 | 4.6           | 4.4         | 4   | 48.2          | 50.0       | 87    |
| CHROMIUM  | MG/L  | 10587302 | <0.010        | <0.010      | NA  | 0.105         | 0.100      | 105   |
| CHROMIUM  | MG/KG | 10587903 | 5.8           | 7.7         | 28* | 49.7          | 50.0       | 88    |
| CHROMIUM  | MG/KG | 10587904 | 4.4           | 4.5         | 2   | 49.2          | 50.0       | 90    |
| COPPER    | MG/L  | 10587302 | <0.010        | <0.010      | NA  | 0.097         | 0.100      | 97    |
| COPPER    | MG/KG | 10587903 | <0.5          | 0.5         | NA  | 22.2          | 25.0       | 89    |
| COPPER    | MG/KG | 10587904 | 0.9           | 0.8         | 12  | 23.6          | 25.0       | 91    |
| MERCURY   | MG/L  | 10587302 | <0.0002       | <0.0002     | NA  | 0.0050        | 0.0050     | 100   |
| MERCURY   | MG/KG | 10587904 | <0.02         | <0.02       | NA  | 0.48          | 0.50       | 96    |
| MERCURY   | MG/KG | 10585514 | <0.02         | <0.02       | NA  | 0.49          | 0.50       | 98    |
| MERCURY   | MG/KG | 10683609 | <0.02         | <0.02       | NA  | 0.48          | 0.50       | 96    |
| POTASSIUM | MG/L  | 10587302 | 3.6           | 3.4         | 6   | 52.3          | 50.0       | 97    |
| POTASSIUM | MG/KG | 10587903 | 2200          | 3040        | 32* | 3940          | 2500       | 70*   |
| POTASSIUM | MG/KG | 10587904 | 1440          | 1510        | 5   | 4000          | 2500       | 102   |
| NICKEL    | MG/L  | 10587302 | <0.020        | <0.020      | NA  | 0.086         | 0.100      | 86    |
| NICKEL    | MG/KG | 10587903 | 10.4          | 12.1        | 15  | 53.2          | 50.0       | 86    |
| NICKEL    | MG/KG | 10587904 | 9.2           | 9.4         | 2   | 52.5          | 50.0       | 87    |
| LEAD      | MG/L  | 10586501 | <0.002        | <0.002      | NA  | 0.049         | 0.050      | 98    |
| LEAD      | MG/KG | 10587903 | 7             | 8           | 13  | 49            | 50         | 84    |
| LEAD      | MG/KG | 10587904 | <5            | <5          | NA  | 47            | 50         | 94    |
| ANTIMONY  | MG/L  | 10587302 | <0.05         | <0.05       | NA  | 0.97          | 1.00       | 97    |
| ANTIMONY  | MG/KG | 10587903 | <3            | <3          | NA  | 13            | 50         | 26*   |
| ANTIMONY  | MG/KG | 10587904 | <3            | <3          | NA  | 11            | 50         | 22*   |
| SELENIUM  | MG/L  | 10583601 | <0.005        | <0.005      | NA  | MSA           | CC=        | .99   |
| SELENIUM  | MG/KG | 10587904 | <3            | <3          | NA  | 26            | 25         | 104   |
| VANADIUM  | MG/L  | 10587302 | <0.010        | 0.011       | NA  | 0.107         | 0.100      | 107   |
| VANADIUM  | MG/KG | 10587903 | 10.3          | 8.0         | 25* | 46.8          | 50.0       | 73*   |
| VANADIUM  | MG/KG | 10587904 | 7.3           | 5.7         | 25* | 44.5          | 50.0       | 74*   |
| ZINC      | MG/L  | 10587302 | 0.190         | 0.190       | 0   | 0.301         | 0.100      | 111   |
| ZINC      | MG/KG | 10587903 | 13.9          | 17.0        | 20  | 35.0          | 25.0       | 84    |
| ZINC      | MG/KG | 10587904 | 12.5          | 12.6        | 0.8 | 33.4          | 25.0       | 84    |

% Recovery = (Spike Sample Result - Sample Result)

X 100

Spike Concentration

RPD (Relative Percent Difference) = (Sample Result - Duplicate Result)

X 10

\* Result out of limits due to sample matrix interference



Analytical **Technologies**, Inc.

## GCMS - RESULTS

ATI I.D. : 10587910

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 E 14.0  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 06/05/91  
DATE ANALYZED : 06/05/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <5      |
| VINYL CHLORIDE              | <0.5    |
| CHLOROETHANE                | <0.5    |
| METHYLENE CHLORIDE          | <3      |
| ACETONE                     | <10     |
| CARBON DISULFIDE            | <5      |
| 1,1-DICHLOROETHENE          | <5      |
| 1,1-DICHLOROETHANE          | <5      |
| 1,2-DICHLOROETHENE (TOTAL)  | <5      |
| CHLOROFORM                  | <5      |
| 1,2-DICHLOROETHANE          | <5      |
| 2-BUTANONE (MEK)            | <5      |
| 1,1,1-TRICHLOROETHANE       | <5      |
| CARBON TETRACHLORIDE        | <5      |
| VINYL ACETATE               | <5      |
| BROMODICHLOROMETHANE        | <5      |
| 1,1,2,2-TETRACHLOROETHANE   | <5      |
| 1,2-DICHLOROPROPANE         | <5      |
| TRANS-1,3-DICHLOROPROPENE   | <5      |
| TRICHLOROETHENE             | <5      |
| DIBROMOCHLOROMETHANE        | <5      |
| 1,1,2-TRICHLOROETHANE       | <5      |
| BENZENE                     | <5      |
| CIS-1,3-DICHLOROPROPENE     | <5      |
| BROMOFORM                   | <3      |
| 2-HEXANONE (MBK)            | <5      |
| 4-METHYL-2-PENTANONE (MIBK) | <5      |
| TETRACHLOROETHENE           | <5      |
| TOLUENE                     | <5      |
| CHLOROBENZENE               | <5      |
| ETHYLBENZENE                | <5      |
| STYRENE                     | <5      |
| TOTAL XYLENES               | <5      |
| ACROLEIN                    | <10     |
| ACRYLONITRILE               | <5      |
| DIBROMOMETHANE              | <5      |
| DICHLORODIFLUOROMETHANE     | <5      |
| METHYL IODIDE               | <2.5    |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5    |
| TRICHLOROMONOFUOROMETHANE   | <5      |
| 1,2,3-TRICHLOROPROPANE      | <5      |

(CONTINUED NEXT PAGE)



TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <2.5    |
| ETHANOL                  | <100    |
| BROMOMETHANE             | <10     |
| 2-CHLOROETHYL VINYLETHER | <5      |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 109 |
| BFB (%)                   | 95  |
| TOLUENE-D8 (%)            | 97  |



## GCMS - RESULTS

ATI I.D. : 10587911

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : TRIP BLANK  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 06/05/91  
DATE ANALYZED : 06/05/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <5      |
| VINYL CHLORIDE              | <0.5    |
| CHLOROETHANE                | <0.5    |
| METHYLENE CHLORIDE          | <3      |
| ACETONE                     | <10     |
| CARBON DISULFIDE            | <5      |
| 1,1-DICHLOROETHENE          | <5      |
| 1,1-DICHLOROETHANE          | <5      |
| 1,2-DICHLOROETHENE (TOTAL)  | <5      |
| CHLOROFORM                  | <5      |
| 1,2-DICHLOROETHANE          | <5      |
| 2-BUTANONE (MEK)            | <5      |
| 1,1,1-TRICHLOROETHANE       | <5      |
| CARBON TETRACHLORIDE        | <5      |
| VINYL ACETATE               | <5      |
| BROMODICHLOROMETHANE        | <5      |
| 1,1,2,2-TETRACHLOROETHANE   | <5      |
| 1,2-DICHLOROPROPANE         | <5      |
| TRANS-1,3-DICHLOROPROPENE   | <5      |
| TRICHLOROETHENE             | <5      |
| DIBROMOCHLOROMETHANE        | <5      |
| 1,1,2-TRICHLOROETHANE       | <5      |
| BENZENE                     | <5      |
| CIS-1,3-DICHLOROPROPENE     | <5      |
| BROMOFORM                   | <3      |
| 2-HEXANONE (MBK)            | <5      |
| 4-METHYL-2-PENTANONE (MIBK) | <5      |
| TETRACHLOROETHENE           | <5      |
| TOLUENE                     | <5      |
| CHLOROBENZENE               | <5      |
| ETHYLBENZENE                | <5      |
| STYRENE                     | <5      |
| TOTAL XYLENES               | <5      |
| ACROLEIN                    | <10     |
| ACRYLONITRILE               | <5      |
| DIBROMOMETHANE              | <5      |
| DICHLORODIFLUOROMETHANE     | <5      |
| METHYL IODIDE               | <2.5    |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5    |
| TRICHLOROMONOFUOROMETHANE   | <5      |
| 1,2,3-TRICHLOROPROPANE      | <5      |

(CONTINUED NEXT PAGE)



TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <2.5    |
| ETHANOL                  | <100    |
| BROMOMETHANE             | <10     |
| 2-CHLOROETHYL VINYLETHER | <5      |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 115 |
| BFB (%)                   | 94  |
| TOLUENE-D8 (%)            | 100 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105879  
DATE EXTRACTED : 06/05/91  
DATE ANALYZED : 06/05/91  
UNITS : UG/L  
DILUTION FACTOR : N/A

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <5      |
| VINYL CHLORIDE              | <0.5    |
| CHLOROETHANE                | <0.5    |
| METHYLENE CHLORIDE          | <3      |
| ACETONE                     | TR      |
| CARBON DISULFIDE            | <5      |
| 1,1-DICHLOROETHENE          | <5      |
| 1,1-DICHLOROETHANE          | <5      |
| 1,2-DICHLOROETHENE (TOTAL)  | <5      |
| CHLOROFORM                  | <5      |
| 1,2-DICHLOROETHANE          | <5      |
| 2-BUTANONE (MEK)            | <5      |
| 1,1,1-TRICHLOROETHANE       | <5      |
| CARBON TETRACHLORIDE        | <5      |
| VINYL ACETATE               | <5      |
| BROMODICHLOROMETHANE        | <5      |
| 1,1,2,2-TETRACHLOROETHANE   | <5      |
| 1,2-DICHLOROPROPANE         | <5      |
| TRANS-1,3-DICHLOROPROPENE   | <5      |
| TRICHLOROETHENE             | <5      |
| DIBROMOCHLOROMETHANE        | <5      |
| 1,1,2-TRICHLOROETHANE       | <5      |
| BENZENE                     | <5      |
| CIS-1,3-DICHLOROPROPENE     | <5      |
| BROMOFORM                   | <3      |
| 2-HEXANONE (MBK)            | <5      |
| 4-METHYL-2-PENTANONE (MIBK) | <5      |
| TETRACHLOROETHENE           | <5      |
| TOLUENE                     | <5      |
| CHLOROBENZENE               | <5      |
| ETHYLBENZENE                | <5      |
| STYRENE                     | <5      |
| TOTAL XYLENES               | <5      |
| ACROLEIN                    | <10     |
| ACRYLONITRILE               | <5      |
| DIBROMOMETHANE              | <5      |
| DICHLORODIFLUOROMETHANE     | <5      |
| METHYL IODIDE               | <2.5    |
| TRANS-1,4-DICHLORO-2-BUTENE | <2.5    |
| TRICHLOROMONOFUOROMETHANE   | <5      |
| 1,2,3-TRICHLOROPROPANE      | <5      |
| ETHYL METHACRYLATE          | <2.5    |
| ETHANOL                     | <100    |

TR - Compound detected at an unquantifiable trace level  
(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105879

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| BROMOMETHANE             | <10     |
| 2-CHLOROETHYL VINYLETHER | <5      |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |    |
|---------------------------|----|
| 1,2-DICHLOROETHANE-D4 (%) | 92 |
| BFB (%)                   | 86 |
| TOLUENE-D8 (%)            | 95 |



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105879

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
REF I.D. : 10699913

DATE ANALYZED : 06/06/91  
SAMPLE MATRIX : AQUEOUS  
UNITS : UG/L

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP. SPIKED |      | RPD |
|--------------------|--------------|--------|------------------|-----------|-------------|------|-----|
|                    | RESULT       | SPIKED |                  |           | SAMPLE      | REC. |     |
| 1,1-DICHLOROETHENE | <5           | 50     | 47               | 94        | 47          | 94   | 0   |
| TRICHLOROETHENE    | <5           | 50     | 48               | 96        | 51          | 102  | 6   |
| CHLOROBENZENE      | <5           | 50     | 45               | 90        | 46          | 92   | 2   |
| TOLUENE            | <5           | 50     | 45               | 90        | 45          | 90   | 0   |
| BENZENE            | <5           | 50     | 40               | 80        | 40          | 80   | 0   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10587910

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 E 14.0  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/28/91  
DATE ANALYZED : 06/06/91  
UNITS : UG/L  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <5      |
| PHENOL                       | <5      |
| ANILINE                      | <5      |
| BIS(2-CHLOROETHYL) ETHER     | <5      |
| 2-CHLOROPHENOL               | <5      |
| 1,3-DICHLOROBENZENE          | <5      |
| 1,4-DICHLOROBENZENE          | <5      |
| BENZYL ALCOHOL               | <5      |
| 1,2-DICHLOROBENZENE          | <5      |
| 2-METHYLPHENOL               | <5      |
| BIS(2-CHLOROISOPROPYL) ETHER | <5      |
| 4-METHYLPHENOL               | <5      |
| N-NITROSO-DI-N-PROPYLAMINE   | <5      |
| HEXACHLOROETHANE             | <5      |
| NITROBENZENE                 | <5      |
| ISOPHORENE                   | <5      |
| 2-NITROPHENOL                | <5      |
| 2,4-DIMETHYLPHENOL           | <5      |
| BENZOIC ACID                 | <25     |
| BIS(2-CHLOROETHOXY) METHANE  | <5      |
| 2,4-DICHLOROPHENOL           | <5      |
| 1,2,4-TRICHLOROBENZENE       | <5      |
| NAPHTHALENE                  | <5      |
| 4-CHLOROANILINE              | <5      |
| HEXACHLOROBUTADIENE          | <5      |
| 4-CHLORO-3-METHYLPHENOL      | <5      |
| 2-METHYLNAPHTHALENE          | <5      |
| HEXACHLOROCYCLOPENTADIENE    | <5      |
| 2,4,6-TRICHLOROPHENOL        | <5      |
| 2,4,5-TRICHLOROPHENOL        | <25     |
| 2-NITROANILINE               | <25     |
| DIMETHYLPHTHALATE            | <5      |
| ACENAPHTHYLENE               | <5      |
| 3-NITROANINLINE              | <25     |
| ACENAPHTHENE                 | <5      |
| 2,4-DINITROPHENOL            | <25     |
| 4-NITROPHENOL                | <25     |
| 2,4-DINITROTOLUENE           | <5      |
| 2,6-DINITROTOLUENE           | <5      |
| DIETHYLPHTHALATE             | <5      |
| 4-CHLOROPHENYL-PHENYLETHER   | <5      |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <5      |
| 4-NITROANILINE             | <25     |
| 4,6-DINITRO-2-METHYLPHENOL | <25     |
| N-NITROSODIPHENYLAMINE     | <5      |
| 4-BROMOPHENYL-PHENYLETHER  | <5      |
| HEXACHLOROBENZENE          | <5      |
| PENTACHLOROPHENOL          | <25     |
| PHENANTHRENE               | <5      |
| ANTHRACENE                 | <5      |
| DI-N-BUTYLPHTHALATE        | <5      |
| FLUORANTHENE               | <5      |
| BENZIDINE                  | <50     |
| PYRENE                     | <5      |
| BUTYLBENZYLPHTHALATE       | <5      |
| 3,3'-DICHLOOROBENZIDINE    | <10     |
| BENZO(a)ANTHRACENE         | <5      |
| BIS(2-ETHYLHEXYL)PHTHALATE | <5      |
| CHRYSENE                   | <5      |
| BENZO(b)FLUORANTHENE       | <5      |
| BENZO(k)FLUORANTHENE       | <5      |
| BENZO(a)PYRENE             | <5      |
| INDENO(1,2,3-cd)PYRENE     | <5      |
| DIBENZO(a,h)ANTHRACENE     | <5      |
| BENZO(g,h,i)PERYLENE       | <5      |
| 1-CHLORONAPHTHANE          | <5      |
| 2-CHLORONAPHTHANE          | <5      |
| DIBENZO(A,J)ACRIDINE       | <5      |
| DI-N-OCTYLPHTHALATE        | <5      |
| 1,2-DIPHENYLHYDRAZINE      | <5      |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 60 |
| 2-FLUOROBIPHENYL (%)     | 60 |
| TERPHENYL (%)            | 55 |
| PHENOL-D6 (%)            | 50 |
| 2-FLUOROPHENOL (%)       | 52 |
| 2,4,6-TRIBROMOPHENOL (%) | 49 |



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10587910

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 E 14.0  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/28/91  
DATE ANALYZED : 06/06/91  
UNITS : UG/L  
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

|                                 |     |
|---------------------------------|-----|
| ACETOPHENONE                    | <5  |
| a,a-DIMETHYLPHENETHYLAMINE      | <5  |
| 4-AMINOBIIPHENYL                | <5  |
| 2,6-DICHLOROPHENOL              | <5  |
| p-(DIMETHYLAMINO)AZOBENZENE     | <5  |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <5  |
| DIPHENYLAMINE                   | <5  |
| ETHYL METHANESULFONATE          | <5  |
| 3-METHYLCHOLANTHRENE            | <5  |
| METHYL METHANESULFONATE         | <5  |
| 3-METHYLPHENOL (m-CRESOL)       | <5  |
| 1-NAPHTHYLAMINE                 | <5  |
| 2-NAPHTHYLAMINE                 | <5  |
| N-NITROSO-DI-BUTYLAMINE         | <5  |
| N-NITROSOPIPERIDINE             | <5  |
| PENTACHLOROBENZENE              | <5  |
| PENTACHLORONITROBENZENE         | <25 |
| PHENACETIN                      | <5  |
| 2-PICOLINE                      | <5  |
| PRONAMIDE                       | <5  |
| 1,2,4,5-TETRACHLOROBENZENE      | <5  |
| 2,3,4,6-TETRACHLOROPHENOL       | <25 |



## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105879   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/28/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/06/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <5      |
| PHENOL                       | <5      |
| ANILINE                      | <5      |
| BIS(2-CHLOROETHYL) ETHER     | <5      |
| 2-CHLOROPHENOL               | <5      |
| 1,3-DICHLOROBENZENE          | <5      |
| 1,4-DICHLOROBENZENE          | <5      |
| BENZYL ALCOHOL               | <5      |
| 1,2-DICHLOROBENZENE          | <5      |
| 2-METHYLPHENOL               | <5      |
| BIS(2-CHLOROISOPROPYL) ETHER | <5      |
| 4-METHYLPHENOL               | <5      |
| N-NITROSO-DI-N-PROPYLAMINE   | <5      |
| HEXACHLOROETHANE             | <5      |
| NITROBENZENE                 | <5      |
| ISOPHORENE                   | <5      |
| 2-NITROPHENOL                | <5      |
| 2,4-DIMETHYLPHENOL           | <5      |
| BENZOIC ACID                 | <25     |
| BIS(2-CHLOROETHOXY) METHANE  | <5      |
| 2,4-DICHLOROPHENOL           | <5      |
| 1,2,4-TRICHLOROBENZENE       | <5      |
| NAPHTHALENE                  | <5      |
| 4-CHLOROANILINE              | <5      |
| HEXACHLOROBUTADIENE          | <5      |
| 4-CHLORO-3-METHYLPHENOL      | <5      |
| 2-METHYLNAPHTHALENE          | <5      |
| HEXACHLOROCYCLOPENTADIENE    | <5      |
| 2,4,6-TRICHLOROPHENOL        | <5      |
| 2,4,5-TRICHLOROPHENOL        | <25     |
| 2-NITROANILINE               | <25     |
| DIMETHYLPHTHALATE            | <5      |
| ACENAPHTHYLENE               | <5      |
| 3-NITROANINLINE              | <25     |
| ACENAPHTHENE                 | <5      |
| 2,4-DINITROPHENOL            | <25     |
| 4-NITROPHENOL                | <25     |
| 2,4-DINITROTOLUENE           | <5      |
| 2,6-DINITROTOLUENE           | <5      |
| DIETHYLPHTHALATE             | <5      |
| 4-CHLOROPHENYL-PHENYLETHER   | <5      |
| FLUORENE                     | <5      |
| 4-NITROANILINE               | <25     |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| 4,6-DINITRO-2-METHYLPHENOL | <25     |
| N-NITROSODIPHENYLAMINE     | <5      |
| 4-BROMOPHENYL-PHENYLETHER  | <5      |
| HEXACHLOROBENZENE          | <5      |
| PENTACHLOROPHENOL          | <25     |
| PHENANTHRENE               | <5      |
| ANTHRACENE                 | <5      |
| DI-N-BUTYLPHTHALATE        | <5      |
| FLUORANTHENE               | <5      |
| BENZIDINE                  | <50     |
| PYRENE                     | <5      |
| BUTYLBENZYLPHTHALATE       | <5      |
| 3,3'-DICHLOBENZIDINE       | <10     |
| BENZO(a)ANTHRACENE         | <5      |
| BIS(2-ETHYLHEXYL)PHTHALATE | <5      |
| CHRYSENE                   | <5      |
| BENZO(b)FLUORANTHENE       | <5      |
| BENZO(k)FLUORANTHENE       | <5      |
| BENZO(a)PYRENE             | <5      |
| INDENO(1,2,3-cd)PYRENE     | <5      |
| DIBENZO(a,h)ANTHRACENE     | <5      |
| BENZO(g,h,i)PERYLENE       | <5      |
| 1-CHLORONAPHTHANE          | <5      |
| 2-CHLORONAPHTHANE          | <5      |
| DIBENZO(A,J)ACRIDINE       | <5      |
| DI-N-OCTYLPHTHALATE        | <5      |
| 1,2-DIPHENYLHYDRAZINE      | <5      |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 60 |
| 2-FLUOROBIPHENYL (%)     | 56 |
| TERPHENYL (%)            | 54 |
| PHENOL-D6 (%)            | 46 |
| 2-FLUOROPHENOL (%)       | 49 |
| 2,4,6-TRIBROMOPHENOL (%) | 45 |



## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105879  
DATE EXTRACTED : 05/28/91  
DATE ANALYZED : 06/06/91  
UNITS : UG/L  
DILUTION FACTOR : N/A

## COMPOUNDS

## RESULTS

|                                 |     |
|---------------------------------|-----|
| ACETOPHENONE                    | <5  |
| a,a-DIMETHYLPHENETHYLAMINE      | <5  |
| 4-AMINOBIPHENYL                 | <5  |
| 2,6-DICHLOROPHENOL              | <5  |
| p-(DIMETHYLAMINO)AZOBENZENE     | <5  |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <5  |
| DIPHENYLAMINE                   | <5  |
| ETHYL METHANESULFONATE          | <5  |
| 3-METHYLCHOLANTHRENE            | <5  |
| METHYL METHANESULFONATE         | <5  |
| 3-METHYLPHENOL (m-CRESOL)       | <5  |
| 1-NAPHTHYLAMINE                 | <5  |
| 2-NAPHTHYLAMINE                 | <5  |
| N-NITROSO-DI-BUTYLAMINE         | <5  |
| N-NITROSOPIPERIDINE             | <5  |
| PENTACHLOROBENZENE              | <5  |
| PENTACHLORONITROBENZENE         | <25 |
| PHENACETIN                      | <5  |
| 2-PICOLINE                      | <5  |
| PRONAMIDE                       | <5  |
| 1,2,4,5-TETRACHLOROBENZENE      | <5  |
| 2,3,4,6-TETRACHLOROPHENOL       | <25 |



Analytical Technologies, Inc.

## QUALITY CONTROL DATA

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX  
ATI I.D. : 105879CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
REF I.D. : 10699907DATE ANALYZED : 06/07/91  
SAMPLE MATRIX : AQUEOUS  
UNITS : UG/L

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP.             | DUP.      | RPD |
|-----------------------------|--------------|--------|------------------|-----------|------------------|-----------|-----|
|                             | RESULT       | SPIKED |                  |           | SPIKED<br>SAMPLE | %<br>REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <5           | 50     | 30               | 60        | 31               | 62        | 3   |
| ACENAPHTHENE                | <5           | 50     | 30               | 60        | 29               | 58        | 3   |
| 2,4-DINITROTOLUENE          | <5           | 50     | 29               | 58        | 28               | 56        | 4   |
| PYRENE                      | <5           | 50     | 26               | 52        | 25               | 50        | 4   |
| N-NITROSO-DI-N-PROPYL AMINE | <5           | 50     | 36               | 72        | 33               | 66        | 9   |
| 1,4-DICHLOROBENZENE         | <5           | 50     | 29               | 58        | 27               | 54        | 7   |
| PENTACHLOROPHENOL           | <25          | 100    | 92               | 92        | 92               | 92        | 0   |
| PHENOL                      | <5           | 100    | 57               | 57        | 58               | 58        | 2   |
| 2-CHLOROPHENOL              | <5           | 100    | 58               | 58        | 60               | 60        | 3   |
| 4-CHLORO-3-METHYLPHENOL     | <5           | 100    | 62               | 62        | 65               | 65        | 5   |
| 4-NITROPHENOL               | <25          | 100    | 74               | 74        | 72               | 72        | 3   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10587901

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 92  |
| BFB (%)                   | 104 |
| TOLUENE-D8 (%)            | 116 |



## GCMS - RESULTS

ATI I.D. : 10587902

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10587902

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 95  |
| BFB (%)                   | 114 |
| TOLUENE-D8 (%)            | 116 |



## GCMS - RESULTS

ATI I.D. : 10587903

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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## GCMS - RESULTS

ATI I.D. : 10587903

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 91  |
| BFB (%)                   | 115 |
| TOLUENE-D8 (%)            | 110 |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10587904

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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## GCMS - RESULTS

ATI I.D. : 10587904

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 91  |
| BFB (%)                   | 116 |
| TOLUENE-D8 (%)            | 110 |



## GCMS - RESULTS

ATI I.D. : 10587905

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 D 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10587905

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 86  |
| BFB (%)                   | 112 |
| TOLUENE-D8 (%)            | 112 |



Analytical Technologies, Inc.

## GCMS - RESULTS

ATI I.D. : 10587906

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                             |       |
|-----------------------------|-------|
| CHLOROMETHANE               | <0.50 |
| VINYL CHLORIDE              | <0.05 |
| CHLOROETHANE                | <0.05 |
| METHYLENE CHLORIDE          | <0.3  |
| ACETONE                     | <1.0  |
| CARBON DISULFIDE            | <0.5  |
| 1,1-DICHLOROETHENE          | <0.5  |
| 1,1-DICHLOROETHANE          | <0.5  |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5  |
| CHLOROFORM                  | <0.5  |
| 1,2-DICHLOROETHANE          | <0.5  |
| 2-BUTANONE (MEK)            | <0.50 |
| 1,1,1-TRICHLOROETHANE       | <0.5  |
| CARBON TETRACHLORIDE        | <0.5  |
| VINYL ACETATE               | <0.50 |
| BROMODICHLOROMETHANE        | <0.5  |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5  |
| 1,2-DICHLOROPROPANE         | <0.5  |
| TRANS-1,3-DICHLOROPROPENE   | <0.5  |
| TRICHLOROETHENE             | <0.5  |
| DIBROMOCHLOROMETHANE        | <0.5  |
| 1,1,2-TRICHLOROETHANE       | <0.5  |
| BENZENE                     | <0.5  |
| CIS-1,3-DICHLOROPROPENE     | <0.5  |
| BROMOFORM                   | <0.3  |
| 2-HEXANONE (MBK)            | <0.50 |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5  |
| TETRACHLOROETHENE           | <0.5  |
| TOLUENE                     | <0.5  |
| CHLOROBENZENE               | <0.5  |
| ETHYLBENZENE                | <0.5  |
| STYRENE                     | <0.5  |
| TOTAL XYLENES               | <0.5  |
| ACROLEIN                    | <1    |
| ACRYLONITRILE               | <0.50 |
| DIBROMOMETHANE              | <0.5  |
| DICHLORODIFLUOROMETHANE     | <0.5  |
| METHYL IODIDE               | <0.25 |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25 |
| TRICHLOROMONOFUOROMETHANE   | <0.5  |
| 1,2,3-TRICHLOROPROPANE      | <0.5  |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10587906

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 95  |
| BFB (%)                   | 114 |
| TOLUENE-D8 (%)            | 113 |



## GCMS - RESULTS

ATI I.D. : 10587907

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                             |       |
|-----------------------------|-------|
| CHLOROMETHANE               | <0.50 |
| VINYL CHLORIDE              | <0.05 |
| CHLOROETHANE                | <0.05 |
| METHYLENE CHLORIDE          | <0.3  |
| ACETONE                     | <1.0  |
| CARBON DISULFIDE            | <0.5  |
| 1,1-DICHLOROETHENE          | <0.5  |
| 1,1-DICHLOROETHANE          | <0.5  |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5  |
| CHLOROFORM                  | <0.5  |
| 1,2-DICHLOROETHANE          | <0.5  |
| 2-BUTANONE (MEK)            | <0.50 |
| 1,1,1-TRICHLOROETHANE       | <0.5  |
| CARBON TETRACHLORIDE        | <0.5  |
| VINYL ACETATE               | <0.50 |
| BROMODICHLOROMETHANE        | <0.5  |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5  |
| 1,2-DICHLOROPROPANE         | <0.5  |
| TRANS-1,3-DICHLOROPROPENE   | <0.5  |
| TRICHLOROETHENE             | <0.5  |
| DIBROMOCHLOROMETHANE        | <0.5  |
| 1,1,2-TRICHLOROETHANE       | <0.5  |
| BENZENE                     | <0.5  |
| CIS-1,3-DICHLOROPROPENE     | <0.5  |
| BROMOFORM                   | <0.3  |
| 2-HEXANONE (MBK)            | <0.50 |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5  |
| TETRACHLOROETHENE           | <0.5  |
| TOLUENE                     | <0.5  |
| CHLOROBENZENE               | <0.5  |
| ETHYLBENZENE                | <0.5  |
| STYRENE                     | <0.5  |
| TOTAL XYLENES               | <0.5  |
| ACROLEIN                    | <1    |
| ACRYLONITRILE               | <0.50 |
| DIBROMOMETHANE              | <0.5  |
| DICHLORODIFLUOROMETHANE     | <0.5  |
| METHYL IODIDE               | <0.25 |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25 |
| TRICHLOROMONOFUOROMETHANE   | <0.5  |
| 1,2,3-TRICHLOROPROPANE      | <0.5  |

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10587907

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 90  |
| BFB (%)                   | 119 |
| TOLUENE-D8 (%)            | 119 |



## GCMS - RESULTS

ATI-I.D. : 10587908

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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## GCMS - RESULTS

ATI I.D. : 10587908

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| ETHYL METHACRYLATE       | <0.25   |
| ETHANOL                  | <10     |
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 106 |
| BFB (%)                   | 112 |
| TOLUENE-D8 (%)            | 116 |



## GCMS - RESULTS

ATI I.D. : 10587909

## TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/05/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |

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## GCMS - RESULTS

ATI I.D. : 10587909

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| ETHYL METHACRYLATE      | <0.25   |
| ETHANOL                 | <10     |
| BROMOMETHANE            | <1      |
| 2-CHLOROETHYLVINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE   | <0.5    |

## SURROGATE PERCENT RECOVERIES

|                           |    |
|---------------------------|----|
| 1,2-DICHLOROETHANE-D4 (%) | 97 |
| BFB (%)                   | 90 |
| TOLUENE-D8 (%)            | 96 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105879  
DATE EXTRACTED : 05/30/91  
DATE ANALYZED : 06/03/91  
UNITS : MG/KG  
DILUTION FACTOR : N/A

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |
| ETHYL METHACRYLATE          | <0.25   |
| ETHANOL                     | <10     |

(CONTINUED NEXT PAGE)



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GCMS - RESULTS

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ATI I.D. : 105879

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

| COMPOUNDS                | RESULTS |
|--------------------------|---------|
| BROMOMETHANE             | <1      |
| 2-CHLOROETHYL VINYLETHER | <0.5    |
| 1,4-DICHLORO-2-BUTANE    | <0.5    |

SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 94  |
| BFB (%)                   | 109 |
| TOLUENE-D8 (%)            | 119 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105879   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/30/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/05/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : MG/KG    |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| CHLOROMETHANE               | <0.50   |
| VINYL CHLORIDE              | <0.05   |
| CHLOROETHANE                | <0.05   |
| METHYLENE CHLORIDE          | <0.3    |
| ACETONE                     | <1.0    |
| CARBON DISULFIDE            | <0.5    |
| 1,1-DICHLOROETHENE          | <0.5    |
| 1,1-DICHLOROETHANE          | <0.5    |
| 1,2-DICHLOROETHENE (TOTAL)  | <0.5    |
| CHLOROFORM                  | <0.5    |
| 1,2-DICHLOROETHANE          | <0.5    |
| 2-BUTANONE (MEK)            | <0.50   |
| 1,1,1-TRICHLOROETHANE       | <0.5    |
| CARBON TETRACHLORIDE        | <0.5    |
| VINYL ACETATE               | <0.50   |
| BROMODICHLOROMETHANE        | <0.5    |
| 1,1,2,2-TETRACHLOROETHANE   | <0.5    |
| 1,2-DICHLOROPROPANE         | <0.5    |
| TRANS-1,3-DICHLOROPROPENE   | <0.5    |
| TRICHLOROETHENE             | <0.5    |
| DIBROMOCHLOROMETHANE        | <0.5    |
| 1,1,2-TRICHLOROETHANE       | <0.5    |
| BENZENE                     | <0.5    |
| CIS-1,3-DICHLOROPROPENE     | <0.5    |
| BROMOFORM                   | <0.3    |
| 2-HEXANONE (MBK)            | <0.50   |
| 4-METHYL-2-PENTANONE (MIBK) | <0.5    |
| TETRACHLOROETHENE           | <0.5    |
| TOLUENE                     | <0.5    |
| CHLOROBENZENE               | <0.5    |
| ETHYLBENZENE                | <0.5    |
| STYRENE                     | <0.5    |
| TOTAL XYLENES               | <0.5    |
| ACROLEIN                    | <1      |
| ACRYLONITRILE               | <0.50   |
| DIBROMOMETHANE              | <0.5    |
| DICHLORODIFLUOROMETHANE     | <0.5    |
| METHYL IODIDE               | <0.25   |
| TRANS-1,4-DICHLORO-2-BUTENE | <0.25   |
| TRICHLOROMONOFUOROMETHANE   | <0.5    |
| 1,2,3-TRICHLOROPROPANE      | <0.5    |
| ETHYL METHACRYLATE          | <0.25   |
| ETHANOL                     | <10     |

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GCMS - RESULTS

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ATI I.D. : 105879

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

-----  
COMPOUNDS

RESULTS  
-----

|                         |      |
|-------------------------|------|
| BROMOMETHANE            | <1   |
| 2-CHLOROETHYLVINYLETHER | <0.5 |
| 1,4-DICHLORO-2-BUTANE   | <0.5 |

SURROGATE PERCENT RECOVERIES

|                           |    |
|---------------------------|----|
| 1,2-DICHLOROETHANE-D4 (%) | 92 |
| BFB (%)                   | 89 |
| TOLUENE-D8 (%)            | 96 |



Analytical Technologies, Inc.

QUALITY CONTROL DATA

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 105879

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10587909

DATE ANALYZED : 06/05/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED | % SPIKED | DUP.   |      | RPD |
|--------------------|--------------|--------|--------|----------|--------|------|-----|
|                    | RESULT       | SPIKED |        |          | SAMPLE | REC. |     |
| 1,1-DICHLOROETHENE | <0.5         | 2.5    | 2.3    | 92       | 2.5    | 100  | 8   |
| TRICHLOROETHENE    | <0.5         | 2.5    | 2.4    | 96       | 2.4    | 96   | 0   |
| CHLOROBENZENE      | <0.5         | 2.5    | 2.3    | 92       | 2.5    | 100  | 8   |
| TOLUENE            | <0.5         | 2.5    | 2.2    | 88       | 2.4    | 96   | 9   |
| BENZENE            | <0.5         | 2.5    | 2.0    | 80       | 2.2    | 88   | 10  |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10587901

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| N-NITROSODIMETHYLAMINE      | <0.17   |
| PHENOL                      | <0.17   |
| ANILINE                     | <0.17   |
| BIS(2-CHLOROETHYL)ETHER     | <0.17   |
| 2-CHLOROPHENOL              | <0.17   |
| 1,3-DICHLOROBENZENE         | <0.17   |
| 1,4-DICHLOROBENZENE         | <0.17   |
| BENZYL ALCOHOL              | <0.17   |
| 1,2-DICHLOROBENZENE         | <0.17   |
| 2-METHYLPHENOL              | <0.17   |
| BIS(2-CHLOROISOPROPYL)ETHER | <0.17   |
| 4-METHYLPHENOL              | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE  | <0.17   |
| HEXACHLOROETHANE            | <0.17   |
| NITROBENZENE                | <0.17   |
| ISOPHORENE                  | <0.17   |
| 2-NITROPHENOL               | <0.17   |
| 2,4-DIMETHYLPHENOL          | <0.17   |
| BENZOIC ACID                | <0.85   |
| BIS(2-CHLOROETHOXY)METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL          | <0.17   |
| 1,2,4-TRICHLOROBENZENE      | <0.17   |
| NAPHTHALENE                 | <0.17   |
| 4-CHLOROANILINE             | <0.17   |
| HEXACHLOROBUTADIENE         | <0.17   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17   |
| 2-METHYLNAPHTHALENE         | <0.17   |
| HEXACHLOROCYCLOPENTADIENE   | <0.17   |
| 2,4,6-TRICHLOROPHENOL       | <0.17   |
| 2,4,5-TRICHLOROPHENOL       | <0.85   |
| 2-NITROANILINE              | <0.85   |
| DIMETHYLPHTHALATE           | <0.17   |
| ACENAPHTHYLENE              | <0.17   |
| 3-NITROANILINE              | <0.85   |
| ACENAPHTHENE                | <0.17   |
| 2,4-DINITROPHENOL           | <0.85   |
| 4-NITROPHENOL               | <0.85   |
| 2,4-DINITROTOLUENE          | <0.17   |
| 2,6-DINITROTOLUENE          | <0.17   |
| DIETHYLPHTHALATE            | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER  | <0.17   |

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## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 45 |
| 2-FLUOROBIPHENYL (%)     | 69 |
| TERPHENYL (%)            | 60 |
| PHENOL-D6 (%)            | 42 |
| 2-FLUOROPHENOL (%)       | 44 |
| 2,4,6-TRIBROMOPHENOL (%) | 51 |



## GCMS - RESULTS

ATI I.D. : 10587901

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

ATI I.D. : 10587902

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| N-NITROSODIMETHYLAMINE      | <0.17   |
| PHENOL                      | <0.17   |
| ANILINE                     | <0.17   |
| BIS(2-CHLOROETHYL)ETHER     | <0.17   |
| 2-CHLOROPHENOL              | <0.17   |
| 1,3-DICHLOROBENZENE         | <0.17   |
| 1,4-DICHLOROBENZENE         | <0.17   |
| BENZYL ALCOHOL              | <0.17   |
| 1,2-DICHLOROBENZENE         | <0.17   |
| 2-METHYLPHENOL              | <0.17   |
| BIS(2-CHLOROISOPROPYL)ETHER | <0.17   |
| 4-METHYLPHENOL              | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE  | <0.17   |
| HEXACHLOROETHANE            | <0.17   |
| NITROBENZENE                | <0.17   |
| ISOPHORENE                  | <0.17   |
| 2-NITROPHENOL               | <0.17   |
| 2,4-DIMETHYLPHENOL          | <0.17   |
| BENZOIC ACID                | <0.85   |
| BIS(2-CHLOROETHOXY)METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL          | <0.17   |
| 1,2,4-TRICHLOROBENZENE      | <0.17   |
| NAPHTHALENE                 | <0.17   |
| 4-CHLOROANILINE             | <0.17   |
| HEXACHLOROBUTADIENE         | <0.17   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17   |
| 2-METHYLNAPHTHALENE         | <0.17   |
| HEXACHLOROCYCLOPENTADIENE   | <0.17   |
| 2,4,6-TRICHLOROPHENOL       | <0.17   |
| 2,4,5-TRICHLOROPHENOL       | <0.85   |
| 2-NITROANILINE              | <0.85   |
| DIMETHYLPHTHALATE           | <0.17   |
| ACENAPHTHYLENE              | <0.17   |
| 3-NITROANINLINE             | <0.85   |
| ACENAPHTHENE                | <0.17   |
| 2,4-DINITROPHENOL           | <0.85   |
| 4-NITROPHENOL               | <0.85   |
| 2,4-DINITROTOLUENE          | <0.17   |
| 2,6-DINITROTOLUENE          | <0.17   |
| DIETHYLPHTHALATE            | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER  | <0.17   |

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## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 54 |
| 2-FLUOROBIPHENYL (%)     | 52 |
| TERPHENYL (%)            | 47 |
| PHENOL-D6 (%)            | 49 |
| 2-FLUOROPHENOL (%)       | 47 |
| 2,4,6-TRIBROMOPHENOL (%) | 44 |



## GCMS - RESULTS

ATI I.D. : 10587902

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10587903

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/22/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/23/91 |
| PROJECT NAME  | : PHASE II RFI       | DATE EXTRACTED  | : 05/31/91 |
| CLIENT I.D.   | : RFI 0105 V 11.0    | DATE ANALYZED   | : 06/06/91 |
| SAMPLE MATRIX | : SOIL               | UNITS           | : MG/KG    |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | 0.21  |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE.            | <0.17 |
| 4-CHLOROPHENYL-PHENYLEETHER  | <0.17 |

(CONTINUED NEXT PAGE)



## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 52 |
| 2-FLUOROBIPHENYL (%)     | 51 |
| TERPHENYL (%)            | 50 |
| PHENOL-D6 (%)            | 47 |
| 2-FLUOROPHENOL (%)       | 46 |
| 2,4,6-TRIBROMOPHENOL (%) | 45 |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10587903

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

### COMPOUNDS

### RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10587904

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| N-NITROSODIMETHYLAMINE      | <0.17   |
| PHENOL                      | <0.17   |
| ANILINE                     | <0.17   |
| BIS(2-CHLOROETHYL)ETHER     | <0.17   |
| 2-CHLOROPHENOL              | <0.17   |
| 1,3-DICHLOROBENZENE         | <0.17   |
| 1,4-DICHLOROBENZENE         | <0.17   |
| BENZYL ALCOHOL              | <0.17   |
| 1,2-DICHLOROBENZENE         | <0.17   |
| 2-METHYLPHENOL              | <0.17   |
| BIS(2-CHLOROISOPROPYL)ETHER | <0.17   |
| 4-METHYLPHENOL              | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE  | <0.17   |
| HEXACHLOROETHANE            | <0.17   |
| NITROBENZENE                | <0.17   |
| ISOPHORENE                  | <0.17   |
| 2-NITROPHENOL               | <0.17   |
| 2,4-DIMETHYLPHENOL          | <0.17   |
| BENZOIC ACID                | <0.85   |
| BIS(2-CHLOROETHOXY)METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL          | <0.17   |
| 1,2,4-TRICHLOROBENZENE      | <0.17   |
| NAPHTHALENE                 | <0.17   |
| 4-CHLOROANILINE             | <0.17   |
| HEXACHLOROBUTADIENE         | <0.17   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17   |
| 2-METHYLNAPHTHALENE         | <0.17   |
| HEXACHLOROCYCLOPENTADIENE   | <0.17   |
| 2,4,6-TRICHLOROPHENOL       | <0.17   |
| 2,4,5-TRICHLOROPHENOL       | <0.85   |
| 2-NITROANILINE              | <0.85   |
| DIMETHYLPHTHALATE           | <0.17   |
| ACENAPHTHYLENE              | <0.17   |
| 3-NITROANINLINE             | <0.85   |
| ACENAPHTHENE                | <0.17   |
| 2,4-DINITROPHENOL           | <0.85   |
| 4-NITROPHENOL               | <0.85   |
| 2,4-DINITROTOLUENE          | <0.17   |
| 2,6-DINITROTOLUENE          | <0.17   |
| DIETHYLPHTHALATE            | <0.17   |
| 4-CHLOROPHENYL-PHENYLEETHER | <0.17   |



## GCMS - RESULTS

ATI I.D. : 10587904

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 52 |
| 2-FLUOROBIPHENYL (%)     | 52 |
| TERPHENYL (%)            | 50 |
| PHENOL-D6 (%)            | 50 |
| 2-FLUOROPHENOL (%)       | 52 |
| 2,4,6-TRIBROMOPHENOL (%) | 49 |



## GCMS - RESULTS

ATI I.D. : 10587904

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 V 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

ATI I.D. : 10587905

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 D 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                   | RESULTS |
|-----------------------------|---------|
| N-NITROSODIMETHYLAMINE      | <0.17   |
| PHENOL                      | <0.17   |
| ANILINE                     | <0.17   |
| BIS(2-CHLOROETHYL)ETHER     | <0.17   |
| 2-CHLOROPHENOL              | <0.17   |
| 1,3-DICHLOROBENZENE         | <0.17   |
| 1,4-DICHLOROBENZENE         | <0.17   |
| BENZYL ALCOHOL              | <0.17   |
| 1,2-DICHLOROBENZENE         | <0.17   |
| 2-METHYLPHENOL              | <0.17   |
| BIS(2-CHLOROISOPROPYL)ETHER | <0.17   |
| 4-METHYLPHENOL              | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE  | <0.17   |
| HEXACHLOROETHANE            | <0.17   |
| NITROBENZENE                | <0.17   |
| ISOPHORENE                  | <0.17   |
| 2-NITROPHENOL               | <0.17   |
| 2,4-DIMETHYLPHENOL          | <0.17   |
| BENZOIC ACID                | <0.85   |
| BIS(2-CHLOROETHOXY)METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL          | <0.17   |
| 1,2,4-TRICHLOROBENZENE      | <0.17   |
| NAPHTHALENE                 | <0.17   |
| 4-CHLOROANILINE             | <0.17   |
| HEXACHLOROBUTADIENE         | <0.17   |
| 4-CHLORO-3-METHYLPHENOL     | <0.17   |
| 2-METHYLNAPHTHALENE         | 0.33    |
| HEXACHLOROCYCLOPENTADIENE   | <0.17   |
| 2,4,6-TRICHLOROPHENOL       | <0.17   |
| 2,4,5-TRICHLOROPHENOL       | <0.85   |
| 2-NITROANILINE              | <0.85   |
| DIMETHYLPHTHALATE           | <0.17   |
| ACENAPHTHYLENE              | <0.17   |
| 3-NITROANINLINE             | <0.85   |
| ACENAPHTHENE                | <0.17   |
| 2,4-DINITROPHENOL           | <0.85   |
| 4-NITROPHENOL               | <0.85   |
| 2,4-DINITROTOLUENE          | <0.17   |
| 2,6-DINITROTOLUENE          | <0.17   |
| DIETHYLPHTHALATE            | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER  | <0.17   |

(CONTINUED NEXT PAGE)



TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 49 |
| 2-FLUOROBIPHENYL (%)     | 48 |
| TERPHENYL (%)            | 46 |
| PHENOL-D6 (%)            | 46 |
| 2-FLUOROPHENOL (%)       | 49 |
| 2,4,6-TRIBROMOPHENOL (%) | 46 |



## GCMS - RESULTS

ATI I.D. : 10587905

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0105 D 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

ATI I.D. : 10587906

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

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## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOOROBENZIDINE    | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 51 |
| 2-FLUOROBIPHENYL (%)     | 51 |
| TERPHENYL (%)            | 47 |
| PHENOL-D6 (%)            | 45 |
| 2-FLUOROPHENOL (%)       | 46 |
| 2,4,6-TRIBROMOPHENOL (%) | 45 |



## GCMS - RESULTS

ATI I.D. : 10587906

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 4.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIHENYL                  | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

ATI I.D. : 10587907

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 10

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <1.7    |
| PHENOL                       | <1.7    |
| ANILINE                      | <1.7    |
| BIS(2-CHLOROETHYL) ETHER     | <1.7    |
| 2-CHLOROPHENOL               | <1.7    |
| 1,3-DICHLOROBENZENE          | <1.7    |
| 1,4-DICHLOROBENZENE          | <1.7    |
| BENZYL ALCOHOL               | <1.7    |
| 1,2-DICHLOROBENZENE          | <1.7    |
| 2-METHYLPHENOL               | <1.7    |
| BIS(2-CHLOROISOPROPYL) ETHER | <1.7    |
| 4-METHYLPHENOL               | <1.7    |
| N-NITROSO-DI-N-PROPYLAMINE   | <1.7    |
| HEXACHLOROETHANE             | <1.7    |
| NITROBENZENE                 | <1.7    |
| ISOPHORENE                   | <1.7    |
| 2-NITROPHENOL                | <1.7    |
| 2,4-DIMETHYLPHENOL           | <1.7    |
| BENZOIC ACID                 | <8.5    |
| BIS(2-CHLOROETHOXY) METHANE  | <1.7    |
| 2,4-DICHLOROPHENOL           | <1.7    |
| 1,2,4-TRICHLOROBENZENE       | <1.7    |
| NAPHTHALENE                  | <1.7    |
| 4-CHLOROANILINE              | <1.7    |
| HEXACHLOROBUTADIENE          | <1.7    |
| 4-CHLORO-3-METHYLPHENOL      | <1.7    |
| 2-METHYLNAPHTHALENE          | <1.7    |
| HEXACHLOROCYCLOPENTADIENE    | <1.7    |
| 2,4,6-TRICHLOROPHENOL        | <1.7    |
| 2,4,5-TRICHLOROPHENOL        | <8.5    |
| 2-NITROANILINE               | <8.5    |
| DIMETHYLPHTHALATE            | <1.7    |
| ACENAPHTHYLENE               | <1.7    |
| 3-NITROANINLINE              | <8.5    |
| ACENAPHTHENE                 | <1.7    |
| 2,4-DINITROPHENOL            | <8.5    |
| 4-NITROPHENOL                | <8.5    |
| 2,4-DINITROTOLUENE           | <1.7    |
| 2,6-DINITROTOLUENE           | <1.7    |
| DIETHYLPHTHALATE             | <1.7    |
| 4-CHLOROPHENYL-PHENYLETHER   | <1.7    |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <1.7    |
| 4-NITROANILINE             | <8.5    |
| 4,6-DINITRO-2-METHYLPHENOL | <8.5    |
| N-NITROSODIPHENYLAMINE     | <1.7    |
| 4-BROMOPHENYL-PHENYLETHER  | <1.7    |
| HEXACHLOROBENZENE          | <1.7    |
| PENTACHLOROPHENOL          | <8.5    |
| PHENANTHRENE               | <1.7    |
| ANTHRACENE                 | <1.7    |
| DI-N-BUTYLPHTHALATE        | <1.7    |
| FLUORANTHENE               | <1.7    |
| BENZIDINE                  | <1.7    |
| PYRENE                     | <1.7    |
| BUTYLBENZYLPHTHALATE       | <1.7    |
| 3,3'-DICHLOROBENZIDINE     | <3.4    |
| BENZO(a)ANTHRACENE         | <1.7    |
| BIS(2-ETHYLHEXYL)PHTHALATE | <1.7    |
| CHRYSENE                   | <1.7    |
| BENZO(b)FLUORANTHENE       | <1.7    |
| BENZO(k)FLUORANTHENE       | <1.7    |
| BENZO(a)PYRENE             | <1.7    |
| INDENO(1,2,3-cd)PYRENE     | <1.7    |
| DIBENZO(a,h)ANTHRACENE     | <1.7    |
| BENZO(g,h,i)PERYLENE       | <1.7    |
| 1-CHLORONAPHTHANE          | <1.7    |
| 2-CHLORONAPHTHANE          | <1.7    |
| DIBENZO(A,J)ACRIDINE       | <1.7    |
| DI-N-OCTYLPHTHALATE        | <1.7    |
| 1,2-DIPHENYLHYDRAZINE      | <1.7    |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 45 |
| 2-FLUOROBIPHENYL (%)     | 58 |
| TERPHENYL (%)            | 56 |
| PHENOL-D6 (%)            | 33 |
| 2-FLUOROPHENOL (%)       | 40 |
| 2,4,6-TRIBROMOPHENOL (%) | 36 |



## GCMS - RESULTS

ATI I.D. : 10587907

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 9.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10587908

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                    | RESULTS |
|------------------------------|---------|
| N-NITROSODIMETHYLAMINE       | <0.17   |
| PHENOL                       | <0.17   |
| ANILINE                      | <0.17   |
| BIS(2-CHLOROETHYL) ETHER     | <0.17   |
| 2-CHLOROPHENOL               | <0.17   |
| 1,3-DICHLOROBENZENE          | <0.17   |
| 1,4-DICHLOROBENZENE          | <0.17   |
| BENZYL ALCOHOL               | <0.17   |
| 1,2-DICHLOROBENZENE          | <0.17   |
| 2-METHYLPHENOL               | <0.17   |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17   |
| 4-METHYLPHENOL               | <0.17   |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17   |
| HEXACHLOROETHANE             | <0.17   |
| NITROBENZENE                 | <0.17   |
| ISOPHORENE                   | <0.17   |
| 2-NITROPHENOL                | <0.17   |
| 2,4-DIMETHYLPHENOL           | <0.17   |
| BENZOIC ACID                 | <0.85   |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17   |
| 2,4-DICHLOROPHENOL           | <0.17   |
| 1,2,4-TRICHLOROBENZENE       | <0.17   |
| NAPHTHALENE                  | <0.17   |
| 4-CHLOROANILINE              | <0.17   |
| HEXACHLOROBUTADIENE          | <0.17   |
| 4-CHLORO-3-METHYLPHENOL      | <0.17   |
| 2-METHYLNAPHTHALENE          | <0.17   |
| HEXACHLOROCYCLOPENTADIENE    | <0.17   |
| 2,4,6-TRICHLOROPHENOL        | <0.17   |
| 2,4,5-TRICHLOROPHENOL        | <0.85   |
| 2-NITROANILINE               | <0.85   |
| DIMETHYLPHTHALATE            | <0.17   |
| ACENAPHTHYLENE               | <0.17   |
| 3-NITROANINLINE              | <0.85   |
| ACENAPHTHENE                 | <0.17   |
| 2,4-DINITROPHENOL            | <0.85   |
| 4-NITROPHENOL                | <0.85   |
| 2,4-DINITROTOLUENE           | <0.17   |
| 2,6-DINITROTOLUENE           | <0.17   |
| DIETHYLPHTHALATE             | <0.17   |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17   |

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | <0.17   |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 50 |
| 2-FLUOROBIPHENYL (%)     | 52 |
| TERPHENYL (%)            | 44 |
| PHENOL-D6 (%)            | 46 |
| 2-FLUOROPHENOL (%)       | 47 |
| 2,4,6-TRIBROMOPHENOL (%) | 39 |



## GCMS - RESULTS

ATI I.D. : 10587908

## TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 11.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

| COMPOUNDS                       | RESULTS |
|---------------------------------|---------|
| ACETOPHENONE                    | <0.17   |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17   |
| 4-AMINOBIIPHENYL                | <0.17   |
| 2,6-DICHLOROPHENOL              | <0.17   |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17   |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17   |
| DIPHENYLAMINE                   | <0.17   |
| ETHYL METHANESULFONATE          | <0.17   |
| 3-METHYLCHOLANTHRENE            | <0.17   |
| METHYL METHANESULFONATE         | <0.17   |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17   |
| 1-NAPHTHYLAMINE                 | <0.17   |
| 2-NAPHTHYLAMINE                 | <0.17   |
| N-NITROSO-DI-BUTYLAMINE         | <0.17   |
| N-NITROSOPIPERIDINE             | <0.17   |
| PENTACHLOROBENZENE              | <0.17   |
| PENTACHLORONITROBENZENE         | <0.85   |
| PHENACETIN                      | <0.17   |
| 2-PICOLINE                      | <0.17   |
| PRONAMIDE                       | <0.17   |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17   |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85   |



## GCMS - RESULTS

ATI I.D. : 10587909

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : .1

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COMPOUNDS RESULTS

---

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY)METHANE   | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANINLINE              | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |

(CONTINUED NEXT PAGE)



TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| FLUORENE                   | <0.17   |
| 4-NITROANILINE             | <0.85   |
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLEETHER | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | 0.26    |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOOROBENZIDINE    | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

## SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 55 |
| 2-FLUOROBIPHENYL (%)     | 55 |
| TERPHENYL (%)            | 48 |
| PHENOL-D6 (%)            | 49 |
| 2-FLUOROPHENOL (%)       | 52 |
| 2,4,6-TRIBROMOPHENOL (%) | 43 |



Analytical Technologies, Inc.

# GCMS - RESULTS

ATI I.D. : 10587909

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING.CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : RFI 0106 A 14.0  
SAMPLE MATRIX : SOIL

DATE SAMPLED : 05/22/91  
DATE RECEIVED : 05/23/91  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : PHASE II RFI  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 105879  
DATE EXTRACTED : 05/31/91  
DATE ANALYZED : 06/06/91  
UNITS : MG/KG  
DILUTION FACTOR : N/A

---

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

---

|                              |       |
|------------------------------|-------|
| N-NITROSODIMETHYLAMINE       | <0.17 |
| PHENOL                       | <0.17 |
| ANILINE                      | <0.17 |
| BIS(2-CHLOROETHYL) ETHER     | <0.17 |
| 2-CHLOROPHENOL               | <0.17 |
| 1,3-DICHLOROBENZENE          | <0.17 |
| 1,4-DICHLOROBENZENE          | <0.17 |
| BENZYL ALCOHOL               | <0.17 |
| 1,2-DICHLOROBENZENE          | <0.17 |
| 2-METHYLPHENOL               | <0.17 |
| BIS(2-CHLOROISOPROPYL) ETHER | <0.17 |
| 4-METHYLPHENOL               | <0.17 |
| N-NITROSO-DI-N-PROPYLAMINE   | <0.17 |
| HEXACHLOROETHANE             | <0.17 |
| NITROBENZENE                 | <0.17 |
| ISOPHORENE                   | <0.17 |
| 2-NITROPHENOL                | <0.17 |
| 2,4-DIMETHYLPHENOL           | <0.17 |
| BENZOIC ACID                 | <0.85 |
| BIS(2-CHLOROETHOXY) METHANE  | <0.17 |
| 2,4-DICHLOROPHENOL           | <0.17 |
| 1,2,4-TRICHLOROBENZENE       | <0.17 |
| NAPHTHALENE                  | <0.17 |
| 4-CHLOROANILINE              | <0.17 |
| HEXACHLOROBUTADIENE          | <0.17 |
| 4-CHLORO-3-METHYLPHENOL      | <0.17 |
| 2-METHYLNAPHTHALENE          | <0.17 |
| HEXACHLOROCYCLOPENTADIENE    | <0.17 |
| 2,4,6-TRICHLOROPHENOL        | <0.17 |
| 2,4,5-TRICHLOROPHENOL        | <0.85 |
| 2-NITROANILINE               | <0.85 |
| DIMETHYLPHTHALATE            | <0.17 |
| ACENAPHTHYLENE               | <0.17 |
| 3-NITROANILINE               | <0.85 |
| ACENAPHTHENE                 | <0.17 |
| 2,4-DINITROPHENOL            | <0.85 |
| 4-NITROPHENOL                | <0.85 |
| 2,4-DINITROTOLUENE           | <0.17 |
| 2,6-DINITROTOLUENE           | <0.17 |
| DIETHYLPHTHALATE             | <0.17 |
| 4-CHLOROPHENYL-PHENYLETHER   | <0.17 |
| FLUORENE                     | <0.17 |
| 4-NITROANILINE               | <0.85 |

(CONTINUED. NEXT PAGE.)



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 105879

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

| COMPOUNDS                  | RESULTS |
|----------------------------|---------|
| 4,6-DINITRO-2-METHYLPHENOL | <0.85   |
| N-NITROSODIPHENYLAMINE     | <0.17   |
| 4-BROMOPHENYL-PHENYLETHER  | <0.17   |
| HEXACHLOROBENZENE          | <0.17   |
| PENTACHLOROPHENOL          | <0.85   |
| PHENANTHRENE               | <0.17   |
| ANTHRACENE                 | <0.17   |
| DI-N-BUTYLPHTHALATE        | 0.08    |
| FLUORANTHENE               | <0.17   |
| BENZIDINE                  | <0.17   |
| PYRENE                     | <0.17   |
| BUTYLBENZYLPHTHALATE       | <0.17   |
| 3,3'-DICHLOROBENZIDINE     | <0.34   |
| BENZO(a)ANTHRACENE         | <0.17   |
| BIS(2-ETHYLHEXYL)PHTHALATE | <0.17   |
| CHRYSENE                   | <0.17   |
| BENZO(b)FLUORANTHENE       | <0.17   |
| BENZO(k)FLUORANTHENE       | <0.17   |
| BENZO(a)PYRENE             | <0.17   |
| INDENO(1,2,3-cd)PYRENE     | <0.17   |
| DIBENZO(a,h)ANTHRACENE     | <0.17   |
| BENZO(g,h,i)PERYLENE       | <0.17   |
| 1-CHLORONAPHTHANE          | <0.17   |
| 2-CHLORONAPHTHANE          | <0.17   |
| DIBENZO(A,J)ACRIDINE       | <0.17   |
| DI-N-OCTYLPHTHALATE        | <0.17   |
| 1,2-DIPHENYLHYDRAZINE      | <0.17   |

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 55 |
| 2-FLUOROBIPHENYL (%)     | 55 |
| TERPHENYL (%)            | 46 |
| PHENOL-D6 (%)            | 48 |
| 2-FLUOROPHENOL (%)       | 48 |
| 2,4,6-TRIBROMOPHENOL (%) | 38 |



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105879   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/31/91 |
| PROJECT NAME | : PHASE II RFI       | DATE ANALYZED   | : 06/06/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : MG/KG    |
|              |                      | DILUTION FACTOR | : N/A      |

COMPOUNDS

RESULTS

|                                 |       |
|---------------------------------|-------|
| ACETOPHENONE                    | <0.17 |
| a,a-DIMETHYLPHENETHYLAMINE      | <0.17 |
| 4-AMINOBIIPHENYL                | <0.17 |
| 2,6-DICHLOROPHENOL              | <0.17 |
| p-(DIMETHYLAMINO)AZOBENZENE     | <0.17 |
| 7,12-DIMETHYLBENZO(a)ANTHRACENE | <0.17 |
| DIPHENYLAMINE                   | <0.17 |
| ETHYL METHANESULFONATE          | <0.17 |
| 3-METHYLCHOLANTHRENE            | <0.17 |
| METHYL METHANESULFONATE         | <0.17 |
| 3-METHYLPHENOL (m-CRESOL)       | <0.17 |
| 1-NAPHTHYLAMINE                 | <0.17 |
| 2-NAPHTHYLAMINE                 | <0.17 |
| N-NITROSO-DI-BUTYLAMINE         | <0.17 |
| N-NITROSOPIPERIDINE             | <0.17 |
| PENTACHLOROBENZENE              | <0.17 |
| PENTACHLORONITROBENZENE         | <0.85 |
| PHENACETIN                      | <0.17 |
| 2-PICOLINE                      | <0.17 |
| PRONAMIDE                       | <0.17 |
| 1,2,4,5-TETRACHLOROBENZENE      | <0.17 |
| 2,3,4,6-TETRACHLOROPHENOL       | <0.85 |



Analytical Technologies, Inc.

## QUALITY CONTROL DATA

ATI I.D. : 105879

TEST : SEMI-VOLATILE ORGANICS (EPA 8270) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : PHASE II RFI

REF I.D. : 10587906

DATE ANALYZED : 06/06/91

SAMPLE MATRIX : SOIL

UNITS : MG/KG

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>RESULT | SPIKED<br>SAMPLE | %<br>REC. | DUP.   | DUP.           | RPD |
|-----------------------------|--------------|--------|------------------|------------------|-----------|--------|----------------|-----|
|                             | RESULT       | SPIKED |                  |                  |           | SAMPLE | SPIKED<br>REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <0.17        | 1.7    | 1.1              | 65               | 1.1       | 65     | 0              |     |
| ACENAPHTHENE                | <0.17        | 1.7    | 1.1              | 65               | 1.0       | 59     | 10             |     |
| 2,4-DINITROTOLUENE          | <0.17        | 1.7    | 1.0              | 59               | 1.0       | 59     | 0              |     |
| PYRENE                      | <0.17        | 1.7    | 0.9              | 53               | 0.9       | 53     | 0              |     |
| N-NITROSO-DI-N-PROPYL AMINE | <0.17        | 1.7    | 1.2              | 71               | 1.2       | 71     | 0              |     |
| 1,4-DICHLOROBENZENE         | <0.17        | 1.7    | 1.0              | 59               | 1.0       | 59     | 0              |     |
| PENTACHLOROPHENOL           | <0.85        | 3.3    | 3.0              | 91               | 3.1       | 94     | 3              |     |
| PHENOL                      | <0.17        | 3.3    | 2.2              | 67               | 2.2       | 67     | 0              |     |
| 2-CHLOROPHENOL              | <0.17        | 3.3    | 2.2              | 67               | 2.2       | 67     | 0              |     |
| 4-CHLORO-3-METHYLPHENOL     | <0.17        | 3.3    | 2.4              | 73               | 2.2       | 67     | 9              |     |
| 4-NITROPHENOL               | <0.85        | 3.3    | 2.6              | 79               | 2.7       | 82     | 4              |     |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.  
Phoenix, Arizona

# Chain of Custody

DATE 5-22-91 PAGE 1 OF 2

| PROJECT MANAGER: C. ROSENDALE     |  |  |  | ANALYSIS REQUEST |         |        |        |  |  |  |  |  |  |  |  |  |  | RELINQUISHED BY: 1.    |  |  |  | RELINQUISHED BY: 2.    |  |  |  | RELINQUISHED BY: 3.    |  |  |  |
|-----------------------------------|--|--|--|------------------|---------|--------|--------|--|--|--|--|--|--|--|--|--|--|------------------------|--|--|--|------------------------|--|--|--|------------------------|--|--|--|
| COMPANY: GIANT REFINING CO        |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  |
| ADDRESS: Rt 3 Box 7               |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  |
| GALLUP, NM 87301                  |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  |
| BILL TO: SAME                     |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Company: [Company]     |  |  |  | Company: [Company]     |  |  |  | Company: [Company]     |  |  |  |
| COMPANY: SAME                     |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | RECEIVED BY: 1.        |  |  |  | RECEIVED BY: 2.        |  |  |  | RECEIVED BY: (LAB)     |  |  |  |
| ADDRESS: [Address]                |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  |
| PHONE NUMBER: (505) 772-0227      |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  |
| SAMPLERS: (Signature) [Signature] |  |  |  |                  |         |        |        |  |  |  |  |  |  |  |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  |
| SAMPLE ID                         |  |  |  | DATE             | TIME    | MATRIX | LAB ID |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0105V4.0                       |  |  |  | 5-22-91          | 10:30AM | SOIL   | 1      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0105V9.0                       |  |  |  | 5-22-91          | 10:45AM | SOIL   | 2      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0105V11.0                      |  |  |  | 5-22-91          | 10:57AM | SOIL   | 3      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0105V14.0                      |  |  |  | 5-22-91          | 11:25AM | SOIL   | 4      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0105V14.0                      |  |  |  | 5-22-91          | 11:25AM | SOIL   | 5      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0106A4.0                       |  |  |  | 5-22-91          | 12:40PM | SOIL   | 6      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0106A9.0                       |  |  |  | 5-22-91          | 12:55PM | SOIL   | 7      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0106A11.0                      |  |  |  | 5-22-91          | 1:25PM  | SOIL   | 8      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |
| RFE0106A14.0                      |  |  |  | 5-22-91          | 2:00PM  | SOIL   | 9      |  |  |  |  |  |  |  |  |  |  |                        |  |  |  |                        |  |  |  |                        |  |  |  |

| PROJECT INFORMATION                                                     |  |  |  | SAMPLE RECEIPT                                                                                                             |  |  |  |
|-------------------------------------------------------------------------|--|--|--|----------------------------------------------------------------------------------------------------------------------------|--|--|--|
| PROJECT NO: [Project No]                                                |  |  |  | TOTAL NO. OF CONTAINERS: 27                                                                                                |  |  |  |
| PROJECT NAME: PHASE II RFI                                              |  |  |  | CHAIN OF CUSTODY SEALS: Y                                                                                                  |  |  |  |
| P.O. NO. 01909                                                          |  |  |  | INTACT?: Y                                                                                                                 |  |  |  |
| SHIPPED VIA: FED EXPRESS                                                |  |  |  | RECEIVED GOOD COND./COLD: Y                                                                                                |  |  |  |
| SAMPLE DISPOSAL INSTRUCTIONS                                            |  |  |  | LAB NUMBER: 105879                                                                                                         |  |  |  |
| <input checked="" type="checkbox"/> ATI <input type="checkbox"/> RETURN |  |  |  |                                                                                                                            |  |  |  |
| PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS                       |  |  |  |                                                                                                                            |  |  |  |
| TAT: (NORMAL) X                                                         |  |  |  | (RUSH) <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 72 <input type="checkbox"/> 1 WEEK |  |  |  |
| Comments: SEE ATTACHED LIST FOR PARAMETERS                              |  |  |  |                                                                                                                            |  |  |  |

| RELINQUISHED BY: 1.    |  |  |  | RELINQUISHED BY: 2.    |  |  |  | RELINQUISHED BY: 3.    |  |  |  |
|------------------------|--|--|--|------------------------|--|--|--|------------------------|--|--|--|
| Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  |
| Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  |
| Date: [Date]           |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  |
| Company: [Company]     |  |  |  | Company: [Company]     |  |  |  | Company: [Company]     |  |  |  |

| RELINQUISHED BY: 1.    |  |  |  | RELINQUISHED BY: 2.    |  |  |  | RELINQUISHED BY: 3.    |  |  |  |
|------------------------|--|--|--|------------------------|--|--|--|------------------------|--|--|--|
| Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  |
| Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  |
| Date: [Date]           |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  |
| Company: [Company]     |  |  |  | Company: [Company]     |  |  |  | Company: [Company]     |  |  |  |

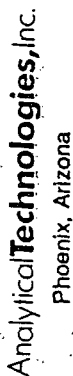
  

| RELINQUISHED BY: 1.    |  |  |  | RELINQUISHED BY: 2.    |  |  |  | RELINQUISHED BY: 3.    |  |  |  |
|------------------------|--|--|--|------------------------|--|--|--|------------------------|--|--|--|
| Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  | Signature: [Signature] |  |  |  |
| Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  | Printed Name: [Name]   |  |  |  |
| Date: [Date]           |  |  |  | Date: [Date]           |  |  |  | Date: [Date]           |  |  |  |
| Company: [Company]     |  |  |  | Company: [Company]     |  |  |  | Company: [Company]     |  |  |  |

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. - Pink - ORIGINATOR

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 438-1530 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

SEE ATTACHED LIST FOR PARAMETERS



# Chain of Custody

DATE 5-22-91 PAGE 2 OF 2

|                                                                                                                                                                    |  |                                        |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------|--|
| <b>ANALYSIS REQUEST</b>                                                                                                                                            |  |                                        |  |
| PROJECT MANAGER: <u>C. ROSENDALE</u>                                                                                                                               |  |                                        |  |
| COMPANY: <u>GIANT REFINING CO</u><br>ADDRESS: <u>RT 3 BOX 7</u><br><u>GALLUP, NM 87301</u><br>BILL TO: <u>SAME</u><br>COMPANY: <u>SAME</u><br>ADDRESS: <u>SAME</u> |  |                                        |  |
| SAMPLE ID: <u>REF0106E14.0</u><br><u>TRIP BLANK</u>                                                                                                                |  | DATE: <u>5-22-91</u><br><u>5-22-91</u> |  |
| MATRIX: <u>WATER</u><br><u>WATER</u>                                                                                                                               |  | TIME: <u>2:05PM</u><br><u>2:05PM</u>   |  |
| LAB ID: <u>10</u><br><u>11</u>                                                                                                                                     |  | PHONE NUMBER: <u>505 722-0227</u>      |  |
| ANALYSIS REQUEST (SEE ATTACHED LIST)                                                                                                                               |  |                                        |  |
| The 13 Priority Pollutant Metals                                                                                                                                   |  |                                        |  |
| The 8 EP Tox Metals by EP Tox Prep. (1310)                                                                                                                         |  |                                        |  |
| The 8 EP Tox Metals by Total Digestion                                                                                                                             |  |                                        |  |
| The 8 EP Tox Metals by TCLP (1311)                                                                                                                                 |  |                                        |  |
| BACKGROUNDMETALS                                                                                                                                                   |  |                                        |  |
| (SEE ATTACHED LIST)                                                                                                                                                |  |                                        |  |
| NUMBER OF CONTAINERS                                                                                                                                               |  |                                        |  |

|                                                                                   |  |                                                                                                                            |  |
|-----------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------|--|
| PROJECT INFORMATION                                                               |  | SAMPLE RECEIPT                                                                                                             |  |
| PROJECT NO: <u>7</u>                                                              |  | TOTAL NO. OF CONTAINERS: <u>7</u>                                                                                          |  |
| PROJECT NAME: <u>PHASE II RFE</u>                                                 |  | CHAIN OF CUSTODY SEALS: <u>Y</u>                                                                                           |  |
| P.O. NO. <u>01909</u>                                                             |  | INTACT?: <u>Y</u>                                                                                                          |  |
| SHIPPED VIA: <u>FED EXPRESS</u>                                                   |  | RECEIVED GOOD COND./COLD: <u>Y</u>                                                                                         |  |
| SAMPLE DISPOSAL INSTRUCTIONS: <u>ATI</u>                                          |  | LAB NUMBER: <u>105879</u>                                                                                                  |  |
| PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS                                 |  | (RUSH) <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 72 <input type="checkbox"/> 1 WEEK |  |
| TAT: (NORMAL) <input checked="" type="checkbox"/> (RUSH) <input type="checkbox"/> |  | COMMENTS: <u>SEE ATTACHED LIST FOR PARAMETERS</u>                                                                          |  |

|                                                                       |  |                                                                        |  |
|-----------------------------------------------------------------------|--|------------------------------------------------------------------------|--|
| RELINQUISHED BY: 1. Signature: <u>[Signature]</u> Time: <u>2:30PM</u> |  | RELINQUISHED BY: 2. Signature: _____ Time: _____                       |  |
| Printed Name: <u>LYNN SLEETER</u> Date: <u>5-22-91</u>                |  | Printed Name: _____ Date: _____                                        |  |
| Company: <u>GIANT REFINING CO</u>                                     |  | Company: _____                                                         |  |
| RECEIVED BY: 1. Signature: _____ Time: _____                          |  | RECEIVED BY: (LAB) 3. Signature: <u>[Signature]</u> Time: <u>10:30</u> |  |
| Printed Name: _____ Date: _____                                       |  | Printed Name: <u>Linda Eschelman</u> Date: <u>5/23/91</u>              |  |
| Company: _____                                                        |  | Company: <u>Analytical Technologies, Inc.</u>                          |  |

TABLE -1  
BACKGROUND METALS

Total Metals

| <u>Parameter</u> | <u>Analytical Method</u> | <u>Reporting Limit mg/kg</u> |
|------------------|--------------------------|------------------------------|
| Antimony         | 6010                     | 6.0                          |
| - Arsenic        | 7060                     | 0.5                          |
| Barium           | 6010                     | 1.0                          |
| Beryllium        | 6010                     | 0.2                          |
| Cadmium          | 6010                     | 0.5                          |
| Chromium         | 6010                     | 1.0                          |
| Cobalt           | 6010                     | 1.0                          |
| Copper           | 6010                     | 2.0                          |
| Lead             | 6010                     | 5.0                          |
| Mercury          | 7471                     | 0.2                          |
| Nickel           | 6010                     | 4.0                          |
| Potassium        | 6010                     | 500                          |
| - Selenium       | 7740                     | 0.5                          |
| Vanadium         | 6010                     | 1.0                          |
| Zinc             | 6010                     | 2.0                          |

TABLE-2  
PRIORITY POLLUTANT VOLATILES

Method 8240

| <u>Parameter</u>                              | <u>Reporting Limits ug/kg</u> |
|-----------------------------------------------|-------------------------------|
| Acetone                                       | 5,000                         |
| Acrolein                                      | 10,000                        |
| Acrylonitrile                                 | 10,000                        |
| Benzene                                       | 500                           |
| Bromodichloromethane                          | 500                           |
| Bromoform                                     | 500                           |
| Bromomethane(methyl bromide)                  | 1,000                         |
| Carbon disulfide                              | 500                           |
| Carbon tetrachloride                          | 500                           |
| Chlorobenzene                                 | 500                           |
| Chlorodibromoethane                           | 500                           |
| Chloroethane                                  | 1,000                         |
| 2-Chloroethylvinyl ether                      | 1,000                         |
| Chloroform                                    | 500                           |
| Chloromethane                                 | 1,000                         |
| Dibromomethane                                | 500                           |
| 1,4 - Dichloro-2-butane                       | -                             |
| trans-1,4-Dichloro-2-butene                   | 500                           |
| Dichlorodifluoromethane                       | 2,000                         |
| 1,1-Dichloroethane                            | 500                           |
| 1,2-Dichloroethane                            | 500                           |
| 1,1-Dichloroethylene                          | 500                           |
| trans-1,2-Dichloroethylene                    | 500                           |
| 1,2-Dichloropropane                           | 500                           |
| cis-1,3-Dichloropropene                       | 500                           |
| trans-1,3-Dichloropropene                     | 500                           |
| Ethanol                                       | 10,000                        |
| Ethyl benzene                                 | 500                           |
| Ethyl methacrylate                            | 1,000                         |
| 2-Hexanone                                    | 1,000                         |
| Iodomethane                                   | 500                           |
| Methylene Chloride                            | 500                           |
| Methyl ethyl ketone (2-Butanone)              | 1,000                         |
| Methyl isobutyl ketone (4-methyl-2-pentanone) | 1,000                         |
| Styrene                                       | 500                           |
| 1,1,2,2,-Tetrachloroethane                    | 500                           |
| Tetrachloroethylene                           | 500                           |
| Toluene                                       | 500                           |
| 1,1,1-Trichloroethane                         | 500                           |
| 1,1,2-Trichloroethane                         | 500                           |
| Trichloroethylene                             | 500                           |
| Trichlorofluoromethane                        | 500                           |
| 1,2,3-Trichloropropane                        | 500                           |
| Vinyl acetate                                 | 1,000                         |
| Vinyl chloride                                | 1,000                         |
| Xylenes                                       | 500                           |

TABLE-3  
PRIORITY POLLUTANT SEMIVOLATILES

| <u>Parameter</u>                                     | <u>Method 8270</u> | <u>Reporting Limits ug/kg</u> |
|------------------------------------------------------|--------------------|-------------------------------|
| Acenaphthene                                         |                    | 5,000                         |
| Acenaphthylene                                       |                    | 5,000                         |
| Acetophenone                                         |                    | 5,000                         |
| 4-Aminobiphenyl                                      |                    | -                             |
| Aniline                                              |                    | 5,000                         |
| Anthracene                                           |                    | 5,000                         |
| Benzidine                                            |                    | 50,000                        |
| Benzoic Acid                                         |                    | 5,000                         |
| Benzo(a)anthracene                                   |                    | 5,000                         |
| Benzo(b)fluoranthene                                 |                    | 5,000                         |
| Benzo(k)fluoranthene                                 |                    | 5,000                         |
| Benzo(g,h,i)perylene                                 |                    | 5,000                         |
| Benzo(a)pyrene                                       |                    | 5,000                         |
| Benzyl alcohol                                       |                    | 5,000                         |
| Bis(2-chloroethoxy)methane                           |                    | 5,000                         |
| Bis(2-chloroethyl)ether                              |                    | 5,000                         |
| Bis(2-chloroisopropyl)ether                          |                    |                               |
| [bis(2-chloro-1 methylethyl)ether]                   |                    | 5,000                         |
| Bis(2-ethylhexyl)phthalate                           |                    | 5,000                         |
| 4-Bromophenyl phenyl ether                           |                    | 5,000                         |
| Butyl benzyl phthalate                               |                    | 5,000                         |
| 4-Chloroaniline                                      |                    | 5,000                         |
| 4-Chloro-3-methylphenol                              |                    | 5,000                         |
| 1-Chloronaphthene                                    |                    | 5,000                         |
| 2-Chloronaphthene                                    |                    | 5,000                         |
| 2-Chlorophenol                                       |                    | 5,000                         |
| 4-Chlorophenyl phenyl ether                          |                    | 5,000                         |
| Chrysene                                             |                    | 5,000                         |
| Dibenzo(a,j)acridine                                 |                    | -                             |
| Dibenzo(a,h) anthracene                              |                    | 5,000                         |
| Dibenzo furans(tetrachloro, pentachloro, hexachloro) |                    | -                             |
| Di-n-butylphthalate                                  |                    | 5,000                         |
| 1,2-Dichlorobenzene                                  |                    | 5,000                         |
| 1,3-Dichlorobenzene                                  |                    | 5,000                         |
| 1,4-Dichlorobenzene                                  |                    | 5,000                         |
| 3,3-Dichlorobenzidine                                |                    | 10,000                        |
| 2,4-Dichlorophenol                                   |                    | 5,000                         |
| 2,6-Dichlorophenol                                   |                    | 5,000                         |
| Diethyl phthalate                                    |                    | 5,000                         |
| p(Dimethylamino)azobenzene                           |                    | 5,000                         |
| 7,12-Dimethylbenz(a)anthracene                       |                    | 5,000                         |
| aa-Demethylphenethylamine                            |                    | 5,000                         |
| 2,4-Dimethylphenol                                   |                    | 5,000                         |
| Dimethyl phthalate                                   |                    | 5,000                         |
| 4,6-Dinitro-2-methylphenol                           |                    | 25,000                        |
| 2,4-Dinitrophenol                                    |                    | 25,000                        |
| 2,4-Dinitrotoluene                                   |                    | 5,000                         |

TABLE-3 Continued

|                            |        |
|----------------------------|--------|
| 2,6-Dinitrotoluene         | 5,000  |
| Di-n-octyl phthalate       | 5,000  |
| Diphenylamine              | 5,000  |
| 1,2-Diphenylhydrazine      | 5,000  |
| Ethyl methanesulfonate     | 5,000  |
| Fluoranthene               | 5,000  |
| Flourene                   | 5,000  |
| Hexachlorobenzene          | 5,000  |
| Hexachloro-1,3-butadiene   | 5,000  |
| Hexachlorocyclopentadiene  | 5,000  |
| Hexachloroethane           | 5,000  |
| Indeno(1,2,3-cd)pyrene     | 5,000  |
| Isophorene                 | 5,000  |
| 3-Methylcholanthrene       | 5,000  |
| Methyl methanesulfonate    | 5,000  |
| 2-Methylnaphthalene        | 5,000  |
| 2-Methylphenol             | 5,000  |
| 3-Methylphenol             | 5,000  |
| 4-Methylphenol             | 5,000  |
| Naphthalene                | 5,000  |
| 1-Naphthylamine            | 5,000  |
| 2-Naphthylamine            | 5,000  |
| 2-Nitroaniline             | 25,000 |
| 3-Nitroaniline             | 25,000 |
| 4-Nitroaniline             | 25,000 |
| Nitrobenzene               | 5,000  |
| 2-Nitrophenol              | 5,000  |
| 4-Nitrophenol              | 25,000 |
| N-Nitrosodimethylamine     | 5,000  |
| N-Nitroso-di-n-butylamine  | 5,000  |
| N-Nitroso-di-n-propylamine | 5,000  |
| N-Nitrosopiperidine        | 5,000  |
| N-Nitrosodiphenylamine     | 5,000  |
| Pentachlorobenzene         | 5,000  |
| Pentachloronitrobenzene    | 25,000 |
| Pentachlorophenol          | 25,000 |
| Phenacetin                 | 5,000  |
| Phenanthrene               | 5,000  |
| Phenol                     | 5,000  |
| 2-Picoline                 | 5,000  |
| Pronamide                  | 5,000  |
| Pyrene                     | 5,000  |
| 1,2,4,5-Tetrachlorobenzene | 5,000  |
| 2,3,4,6-Tetrachlorophenol  | 25,000 |
| 1,2,4-Trichlorobenzene     | 5,000  |
| 2,4,5-Trichlorophenol      | 25,000 |
| 2,4,6-Trichlorophenol      | 5,000  |



Analytical **Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105510

June 10, 1991

Giant Refining Company  
Route 3, P.O. Box 7  
Gallup, NM 87301

Project Name/Number: RFI

Attention: Claud Rosendale

On 05/01/91, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Sample OW-5 had matrix interferences for several metals (excluding As, Pb, K, and Mercury) analyses. These samples had to be diluted to be analyzed. Detection limits have been raised accordingly.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt  
Senior Project Manager

Robert V. Woods  
Laboratory Manager

Lorraine Davis  
QA Coordinator

RVW:clf  
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/01/91

REPORT DATE : 05/29/91

ATI I.D. : 105510

| ATI # | CLIENT DESCRIPTION | MATRIX  | DATE COLLECTED |
|-------|--------------------|---------|----------------|
| 01    | MW-4               | AQUEOUS | 04/30/91       |
| 02    | OW-5               | AQUEOUS | 04/30/91       |
| 03    | OW-7               | AQUEOUS | 04/30/91       |
| 04    | TRIP BLANK         | AQUEOUS | 04/30/91       |

----- TOTALS -----

| MATRIX  | # SAMPLES |
|---------|-----------|
| AQUEOUS | 4         |

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

# GENERAL CHEMISTRY RESULTS

ATI I.D. : 105510

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/01/91

REPORT DATE : 05/29/91

| PARAMETER | UNITS | 01   | 02   | 03   |
|-----------|-------|------|------|------|
| PH        | UNITS | 8.77 | 6.98 | 8.87 |



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

ATI I.D. : 105510

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| PH        | UNITS | 10551003 | 8.87          | 8.87        | 0   | NA            | NA         | NA    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

# METALS RESULTS

ATI I.D. : 105510

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/01/91

REPORT DATE : 05/29/91

| PARAMETER | UNITS | 01      | 02      | 03      |
|-----------|-------|---------|---------|---------|
| ARSENIC   | MG/L  | <0.005  | <0.005  | <0.005  |
| BARIUM    | MG/L  | 0.024   | 0.085   | 0.067   |
| BERYLLIUM | MG/L  | <0.005  | <0.010  | <0.005  |
| CADMIUM   | MG/L  | <0.005  | <0.025  | <0.005  |
| COBALT    | MG/L  | <0.010  | <0.050  | <0.010  |
| CHROMIUM  | MG/L  | <0.010  | <0.010  | <0.010  |
| COPPER    | MG/L  | 0.379   | <0.050  | 0.018   |
| MERCURY   | MG/L  | <0.0002 | <0.0002 | <0.0002 |
| POTASSIUM | MG/L  | 1.4     | 7.9     | 2.0     |
| NICKEL    | MG/L  | <0.020  | <0.10   | <0.020  |
| LEAD      | MG/L  | 0.002   | 0.021   | 0.003   |
| ANTIMONY  | MG/L  | <0.05   | <0.25   | <0.05   |
| SELENIUM  | MG/L  | <0.005  | <0.05   | <0.005  |
| VANADIUM  | MG/L  | <0.010  | <0.50   | 0.024   |
| ZINC      | MG/L  | 0.038   | <0.050  | 0.015   |



Analytical Technologies, Inc.

# METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

ATI I.D. : 105510

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| ARSENIC   | MG/L  | 10551904 | <0.005        | <0.005      | NA  | 0.040         | 0.050      | 80    |
| BARIUM    | MG/L  | 10551003 | 0.067         | 0.068       | 1   | 1.01          | 1.00       | 94    |
| BERYLLIUM | MG/L  | 10551103 | <0.005        | <0.005      | NA  | 0.465         | 0.500      | 93    |
| CADMIUM   | MG/L  | 10551003 | <0.005        | <0.005      | NA  | 0.490         | 0.500      | 98    |
| COBALT    | MG/L  | 10551003 | <0.010        | <0.010      | NA  | 0.960         | 1.00       | 96    |
| CHROMIUM  | MG/L  | 10551003 | <0.010        | <0.010      | NA  | 0.929         | 1.00       | 93    |
| COPPER    | MG/L  | 10551003 | 0.018         | 0.018       | 0   | 0.502         | 0.500      | 97    |
| MERCURY   | MG/L  | 10491402 | <0.0002       | <0.0002     | NA  | 0.0049        | 0.0050     | 98    |
| POTASSIUM | MG/L  | 10551101 | 2.6           | 2.6         | 0   | 56.4          | 50.0       | 108   |
| NICKEL    | MG/L  | 10551003 | <0.020        | <0.020      | NA  | 0.949         | 1.00       | 95    |
| LEAD      | MG/L  | 10490101 | 0.009         | 0.009       | 0   | 0.057         | 0.050      | 96    |
| ANTIMONY  | MG/L  | 10551003 | <0.05         | <0.05       | NA  | 0.94          | 1.00       | 94    |
| SELENIUM  | MG/L  | 10488708 | <0.005        | <0.005      | NA  | 0.037         | 0.050      | 74    |
| VANADIUM  | MG/L  | 10551003 | 0.024         | 0.022       | 9   | 1.00          | 1.00       | 98    |
| ZINC      | MG/L  | 10551003 | 0.015         | 0.011       | 31  | 0.506         | 0.500      | 98    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10551001

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : MW-4               | DATE ANALYZED   | : 05/13/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| CARBON DISULFIDE        | <5      |
| 1,2-DICHLOROETHANE      | <5      |
| 2-BUTANONE (MEK)        | <5      |
| BENZENE                 | <5      |
| 2-CHLOROETHYLVINYLETHER | <5      |
| TOLUENE                 | <5      |
| CHLOROBENZENE           | <5      |
| ETHYLBENZENE            | <5      |
| STYRENE                 | <5      |
| TOTAL XYLENES           | <5      |
| 1,4-DIOXANE             | <10     |
| 1,2-DIBROMOETHANE (EDB) | <2.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 96  |
| BROMOFLUOROBENZENE (%)    | 94  |
| TOLUENE-D8 (%)            | 105 |



## GCMS - RESULTS

ATI I.D. : 10551002

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : OW-5               | DATE ANALYZED   | : 05/13/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 103 |
| BROMOFLUOROBENZENE (%)    | 104 |
| TOLUENE-D8 (%)            | 109 |



## GCMS - RESULTS

ATI I.D. : 10551003

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : OW-7               | DATE ANALYZED   | : 05/13/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 103 |
| BROMOFLUOROBENZENE (%)    | 90  |
| TOLUENE-D8 (%)            | 110 |



## GCMS - RESULTS

ATI I.D. : 10551004

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : TRIP BLANK         | DATE ANALYZED   | : 05/13/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 106 |
| BROMOFLUOROBENZENE (%)    | 92  |
| TOLUENE-D8 (%)            | 107 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|              |                      |                  |          |
|--------------|----------------------|------------------|----------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D. :       | 105510   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED : | 05/13/91 |
| PROJECT NAME | : RFI                | DATE ANALYZED :  | 05/13/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS            | : UG/L   |
|              |                      | DILUTION FACTOR  | : N/A    |

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 106 |
| BROMOFLUOROBENZENE (%)    | 101 |
| TOLUENE-D8 (%)            | 105 |



Analytical Technologies, Inc.

# QUALITY CONTROL DATA

ATI I.D. : 105510

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599906

DATE ANALYZED : 05/13/91

SAMPLE MATRIX : SOIL

UNITS : UG/L

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED | % SPIKED | DUP.   |      | RPD |
|--------------------|--------------|--------|--------|----------|--------|------|-----|
|                    | RESULT       | SPIKED |        |          | SAMPLE | REC. |     |
| 1,1-DICHLOROETHENE | <1           | 50     | 59     | 118      | 53     | 106  | 11  |
| TRICHLOROETHENE    | <1           | 50     | 47     | 94       | 51     | 102  | 8   |
| CHLOROBENZENE      | <5           | 50     | 49     | 98       | 53     | 106  | 8   |
| TOLUENE            | <5           | 50     | 53     | 106      | 58     | 116  | 9   |
| BENZENE            | <5           | 50     | 51     | 102      | 51     | 102  | 0   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

TR - Compound detected at an unquantifiable trace level



## GCMS - RESULTS

ATI I.D. : 10551001

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : 05/01/91 |
| CLIENT I.D.   | : MW-4               | DATE ANALYZED   | : 05/11/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                                  |      |
|----------------------------------|------|
| PHENOL                           | <5   |
| 1,3-DICHLOROBENZENE              | <5   |
| 1,4-DICHLOROBENZENE              | <5   |
| 1,2-DICHLOROBENZENE              | <5   |
| 2-METHYLPHENOL                   | <5   |
| 4-METHYLPHENOL                   | <5   |
| 2,4-DIMETHYLPHENOL               | <5   |
| NAPHTHALENE                      | <5   |
| DIMETHYLPHTHALATE                | <5   |
| 2,4-DINITROPHENOL                | <25  |
| 4-NITROPHENOL                    | <25  |
| DIETHYLPHTHALATE                 | <5   |
| PHENANTHRENE                     | <5   |
| ANTHRACENE                       | <5   |
| DI-N-BUTYLPHTHALATE              | <5   |
| FLUORANTHENE                     | <5   |
| PYRENE                           | <5   |
| BUTYLBENZYLPHTHALATE             | <5   |
| BENZO (a) ANTHRACENE             | <5   |
| BIS (2-ETHYLHEXYL) PHTHALATE     | <5   |
| CHRYSENE                         | <5   |
| DI-N-OCTYLPHTHALATE              | <5   |
| BENZO (b) FLUORANTHENE           | <5   |
| BENZO (k) FLUORANTHENE           | <5   |
| BENZO (a) PYRENE                 | <5   |
| DIBENZO (a, h) ANTHRACENE        | <5   |
| BENZENETHIOL                     | <5   |
| DIBENZO (A, J) ACRIDINE          | <5 * |
| 7,12-DIMETHYLBENZ (a) ANTHRACENE | <5   |
| INDENE                           | <5   |
| METHYLCHRYSENE                   | <5   |
| 1-METHYLNAPHTHALENE              | <5   |
| 3-METHYLPHENOL                   | <5   |
| PYRIDINE                         | <5   |
| QUINOLINE                        | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551001

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 42 |
| 2-FLUOROBIPHENYL (%)     | 46 |
| TERPHENYL (%)            | 92 |
| PHENOL-D6 (%)            | 38 |
| 2-FLUOROPHENOL (%)       | 51 |
| 2,4,6-TRIBROMOPHENOL (%) | 44 |

## GCMS - RESULTS

ATI I.D. : 10551002

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : 05/01/91 |
| CLIENT I.D.   | : OW-5               | DATE ANALYZED   | : 05/11/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                                  |      |
|----------------------------------|------|
| PHENOL                           | <5   |
| 1,3-DICHLOROBENZENE              | <5   |
| 1,4-DICHLOROBENZENE              | <5   |
| 1,2-DICHLOROBENZENE              | <5   |
| 2-METHYLPHENOL                   | <5   |
| 4-METHYLPHENOL                   | <5   |
| 2,4-DIMETHYLPHENOL               | <5   |
| NAPHTHALENE                      | <5   |
| DIMETHYLPHTHALATE                | <5   |
| 2,4-DINITROPHENOL                | <25  |
| 4-NITROPHENOL                    | <25  |
| DIETHYLPHTHALATE                 | <5   |
| PHENANTHRENE                     | <5   |
| ANTHRACENE                       | <5   |
| DI-N-BUTYLPHTHALATE              | <5   |
| FLUORANTHENE                     | <5   |
| PYRENE                           | <5   |
| BUTYLBENZYLPHTHALATE             | <5   |
| BENZO (a) ANTHRACENE             | <5   |
| BIS (2-ETHYLHEXYL) PHTHALATE     | <5   |
| CHRYSENE                         | <5   |
| DI-N-OCTYLPHTHALATE              | <5   |
| BENZO (b) FLUORANTHENE           | <5   |
| BENZO (k) FLUORANTHENE           | <5   |
| BENZO (a) PYRENE                 | <5   |
| DIBENZO (a, h) ANTHRACENE        | <5   |
| BENZENETHIOL                     | <5   |
| DIBENZO (A, J) ACRIDINE          | <5 * |
| 7,12-DIMETHYLBENZ (a) ANTHRACENE | <5   |
| INDENE                           | <5   |
| METHYLCHRYSENE                   | <5   |
| 1-METHYLNAPHTHALENE              | <5   |
| 3-METHYLPHENOL                   | <5   |
| PYRIDINE                         | <5   |
| QUINOLINE                        | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551002

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 60 |
| 2-FLUOROBIPHENYL (%)     | 56 |
| TERPHENYL (%)            | 97 |
| PHENOL-D6 (%)            | 32 |
| 2-FLUOROPHENOL (%)       | 44 |
| 2,4,6-TRIBROMOPHENOL (%) | 42 |



## GCMS - RESULTS

ATI I.D. : 10551003

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : 05/01/91 |
| CLIENT I.D.   | : OW-7               | DATE ANALYZED   | : 05/11/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                                |      |
|--------------------------------|------|
| PHENOL                         | <5   |
| 1,3-DICHLOROBENZENE            | <5   |
| 1,4-DICHLOROBENZENE            | <5   |
| 1,2-DICHLOROBENZENE            | <5   |
| 2-METHYLPHENOL                 | <5   |
| 4-METHYLPHENOL                 | <5   |
| 2,4-DIMETHYLPHENOL             | <5   |
| NAPHTHALENE                    | <5   |
| DIMETHYLPHTHALATE              | <5   |
| 2,4-DINITROPHENOL              | <25  |
| 4-NITROPHENOL                  | <25  |
| DIETHYLPHTHALATE               | <5   |
| PHENANTHRENE                   | <5   |
| ANTHRACENE                     | <5   |
| DI-N-BUTYLPHTHALATE            | <5   |
| FLUORANTHENE                   | <5   |
| PYRENE                         | <5   |
| BUTYLBENZYLPHTHALATE           | <5   |
| BENZO(a)ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL) PHTHALATE    | <5   |
| CHRYSENE                       | <5   |
| DI-N-OCTYLPHTHALATE            | <5   |
| BENZO(b)FLUORANTHENE           | <5   |
| BENZO(k)FLUORANTHENE           | <5   |
| BENZO(a)PYRENE                 | <5   |
| DIBENZO(a,h)ANTHRACENE         | <5   |
| BENZENETHIOL                   | <5   |
| DIBENZO(A,J)ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE | <5   |
| INDENE                         | <5   |
| METHYLCHRYSENE                 | <5   |
| 1-METHYLNAPHTHALENE            | <5   |
| 3-METHYLPHENOL                 | <5   |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551003

-----  
COMPOUNDS

-----  
RESULTS  
-----

PYRIDINE  
QUINOLINE

<5  
<25

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)  
2-FLUOROBIPHENYL (%)  
TERPHENYL (%)  
PHENOL-D6 (%)  
2-FLUOROPHENOL (%)  
2,4,6-TRIBROMOPHENOL (%)

59  
58  
106  
10  
21  
14



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105510   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/01/91 |
| PROJECT NAME | : RFI                | DATE ANALYZED   | : 05/10/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                                 |      |
|---------------------------------|------|
| PHENOL                          | <5   |
| 1,3-DICHLOROBENZENE             | <5   |
| 1,4-DICHLOROBENZENE             | <5   |
| 1,2-DICHLOROBENZENE             | <5   |
| 2-METHYLPHENOL                  | <5   |
| 4-METHYLPHENOL                  | <5   |
| 2,4-DIMETHYLPHENOL              | <5   |
| NAPHTHALENE                     | <5   |
| DIMETHYLPHTHALATE               | <5   |
| 2,4-DINITROPHENOL               | <25  |
| 4-NITROPHENOL                   | <25  |
| DIETHYLPHTHALATE                | <5   |
| PHENANTHRENE                    | <5   |
| ANTHRACENE                      | <5   |
| DI-N-BUTYLPHTHALATE             | <5   |
| FLUORANTHENE                    | <5   |
| PYRENE                          | <5   |
| BUTYLBENZYLPHTHALATE            | <5   |
| BENZO(a) ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL) PHTHALATE     | <5   |
| CHRYSENE                        | <5   |
| DI-N-OCTYLPHTHALATE             | <5   |
| BENZO(b) FLUORANTHENE           | <5   |
| BENZO(k) FLUORANTHENE           | <5   |
| BENZO(a) PYRENE                 | <5   |
| DIBENZO(a,h) ANTHRACENE         | <5   |
| BENZENETHIOL                    | <5   |
| DIBENZO(A,J) ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a) ANTHRACENE | <5   |
| INDENE                          | <5   |
| METHYLCHRYSENE                  | <5   |
| 1-METHYLNAPHTHALENE             | <5   |
| 3-METHYLPHENOL                  | <5   |
| PYRIDINE                        | <5   |
| QUINOLINE                       | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 105510

COMPOUNDS

RESULTS

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 41 |
| 2-FLUOROBIPHENYL (%)     | 49 |
| TERPHENYL (%)            | 96 |
| PHENOL-D6 (%)            | 57 |
| 2-FLUOROPHENOL (%)       | 71 |
| 2,4,6-TRIBROMOPHENOL (%) | 40 |



Analytical Technologies, Inc.

# QUALITY CONTROL DATA

ATI I.D. : 105510

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599911

DATE ANALYZED : 05/09/91

SAMPLE MATRIX :

UNITS : UG/L

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP.<br>SPIKED % |      | RPD |
|-----------------------------|--------------|--------|------------------|-----------|------------------|------|-----|
|                             | RESULT       | SPIKED |                  |           | SAMPLE           | REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <10          | 50     | 37               | 74        | 34               | 68   | 8   |
| ACENAPHTHENE                | <10          | 50     | 36               | 72        | 41               | 82   | 13  |
| 2,4-DINITROTOLUENE          | <25          | 50     | 31               | 62        | 34               | 68   | 9   |
| PYRENE                      | <5           | 50     | 63               | 126       | 57               | 114  | 10  |
| N-NITROSO-DI-N-PROPYL AMINE | <10          | 50     | 38               | 76        | 43               | 86   | 12  |
| 1,4-DICHLOROBENZENE         | <5           | 50     | 42               | 84        | 41               | 82   | 2   |
| PENTACHLOROPHENOL           | <50          | 100    | 88               | 88        | 89               | 89   | 1   |
| PHENOL                      | <5           | 100    | 77               | 77        | 79               | 79   | 3   |
| 2-CHLOROPHENOL              | <10          | 100    | 84               | 84        | 82               | 82   | 2   |
| 4-CHLORO-3-METHYLPHENOL     | <10          | 100    | 80               | 80        | 75               | 75   | 6   |
| 4-NITROPHENOL               | <50          | 100    | 40               | 40        | 47               | 47   | 16  |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



Analytical Technologies, Inc.  
Phoenix, Arizona

# Chain of Custody

DATE 4-30-94 PAGE 1 OF 1

| PROJECT MANAGER: <u>Elizabeth Proffitt</u>                            |  |  |  | ANALYSIS REQUEST |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
|-----------------------------------------------------------------------|--|--|--|------------------|------|--------|--------|--------------------------------|-----------------------|--------------------------------------|-------------|-------------------------------------|----------------------------------|------|---------------------------|-----------------------|------------------------------------------|------------------------------------------------------|------------------------|--------------------------|------------------------------|----------------------------------|--------------------------------------------|----------------------------------------|------------------------------------|----------------------------------|----------------------|
| COMPANY: <u>Giant Refining Co.</u>                                    |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| ADDRESS: <u>Box 3 Box 7</u>                                           |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| ADDRESS: <u>Gallop, New Mexico 87301</u>                              |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| BILL TO: <u>Sam</u>                                                   |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| COMPANY: <u>Sam</u>                                                   |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| ADDRESS: <u>Sam</u>                                                   |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| SAMPLERS: (Signature) <u>Charles</u> PHONE NUMBER <u>505 722-0217</u> |  |  |  |                  |      |        |        |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| SAMPLE ID                                                             |  |  |  | DATE             | TIME | MATRIX | LAB ID |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  |                      |
| MW-4                                                                  |  |  |  | 4-30             | 0850 | Water  | 1      | Petroleum Hydrocarbons (418.1) | (MOD 8015) Gas/Diesel | Diesel/Gasoline/BTXE (MOD 8015/8020) | BTXE (8020) | Chlorinated Hydrocarbons (601/8010) | Aromatic Hydrocarbons (602/8020) | MTBE | Pesticides/PCB (608/8080) | Herbicides (615/8150) | Base/Neutral/Acid Compounds GC/MS (8270) | Volatile Organics GC/MS (8240) <u>See Analytical</u> | SDWA Primary Standards | SDWA Secondary Standards | SDWA Volatiles (502.1/503.1) | The 13 Priority Pollutant Metals | The 8 EP Tox Metals by EP Tox Prep. (1310) | The 8 EP Tox Metals by Total Digestion | The 8 EP Tox Metals by TCLP (1311) | 15 Background Metals (Attaching) | NUMBER OF CONTAINERS |
| OW-5                                                                  |  |  |  | 4-30             | 0755 | Water  | 2      | X                              | X                     | X                                    | X           | X                                   | X                                | X    | X                         | X                     | X                                        | X                                                    |                        |                          |                              |                                  |                                            |                                        |                                    |                                  | 6                    |
| OW-7                                                                  |  |  |  | 4-30             | 0919 | Water  | 3      | X                              | X                     | X                                    | X           | X                                   | X                                | X    | X                         | X                     | X                                        | X                                                    |                        |                          |                              |                                  |                                            |                                        |                                    |                                  | 6                    |
| Trip Blank                                                            |  |  |  | -                | -    | Water  | 4      |                                |                       |                                      |             |                                     |                                  |      |                           |                       |                                          |                                                      |                        |                          |                              |                                  |                                            |                                        |                                    |                                  | 1                    |

| PROJECT INFORMATION                                                                                                                                                          |                         | SAMPLE RECEIPT           |            | RELINQUISHED BY: 1                                                              |                | RELINQUISHED BY: 2                                                              |                | RELINQUISHED BY: 3                                                              |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------|------------|---------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------|----------------|
| PROJECT NO:                                                                                                                                                                  | TOTAL NO. OF CONTAINERS | CHAIN OF CUSTODY SEALS   | INTACT?    | SIGNATURE                                                                       | TIME           | SIGNATURE                                                                       | TIME           | SIGNATURE                                                                       | TIME           |
| PROJECT NAME: <u>REF</u>                                                                                                                                                     | 19                      | Y                        | Y          | <u>Charles</u>                                                                  | <u>0930</u>    |                                                                                 |                |                                                                                 |                |
| P.O. NO. <u>01909</u>                                                                                                                                                        |                         | Y                        | Y          | <u>Elizabeth Proffitt</u>                                                       | <u>4-30-94</u> |                                                                                 |                |                                                                                 |                |
| SHIPPED VIA: <u>Fed. Exp.</u>                                                                                                                                                |                         | Y                        | Y          | <u>Charles</u>                                                                  | <u>0930</u>    |                                                                                 |                |                                                                                 |                |
| SAMPLE DISPOSAL INSTRUCTIONS                                                                                                                                                 | LAB NUMBER              | RECEIVED GOOD COND./COLD | LAB NUMBER | SIGNATURE                                                                       | TIME           | SIGNATURE                                                                       | TIME           | SIGNATURE                                                                       | TIME           |
| <input checked="" type="checkbox"/> AT <input type="checkbox"/> RETURN                                                                                                       | <u>05510</u>            |                          |            | <u>Charles</u>                                                                  | <u>0930</u>    | <u>Charles</u>                                                                  | <u>0930</u>    | <u>Charles</u>                                                                  | <u>0930</u>    |
| PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS                                                                                                                            |                         |                          |            | RECEIVED BY: (LAB)                                                              |                | RECEIVED BY: (LAB)                                                              |                | RECEIVED BY: (LAB)                                                              |                |
|                                                                                                                                                                              |                         |                          |            | SIGNATURE                                                                       | TIME           | SIGNATURE                                                                       | TIME           | SIGNATURE                                                                       | TIME           |
|                                                                                                                                                                              |                         |                          |            | <u>Charles</u>                                                                  | <u>0930</u>    | <u>Charles</u>                                                                  | <u>0930</u>    | <u>Charles</u>                                                                  | <u>0930</u>    |
| TAT: (NORMAL) <input checked="" type="checkbox"/> (RUSH) <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 72 <input type="checkbox"/> 1 WEEK |                         |                          |            | PRINTED NAME:                                                                   |                | PRINTED NAME:                                                                   |                | PRINTED NAME:                                                                   |                |
|                                                                                                                                                                              |                         |                          |            | <u>Charles</u>                                                                  | <u>0930</u>    | <u>Charles</u>                                                                  | <u>0930</u>    | <u>Charles</u>                                                                  | <u>0930</u>    |
| Comments: <u>see attached for specific analytical parameters</u>                                                                                                             |                         |                          |            | DATE:                                                                           |                | DATE:                                                                           |                | DATE:                                                                           |                |
|                                                                                                                                                                              |                         |                          |            | <u>4-30-94</u>                                                                  | <u>4-30-94</u> | <u>4-30-94</u>                                                                  | <u>4-30-94</u> | <u>4-30-94</u>                                                                  | <u>4-30-94</u> |
| ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 438-1530 • Seattle (206) 228-8335 • Pensacola (904) 474-1001                                                              |                         |                          |            | DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR |                | DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR |                | DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR |                |

TABLE -1  
BACKGROUND METALS

Total Metals

| <u>Parameter</u> | <u>Analytical Method</u> | <u>Reporting Limit mg/kg</u> |
|------------------|--------------------------|------------------------------|
| ✓Antimony        | 6010                     | 6.0                          |
| ✓Arsenic         | 7060                     | 0.5                          |
| ✓Barium          | 6010                     | 1.0                          |
| ✓Beryllium       | 6010                     | 0.2                          |
| ✓Cadmium         | 6010                     | 0.5                          |
| ✓Chromium        | 6010                     | 1.0                          |
| ✓Cobalt          | 6010                     | 1.0                          |
| ✓Copper          | 6010                     | 2.0                          |
| ✓Lead            | 6010                     | 5.0                          |
| ✓Mercury         | 7471                     | 0.2                          |
| ✓Nickel          | 6010                     | 4.0                          |
| ✓Potassium       | 6010                     | 500                          |
| ✓Selenium        | 7740                     | 0.5                          |
| ✓Vanadium        | 6010                     | 1.0                          |
| ✓Zinc            | 6010                     | 2.0                          |

TABLE-4  
SKINNER LIST

METHOD 8240

| <u>Parameter</u>                 | <u>Reporting Limit (ug/kg)</u> |
|----------------------------------|--------------------------------|
| Benzene                          | 500                            |
| Carbon disulfide                 | 500                            |
| Chlorobenzene                    | 500                            |
| 2-Chloroethylvinyl ether         | 1,000                          |
| 1,2-Dibromomethane               | 1,000                          |
| 1,2-Dichloroethane               | 500                            |
| 1,4-Dioxane                      | 50,000                         |
| Ethyl Benzene                    | 500                            |
| Methyl ethyl ketone (2-butanone) | 1,000                          |
| Styrene                          | 500                            |
| Toluene                          | 500                            |
| Xylenes                          | 500                            |

METHOD 8270

|                                |        |
|--------------------------------|--------|
| Anthracene                     | 5,000  |
| Benzenethiol                   | -      |
| Benzo(a)anthracene             | 5,000  |
| Benzo(b)fluoranthene           | 5,000  |
| Benzo(k)fluoranthene           | 5,000  |
| Benzo(a)pyrene                 | 5,000  |
| Bis(2-ethylhexyl)phthalate     | 5,000  |
| Butyl benzyl phthalate         | 5,000  |
| Chrysene                       | -      |
| Dibenzo(a,X)acridine           | 5,000  |
| Dibenzo(a,h)anthracene         | 5,000  |
| Di-n-butylphthalate            | 5,000  |
| 1,2-Dichlorobenzene            | 5,000  |
| 1,3-Dichlorobenzene            | 5,000  |
| 1,4-Dichlorobenzene            | 5,000  |
| Diethyl phthalate              | 5,000  |
| 7,12-Dimethylbenz(a)anthracene | 5,000  |
| 2,4-Dimethylphenol             | 5,000  |
| Dimethyl phthalate             | 5,000  |
| 2,4-Dinitrophenol              | 25,000 |
| Di-n-octyl phthalate           | 5,000  |
| Fluoranthene                   | 5,000  |
| Indene                         | -      |
| Methylchrysene                 | 5,000  |
| 1-Methylnaphthalene            | 5,000  |
| 2-Methylphenol                 | 5,000  |
| 3-Methylphenol                 | 5,000  |
| 4-Methylphenol                 | 5,000  |
| Naphthalene                    | 5,000  |
| 4-Nitrophenol                  | 25,000 |
| Phenanthrene                   | 5,000  |

TABLE-4 Continued

|           |        |
|-----------|--------|
| Phenol.   | 5,000  |
| Pyrene    | 5,000  |
| Pyridine  | 10,000 |
| Quinoline | 25,000 |



Analytical **Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105537

June 10, 1991

Giant Refining Company  
Route 3, P.O. Box 7  
Gallup, NM 87301

Project Name/Number: RFI  
Attention: Claud Rosendale

On 05/02/91, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

The 14 day volatile holding time for samples OW-9, OW-10, and the trip blank has been surpassed by one day. The samples were maintained at 4°C with hydrochloric acid so the data is thought to be reliable. The results for the 8240 analysis are provided at no charge.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt  
Senior Project Manager

Robert V. Woods  
Laboratory Manager

RVW:clf  
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/02/91

REPORT DATE : 05/29/91

ATI I.D. : 105537

| ATI # | CLIENT DESCRIPTION | MATRIX  | DATE COLLECTED |
|-------|--------------------|---------|----------------|
| 01    | OW-9               | AQUEOUS | 05/01/91       |
| 02    | OW-10              | AQUEOUS | 05/01/91       |
| 03    | TRIP BLANK         | AQUEOUS | 05/01/91       |

----- TOTALS -----

|         |           |
|---------|-----------|
| MATRIX  | # SAMPLES |
| -----   | -----     |
| AQUEOUS | 3         |

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 105537

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/02/91

PROJECT # : (NONE)

PROJECT NAME : RFI

REPORT DATE : 05/29/91

| PARAMETER | UNITS | 01   | 02   |
|-----------|-------|------|------|
| PH        | UNITS | 8.48 | 8.36 |



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

ATI I.D. : 105537

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| PH        | UNITS | 10553702 | 8.36          | 8.37        | 0.1 | NA            | NA         | NA    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



## METALS RESULTS

ATI I.D. : 105537

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/02/91

REPORT DATE : 05/29/91

| PARAMETER | UNITS | 01      | 02      |
|-----------|-------|---------|---------|
| ARSENIC   | MG/L  | <0.005  | <0.005  |
| BARIUM    | MG/L  | 0.044   | 0.081   |
| BERYLLIUM | MG/L  | <0.005  | <0.005  |
| CADMIUM   | MG/L  | <0.005  | 0.013   |
| COBALT    | MG/L  | <0.010  | <0.010  |
| CHROMIUM  | MG/L  | <0.010  | <0.010  |
| COPPER    | MG/L  | 0.014   | <0.010  |
| MERCURY   | MG/L  | <0.0002 | <0.0002 |
| POTASSIUM | MG/L  | 1.0     | 1.8     |
| NICKEL    | MG/L  | <0.020  | <0.020  |
| LEAD      | MG/L  | 0.002   | <0.002  |
| ANTIMONY  | MG/L  | <0.05   | <0.05   |
| SELENIUM  | MG/L  | 0.013   | 0.024   |
| VANADIUM  | MG/L  | 0.012   | <0.010  |
| ZINC      | MG/L  | 0.023   | 0.012   |



## METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

ATI I.D. : 105537

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| ARSENIC   | MG/L  | 10554901 | <0.005        | <0.005      | NA  | 0.052         | 0.050      | 104   |
| BARIUM    | MG/L  | 10553701 | 0.044         | 0.042       | 5   | 0.987         | 1.00       | 94    |
| BARIUM    | MG/L  | 10553702 | 0.081         | 0.080       | 1   | 0.178         | 0.100      | 97    |
| BERYLLIUM | MG/L  | 10553401 | 0.007         | 0.007       | 0   | 0.105         | 0.100      | 98    |
| BERYLLIUM | MG/L  | 10599912 | <0.005        | <0.005      | NA  | 0.112         | 0.100      | 112   |
| CADMIUM   | MG/L  | 10553701 | <0.005        | <0.005      | NA  | 0.500         | 0.500      | 100   |
| CADMIUM   | MG/L  | 10553702 | 0.013         | 0.014       | 7   | 0.109         | 0.100      | 96    |
| COBALT    | MG/L  | 10553701 | <0.010        | <0.010      | NA  | 1.00          | 1.00       | 100   |
| COBALT    | MG/L  | 10553702 | <0.010        | <0.010      | NA  | 0.110         | 0.100      | 110   |
| CHROMIUM  | MG/L  | 10553701 | <0.010        | <0.010      | NA  | 0.944         | 1.00       | 94    |
| CHROMIUM  | MG/L  | 10553702 | <0.010        | <0.010      | NA  | 0.089         | 0.100      | 89    |
| COPPER    | MG/L  | 10553701 | 0.014         | 0.014       | 0   | 0.504         | 0.500      | 98    |
| COPPER    | MG/L  | 10553702 | <0.010        | <0.010      | NA  | 0.097         | 0.100      | 97    |
| MERCURY   | MG/L  | 10557001 | <0.0002       | <0.0002     | NA  | 0.0048        | 0.0050     | 96    |
| POTASSIUM | MG/L  | 10551101 | 2.6           | 2.6         | 0   | 56.4          | 50.0       | 108   |
| POTASSIUM | MG/L  | 10557001 | 3.9           | 3.8         | 3   | 59.5          | 50.0       | 111   |
| NICKEL    | MG/L  | 10553701 | <0.020        | <0.020      | NA  | 0.960         | 1.00       | 96    |
| NICKEL    | MG/L  | 10553702 | <0.020        | <0.020      | NA  | 0.100         | 0.100      | 100   |
| LEAD      | MG/L  | 10551103 | <0.002        | <0.002      | NA  | 0.047         | 0.050      | 94    |
| ANTIMONY  | MG/L  | 10553701 | <0.05         | <0.05       | NA  | 0.93          | 1.00       | 93    |
| ANTIMONY  | MG/L  | 10599906 | <0.05         | <0.05       | NA  | 0.09          | 0.10       | 90    |
| SELENIUM  | MG/L  | 10554901 | <0.005        | <0.005      | NA  | 0.031         | 0.050      | 62    |
| VANADIUM  | MG/L  | 10553701 | 0.012         | 0.011       | 9   | 0.990         | 1.00       | 98    |
| VANADIUM  | MG/L  | 10553702 | <0.010        | <0.010      | NA  | 0.104         | 0.100      | 104   |
| ZINC      | MG/L  | 10553701 | 0.023         | 0.023       | 0   | 0.527         | 0.500      | 101   |
| ZINC      | MG/L  | 10553702 | 0.012         | 0.012       | 0   | 0.122         | 0.100      | 110   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



## GCMS - RESULTS

ATTI I.D. : 10553701

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/01/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/02/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : OW-9               | DATE ANALYZED   | : 05/16/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 102 |
| BROMOFLUOROBENZENE (%)    | 90  |
| TOLUENE-D8 (%)            | 102 |



## GCMS - RESULTS

ATI I.D. : 10553702

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/01/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/02/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : OW-10              | DATE ANALYZED   | : 05/16/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 103 |
| BROMOFLUOROBENZENE (%)    | 91  |
| TOLUENE-D8 (%)            | 101 |



## GCMS - RESULTS

ATI I.D. : 10553703

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 05/01/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/02/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : TRIP BLANK         | DATE ANALYZED   | : 05/16/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 103 |
| BROMOFLUOROBENZENE (%)    | 87  |
| TOLUENE-D8 (%)            | 99  |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105537   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/16/91 |
| PROJECT NAME | : RFI                | DATE ANALYZED   | : 05/16/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : N/A      |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 99  |
| BROMOFLUOROBENZENE (%)    | 88  |
| TOLUENE-D8 (%)            | 102 |



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 105537

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599907

DATE ANALYZED : 05/16/91

SAMPLE MATRIX : SOIL

UNITS : UG/L

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED<br>SAMPLE | DUP.             |                  | RPD |
|--------------------|--------------|--------|------------------|------------------|------------------|-----|
|                    | RESULT       | SPIKED |                  | % SPIKED<br>REC. | % SPIKED<br>REC. |     |
| 1,1-DICHLOROETHENE | <1           | 50     | 55               | 110              | 54               | 2   |
| TRICHLOROETHENE    | <1           | 50     | 49               | 98               | 49               | 0   |
| CHLOROBENZENE      | <5           | 50     | 51               | 102              | 51               | 0   |
| TOLUENE            | <5           | 50     | 51               | 102              | 51               | 0   |
| BENZENE            | <5           | 50     | 41               | 82               | 41               | 0   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

TR - Compound detected at an unquantifiable trace level.



## GCMS - RESULTS

ATI I.D. : 10553701

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI  
CLIENT I.D. : OW-9  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/01/91  
DATE RECEIVED : 05/02/91  
DATE EXTRACTED : 05/06/91  
DATE ANALYZED : 05/15/91  
UNITS : UG/L  
DILUTION FACTOR : N/A

## COMPOUNDS

## RESULTS

|                                |      |
|--------------------------------|------|
| PHENOL                         | <5   |
| 1,3-DICHLOROBENZENE            | <5   |
| 1,4-DICHLOROBENZENE            | <5   |
| 1,2-DICHLOROBENZENE            | <5   |
| 2-METHYLPHENOL                 | <5   |
| 4-METHYLPHENOL                 | <5   |
| 2,4-DIMETHYLPHENOL             | <5   |
| NAPHTHALENE                    | <5   |
| DIMETHYLPHTHALATE              | <5   |
| 2,4-DINITROPHENOL              | <25  |
| 4-NITROPHENOL                  | <25  |
| DIETHYLPHTHALATE               | <5   |
| PHENANTHRENE                   | <5   |
| ANTHRACENE                     | <5   |
| DI-N-BUTYLPHTHALATE            | <5   |
| FLUORANTHENE                   | <5   |
| PYRENE                         | <5   |
| BUTYLBENZYLPHTHALATE           | <5   |
| BENZO(a)ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL)PHTHALATE     | <5   |
| CHRYSENE                       | <5   |
| DI-N-OCTYLPHTHALATE            | <5   |
| BENZO(b)FLUORANTHENE           | <5   |
| BENZO(k)FLUORANTHENE           | <5   |
| BENZO(a)PYRENE                 | <5   |
| DIBENZO(a,h)ANTHRACENE         | <5   |
| BENZENETHIOL                   | <5   |
| DIBENZO(A,J)ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE | <5   |
| INDENE                         | <5   |
| METHYLCHRYSENE                 | <5   |
| 1-METHYLNAPHTHALENE            | <5   |
| 3-METHYLPHENOL                 | <5   |
| PYRIDINE                       | <5   |
| QUINOLINE                      | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10553701

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 45 |
| 2-FLUOROBIPHENYL (%)     | 46 |
| TERPHENYL (%)            | 87 |
| PHENOL-D6 (%)            | 37 |
| 2-FLUOROPHENOL (%)       | 57 |
| 2,4,6-TRIBROMOPHENOL (%) | 42 |



## GCMS - RESULTS

ATI I.D. : 10553702

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI  
CLIENT I.D. : OW-10  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 05/01/91  
DATE RECEIVED : 05/02/91  
DATE EXTRACTED : 05/06/91  
DATE ANALYZED : 05/15/91  
UNITS : UG/L  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                |      |
|--------------------------------|------|
| PHENOL                         | <5   |
| 1,3-DICHLOROBENZENE            | <5   |
| 1,4-DICHLOROBENZENE            | <5   |
| 1,2-DICHLOROBENZENE            | <5   |
| 2-METHYLPHENOL                 | <5   |
| 4-METHYLPHENOL                 | <5   |
| 2,4-DIMETHYLPHENOL             | <5   |
| NAPHTHALENE                    | <5   |
| DIMETHYLPHTHALATE              | <5   |
| 2,4-DINITROPHENOL              | <25  |
| 4-NITROPHENOL                  | <25  |
| DIETHYLPHTHALATE               | <5   |
| PHENANTHRENE                   | <5   |
| ANTHRACENE                     | <5   |
| DI-N-BUTYLPHTHALATE            | <5   |
| FLUORANTHENE                   | <5   |
| PYRENE                         | <5   |
| BUTYLBENZYLPHTHALATE           | <5   |
| BENZO(a)ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL)PHTHALATE     | <5   |
| CHRYSENE                       | <5   |
| DI-N-OCTYLPHTHALATE            | <5   |
| BENZO(b)FLUORANTHENE           | <5   |
| BENZO(k)FLUORANTHENE           | <5   |
| BENZO(a)PYRENE                 | <5   |
| DIBENZO(a,h)ANTHRACENE         | <5   |
| BENZENETHIOL                   | <5   |
| DIBENZO(A,J)ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE | <5   |
| INDENE                         | <5   |
| METHYLCHRYSENE                 | <5   |
| 1-METHYLNAPHTHALENE            | <5   |
| 3-METHYLPHENOL                 | <5   |
| PYRIDINE                       | <5   |
| QUINOLINE                      | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10553702

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 52  |
| 2-FLUOROBIPHENYL (%)     | 57  |
| TERPHENYL (%)            | 107 |
| PHENOL-D6 (%)            | 37  |
| 2-FLUOROPHENOL (%)       | 51  |
| 2,4,6-TRIBROMOPHENOL (%) | 39  |



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105537   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/06/91 |
| PROJECT NAME | : RFI                | DATE ANALYZED   | : 05/15/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                                 |      |
|---------------------------------|------|
| PHENOL                          | <5   |
| 1,3-DICHLOROBENZENE             | <5   |
| 1,4-DICHLOROBENZENE             | <5   |
| 1,2-DICHLOROBENZENE             | <5   |
| 2-METHYLPHENOL                  | <5   |
| 4-METHYLPHENOL                  | <5   |
| 2,4-DIMETHYLPHENOL              | <5   |
| NAPHTHALENE                     | <5   |
| DIMETHYLPHTHALATE               | <5   |
| 2,4-DINITROTOLUENE              | <5   |
| 2,6-DINITROTOLUENE              | <5   |
| DIETHYLPHTHALATE                | <5   |
| PHENANTHRENE                    | <5   |
| ANTHRACENE                      | <5   |
| DI-N-BUTYLPHTHALATE             | <5   |
| FLUORANTHENE                    | <5   |
| PYRENE                          | <5   |
| BUTYLBENZYLPHTHALATE            | <5   |
| BENZO(a) ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL) PHTHALATE     | <5   |
| CHRYSENE                        | <5   |
| DI-N-OCTYLPHTHALATE             | <5   |
| BENZO(b) FLUORANTHENE           | <5   |
| BENZO(k) FLUORANTHENE           | <5   |
| BENZO(a) PYRENE                 | <5   |
| DIBENZO(a,h) ANTHRACENE         | <5   |
| BENZENETHIOL                    | <5   |
| DIBENZO(A,J) ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a) ANTHRACENE | <5   |
| INDENE                          | <5   |
| METHYLCHRYSENE                  | <5   |
| 1-METHYLNAPHTHALENE             | <5   |
| 3-METHYLPHENOL                  | <5   |
| PYRIDINE                        | <5   |
| QUINOLINE                       | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 105537

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 67  |
| 2-FLUOROBIPHENYL (%)     | 67  |
| TERPHENYL (%)            | 107 |
| PHENOL-D6 (%)            | 45  |
| 2-FLUOROPHENOL (%)       | 56  |
| 2,4,6-TRIBROMOPHENOL (%) | 38  |



Analytical Technologies, Inc.

## QUALITY CONTROL DATA

ATI I.D. : 105537

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599915

DATE ANALYZED : 05/15/91

SAMPLE MATRIX :

UNITS : UG/L

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>SAMPLE | %<br>REC. | DUP.             | DUP.      | RPD |
|-----------------------------|--------------|--------|------------------|-----------|------------------|-----------|-----|
|                             | RESULT       | SPIKED |                  |           | SPIKED<br>SAMPLE | %<br>REC. |     |
| 1,2,4-TRICHLOROBENZENE      | <10          | 50     | 31               | 62        | 33               | 66        | 6   |
| ACENAPHTHENE                | <10          | 50     | 32               | 64        | 37               | 74        | 14  |
| 2,4-DINITROTOLUENE          | <25          | 50     | 26               | 52        | 31               | 62        | 18  |
| PYRENE                      | <5           | 50     | 52               | 104       | 55               | 110       | 6   |
| N-NITROSO-DI-N-PROPYL AMINE | <10          | 50     | 26               | 52        | 29               | 58        | 11  |
| 1,4-DICHLOROBENZENE         | <5           | 50     | 37               | 74        | 38               | 76        | 3   |
| PENTACHLOROPHENOL           | <50          | 100    | 61               | 61        | 65               | 65        | 6   |
| PHENOL                      | <5           | 100    | 50               | 50        | 52               | 104       | 4   |
| 2-CHLOROPHENOL              | <10          | 100    | 52               | 52        | 58               | 58        | 11  |
| 4-CHLORO-3-METHYLPHENOL     | <10          | 100    | 47               | 47        | 47               | 47        | 0   |
| 4-NITROPHENOL               | <50          | 100    | 40               | 40        | 41               | 41        | 2   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



# Chain of Custody

DATE 5-1-81 PAGE 1 OF 1

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7.258

TABLE -1  
BACKGROUND METALS

Total Metals

| <u>Parameter</u> | <u>Analytical Method</u> | <u>Reporting Limit mg/kg</u> |
|------------------|--------------------------|------------------------------|
| ✓Antimony        | 6010                     | 6.0                          |
| ✓Arsenic         | 7060                     | 0.5                          |
| ✓Barium          | 6010                     | 1.0                          |
| ✓Beryllium       | 6010                     | 0.2                          |
| ✓Cadmium         | 6010                     | 0.5                          |
| ✓Chromium        | 6010                     | 1.0                          |
| ✓Cobalt          | 6010                     | 1.0                          |
| ✓Copper          | 6010                     | 2.0                          |
| ✓Lead            | 6010                     | 5.0                          |
| ✓Mercury         | 7471                     | 0.2                          |
| ✓Nickel          | 6010                     | 4.0                          |
| ✓Potassium       | 6010                     | 500                          |
| ✓Selenium        | 7740                     | 0.5                          |
| ✓Vanadium        | 6010                     | 1.0                          |
| ✓Zinc            | 6010                     | 2.0                          |

TABLE-4  
SKINNER LIST

METHOD 8240

| <u>Parameter</u>                 | <u>Reporting Limit (ug/kg)</u> |
|----------------------------------|--------------------------------|
| Benzene                          | 500                            |
| Carbon disulfide                 | 500                            |
| Chlorobenzene                    | 500                            |
| 2-Chloroethylvinyl ether         | 1,000                          |
| 1,2-Dibromomethane               | 1,000                          |
| 1,2-Dichloroethane               | 500                            |
| 1,4-Dioxane                      | 50,000                         |
| Ethyl Benzene                    | 500                            |
| Methyl ethyl ketone (2-butanone) | 1,000                          |
| Styrene                          | 500                            |
| Toluene                          | 500                            |
| Xylenes                          | 500                            |

METHOD 8270

|                                |        |
|--------------------------------|--------|
| Anthracene                     | 5,000  |
| Benzenethiol                   | -      |
| Benzo(a)anthracene             | 5,000  |
| Benzo(b)fluoranthene           | 5,000  |
| Benzo(k)fluoranthene           | 5,000  |
| Benzo(a)pyrene                 | 5,000  |
| Bis(2-ethylhexyl)phthalate     | 5,000  |
| Butyl benzyl phthalate         | 5,000  |
| Chrysene                       | 5,000  |
| Dibenzo(a,X)acridine           | -      |
| Dibenzo(a,h)anthracene         | 5,000  |
| Di-n-butylphthalate            | 5,000  |
| 1,2-Dichlorobenzene            | 5,000  |
| 1,3-Dichlorobenzene            | 5,000  |
| 1,4-Dichlorobenzene            | 5,000  |
| Diethyl phthalate              | 5,000  |
| 7,12-Dimethylbenz(a)anthracene | 5,000  |
| 2,4-Dimethylphenol             | 5,000  |
| Dimethyl phthalate             | 5,000  |
| 2,4-Dinitrophenol              | 25,000 |
| Di-n-octyl phthalate           | 5,000  |
| Fluoranthene                   | 5,000  |
| Indene                         | 5,000  |
| Methylchrysene                 | -      |
| 1-Methylnaphthalene            | 5,000  |
| 2-Methylphenol                 | 5,000  |
| 3-Methylphenol                 | 5,000  |
| 4-Methylphenol                 | 5,000  |
| Naphthalene                    | 5,000  |
| 4-Nitrophenol                  | 25,000 |
| Phenanthrene                   | 5,000  |

TABLE-4 Continued

|           |        |
|-----------|--------|
| Phenol.   | 5,000  |
| Pyrene    | 5,000  |
| Pyridine  | 10,000 |
| Quinoline | 25,000 |



Analytical **Technologies**, Inc.

9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105511

June 10, 1991

Giant Refining Company  
Route 3, P.O. Box 7  
Gallup, NM 87301

Project Name/Number: RFI

Attention: Claud Rosendale

On 05/01/91, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt  
Senior Project Manager

Robert V. Woods  
Laboratory Manager

RVW:clf  
Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/01/91

REPORT DATE : 05/29/91

ATI I.D. : 105511

| ATI # | CLIENT DESCRIPTION | MATRIX  | DATE COLLECTED |
|-------|--------------------|---------|----------------|
| 01    | OW-1               | AQUEOUS | 04/30/91       |
| 02    | OW-30              | AQUEOUS | 04/30/91       |
| 03    | EQUIP. WASH        | AQUEOUS | 04/30/91       |

----- TOTALS -----

| MATRIX  | # SAMPLES |
|---------|-----------|
| AQUEOUS | 3         |

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



Analytical Technologies, Inc.

# GENERAL CHEMISTRY RESULTS

ATI I.D. : 105511

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/01/91

PROJECT # : (NONE)

PROJECT NAME : RFI

REPORT DATE : 05/29/91

| PARAMETER | UNITS | 01   | 02   | 03   |
|-----------|-------|------|------|------|
| PH        | UNITS | 8.86 | 8.85 | 5.79 |



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

ATI I.D. : 105511

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| PH        | UNITS | 10553702 | 8.36          | 8.37        | 0.1 | NA            | NA         | NA    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



## METALS RESULTS

ATI I.D. : 105511

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

DATE RECEIVED : 05/01/91

REPORT DATE : 05/29/91

| PARAMETER | UNITS | 01      | 02      | 03      |
|-----------|-------|---------|---------|---------|
| ARSENIC   | MG/L  | <0.005  | <0.005  | <0.005  |
| BARIUM    | MG/L  | 0.128   | 0.130   | <0.010  |
| BERYLLIUM | MG/L  | <0.005  | <0.005  | <0.005  |
| CADMIUM   | MG/L  | 0.006   | <0.005  | <0.005  |
| COBALT    | MG/L  | <0.010  | <0.010  | <0.010  |
| CHROMIUM  | MG/L  | <0.010  | <0.050  | <0.010  |
| COPPER    | MG/L  | 0.017   | 0.019   | <0.010  |
| MERCURY   | MG/L  | <0.0002 | <0.0002 | <0.0002 |
| POTASSIUM | MG/L  | 2.6     | 2.2     | <1.0    |
| NICKEL    | MG/L  | <0.020  | <0.020  | <0.020  |
| LEAD      | MG/L  | 0.008   | 0.010   | <0.002  |
| ANTIMONY  | MG/L  | <0.05   | <0.05   | <0.05   |
| SELENIUM  | MG/L  | 0.007   | 0.007   | <0.005  |
| VANADIUM  | MG/L  | 0.050   | 0.051   | <0.010  |
| ZINC      | MG/L  | 0.033   | 0.036   | 0.012   |



Analytical Technologies, Inc.

## METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI

ATI I.D. : 105511

| PARAMETER | UNITS | ATI I.D. | SAMPLE RESULT | DUP. RESULT | RPD | SPIKED SAMPLE | SPIKE CONC | % REC |
|-----------|-------|----------|---------------|-------------|-----|---------------|------------|-------|
| ARSENIC   | MG/L  | 10551904 | <0.005        | <0.005      | NA  | 0.040         | 0.050      | 80    |
| ARSENIC   | MG/L  | 10551103 | <0.005        | <0.005      | NA  | 0.038         | 0.050      | 76    |
| BARIUM    | MG/L  | 10551003 | 0.067         | 0.068       | 1   | 1.01          | 1.00       | 94    |
| BERYLLIUM | MG/L  | 10551103 | <0.005        | <0.005      | NA  | 0.465         | 0.500      | 93    |
| CADMIUM   | MG/L  | 10551003 | <0.005        | <0.005      | NA  | 0.490         | 0.500      | 98    |
| COBALT    | MG/L  | 10551003 | <0.010        | <0.010      | NA  | 0.960         | 1.00       | 96    |
| CHROMIUM  | MG/L  | 10551003 | <0.010        | <0.010      | NA  | 0.929         | 1.00       | 93    |
| COPPER    | MG/L  | 10551003 | 0.018         | 0.018       | 0   | 0.502         | 0.500      | 97    |
| MERCURY   | MG/L  | 10491402 | <0.0002       | <0.0002     | NA  | 0.0049        | 0.0050     | 98    |
| POTASSIUM | MG/L  | 10551101 | 2.6           | 2.6         | 0   | 56.4          | 50.0       | 108   |
| NICKEL    | MG/L  | 10551003 | <0.020        | <0.020      | NA  | 0.949         | 1.00       | 95    |
| LEAD      | MG/L  | 10551102 | 0.010         | 0.008       | 22  | 0.061         | 0.050      | 102   |
| LEAD      | MG/L  | 10551103 | <0.002        | <0.002      | NA  | 0.047         | 0.050      | 94    |
| ANTIMONY  | MG/L  | 10551003 | <0.05         | <0.05       | NA  | 0.94          | 1.00       | 94    |
| SELENIUM  | MG/L  | 10488708 | <0.005        | <0.005      | NS  | 0.037         | 0.050      | 74    |
| SELENIUM  | MG/L  | 10551103 | <0.005        | <0.005      | NA  | 0.049         | 0.050      | 98    |
| VANADIUM  | MG/L  | 10551003 | 0.024         | 0.022       | 9   | 1.00          | 1.00       | 98    |
| ZINC      | MG/L  | 10551003 | 0.015         | 0.011       | 31  | 0.506         | 0.500      | 98    |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



## GCMS - RESULTS

ATI I.D. : 10551101

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI  
CLIENT I.D. : OW-1  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/30/91  
DATE RECEIVED : 05/01/91  
DATE EXTRACTED : N/A  
DATE ANALYZED : 05/13/91  
UNITS : UG/L  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                          |      |
|--------------------------|------|
| CARBON DISULFIDE         | <5   |
| 1,2-DICHLOROETHANE       | <5   |
| 2-BUTANONE (MEK)         | <5   |
| BENZENE                  | <5   |
| 2-CHLOROETHYL VINYLETHER | <5   |
| TOLUENE                  | <5   |
| CHLOROBENZENE            | <5   |
| ETHYLBENZENE             | <5   |
| STYRENE                  | <5   |
| TOTAL XYLENES            | <5   |
| 1,4-DIOXANE              | <10  |
| 1,2-DIBROMOETHANE (EDB)  | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 105 |
| BROMOFLUOROBENZENE (%)    | 82  |
| TOLUENE-D8 (%)            | 106 |



## GCMS - RESULTS

ATI I.D. : 10551102

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : OW-30              | DATE ANALYZED   | : 05/13/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 110 |
| BROMOFLUOROBENZENE (%)    | 106 |
| TOLUENE-D8 (%)            | 108 |



## GCMS - RESULTS

ATI I.D. : 10551103

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : N/A      |
| CLIENT I.D.   | : EQUIP. WASH        | DATE ANALYZED   | : 05/13/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                         |      |
|-------------------------|------|
| CARBON DISULFIDE        | <5   |
| 1,2-DICHLOROETHANE      | <5   |
| 2-BUTANONE (MEK)        | <5   |
| BENZENE                 | <5   |
| 2-CHLOROETHYLVINYLETHER | <5   |
| TOLUENE                 | <5   |
| CHLOROBENZENE           | <5   |
| ETHYLBENZENE            | <5   |
| STYRENE                 | <5   |
| TOTAL XYLENES           | <5   |
| 1,4-DIOXANE             | <10  |
| 1,2-DIBROMOETHANE (EDB) | <2.5 |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 105 |
| BROMOFLUOROBENZENE (%)    | 90  |
| TOLUENE-D8 (%)            | 109 |



## GCMS - RESULTS

## REAGENT BLANK

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105511   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/13/91 |
| PROJECT NAME | : RFI                | DATE ANALYZED   | : 05/13/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : N/A      |

| COMPOUNDS               | RESULTS |
|-------------------------|---------|
| CARBON DISULFIDE        | <5      |
| 1,2-DICHLOROETHANE      | <5      |
| 2-BUTANONE (MEK)        | <5      |
| BENZENE                 | <5      |
| 2-CHLOROETHYLVINYLETHER | <5      |
| TOLUENE                 | <5      |
| CHLOROBENZENE           | <5      |
| ETHYLBENZENE            | <5      |
| STYRENE                 | <5      |
| TOTAL XYLENES           | <5      |
| 1,4-DIOXANE             | <10     |
| 1,2-DIBROMOETHANE (EDB) | <2.5    |

## SURROGATE PERCENT RECOVERIES

|                           |     |
|---------------------------|-----|
| 1,2-DICHLOROETHANE-D4 (%) | 106 |
| BROMOFLUOROBENZENE (%)    | 101 |
| TOLUENE-D8 (%)            | 105 |



Analytical Technologies, Inc.

# QUALITY CONTROL DATA

ATI I.D. : 105511

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599906

DATE ANALYZED : 05/13/91

SAMPLE MATRIX : SOIL

UNITS : UG/L

| COMPOUNDS          | SAMPLE CONC. |        | SPIKED<br>SAMPLE | % SPIKED<br>REC. | DUP. SPIKED % |      | RPD |
|--------------------|--------------|--------|------------------|------------------|---------------|------|-----|
|                    | RESULT       | SPIKED |                  |                  | SAMPLE        | REC. |     |
| 1,1-DICHLOROETHENE | <1           | 50     | 59               | 118              | 53            | 106  | 11  |
| TRICHLOROETHENE    | <1           | 50     | 47               | 94               | 51            | 102  | 8   |
| CHLOROBENZENE      | <5           | 50     | 49               | 98               | 53            | 106  | 8   |
| TOLUENE            | <5           | 50     | 53               | 106              | 58            | 116  | 9   |
| BENZENE            | <5           | 50     | 51               | 102              | 51            | 102  | 0   |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

TR - Compound detected at an unquantifiable trace level



## GCMS - RESULTS

ATI I.D. : 10551101

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT : GIANT REFINING CO.  
PROJECT # : (NONE)  
PROJECT NAME : RFI  
CLIENT I.D. : OW-1  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/30/91  
DATE RECEIVED : 05/01/91  
DATE EXTRACTED : 05/01/91  
DATE ANALYZED : 05/11/91  
UNITS : UG/L  
DILUTION FACTOR : 1

## COMPOUNDS

## RESULTS

|                                  |      |
|----------------------------------|------|
| PHENOL                           | <5   |
| 1,3-DICHLOROBENZENE              | <5   |
| 1,4-DICHLOROBENZENE              | <5   |
| 1,2-DICHLOROBENZENE              | <5   |
| 2-METHYLPHENOL                   | <5   |
| 4-METHYLPHENOL                   | <5   |
| 2,4-DIMETHYLPHENOL               | <5   |
| NAPHTHALENE                      | <5   |
| DIMETHYLPHTHALATE                | <5   |
| 2,4-DINITROPHENOL                | <25  |
| 4-NITROPHENOL                    | <25  |
| DIETHYLPHTHALATE                 | <5   |
| PHENANTHRENE                     | <5   |
| ANTHRACENE                       | <5   |
| DI-N-BUTYLPHTHALATE              | <5   |
| FLUORANTHENE                     | <5   |
| PYRENE                           | <5   |
| BUTYLBENZYLPHTHALATE             | <5   |
| BENZO (a) ANTHRACENE             | <5   |
| BIS (2-ETHYLHEXYL) PHTHALATE     | <5   |
| CHRYSENE                         | <5   |
| DI-N-OCTYLPHTHALATE              | <5   |
| BENZO (b) FLUORANTHENE           | <5   |
| BENZO (k) FLUORANTHENE           | <5   |
| BENZO (a) PYRENE                 | <5   |
| DIBENZO (a, h) ANTHRACENE        | <5   |
| BENZENETHIOL                     | <5   |
| DIBENZO (A, J) ACRIDINE          | <5 * |
| 7,12-DIMETHYLBENZ (a) ANTHRACENE | <5   |
| INDENE                           | <5   |
| METHYLCHRYSENE                   | <5   |
| 1-METHYLNAPHTHALENE              | <5   |
| 3-METHYLPHENOL                   | <5   |
| PYRIDINE                         | <5   |
| QUINOLINE                        | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



### ADDITIONAL COMPOUNDS

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551101

-----  
COMPOUNDS

RESULTS  
-----

#### ADDITIONAL COMPOUND

HYDROCARBON C10

40

#### SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)

54

2-FLUOROBIPHENYL (%)

58

TERPHENYL (%)

83

PHENOL-D6 (%)

33

2-FLUOROPHENOL (%)

47

2,4,6-TRIBROMOPHENOL (%)

42

## GCMS - RESULTS

ATI I.D. : 10551102

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : 05/01/91 |
| CLIENT I.D.   | : OW-30              | DATE ANALYZED   | : 05/11/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

## COMPOUNDS

## RESULTS

|                                |      |
|--------------------------------|------|
| PHENOL                         | <5   |
| 1,3-DICHLOROBENZENE            | <5   |
| 1,4-DICHLOROBENZENE            | <5   |
| 1,2-DICHLOROBENZENE            | <5   |
| 2-METHYLPHENOL                 | <5   |
| 4-METHYLPHENOL                 | <5   |
| 2,4-DIMETHYLPHENOL             | <5   |
| NAPHTHALENE                    | <5   |
| DIMETHYLPHTHALATE              | <5   |
| 2,4-DINITROPHENOL              | <25  |
| 4-NITROPHENOL                  | <25  |
| DIETHYLPHTHALATE               | <5   |
| PHENANTHRENE                   | <5   |
| ANTHRACENE                     | <5   |
| DI-N-BUTYLPHTHALATE            | <5   |
| FLUORANTHENE                   | <5   |
| PYRENE                         | <5   |
| BUTYLBENZYLPHTHALATE           | <5   |
| BENZO(a)ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL)PHTHALATE     | <5   |
| CHRYSENE                       | <5   |
| DI-N-OCTYLPHTHALATE            | <5   |
| BENZO(b)FLUORANTHENE           | <5   |
| BENZO(k)FLUORANTHENE           | <5   |
| BENZO(a)PYRENE                 | <5   |
| DIBENZO(a,h)ANTHRACENE         | <5   |
| BENZENETHIOL                   | <5   |
| DIBENZO(A,J)ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE | <5   |
| INDENE                         | <5   |
| METHYLCHRYSENE                 | <5   |
| 1-METHYLNAPHTHALENE            | <5   |
| 3-METHYLPHENOL                 | <5   |
| PYRIDINE                       | <5   |
| QUINOLINE                      | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551102

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 63 |
| 2-FLUOROBIPHENYL (%)     | 55 |
| TERPHENYL (%)            | 92 |
| PHENOL-D6 (%)            | 35 |
| 2-FLUOROPHENOL (%)       | 49 |
| 2,4,6-TRIBROMOPHENOL (%) | 46 |

## GCMS - RESULTS

ATI I.D. : 10551103

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|               |                      |                 |            |
|---------------|----------------------|-----------------|------------|
| CLIENT        | : GIANT REFINING CO. | DATE SAMPLED    | : 04/30/91 |
| PROJECT #     | : (NONE)             | DATE RECEIVED   | : 05/01/91 |
| PROJECT NAME  | : RFI                | DATE EXTRACTED  | : 05/01/91 |
| CLIENT I.D.   | : EQUIP. WASH        | DATE ANALYZED   | : 05/11/91 |
| SAMPLE MATRIX | : AQUEOUS            | UNITS           | : UG/L     |
|               |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS | RESULTS |
|-----------|---------|
|-----------|---------|

|                                |      |
|--------------------------------|------|
| PHENOL                         | <5   |
| 1,3-DICHLOROBENZENE            | <5   |
| 1,4-DICHLOROBENZENE            | <5   |
| 1,2-DICHLOROBENZENE            | <5   |
| 2-METHYLPHENOL                 | <5   |
| 4-METHYLPHENOL                 | <5   |
| 2,4-DIMETHYLPHENOL             | <5   |
| NAPHTHALENE                    | <5   |
| DIMETHYLPHTHALATE              | <5   |
| 2,4-DINITROPHENOL              | <25  |
| 4-NITROPHENOL                  | <25  |
| DIETHYLPHTHALATE               | <5   |
| PHENANTHRENE                   | <5   |
| ANTHRACENE                     | <5   |
| DI-N-BUTYLPHTHALATE            | <5   |
| FLUORANTHENE                   | <5   |
| PYRENE                         | <5   |
| BUTYLBENZYLPHTHALATE           | <5   |
| BENZO(a)ANTHRACENE             | <5   |
| BIS(2-ETHYLHEXYL) PHTHALATE    | <5   |
| CHRYSENE                       | <5   |
| DI-N-OCTYLPHTHALATE            | <5   |
| BENZO(b)FLUORANTHENE           | <5   |
| BENZO(k)FLUORANTHENE           | <5   |
| BENZO(a)PYRENE                 | <5   |
| DIBENZO(a,h)ANTHRACENE         | <5   |
| BENZENETHIOL                   | <5   |
| DIBENZO(A,J)ACRIDINE           | <5 * |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE | <5   |
| INDENE                         | <5   |
| METHYLCHRYSENE                 | <5   |
| 1-METHYLNAPHTHALENE            | <5   |
| 3-METHYLPHENOL                 | <5   |
| PYRIDINE                       | <5   |
| QUINOLINE                      | <25  |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551103

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |     |
|--------------------------|-----|
| NITROBENZENE-D5 (%)      | 50  |
| 2-FLUOROBIPHENYL (%)     | 48  |
| TERPHENYL (%)            | 111 |
| PHENOL-D6 (%)            | 34  |
| 2-FLUOROPHENOL (%)       | 52  |
| 2,4,6-TRIBROMOPHENOL (%) | 35  |



## GCMS - RESULTS

## REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

|              |                      |                 |            |
|--------------|----------------------|-----------------|------------|
| CLIENT       | : GIANT REFINING CO. | ATI I.D.        | : 105511   |
| PROJECT #    | : (NONE)             | DATE EXTRACTED  | : 05/01/91 |
| PROJECT NAME | : RFI                | DATE ANALYZED   | : 05/10/91 |
| CLIENT I.D.  | : REAGENT BLANK      | UNITS           | : UG/L     |
|              |                      | DILUTION FACTOR | : 1        |

| COMPOUNDS                      | RESULTS |
|--------------------------------|---------|
| PHENOL                         | <5      |
| 1,3-DICHLOROBENZENE            | <5      |
| 1,4-DICHLOROBENZENE            | <5      |
| 1,2-DICHLOROBENZENE            | <5      |
| 2-METHYLPHENOL                 | <5      |
| 4-METHYLPHENOL                 | <5      |
| 2,4-DIMETHYLPHENOL             | <5      |
| NAPHTHALENE                    | <5      |
| DIMETHYLPHTHALATE              | <25     |
| 2,4-DINITROPHENOL              | <25     |
| 4-NITROPHENOL                  | <5      |
| DIETHYLPHTHALATE               | <5      |
| PHENANTHRENE                   | <5      |
| ANTHRACENE                     | <5      |
| DI-N-BUTYLPHTHALATE            | <5      |
| FLUORANTHENE                   | <5      |
| PYRENE                         | <5      |
| BUTYLBENZYLPHTHALATE           | <5      |
| BENZO(a)ANTHRACENE             | <5      |
| BIS(2-ETHYLHEXYL)PHTHALATE     | <5      |
| CHRYSENE                       | <5      |
| DI-N-OCTYLPHTHALATE            | <5      |
| BENZO(b)FLUORANTHENE           | <5      |
| BENZO(k)FLUORANTHENE           | <5      |
| BENZO(a)PYRENE                 | <5      |
| DIBENZO(a,h)ANTHRACENE         | <5      |
| BENZENETHIOL                   | <5      |
| DIBENZO(A,J)ACRIDINE           | <5 *    |
| 7,12-DIMETHYLBENZ(a)ANTHRACENE | <5      |
| INDENE                         | <5      |
| METHYLCHRYSENE                 | <5      |
| 1-METHYLNAPHTHALENE            | <5      |
| 3-METHYLPHENOL                 | <5      |
| PYRIDINE                       | <5      |
| QUINOLINE                      | <25     |

\* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.



Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551101

-----  
COMPOUNDS

-----  
RESULTS  
-----

SURROGATE PERCENT RECOVERIES

|                          |    |
|--------------------------|----|
| NITROBENZENE-D5 (%)      | 41 |
| 2-FLUOROBIPHENYL (%)     | 49 |
| TERPHENYL (%)            | 96 |
| PHENOL-D6 (%)            | 57 |
| 2-FLUOROPHENOL (%)       | 71 |
| 2,4,6-TRIBROMOPHENOL (%) | 40 |



Analytical Technologies, Inc.

## QUALITY CONTROL DATA

ATI I.D. : 105511

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : RFI

REF I.D. : 10599911

DATE ANALYZED : 05/09/91

SAMPLE MATRIX :

UNITS : UG/L

| COMPOUNDS                   | SAMPLE CONC. |        | SPIKED<br>RESULT | SPIKED<br>SAMPLE | DUP. %      |             | DUP. % | RPD |
|-----------------------------|--------------|--------|------------------|------------------|-------------|-------------|--------|-----|
|                             | RESULT       | SPIKED |                  |                  | REC. SAMPLE | REC. SAMPLE |        |     |
| 1,2,4-TRICHLOROBENZENE      | <10          | 50     | 37               | 74               | 34          | 68          | 8      |     |
| ACENAPHTHENE                | <10          | 50     | 36               | 72               | 41          | 82          | 13     |     |
| 2,4-DINITROTOLUENE          | <25          | 50     | 31               | 62               | 34          | 68          | 9      |     |
| PYRENE                      | <5           | 50     | 63               | 126              | 57          | 114         | 10     |     |
| N-NITROSO-DI-N-PROPYL AMINE | <10          | 50     | 38               | 76               | 43          | 86          | 12     |     |
| 1,4-DICHLOROBENZENE         | <5           | 50     | 42               | 84               | 41          | 82          | 2      |     |
| PENTACHLOROPHENOL           | <50          | 100    | 88               | 88               | 89          | 89          | 1      |     |
| PHENOL                      | <5           | 100    | 77               | 77               | 79          | 79          | 3      |     |
| 2-CHLOROPHENOL              | <10          | 100    | 84               | 84               | 82          | 82          | 2      |     |
| 4-CHLORO-3-METHYLPHENOL     | <10          | 100    | 80               | 80               | 75          | 75          | 6      |     |
| 4-NITROPHENOL               | <50          | 100    | 40               | 40               | 47          | 47          | 16     |     |

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$



TABLE -1  
BACKGROUND METALS

Total Metals

| <u>Parameter</u> | <u>Analytical Method</u> | <u>Reporting Limit mg/kg</u> |
|------------------|--------------------------|------------------------------|
| ✓Antimony        | 6010                     | 6.0                          |
| ✓Arsenic         | 7060                     | 0.5                          |
| ✓Barium          | 6010                     | 1.0                          |
| ✓Beryllium       | 6010                     | 0.2                          |
| ✓Cadmium         | 6010                     | 0.5                          |
| ✓Chromium        | 6010                     | 1.0                          |
| ✓Cobalt          | 6010                     | 1.0                          |
| ✓Copper          | 6010                     | 2.0                          |
| ✓Lead            | 6010                     | 5.0                          |
| ✓Mercury         | 7471                     | 0.2                          |
| ✓Nickel          | 6010                     | 4.0                          |
| ✓Potassium       | 6010                     | 500                          |
| ✓Selenium        | 7740                     | 0.5                          |
| ✓Vanadium        | 6010                     | 1.0                          |
| ✓Zinc            | 6010                     | 2.0                          |

TABLE-4  
SKINNER LIST

METHOD 8240

| <u>Parameter</u>                 | <u>Reporting Limit (ug/kg)</u> |
|----------------------------------|--------------------------------|
| Benzene                          | 500                            |
| Carbon disulfide                 | 500                            |
| Chlorobenzene                    | 500                            |
| 2-Chloroethylvinyl ether         | 1,000                          |
| 1,2-Dibromomethane               | 1,000                          |
| 1,2-Dichloroethane               | 500                            |
| 1,4-Dioxane                      | 50,000                         |
| Ethyl Benzene                    | 500                            |
| Methyl ethyl ketone (2-butanone) | 1,000                          |
| Styrene                          | 500                            |
| Toluene                          | 500                            |
| Xylenes                          | 500                            |

METHOD 8270

|                                |        |
|--------------------------------|--------|
| Anthracene                     | 5,000  |
| Benzenethiol                   | -      |
| Benzo(a)anthracene             | 5,000  |
| Benzo(b)fluoranthene           | 5,000  |
| Benzo(k)fluoranthene           | 5,000  |
| Benzo(a)pyrene                 | 5,000  |
| Bis(2-ethylhexyl)phthalate     | 5,000  |
| Butyl benzyl phthalate         | 5,000  |
| Chrysene                       | 5,000  |
| Dibenzo(a,X)acridine           | -      |
| Dibenzo(a,h)anthracene         | 5,000  |
| Di-n-butylphthalate            | 5,000  |
| 1,2-Dichlorobenzene            | 5,000  |
| 1,3-Dichlorobenzene            | 5,000  |
| 1,4-Dichlorobenzene            | 5,000  |
| Diethyl phthalate              | 5,000  |
| 7,12-Dimethylbenz(a)anthracene | 5,000  |
| 2,4-Dimethylphenol             | 5,000  |
| Dimethyl phthalate             | 5,000  |
| 2,4-Dinitrophenol              | 25,000 |
| Di-n-octyl phthalate           | 5,000  |
| Fluoranthene                   | 5,000  |
| Indene                         | 5,000  |
| Methylchrysene                 | -      |
| 1-Methylnaphthalene            | 5,000  |
| 2-Methylphenol                 | 5,000  |
| 3-Methylphenol                 | 5,000  |
| 4-Methylphenol                 | 5,000  |
| Naphthalene                    | 5,000  |
| 4-Nitrophenol                  | 25,000 |
| Phenanthrene                   | 5,000  |

TABLE-4 Continued

|           |        |
|-----------|--------|
| Phenol.   | 5,000  |
| Pyrene    | 5,000  |
| Pyridine  | 10,000 |
| Quinoline | 25,000 |