

GW - 32

REPORTS

YEAR(S):

1993 GW DATA

**ANNUAL GROUNDWATER
ANALYTICAL AND STATISTICAL
DATA**

**GIANT REFINING COMPANY
CINIZA REFINERY**

JUNE 30, 1994

PREPARED BY:

**LYNN SHELTON
SENIOR ENVIRONMENTAL COORDINATOR**

CONTENTS

- I. MONITOR WELL STATISTICS**
- II. MONITOR WELL GRAPHS**
- III. EARLY DETECTION WELL STATISTICS**
- IV. TABULATED ANALYTICAL DATA**
- V. ORIGINAL ANALYTICAL DATA**

I. MONITOR WELL STATISTICS
STUDENT'S-T

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton Telephone: 722-0227
 Facility Name: GIANT CINIZA EPA ID #: NMD000333211-2
 Date: Spring, 94 Parameter: pH
 Well Number: MW-1 Up or Downgradient: DOWN

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	8.51	S(b) ² =	0.015	t(b)=	2.947
W(b)=	0.000937	n(b)=	16		

Please list the current values for this monitoring well.

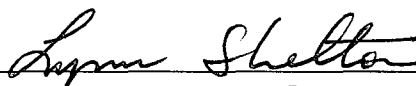
	Value	(Value - X(m)) ²
1	9.15	0.0000
2	9.14	0.0001
3	9.16	0.0001
4	9.15	0.0000
Total 1	36.6	Total 2 0.0002

Mean value X(m)	9.15	t(m)=	5.841
Variance S(m) ²	0.0001	W(m)=	0.000016

t(*)= 20.7190

t(c)= 2.9976

If t(*) absolute is less than t(c)
there has not been an increase
in the value



 Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton Telephone: 722-0227
 Facility Name: GIANT CINIZA EPA ID #: NMD000333211-2
 Date: Spring, 94 Parameter: pH
 Well Number: MW-2 Up or Downgradient: : DOWN

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	8.51	S(b) ² =	0.015	t(b)=	2.947
W(b)=	0.000937	n(b)=	16		

Please list the current values for this monitoring well.

	Value	(Value - X(m)) ²
1	9.2	0.0025
2	9.2	0.0025
3	9.19	0.0016
4	9.21	0.0036

Total 1	35.22	Total 2	0.0102
---------	-------	---------	--------

Mean value X(m)	9.2	t(m)=	5.841
Variance S(m) ²	0.0034	W(m)=	0.00085

t(*)= 16.3202

t(c)= 4.3232

If t(*) absolute is less than t(c)
there has not been an increase
in the value

Lynn Shelton

Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton Telephone: 722-0227
 Facility Name: GIANT CINIZA EPA ID #: NMD000333211-2
 Date: Spring, 94 Parameter: pH
 Well Number: MW-4 Up or Downgradient: UP

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	8.51	S(b)2=	0.015	t(b)=	2.947
W(b)=	0.000937	n(b)=	16		

Please list the current values for this monitoring well.

	Value	(Value - X(m))2
1	8.84	0.0961
2	8.85	0.0900
3	8.84	0.0961
4	8.84	0.0961

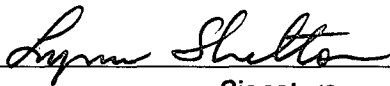
Total 1	33.83	Total 2	0.3783
---------	-------	---------	--------

Mean value X(m)	8.8425	t(m)=	5.841
Variance S(m)2	0.1261	W(m)=	0.031525

t(*)= 1.8454

t(c)= 5.7574

If t(*) absolute is less than t(c)
there has not been an increase
in the value



Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton Telephone: 722-0227
 Facility Name: GIANT CINIZA EPA ID #: NMD000333211-2
 Date: Spring, 94 Parameter: pH
 Well Number: MW-5 Up or Downgradient: DOWN

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	8.51	S(b) ² =	0.015	t(b)=	2.947
W(b)=	0.000937	n(b)=	16		

Please list the current values for this monitoring well.

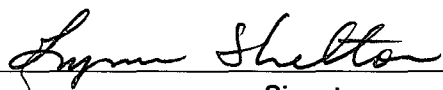
	Value	(Value - X(m)) ²
1	9.04	0.0121
2	9.09	0.0036
3	9.11	0.0016
4	9.05	0.0100
Total 1	35.31	Total 2 0.0273

Mean value X(m)	9.0725	t(m)=	5.841
Variance S(m) ²	0.0091	W(m)=	0.002275

t(*)= 9.9243

t(c)= 4.9964

If t(*) absolute is less than t(c)
there has not been an increase
in the value



 Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton
 Telephone: 722-0227
 Facility Name: GIANT CINIZA
 EPA ID #: NMD000333211-2
 Date: Spring, 94
 Parameter: SPEC. COND.
 Well Number: MW-1
 Up or Downgradient: DOWN

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	984	S(b) ² =	1487	t(b)=	2.602
W(b)=	92.9375	n(b)=	16		

Please list the current values for this monitoring well.

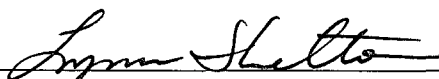
	Value	(Value - X(m)) ²
1	1110	6.25
2	1110	6.25
3	1120	56.25
4	1110	6.25
Total 1	4570	Total 2 75.00

Mean value X(m)	1112.5	t(m)=	4.541
Variance S(m) ²	25.0000	W(m)=	6.25

t(*)= 12.9025

t(c)= 2.7242

If t(*) absolute is less than t(c)
there has not been an increase
in the value



 Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton Telephone: 722-0227
 Facility Name: GIANT CINIZA EPA ID #: NMD000333211-2
 Date: Spring, 94 Parameter: SPEC. COND.
 Well Number: MW-2 Up or Downgradient: : DOWN

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	984	S(b)2=	1487	t(b)=	2.602
W(b)=	92.9375	n(b)=	16		

Please list the current values for this monitoring well.

	Value	(Value - X(m))2
1	1120	56.25
2	1120	56.25
3	1120	56.25
4	1110	6.25
Total 1	4570	Total 2 175.00

Mean value X(m)	1117.5	t(m)=	4.541
Variance S(m)2	58.3333	W(m)=	14.58333

t(*)= 12.8746

t(c)= 2.8650

If t(*) absolute is less than t(c)
there has not been an increase
in the value

Lynn Shelton

Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton Telephone: 722-0227
 Facility Name: GIANT CINIZA EPA ID #: NMD000333211-2
 Date: Spring, 94 Parameter: SPEC. COND.
 Well Number: MW-4 Up or Downgradient: UP

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	984	S(b)2=	1487	t(b)=	2.602
W(b)=	92.9375	n(b)=	16		

Please list the current values for this monitoring well.

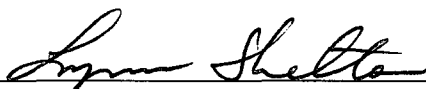
	Value	(Value - X(m))2
1	1140	756.25
2	1150	1406.25
3	1150	1406.25
4	1150	1406.25
Total 1	4570	Total 2 4975.00

Mean value X(m)	1147.5	t(m)=	4.541
Variance S(m)2	1658.3333	W(m)=	414.5833

t(*)= 7.2576

t(c)= 4.1859

If t(*) absolute is less than t(c)
there has not been an increase
in the value



Signature

Calculation Sheet for Semi-Annual Evaluation of Indicator Parameters

Prepared by: Lynn Shelton
Telephone: 722-0227
 Facility Name: GIANT CINIZA
EPA ID #: NMD000333211-2
 Date: Spring, 94
Parameter: SPEC. COND.
 Well Number: MW-5
Up or Downgradient: : DOWN

Please list the values calculated for the background parameters
on the Background Indicator Parameter Calculation Sheet:

X(b)=	984	S(b)2=	1487	t(b)=	2.602
W(b)=	92.9375	n(b)=	16		

Please list the current values for this monitoring well.

	Value	(Value - X(m)) ²
1	1110	6.25
2	1130	306.25
3	1120	56.25
4	1120	56.25
Total 1	4570	Total 2 425.00

Mean value X(m)	1120	t(m)=	4.541
Variance S(m) ²	141.6667	W(m)=	35.41666

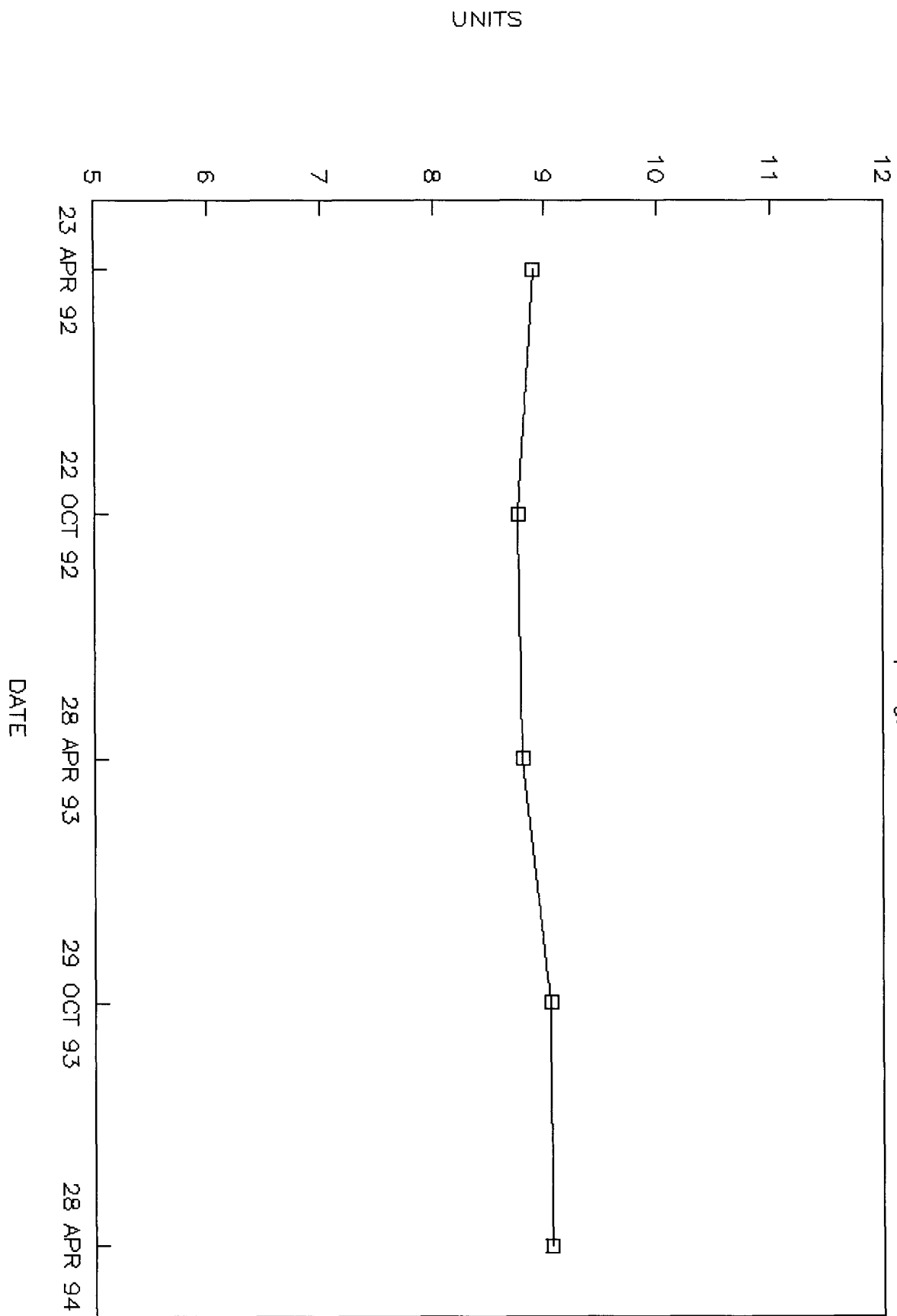
t(*)= 12.0042
 t(c)= 3.1370

If t(*) absolute is less than t(c)
 there has not been an increase
 in the value


 Signature

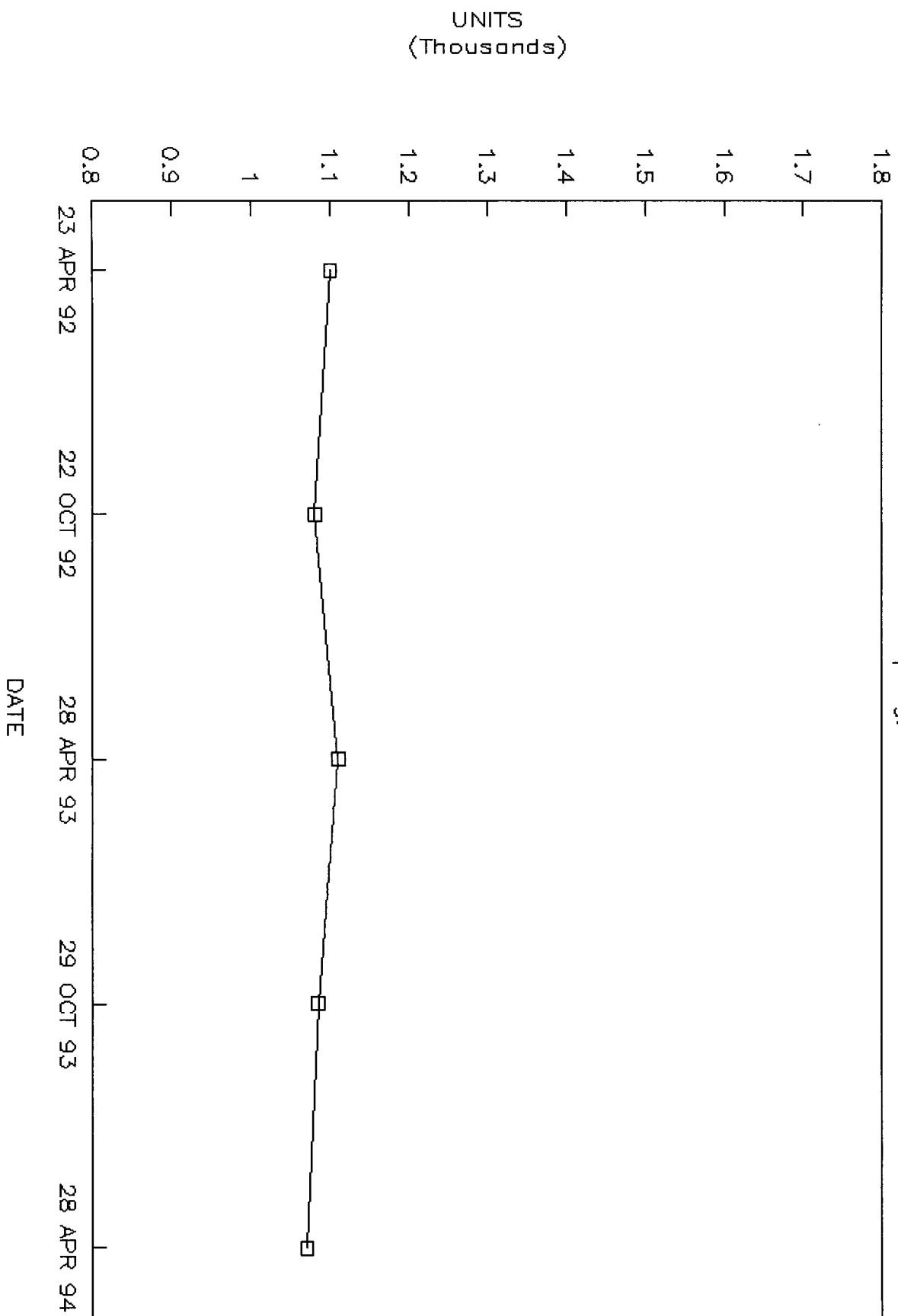
II. MONITOR WELL GRAPHS

MW-1 pH Spring, 94

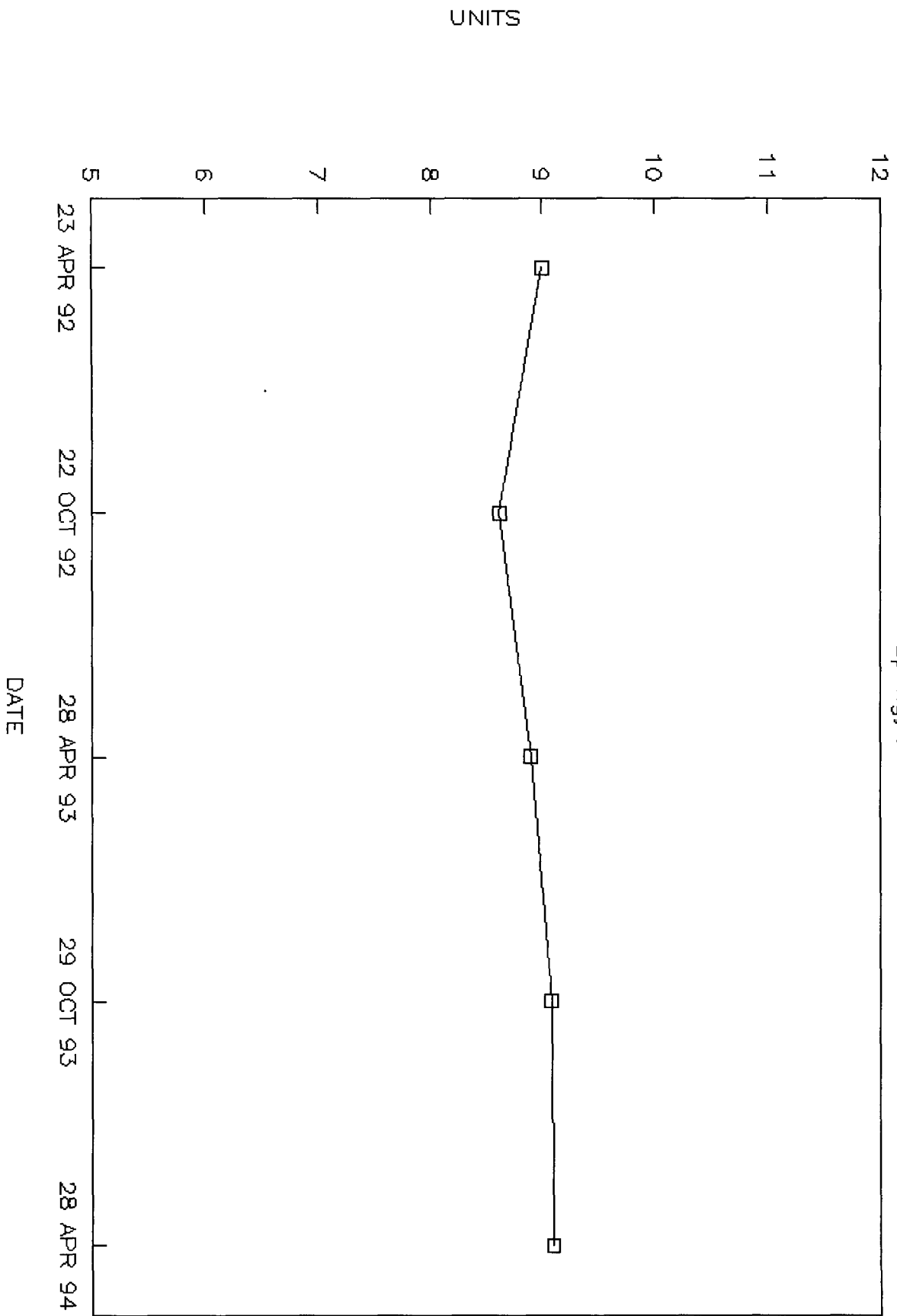


MW-1 EC

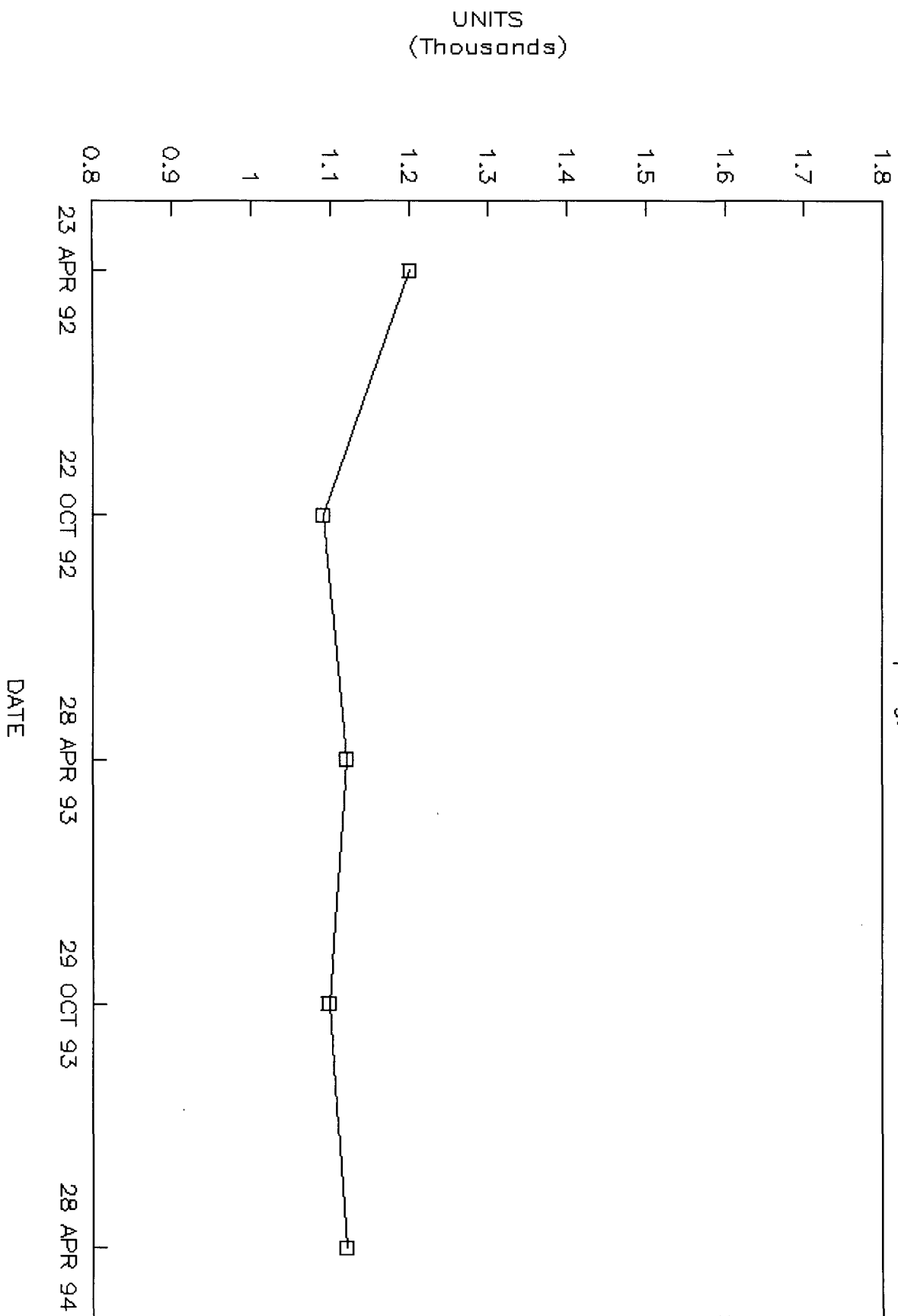
Spring, 94



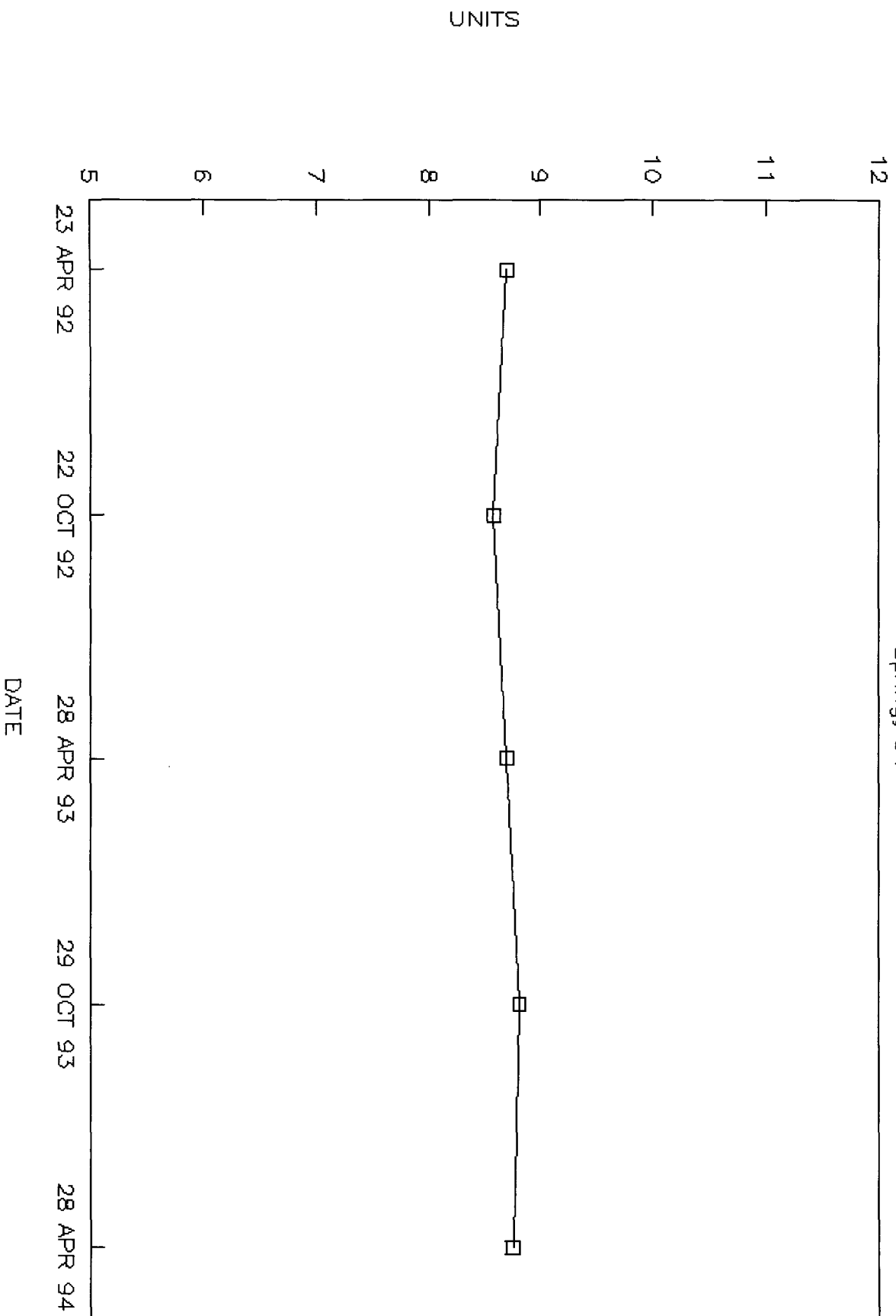
MW-2 pH Spring, 94



MW-2 EC Spring, 94

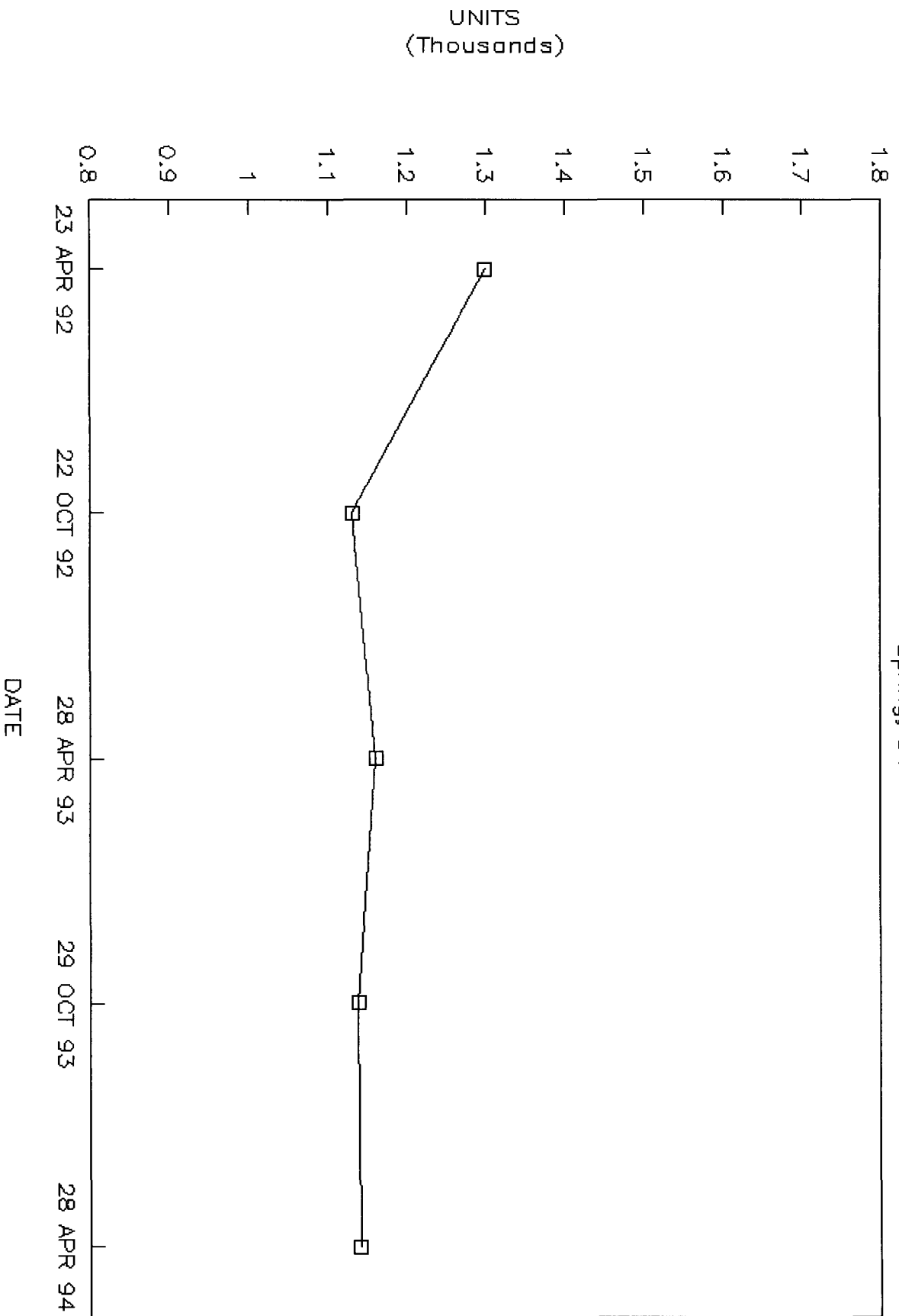


MW-4 pH Spring, 94

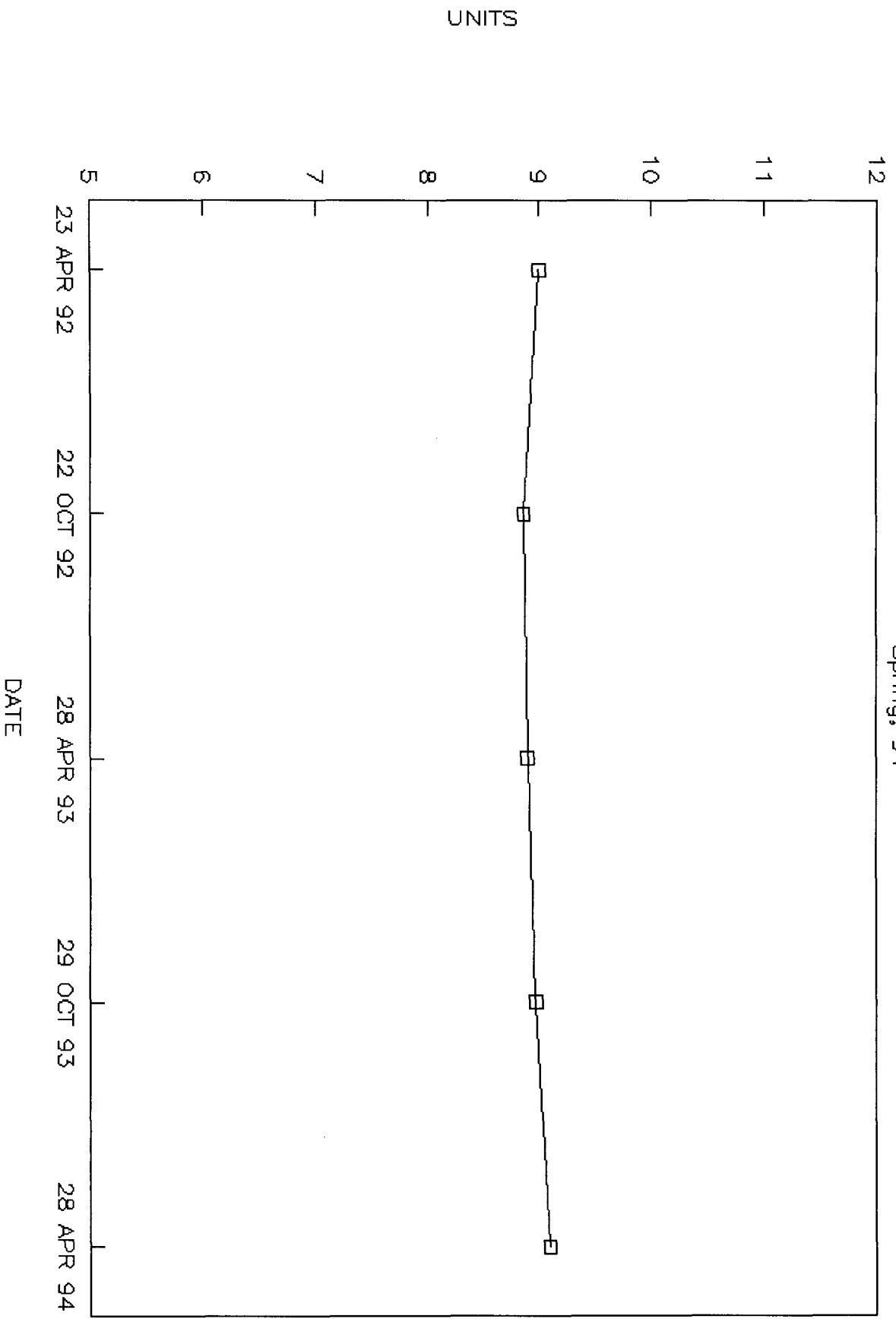


MW-4 EC

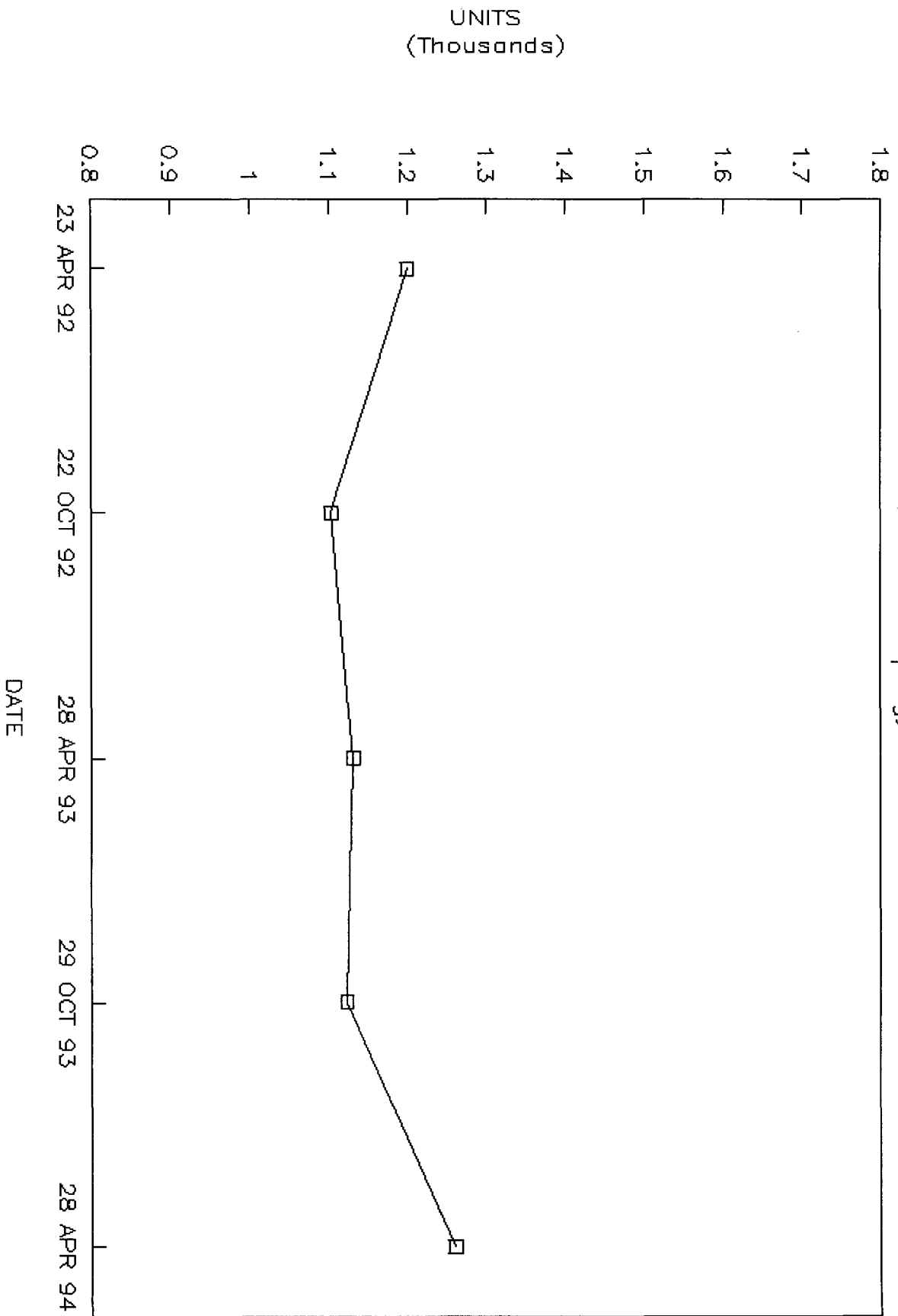
Spring, 94



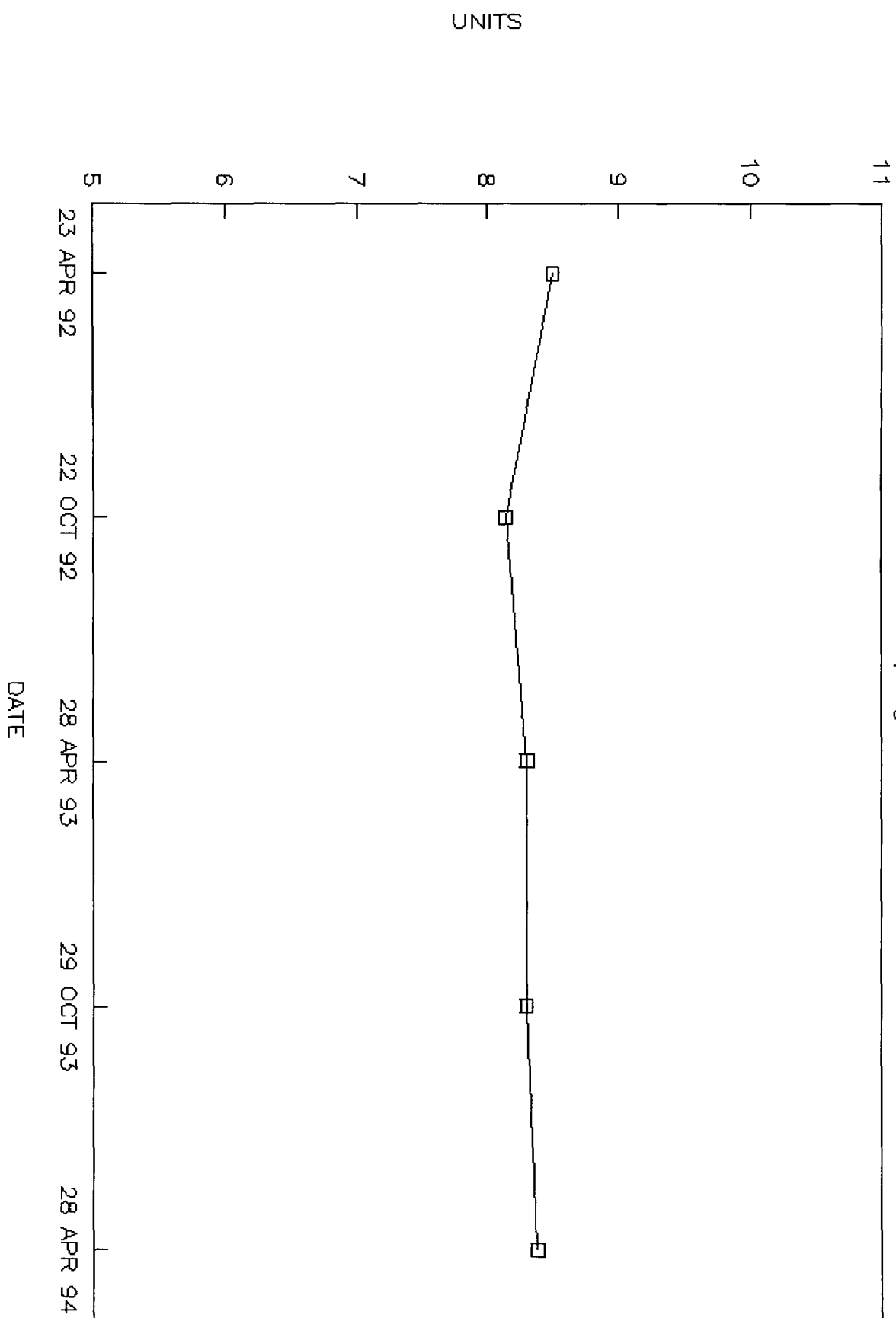
MW-5 pH Spring, 94



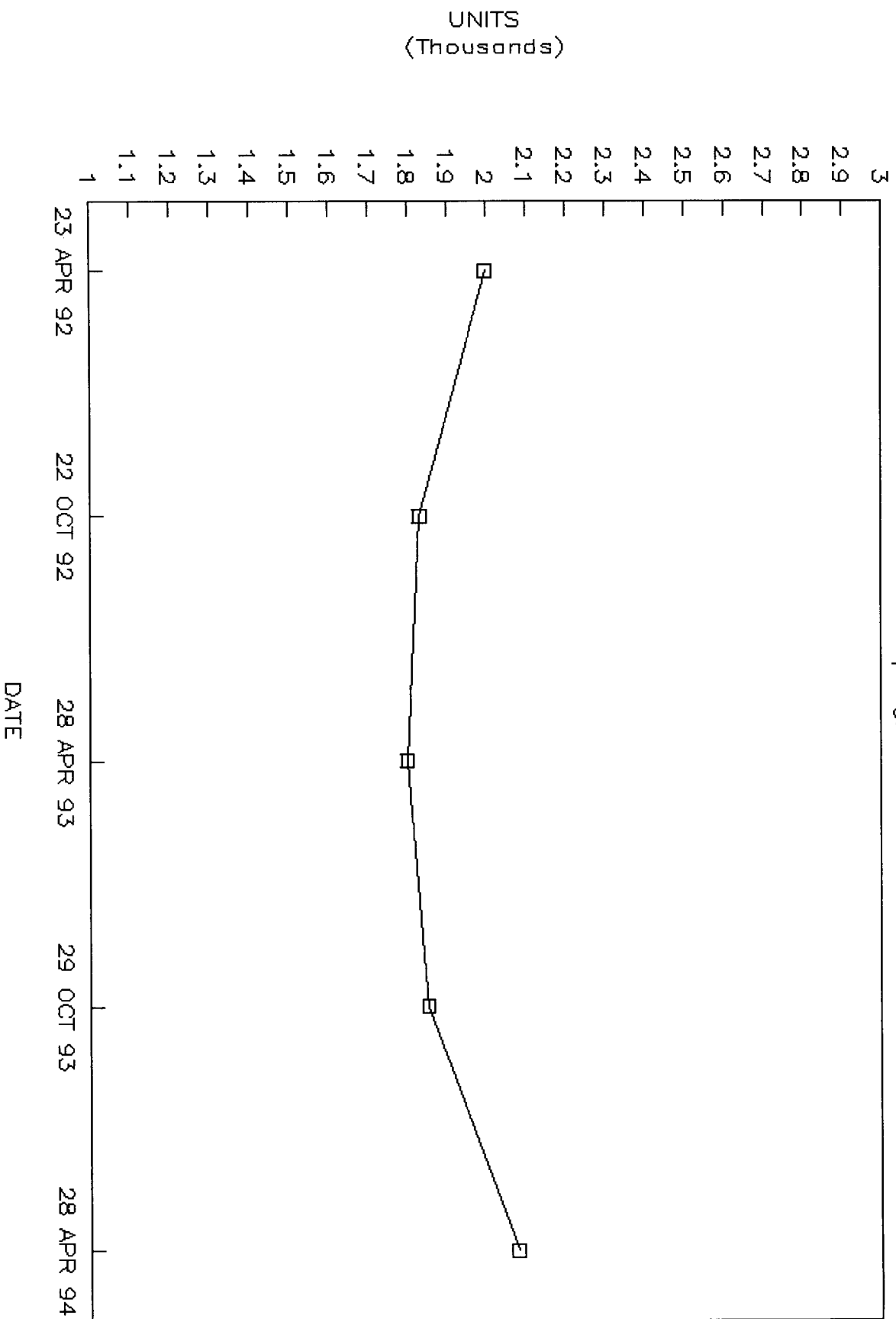
MW-5 EC Spring, 94



OW-11 PH Spring, 94



OW-11 EC Spring, 94



III. EARLY DETECTION WELL STATISTICS
TOLERANCE INTERVAL

TOLERANCE INTERVAL

1994

LEAD

SMW-3 4-94 MEAN- 0.0018 SD 0.0016

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.0025	0.005	ppm	Does not exceed the tolerance limit.

SMW-4 4-94 MEAN- 0.0019 SD 0.0015

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.0025	0.005	ppm	Does not exceed the tolerance limit.

SMW-5 4-94 MEAN- 0.0017 SD 0.0016

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.0025	0.005	ppm	Does not exceed the tolerance limit.

SMW-6 4-94 MEAN- 0.0017 SD 0.0016

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.0025	0.005	ppm	Does not exceed the tolerance limit.

* 1/2 of Reporting Limit.
 TLS94

TOLERANCE INTERVAL

CHROME

SMW-3 4-94 MEAN- 0.0044 SD 0.0044

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.062	0.013	ppm	Exceeds the tolerance limit by 477%.

SMW-4 4-94 MEAN- 0.0045 SD 0.0036

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.005	* 0.012	ppm	Does not exceed the tolerance limit.

SMW-5 4-94 MEAN- 0.0109 SD 0.0253

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.094	0.062	ppm	Exceeds the tolerance limit by 15%.

SMW-6 4-94 MEAN- 0.0402 SD 0.1213

DATE	RESULT	TOL LIMIT	UNITS	
4-94	0.442	0.283	ppm	Exceeds the tolerance limit by 156%.

* 1/2 of reporting limit.
 TLS94

TOLERANCE INTERVAL

pH

SMW-3 4-94 MEAN- 7.84 SD 0.1449

DATE	RESULT	TOL LIMIT	UNITS	
4-94	7.81	8.130	---	Does not exceed the tolerance limit.

SMW-4 4-94 MEAN- 8.34 SD 0.1657

DATE	RESULT	TOL LIMIT	UNITS	
4-94	8.49	8.671	---	Does not exceed the tolerance limit.

SMW-5 4-94 MEAN- 8.487 SD 0.3409

DATE	RESULT	TOL LIMIT	UNITS	
4-94	8.85	9.169	---	Does not exceed the tolerance limit.

SMW-6 4-94 MEAN- 8.01 SD 0.3519

DATE	RESULT	TOL LIMIT	UNITS	
4-94	7.24	8.714	---	Does not exceed the tolerance limit.

TLS94

TOLERANCE INTERVAL

EC

SMW-3 4-94 MEAN- 3219.15 SD 315.59

DATE	RESULT	TOL LIMIT	UNITS	
4-94	3160	3850.330	---	Does not exceed the tolerance limit.

SMW-4 4-94 MEAN- 1225.83 SD 99.93

DATE	RESULT	TOL LIMIT	UNITS	
4-94	1190	1425.690	---	Does not exceed the tolerance limit.

SMW-5 4-94 MEAN- 1135.67 SD 78.31

DATE	RESULT	TOL LIMIT	UNITS	
4-94	1130	1292.290	---	Does not exceed the tolerance limit.

SMW-6 4-94 MEAN- 2820.1 SD 4250.43

DATE	RESULT	TOL LIMIT	UNITS	
4-94	16900	11320.96	---	Exceeds the tolerance limit by 149%.

TLS94

TOLERANCE INTERVAL

TEMPERATURE

SMW-3 4-94 MEAN- 54.81 SD 2.54

DATE	RESULT	TOL LIMIT	UNITS	
4-94	52	59.89	degrees	Does not exceed the tolerance limit.

SMW-4 4-94 MEAN- 55.28 SD 2.76

DATE	RESULT	TOL LIMIT	UNITS	
4-94	53	60.80	degrees	Does not exceed the tolerance limit.

SMW-5 4-94 MEAN- 54.44 SD 3.01

DATE	RESULT	TOL LIMIT	UNITS	
4-94	50	60.46	degrees	Does not exceed the tolerance limit.

SMW-6 4-94 MEAN- 54.25 SD 3.78

DATE	RESULT	TOL LIMIT	UNITS	
4-94	48	61.81	degrees	Does not exceed the tolerance limit.

TLS94

TOLERANCE INTERVAL

WATER LEVEL

SMW-3 4-94 MEAN- 6851.52 SD 2.33

DATE	RESULT	TOL LIMIT	UNITS	
4-94	6855.35	6856.18	feet	Does not exceed the tolerance limit.

SMW-4 4-94 MEAN- 6848.85 SD 1.44

DATE	RESULT	TOL LIMIT	UNITS	
4-94	6850.29	6851.73	feet	Does not exceed the tolerance limit.

SMW-5 4-94 MEAN- 6847.3 SD 1.15

DATE	RESULT	TOL LIMIT	UNITS	
4-94	6848.13	6849.60	feet	Does not exceed the tolerance limit.

SMW-6 4-94 MEAN- 6855.71 SD 8.6

DATE	RESULT	TOL LIMIT	UNITS	
4-94	6875.88	6872.91	feet	Exceeds the tolerance limit by 33.3%.

TLS94

IV. TABULATED ANALYTICAL DATA

SMW-3

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	ug/L	5.0
Acetone	ND	ND	ND	ug/L	10
Carbon disulfide	ND	ND	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ug/L	5.0
Vinyl acetate	ND	ND	ND	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
Trichloroethene	ND	ND	ND	ug/L	5.0
Chlorodibromomethane	---	---	---	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L	10

SMW-3

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Bromoform	ND	ND	ND	ug/L	5.0
4-Methyl-2-pentanone	ND	ND	ND	ug/L	10
2-Hexanone	ND	ND	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L	5.0
Tetrachloroethene	ND	ND	ND	ug/L	5.0
Toluene	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ug/L	5.0
Stryene	ND	ND	ND	ug/L	5.0
Xylenes (total)	ND	ND	ND	ug/L	5.0

SMW-3

Giant Refining Gallup, New Mexico

Dissolved Metals

Parameter	22 APR 92 Result	29 APR 93 Result	29 APR 94 Result	Units	Reporting Limit
Calcium	42	43.5	45	mg/L	0.40
Magnesium	12	15.6	13.9	mg/L	0.40
Potassium	ND	ND	ND	mg/L	10.0
Sodium	220	820	744	mg/L	10.0

SMW-3

Giant Refining Gallup, New Mexico

Total Metals

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chromium	0.012	ND	0.062	mg/L	0.010
Lead	ND	ND	ND	mg/L	0.0050

SMW-3

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO ₃ at pH 4.5	630	---	660	mg/L	5.0
Alkalinity, Carb. as CaCO ₃ at pH 8.3	ND	---	ND	mg/L	5.0
Chloride	70	---	83	mg/L	3.0
pH	7.9	7.66	7.81	units	---
pH	---	7.68	---	units	---
pH	---	7.71	---	units	---
pH	---	7.72	---	units	---
Average pH		7.6925		units	---
Sulfate	1000		1000	mg/L	5.0
Specific Conductance at 25 deg.C	3170	3220	3160	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	3250	---	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	3190	---	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	3230	---	umhos/cm	1.0
Average Specific Conductance at 25 deg.C		3222.5		umhos/cm	1.0
Total Organic Carbon	3	2	2	mg/L	0.50
Total Organic Carbon	---	2	2	mg/L	0.50
Total Organic Carbon	---	---	---	mg/L	0.50
Total Organic Carbon	---	---	---	mg/L	0.50
Total Organic Halogen as Cl	40	30	30	ug/L	30
Total Organic Halogen as Cl	---	30	30	ug/L	30
Total Organic Halogen as Cl	---	---	---	ug/L	30
Total Organic Halogen as Cl	---	---	---	ug/L	30
Total Dissolved Solids	2300	---	2300	mg/L	10
Water Elevation	6846.24	6852.43	6855.35	ft	

SMW-4

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	ug/L	5.0
Acetone	ND	ND	ND	ug/L	10
Carbon disulfide	ND	ND	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ug/L	5.0
Vinyl acetate	ND	ND	ND	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
Trichloroethene	ND	ND	ND	ug/L	5.0
Chlorodibromomethane	---	---	---	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L	10
Bromoform	ND	ND	ND	ug/L	5.0
4-Methyl-2-pentanone	ND	ND	ND	ug/L	10
2-Hexanone	ND	ND	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L	5.0
Tetrachloroethene	ND	ND	ND	ug/L	5.0
Toluene	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ug/L	5.0
Stryene	ND	ND	ND	ug/L	5.0
Xylenes (total)	ND	ND	ND	ug/L	5.0

SMW-4

Giant Refinery Gallup, New Mexico

Dissolved Metals

Parameter	22 APR 92 Result	29 APR 93 Result	29 APR 93 DUP	29 APR 94 Result	Units
Calcium	2.8	4.2	4.6	2.6	mg/L
Magnesium	0.78	1.4	1.5	0.7	mg/L
Potassium	ND	ND	ND	ND	mg/L
Sodium	82	318	321	286	mg/L

SMW-4

Giant Refining Gallup, New Mexico

Total Metals

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chromium	0.014	ND	ND	mg/L	0.010
Lead	ND	ND	ND	mg/L	0.0050

SMW-4

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units
Alkalinity, Bicarb. as CaCO ₃ at pH 4.5	420	---	393	mg/L
Alkalinity, Carb. as CaCO ₃ at pH 8.3	ND	---	18	mg/L
Chloride	61	---	56	mg/L
pH	8.2	8.52	8.49	units
pH	---	8.48	---	units
pH	---	8.48	---	units
pH	---	8.52	---	units
Average pH		8.5		units
Sulfate	180	---	160	mg/L
Specific Conductance at 25 deg.C	1310	1260	1190	umhos/cm
Specific Conductance at 25 deg.C	---	1270	---	umhos/cm
Specific Conductance at 25 deg.C	---	1280	---	umhos/cm
Specific Conductance at 25 deg.C	---	1270	---	umhos/cm
Average Specific Conductance at 25 deg.C		1270		umhos/cm
Total Organic Carbon	3	ND	3	mg/L
Total Organic Carbon	---	ND	3	mg/L
Total Organic Carbon	---	---	---	mg/L
Total Organic Carbon	---	---	---	mg/L
Total Organic Halogen as Cl	40	ND	80	ug/L
Total Organic Halogen as Cl	---	ND	50	ug/L
Total Organic Halogen as Cl	---	---	---	ug/L
Total Organic Halogen as Cl	---	---	---	ug/L
Total Dissolved Solids	840	---	760	mg/L
Water Elevation	6848.84	6848.99	6850.29	ft

SMW-5

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	ug/L	5.0
Acetone	ND	ND	ND	ug/L	10
Carbon disulfide	ND	ND	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ug/L	5.0
Vinyl acetate	ND	ND	ND	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
Trichloroethene	ND	ND	ND	ug/L	5.0
Chlorodibromomethane	---	---	---	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L	10
Bromoform	ND	ND	ND	ug/L	5.0
4-Methyl-2-pentanone	ND	ND	ND	ug/L	10
2-Hexanone	ND	ND	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L	5.0
Tetrachloroethene	ND	ND	ND	ug/L	5.0
Toluene	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ug/L	5.0
Stryene	ND	ND	ND	ug/L	5.0
Xylenes (total)	ND	ND	ND	ug/L	5.0

SMW-5

Giant Refinery Gallup, New Mexico

Dissolved Metals

Parameter	29 APR 93 Result	29 APR 94 Result	Units	Reporting Limit
Calcium	3.4	1.6	mg/L	0.40
Magnesium	1.5	0.7	mg/L	0.40
Potassium	1.3	ND	mg/L	10.0
Sodium	256	267	mg/L	10.0

SMW-5

Giant Refining Gallup, New Mexico

Total Metals

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chromium	0.012	ND	0.094	mg/L	0.010
Lead	ND	ND	ND	mg/L	0.0050

SMW-5

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO ₃ at pH 4.5	335	---	349	mg/L	5.0
Alkalinity, Carb. as CaCO ₃ at pH 8.3	10	---	24	mg/L	5.0
Chloride	61	---	67	mg/L	3.0
pH	8.5	8.74	8.85	units	---
pH	---	8.71	---	units	---
pH	---	8.76	---	units	---
pH	---	8.76	---	units	---
Average pH		8.7425		units	---
Sulfate	140	---	150	mg/L	5.0
Specific Conductance at 25 deg.C	1130	1140	1130	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	1140	---	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	1150	---	umhos/cm	1.0
Specific Conductance at 25 deg.C	---	1150	---	umhos/cm	1.0
Average Specific Conductance at 25 deg.C		1145		umhos/cm	1.0
Total Organic Carbon	8	ND	2	mg/L	0.50
Total Organic Carbon	---	ND	2	mg/L	0.50
Total Organic Carbon	---	---	---	mg/L	0.50
Total Organic Carbon	---	---	---	mg/L	0.50
Total Organic Halogen as Cl	90	ND	30	ug/L	30
Total Organic Halogen as Cl	---	ND	ND	ug/L	30
Total Organic Halogen as Cl	---	---	---	ug/L	30
Total Organic Halogen as Cl	---	---	---	ug/L	30
Total Dissolved Solids	770	---	720	mg/L	10
Water Elevation	6847.02	6846.98	6848.13	ft	

SMW-6

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chloromethane	ND	ND	ND	ug/L	10
Bromomethane	ND	ND	ND	ug/L	10
Vinyl chloride	ND	ND	ND	ug/L	10
Chloroethane	ND	ND	ND	ug/L	10
Methylene chloride	ND	ND	ND	ug/L	5.0
Acetone	ND	ND	11.0	ug/L	10
Carbon disulfide	---	---	ND	ug/L	5.0
1,1-Dichloroethene	ND	ND	ND	ug/L	5.0
1,1-Dichloroethane	ND	ND	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L	5.0
Chloroform	ND	ND	ND	ug/L	5.0
1,2-Dichloroethane	ND	ND	ND	ug/L	5.0
2-Butanone	---	---	---	ug/L	5.0
1,1,1-Trichloroethane	ND	ND	ND	ug/L	10
Carbon tetrachloride	ND	ND	ND	ug/L	5.0
Vinyl acetate	---	---	---	ug/L	5.0
Bromodichloromethane	ND	ND	ND	ug/L	10
trans-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
Trichloroethene	---	---	---	ug/L	5.0
Chlorodibromomethane	---	---	---	ug/L	5.0
1,1,2-Trichloroethane	ND	ND	ND	ug/L	5.0
Benzene	ND	ND	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ND	ND	ug/L	5.0
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L	10
Bromoform	ND	ND	ND	ug/L	5.0
4-Methyl-2-pentanone	---	---	---	ug/L	10
2-Hexanone	ND	ND	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L	5.0
Tetrachloroethene	---	---	---	ug/L	5.0
Toluene	ND	ND	ND	ug/L	5.0
Chlorobenzene	ND	ND	ND	ug/L	5.0
Ethylbenzene	ND	ND	ND	ug/L	5.0
Stryene	---	---	---	ug/L	5.0
Xylenes (total)	ND	ND	ND	ug/L	5.0

SMW-6

Giant Refinery Gallup, New Mexico

Metals
Dissolved Metals

Parameter	05 MAR 91 Result*	22 APR 92 Result	29 APR 94 Result	Units	Reporting Limit
Calcium	6.6	4.6	1140	mg/L	0.40
Magnesium	1.9	1.4	221	mg/L	0.40
Potassium	3.6	1.0	4.6	mg/L	10.0
Sodium	376	86	3120	mg/L	10.0

SMW-6

Giant Refining Gallup, New Mexico

Total Metals

Parameter	22 OCT 92 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Chromium	0.138	ND	0.442	mg/L	0.010
Lead	0.010	ND	ND	mg/L	0.0050

SMW-6

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	29 APR 93 Result	30 NOV 93 Result	29 APR 94 Result	Units	Reporting Limit
Alkalinity, Bicarb. as CaCO3 at pH 4.5	591	---	374	mg/L	10
Alkalinity, Carb. as CaCO3 at pH 8.3	ND	---	ND	mg/L	10
Chloride	90	---	5400	mg/L	5.0
pH	8.2	8.14	7.24	units	10
pH	---	8.15	---	units	5.0
pH	---	8.05	---	units	5.0
pH	---	8	---	units	5.0
Average pH		8.085		units	
Sulfate	220	---	2100	mg/L	5.0
Specific Conductance at 25 deg.C	1760	1670	16900	umhos/cm	5.0
Specific Conductance at 25 deg.C	---	1650	---	umhos/cm	10
Specific Conductance at 25 deg.C	---	1680	---	umhos/cm	5.0
Specific Conductance at 25 deg.C	---	1670	---	umhos/cm	5.0
Average Specific Conductance at 25 deg.C		1667.5		umhos/cm	5.0
Total Organic Carbon	2	ND	32	mg/L	5.0
Total Organic Carbon	---	ND	31	mg/L	5.0
Total Organic Carbon	---	---	---	mg/L	5.0
Total Organic Carbon	---	---	---	mg/L	10
Total Organic Halogen as Cl	ND	20	290	ug/L	5.0
Total Organic Halogen as Cl	---	20	210	ug/L	10
Total Organic Halogen as Cl	---	---	---	ug/L	5.0
Total Organic Halogen as Cl	---	---	---	ug/L	5.0
Total Organic Halogen as Cl	---	---	---	ug/L	5.0
Total Dissolved Halogen as Cl	---	---	---	ug/L	5.0
Total Dissolved Solids	1100	---	13000	mg/L	5.0
Water Elevation	6848.90	6849.01	6875.88	ft	

OW-1 Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	28 APR 93 Result	4 JUN 93 Result*	14 JUL 93 Result**	29 OCT 93 Result	3 MAY 94 Result	Units
Benzene	ND	0.9	ND	ND	ND	ug/L
Toluene	2.3	1.9	1.4	ND	0.9	ug/L
Ethylbenzene	ND	ND	ND	ND	ND	ug/L
Xylenes (total)	ND	1.6	0.6	ND	2.7	ug/L

OW-11

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	28 APR 93 Result	29 OCT 93 Result	3 MAY 94 Result	Units
1,1-Dichloroethene	ND	ND	ND	ug/L
2-Butanone	ND	ND	ND	ug/L
1,1,1-Trichloroethane	ND	ND	ND	ug/L
Benzene	ND	ND	ND	ug/L
Tetrachloroethene	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	ND	ug/L
Acetone	ND	ND	ND	ug/L
Carbon Disulfide	ND	ND	ND	ug/L
Chloromethane	ND	ND	ND	ug/L
Bromomethane	ND	ND	ND	ug/L
Vinyl Chloride	ND	ND	ND	ug/L
Chloroethane	ND	ND	ND	ug/L
Methylene Chloride	ND	ND	ND	ug/L
Carbon Disulfide	ND	ND	ND	ug/L
1,1-Dichloroethane	ND	ND	ND	ug/L
1,2-Dichloroethene (Total)	ND	ND	ND	ug/L
Chloroform	ND	ND	ND	ug/L
1,2-Dichloroethane	ND	ND	ND	ug/L
Carbon Tetrachloride	ND	ND	ND	ug/L
Vinyl Acetate	ND	ND	ND	ug/L
Bromodichloromethane	ND	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L
1,2-Dichloropropane	ND	ND	ND	ug/L
Trans-1,3-Dichloropropene	ND	ND	ND	ug/L
Trichloroethene	ND	ND	ND	ug/L
Dibromochloromethane	ND	ND	ND	ug/L
1,1,2-Trichloroethane	ND	ND	ND	ug/L
Cis-1,3-Dichloropropene	ND	ND	ND	ug/L
2-Chloroethylvinylether	ND	ND	ND	ug/L
Bromoform	ND	ND	ND	ug/L
2-Hexanone (MBK)	ND	ND	ND	ug/L
4-Methyl-2-Pentanone (MIBK)	ND	ND	ND	ug/L
Chlorobenzene	ND	ND	ND	ug/L

OW-11

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	28 APR 93 Result	29 OCT 93 Result	3 MAY 94 Result	Units
Styrene	ND	ND	ND	ug/L
Acrolein	---	---	---	ug/L
Acrylonitrile	---	---	---	ug/L
Dibromomethane	---	---	---	ug/L
Dichlorodifluoromethane	---	---	---	ug/L
Methyl Iodide	---	---	---	ug/L
Trans-1,4-Dichloro-2-Butene	---	---	---	ug/L
Trichloromonofluoromethane	---	---	---	ug/L
1,2,3-Trichloropropane	---	---	---	ug/L
Ethyl Methacrylate	---	---	---	ug/L
Ethanol	---	---	---	ug/L
1,4-Dichloro-2-Butane	---	---	---	ug/L

OW-11 Giant Refining Gallup, New Mexico

Metals
Dissolved Metals

Parameter	22 APR 92 Result	28 APR 93 Result	29 APR 94 Result	Units
Arsenic	ND	ND	ND	mg/L
Barium	ND	ND	0.015	mg/L
Cadmium	ND	ND	ND	mg/L
Calcium	7.1	4.8	5.5	mg/L
Copper	---	---	---	mg/L
Manganese	ND	ND	ND	mg/L
Nickel	---	---	---	mg/L
Selenium	ND	ND	ND	mg/L
Silver	ND	ND	ND	mg/L
Sodium	140	421	505	mg/L
Zinc	---	---	---	mg/L
Potassium	1.2	1.1	1.1	mg/L

OW-11 Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	29 APR 94 Result	Units
Chromium	0.010	ND	ND	ND	mg/L
Lead	ND	ND	ND	ND	mg/L
Mercury	---	ND	---	ND	mg/L

OW-11 Giant Refining Gallup, New Mexico

General Inorganics

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	29 APR 94 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	---	485	---	374	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	---	ND	---	11	mg/L
Chloride	---	160	---	144	mg/L
pH	8.12	8.3	8.26	8.38	units
pH	8.12	---	8.31	---	units
pH	8.11	---	8.32	---	units
pH	8.2	---	8.3	---	units
	8.1375		8.2975	8.38	
Phenolics	ND	ND	ND	ND	mg/L
Sulfate	---	200	---	600	mg/L
Specific Conductance at 25 deg.C	1820	1800	1840	2080	umhos/cm
Specific Conductance at 25 deg.C	1840	---	1870	---	umhos/cm
Specific Conductance at 25 deg.C	1840	---	1820	---	umhos/cm
Specific Conductance at 25 deg.C	1820	---	1880	---	umhos/cm
	1830		1852.5	2080	
Total Organic Carbon	6.80	4	3	2	mg/L
Total Organic Carbon	6.20	---	3	2	mg/L
Total Organic Carbon	---	---	---	---	mg/L
Total Organic Carbon	---	---	---	---	mg/L
Total Organic Halogen as Cl	0.021	30	200	30	ug/L
Total Organic Halogen as Cl	0.023	---	200	ND	ug/L
Total Organic Halogen as Cl	---	---	---	---	ug/L
Total Organic Halogen as Cl	---	---	---	---	ug/L
Total Dissolved Solids	---	1100	---	1400	mg/L
Water Elevation	6905.01	6905.79	6905.62	6905.62	ft

MW-1 GIANT REFINING GALLUP, NEW MEXICO

Volatile Organics Method 8240

Parameter	29 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Chloromethane	ND	ND	ND	ug/L
Bromomethane	ND	ND	ND	ug/L
Vinyl chloride	ND	ND	ND	ug/L
Chloroethane	ND	ND	ND	ug/L
Methylene chloride	ND	ND	ND	ug/L
Acetone	ND	ND	ND	ug/L
Carbon disulfide	ND	ND	ND	ug/L
1,1-Dichloroethene	ND	ND	ND	ug/L
1,1-Dichloroethane	ND	ND	ND	ug/L
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L
Chloroform	ND	ND	ND	ug/L
1,2-Dichloroethane	ND	ND	ND	ug/L
2-Butanone	ND	ND	ND	ug/L
1,1,1-Trichloroethane	ND	ND	ND	ug/L
Carbon tetrachloride	ND	ND	ND	ug/L
Vinyl acetate	ND	ND	ND	ug/L
Bromodichloromethane	ND	ND	ND	ug/L
trans-1,3-Dichloropropene	ND	ND	ND	ug/L
Trichloroethene	ND	ND	ND	ug/L
Chlorodibromomethane	ND	ND	ND	ug/L
1,1,2-Trichloroethane	ND	ND	ND	ug/L
Benzene	ND	ND	ND	ug/L
cis-1,3-Dichloropropene	ND	ND	ND	ug/L
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L
Bromoform	ND	ND	ND	ug/L
4-Methyl-2-pentanone	ND	ND	ND	ug/L
2-Hexanone	ND	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L
Tetrachloroethene	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ug/L
Chlorobenzene	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ug/L
Stryene	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	ND	ug/L

MW-1 GIANT REFINING GALLUP, NEW MEXICO

Metals Dissolved Metals

Parameter	23 APR 92 Result	28 APR 93 Result	29 APR 94 Result	Units
Arsenic	ND	ND	ND	mg/L
Barium	0.09	ND	0.016	mg/L
Cadmium	0.0012	ND	ND	mg/L
Calcium	1.8	1.1	1.2	mg/L
Magnesium	0.26	0.2	0.3	mg/L
Manganese	0.10	ND	0.016	mg/L
Potassium	ND	ND	ND	mg/L
Selenium	ND	ND	ND	mg/L
Silver	ND	ND	ND	mg/L
Sodium	72		254	mg/L

MW-1

Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Chromium	0.025	ND	ND	ND	mg/L
Lead	0.004	ND	.036	ND	mg/L
Mercury	---	ND	---	ND	mg/L

MW-1

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	---	322	---	301	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	---	26	---	48	mg/L
Chloride	---	49	---	52	mg/L
pH	8.76	8.8	9.05	9.06	units
pH	8.78	---	9		units
pH	8.78	---	9.08		units
pH	8.74	---	9.08		units
	8.765	8.8	9.0525	9.06	
Phenolics	---	ND	ND	ND	mg/L
Sulfate	---	150	---	160	mg/L
Specific Conductance at 25 deg.C	1070	1110	1090	1070	umhos/cm
Specific Conductance at 25 deg.C	1090	---	1080	---	umhos/cm
Specific Conductance at 25 deg.C	1070	---	1080	---	umhos/cm
Specific Conductance at 25 deg.C	1090	---	1090	---	umhos/cm
	1080	1110	1085	1070	
Total Organic Carbon	1.5	ND	ND	ND	mg/L
Total Organic Carbon	3.0	---	ND	ND	mg/L
Total Organic Carbon	---	---	---	---	mg/L
Total Organic Carbon	---	---	---	---	mg/L
Total Organic Halogen as Cl	0.015	ND	ND	ND	ug/L
Total Organic Halogen as Cl	0.020	---	ND	20	ug/L
Total Organic Halogen as Cl	---	---	---	---	ug/L
Total Organic Halogen as Cl	---	---	---	---	ug/L
Total Dissolved Solids	---	690	---	720	mg/L
Water Elevation	6872.82	6873.52	6864.61	6873.34	ft

MW-2

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Chloromethane	ND	ND	ND	ND	ug/L
Bromomethane	ND	ND	ND	ND	ug/L
Vinyl chloride	ND	ND	ND	ND	ug/L
Chloroethane	ND	ND	ND	ND	ug/L
Methylene chloride	ND	ND	ND	ND	ug/L
Acetone	4.3 J	ND	ND	ND	ug/L
Carbon disulfide	17	ND	ND	ND	ug/L
1,1-Dichloroethene	ND	ND	ND	ND	ug/L
1,1-Dichloroethane	ND	ND	ND	ND	ug/L
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ND	ug/L
Chloroform	ND	ND	ND	ND	ug/L
1,2-Dichloroethane	ND	ND	ND	ND	ug/L
2-Butanone	---	ND	ND	ND	ug/L
1,1,1-Trichloroethane	ND	ND	ND	ND	ug/L
Carbon tetrachloride	ND	ND	ND	ND	ug/L
Vinyl acetate	ND	ND	ND	ND	ug/L
Bromodichloromethane	ND	ND	ND	ND	ug/L
trans-1,3-Dichloropropene	ND	ND	ND	ND	ug/L
Trichloroethene	ND	ND	ND	ND	ug/L
Chlorodibromomethane	ND	ND	ND	ND	ug/L
1,1,2-Trichloroethane	ND	ND	ND	ND	ug/L
Benzene	ND	ND	ND	ND	ug/L
cis-1,3-Dichloropropene	ND	ND	ND	ND	ug/L
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ug/L
Bromoform	ND	ND	ND	ND	ug/L
4-Methyl-2-pentanone	---	ND	ND	ND	ug/L
2-Hexanone	ND	ND	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ug/L
Tetrachloroethene	ND	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ND	ug/L
Chlorobenzene	ND	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ND	ug/L
Stryene	ND	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	ND	ND	ug/L

MW-2 GIANT REFINING GALLUP, NEW MEXICO

Metals Dissolved Metals

Parameter	23 APR 92 Result	28 APR 93 Result	28 APR 94 Result	Units
Arsenic	ND	ND	ND	mg/L
Barium	ND	0.015	0.021	mg/L
Cadmium	ND	ND	ND	mg/L
Calcium	1.6	0.9	0.6	mg/L
Magnesium	0.18	0.1	ND	mg/L
Manganese	ND	ND	ND	mg/L
Potassium	ND	ND	ND	mg/L
Selenium	ND	ND	ND	mg/L
Silver	ND	ND	ND	mg/L
Sodium	78		257	mg/L

MW-2

Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Chromium	0.012	ND	ND	0.011	mg/L
Lead	ND	ND	.003	ND	mg/L
Mercury	---	ND	---	ND	mg/L

MW-2

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Alkalinity, Bicarb. as CaCO3 at pH 4.5	---	303	---	294	mg/L
Alkalinity, Carb. as CaCO3 at pH 8.3	---	33	---	42	mg/L
Chloride	---	57	---	61	mg/L
pH	8.67	8.9	9.09	9.10	units
pH	8.61		9.08		units
pH	8.6		9.1		units
pH	8.61		9.07		units
	8.6225	8.9	9.085	9.1	
Phenolics	---	ND	---	ND	mg/L
Sulfate	---	160	---	160	mg/L
Specific Conductance at 25 deg.C	1050	1120	1100	1120	umhos/cm
Specific Conductance at 25 deg.C	1130		1110		umhos/cm
Specific Conductance at 25 deg.C	1100		1090		umhos/cm
Specific Conductance at 25 deg.C	1080		1090		umhos/cm
	1090	1120	1097.5	1120	
Total Organic Carbon	1.60	1	ND	ND	mg/L
Total Organic Carbon	ND		ND	ND	mg/L
Total Organic Carbon	---		---	---	mg/L
Total Organic Carbon	---		---	---	mg/L
Total Organic Halogen as Cl	ND	ND	ND	20	ug/L
Total Organic Halogen as Cl	ND		ND	20	ug/L
Total Organic Halogen as Cl	---		---	---	ug/L
Total Organic Halogen as Cl	---		---	---	ug/L
Total Dissolved Solids	---	680	---	700	mg/L
Water Elevation	6872.05	6872.62	6872.65	6873.62	ft

MW-4

Giant Refining Gallup, New Mexico

Volatile Organics
Method 8240

Parameter	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Chloromethane	ND	ND	ND	ug/L
Bromomethane	ND	ND	ND	ug/L
Vinyl chloride	ND	ND	ND	ug/L
Chloroethane	ND	ND	ND	ug/L
Methylene chloride	ND	ND	ND	ug/L
Acetone	ND	ND	ND	ug/L
Carbon disulfide	ND	ND	ND	ug/L
1,1-Dichloroethene	ND	ND	ND	ug/L
1,1-Dichloroethane	ND	ND	ND	ug/L
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L
Chloroform	ND	ND	ND	ug/L
1,2-Dichloroethane	ND	ND	ND	ug/L
2-Butanone	ND	ND	ND	ug/L
1,1,1-Trichloroethane	ND	ND	ND	ug/L
Carbon tetrachloride	ND	ND	ND	ug/L
Vinyl acetate	ND	ND	ND	ug/L
Bromodichloromethane	ND	ND	ND	ug/L
trans-1,3-Dichloropropene	ND	ND	ND	ug/L
Trichloroethene	ND	ND	ND	ug/L
Chlorodibromomethane	ND	ND	ND	ug/L
1,1,2-Trichloroethane	ND	ND	ND	ug/L
Benzene	ND	ND	ND	ug/L
cis-1,3-Dichloropropene	ND	ND	ND	ug/L
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L
Bromoform	ND	ND	ND	ug/L
4-Methyl-2-pentanone	ND	ND	ND	ug/L
2-Hexanone	ND	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L
Tetrachloroethene	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ug/L
Chlorobenzene	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ug/L
Styrene	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	ND	ug/L

MW-4 GIANT REFINING GALLUP, NEW MEXICO

Metals
Dissolved Metals

Parameter	23 APR 92 Result	28 APR 93 Result	28 APR 94 Result	Units
Arsenic	ND	ND	ND	mg/L
Barium	0.06	0.015	0.019	mg/L
Cadmium	ND	ND	ND	mg/L
Calcium	1.5	1.5	0.8	mg/L
Magnesium	0.24	0.3	0.8	mg/L
Manganese	0.08	ND	0.010	mg/L
Potassium	ND	ND	ND	mg/L
Selenium	ND	ND	ND	mg/L
Silver	ND	ND	ND	mg/L
Sodium	78	295	283	mg/L

MW-4

Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter		22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Chromium		0.032	ND	ND	ND	mg/L
Lead		0.008	ND	ND	ND	mg/L
Mercury		---	ND	---	ND	mg/L

MW-4

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	28 APR 93 Result	29 OCT 93 Result	28 APR 94 Result	Units
Alkalinity, Bicarb. as CaCO ₃ at pH 4.5	426---	431mg---	431	mg/L
Alkalinity, Carb. as CaCO ₃ at pH 8.3	26---	33mg/L---	33	mg/L
Chloride	18	---	17mg/L	mg/L
pH	8.7	8.82	8.76	units
pH	---	8.83	---	units
pH	---	8.8	---	units
pH	---	8.8	---	units
	8.7	8.8125	8.76	
Phenolics	ND	ND	NDmg/L	mg/L
Sulfate	140	---	150mg/L	mg/L
Specific Conductance at 25 deg.C	1160	1140umh	1140	umhos/cm
Specific Conductance at 25 deg.C	---	1130umhos/cm		umhos/cm
Specific Conductance at 25 deg.C	---	1130umhos/cm		umhos/cm
Specific Conductance at 25 deg.C	---	1150umhos/cm		umhos/cm
	1160	1137.5	1140	
Total Organic Carbon	1NDNDm	ND	ND	mg/L
Total Organic Carbon	---NDN	ND	ND	mg/L
Total Organic Carbon	-----	---	---	mg/L
Total Organic Carbon	-----	---	---	mg/L
Total Organic Halogen as Cl	NDND20	ug/L ND	20	ug/L
Total Organic Halogen as Cl	---ND40	ug/L ND	40	ug/L
Total Organic Halogen as Cl	-----	ug/L---	---	ug/L
Total Organic Halogen as Cl	-----	ug/L---	---	ug/L
Total Dissolved Solids	730	---	740mg/L	mg/L
Water Elevation	6876.5768	77 6877.10	6876.76	ft

MW-5

Giant Refining Gallup, NM

Volatile Organics
Method 8240

Parameter	28 APR 93 Result	29 OCT 93 Result	27 APR 94 Result	Units
Chloromethane	ND	ND	ND	ug/L
Bromomethane	ND	ND	ND	ug/L
Vinyl chloride	ND	ND	ND	ug/L
Chloroethane	ND	ND	ND	ug/L
Methylene chloride	ND	ND	ND	ug/L
Acetone	ND	ND	ND	ug/L
Carbon disulfide	ND	ND	ND	ug/L
1,1-Dichloroethene	ND	ND	ND	ug/L
1,1-Dichloroethane	ND	ND	ND	ug/L
1,2-Dichloroethene (cis/trans)	ND	ND	ND	ug/L
Chloroform	ND	ND	ND	ug/L
1,2-Dichloroethane	ND	ND	ND	ug/L
2-Butanone	ND	ND	ND	ug/L
1,1,1-Trichloroethane	ND	ND	ND	ug/L
Carbon tetrachloride	ND	ND	ND	ug/L
Vinyl acetate	ND	ND	ND	ug/L
Bromodichloromethane	ND	ND	ND	ug/L
trans-1,3-Dichloropropene	ND	ND	ND	ug/L
Trichloroethene	ND	ND	ND	ug/L
Chlorodibromomethane	ND	ND	ND	ug/L
1,1,2-Trichloroethane	ND	ND	ND	ug/L
Benzene	ND	ND	ND	ug/L
cis-1,3-Dichloropropene	ND	ND	ND	ug/L
2-Chloroethyl vinyl ether	ND	ND	ND	ug/L
Bromoform	ND	ND	ND	ug/L
4-Methyl-2-pentanone	ND	ND	ND	ug/L
2-Hexanone	ND	ND	ND	ug/L
1,1,2,2-Tetrachloroethane	ND	ND	ND	ug/L
Tetrachloroethene	ND	ND	ND	ug/L
Toluene	ND	ND	ND	ug/L
Chlorobenzene	ND	ND	ND	ug/L
Ethylbenzene	ND	ND	ND	ug/L
Stryene	ND	ND	ND	ug/L
Xylenes (total)	ND	ND	ND	ug/L

MW-5

Giant Refining Gallup, New Mexico

Metals
Dissolved Metals

Parameter	23 APR 92 Result	28 APR 93 Result	27 APR 94 Result	Units
Arsenic	ND	ND	ND	mg/L
Barium	ND	0.015	0.018	mg/L
Cadmium	ND	ND	ND	mg/L
Calcium	1.1	1.4	1.4	mg/L
Magnesium	0.15	0.2	0.1	mg/L
Manganese	ND	ND	ND	mg/L
Potassium	ND	1.5	ND	mg/L
Selenium	ND	ND	ND	mg/L
Silver	ND	ND	0.010	mg/L
Sodium	64	269	263	mg/L

MW-5

Giant Refining Gallup, New Mexico

Metals
Total Metals

Parameter	22 OCT 92 Result	28 APR 93 Result	29 OCT 93 Result	27 APR 94 Result	Units
Chromium	ND	ND	ND	ND	mg/L
Lead	0.003	ND	.002	ND	mg/L
Mercury	---	ND	---	ND	mg/L

MW-5

Giant Refining Gallup, New Mexico

General Inorganics

Parameter	28 APR 93 Result	29 OCT 93 Result	27 APR 94 Result	Units
Alkalinity, Bicarb. as CaCO ₃ at pH 4.5	295	---	289	mg/L
Alkalinity, Carb. as CaCO ₃ at pH 8.3	29	---	42	mg/L
Chloride	66	---	66	mg/L
pH	8.9	8.96	9.10	units
pH	---	8.96		units
pH	---	9		units
pH	---	8.97		units
	8.9	8.9725	9.1	
Phenolics	ND	---	ND	mg/L
Sulfate	160	---	170	mg/L
Specific Conductance at 25 deg.C	1130	1110	1260	umhos/cm
Specific Conductance at 25 deg.C	---	1130	---	umhos/cm
Specific Conductance at 25 deg.C	---	1120	---	umhos/cm
Specific Conductance at 25 deg.C	---	1130	---	umhos/cm
	1130	1122.5	1260	
Total Organic Carbon	1	ND		mg/L
Total Organic Carbon	---	ND		mg/L
Total Organic Carbon	---	---		mg/L
Total Organic Carbon	---	---		mg/L
Total Organic Halogen as Cl	50	ND		ug/L
Total Organic Halogen as Cl	---	ND		ug/L
Total Organic Halogen as Cl	---	---		ug/L
Total Organic Halogen as Cl	---	---		ug/L
Total Dissolved Solids	700	---	700	mg/L
Water Elevation	6871.51	6873.53	6873.83	ft

V. ORIGINAL ANALYTICAL DATA



Analytical **Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 405312

June 9, 1994

Giant Refining
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: ANNUAL GDWTR

Attention: Lynn Shelton

On 05/03/94, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples 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.

Please note on the Total Organic Halide analysis relatively high RPD's for duplicate results were observed for some samples. This is likely due to the following factors. One, when concentrations are near the detection limit of 20 mg/L the reproducibility of the TOX measurements is in the range of approximately +/- 20 mg/L. Two, the samples contained a very fine particulate material. The particulates may have caused the samples to be heterogeneous since the particulates would not be evenly distributed throughout the sample.

All Total Organic Halide and Total Organic Carbon samples received at ATI, Albuquerque had headspace.

Total Organic Carbon, Total Organic Halides analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

EPA Method 150.1 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.



Analytical **Technologies**, Inc.

Giant Refining

June 9, 1994

Page Two

This is an amended report. Please note that for the EPA method 8240 analysis of sample SMW-6, the acetone concentration has changed from 17 $\mu\text{g/L}$ to 11 $\mu\text{g/L}$. This amended report corrects a data entry error, the sample was not reanalyzed.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING DATE RECEIVED : 05/03/94
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR REPORT DATE : 06/09/94

ATI ID: 405312

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	405312-01	SMW-3	AQUEOUS	04/29/94
02	405312-02	SMW-4	AQUEOUS	04/29/94
03	405312-03	SMW-5	AQUEOUS	04/29/94
04	405312-04	SMW-6	AQUEOUS	04/29/94

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
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

CLIENT : GIANT REFINING ATI I.D. : 405312
PROJECT # : (NONE) DATE RECEIVED : 05/03/94
PROJECT NAME : ANNUAL GDWTR DATE ANALYZED : 05/03/94

PARAMETER	UNITS	01	02	03	04
PH (150.1)	UNITS	7.81	8.49	8.85	7.24



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING ATI I.D. : 405312
PROJECT # : (NONE) SAMPLE MATRIX : AQUEOUS
PROJECT NAME : ANNUAL GDWTR

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	40530101	9.06	9.07	0.1	NA	NA	NA

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

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



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405312

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/03/94

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

REPORT DATE : 06/09/94

PARAMETER	UNITS	01	02	03	04
CARBONATE (CACO3)	MG/L	<1	18	24	<1
BICARBONATE (CACO3)	MG/L	660	393	349	374
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	660	411	373	374
CHLORIDE (EPA 325.2)	MG/L	83	56	67	5400
CONDUCTIVITY, (UMHOS/CM)		3160	1190	1130	16900
SULFATE (EPA 375.2)	MG/L	1000	160	150	2100
T. DISSOLVED SOLIDS (160.1)	MG/L	2300	760	720	13000



Analytical Technologies, Inc. GENERAL CHEMISTRY - QUALITY CONTROL

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

ATI I.D. : 405312

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	40531202	18	18	0	NA	NA	NA
BICARBONATE	MG/L		393	389	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		411	407	1	NA	NA	NA
CHLORIDE	MG/L	40531201	83	82	1	161	80	98
CONDUCTIVITY(UMHOS/CM)		40561704	724	716	1	NA	NA	NA
SULFATE	MG/L	40530302	40	40	0	80	40	100
TOTAL DISSOLVED SOLIDS	MG/L	40530103	1400	1500	7	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. : 405312

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/03/94

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

REPORT DATE : 06/09/94

PARAMETER	UNITS	01	02	03	04
CALCIUM (EPA 200.7/6010)	MG/L	45.0	2.6	1.6	1140
CHROMIUM (EPA 200.7/6010)	MG/L	0.062	<0.010	0.094	0.442
POTASSIUM (EPA 200.7/6010)	MG/L	<1.0	<1.0	<1.0	4.6
MAGNESIUM (EPA 200.7/6010)	MG/L	13.9	0.7	0.7	221
SODIUM (EPA 200.7/6010)	MG/L	744	286	267	3120
LEAD (200.7/6010)	MG/L	<0.10	<0.10	<0.10	<0.10



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

ATI I.D. : 405312

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	MG/L	40531202	2.6	2.5	4	56.7	50.0	108
CHROMIUM	MG/L	40531201	0.062	0.061	2	0.973	1.00	91
POTASSIUM	MG/L	40531202	<1.0	<1.0	NA	49.3	50.0	99
MAGNESIUM	MG/L	40531202	0.7	0.7	0	26.0	25.0	101
SODIUM	MG/L	40531202	286	284	0.7	372	100	86
LEAD	MG/L	40531201	<0.10	<0.10	NA	0.90	1.00	90

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

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



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531201

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : SMW-3
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/29/94
DATE RECEIVED : 05/03/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531201

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

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

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	99
TOLUENE-D8 (%)	100



Analytical **Technologies, Inc.**

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40531201

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531202

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : SMW-4
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/29/94
DATE RECEIVED : 05/03/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531202

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS

RESULTS

ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLEETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	99
TOLUENE-D8 (%)	98



Analytical **Technologies, Inc.** ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40531202

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531203

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : SMW-5
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/29/94
DATE RECEIVED : 05/03/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531203

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

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

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	100
TOLUENE-D8 (%)	101



Analytical **Technologies**, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40531203

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531204

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : SMW-6
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/29/94
DATE RECEIVED : 05/03/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	11
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40531204

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLEETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BFB (%)	98
TOLUENE-D8 (%)	99



Analytical **Technologies**, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40531204

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 405312
PROJECT #	: (NONE)	DATE EXTRACTED	: 05/11/94
PROJECT NAME	: ANNUAL GDWTR	DATE ANALYZED	: 05/11/94
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 405312

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS

RESULTS

BROMOMETHANE	<10
2-CHLOROETHYLVINYLEETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BFB (%)	100
TOLUENE-D8 (%)	99



Analytical**Technologies**, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.

ATI I.D : 405312

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 405312

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
REF I.D. : 40530103

DATE ANALYZED : 05/11/94
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	DUP.		RPD
	RESULT	SPIKED	REC.	SPIKED	REC.	
1,1-DICHLOROETHENE	<5	50	51	102	48	6
TRICHLOROETHENE	<5	50	51	102	50	2
CHLOROBENZENE	<5	50	51	102	50	2
TOLUENE	<5	50	51	102	50	2
BENZENE	<5	50	50	100	49	2

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

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



Analytical Technologies, Inc.

TOTAL ORGANIC CARBON

Method 415.2

Lab Name: Analytical Technologies, Inc.

Date Collected: 04/29/94

Client Name: ATI-NM

Date Analyzed: 05/09/94

Client Project ID: GRC -- 405312

Sample Matrix: Water

Lab Workorder Number: 94-05-045

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 94-05-045	1	< 1.0	< 1.0	N/A
405312-1	94-05-045-01	1	2		
	94-05-045-01DUP	1	2	2	0
405312-2	94-05-045-02	1	3		
	94-05-045-02DUP	1	3	3	0
405312-3	94-05-045-03	1	2		
	94-05-045-03DUP	1	2	2	0
405312-4	94-05-045-04	1	32		
	94-05-045-04DUP	1	31	31.5	3



Analytical Technologies, Inc.

TOTAL ORGANIC HALIDE
Modified Method 9020 TOX

Lab Name: Analytical Technologies, Inc.

Date Collected: 04/29/94

Client Name: ATI-NM

Date Extracted: 05/11/94

Client Project ID: GRC -- 405312

Date Analyzed: 05/11/94

Lab Workorder Number: 94-05-045

Sample Matrix: Water

Sample ID	Lab Sample ID	Sample Volume (mL)	TOX Conc. (ug/L)	TOX AVG	RPD
Reagent Blank	WRB94-05-045	100	< 20	< 20	N/A
405312-1	94-05-045-01	100	30		
	94-05-045-01DUP	100	30	30	0
405312-2	94-05-045-02	100	80		
	94-05-045-02DUP	100	50	65	46
405312-3	94-05-045-03	100	30		
	94-05-045-03DUP	100	< 20	15	N/A
405312-4	94-05-045-04	50	290		
	94-05-045-04DUP	50	210	250	32



Analytical **Technologies**, Inc.

TOTAL ORGANIC HALIDE MATRIX SPIKE RESULTS

Modified Method 9020 TOX

Lab Name: Analytical Technologies, Inc.

Client Name: ATI-NM

Lab Sample ID: 94-04-307-02

Sample Matrix: Water

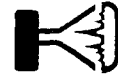
Sample ID

In House

Date Extracted: 05/11/94

Date Analyzed: 05/11/94

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery
2,4,6-Trichlorophenol	200	< 20	200	100



PROJECT MANAGER:

COMPANY: Giant Refining
ADDRESS: I-40, Exit 39
Jamestown, NM 87347
PHONE: 505/722-3833
FAX: 505/722-0210
BILL TO: Same
COMPANY: Same
ADDRESS: Route 3, Box 7
Gallup, NM 87301

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	Diesel/Gasoline/BTCE/MTBE (MOD 8015/8020)	BTCE/MTBE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	TDC	TOX	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240) *	Polynuclear Aromatics (610/8310)	TOTAL METALS (Cr, Pb)	DISSOLVED METALS **	SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal	PH, EC, TDS, ALKALINITY	The 13 Priority Pollutant Metals	HCRA Metals by Total Digestion	HCRA Metals by TCLP (1311)	NUMBER OF CONTAINERS
3mw-3	4-29	2:50	H ₂ O	01							X	X	X						X	X					X			11
3mw-4	4-29	3:25	H ₂ O	02							X	X	X						X	X					X			11
3mw-5	4-29	4:00	H ₂ O	03							X	X	X						X	X					X			11
3mw-6	4-29	4:40	H ₂ O	04							X	X	X						X	X					X			11

PROJECT INFORMATION

PROJ. NO.:
PROJ. NAME: ANNUAL GOWTR
P.O. NO.: 997 9023 94
SHIPPED VIA: FEDEX
NO. CONTAINERS: 44
CUSTODY SEALS: YIN (NA)
RECEIVED INTACT: Y
RECEIVED COLD: Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1WEEK (NORMAL) ☒ 2WEEK
Comments: * C.O.C. seals intact on outside cooler.
* SEE ATTACHED LIST OF PARAMETERS

** Ca, Mg, K, Na

SAMPLE RECEIPT

SAMPLED & RELINQUISHED BY: 1
Signature: [Signature]
Printed Name: LYN SHELTON
Company: GIANT
Time: 11:00 AM
Date: 5-2-94
Phone: 722-0227

RELINQUISHED BY: 2

RELINQUISHED BY: 2
Signature: [Signature]
Printed Name: [Blank]
Company: [Blank]
Time: [Blank]
Date: [Blank]

RECEIVED BY: (LAB)

RECEIVED BY: (LAB)
Signature: [Signature]
Printed Name: [Blank]
Company: [Blank]
Time: [Blank]
Date: [Blank]

ANALYSIS REQUEST			
NETWORK PROJECT MANAGER: BETH PROFFITT COMPANY: Analytical Technologies, Inc. ADDRESS: 2709-D Pan American Freeway, NE Albuquerque, NM 87107			
CLIENT PROJECT MANAGER:			
SAMPLE ID	DATE	TIME	MATRIX
405312-1	7/2/94	1450	PA
-2		1525	
-3		1600	
-4		1640	
TOX - run duplicates			
ORGANIC LEAD			
SULFIDE			
SURFACTANTS (MBAS)			
632/632 MOD			
619/619 MOD			
610/6310			
8240 (TCCLP 1311) ZHE			
Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)			
Volatiles Organics GC/MS (624/8240)			
NACE			
ASBESTOS			
BOD			
TOTAL COLIFORM			
FECAL COLIFORM			
GROSS ALPHA/BETA			
RADIUM 226/228			
AIR - O2, CO2, METHANE			
AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)			
NUMBER OF CONTAINERS			

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: 405312	TOTAL NUMBER OF CONTAINERS: 20		
PROJECT NAME: GRC	CHAIN OF CUSTODY SEALS: N		
QC LEVEL: STD IV	INTACT?: N		
QC REQUIRED: MS MSD BLANK	RECEIVED GOOD COND. COLD		
TAT: STANDARD RUSHI	LAB NUMBER: 94-05-045		
DUE DATE: 5/17/94 RUSH SURCHARGE: CLIENT DISCOUNT: 20%		200.45720	

RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
Signature: <i>John D. Delle</i>	Time: 1:30	Signature:	Time:
Printed Name: John D. Delle	Date: 5/14/94	Printed Name:	Date:
Company: Analytical Technologies, Inc. Albuquerque		Company:	
RECEIVED BY: (LAB) 1.		RECEIVED BY: (LAB) 2.	
Signature:	Time:	Signature:	Time:
Printed Name:	Date:	Printed Name:	Date:
Company:		Company:	

QUANT REPORT

Operator ID: QMW Date Acquired: 11 May 94 3:31 pm
 Data File: C:\CHEMPC\DATA\MAY11II\0901009.D
 Name: 405312-04
 Misc: 0.5ML G624
 Method: ATI8260.M
 Title: VOA Standards for 5 point calibration
 Last Calibration: Wed May 25 19:00:47 1994
 Quantitated using Single Level Calibration

Internal Standards

Compound	R.T.	Qion	Area	Conc	Unit	Dev (Min)
23) Pentafluorobenzene	10.93	168	1312457	50.00	ug/l	-0.02
28) 1,4-Difluorobenzene	12.43	114	2247775	50.00	ug/l	-0.03
45) Chlorobenzene-d5	18.73	117	1881927	50.00	ug/l	-0.02
67) 1,4-Dichlorobenzene-d4	24.16	152	939729	50.00	ug/l	-0.02

System Monitoring Compounds

	R.T.	Qion	Area	Conc	Unit	%Recovery
21) Dibromofluoromethane	10.80	111	1400867	50.72	ug/l	101.44%
36) Toluene-d8	15.54	98	2240767	49.65	ug/l	99.30%
54) Bromofluorobenzene	21.43	95	1252056	49.94	ug/l	99.87%

Target Compounds

	R.T.	Qion	Area	Conc	Unit	ISTD#
1) Dichlorodifluoromethane	0.00			**Not Found**		001
2) Chloromethane	0.00			**Not Found**		001
3) Vinyl Chloride	0.00			**Not Found**		001
4) Bromomethane	0.00			**Not Found**		001
5) Chloroethane	0.00			**Not Found**		001
6) Trichlorofluoromethane	0.00			**Not Found**		001
7) 1,1-Dichloroethene	0.00			**Not Found**		001
8) 1,1,2-TRICHLORO-1,2,2-TRIF	0.00			**Not Found**		001
9) Acetone	6.10	43	43420	10.74	ug/l	001m
10) Carbon Disulfide	0.00			**Not Found**		001
11) Methylene Chloride	0.00			**Not Found**		001
12) trans-1,2-Dichloroethene	0.00			**Not Found**		001
13) MTBE	0.00			**Not Found**		001
14) 1,1-Dichloroethane	0.00			**Not Found**		001
15) Vinyl Acetate	9.86	43	74028	2.21	ug/l	001#
16) 2,2-Dichloropropane	0.00			**Not Found**		001
17) cis-1,2-Dichloroethene	10.93	61	45848	1.27	ug/l	001#
18) 2-Butanone	9.86	43	74028	7.29	ug/l	001
19) Bromochloromethane	0.00			**Not Found**		001
20) Chloroform	0.00			**Not Found**		001
22) 1,1,1-Trichloroethane	0.00			**Not Found**		001
24) Carbon Tetrachloride	10.93	117	152869	6.60	ug/l	002#
25) 1,1-Dichloropropene	10.92	75	166938	6.36	ug/l	002#
26) Benzene	0.00			**Not Found**		002
27) 1,2-Dichloroethane	0.00			**Not Found**		002
29) Trichloroethene	12.44	95	61767	2.98	ug/l	002#
30) 1,2-Dichloropropane	0.00			**Not Found**		002
31) Dibromomethane	12.44	93	32450	1.63	ug/l	002#
32) Bromodichloromethane	0.00			**Not Found**		002
33) 2-Chloroethyl vinyl ether	0.00			**Not Found**		002
34) trans-1,3-Dichloropropene	18.73	75	34985	1.10	ug/l	002#
35) 4-Methyl-2-Pentanone	0.00			**Not Found**		002
37) Toluene	0.00			**Not Found**		002

(#) = qualifier out of range

QUANT REPORT

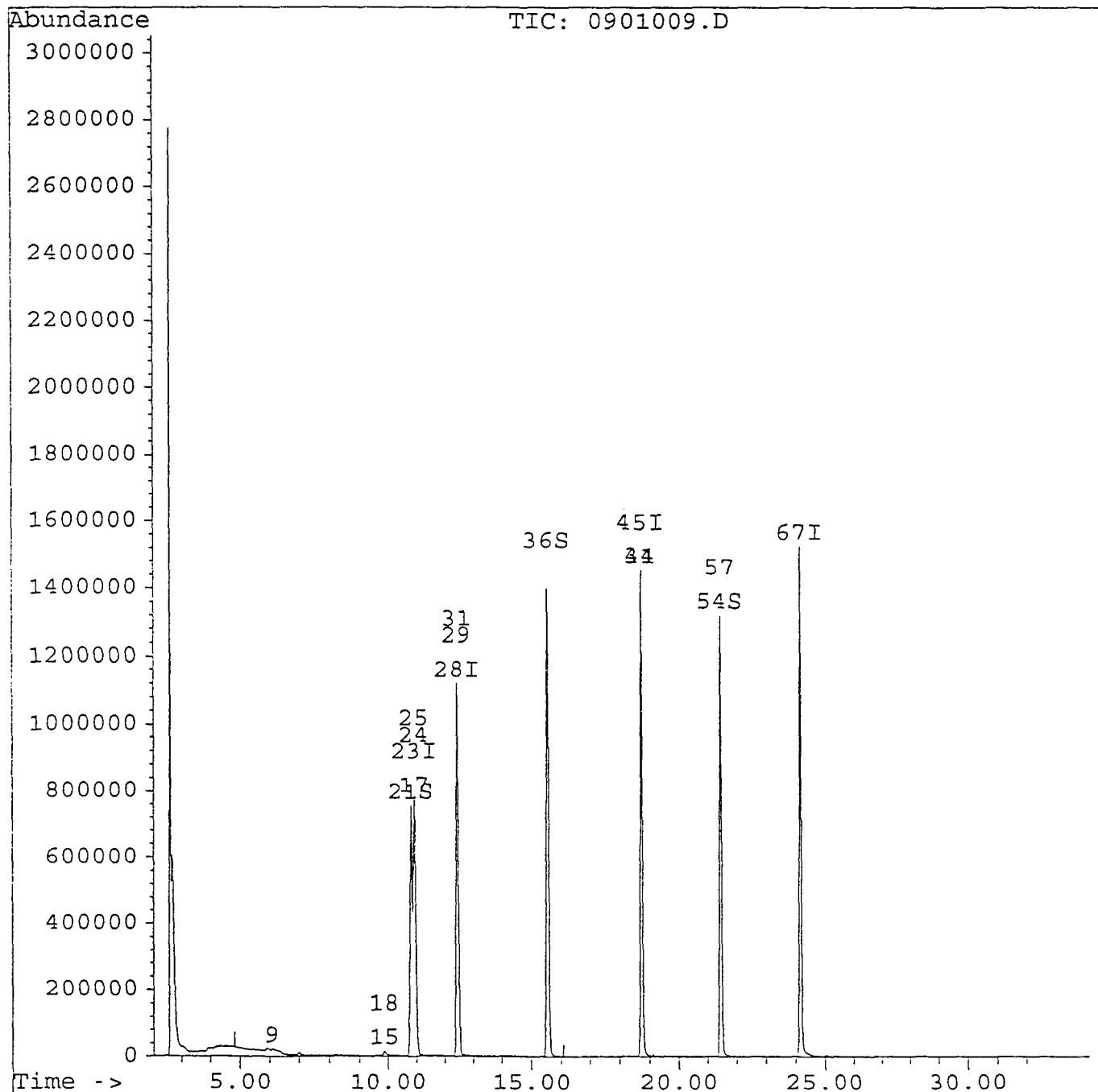
Operator ID: QMW Date Acquired: 11 May 94 3:31 pm
Data File: C:\CHEMPC\DATA\MAY11III\0901009.D
Name: 405312-04
Misc: 0.5ML G624
Method: ATI8260.M
Title: VOA Standards for 5 point calibration
Last Calibration: Wed May 25 19:00:47 1994
Quantitated using Single Level Calibration

Compound	R.T.	Qion	Area	Conc Unit	Dev(Min)
38) cis-1,3-Dichloropropene	0.00			**Not Found**	002
39) 1,1,2-Trichloroethane	0.00			**Not Found**	002
40) Tetrachloroethene	0.00			**Not Found**	003
41) 1,3-Dichloropropane	18.73	76	105313	3.62 ug/l	003#
42) 2-Hexanone	0.00			**Not Found**	003
43) Dibromochloromethane	0.00			**Not Found**	003
44) 1,2-Dibromoethane (EDB)	0.00			**Not Found**	002
46) Chlorobenzene	0.00			**Not Found**	003
47) 1,1,1,2-Tetrachloroethane	0.00			**Not Found**	003
48) Ethylbenzene	0.00			**Not Found**	003
49) M&P Xylenes	0.00			**Not Found**	003
50) O-Xylene	0.00			**Not Found**	003
51) Styrene	0.00			**Not Found**	003
52) Bromoform	0.00			**Not Found**	003
53) Isopropyl benzene	0.00			**Not Found**	004
55) Bromobenzene	0.00			**Not Found**	004
56) 1,1,2,2-Tetrachloroethane	0.00			**Not Found**	004
57) 1,2,3-Trichloropropane	21.44	75	582562	31.65 ug/l	004#
58) n-Propylbenzene	0.00			**Not Found**	004
59) 2-Chlorotoluene	0.00			**Not Found**	004
60) 1,3,5-Trimethylbenzene	0.00			**Not Found**	004
61) 4-Chlorotoluene	0.00			**Not Found**	004
62) tert-Butylbenzene	0.00			**Not Found**	004
63) 1,2,4-Trimethylbenzene	0.00			**Not Found**	004
64) sec-Butylbenzene	0.00			**Not Found**	004
65) 1,3-Dichlorobenzene	0.00			**Not Found**	004
66) p-Isopropyltoluene	0.00			**Not Found**	004
68) 1,4-Dichlorobenzene	0.00			**Not Found**	004
69) 1,2-Dichlorobenzene	0.00			**Not Found**	004
70) n-Butylbenzene	0.00			**Not Found**	004
71) 1,2-Dibromo-3-Chloropropan	0.00			**Not Found**	004
72) 1,2,4-Trichlorobenzene	0.00			**Not Found**	004
73) Hexachlorobutadiene	0.00			**Not Found**	004
74) Naphthalene	0.00			**Not Found**	004
75) 1,2,3-Trichlorobenzene	0.00			**Not Found**	004

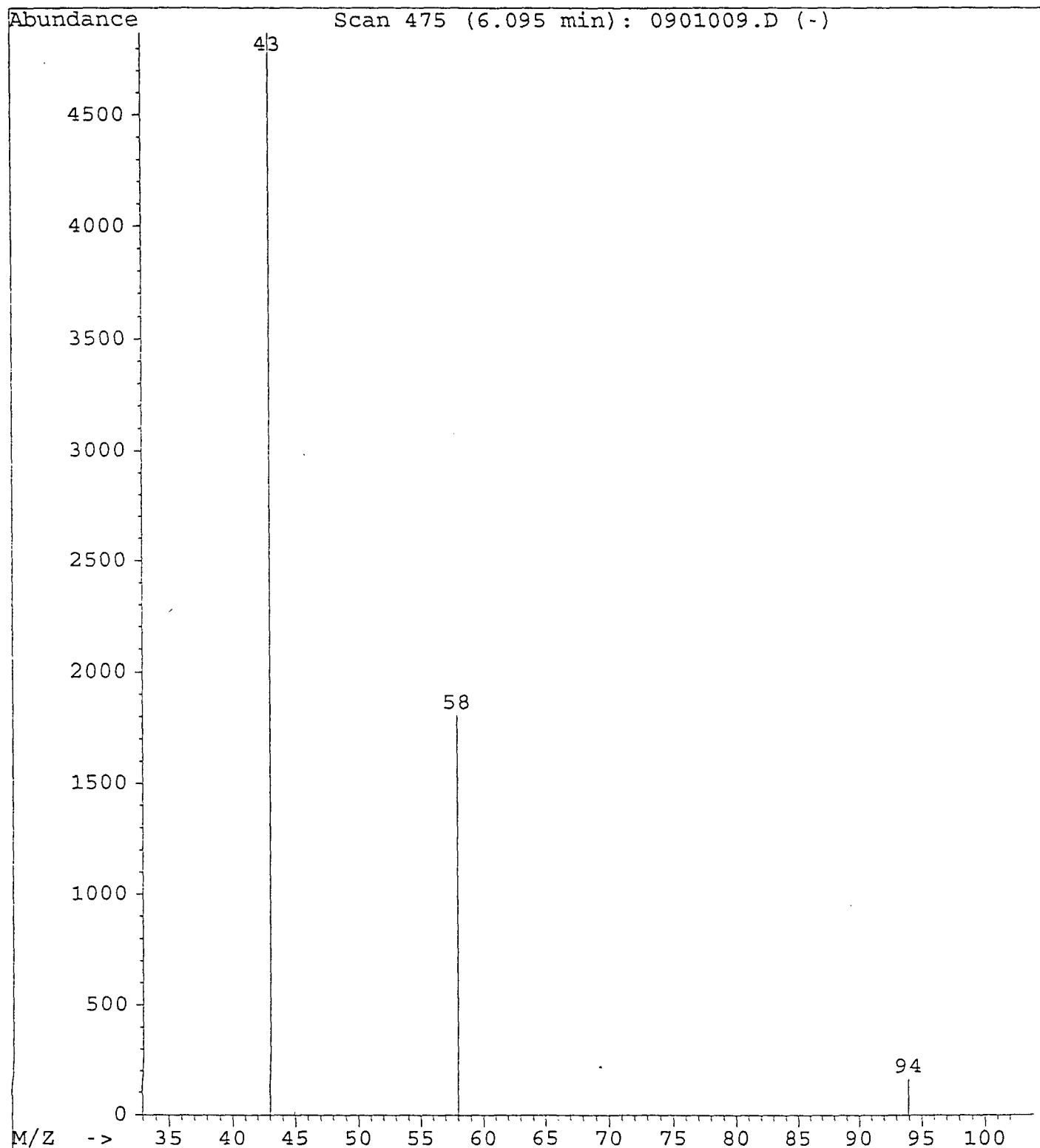
(#) = qualifier out of range

QUANT REPORT

Operator ID: QMW Date Acquired: 11 May 94 3:31 pm
 Data File: C:\CHEMPC\DATA\MAY11II\0901009.D
 Name: 405312-04
 Misc: 0.5ML G624
 Method: ATI8260.M
 Title: VOA Standards for 5 point calibration
 Last Calibration: Wed May 25 19:00:47 1994
 Quantitated using Single Level Calibration



File: C:\CHEMPC\DATA\MAY11II\0901009.D
Operator: QMW
Date Acquired: 11 May 94 3:31 pm
Method File: ATI8260.M
Sample Name: 405312-04
Misc Info: 0.5ML G624
ALS vial: 9





Analytical **Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **405301**

May 26, 1994

Giant Refining
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: ANN GDWTR (NONE)

Attention: Lynn Shelton

On **05/02/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples 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 Total Organic Halide analysis was run in duplicate for all samples as requested on the chain of custody. Please note on the Total Organic Halide analysis, the TOX results for all samples in this project were near the detection limit of 20 mg/L. When concentrations are near the detection limit, the reproducibility of the TOX measurements is in the range of approximately +/- 20 mg/L. It is not possible to calculate the relative percent difference (RPD) between two values when one value is at or slightly above the detection limit and the other value is below the detection limit.

Sample OW-3 and all 8240 sample VOA vials arrived separately and were received at Albuquerque, NM on 05/03/94.

All Total Organic Halide and Total Organic Carbon sample bottles were received with headspace.

Total Organic Carbon and Total Organic Halide analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

EPA Method 150.1 and 8020 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.



Analytical **Technologies**, Inc.

May 26, 1994
Giant Refining
Page 2

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure



Analytical Technologies, Inc.

CLIENT : GIANT REFINING DATE RECEIVED : 05/02/94
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR REPORT DATE : 05/26/94

ATI ID: 405301

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-1	AQUEOUS	04/29/94
02	MW-4	AQUEOUS	04/29/94
03	OW-11	AQUEOUS	04/29/94
04	OW-3	AQUEOUS	04/29/94

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
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

CLIENT : GIANT REFINING ATI I.D. : 405301
PROJECT # : (NONE) DATE RECEIVED : 05/03/94
PROJECT NAME : ANN GDWTR DATE ANALYZED : 05/03/94

PARAMETER	UNITS	01	02	03	04
(150.1)	UNITS	9.06	8.76	8.38	7.88



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING ATI I.D. : 405301
PROJECT # : (NONE) SAMPLE MATRIX : AQUEOUS
PROJECT NAME : ANN GDWTR

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	40530101	9.06	9.07	0.1	NA	NA	NA

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

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



Analytical Technologies, Inc.

TOTAL ORGANIC CARBON

Method 415.2

Lab Name: Analytical Technologies, Inc.

Date Collected: 04/28/94

Client Name: ATI-NM

Date Analyzed: 05/09/94

Client Project ID: GRC -- 405301

Sample Matrix: Water

Lab Workorder Number: 94-05-016

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 94-05-016	1	< 1.0	< 1.0	N/A
405301-1	94-05-016-01	1	< 1.0		
	94-05-016-01DUP	1	< 1.0	< 1.0	N/A
405301-2	94-05-016-02	1	< 1.0		
	94-05-016-02DUP	1	< 1.0	< 1.0	N/A
405301-3	94-05-016-03	1	2		
	94-05-016-03DUP	1	2	2	0



Analytical Technologies, Inc.

TOTAL ORGANIC HALIDE

Modified Method 9020 TOX

Lab Name: Analytical Technologies, Inc.

Date Collected: 04/28/94

Client Name: ATI-NM

Date Extracted: 05/12/94

Client Project ID: GRC -- 405301

Date Analyzed: 05/12/94

Lab Workorder Number: 94-05-016

Sample Matrix: Water

Sample ID	Lab Sample ID	Sample Volume (mL)	TOX Conc. (ug/L)	TOX AVG	RPD
Reagent Blank	WRB94-05-016	100	< 20	< 20	N/A
405301-1	94-05-016-01	100	< 20		
	94-05-016-01DUP	100	20	10	N/A
405301-2	94-05-016-02	100	< 20		
	94-05-016-02DUP	100	40	20	N/A
405301-3	94-05-016-03	100	30		
	94-05-016-03DUP	100	< 20	15	N/A



Analytical Technologies, Inc.

TOTAL ORGANIC HALIDE MATRIX SPIKE RESULTS

Modified Method 9020 TOX

Lab Name: Analytical Technologies, Inc.

Client Name: ATI-NM

Lab Sample ID: 94-04-307-02

Sample Matrix: Water

Sample ID

In House

Date Extracted: 05/11/94

Date Analyzed: 05/11/94

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery
2,4,6-Trichlorophenol	200	< 20	200	100



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 405301

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/02/94

PROJECT # : (NONE)

PROJECT NAME : ANN GDWTR

REPORT DATE : 05/26/94

PARAMETER	UNITS	01	02	03	04
CARBONATE (CACO3)	MG/L	48	33	11	<1
BICARBONATE (CACO3)	MG/L	301	431	374	662
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	349	464	385	662
CHLORIDE (EPA 325.2)	MG/L	52	17	144	42
CONDUCTIVITY, (UMHOS/CM)		1070	1140	2080	1240
PHENOLICS, TOTAL (EPA 420.1)	MG/L	<0.005	<0.005	<0.005	-
SULFATE (EPA 375.2)	MG/L	160	150	600	18
T. DISSOLVED SOLIDS (160.1)	MG/L	720	740	1400	800



Analytical Technologies, Inc. GENERAL CHEMISTRY - QUALITY CONTROL

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

ATI I.D. : 405301

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	40443603	42	42	0	NA	NA	NA
BICARBONATE	MG/L		294	298	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		336	340	1	NA	NA	NA
CHLORIDE	MG/L	40550901	88	88	0	184	100	96
CONDUCTIVITY(UMHOS/CM)		40530103	2080	2120	2	NA	NA	NA
PHENOLICS, TOTAL	MG/L	40549908	<0.005	<0.005	NA	0.025	0.025	100
SULFATE	MG/L	40443601	20	20	0	40	20	100
TOTAL DISSOLVED SOLIDS	MG/L	40530103	1400	1500	7	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. : 405301

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 05/02/94

PROJECT # : (NONE)

PROJECT NAME : ANN GDWTR

REPORT DATE : 05/26/94

PARAMETER	UNITS	01	02	03	04
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	<0.010
ARSENIC (200.7/6010)	MG/L	<0.1	<0.1	<0.1	<0.1
BARIUM (EPA 200.7/6010)	MG/L	0.016	0.019	0.015	0.077
CALCIUM (EPA 200.7/6010)	MG/L	1.2	0.8	5.5	8.1
CADMIUM (200.7/6010)	MG/L	<0.005	<0.005	<0.005	<0.005
CHROMIUM (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	-
MERCURY (EPA 245.1/7470)	MG/L	<0.0002	<0.0002	<0.0002	-
POTASSIUM (EPA 200.7/6010)	MG/L	<1.0	<1.0	1.1	<1.0
MAGNESIUM (EPA 200.7/6010)	MG/L	0.3	0.8	0.7	3.1
MANGANESE (EPA 200.7/6010)	MG/L	0.016	0.010	<0.010	0.066
SODIUM (EPA 200.7/6010)	MG/L	254	283	505	313
LEAD (200.7/6010)	MG/L	<0.10	<0.10	<0.10	-
SELENIUM (200.7/6010)	MG/L	<0.1	<0.1	<0.1	<0.1



Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : ANN GDWTR

ATI I.D. : 405301

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	40530101	<0.010	<0.010	NA	0.995	1.00	100
ARSENIC (ICAP)	MG/L	40530101	<0.1	<0.1	NA	1.0	1.0	100
BARIUM	MG/L	40530101	0.016	0.016	0	0.992	1.00	98
CALCIUM	MG/L	40531102	47.6	47.9	0.6	101	50.0	107
CADMIUM	MG/L	40530102	<0.005	<0.005	NA	1.00	1.00	100
CHROMIUM	MG/L	40551301	<0.010	<0.010	NA	0.952	1.00	95
CHROMIUM	MG/L	40530103	<0.010	<0.010	NA	0.997	1.00	100
MERCURY	MG/L	40549906	0.0003	<0.0002	NA	0.0050	0.0050	94
MERCURY	MG/L	40554201	<0.0002	0.0003	NA	0.0046	0.0050	92
POTASSIUM	MG/L	40531102	4.0	3.9	3	53.9	50.0	100
MAGNESIUM	MG/L	40531102	17.0	17.2	1	42.0	25.0	100
MANGANESE	MG/L	40530101	0.016	0.016	0	1.01	1.00	99
SODIUM	MG/L	40531102	52.3	53.0	1	99.3	50.0	94
LEAD	MG/L	40530101	<0.10	<0.10	NA	0.97	1.00	97
SELENIUM (ICAP)	MG/L	40530101	<0.1	<0.1	NA	1.0	1.0	100

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

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



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING ATI I.D.: 405301
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
4	OW-3	AQUEOUS	04/29/94	NA	05/03/94	1

PARAMETER	UNITS	04
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5
METHYL-t-BUTYL ETHER	UG/L	<2.5

SURROGATE:

BROMOFLUOROBENZENE (%) 103



Analytical **Technologies**, Inc.

GAS CHROMATOGRAPHY RESULTS

REAGENT BLANK

TEST	: BTEX, MTBE (EPA 8020)	ATI I.D.	: 405301
BLANK I.D.	: 050394	MATRIX	: AQUEOUS
CLIENT	: GIANT REFINING	DATE EXTRACTED	: NA
PROJECT #	: (NONE)	DATE ANALYZED	: 05/03/94
PROJECT NAME	: ANN GDWTR	DILUTION FACTOR	: 1

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5
METHYL-t-BUTYL ETHER	UG/L	<2.5

SURROGATE:

BROMOFLUOROBENZENE (%)	98
------------------------	----



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

MSMSD

TEST : BTEX, MTBE (EPA 8020)
MSMSD # : 40443315 ATI I.D. : 405301
CLIENT : GIANT REFINING DATE EXTRACTED : NA
PROJECT # : (NONE) DATE ANALYZED : 05/04/94
PROJECT NAME : ANN GDWTR SAMPLE MATRIX : AQUEOUS
REF. I.D. : 40443315 UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
BENZENE	<0.5	10	9.0	90	9.5	95	5
TOLUENE	<0.5	10	9.2	92	9.6	96	4
ETHYLBENZENE	<0.5	10	9.2	92	9.8	98	6
TOTAL XYLENES	<0.5	30	28	93	29	97	4
METHYL-t-BUTYL ETHER	<2.5	20	18	90	19	95	5

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

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



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40530101

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR
CLIENT I.D. : MW-1
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/28/94
DATE RECEIVED : 05/02/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40530101

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS

RESULTS

ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYL VINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	98
TOLUENE-D8 (%)	100



Analytical **Technologies, Inc.** ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40530101

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40530102

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR
CLIENT I.D. : MW-4
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/28/94
DATE RECEIVED : 05/02/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical **Technologies**, Inc.

GCMS - RESULTS

ATI I.D. : 40530102

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
-----------	---------

ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYL VINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	100
TOLUENE-D8 (%)	99



Analytical **Technologies, Inc.** ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40530102

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40530103

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR
CLIENT I.D. : OW-11
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/28/94
DATE RECEIVED : 05/02/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40530103

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

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

SURROGATE PERCENT RECOVERIES

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



Analytical **Technologies, Inc.**

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40530103

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 405301
DATE EXTRACTED : 05/11/94
DATE ANALYZED : 05/11/94
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 405301

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	101
BFB (%)	100
TOLUENE-D8 (%)	99



Analytical **Technologies**, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.

ATI I.D : 405301

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 405301

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANN GDWTR
REF I.D. : 40530103

DATE ANALYZED : 05/11/94
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
					SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<5	50	51	102	48	96	6
TRICHLOROETHENE	<5	50	51	102	50	100	2
CHLOROBENZENE	<5	50	51	102	50	100	2
TOLUENE	<5	50	51	102	50	100	2
BENZENE	<5	50	50	100	49	98	2

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

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

NETWORK PROJECT MANAGER: BETH PROFFITT				ANALYSIS REQUEST																																																																																																					
COMPANY: Analytical Technologies, Inc. ADDRESS: 2709-D Pan American Freeway, NE Albuquerque, NM 87107				<table border="1"> <thead> <tr> <th>SAMPLE ID</th> <th>DATE</th> <th>TIME</th> <th>MATRIX</th> <th>LAB ID</th> <th>TOX</th> <th>ORGANIC LEAD</th> <th>SULFIDE</th> <th>SURFACTANTS (MBAS)</th> <th>EC, RLK, TDS, CL, SCF</th> <th>632/632 MOD</th> <th>619/619 MOD</th> <th>610/8310</th> <th>Missobal Asph, Cd, Cr, Mg, K, Se, Pb, Ni, Zn</th> <th>8240 (TCLP 1311) ZHE</th> <th>total Phenolics (H2O.1)</th> <th>Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)</th> <th>Volatile Organics GC/MS (624/8240)</th> <th>total GPH, NG</th> <th>NACE</th> <th>ASBESTOS</th> <th>BOD</th> <th>TOTAL COLIFORM</th> <th>FECAL COLIFORM</th> <th>GROSS ALPHA/BETA</th> <th>RADIUM 226/228</th> <th>AIR - O2, CO2, METHANE</th> <th>AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)</th> <th>NUMBER OF CONTAINERS</th> </tr> </thead> </table>												SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	EC, RLK, TDS, CL, SCF	632/632 MOD	619/619 MOD	610/8310	Missobal Asph, Cd, Cr, Mg, K, Se, Pb, Ni, Zn	8240 (TCLP 1311) ZHE	total Phenolics (H2O.1)	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	total GPH, NG	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS																																																													
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	EC, RLK, TDS, CL, SCF	632/632 MOD	619/619 MOD	610/8310	Missobal Asph, Cd, Cr, Mg, K, Se, Pb, Ni, Zn	8240 (TCLP 1311) ZHE	total Phenolics (H2O.1)	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	total GPH, NG	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS																																																																													
CLIENT PROJECT MANAGER: 				<table border="1"> <tbody> <tr> <td>405301-1</td> <td>4/28/94</td> <td>0940</td> <td>AP</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-2</td> <td>7</td> <td>1110</td> <td>1</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>-3</td> <td></td> <td>1300</td> <td></td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>												405301-1	4/28/94	0940	AP	1					X				X	X	X	X	X	X	X											-2	7	1110	1	2					X				X	X	X	X	X	X	X											-3		1300		3					X				X	X	X	X	X	X	X										
405301-1	4/28/94	0940	AP	1					X				X	X	X	X	X	X	X																																																																																						
-2	7	1110	1	2					X				X	X	X	X	X	X	X																																																																																						
-3		1300		3					X				X	X	X	X	X	X	X																																																																																						

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.	
PROJECT NUMBER:	405301	TOTAL NUMBER OF CONTAINERS	15	Signature:		Signature:	
PROJECT NAME:	GLC	CHAIN OF CUSTODY SEALS	n/a	Printed Name:	Kim Dill	Printed Name:	
QC LEVEL:	STD IV	INTACT?	n/a	Date:	5/26/94	Date:	
QC REQUIRED:	MS MSD BLANK	RECEIVED GOOD COND. COLD	Y	Company:	Analytical Technologies, Inc.	Company:	
TAT: (STANDARD)	RUSH	LAB NUMBER	405301	Abuquerque		Abuquerque	
DUE DATE: <u>5/30/94</u> RUSH SURCHARGE: _____ CLIENT DISCOUNT: <u>per quote %</u>		RECEIVED BY: (LAB) 1. Signature:  Time: _____ Printed Name: Kim Dill Date: 5/26/94 Company: Analytical Technologies, Inc.		RECEIVED BY: (LAB) 2. Signature:  Time: _____ Printed Name: Kim Dill Date: 5/26/94 Company: Analytical Technologies, Inc.			

DATE 1-19-94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: Analytical Technologies, Inc.

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

LAB ID	MATRIX	TIME	DATE	SAMPLE ID
1	FD	0940	4/28/04	405301
2		1110		-2
3		1300		-3
4		1500		-4

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT NUMBER: 405301	TOTAL NUMBER OF CONTAINERS 3
PROJECT NAME: GRC	CHAIN OF CUSTODY SEALS N
QC LEVEL: (STD) IV	INTACT? Y
QC REQUIRED: MS MSD BLANK	RECEIVED GOOD COND/COLD Y
TAT: STANDARD RUSH!	LAB NUMBER 405301

DUE DATE: 5/17/94 W.O.# LK712
RUSH SURCHARGE:
CLIENT DISCOUNT: % Second part on
new quote this acc. # 405301

SAMPLES SENT TO:	RELINQUISHED BY:	1.	Time:	RELINQUISHED BY:	2.	Time:
SAN DIEGO	Signature: <i>[Signature]</i>		1:30	Signature:		
FT. COLLINS	Printed Name:		Date	Printed Name:		Date
RENTON	Signature: <i>[Signature]</i>		5/3/94	Company:		
PENSACOLA	Analytical Technologies, Inc.			Company:		
PHOENIX	Albuquerque			Company:		
BARRINGER	RECEIVED BY: (LAB)	1.	Time:	RECEIVED BY: (LAB)	2.	Time:
FIBERQUANT	Signature:			Signature: <i>[Signature]</i>		11:34
	Printed Name:		Date:	Printed Name:		Date:
	Company:			Company: <i>[Signature]</i>		5-4-94



Analytical **Technologies**, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **404436**

May 26, 1994

Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: ANNUAL GDWTR

Attention: Lynn Shelton

On **04/29/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples 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.

For sample OW-2, the metals bottle was marked dissolved metals, filtered and preserved with nitric acid. The sample had a turbidity reading of >1 NTU and there was sediment present; therefore, the sample did not pass criteria for dissolved. The sample was digested and analyzed for total metals.

EPA Method 150.1 and 8020 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

Total Organic Carbon and Total Organic Halide analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

This report is being reissued to correct cover letter information.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 04/29/94

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

REPORT DATE : 05/26/94

ATI ID: 404436

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-2	AQUEOUS	04/27/94
02	OW-1	AQUEOUS	04/27/94
03	MW-2	AQUEOUS	04/27/94
04	MW-5	AQUEOUS	04/27/94
05	TRIP BLANK	AQUEOUS	04/19/94

---TOTALS---

<u>MATRIX</u>	<u>#SAMPLES</u>
AQUEOUS	5

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

CLIENT : GIANT REFINING CO. ATI I.D. : 404436
PROJECT # : (NONE) DATE RECEIVED : 04/29/94
PROJECT NAME : ANNUAL GDWTR DATE ANALYZED : 04/29/94

PARAMETER	UNITS	01	02	03	04
PH (150.1)	UNITS	8.04	8.82	9.10	9.10



Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO. ATI I.D. : 404436
PROJECT # : (NONE) SAMPLE MATRIX : AQUEOUS
PROJECT NAME : ANNUAL GDWTR

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	40443601	8.04	8.01	0.4	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.

GAS CHROMATOGRAPHY RESULTS

TEST : BTEX, MTBE (EPA 8020)
CLIENT : GIANT REFINING CO. ATI I.D.: 404436
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	OW-2	AQUEOUS	04/27/94	NA	05/03/94	1
02	OW-1	AQUEOUS	04/27/94	NA	05/03/94	1

PARAMETER	UNITS	01	02
BENZENE	UG/L	<0.5	<0.5
TOLUENE	UG/L	<0.5	0.9
ETHYLBENZENE	UG/L	<0.5	<0.5
TOTAL XYLENES	UG/L	1.1	2.7
METHYL-t-BUTYL ETHER	UG/L	<2.5	<2.5

SURROGATE:

BROMOFLUOROBENZENE (%) 99 101



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY RESULTS

REAGENT BLANK

TEST	: BTEX, MTBE (EPA 8020)	ATI I.D.	: 404436
BLANK I.D.	: 050394	MATRIX	: AQUEOUS
CLIENT	: GIANT REFINING CO.	DATE EXTRACTED	: NA
PROJECT #	: (NONE)	DATE ANALYZED	: 05/03/94
PROJECT NAME	: ANNUAL GDWTR	DILUTION FACTOR	: 1

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<0.5
METHYL-t-BUTYL ETHER	UG/L	<2.5

SURROGATE:

BROMOFLUOROBENZENE (%)	98
------------------------	----



Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - QUALITY CONTROL

MSMSD

TEST : BTEX, MTBE (EPA 8020)

MSMSD # : 40443315

ATI I.D. : 404436

CLIENT : GIANT REFINING CO.

DATE EXTRACTED : NA

PROJECT # : (NONE)

DATE ANALYZED : 05/04/94

PROJECT NAME : ANNUAL GDWTR

SAMPLE MATRIX : AQUEOUS

REF. I.D. : 40443315

UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD
BENZENE	<0.5	10	9.0	90	9.5	95	5
TOLUENE	<0.5	10	9.2	92	9.6	96	4
ETHYLBENZENE	<0.5	10	9.2	92	9.8	98	6
TOTAL XYLENES	<0.5	30	28	93	29	97	4
METHYL-t-BUTYL ETHER	<2.5	20	18	90	19	95	5

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

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



Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 404436

CLIENT : GIANT REFINING CO.

DATE RECEIVED : 04/29/94

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

REPORT DATE : 05/20/94

PARAMETER	UNITS	01	02	03	04
CARBONATE (CACO3)	MG/L	<1	37	42	42
BICARBONATE (CACO3)	MG/L	668	388	294	289
HYDROXIDE (CACO3)	MG/L	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	668	425	336	331
CHLORIDE (EPA 325.2)	MG/L	46	55	61	66
CONDUCTIVITY, (UMHOS/CM)		1260	1270	1120	1130
PHENOLICS, TOTAL (EPA 420.1)	MG/L	-	-	<0.005	<0.005
SULFATE (EPA 375.2)	MG/L	20	210	160	170
T. DISSOLVED SOLIDS (160.1)	MG/L	890	840	700	730

GENERAL CHEMISTRY - QUALITY CONTROL



Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

ATI I.D. : 404436

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	40443602	37	35	6	NA	NA	NA
BICARBONATE	MG/L		388	383	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		425	418	2	NA	NA	NA
CARBONATE	MG/L	40443603	42	42	0	NA	NA	NA
BICARBONATE	MG/L		294	298	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		336	340	1	NA	NA	NA
CHLORIDE	MG/L	40443601	46	45	2	93	50	94
CONDUCTIVITY(UMHOS/CM)		40443604	1130	1130	0	NA	NA	NA
PHENOLICS, TOTAL	MG/L	40549908	<0.005	<0.005	NA	0.025	0.025	100
SULFATE	MG/L	40443601	20	20	0	40	20	100
TOTAL DISSOLVED SOLIDS	MG/L	40443603	700	700	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. : 404436

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

DATE RECEIVED : 04/29/94

REPORT DATE : 05/20/94

PARAMETER	UNITS	01	02	03	04
SILVER (EPA 200.7/6010)	MG/L	<0.010	<0.010	<0.010	0.010
ARSENIC (200.7/6010)	MG/L	<0.1	<0.1	<0.1	<0.1
BARIUM (EPA 200.7/6010)	MG/L	0.205	0.037	0.021	0.018
CALCIUM (EPA 200.7/6010)	MG/L	7.6	1.1	0.6	1.4
CADMIUM (200.7/6010)	MG/L	<0.005	0.015	<0.005	<0.005
CHROMIUM (EPA 200.7/6010)	MG/L	-	-	0.011	<0.010
MERCURY (EPA 245.1/7470)	MG/L	-	-	<0.0002	<0.0002
POTASSIUM (EPA 200.7/6010)	MG/L	<1.0	<1.0	<1.0	<1.0
MAGNESIUM (EPA 200.7/6010)	MG/L	3.1	0.2	<0.1	0.1
MANGANESE (EPA 200.7/6010)	MG/L	0.288	<0.010	<0.010	<0.010
SODIUM (EPA 200.7/6010)	MG/L	318	306	257	263
LEAD (200.7/6010)	MG/L	-	-	<0.10	<0.10
SELENIUM (200.7/6010)	MG/L	<0.1	<0.1	<0.1	<0.1



METALS - QUALITY CONTROL

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

ATI I.D. : 404436

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	40551301	<0.010	<0.010	NA	0.933	1.00	93
SILVER	MG/L	40530101	<0.010	<0.010	NA	0.995	1.00	100
ARSENIC (ICAP)	MG/L	40443601	<0.1	<0.1	NA	1.0	1.0	100
ARSENIC (ICAP)	MG/L	40530101	<0.1	<0.1	NA	1.0	1.0	100
BARIUM	MG/L	40443601	0.205	0.205	0	1.19	1.00	98
BARIUM	MG/L	40530101	0.016	0.016	0	0.992	1.00	98
CALCIUM	MG/L	40531102	47.6	47.9	0.6	101	50.0	107
CADMIUM	MG/L	40443601	<0.005	<0.005	NA	1.01	1.00	101
CADMIUM	MG/L	40443602	0.015	0.015	0	0.070	0.050	110
CADMIUM	MG/L	40530102	<0.005	<0.005	NA	1.00	1.00	100
CHROMIUM	MG/L	40551301	<0.010	<0.010	NA	0.952	1.00	95
MERCURY	MG/L	40411502	<0.0002	<0.0002	NA	0.0046	0.0050	92
POTASSIUM	MG/L	40531102	4.0	3.9	3	53.9	50.0	100
MAGNESIUM	MG/L	40531102	17.0	17.2	1	42.0	25.0	100
MANGANESE	MG/L	40443601	0.288	0.286	0.7	1.28	1.00	99
MANGANESE	MG/L	40530101	0.016	0.016	0	1.01	1.00	99
SODIUM	MG/L	40531102	52.3	53.0	1	99.3	50.0	94
LEAD	MG/L	40530101	<0.10	<0.10	NA	0.97	1.00	97
SELENIUM (ICAP)	MG/L	40443601	<0.1	<0.1	NA	1.05	1.00	105
SELENIUM (ICAP)	MG/L	40530101	<0.1	<0.1	NA	1.0	1.0	100

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

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



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40443603

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : MW-2
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/27/94
DATE RECEIVED : 04/29/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/05/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS RESULTS

CHLOROMETHANE	<5
VINYL CHLORIDE	<2
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40443603

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

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

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	102
TOLUENE-D8 (%)	104



Analytical **Technologies**, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40443603

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40443604

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : MW-5
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/27/94
DATE RECEIVED : 04/29/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/05/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
-----------	---------

CHLOROMETHANE	<5
VINYL CHLORIDE	<2
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40443604

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS

RESULTS

ETHYL METHACRYLATE	<5
ETHANOL	<100
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	105
TOLUENE-D8 (%)	102

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

 Analytical Technologies, Inc.
TEST VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40443604

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40443605

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : TRIP BLANK
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 04/19/94
DATE RECEIVED : 04/29/94
DATE EXTRACTED : N/A
DATE ANALYZED : 05/05/94
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

CHLOROMETHANE	<5
VINYL CHLORIDE	<2
CHLOROETHANE	<5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5

(CONTINUED NEXT PAGE)



Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 40443605

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

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

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	101
TOLUENE-D8 (%)	104

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

 Analytical Technologies, Inc.
TEST VOLATILE ORGANICS (EPA 8240) APPENDIX IX

ATI I.D. : 40443605

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : ANNUAL GDWTR
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 404436
DATE EXTRACTED : 05/05/94
DATE ANALYZED : 05/05/94
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<5
VINYL CHLORIDE	<0.5
CHLOROETHANE	<0.5
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
TRANS-1,2-DICHLOROETHYLENE	<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	<20
ACRYLONITRILE	<10
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
METHYL IODIDE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
ETHYL METHACRYLATE	<5
ETHANOL	<100

(CONTINUED NEXT PAGE)



Analytical **Technologies**, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 404436

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

COMPOUNDS	RESULTS
BROMOMETHANE	<10
2-CHLOROETHYLVINYLETHER	<5
1,4-DICHLORO-2-BUTANE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	106
BFB (%)	100
TOLUENE-D8 (%)	103



Analytical **Technologies, Inc.**

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.

ATI I.D : 404436

COMPOUNDS

RESULTS

NO ADDITIONAL COMPOUNDS



Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 404436

TEST : VOLATILE ORGANICS (EPA 8240) APPENDIX IX

CLIENT : GIANT REFINING CO.

PROJECT # : (NONE)

PROJECT NAME : ANNUAL GDWTR

REF I.D. : 40443604

DATE ANALYZED : 05/05/94

SAMPLE MATRIX : AQUEOUS

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
1,1-DICHLOROETHENE	<5	50	52	104	52	104	0
TRICHLOROETHENE	<5	50	52	104	52	104	0
CHLOROBENZENE	<5	50	51	102	51	102	0
TOLUENE	<5	50	52	104	53	106	2
BENZENE	<5	50	52	104	54	108	4

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

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

TOTAL ORGANIC CARBON

Method 415.2



Analytical Technologies, Inc.

Lab Name: Analytical Technologies, Inc.

Date Collected: 04/27/94

Client Name: ATI-NM

Date Analyzed: 05/09/94

Client Project ID: GRC -- 404436

Sample Matrix: Water

Lab Workorder Number: 94-04-307

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank 404436-3	RB 94-04-307	1	< 1.0	< 1.0	N/A
	94-04-307-01	1	< 1.0		
404436-4	94-04-307-01DUP	1	< 1.0	< 1.0	N/A
	94-04-307-02	1	< 1.0		
	94-04-307-02DUP	1	< 1.0	< 1.0	N/A



Analytical Technologies, Inc.

TOTAL ORGANIC HALIDE
Modified Method 9020 TOX

Lab Name: Analytical Technologies, Inc.

Date Collected: 04/27/94

Client Name: ATI-NM

Date Extracted: 05/11/94

Client Project ID: GRC -- 404436

Date Analyzed: 05/11/94

Lab Workorder Number: 94-04-307

Sample Matrix: Water

Sample ID	Lab Sample ID	Sample Volume (mL)	TOX Conc. (ug/L)	TOX AVG	RPD
Reagent Blank 404436-3	WRB94-04-307	100	< 20	< 20	N/A
	94-04-307-01	100	20		
404436-4	94-04-307-01DUP	100	20	20	0
	94-04-307-02	100	< 20		
	94-04-307-02DUP	100	< 20	< 20	N/A



Analytical Technologies, Inc.

TOTAL ORGANIC HALIDE MATRIX SPIKE RESULTS

Modified Method 9020 TOX

Lab Name: Analytical Technologies, Inc.

Client Name: ATI-NM

Lab Sample ID: 94-04-307-02

Sample Matrix: Water

Sample ID

404436-4

Date Extracted: 05/11/94

Date Analyzed: 05/11/94

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery
2,4,6-Trichlorophenol	200	< 20	200	100

[illegible]

Chain of Custody

Albuquerque, NM

4/29/94

DATE

PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT				ANALYSIS REQUEST									
COMPANY: Analytical Technologies, Inc.				AIR - O2, CO2, METHANE									
ADDRESS: 2709-D Pan American Freeway, NE				RADIUM 226/228									
Albuquerque, NM 87107				GROSS ALPHA/BETA									
CLIENT PROJECT MANAGER:				TOTAL COLIFORM									
				FECAL COLIFORM									
				BOD									
				ASBESTOS									
				Total Phenolics (HAPs)									
				Total Pb, Ba, Cu, Cd, Cr, Hg, Mn, Ni, P, Se, Zn									
				Volatile Organics GC/MS (624/8240)									
				Diesel/Gasoline/BTEX/MTBE/ (MOD 8015/8020)									
				K, Se, Pb, Na									
				8240 TCLP 1311 ZHE									
				Dissolved Pb, Ba, Cd, Cr, Cu, Hg, Mn, Ni, P, Se, Zn									
				8240 - Asbestos									
				610/8310									
				619/619 MOD									
				632/632 MOD									
				EC, BIK, TDS, Cl, SO4									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									
				TOX									
				SURFACTANTS (MBAS)									
				SULFIDE									
				ORGANIC LEAD									
				TOC									