March 4 - March 7, 1991

GIANT REFINING COMPANY-CINIZA FACILITY
COMPREHENSIVE GROUNDWATER MONITORING EVALUATION

STEVEN M. ALEXANDER
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
NEW MEXICO ENVIRONMENT DEPARTMENT

SEPTEMBER 10, 1991

COMPREHENSIVE GROUNDWATER MONITORING EVALUATION REPORT (CME)

INSPECTION COVER SHEET

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EPA I.D. NUMBER: NMD000333211

NAME OF FACILITY: GIANT REFINING CO.
MAILING ADDRESS: CLAUD ROSENDALE
ROUTE 3, BOX 7
GALLUP, NM 87301

LOCATION: 17 MILES EAST OF GALLUP, NEW MEXICO, NORTH SIDE OF INTERSTATE 40, EXIT 39.

TELEPHONE: 505-722-3833

TYPE OF FACILITY: OIL REFINERY

DATE OF INSPECTION: MARCH 4-7, 1991

INSPECTION PARTICIPANTS:

NAME	AGENCY/COMPANY/POSITION	TELEPHONE
CLAUD ROSENDALE	GRC/ENVIRONMENTAL MANAGER	505-722-0217
LYNN SHELTON	GRC/ENVIRONMENTAL ASSISTANT	505-722-3833
BRUCE SWANTON	NMED/COMPLIANCE SUPERVISOR	505-827-4300
STEVE ALEXANDER	NMED/WATER RESOURCE SPEC.	505-827-4300

TYPE OF EVALUATION:
(Check one)

Oversight: Federal:

Lead: X Commercial TSD:

Other: Other:

FIELD INTERVIEW PREPARED BY: S. ALEXANDER DATE: MARCH 7, 1991

OFFICE REPORT PREPARED BY: S. ALEXANDER DATE: SEPTEMBER 10, 1991

CONCURRED BY: B. SWANTON DATE: DECEMBER 19, 1991

INSPECTION SUMMARY

PURPOSE:

The reasons for conducting this CME were:

1. To observe and verify the appropriateness of the sampling

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NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION

HAZARDOUS WASTE PROGRAM

COMPREHENSIVE GROUNDWATER MONITORING EVALUATION REPORT (CME)

INSPECTION COVER SHEET

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TYPE OF EVALUATION:
(Check one)

Oversight: Federal:

Lead: X Commercial TSD:

Other: Other:

FIELD INTERVIEW PREPARED BY: S. ALEXANDER DATE: MARCH 7, 1991

OFFICE REPORT PREPARED BY: S. ALEXANDER DATE: SEPTEMBER 10, 1991

CONCURRED BY: B. SWANTON DATE: DECEMBER 19, 1991

INSPECTION SUMMARY

PURPOSE:

The reasons for conducting this CME were:

1. To observe and verify the appropriateness of the sampling procedures of the new staff during their sampling of the shallow monitoring well series (SMW-series). A.T. Kearny, Inc. was to perform this task during their 1989 Comprehensive Groundwater Monitoring Evaluation. For reasons unknown ATK only considered the uppermost aquifer monitoring well series (MW-series) during their CME.

2. To obtain split samples from the proposed new background well (OW-11) to determine its water quality. OW-11 would replace the background well MW-4 of the uppermost aquifer monitoring well series (MW-series).

3. To obtain split samples from one of the downgradient MW-series (MW-1) for purposes of verification that Giant Refining Company could, or could not, return to detection monitoring.

GENERAL COMMENTS:

Overall the sampling techniques were good. Personnel followed proper procedures for the sampling of groundwater monitoring wells and were familiar with the directives contained in the permit.

Available information indicates the proposed background well OW-11 may not be screened in the Sonsela aquifer. Also, the well boring log for OW-11 indicates that the 85' sump was not properly sealed and groundwater from saturated zones below the screened interval can enter the Sonsela aquifer.

In an effort to provide reliable indicators of the presence of hazardous constituents in the groundwater the New Mexico Environment Department is developing modifications to the Giant Refining Company RCRA Permit. Permit inadequacies exist in the means of determination of statistically significant increases in metals concentrations and changes in pH. Also inadequate is the language regarding what constitutes an exceedance level denoting contamination of the groundwater by organics.

Specific areas requiring modification are:

1. The Ground Water Protection Standard determination, Module II, page 19.

2. Statistical Methods, Module III, page 27.

3. Detection Monitoring System Design, Construction, and Certification Requirements, Attachment G, page 4.

4. Compliance Monitoring Program, Attachment G, page 7.

5. Corrective Action Plan, Attachment G, page 8.

6. Installation of a facility background well, Attachment H.

CLASS I - VIOLATIONS: NONE

CLASS II - VIOLATIONS: NONE

DEFICIENCIES:

There were no significant deficiencies observed during the **field sampling** portion of the CME. Minor deficiencies noted were:

1. The pH meter calibration and slope set procedures were inadequate.

2. The conductivity (EC) meter was not calibrated.

3. Inadequate method, should organic contamination be indicated, for detecting immiscible layers. Detection is by visual inspection only.

4. During well sampling the bailer contents were emptied into a primary container before being dispensed into the semi-volatile and volatile sample bottles.

5. Some confusion as to the proper well volumes to purge prior to sampling.

6. Individual well water elevations were taken, followed by purging and sampling. All well water elevations must be taken prior to purging individual wells to insure proper potentiometric surface determination.

7. The gasoline-powered submersible pump water lines were not adequately decontaminated between each purging event.

8. Inadequate length of gasoline-powered submersible pump water lines did not permit complete purge of MW-series wells.

There were no significant deficiencies observed during the **office review** portion of the CME. A minor deficiency noted was:

1. Sampling and Analysis Plan does not indicate whether lab or field indicator parameter (pH-EC) values are those used for statistical comparisons. Currently, the four replicate samples used to determine statistically significant changes in pH and conductivity are splits done at the facility's contract laboratory. Four replicate samples should be taken on site and then submitted for analysis.

INSPECTION RECOMMENDATIONS

* Properly calibrate the pH and EC meters prior to sampling.

* Redevelop the turbid wells.

* Replace the water sampling hose on the gasoline-powered submersible pump with an adequate length to reach the bottom of the MW-series wells.

* Design a more effective decontamination system for the submersible pump water hose to avoid cross-contamination.

* Replace dedicated nylon bailer cord with inert cord. There is a possibility of plasticizers entering the well casing water.

CME TECHNICAL REPORT
INTRODUCTION

FACILITY: GIANT REFINERY CO.

FACILITY DESCRIPTION: Refines crude oil and markets gasoline, diesel, kerosene, asphalt, and residual fuel oil. The refinery was built in 1957 by the original owner, El Paso Natural Gas Company. Shell Oil Company acquired the property in 1964 and Giant Refining Company purchased it in 1982[1].

WASTE MANAGEMENT UNITS REQUIRING GROUNDWATER MONITORING

UNIT NAME: LAND TREATMENT AREA ("landfarm")

WASTE TYPE: D001: IGNITABLE MATERIALS GENERATED BY REFINERY OPERATIONS, D007: COOLING WATER FILTER SLUDGE, K049: SLOP OIL EMULSION SOLIDS, K050: HEAT EXCHANGER BUNDLE CLEANING SLUDGE WASTES, K051: API SEPARATOR SLUDGE, K052: LEADED FUEL TANK BOTTOMS[1,2].

SIZE: **7.2 ACRES ACTIVE, 15 ACRES DEDICATED**

CONSTRUCTION: **EARTH DIKES, NATIVE SOIL BOTTOM**

STATUS (Active, non-active, closed): **NON-ACTIVE, CURRENTLY USED FOR SOLID WASTE DISPOSAL**

YEARS OF OPERATION: **NOVEMBER, 1980 - NOVEMBER, 1991**

Have any RCRA units at the facility been granted a groundwater monitoring waiver?
YES/NO/NA **NO**

What was the date that the waiver was granted? **N/A**

Was the waiver granted for interim status, permitted status or both? **N/A**

If yes, then fill out a Groundwater Waiver Checklist for this unit and re-evaluate the appropriateness of the waiver **N/A**

[1] EPA RCRA Facility Assessment Report, Giant Ciniza Refinery, 8/25/87.

[2] Giant Refinery Company, Part B Permit Application, 12/1/84.

Site: Giant Refining Company, Ciniza Facility

Inspector: Steve Alexander

Date: March 7, 1991

EVALUATION OF FACILITY FIELD PROCEDURES & FACILITY LAB PROCEDURES

If appropriate: use "Y" = yes, "N" = no, "N/A" = not applicable, "U" = unknown.

NOTE: THIS CHECKLIST IS FOR THE SMW-SERIES WELLS

A. MEASUREMENT OF WELL DEPTHS/WATER ELEVATIONS

N 1. Are measurements of both depth to standing water and depth to the bottom of the well made and recorded before purging unless the well has a dedicated, permanently installed pump that prevents total depth measurements?

Y 2. Are all water elevations measured within a 24 hour period or less?

Y 3. Are all measurements calculated from the top of the well casing? (i.e., the water elevation and total depth are not measured from the bottom of the well)

Y 4. Are measurements for water elevations taken to the 0.01 feet?

Y 5. Are all total depth measurements recorded to the nearest 0.25 foot or less?

6. What devices are used?
ELECTRONIC MEASURING TAPE

N 7. Is there a visibly marked surveyed reference point on the well casing rim which was established by a licensed surveyor? **NOT DURING CME, HOWEVER, ON MAY 19, 1991 GRC HAD THEIR MONITORING WELL SYSTEMS AND A REFERENCE POINT AT THE WELL RESURVEYED, BY A LICENSED SURVEYOR, UNDER THE NEW MEXICO COORDINATE SYSTEM.**

Y 8. Is this reference point accurate to the 0.01 foot with respect to sea level?

Y 9. Is the measuring equipment cleaned before and between well locations by washing with a non-phosphate detergent followed by a tap water rinse?

N/A 10. If the well has evidenced organic contamination or inorganic contamination, are more stringent decontamination methods used such as a hexane rinse or a hydrochloric acid rinse, respectively?

N/A 11. If a plastic or polytetrafluoroethylene (PTFE) measuring tape is used, is the tape checked periodically, at least once a year, with a steel tape for calibration purposes?

N 12. Does the owner/operator note in the field notebook whether there are any nearby wells that could potentially impact the water elevation measurements? **THERE ARE NO WELLS, OF THIS TYPE, IN THE VICINITY OF GRC.**

N/A 13. At sites with relatively flat gradients, are the water elevations measured several times to ensure accurate measurements?

B. DETECTION OF IMMISCIBLE LAYERS

N 1. Are procedures used which will detect heavy phase immiscible layers? **THE SAMPLING AND ANALYSIS PLAN SPECIFIES PROCEDURES FOR IMMISCIBLE LAYER DETECTION AND SAMPLING.**

Y 2. Are procedures used which will detect light phase immiscible layers?

N 3. Are procedures used to measure the thickness of the immiscible layers?

N 4. Are the procedures used to detect high and low density phase immiscible layers adequate? **SEE FIELD SAMPLING DEFICIENCIES**

C. SAMPLING OF IMMISCIBLE LAYERS

N/A 1. Are the immiscible layers sampled separately prior to well evacuation?

N/A 2. Do the procedures used minimize mixing with water soluble phases?

N/A 3. Describe how the immiscible samples are collected:

N/A 4. Are appropriate methods used to collect the immiscible samples?

D. WELL EVACUATION

Y 1. Are low yielding wells evacuated once to dryness?

N/A 2. Are high yielding wells evacuated so that at least three casing volumes are removed? **NONE OF THE WELLS ARE CONSIDERED HIGH YIELD.**

N/A 3. For high yielding wells, are measurements of pH, specific conductivity, and temperature obtained before, during and after purging in order to verify that these parameters have stabilized? (Stabilization indicates that well has been adequately purged.)

N/A 4. If **NO**, has documentation been provided that demonstrates that stabilization occurs at this well after a specific volume of water has been purged?

5. What device is used to evacuate the wells:
STAINLESS STEEL BAILER

U 6. During purging, was the discharge rate slower than the rate used during development?

Y 7. Was the purge rate slow enough to prevent recharging water rushing turbulently into the well?

N 8. Was the purge water containerized until the groundwater analytical results whether the water is contaminated?
THE PURGE WATER IS DISPOSED OF IN THE ADJACENT LTU.

N/A 9. If the groundwater analyses evidence contamination, is the purge water treated on site in accordance with applicable and relevant regulations or disposed as hazardous waste?

Y 10. If any problems are encountered (e.g. equipment malfunction) are they noted in a field logbook?

E. SAMPLE WITHDRAWAL

Y 1. Are samples withdrawn with either fluorocarbon/resins or stainless steel sampling devices?
STAINLESS STEEL

Y 2. Are sampling devices either bottom valve bailers or positive gas displacement bladder pumps?
BOTTOM VALVE BAILERS

Y 3. Are precautions used to ensure that all sampling equipment that could potentially come into contact with the sample is constructed of inert materials?

N 4. Is an inert bailer cord used?
THE FACILITY UTILIZES A DEDICATED NYLON CORD

N/A 5. If a non-inert bailer cord is used, is it discarded between sampling points?

N/A 6. If bladder pumps are used, are they operated in a continuous manner to prevent aeration of the sample?

N/A 7. If bladder pumps are used, is a flow rate of 100ml/minute or less used to collect organic samples, metal samples, and any other samples which could be chemically unstable due to aeration and turbulence?

Y 8. If bailers are used, are they lowered slowly to prevent degassing of the water?

N 9. If bailers are used, are the contents transferred to the sample container in a way that minimizes agitation and aeration? **SEE INSPECTION DEFICIENCY #4**

Y 10. Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior in insertion into the well?

Y 11. If dedicated sampling equipment is not used, is all sampling equipment that could potentially come into contact with the sample, dissembled and thoroughly cleaned between samples?

12. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps:

Y a. Nonphosphate detergent wash?

Y b. Tap water rinse?

N c. Dilute acid rinse HNO3 or HCL?

Y d. Distilled or deionized water rinse?

Y e. Air dry before use?

13. If samples are for organic analysis, does the cleaning procedure include the following sequential steps:

Y a. Nonphosphate detergent/hot water wash?

Y b. Tap water rinse?

Y c. Distilled/deionized water rinse?

N d. Acetone rinse?

N e. Pesticide-grade hexane rinse?

F. IN-SITU OR FIELD ANALYSES

Y 1. For low yielding wells, are official field measurements for pH, specific conductivity, and temperature obtained as soon as the well has recovered enough to yield water for a sample?

N/A 2. For high yielding wells, are official field measurements for pH, specific conductivity, and temperature obtained as soon as the unofficial field measurements have stabilized?

Y 3. Are the official field measurements for pH recorded to the 0.01 pH unit?

Y 4. Are the official field measurements for specific conductivity recorded to the nearest 10 umhos?

5. Indicate which of the following chemically unstable parameters are determined in the field:

Y pH? Y Temperature?

Y Specific conductivity?

N Redox potential? N Chlorine?

N Dissolved oxygen? N Turbidity?

N/A Other:

Y 6. If the sample is withdrawn from the well, is the parameter measured from a split portion?

N 7. Is monitoring equipment calibrated according to manufacturers specifications? **SEE FIELD SAMPLING DEFICIENCIES #1,2.**

Y 8. Is the date, procedure, and maintenance for equipment calibration documented in the field logbook?

G. SPECIAL HANDLING CONSIDERATIONS

Y 1. Are organic samples handled without filtering?

Y 2. Is one equipment blank prepared each day of groundwater sampling?

Y 3. Is one unfiltered sample taken for total metals?

H. SAMPLE LABELS

Y 1. Are sample labels used?

2. Do they provide the following information:

Y a. Sample identification number?

Y b. Name of collector?

Y c. Date and time of collection?

Y d. Place of collection?

Y e. Parameter(s) requested and preservatives used?

Y 3. Do they remain legible even if wet?

Y 4. Are sample seals placed on those containers to ensure samples are not altered?

Y 5. If individual bottle seals are not used, is the container for holding the bottles sealed? **BOTH BOTTLES AND CONTAINERS ARE SEALED.**

I. FIELD LOGBOOK

Y Is a field logbook maintained?

If yes, does it document the following:

Y 1. Purpose of sampling (e.g., detection or assessment)?

N 2. Location of well(s)?

Y 3. Total depth of each well?

Y 4. Static water level depth and measurement technique?

Y 5. Presence of immiscible layers and detection method?

N/A 6. If immiscible layers exist, collection method for immiscible layers?

Y 7. Well purging procedures?

Y 8. Sample withdrawal procedure?

Y 9. Dates and times of collection?

Y 10. Well sampling sequence?

Y 11. Types of sample containers and sample identification number(s)

Y 12. Preservative(s) used?

Y 13. Field analysis data and method(s)?

Y 14. typical well recharge rates?

J. CHAIN-OF-CUSTODY RECORD

Y 1. Is a chain-of-custody record included with each sample?

2. Does it document the following:

Y a. Sample number?

Y b. Signature of collector?

Y c. Date and time of collection?

Y d. Sample type?

Y e. Station location?

Y f. Number of containers?

Y g. Parameters requested?

Y h. Signatures of persons involved in chain-of-custody?

Y i. Inclusive dates of custody?

B. LABORATORY LOGBOOK

Y 1. Is a laboratory logbook maintained?

Y 2. Are experimental conditions (e.g., temperature, humidity, etc.) noted?

Y 3. If a sample for volatile analysis is received with headspace, is this noted?

Y 4. Are the results for all QC samples identified?

Y 5. Is the time, date, and name of person noted for each processing step included?

Site: Giant Refining Company, Ciniza Facility

Inspector: Steve Alexander

Date: March 7, 1991

EVALUATION OF FACILITY FIELD PROCEDURES & FACILITY LAB PROCEDURES

If appropriate: use "Y" = yes, "N" = no, "N/A" = not applicable, "U" = unknown.

NOTE: THIS CHECKLIST COMPLETED FOR WELL OW-11

A. MEASUREMENT OF WELL DEPTHS/WATER ELEVATIONS

Y 1. Are measurements of both depth to standing water and depth to the bottom of the well made and recorded before purging unless the well has a dedicated, permanently installed pump that prevents total depth measurements?

Y 2. Are all water elevations measured within a 24 hour period or less?

Y 3. Are all measurements calculated from the top of the well casing? (i.e., the water elevation and total depth are not measured from the bottom of the well)

Y 4. Are measurements for water elevations taken to the 0.01 feet?

N/A 5. Are all total depth measurements recorded to the nearest 0.25 foot or less?

6. What devices are used? **ELECTRONIC MEASURING TAPE**

N 7. Is there a visibly marked surveyed reference point on the well casing rim which was established by a licensed surveyor? **NOT DURING CME, HOWEVER, ON MAY 19, 1991 GRC HAD THEIR MONITORING WELL SYSTEMS AND A REFERENCE POINT AT THE WELL RESURVEYED, BY A LICENSED SURVEYOR, UNDER THE NEW MEXICO COORDINATE SYSTEM.**

Y 8. Is this reference point accurate to the 0.01 foot with respect to sea level?

Y 9. Is the measuring equipment cleaned before and between well locations by washing with a non-phosphate detergent followed by a tap water rinse?

N/A 10. If the well has evidenced organic contamination or inorganic contamination, are more stringent decontamination methods used such as a hexane rinse or a hydrochloric acid rinse, respectively?

N/A 11. If a plastic or polytetrafluoroethylene (PTFE) measuring tape is used, is the tape checked periodically, at least once a year, with a steel tape for calibration purposes?

N 12. Does the owner/operator note in the field notebook whether there are any nearby wells that could potentially impact the water elevation measurements?

N/A 13. At sites with relatively flat gradients, are the water elevations measured several times to ensure an accurate measurements? **THIS PROPOSED BACKGROUND WELL IS MORE THAN 3,000' FEET FROM THE RCRA LTU-THE GRADIENT IS MODERATE**

B. DETECTION OF IMMISCIBLE LAYERS

Y 1. Are procedures used which will detect heavy phase immiscible layers?

Y 2. Are procedures used which will detect light phase immiscible layers?

N 3. Are procedures used to measure the thickness of the immiscible layers?

C. SAMPLING OF IMMISCIBLE LAYERS

N 1. Are the immiscible layers sampled separately prior to well evacuation?

N/A 2. Do the procedures used minimize mixing with water soluble phases?

N/A 3. Describe how the immiscible samples are collected:

N/A 4. Are appropriate methods used to collect the immiscible samples?

D. WELL EVACUATION

N 1. Are low yielding wells evacuated once to dryness? **OW-11 IS A MODERATE YIELDING WELL. THREE WELL VOLUMES ARE PURGED PRIOR TO SAMPLING.**

N/A 2. Are high yielding wells evacuated so that at least three casing volumes are removed?

N/A 3. For high yielding wells, are measurements of pH, specific conductivity, and temperature obtained before, during and after purging in order to verify that these parameters have stabilized? (Stabilization indicates that well has been adequately purged.)

N/A 4. If **NO**, has documentation been provided that demonstrates that stabilization occurs at this well after a specific volume of water has been purged?

5. What device is used to evacuate the wells: **SUBMERSIBLE PUMP**

U 6. During purging, was the discharge rate slower than the rate used during development? **UNKNOWN RATE OF DISCHARGE DURING DEVELOPMENT, THE PURGE RATE IS 10 GPM.**

U 7. Was the purge rate slow enough to prevent recharging water rushing turbulently into the well? **THE DISCHARGING WATER IS TURBID. THE LIGHT PHASE IMMISCIBLE DETECTION SAMPLE IS CLEAR AND OBTAINED WITH A BAILER.**

N 8. Was the purge water containerized until the groundwater analytical results determine whether the water is contaminated. **CONTAINERIZED PURGE WATER IS TRANSPORTED/DISCHARGED INTO LTU.**

N/A 9. If the groundwater analyses evidence contamination, is the purge water treated on site in accordance with applicable and relevant regulations or disposed as hazardous waste?

Y 10. If any problems are encountered (e.g. equipment malfunction) are they noted in a field logbook?

E. SAMPLE WITHDRAWAL

Y 1. Are samples withdrawn with either fluorocarbon/resins or stainless steel sampling devices? **STAINLESS STEEL**

Y 2. Are sampling devices either bottom valve bailers or positive gas displacement bladder pumps? **BOTTOM VALVE BAILER**

Y 3. Are precautions used to ensure that all sampling equipment that could potentially come into contact with the sample is constructed of inert materials?

N 4. Is an inert bailer cord used? **DEDICATED NYLON CORD**

N 5. If a non-inert bailer cord is used, is it discarded between sampling points?

N/A 6. If bladder pumps are used, are they operated in a continuous manner to prevent aeration of the sample?

N/A 7. If bladder pumps are used, is a flow rate of 100ml/minute or less used to collect organic samples, metal samples, and any other samples which could be chemically unstable due to aeration and turbulence?

Y 8. If bailers are used, are they lowered slowly to prevent degassing of the water?

N 9. If bailers are used, are the contents transferred to the sample container in a way that minimizes agitation and aeration? **THE BAILER CONTENTS ARE POURED INTO A SECONDARY CONTAINER THEN INTO THE VOA BOTTLES.**

Y 10. Is care taken to avoid placing clean sampling equipment on the ground or other contaminated surfaces prior in insertion into the well?

Y 11. If dedicated sampling equipment is not used, is all sampling equipment that could potentially come into contact with the sample, dissembled and thoroughly cleaned between samples?

12. If samples are for inorganic analysis, does the cleaning procedure include the following sequential steps:

Y a. Nonphosphate detergent wash?

Y b. Tap water rinse?

N c. Dilute acid rinse HNO3 or HCL?

Y d. Distilled or deionized water rinse?

Y e. Air dry before use?

13. If samples are for organic analysis, does the cleaning procedure include the following sequential steps:

Y a. Nonphosphate detergent/hot water wash?

Y b. Tap water rinse?

Y c. Distilled/deionized water rinse?

N d. Acetone rinse?

N e. Pesticide-grade hexane rinse?

F. IN-SITU OR FIELD ANALYSES

N 1. For low yielding wells, are official field measurements for pH, specific conductivity, and temperature obtained as soon as the well has recovered enough to yield water for a sample? **OW-11 IS A MODERATE YIELDING WELL.**

N/A 2. For high yielding wells, are official field measurements for pH, specific conductivity, and temperature obtained as soon as the unofficial field measurements have stabilized?

Y 3. Are the official field measurements for pH recorded to the 0.01 pH unit?

Y 4. Are the official field measurements for specific conductivity recorded to the nearest 10 umhos?

5. Indicate which of the following chemically unstable parameters are determined in the field:

Y pH? Y Temperature?

Y Specific conductivity?

N Redox potential? N Chlorine?

N Dissolved oxygen? N Turbidity?

N/A Other:

Y 6. If the sample is withdrawn from the well, is the parameter measured from a split portion?

N 7. Is monitoring equipment calibrated according to manufacturers specifications? **SEE FIELD SAMPLING DEFICIENCIES #1 and #2.**

Y 8. Is the date, procedure, and maintenance for equipment calibration documented in the field logbook?

G. SPECIAL HANDLING CONSIDERATIONS

Y 1. Are organic samples handled without filtering?

Y 2. Is one equipment blank prepared each day of groundwater sampling?

Y 3. Is one unfiltered sample taken for total metals?

H. SAMPLE LABELS

Y 1. Are sample labels used?

2. Do they provide the following information:

Y a. Sample identification number?

Y b. Name of collector?

Y c. Date and time of collection?

Y d. Place of collection?

Y e. Parameter(s) requested and preservatives used?

Y 3. Do they remain legible even if wet?

Y 4. Are sample seals placed on those containers to ensure samples are not altered?

Y 5. If individual bottle seals are not used, is the container for holding the bottles sealed? **BOTH BOTTLES AND CONTAINER ARE SEALED.**

I. FIELD LOGBOOK

Y Is a field logbook maintained?

If yes, does it document the following:

Y 1. Purpose of sampling (e.g., detection or assessment)?

N 2. Location of well(s)?

Y 3. Total depth of each well?

Y 4. Static water level depth and measurement technique?

Y 5. Presence of immiscible layers and detection method?

Y 6. If immiscible layers exist, collection method for immiscible layers?7

Y 7. Well purging procedures?

Y 8. Sample withdrawal procedure?

Y 9. Dates and times of collection?

Y 10. Well sampling sequence?

Y 11. Types of sample containers and sample identification number(s)

Y 12. Preservative(s) used?

Y 13. Field analysis data and method(s)?

Y 14. typical well recharge rates?

J. CHAIN-OF-CUSTODY RECORD

Y 1. Is a chain-of-custody record included with each sample?

2. Does it document the following:

Y a. Sample number?

Y b. Signature of collector?

Y c. Date and time of collection?

Y d. Sample type?

Y e. Station location?

Y f. Number of containers?

Y g. Parameters requested?

Y h. Signatures of persons involved in chain-of-custody?

Y i. Inclusive dates of custody?

B. LABORATORY LOGBOOK

U 1. Is a laboratory logbook maintained?

U 2. Are experimental conditions (e.g., temperature, humidity, etc.) noted?

U 3. If a sample for volatile analysis is received with headspace, is this noted?

U 4. Are the results for all QC samples identified?

U 5. Is the time, date, and name of person noted for each processing step included?

FIELD SAMPLING NOTES

There are six wells in the Shallow Monitoring Well series (SMW-series). The inside diameter of the stainless steel casing is 2". SMW-1,2 are at the southeast corner, SMW-3 is at the east side, SMW-4 is at the north side, SMW-5 is at the northwest corner and SMW-6 is at the west side of the Unit. The proposed background well OW-11 is located southwest of the facility and approximately three thousand feet from the Unit. The PVC casing material has a 4" inside diameter. **NOTE:** A May 1991 resurvey of the facility revealed that the original datum was in error. The elevations given in the following field notes are the corrected depths (see page 33).

3/4/91 Weather clear, sunny, approximately 55 (F). GRC personnel present were Claud Rosendale and Lynn Shelton. EID personnel present were Bruce Swanton and Steve Alexander.

SMW-1 Tested for volatiles with HNU prior to purge- none detected. Began purge at 11:20. Noted that facility personnel only planned to purge one well volume. ED corrected personnel who then purged to dryness (less than 3 well volumes). The purged water was light red. No notch in casing for accurate water depth measurements, casing lip uneven. TOC= 6880.7', BOC= 6834.2'.

SMW-2 Tested for volatiles with HNU prior to purge- none detected. Purged 12.5 gallons, less than 3 well volumes (15 gal). TOC= 6881.7, BOC= 6827.1

SMW-3 No volatiles detected with HNU. Purged 3.5 gallons to dryness (less than 3 well volumes). TOC= 6882.2, BOC= 6838.7.

SMW-4 No volatiles detected with HNU. Bailed 15 gallons to dryness (less than 3 well volumes). Water clear.

NOTE: All wells (SMW 1-4) were measured only once to determine depth to water.

SMW-5 No volatiles detected with HNU. Purged of 13 gallons to dryness. Clear water. TOC= 6875.7', BOC= 6804.8.

SMW-6 No volatiles detected with HNU. Purged SMW-6 of 12.25 gallons to dryness. Clear water. TOC= 6878.4', BOC= 6807.6'. Clear water.

3/5/91 Weather: Windy, overcast, mid 40 (F), light rain at end of day.

NOTE: For all VOC samples GRC personnel pour bailer water into secondary container first then into VOA bottle. Also, the ED conductivity probe was only soaked one hour prior to obtaining readings.

SMW-1: Calibration (of EC):

	Cond.(MicroMhos)	Temp (C)
Std. Solution (ED)	998	10.00
Tested	*341	11.25
Std. Solution (GRC)	1000	10.00
Tested	350	10.00

EC(MicroMhos)	pH	Temp(C)
2290	7.25	11.25

NOTE: Trip blank contains bubble. Significant drift time period (15-20 minutes) before pH meter stabilized. * Also, the EC probe was not soaked for 24 hours prior to obtaining readings.

SMW-2:

EC(MicroMhos)	pH	Temp(C)	Time
5300	7.39	11.25	9:53
	7.43		9:51
	7.40		9:52
	7.40		9:53
	7.39		9:53
	7.39		9:56

SMW-3:

EC(MicroMhos)	pH	Temp(C)	Time
2280	7.70	9.5	10:49
	7.70		10:39
	7.70		10:44
	7.78		10:46
	7.79		10:49
	7.80		
	6.89		10:53 (pH 7.00 stand.)
	9.95		10:55 (pH 10.00 stand.)

NOTE: Well did not fully recover, only 7' of water in casing.

SMW-4: Calibration (of EC):

EC(MicroMhos)	pH	Temp(C)
850	8.38	10
	6.90	10.1 (pH 7.00 stand.)
	9.94	10.4 (pH 10.00 stand.)

NOTE: Trip blank has bubble. Well had not fully recovered, only 3 gallons removed.

SMW-5:

EC(MicroMhos)	pH	Temp(C)
800	8.57	10

SMW-6:

EC(MicroMhos)	pH	Temp(C)
900	8.14	13.5

Rechecked pH standards:

7.00 standard: 7.03
10.00 standard: 10.00

3/6/91

OW-11 No volatiles detected with HNU. Observed no immiscible layer (light phase) in hand held bucket containing bailed well water. Purged with submersible pump, water turbid.

EC(MicroMhos)	pH	Temp(C)	Time
1000	8.22	10.00	10:25
	8.09		10:18
	8.11		10:18
	8.12		10:18
	8.16		10:19
	8.18		10:20
	8.20		10:22
	8.22		10:22
	8.22		10:26

TOC	BOC	DTW	
6923.00	6857.27	18.70	HNU: no detect

NOTE: duplicates for OW-11 are marked "MW4".

MW-1 No volatiles detected with HNU. Purging begun at 8:30. Observed clear water pumped into adjacent lagoon #3. Volume calculated by pumping into 5 gallon bucket. 7 gal/min for total of 18.5 minutes. Determined that pump hose only extends to within 10' of bottom of well casing, will recommend obtaining longer hose for proper purge. Outside well diameter is 5".

EC(MicroMhos)	pH	Temp(C)
750	9.00	11
	6.99	(pH 7.00 stand.)
	10.00	(PH 10.00 stand.)

TOC	BOC	DTW	
6879.8'	6760.4'	6.03	(approx 119 ft of water)

NOTE: pH is from second sample. Meter was recalibrated following first reading.

Well	DTW
SMW-1	22.78'
" 2	30.18'
" 3	32.11'
" 4	30.37'
" 5	30.62'
SMW-6	30.60
OW-11	18.70'
MW- 4	6.03'
MW- 1	5.07'

3/7/91 Conducted exit interview.

Site: Giant Refining Company, Ciniza Facility

Inspector: Steve Alexander

Date: March 7, 1991

Use "Y" = yes, "N" = no, "N/A" = not applicable, "U" = unknown.

MONITORING WELLS - FACILITY PROVIDED INFORMATION

NOTE: THIS CHECKLIST IS FOR THE SMW-SERIES WELLS

These questions should be answered for each different well design and construction present at the facility. Wells designed or constructed using the same procedures may be grouped.

1. Drilling Methods:

a. What drilling method was used for the well? Check which method was used.

X (1) Hollow-stem auger

(2) Solid-stem auger

(3) Mud rotary

(4) Air rotary

(5) Reverse rotary

(6) Cable tool

(7) Jetting

(8) Air drill w/casing hammer

(9) Other (explain)

U b. Were any cutting fluids (including water) or additives used during drilling? If **YES**, specify,

(1) Type of drilling fluid (e.g., type of foam, Wyoming pure sodium bentonite, etc.):

(2) Source of water used:

U c. Was the drilling equipment steam-cleaned prior to drilling the well?

If other cleaning methods were used, please describe:

U d. Was compressed air used during drilling?

N/A e. If **YES**, was the air filtered to remove oil?

f. How were core samples obtained? Check sample collection method used.

_x_ split spoon ___ core drilling

___ shelby tube ___ other:

g. Were the following analytical tests performed on the core samples or cuttings? Check which tests were performed.

Y Gross description of moisture content (e.g., moist, wet, saturated, etc.)

N Mineralogy (e.g. microscopic tests and x-ray diffraction)

N Petrographic analysis

N degree of sorting, size fraction (i.e. sieving), texture

N degree of crystalinity and cementation of matrixal variations

Y rock type(s) (e.g., limestone, granite, etc.)

Y soil type (sandy loam, sandy clay, etc.)

N approximate bulk geochemistry (e.g., 5% feldspar, 80% limestone, etc.)

N existence of microstructures that may effect or indicate fluid flow

N Falling head tests

N Static head tests

N Settling measurements

N Centrifuge tests

N Column drawings

N Analyses for contaminants. If contaminants were identified, please list:

U h. Were the sample corings logged by a qualified professional in geology?

i. Does the lithology log (driller's log) include the following information:

Y (1) Hole name/number?

N (2) Date started and finished?
ALL SHOW SPUD DATE, SEVERAL ARE MISSING COMPLETION DATE.

Y (3) Driller's name?

N (4) Hole location (i.e. map and elevation)?

N (5) Drill rig type and bit/auger size?

Y (6) Gross petrography (e.g. rock type) of each geologic unit?

N (7) Gross mineralogy of each geologic unit?

N (8) Gross structural interpretation of each geologic unit and structural features (e.g. fractures, gouge material, solution channels, buried streams or valleys, identification of depositional material)?

N (9) Development of soil zones and vertical extent and description of soil type?

Y (10) Depth of water bearing unit(s) and vertical extent of each?
DEPTH TO WATER ONLY

N (11) Depth and reason for termination of borehole?
DEPTH ONLY

Y (12) Depth that water was encountered in hole?

N/A (13) Depth and location of any contaminant encountered in borehole?

N/A (14) Sample location/number?

N/A (15) Percent sample recovery?

Y (16) Narrative descriptions of geologic observations?

Y (17) Narrative descriptions of drilling observations?

2. Monitoring Well Construction Materials

a. Identify well construction materials (by number) and diameters.

(1) Primary Casing:

material: **STAINLESS STEEL**

diameter: **ID= 2.00 IN.**

(2) Secondary or outside casing (double construction)

material: **N/A**

diameter:

(3) Screen

material: **STAINLESS STEEL**

diameter: **ID= 2.00 IN.**

(4) Sump

material: **STAINLESS STEEL**

(5) Centralizers

material: **U**

N/A b. If PVC materials were used, did they bear the National Sanitation Foundation logo for potable water applications (NSF-pw) or American Society of Testing Materials (ASTM)?

Y c. Were inert materials used below and including the static water level within the well?

d. How are the sections of casing and screen connected?

U Pipe sections threaded

U Couplings (friction) with adhesive or solvent

U Couplings (friction) with retainer screws

U Other (specify)

U e. Were the materials steam-cleaned prior to installation?

If no, how were the materials cleaned?

f. Well Intake Design and Well Development

Y (1) Was a well intake screen installed?

Y (2) Was the screen manufactured?

(3) Provide the slot size: **0.010 INCHES**

g. If well construction logs were provided, do they

Y 1. depict the dimensions, locations, elevations and depths of the screen, casing, sump, bentonite seal, bentonite-cement seals and other annular seals, filter pack, centralizers?

Y 2. specify materials of construction (casing, screen, sump, centralizers)?

Y 3. specify the screen slot size?

Y 4. specify the total depth of the well?

N 5. specify the filter pack grain size?

N 6. specify the mineralogy of the filter pack (e.g., 96% silica, 4% feldspar)?

Y 7. specify the surveyed elevation of the top of casing?

Y h. Was a tailpipe or sump installed?

(1) How far does the sump extend below the screen? **THREE FEET**

Y (2) Was the sump capped with an inert bottom?

If **NO**, explain:

Y i. Was a filter pack installed? If so:

(1) Specify which wells have an artificial filter pack: **ALL SMW-SERIES WELLS**

Y (2) Does the filter pack consist of inert, siliceous granular material?

U (3) How was the filter pack installed?

(4) What is the particle size range:
50/60 MESH COLORADO SAND

j. Well development

Y (1) Was the well developed?

(2) Check which method was used:)

___ surge block _X_bailer ___air

___ surging ___water pumping

___ other: _____

(3) What were the turbidity readings? (Please indicate well number) **NONE WERE TAKEN**

U k. Was only an additive free bentonite slurry used as a sealant within the saturated zone

3. Surface protection of the well.

Y a. Is the surficial expression of the well above grade?

N b. Is the surficial expression of the well below grade?

If **YES**, please describe surface configuration of the well.

Y c. Is the upper portion of the borehole sealed with a concrete cap to divert drainage away from the casing?

Y d. Are the dimensions of the concrete cap at least 3 feet by 3 feet by 4 inches thick?
3'X 3'X 6" CONCRETE SLAB WITH STEEL CASING, LATCH/LOCK AND STEEL PIPE BUMPER GUARDS.

Y e. If motor vehicles can approach the well, is the well fitted with an above-ground protective device and bumper guards?

Y f. Has the protective cover been installed with locks to prevent tampering?

4. Have any facility wells been abandoned or plugged? If yes,
MW-3 WAS DRILLED INTO THE CINIZA SAND AND WAS REPLACED BY MW-5 IN JULY, 1986. MW-3 WAS PLUGGED WITH CONCRETE.

U a. Was only an additive free bentonite slurry used as a plug within the saturated zone?

If **NO**, specify what type of material was used as the additive.

U b. How thick was this plug:

U c. Was a different plug used in the unsaturated zone? If yes,

U (1) If yes, did the plug consist of a bentonite-cement slurry?

U (2) If bentonite-cement was not used, specify the materials used (grit and type):

U (3) Was the plug emplaced as a slurry in a continuous process to the surface using a tremie pipe?

U d. Were the plugs appropriate for the site conditions and ensure an adequate seal and do not adversely affect groundwater chemistry? (E.g., cement was not used in the saturated zone, backfill was not used, bentonite grout was used in the saturated zone, etc)

U e. Was the casing removed before the wells were plugged?

If **NO**, describe how the screen and filter pack were plugged:

WELL DATA SUMMARY

WELL NO.	UP,DOWN,OR SIDE GRAD?	DATE DRILLED	TOTAL DEPTH *	STATIC WATER LEVEL **	SCREENED INTERVAL ***
1	D	10/4/85	50.56'	6883.29' 6860.51'	6857.23' 6837.23'
2	D	9/26/85	57.31'	6884.44' 6854.26'	6850.13' 6830.13'
3	S	10/1/85	45.91'	6884.56' 6852.45'	6861.65' 6841.65'
4	D	9/25/85	69.90'	6880.08' 6849.71'	6830.84' 6810.84'
5	D	9/25/85	76.24'	6878.02' 6847.40'	6824.78' 6804.78'
6	D	10/3/85	73.16'	6880.71' 6850.11'	6830.55' 6810.55'

* From top of surveyed casing. **MEASUREMENTS SHOWN ARE 5/13/91 CORRECTED VALUES.**

** Indicate date measured and elevation of top of casing and static water level. **ALL MEASUREMENTS TAKEN 3/4/91 AND CORRECTED 5/13/91. MEASUREMENTS SHOWN ARE CORRECTED VALUES.**

*** Elevation of top and bottom of screened interval. **MEASUREMENTS SHOWN ARE 5/13/91 CORRECTED VALUES.**

Site: Giant Refining Company, Ciniza Facility

Inspector: Steve Alexander

Date: March 7, 1991

Use "Y" = yes, "N" = no, "N/A" = not applicable, "U" = unknown.

MONITORING WELLS - FACILITY PROVIDED INFORMATION

NOTE: THIS CHECKLIST IS FOR OW-11

These questions should be answered for each different well design and construction present at the facility. Wells designed or constructed using the same procedures may be grouped.

1. Drilling Methods:

a. What drilling method was used for the well? Check which method was used.

___ (1) Hollow-stem auger

___ (2) Solid-stem auger

___ (3) Mud rotary

___ (4) Air rotary

___ (5) Reverse rotary

_X__ (6) Cable tool

___ (7) Jetting

___ (8) Air drill w/casing hammer

___ (9) Other (explain)

Y b. Were any cutting fluids (including water) or additives used during drilling? If **YES**, specify,

U (1) Type of drilling fluid (e.g., type of foam, Wyoming pure sodium bentonite, etc.):

U (2) Source of water used:

U c. Was the drilling equipment steam-cleaned prior to drilling the well?

If other cleaning methods were used, please describe:

U d. Was compressed air used during drilling?

N/A e. If **YES**, was the air filtered to remove oil?

f. How were core samples obtained? Check sample collection method used.

split spoon core drilling

shelby tube other: **UNKNOWN**

g. Were the following analytical tests performed on the core samples or cuttings? Check which tests were performed.

N Gross description of moisture content (e.g., moist, wet, saturated, etc.)

N Mineralogy (e.g. microscopic tests and x-ray diffraction)

N Petrographic analysis

N degree of sorting, size fraction (i.e. sieving), texture

N degree of crystalinity and cementation of matrixal variations

N rock type(s) (e.g., limestone, granite, etc.)

soil type (sandy loam, sandy clay, etc.)

N approximate bulk geochemistry (e.g., 5% feldspar, 80% limestone, etc.)

N existence of microstructures that may effect or indicate fluid flow

N Falling head tests

N Static head tests

N Settling measurements

N Centrifuge tests

N Column drawings

N Analyses for contaminants. If contaminants were identified, please list:

U h. Were the sample corings logged by a qualified professional in geology?

i. Does the lithology log (driller's log) include the following information: **ONLY BORING LOG PROVIDED**

Y (1) Hole name/number?

Y (2) Date started and finished?

N (3) Driller's name?

N (4) Hole location (i.e. map and elevation)?
ONLY THE GENERAL LOCATION IS NOTED ON THE SITE MAP

N (5) Drill rig type and bit/auger size?

Y (6) Gross petrography (e.g. rock type) of each geologic unit?

N (7) Gross mineralogy of each geologic unit?

N (8) Gross structural interpretation of each geologic unit and structural features (e.g. fractures, gouge material, solution channels, buried streams or valleys, identification of depositional material)?

N (9) Development of soil zones and vertical extent and description of soil type?

N (10) Depth of water bearing unit(s) and vertical extent of each?
DEPTH TO WATER ONLY

N (11) Depth and reason for termination of borehole?

Y (12) Depth that water was encountered in hole?

N (13) Depth and location of any contaminant encountered in borehole?

N/A (14) Sample location/number?

N/A (15) Percent sample recovery?

N (16) Narrative descriptions of geologic observations?

N (17) Narrative descriptions of drilling observations?

2. Monitoring Well Construction Materials

a. Identify well construction materials (by number) and diameters.

(1) Primary Casing:

material: **PVC**

diameter: **ID= 4.00 IN.**

(2) Secondary or outside casing (double construction)

material: **N/A**

diameter:

(3) Screen

material: **PVC**

diameter: **ID= 4.00 IN.**

(4) Sump

material: **PVC**

(5) Centralizers

material: **N/A**

U b. If PVC materials were used, did they bear the National Sanitation Foundation logo for potable water applications (NSF-pw) or American Society of Testing Materials (ASTM)?

U c. Were inert materials used below and including the static water level within the well?

d. How are the sections of casing and screen connected?

U Pipe sections threaded

" Couplings (friction) with adhesive or solvent

" Couplings (friction) with retainer screws

U Other (specify)

U e. Were the materials steam-cleaned prior to installation? If no, how were the materials cleaned?

f. Well Intake Design and Well Development

N (1) Was a well intake screen installed?
SLOTTED PVC

U (2) Was the screen manufactured?

(3) Provide the slot size: **UNKNOWN**

g. If well construction logs were provided, do they

N 1. depict the dimensions, locations, elevations and depths of the screen, casing, sump, bentonite seal, bentonite-cement seals and other annular seals, filter pack, centralizers?

Y 2. specify materials of construction (casing, screen, sump, centralizers)?

N 3. specify the screen slot size?

Y 4. specify the total depth of the well?

N 5. specify the filter pack grain size?

N 6. specify the mineralogy of the filter pack (e.g., 96% silica, 4% feldspar)?

N 7. specify the surveyed elevation of the top of casing?

Y h. Was a tailpipe or sump installed?

(1) How far does the sump extend below the screen?
85'

U (2) Was the sump capped with an inert bottom?

If **NO**, explain: **SEE COMMENTS**

Y i. Was a filter pack installed? If so:
GRAVEL PACK

(1) Specify which wells have an artificial filter pack:
THE BORING LOG STATES THE GRAVEL WAS PLACED THE LENGTH OF THE SCREEN TO EIGHT FEET ABOVE.

U (2) Does the filter pack consist of inert, siliceous granular material?

U (3) How was the filter pack installed?

U (4) What is the particle size range:

j. Well development

U (1) Was the well developed?

(2) Check which method was used: **N/A**

___surge block ___bailer ___air
___surging ___water pumping
other: _____

U (3) What were the turbidity readings? (Please indicate well number)

U k. Was only an additive free bentonite slurry used as a sealant within the saturated zone? **QUICK-GEL BENTONITE**

3. Surface protection of the well.

Y a. Is the surficial expression of the well above grade?

N b. Is the surficial expression of the well below grade?

If **YES**, please describe surface configuration of the well.

Y c. Is the upper portion of the borehole sealed with a concrete cap to divert drainage away from the casing?

Y d. Are the dimensions of the concrete cap at least 3 feet by 3 feet by 4 inches thick?
BASE OF 3'X 3'X 6" CONCRETE PAD. STEEL CASING AND PROTECTIVE COVER WITH LOCK.

Y e. If motor vehicles can approach the well, is the well fitted with an above-ground protective device and bumper guards?

Y f. Has the protective cover been installed with locks to prevent tampering?

4. Have any facility wells been abandoned or plugged? If yes, **YES, MW-3 WAS FOUND TO BE SCREENED IN THE CINIZA SANDS AND NOT THE SONSELA AQUIFER. IT HAS BEEN PLUGGED THE ENTIRE DEPTH WITH CONCRETE.**

N a. Was only an additive free bentonite slurry used as a plug within the saturated zone?
If **NO**, specify what type of material was used as the additive. **CONCRETE**

b. How thick was this plug: **SEE ITEM 4, ABOVE**

N c. Was a different plug used in the unsaturated zone?

U (1) If yes, did the plug consist of a bentonite-cement slurry? **SEE 4. ABOVE.**

U (2) If bentonite-cement was not used, specify the materials used (grit and type):

U (3) Was the plug emplaced as a slurry in a continuous process to the surface using a tremie pipe?

U d. Were the plugs appropriate for the site conditions and ensure an adequate seal and do not adversely affect groundwater chemistry? (E.g., cement was not used in the saturated zone, backfill was not used, bentonite grout was used in the saturated zone, etc)

U e. Was the casing removed before the wells were plugged?

If **NO**, describe how the screen and filter pack were plugged:

WELL DATA SUMMARY

WELL NO.	UP,DOWN,OR SIDE GRAD?	DATE DRILLED	TOTAL DEPTH *	STATIC WATER LEVEL **	SCREENED INTERVAL ***
OW-11	U	12/20-30/ 80	150.89'	6923.89' 6905.19'	6880.00' 6858.00'

* From top of surveyed casing. **MEASUREMENTS SHOWN ARE 5/13/91 CORRECTED VALUES.**

** Indicate date measured and elevation of top of casing and static water level. **ALL MEASUREMENTS TAKEN 3/4/91 AND CORRECTED 5/13/91. MEASUREMENTS SHOWN ARE CORRECTED VALUES.**

*** Elevation of top and bottom of screened interval. **MEASUREMENTS SHOWN ARE 5/13/91 CORRECTED VALUES.**

COMPREHENSIVE GROUNDWATER MONITORING EVALUATION
OFFICE DOCUMENT REVIEW

List the names and dates of all documents which were reviewed for the office portion of the CME review: **SEE PAGE 57**

For each question, respond with "Y" for yes, "N" for no, "N/A" for not applicable, and "U" for unknown.

NOTE: THIS CHECKLIST IS FOR THE SMW-SERIES AND MW-SERIES WELLS AND IS INDICATED BY: SMW/MW.

EVALUATION OF THE OWNER/OPERATOR'S HYDROGEOLOGIC CHARACTERIZATION

A. Regional and Facility Maps [1,2]

Y 1. Did the owner/operator obtain a regional map of the area and delineate the facility? If yes, attach a copy to this report.

If YES, does this map illustrate:

N/A a. Surficial geologic features?

N/A b. Streams, rivers, lakes or wetlands near the facility?

N/A c. Discharging or recharging wells near the facility?

Y 2. Did the owner/operator prepare a facility site map? If yes, attach a copy to this report.

If YES, does the site map show:

Y a. Regulated units of the facility (e.g. landfill areas, impoundments)?

N/A b. Any seeps, springs, streams, ponds, or wetlands?

c. Location of:

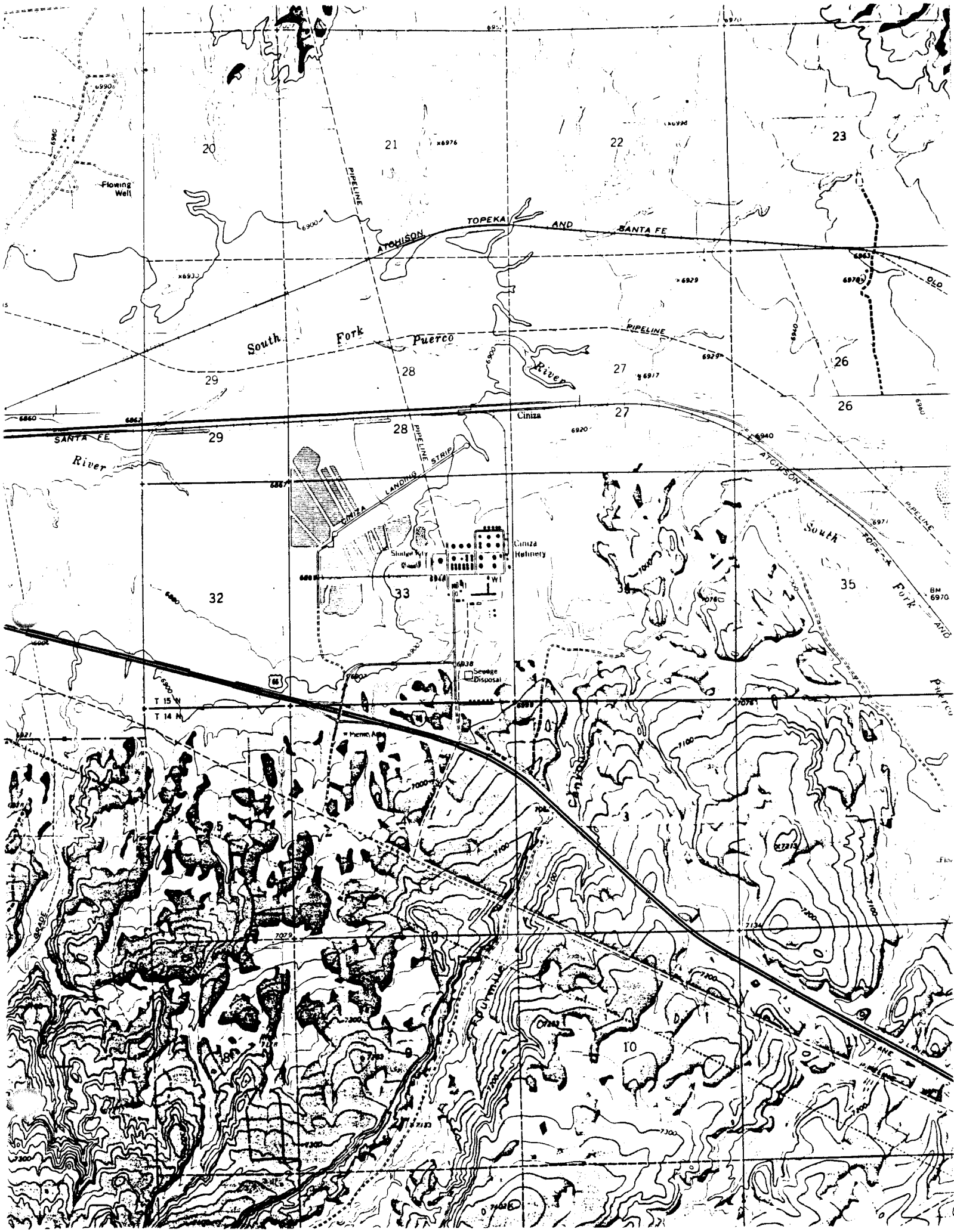
Y active monitoring wells?

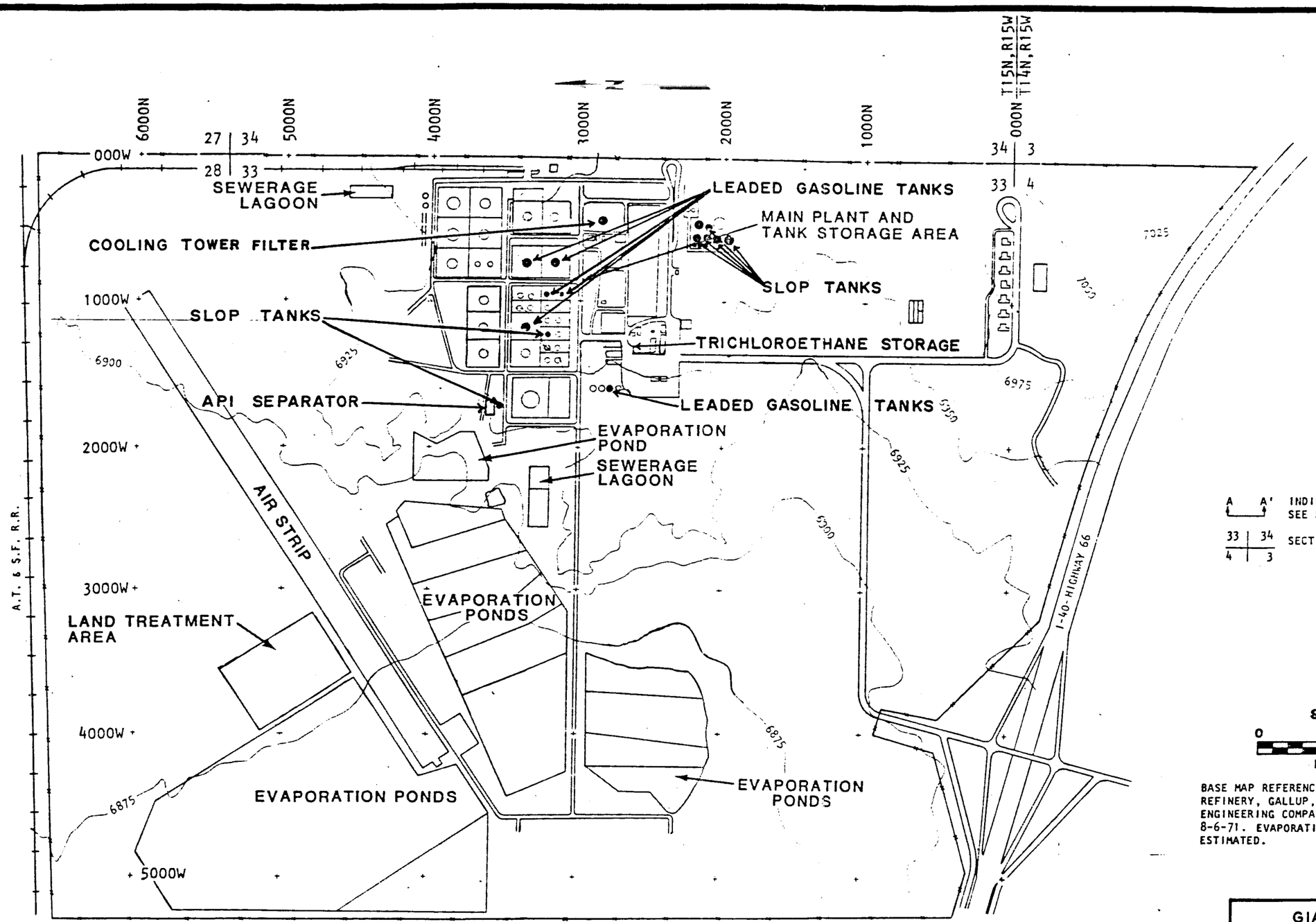
Y decommissioned monitor or production wells?

N/A soil borings?

Y test pits?

N d. Ownership of adjacent land?


Flowing Well
PIPELINE
ATCHISON TOPEKA AND SANTA FE
South Fork Puerco River
PIPELINE
Ciniza
SANTA FE
River
PIPELINE
CINIZA LANDING STRIP
Ciniza Refinery
Sludge Pit
ATCHISON
South Fork
Sewage Disposal
T 15 N
T 14 N
Home Ap
Formula
20
21
22
23
29
28
27
26
32
33
35
10



A A' INDICATES CROSS SECTION LINE SEE PLATES 5A AND 5B

33 | 34 / 4 | 3 SECTION CORNER

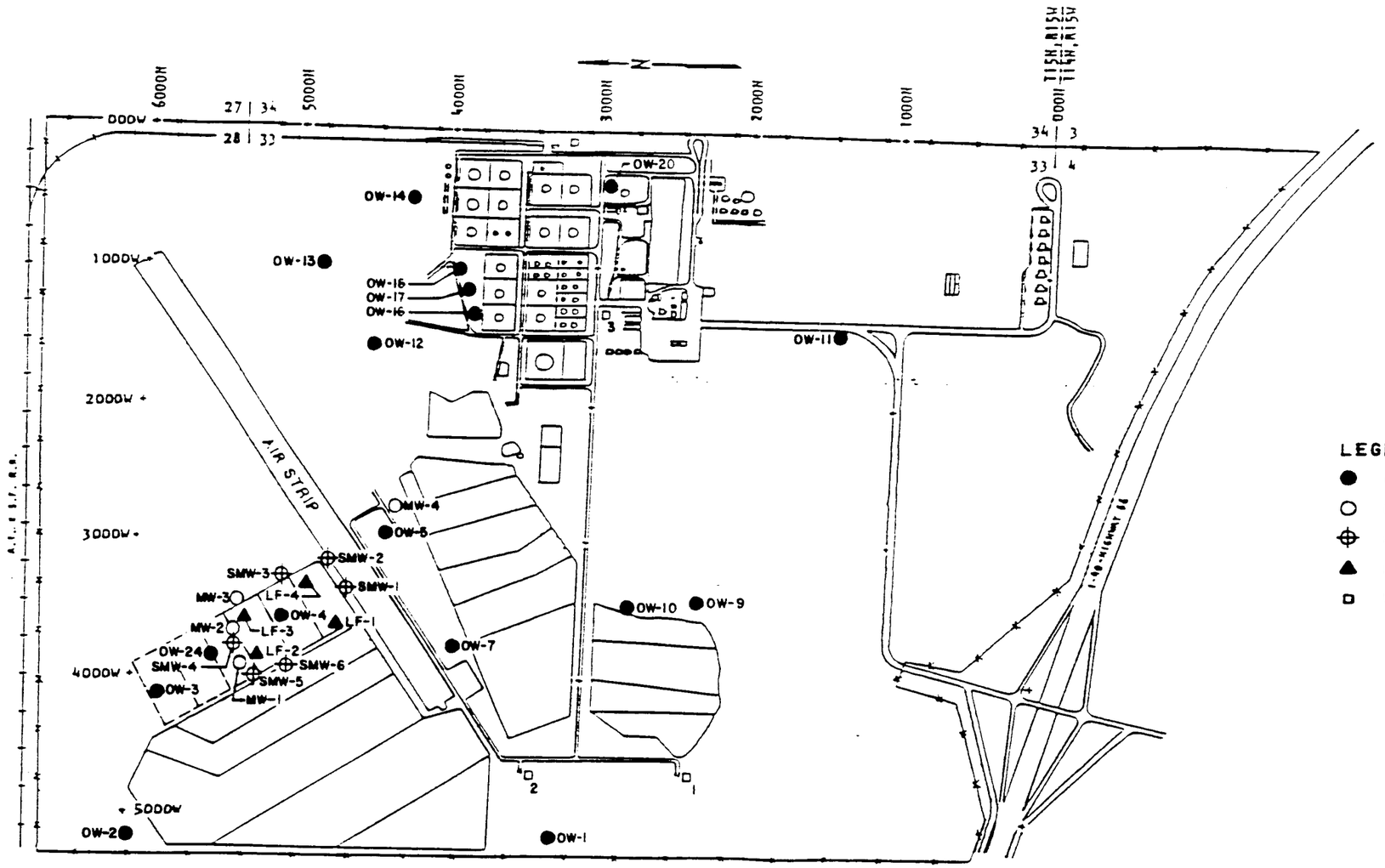
SCALE

0 500 1000

FEET

BASE MAP REFERENCE: MASTER PLAN, CINIZA REFINERY, GALLUP, NEW MEXICO, SOUTHWESTERN ENGINEERING COMPANY, ZZ-02-122-EP, REVISION 8-6-71. EVAPORATION POND BOUNDARIES ARE ESTIMATED.

GIANT REFINING CO.	
FIGURE 13.1-1 REFINERY SITE MAP HAZARDOUS WASTES LOCATIONS	
ENGINEERS: DELTA H ENGINEERING, LTD.	
SCALE: 1:9000	DATE: 11-16-84



LEGEND

- ● OW-SERIES WELLS
- ○ MW-SERIES WELLS
- ⊕ SMW-SERIES WELLS
- ▲ LF-SERIES SOIL SAMPLES
- ▫ WATER SUPPLY WELLS

APPROXIMATE SCALE

0 500 1000

FEET

MAP ADAPTED FROM REFINERY SITE MAP, DELTA H ENGINEERING, LTD., 11-16-84. BASE MAP REFERENCE: MASTER PLAN, CINIZA REFINERY, GALLUP, NEW MEXICO, SOUTHWESTERN ENGINEERING COMPANY, 22-02-122-EP, REVISION 8-6-71. EVAPORATION POND BOUNDARIES ARE ESTIMATED.

APPROXIMATE
SOIL SAMPLE L
GIANT CINIZA REF
RCRA FACILITY ASS

B. Soil boring/test pit program [2,5,6,7]

Y Was a separate soil boring/test pit program conducted independently of the installation of monitor wells? **NO SOIL BORING TESTS WERE CONDUCTED BUT FOUR SOIL TEST PITS WERE DUG FOR INSTALLATION OF SOIL MOISTURE LYSIMETERS. THE FOLLOWING RESPONSES ARE FROM THE SOIL TEST PIT PROGRAM.**

If yes,

Y 1. Were the soil borings/test pits performed under the supervision of a qualified professional? (professional geologist, soil scientist or geotechnical engineer)

N 2. Did the owner/operator provide documentation for selecting the spacing for borings?

N 3. Did the soil borings encounter any saturated zones above the presumed groundwater elevation or potentiometric surface?

N/A 4. Were the borings drilled to the depth of the first confining unit below the uppermost zone of saturation or ten feet into bedrock? If so, which ones:

N/A 5. What drilling method(s) were used for the boreholes?

N 6. Were the cuttings or cores analyzed to determine the presence of any hazardous constituents? If yes,

N/A List the analyses performed:

N/A List the contaminants identified and the depths at which they occurred:

N/A 7. Were the drilling methods appropriate for the collection of adequate data?

N/A 8. Is there a significant possibility that the drilling could have provided communication between flow zones or aquifers?

N/A 9. Were an adequate number of borings drilled to generally characterize the subsurface geology of the vadose zone and uppermost aquifer?

N/A 10. How many borings were drilled?

Y 11. Were the cores or cuttings logged by a qualified professional in geology? **THE TEST PIT PROGRAM WAS UNDER THE DIRECTION OF A GEOLOGIST.**

N/A 12. Were the borings plugged?

N/A 13. Were the plugs appropriate for the site conditions and ensure an adequate seal and do not adversely affect groundwater chemistry? (e.g., cement was not used in the saturated zone, backfill was not used, bentonite grout was used in the saturated zone, etc)

C. Site hydrogeological characterization [2]

NOTE: THIS CHECKLIST IS FOR THE SMW-SERIES AND MW-SERIES WELLS AND IS INDICATED BY: SMW/MW.

N/N 1. Did the owner/operator document the procedure for establishing the potentiometric surface?

2. Are the static water level measurements valid, i.e.:

Y/Y a. Were all elevation measurements made within a 24 hour period?

Y/Y b. Are all elevations measured to the 0.01 foot?

N/A/Y 3. Has the owner/operator included potentiometric contour maps? If yes, **NOT REQUIRED BY THE PERMIT FOR SMW-SERIES**

N/A/Y a. Has the office evaluation confirmed that the potentiometric contours appear to be reasonable based on topography and presented data?

N/A/N b. Do the maps include dates of measurement with the elevations?

N/A/Y c. Are the depicted elevations concurrent for all wells?

Y/Y 4. Have the horizontal and vertical components of groundwater flow been adequately characterized? **HORIZONTAL ONLY. UNLESS CONTAMINATION IDENTIFIED, NO VERTICAL COMPONENT DETERMINATION REQUIRED.**

N/A 5. Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone?

N/A 6. How many wells were used to determine the vertical flow component?

N/A 7. If vertical gradients are suspected, has the office review concluded that flow nets should be constructed?

N/A 8. If yes, did the owner/operator develop flow nets?

If yes, do the owner/operator's flow nets include:

N/A (1) monitor well or piezometer locations?

" (2) depth of screens?

" (3) length of screens?

" (4) concurrent measurements of water levels from all wells and piezometers?

" (5) equipotential lines?

N/A (6) flow lines?

N/N 9. Do water level fluctuations alter the general groundwater gradients and flow directions?

N/A 10. If yes, did the owner/operator adequately consider the seasonal and temporal effects on the groundwater?

N/A 11. Did the owner/operator implement means for gauging long term effects on water movement that may result from on-site or off-site construction or changes in land use patterns?

N/A 12. Is the owner/operator's slug or pump test data consistent with existing geologic information (e.g. boring logs)?

N/A 13. Were the aquifer test procedures, equations, assumptions, raw data, and all calculations of hydraulic conductivity, etc. fully described?

N/A 14. Was the hydraulic conductivity determined adequately using appropriate tests? **THE HYDRAULIC CONDUCTIVITY WAS NOT DETERMINED AT THE FACILITY FOR THE CINIZA SANDS.**

N 15. Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined? **FOR THIS CME THE CINIZA SANDS ARE CONSIDERED THE UPPERMOST SATURATED ZONE. THE SMW-SERIES, SCREENED IN THE CINIZA SANDS BENEATH THE LTU, HAVE PROVIDED WATER QUALITY DATA AND WATER ELEVATIONS WHICH INDICATE THE CINIZA SANDS MAY NOT BE CONTINUOUS OR HYDRAULICALLY CONNECTED BENEATH THE LTU.**

Y 16. Is a confining unit present? If yes,

N 17. Does the confining layer appear to be laterally continuous across the entire site?
SEE #15 ABOVE.

18. If yes, what data supports this continuity?

19. What is the hydraulic conductivity of the confining unit (if available)? **0.007 FT./YR.**

N 20. Do the number of borings and analytical data indicate that the confining layer displays a low enough permeability to impede the migration of contaminants to any stratigraphically lower water-bearing units? **THE HIGH POTENTIOMETRIC SURFACE MAY POSSIBLY IMPEDE CONTAMINANT MIGRATION.**

N 21. Is the uppermost aquifer hydraulically connected with deeper aquifers?

If yes, what data supports this interconnection:

22. Describe the following:

Site stratigraphy: **UPPER-MOST SEQUENCE IS COMPRISED OF SILTY CLAY AND SILTY SHALE, BELOW THAT IS THE SANDSTONE UNIT (SONSELA SANDSTONE) WHICH IS DESIGNATED THE UPPER-MOST AQUIFER FOR REGULATORY PURPOSES. BELOW THIS SANDSTONE IS A THICK SEQUENCE OF MUDSTONE AND SILTSTONE.**

Uppermost aquifer: **IN THIS REPORT THE "CINIZA SANDS" ARE CONSIDERED THE ZONE OF SATURATION BEING MONITORED.**

Depth water encountered **60'-65'**

Saturated thickness: **5'**

Confined/unconfined: **CONFINED**

Horizontal gradient: **NORTHWEST AT 0.008**

Seepage Velocity (facility and evaluator calculated): **UNKNOWN. POSSIBLY ISOLATED SATURATED ZONES, WHICH MAY NOT BE HORIZONTALLY CONNECTED.**

Vertical Gradient: **UNKNOWN**

23. Has the owner/operator adequately identified the uppermost aquifer? **THE FOLLOWING REFERS TO THE CINIZA SANDS. FOR INFORMATION ON THE UPPERMOST AQUIFER (SONSELA SANDSTONE) SEE A.T. KEARNY INC., March 1989 CME.**

Y 24. Were formation samples collected initially during drilling?

N 25. Were continuous sample corings taken?

N 26. Were non-continuous sample corings taken?

If YES, at what intervals: **2.5 FEET**

N/A 27. Were cuttings collected and analyzed?

If YES, at what intervals?

Y 28. Were the sample corings logged by a qualified professional in geology?

29. What drilling methods were used for each monitor well? **HOLLOW STEM AUGER**

Y 30. Were drilling methods used that prevented communication between flow zones or aquifers during drilling and construction operations?

31. Specify the diameter of the borehole **6.5"**

Y 32. Have sufficient data been collected to adequately define the geology of the subsurface? **HOWEVER, SOME QUESTION REMAINS AS TO THE CONTINUITY OF THE CINIZA SANDS.**

33. Regional Geology: Formation **CHINLE**

Lithology **CINIZA SAND: SANDSTONE**

SONSELA SANDSTONE: SANDSTONE COMPOSED OF FINE-GRAINED, MODERATELY SORTED QUARTZOSE, SAND AND SILICA AND CARBONATE CEMENT.

	Regional Gradient	**NORTHWEST**
Site Geology:	Formation	**CHINLE**
	Lithology	**SAME AS ABOVE**
(Sonsela)	Local Gradient	**NORTHWEST, 0.01-0.02**
(ciniza sands)		**NORTHWEST, 0.015**

N 34. Has the office evaluation confirmed that geologic cross sections of the site are necessary for an adequate characterization of this site? If yes:

N/A 35. Has the owner/operator supplied cross sections? If yes:

N/A 36. Do the cross sections lead to any significant conclusions? If so, explain:

D. Office evaluation of groundwater monitoring system [2,7]

(These questions should be answered for each different RCRA well design present at the facility. If the system consists of more than one well design, list the well numbers to which each response applies.) **THE FOLLOWING REFERS TO THE SMW-SERIES WELLS AND OW-11. FOR INFORMATION ON THE UPPERMOST AQUIFER MONITORING WELLS (MW-SERIES) REFER TO THE A.T. KEARNY CME, MARCH 1989. THE FOLLOWING RESPONSES CORRESPOND TO: SMW/OW-11, WHERE INDICATED.**

Y/N 1. Did the owner/operator provide as-built construction schematic for each well? **INFORMATION ON WELL OW-11 WAS OBTAINED FROM THE BORING LOG, NO AS-BUILT SCHEMATIC IS AVAILABLE.**

If yes, include a copy of each here. Do the as-built schematics include the following information:

Elevations for:

Y/Y screen

Y/Y casing

Y/N annular seal

Y/Y filterpack

N/N centralizers **NONE SHOWN**

Construction Materials for:

Y/Y screen

Y/Y casing

NA/NA centralizers

Y/Y seals

N/N filterpack

N 2. Has the facility been granted an alternate groundwater monitoring program, a partial or a full groundwater monitoring waiver? If any are "yes", explain:

3. What length screen has the owner/operator employed in the background monitoring well(s)? (Please include well number.) **THE SMW-SERIES DOES NOT HAVE A BACKGROUND WELL. OW-11 HAS BEEN PROPOSED AS A REPLACEMENT WELL FOR THE BACKGROUND MONITORING WELL MW-4.**

4. What length screen has the owner/operator employed in the downgradient monitoring wells? (Please include well numbers) **20': SMW 1-6**

Y 5. Does the owner/operator provide an explanation for the well screen lengths of each monitoring well or cluster?

N 6. Is the screen likely to provide hydraulic communication or cross-communication between separate permeable zones?

Y 7. Is the screen length short enough to prevent excessive dilution of any groundwater contamination and to allow depth discrete groundwater samples to be taken?

Y 8. Is the screen length and location appropriate for the site conditions and constituents of concern?

N 9. If the aquifer is confined, is the screen positioned adjacent to the uppermost ten feet or less of the uppermost aquifer? **THE ENTIRE CONFINED ZONE IS SCREENED**

N/A 10. If the aquifer is unconfined, is the screen positioned adjacent to the upper ten feet or less of the saturated zone and does the screen extend two to five feet above the seasonal high water table?

N/A/N 11. If the well is designed to monitor dense phase immiscibles, is the screen positioned adjacent to the lowermost ten feet or less of the saturated zone and does it extend to the lower confining unit? **THE SAMPLING AND ANALYSIS PLAN STATES THE OW-SERIES WILL BE MONITORED FOR IMMISCIBLE LAYERS. IT DOES NOT SPECIFY DENSE AND/OR LIGHT PHASE.**

12. What are the dimensions of the filter pack in relation to the screen? (e.g., the filter pack extends x feet above the screen, y feet below the screen): **APPROXIMATELY 2' ABOVE AND 3' BELOW/ 8' ABOVE AND GRAVEL PACKED TO BOTTOM OF SCREENED INTERVAL.**

Y/Y 13. Is there at least 1.5 inches between the borehole and casing to adequately emplace a filter pack?

N/A 14. What are the turbidity readings? (Please indicate well number): **NOT APPLICABLE TO SMW-SERIES/OW-11: 36 NTU**

N/A/N 15. Is further action necessary to lower the turbidity levels? (Note: the background well must have equivalent turbidity or lower turbidity than any of the downgradient monitoring wells.)

Y/Y 16. Does the design and construction of the well ensure representative samples of the groundwater?

N/N 17. Does the pH of the water indicate that cement has contaminated the filter pack?

N/Y 18. Is the bentonite annular seal between filter pack and grout at least 2-5 feet thick? If NO, how thick? **LESS THAN 2' IN THE SMW-SERIES**

Y/NA 19. Has the office review confirmed that at least one monitoring well has been installed in the uppermost aquifer hydraulically upgradient from the limit of the waste management area, and that at least three have been installed in the uppermost aquifer immediately downgradient of the area? **THE SMW-SERIES DOES NOT REQUIRE A BACKGROUND WELL/SEE FOX AND ASSOCIATES CME, 1989 FOR INFORMATION ON THE UPPERMOST AQUIFER MW-SERIES.**

Y 20. Are these well locations adequate? If no, explain:

21. Provide an estimated scale map of the waste management area and the well locations. **SEE ATTACHED**

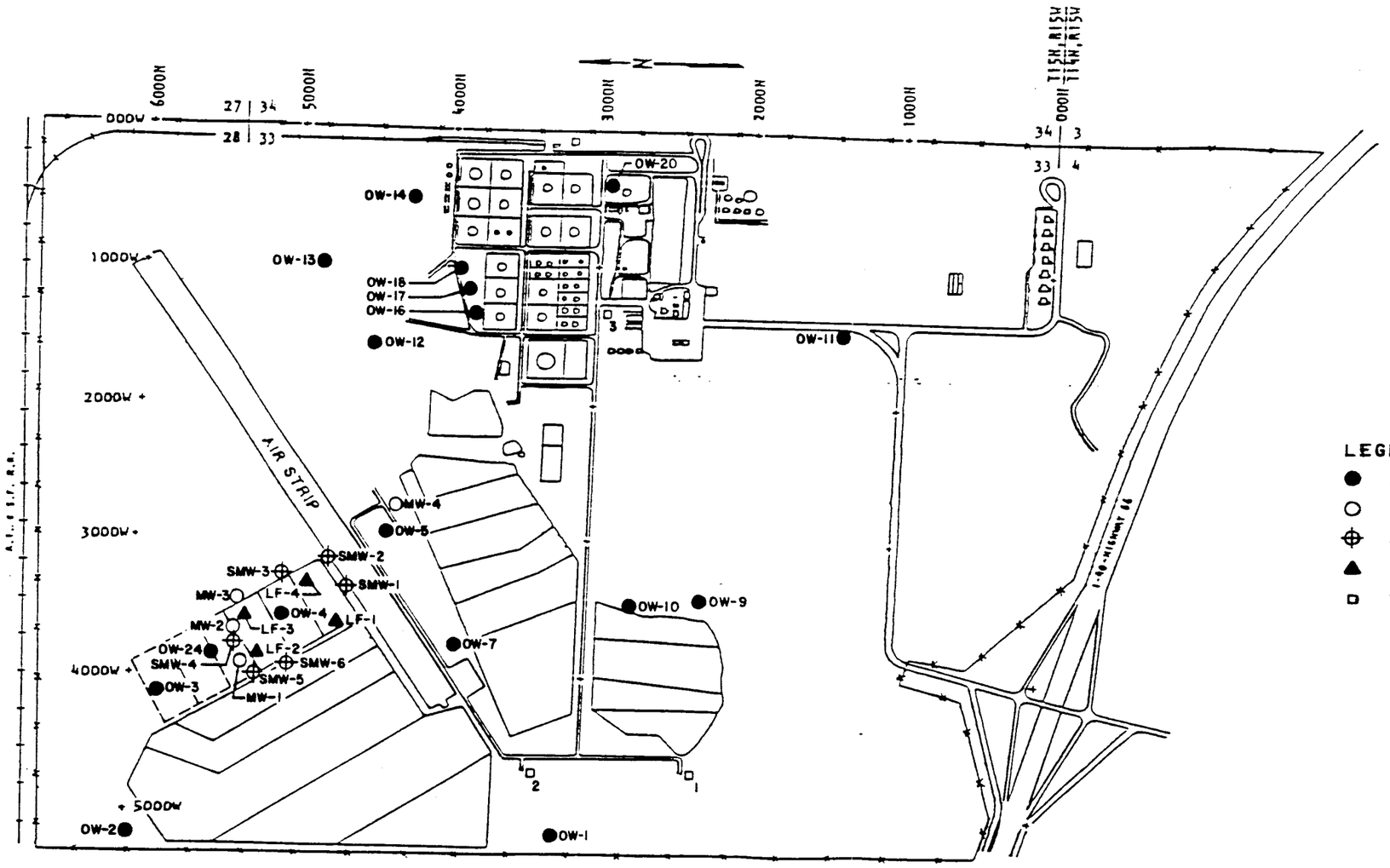
N/A 22. Are groundwater samples from the upgradient (background) well representative of background quality water that is not affected by the facility operations? **THE SMW-SERIES DOES NOT INCLUDE A BACKGROUND WELL. OW-11 IS UPGRADIENT OF THE FACILITY OPERATIONS.**

Y 23. Do well number, locations and depths ensure immediate detection of any hazardous waste constituents or hazardous constituents that could migrate from the waste management area to the uppermost aquifer?

Y 24. Are the groundwater samples from the downgradient wells likely to be representative of the quality of the groundwater passing the point of compliance?

Y 25. Has the office review concluded that the downgradient wells located closely enough to each other to ensure the detection of a plume?

Y 26. Has the office review confirmed that an adequate groundwater monitoring system has been installed?



LEGEND

- ● OW-SERIES WELLS
- ○ MW-SERIES WELLS
- ⊕ SMW-SERIES WELLS
- ▲ LF-SERIES SOIL SAMPLES
- ▫ WATER SUPPLY WELLS

APPROXIMATE SCALE

0 500 1000

FEET

MAP ADAPTED FROM REFINERY SITE MAP, DELTA N ENGINEERING, LTD., 11-16-84. BASE MAP REFERENCE: MASTER PLAN, CINIZA REFINERY, GALLUP, NEW MEXICO, SOUTHWESTERN ENGINEERING COMPANY, 22-02-122-EP, REVISION 8-6-71. EVAPORATION POND BOUNDARIES ARE ESTIMATED.

APPROXIMATE WELL
SOIL SAMPLE LOCA
GIANT CINIZA REFINERY
RCRA FACILITY ASSESS

E. Evaluation of the detection monitoring program[3,6]

THE FOLLOWING RESPONSES REFER TO THE SMW-SERIES WELLS

Were all samples analyzed for:

Y 1. EPA primary interim drinking water standard parameters?

Y 2. Groundwater quality parameters?

Y 3. Contamination indicator parameters?

N 4. Are four replicate measurements of contamination indicator parameters made for each well?

Y 5. Are groundwater surface elevations determined at each well sampling event?

N/A 6. If the facility is performing first year sampling at this time briefly explain why.

Y 7. Was the first year background sampling adequately completed? **FIRST YEAR BACKGROUND SAMPLING WAS NOT DONE.**

During the first year of background sampling, **THE SMW WELLS ARE INCLUDED IN THE RCRA MONITORING SYSTEM AS "PREDETECTION" WELLS. NO BACKGROUND WELL EXISTS FOR THE SMW WELL SYSTEM.**

N/A 8. Did the owner/operator submit the concentrations or values listed above within 15 days after completing each quarterly analysis?

" 9. Did the owner/operator separately identify for each monitoring well any parameters whose concentration or value exceeded the maximum concentration levels listed in Section 265, Appendix III (EPA interim primary drinking water standard parameters).

N/A 10. After the first year (and before the first semi-annual event), did the owner/operator determine the background arithmetic mean and variance by pooling the replicate measurements for the contamination indicator parameters in samples obtained from the upgradient wells during the first year?

11. Specify the dates of the first year quarterly sampling events: **THE SMW-SERIES WAS SAMPLED IN NOVEMBER, 1985 AND FEBRUARY, 1986.**

F. **Semi-Annual Detection Monitoring**[1]

Y 1. Are wells sampled and analyzed annually for groundwater quality parameters? **SEE ATTACHED TABLE**

Y 2. Are wells sampled and analyzed semi-annually for contamination indicator parameters? **SEE ATTACHED TABLE**

N 3. Has the facility substituted other indicator parameters in place of pH, conductivity, TOC and/or TOX?

List the parameters: **N/A**

Date of approval: **N/A**

N 4. Are four replicate measurements of indicator parameters made for each upgradient and downgradient well sample? **SEE OFFICE REVIEW DEFICIENCY**

Y 5. Are groundwater surface elevations determined at each well for each sampling event?

N 6. Were groundwater surface elevations evaluated annually to determine whether monitoring wells are properly placed? **ONLY THE REPORTING OF GROUNDWATER ELEVATIONS IS REQUIRED.**

Y 7. Were statistical comparisons performed for the indicator parameters as soon as possible after the well samples were analyzed? **THE COMPARISONS ARE MADE BETWEEN SPLITS DONE AT THE ANALYTICAL LABORATORY. SEE OFFICE REVIEW DEFICIENCY.**

If yes,

Y 8. Was the Student's t-test at the 0.01 level of significance performed?

N/A 9. If the Student's t-test was not used, what statistical test(s) were the results based on?

Y 10. Are approved statistical tests used?

Y 11. Are the calculations appropriate?

N/A 12. Have statistical increases (or significant pH changes) in contamination indicator parameters been found in the upgradient wells?

13. If yes, explain why this happened:

If significant increases (or pH decreases) in downgradient wells were detected, did the owner/operator:

Table G-2

SEMIANNUAL GROUND WATER MONITORING PARAMETERS

Temperature
#pH
#Conductivity
+Volatile Contaminants
*Water Level
@Lead (total)
@Chromium (total)

Replicate analysis of 4 samples
+ GC/MS purgeable screen may be substituted
@ Predetection monitoring system only
* Replicate analysis of 2 measurements

Table G-3

ANNUAL GROUND WATER MONITORING PARAMETERS

Parameter	MCL*
#pH	
#Conductivity	
@+Volatile Contaminants	
@Water Level	
Arsenic	0.1 mg/l
Barium	1.0 mg/l
Cadmium	0.01 mg/l
Chromium	0.05 mg/l
Lead	0.05 mg/l
Mercury, total	0.002 mg/l
Selenium	0.01 mg/l
Silver	0.05 mg/l
Sodium	
Calcium	
Manganese	
Chloride	
Sulfate	
Carbonate and bicarbonate	
Total dissolved solids	
Phenol	

* Maximum Concentration Limit as promulgated by EPA
# Replicate analyses of 4 samples
+ GC/MS purgeable screen may be substituted
* Replicate analysis of 2 samples

N 14. Resample the "affected well", split the sample into two, and re-analyze for the parameters that showed significant difference? **THE PERMIT PROVIDES THAT APPENDIX IX CONSTITUENTS WILL BE SAMPLED AND ANALYZED SHOULD INDICATOR PARAMETERS SHOW A STATISTICALLY SIGNIFICANT CHANGE. HOWEVER, THE FACILITY CONDUCTS COMPLIANCE SAMPLING WITHOUT RESAMPLING OF THE MW-SERIES AND SMW-SERIES.**

N/A 15. Statistically evaluate split samples and confirm the significant difference?

N/A 16. Within seven days of confirmation, notify the Director that the facility may be affecting the quality of the groundwater? **UPON SAMPLING AND ANALYSIS OF THE SMW-SERIES AND MW-SERIES NO CONTAMINATION WAS EVER DETECTED.**

N 18. Has the facility prepared an assessment plan outline? **THE PERMIT DESCRIBES ACTIONS NECESSARY IF STATISTICALLY SIGNIFICANT CHANGES OF THE INDICATOR PARAMETERS OCCUR. IN PLACE OF AN ASSESSMENT PLAN THE PERMIT REQUIRES THE COMPLIANCE MONITORING PROGRAM BE INITIATED. SEE PERMIT.**

N/A 19. Does the assessment plan outline describe a more comprehensive groundwater monitoring program than that described in Section 265.91 and 265.92, and which is capable of determining:

N/A 20. Whether hazardous waste or hazardous waste constituents (or hazardous constituents if the permit or post-closure permit application has been called) have entered the groundwater?

N/A 21. The rate and extent of migration of hazardous waste, hazardous waste constituents, or hazardous constituents in the groundwater?

N/A 22. The concentrations of hazardous waste, hazardous waste constituents, or hazardous constituents in the groundwater?

N/A 23. Is the assessment plan outline adequate? **THE COMPLIANCE MONITORING PROGRAM IS ADEQUATE.**

F. <u>Office evaluation of the assessment plan</u>

N/A 1. Has the facility been triggered into assessment monitoring? **NOT DUE TO WATER QUALITY INDICATOR PARAMETERS IN THE SMW-SERIES. HOWEVER, DUE TO STATISTICALLY SIGNIFICANT CHANGES IN THE INDICATOR PARAMETERS FOR THE MW-SERIES WELL THE FACILITY HAS HAD TO SAMPLE FOR APPENDIX IX CONSTITUENTS.**

If yes:

2. What are the dates that assessment was initially triggered and subsequently resampled for confirmation?
DUE TO STATISTICALLY SIGNIFICANT CHANGES OF THE INDICATOR PARAMETERS IN THE MW-SERIES FOLLOWING ANALYSIS OF ANNUAL GROUNDWATER SAMPLING ON MARCH, 1989 AND SEMI-ANNUAL GROUNDWATER SAMPLING ON JUNE, 1990 THE ENTIRE MONITORING SYSTEM (SMW-SERIES, MW-SERIES) WAS SAMPLED FOR APPENDIX IX CONSTITUENTS ON OCTOBER 2, 1990 AND JANUARY 29, 1991.

3. What parameters and which wells triggered assessment?
IN PLACE OF RESAMPLING TO DETERMINE STATISTICAL SIGNIFICANCE GRC AGREED TO DO COMPLIANCE SAMPLING ON:
MARCH, 1989: EC FOR ALL THE MW-SERIES, pH FOR MW-1,2 AND MW-5 JUNE, 1990: EC FOR MW-1,2,4,5, pH FOR MW-1 AND LEAD FOR OW-11.

N/A 4. Did the facility develop and submit to NMED an assessment plan within 15 days?

N/A 5. Has the facility prepared an assessment plan?

6. What is the name of the plan and the date?
SEE PERMIT FOR DESCRIPTION OF COMPREHENSIVE MONITORING PROGRAM.

NOTE: QUESTIONS 6 THROUGH 43 ARE N/A

7. Have the assessment monitoring objectives been clearly defined in the assessment plan?

8. Does the plan include evaluation procedures including any applicable groundwater quality information that has been previously gathered?

9. Does the plan provide for a comprehensive program of investigation to fully characterize the horizontal and vertical rate and extent of contaminant migration from the facility?

10. Does the plan call for determining the concentrations of hazardous wastes and hazardous waste constituents in the groundwater?

11. Does the plan employ a quarterly monitoring program?

12. Does the plan include a schedule of implementation?

If yes, does the schedule include:

13. A number of milestones used to judge if sufficient progress is being made toward the completion of the assessment during implementation?

14. A specific milestone at which an initial comprehensive assessment of contamination at the site will be completed?

15. A specific milestone at which a program for continued monitoring will be implemented following plume characterization?

16. Does the schedule represent an acceptable time frame?

17. Does the plan specify the number, location, and depth of wells which will be installed initially?

18. Does the plan include sampling and analytical methods?

19. Does the assessment period consist of a phased investigation so that data gained in initial rounds may help guide subsequent rounds?

20. Do initial rounds incorporate geophysical techniques to approximate the limits of the contaminant plume?

21. Does the AP include the rationale for the placement of the first phase wells and identify the basis that will be used to select subsequent well locations and depths in later assessment phases?

22. Are the essential investigatory techniques to be used in the assessment program based on direct methods?

    If yes:

23. Does the plan provide sufficient descriptions of the direct methods to be used?

24. Are indirect methods (e.g., soil gas study) to be used as well?

    If yes:

25. Does the plan provide sufficient descriptions of the indirect methods to be used?

26. Is the sampling program designed adequately to portray a three dimensional plume configuration?

27. Does the approach employ taking samples during drilling or collecting core samples for further analysis? If yes, at what intervals?

28. Does the proposed list of monitoring parameters include all hazardous constituents (including breakdown products) or hazardous waste constituents associated with the facility's waste stream?

29. Has the owner/operator provided complete waste analysis documentation for the selection of waste-specific target parameters?

30. Does sufficient hydrogeologic data exist in the direction of the contaminant plume?

31. Does the subsurface setting suggest that locally specific transport or attenuation processes might alter the generally anticipated contaminant migration?

32. If yes, have provisions been made to determine the impact of these processes? Please comment.

33. Has NMED approved the plan?

34. Has the owner/operator implemented an approved assessment plan?

    If yes,

35. When did the facility begin to implement the assessment program/plan?

36. If the facility should have implemented the assessment plan, but has not, when was the scheduled date of implementation?

37. Are the assessment wells adequately constructed, located and screened?

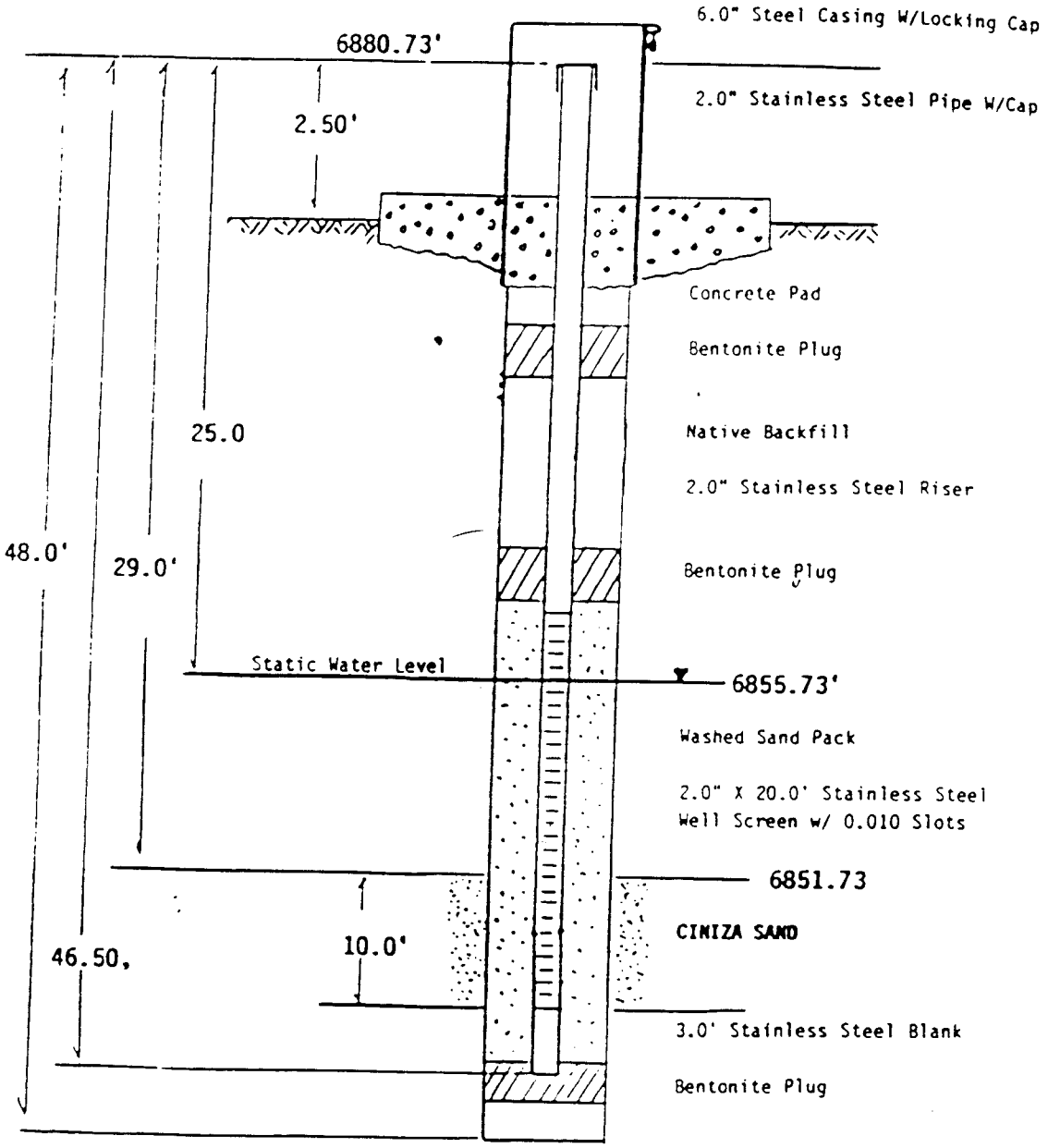
Attach a copy of each as-built assessment well construction log here, and an estimated scale map of well locations.

38. If the plan is in progress, give projected completion date:

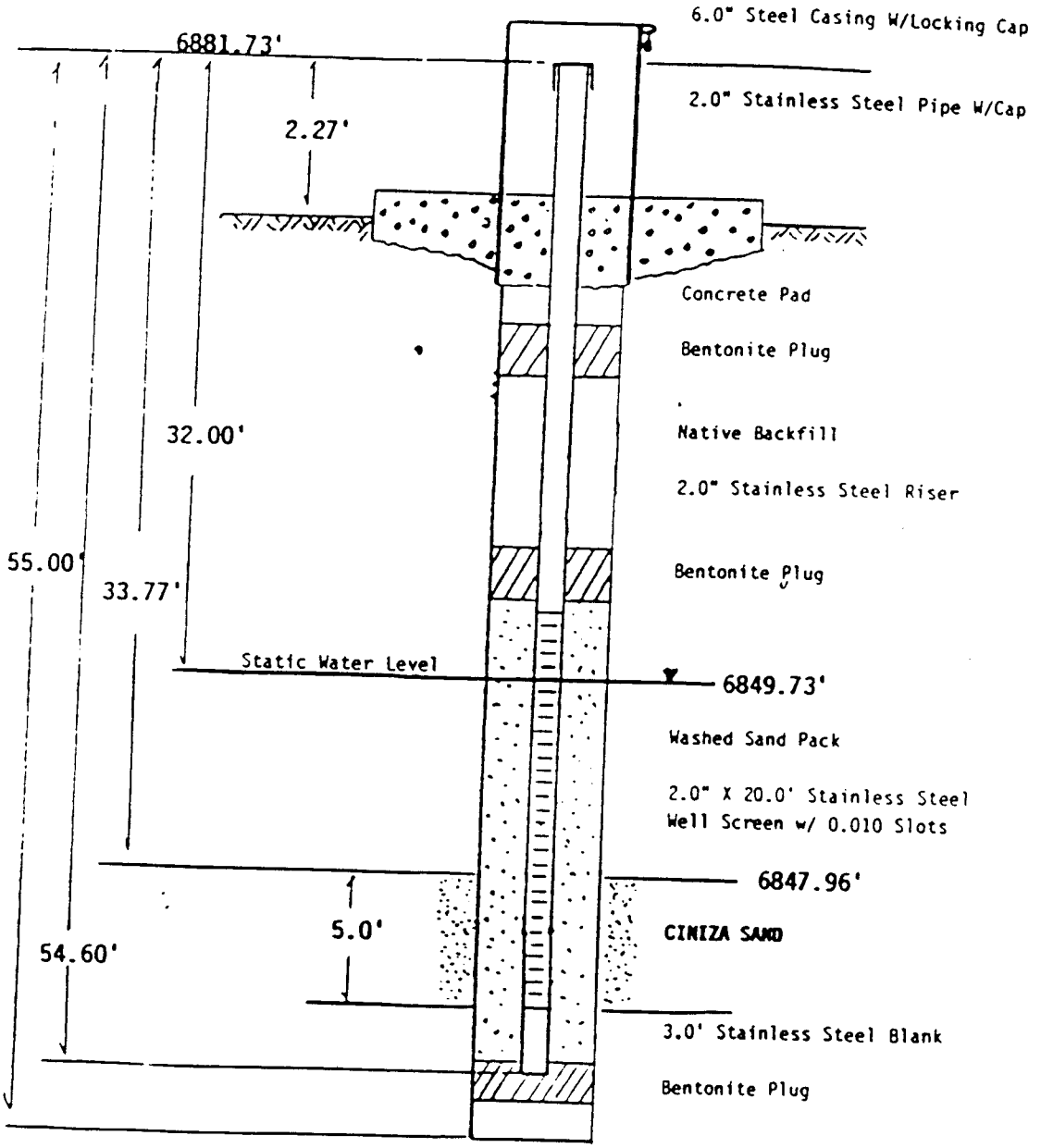
39. Describe actions to date:

40. Is the facility on schedule?

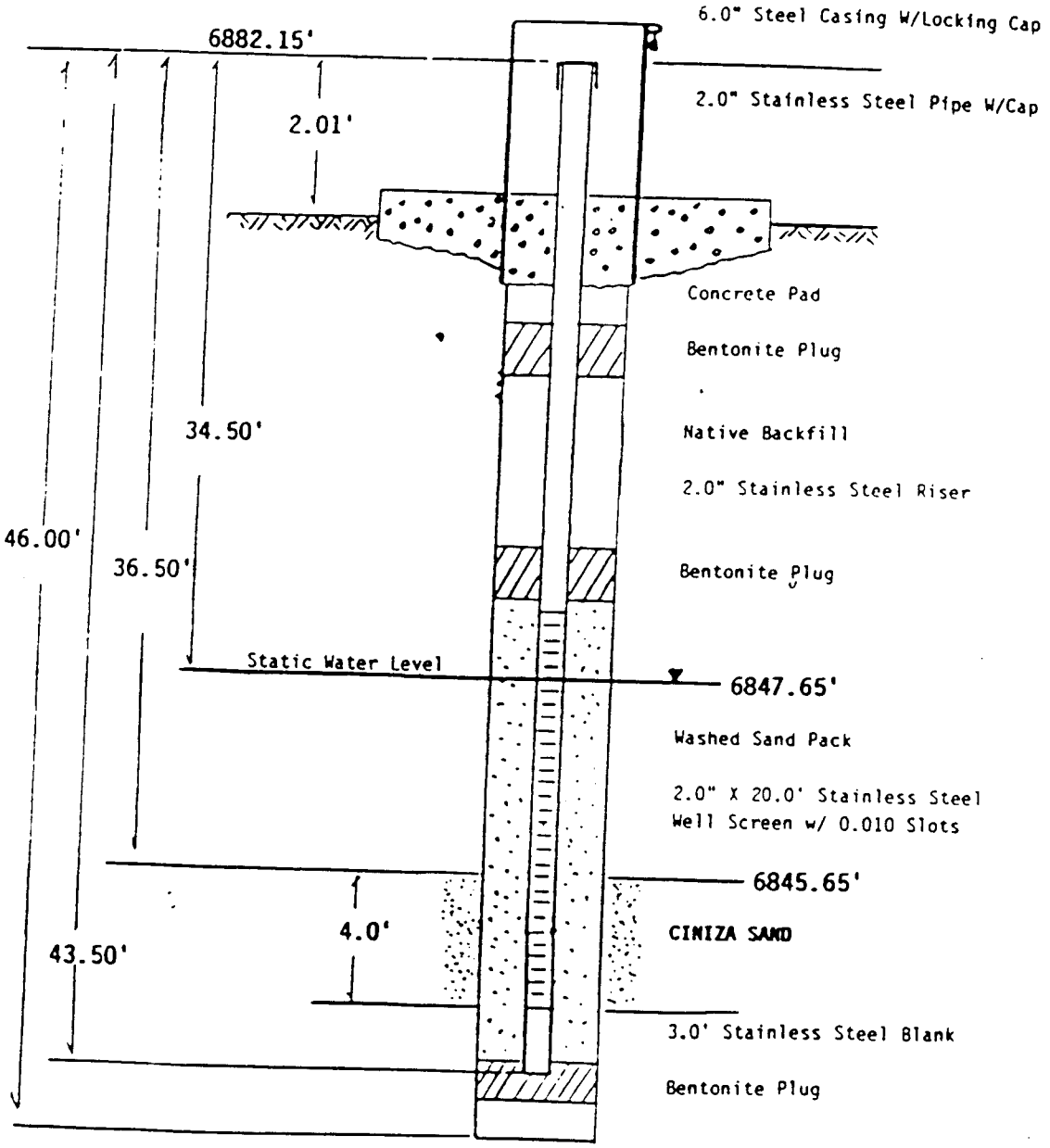
41. If the plan has been completed, give the name and date of the groundwater assessment report:



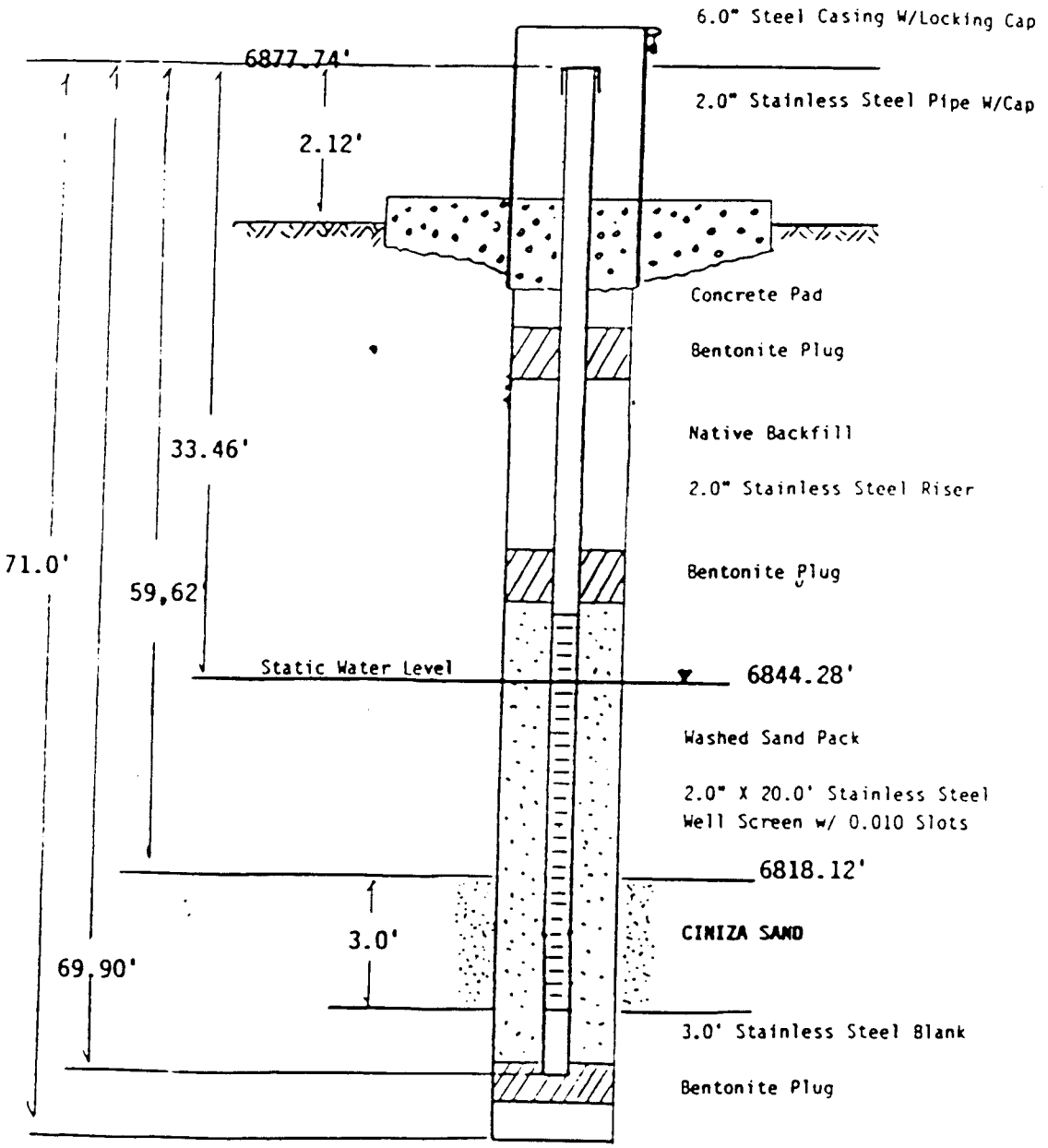
COMPLETION DIAGRAM FOR WELL SMW-1



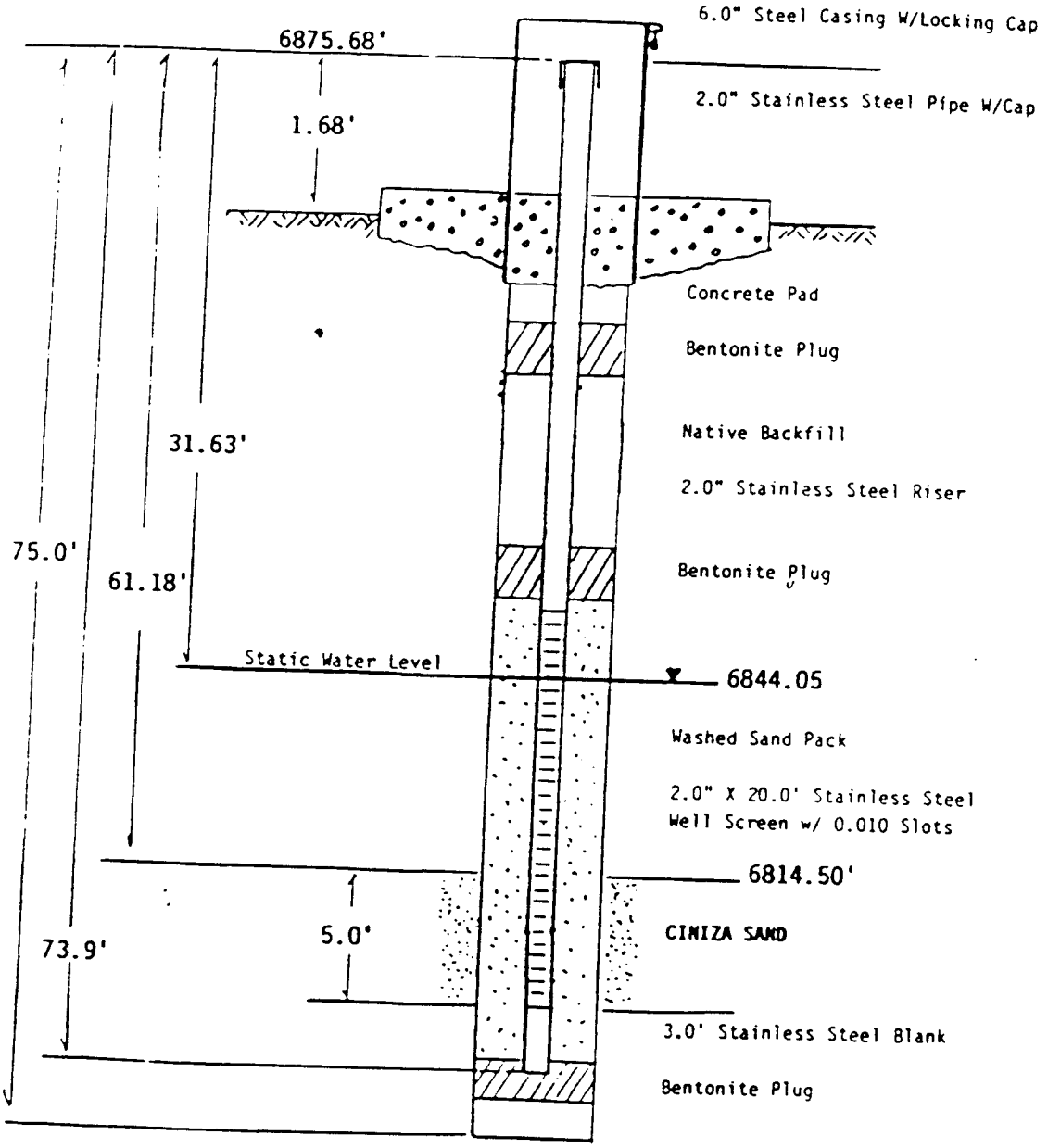
COMPLETION DIAGRAM FOR WELL SMW-2



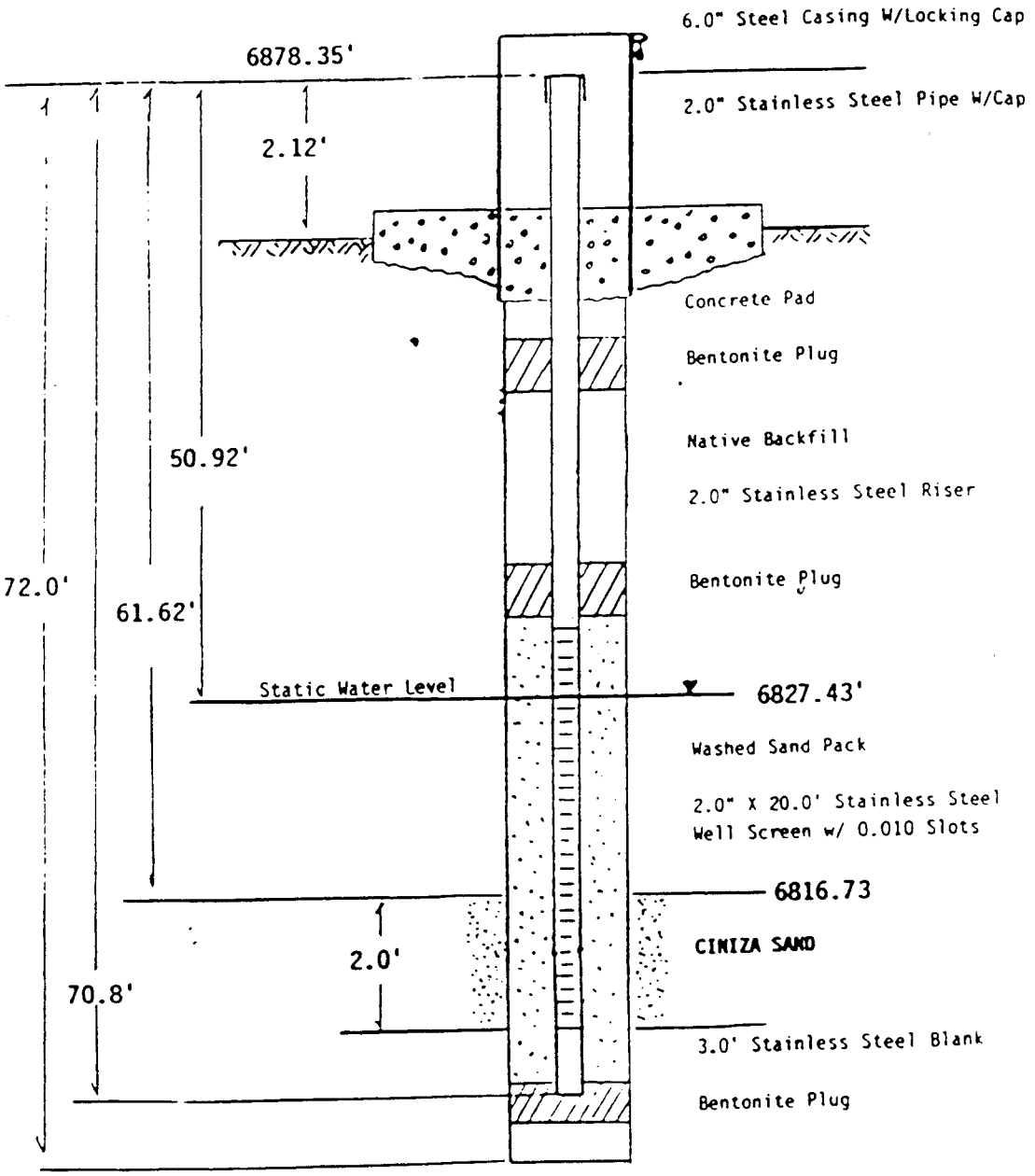
COMPLETION DIAGRAM FOR WELL SMW-3



COMPLETION DIAGRAM FOR WELL SMW-4



COMPLETION DIAGRAM FOR WELL SMW-5



COMPLETION DIAGRAM FOR WELL SMW-6

BORING OW-11

SURFACE ELEVATION: 6923 FEET

DEPTH IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

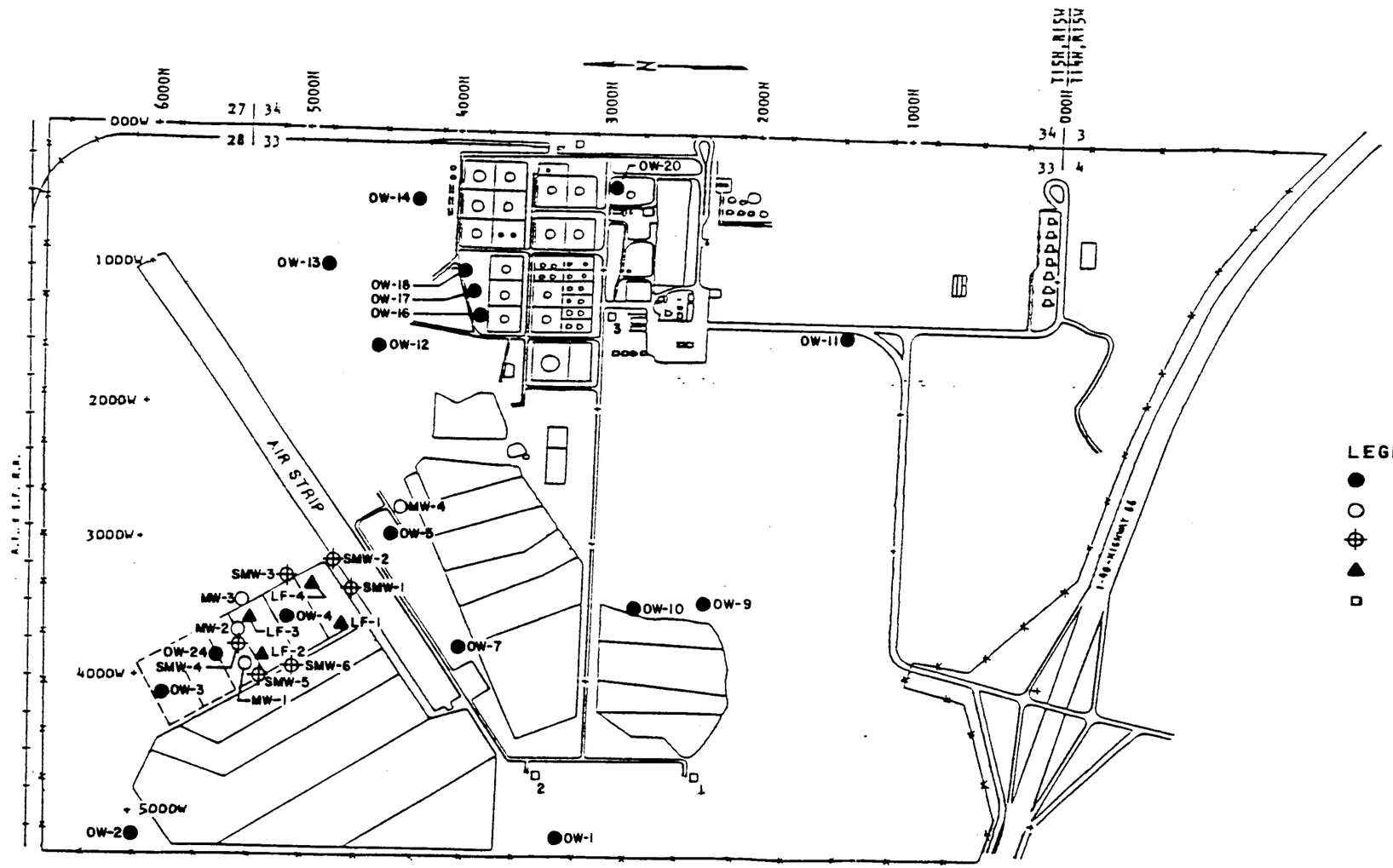
PENETRATION RATE MINUTES/FOOT: 1.6, 1.4, 2.4, 3.0, 6.5, 2.4, 12.5, 4.4, 5.5, 4.0, 3.1, 4.3, 5.0, 8.0, 2.5, 3.3, 4.0, 2.3, 3.6, 2.3, 4.3, 4.5, 2.7, 3.0, 3.5, 4.0, 4.3, 2.5, 3.3, 4.5, 2.7, 4.5, 2.0, 6.5, 5.0, 2.3, 2.3, 2.7, 3.0, 2.2, 2.3, 2.2, 2.7, 3.3, 2.7, 2.2

SYMBOLS	DESCRIPTION
SM	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY FINE SAND, SOFT, HIGHLY WEATHERED GRADES WITH GRAVEL-SIZED FRAGMENTS OF FINE SANDSTONE AND LIMESTONE FROM 7 FEET
SHALE	13 FEET: SHALE, GRAY, SILTY, WITH OCCASIONAL THIN INTERBEDS OF WHITE SANDSTONE, SOFT, FRESH GRADES WITH REDDISH BROWN SANDSTONE INTERBEDS FROM 20 FEET GRADES WITH LAYER OF WHITE, FINE-GRAINED SANDSTONE FROM 23 TO 24 FEET
SS	30 FEET: SANDSTONE, WHITE, FINE-GRAINED, WITH GRAVEL-SIZED FRAGMENTS OF CHERT, OCCASIONAL THIN INTERBEDS OF REDDISH BROWN FINE-GRAINED SANDSTONE, THINLY BEDDED, HARD, FRESH
SHALE	40 FEET: SHALE, GRAY TO PURPLE, SILTY AND SANDY, SOFT, FRESH GRADES WITH SOME SAND FROM 47 FEET GRADES GRAY AND HARD FROM 50 TO 55 FEET GRADES WHITE TO LIGHT GRAY FROM 55 FEET, SOFT GRADES PURPLE FROM 68 FEET GRADES GRAY FROM 78 FEET GRADES WITH OCCASIONAL THIN INTERBEDS OF LIMESTONE AND GRAVEL-SIZED FRAGMENTS OF CHERT FROM 92 FEET GRADES REDDISH BROWN FROM 103 FEET GRADES GRAY AND HARD FROM 110 FEET GRADES SOFT WITH NO INTERBEDS FROM 114 FEET GRADES PURPLISH GRAY FROM 117 FEET GRADES GRAY FROM 140 FEET

BORING COMPLETED AT 150.0 FEET ON 12/30/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 43.0 TO 65.0 FEET.
GRAVEL PLACED FROM 35.0 TO 65.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 20.2 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE



LEGEND

- ● OW-SERIES WELLS
- ○ MW-SERIES WELLS
- ⊕ SMW-SERIES WELLS
- ▲ LF-SERIES SOIL SAMPLES
- ▫ WATER SUPPLY WELLS

APPROXIMATE SCALE

0 500 1000

FEET

MAP ADAPTED FROM REFINERY SITE MAP, DELTA H ENGINEERING, LTD., 11-16-84. BASE MAP REFERENCE: MASTER PLAN, CINIZA REFINERY, GALLUP, NEW MEXICO, SOUTHWESTERN ENGINEERING COMPANY, ZZ-02-122-EP, REVISION 8-6-71. EVAPORATION POND BOUNDARIES ARE ESTIMATED.

APPROXIMATE WE
SOIL SAMPLE LOCA
GIANT CINIZA REFINER
RCRA FACILITY ASSES

42. Has the facility sampled and analyzed for all the hazardous waste constituents or hazardous constituents?

43. Do the results indicate that hazardous constituents or hazardous waste constituents have been detected in the groundwater?

44. List the hazardous constituents or hazardous waste constituents detected in the groundwater to date: **UPON SAMPLING FOR APPENDIX IX CONSTITUENTS NO CONTAMINATION WAS DETECTED IN EITHER THE SMW-SERIES OR MW-SERIES WELLS.**

N/A 45. Has the Sampling and Analysis Plan been revised to include any newly identified constituents?

N/A 46. If constituents have not been detected, was detection monitoring reinstated?

N/A 47. If constituents have been detected, was an assessment monitoring program continued?

N/A 48. If assessment has been completed, and persistent levels of hazardous constituents confirmed, has the facility quarterly, since completion of the assessment, continued to:

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N/A 51. Annually, no later than March 1, has the owner/operator reported the results of the assessment program (with the annual groundwater report)? **ALTHOUGH NO FORMAL ASSESSMENT PLAN EXISTS THE SAMPLING ANALYSIS REPORTS FROM DETECTION MONITORING ANALYSIS ARE SUBMITTED TO NMED FOR REVIEW.**

N/A 52. Did the annual report include the calculated (or measured) rate of migration of the hazardous constituents in the ground water during the reporting period?

N/A 53. Has the owner/operator implemented the assessment plan satisfactorily?

N 54. Has the owner/operator adequately characterized site hydrogeology to determine contaminant migration?

G. Sample Analysis - QA/QC [4]

Y 1. Is the validity and reliability of the laboratory and field generated data ensured by a laboratory QA/QC program? If yes, does the QA/QC program include:

Y a. Documentation of any deviation from approved procedures?

b. Documentation and analytical results verifying that the lab QA/QC procedures include:

Y 1) The requirement that the presence of all constituents identified above the MDL will be reported?

(The Method Detection Limit is defined as the estimated concentration at which the signal generated by a known constituent is three standard deviations above the signal generated by a blank, and represents the 99% confidence level that the constituent does exist in the sample.)

Y 2) Checking the "tune" of the GC/MS every 12 hours for volatile organic constituents using the recovery percent of 4-bromofluorobenzene (BFB).

Y 3) Checking the "tune" of the GC/MS every 12 hours for semi-volatile organic constituents using the recovery percent of decafluoro-triphenylphosphine (DFTPP)?

2. For every 20 samples perform and report:

Y 1) Duplicate spike?

Y 2) Reagent blank?

Y 3) Surrogate spike and spike recovery?

N 4) Requirements that the spike recovery fall within plus or minus 20% of the true value? **THE LABORATORY DOES NOT GUARANTEE THE 20% SPIKE RECOVERY FROM THE MATRIX SPIKE BUT DOES GUARANTEE +/- 20% RECOVERY FROM THE LABORATORY REAGENT BLANK. DOCUMENTATION FOR ANY SPIKE RECOVERY OUTSIDE THIS INTERVAL WILL BE PROVIDED UPON REQUEST.**

Y 5) One check sample at or near the Practical Quantitation Limit for a subset of the parameters?

Y 3. Is the QA/AC program adequate?

N 4. Are the results "blank corrected?"

Y 5. Are all samples analyzed using an EPA-approved method?

Y 6. Are detection limits provided for each parameter? If yes,

Y 7. Are the detection limits generally in line with those listed in Appendix IX to §264?

Y 8. Are samples analyzed within specified holding times?

Y 9. If a sample for volatile analysis is received with headspace, is this noted?

Y 10. Is the date of sample receipt, extraction and analysis noted for each method result report?

Y 11. Is the name and signature of the lab manager noted for each method result report?

[1] Giant Refining Company, Part B Permit Application, December 1, 1984

[2] Documentation Supporting Adequacy of Ground Water Monitoring System and Certification at Giant's Ciniza Refinery Gallup, New Mexico, Geoscience Consultants, Ltd., September 26, 1986

[3] Giant Refining Company, Ciniza Facility, RCRA Permit NMD 000333211-2, November 4, 1988

[4] Giant Refining Company, March 1991 Comprehensive Groundwater Monitoring Evaluation Water Quality Analytical Results, Analytical Technologies, Inc.

[5] Soil Moisture Investigation and Lysimeter-Tensiometer Installation At Giant Refining Company Land Treatment Unit, K.W. Brown and Associates, Inc., Sept. 1989

[6] EPA/RCRA Facility Assessment Report, Giant Ciniza Refinery, August 25, 1987

[7] Ground-Water Investigation, Ciniza Refinery, Near Gallup, New Mexico For Shell Oil Company, Dames-Moore, 1981

[8] Comprehensive Ground-Water Monitoring Evaluation, Final Report, A.T. KEARNY INC. March 1989

Looking west of facility towards the evaporation ponds. OW-11 is located in the upper-left of photo. MW-4 is located immediately above the blue pickup in the middle-right of photo.

Looking to the northwest with the evaporation ponds in the background and the land treatment unit (LTU) in the foreground, adjacent to the evaporation ponds.

Well sampling- note personnel fill sample bottles from bailer-filled glass beaker.

Purging OW-11 with submersible pump.

Purging MW-1 with submersible pump.

Sample collection with stainless steel bailer.

Inspecting for light phase immiscible layer at OW-11. The sample is visually inspected while in the white bucket.

Decontaminant rinse of stainless steel bailer between well samples.

Decontamination of submersible pump hose between well samples.

3/1/91 00001 ~~10000~~ ~~00000~~ ~~00010~~

GRC - CME

Steve Alexander

Field Notes

1 Mar 90

VOA bottle contains air bubble in Trip blank for VOA's ~~MW~~ SA SM 2-6 and ~~MW~~ SA MW4. 1 Mar 90

3/4 Mar 4, 91

John Knoll - Eng

Claud Rosendale

Lynn Shelton

- Arrived @ facility 10:50
- Began purge of SW-1 @ 11:20 — Only purged (1) well casing?!
  - depth to water — TOID to do (3)
  - no volatiles with Gas spec. water reddish

- Purged SMW-2
  TOC 6981.7 BOC 6827.1 24.4 ft
  purged 12.5 gal need to purge 75 gal
- Purged SMW-3 3.5 gal ⟹ dry 32.11 ft ⟹ water
  TOC 6982.2 ⟹ 6859.7 BOC

- SMW 4
  TOC 6977.7 BOC 6807.8
  Bailed 15 gal to dryness.

NOTE: All wells were measured for water surface depth only once with lighted reel.

s: /100 Mesh CO Sand

0.010 in slotted screen casing

Well	DTW	HNV	pH	SC	°C
SMW 1	22.78				
" 2	30.18				
" 3	32.11				
" 4	30.37				
" 5	30.62				
SMW 6	30.60				
OW 11	18.70				
MW 4	6.03				
MW 1	5.07				

3/4/91

SMW5

TOC 6875.7 BOC 6804.8

Purged 13gal ⇒ dry

Clear water

SMW6

TOC 6878.4 BOC 6807.6

purged 12.25gal ⇒ dry

Clear water

3/5/91

00003

Calibration

~~SMW~~ 1

	COND.	pH	Temp(°C)
Tested	341 µmhos		11.25°C
stand. SOLUTION	999 µmhos		
stand. GRE Solution	1000 µmhos		10°C
tested	350 µmhos		

weather: windy, overcast, 40's, no precip. until last sample.

NOTE: GRE does not pour water directly from bailer into VOA bottles

• SMW1

Eh	pH	Temp(°C)
2290	7.25	11.25°C

NOTE: VOA trip blank contains bubble

• SMW2

Eh	pH	Temp(°C)	Time
5300	7.39	11.25	

3/5/91

00001

• SMW 3

Eh	pH	Temp (°C)	Time
2280	~~7.80~~ 7.70	9.5	10:49
	7.70		10:39
	7.70		10:44
	7.70		10:46
	7.79		10:49
	7.80		
	7		
	6.99		10:53 ⇒ pH stand. 7.0
	9.95		10:55 ⇒ pH stand 10.0

NOTE: Well did not recover fully, only to 7' of depth.

• SMW4

Eh	pH	Temp (°C)
850	8.58	10
	6.90	pH stand. 7.0
	9.94	pH stand. 10.0

NOTE: Trip blank has bubble in VOA

NOTE: Well did not fully recover, only 3 gal. in well.

• SMW 5

Eh	pH	Temp (°C)
800	8.57	10°C

• SMW 6

Eh	pH	Temp (°C)
900	8.14	13.5

3/6/91

00005

Purging of MW4 began @ 8:30

TOC	BOC	DTW
6879.8'	6760.4'	6.03 ≅ 119. ft H_2O

Purge of well (OW11)

- observed no immiscible layer in hand held bucket containing pumped well water.

TOC	BOC	DTW	
6923.00	6857.27	15.70	HNV ⇒ nothing

NOTE: Duplicates for OW11 are marked "MW4"

NOTE: Purged H_2O is clear & pumped into adjacent lagoon #3. Volume calculated by timed pump (7 gal/min) for total of 18½ min.

3/6/91

00003

• OW11

Eh	pH	Temp(°C)	Time
1000	8.22	10	10:25
	8.09		10:08
	8.11		"
	8.12		"
	8.16		10:19
	8.18		10:20
	8.20		10:22
	8.22		10:24
	8.22		10:26

pH meter Standardization

	7.	10.0
Stand	7.00	10.0
Test	7.01	10.00

@ 10:16

NOTE: Sampled pH of metals sampled pH = 1.97

MW4 (Duplicate of OW11)

NOTE: Trip blank has bubble

• MW1 ~~#~~ (5A)

Eh	pH	Temp(°C)	Time
750	9.00	11	

NOTE: pH is from second sample. Meter was recalibrated following 1st reading

6.99 pH stand. 7.00
10.00 pH stand. 10.00

3/7/91

00007

NOTE: See page 10 for details of exit interview

00001 Bruce Swanton
Field Book

WELL	DTW	HNU ppm	SC	°F
SMW1	22.78	Ø		
SMW2	30.18	Ø		
SMW3	32.11	Ø		
SMW4	30.87	Ø		
SMW5	30.62	Ø		
SMW6	30.60	Ø		
OW11	18.70	Ø		
MW4	6.03	Ø		
MW1	5.07	Ø		

3/4/91 00001

GIANT Refining Co CMS

Arrived ~11:00 - clear, sunny ~55°F
Claude Rosendale
JOHN SHECTON
Sampling SMW 1
First Claude tested well
Bore w/ HNU, no reading

SMW-1 - 2" well 6880.7 → 6834.2
~~12~~ 12
Water is turbid - has the reddish
Bailed ~5 gal, add 3.77
They only bailed 1 casing - 1 take them to bail two more casings
Purge water → ~~surface impoundment~~
Water continues to be turbid
Well casing is not notched, casing head is very uneven. + Landform

SMW2 6881.7 - 6827.1 24.4 ft
bails ~15 gal purge
got 12.5 gal → almost dry

3/4

SMW3 - 3.5 gal → dry
still ft → water
TOC 6882.2 → 6838.7 BOC

SMW4 TOC 6877.7 → 6807.8 BOC
all wells = measure depth to water only once, pump once: lower electric line until light-on, pinch tape at casing 'top' where light-on occurs, measure w/ tape measure from nearest 5' foot mark to pinched tape
bailed 15 gal → dry
water is clear here

SMW5 TOC 6875.7 → 6821.8
bailed 13 gal → dry
clear water

SMW6 6878.4 → 6817.6
clear water
1-.25 gal → dry

00030

3/5

[illegible]-1

COND.	PH	Temp.
2290	~~6.87~~ 7.25	11.25°C

00034

Conductivity = Temp 11.25 C

Reading 341 umh

Solution = 998 umho

GRC standard 1000 µmho

Temp. 10 C

350 umhos

PH of sample started @ 6.87 and slowly drifted upward until the drift almost ceased @ ~15-20 min at this point the drift was less than 1 unit/3 min.

Weather: Windy, Overcast, 40's & no precip. until last sample well!

NOTE: GRE does not use chain-of-custody form for shipment/analysis. Found not to be the case during exit int 3/7/91

NOTE: GRE personnel take VOA samples from bailer, not directly from bailer!

NOTE. VOA trip blnk contained bubble. also SMW4 TRIP BLANK has bubble

3/5

00035

SMW-2

COND	pH	Temp(C)
5,300	7.39	11.25

START	TIME
7.43	9:51 AM
7.40	9:52
"	9:53
7.39	9:53
7.39	9:56
7.40	9:58

SMW-3 SA

COND	pH	Temp °C
2280	7.80	9.5

Well did not recover fully, only to 7' of H2O in well

7.70	10:39 AM	
7.77	10:41	Δ approx. .01 unit pH every 3 min.
7.78	10:45	
7.79	10:46	
7.80	10:49	
6.89	1053	pH buffer 7.0
9.95	10:55	pH buffer 10.0

00030 3/5/91

Recheckout on pH Meter 11:07

150 was 7.00
slope was 101.5
changed to 100
Sample was 5.62
changed to 7.00

Recal'd w/ 7.00 & 10.00
buffers

SMW-4

3/5/91 00030

SMW 4

COND	pH	Temp(C)
~~580~~ 850	8.38	10

6.90	pH 7.0 buffer @	10.1 C
9.94	pH 10.0 buffer @	10.4C

Note again trip blank has bubble.

Note only 3 gals approx in this well. Did not recover overnight. Additional indication that this crew does not regularly purge the wells to 3 casing vols or to dryness.

9/5/91

00037

SMW5

COND	pH	Temp (°C)
800	8.57	10

	Time
8.57	12:37

SMW6

COND	pH	Temp.
900	8.14	13.5

~~Prior to recalib pH buffer 7.0 → 7.03~~

Prior to Recalibration

Buffer	
7.00	10.06
7.03	10.06

DID NOT RECALIBRATE

00033 3/6/91

Purging OW-11 [illegible] to immiscible layer

TOC 0923.00 → BOC 0857.27

DTW 15.70 [illegible]

Note that samples marked MW-4 are duplicates of OW-11.

All immiscible layer water retrieved w/ the bailer was clear. So far no immiscible layer has been observed in any of the wells.

Once mechanical pumping was begun, water was turbid less so after some minutes. Final observation concludes fairly evenly turbid thru out process except the bailed immiscibility sample.

TOTAL pumped = 3 55 gal barrels

3/6/91 00034

Purging MW-4 8:30 am

~~TOC 0877.7 → BOC 0~~

TOC 0879.8 → BOC 0760.4

DTW 6.03

= ~119.7 water

Purged water is clear and is conveyed to Lagoon #3 by a hose.

Well is 5" O.D.

Purge volume calculated by time pumped: ~7 gal/min

Started at 8:37 am

ran 15½ minutes

Purging Well MW-1

6876.2 → 6746.5.
DTW 5.07
5" casing - will purge 175 gal. Pump total depth = 120 so pump is 10 off the bottom.

Q: Is this enough purging? Should they test ind. param stability to see if this is enough.

pump @ 15 min @ ~7 gal/m

3/4/91

OW11
Metals sample
pH 1.97

pH meter standard.

stand.	7.01	10.00

@ 10:16 AM

Sample

NOTE: Bubble in Trip Blank

S.C.	pH	temp °C	Time
1000	8.22	10	10:25
	8.09		10:18
	8.11		"
	8.12		"
	8.16		10:19
	8.18		10:20
	8.20		10:22
	8.22		10:24
	8.22		10:26

MW-1
Trip blank had bubble.
Approximate MW-1 is dup of OW-11

Beth Profit 602 438-1530

TONY DAVIS 823-3625

check for: ATTACHMENTS for
Disch. P. GW-32
Volume 1 ATTACH A-B4
2/14/86

3/6/91

00040

MW1

Sa.	pH	Temp C	Time
750	7.00*	11	

* This was result from 3rd sample. Meter had just been recalibrated. Tested 7 & 10 buffers again:

10 buffer: 10.00

7 buffer: 6.99

The recorded pH was 8.51

The same 7 & 10 buffers again:

7 buffer: 7.10

10 buffer

Office Visit

Change question 2D on hydro

MW wells may not be surged to bigness as the pump will not reach bottom of well.

Their permit does not, according to David, require them to run TOX or TOC, but they have been doing so. Which parameters have the possibility of triggering compliance monitoring w/i the permit?

This sampling event is first time ~~AFI will~~ their contract lab will have done the 4 replicates on pH & conductivity.

EID originally did not like MW4 as a background well since it does not appear to be upgradient of GRC's coke industrial facility.

They hope to (David hopes) get approval for drilling a new background. They may want to use OW11, and ~~as~~ the new background well together.

Warned them about nylon rope & plasticizers. Said if plasticizer appears in samples they will have to prove ~~it~~ that they do not come from the aquifer

Told them about lax cleaning of electric tape and pump equipment.

Told them about sampling of VOC's - not to use transfer beaker

Speed of bailer drop

GRC will document EC procedures.

Question of field vs lab determination for pH & EC.

00042

SAFETY PLAN CHECKLIST
(Sampling Inspections)

SITE NAME: Giant Refining Company-Ciniza Facility

EPA ID #: NMD000333211

LEAD INSPECTOR: Steve Alexander

SCHEDULED DATE: March 4-7, 1991

INSPECTION ACTIVITIES: A Comprehensive Monitoring Evaluation (CME) was conducted to observe sampling procedures of GRC personnel, collect samples and determine the potentiometric surface for Shallow Monitoring Wells SMW-1, 2, 3, 4, 5, 6 and Observation Well OW-11. The data collection for OW-11 was conducted to determine the adequacy of OW-11 for use as a new background well for the uppermost aquifer water quality monitoring system (MW-series). Also, collect samples and determine the potentiometric surface for Monitoring Well MW-1.

HAZARDOUS SUBSTANCES (known or suspected, contaminated media or in storage container, etc.)

See Attachment A

HAZARDS ANTICIPATED:

Toxic Vapors: Yes___ No X

If yes, list: 1. 2.

Oxygen Depletion: Yes___ No X

Buries Utilities: Yes___ No X

If yes, specify N/A

Explosivity: Yes___ No X

Radioactivity: Yes___ No X

LEVEL OF PROTECTION RECOMMENDED (have available) Level D

PERSONNEL SAFETY EQUIPMENT: Latex gloves, hard hat, and safety goggles. SITE MONITORING PROCEDURES (equipment to be used): N/A

HNU ___ OVA ___ Oxygen Meter ___

Radiation Monitoring ___ Explosive Meter ___Other ____

DECONTAMINATION/DISPOSAL PROCEDURES:

Disposable personnel protective equipment will be disposed of on-site. Non-disposable equipment will be decontaminated on-site by the contractor or EID staff. Reusable sample equipment will be decontaminated on-site by the contractor or EID staff. All decontamination/disposal procedures will be in accordance with the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (October 1985) by NIOSH, OSHA, USCG, and EPA.

EMERGENCY PROCEDURES

In the event of overt personnel exposure (e.g., skin contact, inhalation, ingestion):

Skin or eyes exposed to contaminants will be immediately flushed and washed with a minimum of one gallon of water. Contaminant ingestion will require immediate medical attention.

In the event of personnel injury:

Personnel would be evacuated to medical facility listed below.

EMERGENCY CONTACTS

MEDICAL:	Rehobeth General Hospital
Location:	1901 Redrock Drive Gallup, NM
Hospital Phone #:	863-6832
EMT Phone #:	722-7746
FIRE:	Gallup City Fire Department
Phone #:	722-4195
POLICE:	New Mexico State Police
Phone #:	863-9353
POISON CONTROL CENTER:	Rehobeth General Hospital
Location:	1901 Redrock Drive Gallup, NM
Phone #:	863-6832

FACILITY CONTACT: Claud Rosendale
(505) 722-0217

STATE CONTACT: Edward Horst
(505) 827-2929

42. Has the facility sampled and analyzed for all the hazardous waste constituents or hazardous constituents?

43. Do the results indicate that hazardous constituents or hazardous waste constituents have been detected in the groundwater?

44. List the hazardous constituents or hazardous waste constituents detected in the groundwater to date: **UPON SAMPLING FOR APPENDIX IX CONSTITUENTS NO CONTAMINATION WAS DETECTED IN EITHER THE SMW-SERIES OR MW-SERIES WELLS.**

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[1] Giant Refining Company, Part B Permit Application, December 1, 1984

[2] Documentation Supporting Adequacy of Ground Water Monitoring System and Certification at Giant's Ciniza Refinery Gallup, New Mexico, Geoscience Consultants, Ltd., September 26, 1986

[3] Giant Refining Company, Ciniza Facility, RCRA Permit NMD 000333211-2, November 4, 1988

[4] Giant Refining Company, March 1991 Comprehensive Groundwater Monitoring Evaluation Water Quality Analytical Results, Analytical Technologies, Inc.

[5] Soil Moisture Investigation and Lysimeter-Tensiometer Installation At Giant Refining Company Land Treatment Unit, K.W. Brown and Associates, Inc., Sept. 1989

[6] EPA/RCRA Facility Assessment Report, Giant Ciniza Refinery, August 25, 1987

[7] Ground-Water Investigation, Ciniza Refinery, Near Gallup, New Mexico For Shell Oil Company, Dames-Moore, 1981

[8] Comprehensive Ground-Water Monitoring Evaluation, Final Report, A.T. KEARNY INC. March 1989

SAFETY PLAN CHECKLIST
(Sampling Inspections)

SITE NAME: Giant Refining Company-Ciniza Facility

EPA ID #: NMD000333211

LEAD INSPECTOR: Steve Alexander

SCHEDULED DATE: March 4-7, 1991

INSPECTION ACTIVITIES: A Comprehensive Monitoring Evaluation (CME) was conducted to observe sampling procedures of GRC personnel, collect samples and determine the potentiometric surface for Shallow Monitoring Wells SMW-1, 2, 3, 4, 5, 6 and Observation Well OW-11. The data collection for OW-11 was conducted to determine the adequacy of OW-11 for use as a new background well for the uppermost aquifer water quality monitoring system (MW-series). Also, collect samples and determine the potentiometric surface for Monitoring Well MW-1.

HAZARDOUS SUBSTANCES (known or suspected, contaminated media or in storage container, etc.)

See Attachment A

HAZARDS ANTICIPATED:

Toxic Vapors: Yes___ No X

If yes, list: 1. 2.

Oxygen Depletion: Yes___ No X

Buries Utilities: Yes___ No X

If yes, specify N/A

Explosivity: Yes___ No X

Radioactivity: Yes___ No X

LEVEL OF PROTECTION RECOMMENDED (have available) Level D

PERSONNEL SAFETY EQUIPMENT: Latex gloves, hard hat, and safety goggles. SITE MONITORING PROCEDURES (equipment to be used): N/A

HNU ___ OVA ___ Oxygen Meter ___

Radiation Monitoring ___ Explosive Meter ___Other ____

DECONTAMINATION/DISPOSAL PROCEDURES:

Disposable personnel protective equipment will be disposed of on-site. Non-disposable equipment will be decontaminated on-site by the contractor or EID staff. Reusable sample equipment will be decontaminated on-site by the contractor or EID staff. All decontamination/disposal procedures will be in accordance with the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (October 1985) by NIOSH, OSHA, USCG, and EPA.

EMERGENCY PROCEDURES

In the event of overt personnel exposure (e.g., skin contact, inhalation, ingestion):

Skin or eyes exposed to contaminants will be immediately flushed and washed with a minimum of one gallon of water. Contaminant ingestion will require immediate medical attention.

In the event of personnel injury:

Personnel would be evacuated to medical facility listed below.

EMERGENCY CONTACTS

MEDICAL:	Rehobeth General Hospital
Location:	1901 Redrock Drive Gallup, NM
Hospital Phone #:	863-6832
EMT Phone #:	722-7746
FIRE:	Gallup City Fire Department
Phone #:	722-4195
POLICE:	New Mexico State Police
Phone #:	863-9353
POISON CONTROL CENTER:	Rehobeth General Hospital
Location:	1901 Redrock Drive Gallup, NM
Phone #:	863-6832

FACILITY CONTACT: Claud Rosendale
(505) 722-0217

STATE CONTACT: Edward Horst
(505) 827-2929

AnalyticalTechnologies,Inc.
San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins
PH# (602) 438-1530 FAX (602) 431-9259

☐ Pickup by client on _____
☒ Ship Federal Express on 2/27/91
☒ Overnight Priority ☐ Bill to Client
Fed. Ex. Acct.# _____
☐ Economy (2nd business day)
☐ Courier to Client on _____
☐ UPS to Client

SAMPLE KIT

CLIENT NAME: New Mexico EID
~~HAZARDOUS AND RADIOACTIVE WASTE BUREAU~~
ADDRESS: 1190 St. Francis Dr.
Santa Fe, NM 87503
REQUESTED BY: Bruce Swanton
PQ# _____

PHONE NUMBER: 505-827-2898
CONTACT: _____
DATE REQUIRED: 2/28/91
DATE: 2/27/91
PROJ. MANAGER: _____

PARAMETER	HOLDING TIME	# SAMPLES	BOTTLE DESCRIPTION	PRESERVATIVE
App IX 8270	7 days ext	4	2 x 1000 ml Amber	None
App IX 8240	14 days	11	2 x 40 ml VOA	HCL
App IX 8150	7 days ext	4	2 x 1000 ml Amber	None
App IX Metals	28 days	4	1 - 1000 ml P	HNO_3
Total Cyanide	14 days	4	1 - 1000 ml P	NaOH
Total Sulfide	7 days	4	1 - 250 ml P	Zn Ac, NaOH
Turbidity	48 hrs	4	1 - 250 ml P	None
Travel Blank - 1	per cooler		40 ml VOA	HCL
Note: Separate into 4 Sample sets				

☐ BLUE ICE
☒ CHAIN OF CUSTODY
☒ SEALS
☐ PEN
☐ GLOVES
☒ LABELS
☒ COOLER# 1 per sample kit
#402, 404: 1 small for
512, 513 7 sets of VOAs
211
☒ OTHER FedX Return labels - Filled out with our FedX Acct #. + BAGGIES

■ **PRIOR AUTHORIZATION FROM ATI IS REQUIRED FOR RUSH PROJECTS.**
■ **PLEASE DO NOT REMOVE ANY PLASTIC TAGGING FROM COOLERS.**

These containers were prepared for you by Sample Control of ATI. ***PLEASE BE AWARE THAT SOME CONTAINERS MAY HAVE BEEN PRESERVED FOR SAMPLE INTEGRITY.***

1. Do not rinse container.
2. Fill container to the top; but do not overfill.
3. Please arrange to have container returned to the lab with Chain-of-Custody as soon as possible, please keep cold.
4. Label the container with your site ID, time and date.
5. Fill in Chain-of-Custody.

If you have any questions, need assistance or a change of containers, please call ATI Sample Control.

Received by _____ Date _____

TED

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3/6/91 PAGE 1 OF 1

PROJECT MANAGER: BRUCE SWANTON

COMPANY: EID HAZ. RADIOACTIVE WASTE BUREAU
ADDRESS: 1190 ST. FRANCIS DR RM N2300
SANTA FE, NM 87503

BILL TO: ANALYTICAL TECHNOLOGIES INC
COMPANY: 2113 S. 48TH STREET, SUITE 107
ADDRESS: TEMPE, AZ 85282 602-438-1530

SAMPLERS: (Signature) (505) 827-2929 PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)		(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE		Pesticides/PCB (608/8080)	Herbicides (615/8150)			Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	TURBIDITY		SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TOTAL CYANIDE	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP	TOTAL SULFIDE		NUMBER OF CONTAINERS
OW-11	3/6	4:30p	water	1											2			2	2	1					1	1				1		10
Trip blank	3/6	4:30p	water	2																												1

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NO.:	TOTAL NO. OF CONTAINERS	11
PROJECT NAME: GRC	CHAIN OF CUSTODY SEALS	Y
P.O. NO.:	INTACT?	Y
VIA:	RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	LAB NUMBER 103600	

SAMPLE DISPOSAL INSTRUCTIONS
☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments: 11 TOTAL containers including Trip blank

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 4:30p	Signature: Time:	Signature: Time:
Printed Name: SWANTON Date 3/6/91	Printed Name: Date	Printed Name: Date
Company: EID/HAZ WASTE	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time: 1650	Signature: Time:	Signature: Time: 1145
Printed Name: HORACIO GONZALES Date: 3/6	Printed Name: Date:	Printed Name: MARGUERITE Date:
Company: FEC	Company:	Analytical Technologies, Inc. 3/6/91

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE _____ PAGE ___ OF ___

PROJECT MANAGER: BRUCE SWANTON

COMPANY: EID HAZ. RADIOACTIVE WASTE BUREAU
ADDRESS: 1190 ST. FRANCIS DR RM N2300
SANTA FE, NM 87503

BILL TO: ANALYTICAL TECHNOLOGIES INC
COMPANY: 2113 S. 48TH STREET, SUITE 107
ADDRESS: TEMPE, AZ 85282 602-438-1530

SAMPLERS: (Signature)
(505) 827-2929
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	TURBIDITY	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	CYANIDE TOTAL	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP	SULFIDE TOTAL	NUMBER OF CONTAINERS
SM4 aka SW4*	3/5	11:35a	water	1									N		N	N	1				1	1				1	10
one SM4 Trip blank	3/5	11:30a	"	2																							1

*SAME SAMPLE - REPORT AS "SMW-4"

PROJECT INFORMATION	
PROJECT NO.:	
PROJECT NAME: GRC/CMC	
P.O. NO.:	
VIA:	
TAT: ☒ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	11
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	103570

SAMPLE DISPOSAL INSTRUCTIONS
☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments: 11 containers including the trip blank

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 4:13	Signature: Time:	Signature: Time:
Printed Name: Date BRUCE SWANTON 3/5	Printed Name: Date	Printed Name: Date
Company: EID / HAZ WASTE	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time: 1615	Signature: Time:	Signature: Linda Eshelman Time: 10:20
Printed Name: Date: 3/5 Horacio Garza	Printed Name: Date:	Printed Name: Date: Linda Eshelman 3/6/91
Company: FED EXP.	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC.• Pink - ORIGINATOR

Analytical**Technologies,**Inc.
Phoenix, Arizona

Chain of Custody

DATE _____ PAGE ___ OF ___

PROJECT MANAGER: BRUCE SWANTON

COMPANY: EID HAZ. RADIOACTIVE WASTE BUREAU
ADDRESS: 1190 ST. FRANCIS DR RM N2300
SANTA FE, NM 87503

BILL TO: ANALYTICAL TECHNOLOGIES INC
COMPANY: 2113 S. 48TH STREET, SUITE 107
ADDRESS: TEMPE, AZ 85282 602-438-1530

SAMPLERS: (Signature)

(505) 827-2929
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP	NUMBER OF CONTAINERS
SMW-1	3/5	11:00AM	WATER	1											2								2
SMW-2	3/5	"	"	2											2								2
SMW-3	3/5	"	"	3											2								2
SMW-5	3/5	"	"	4											2								2
SMW-6	3/5	"	"	5											2								2
SMW-6 Trip blank	3/5	"	"	6																			1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.:		TOTAL NO. OF CONTAINERS	11
PROJECT NAME: GRC/CME		CHAIN OF CUSTODY SEALS	Y
P.O. NO.:		INTACT?	Y
VIA:		RECEIVED GOOD COND./COLD	Y
TAT: ☒ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER	103568

SAMPLE DISPOSAL INSTRUCTIONS

☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments: 11 samples total

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 4:13pm	Signature: Time:	Signature: Time:
Printed Name: Date 3/5 BRUCE SWANTON	Printed Name: Date	Printed Name: Date
Company: E.I.D./HazWaste	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time: 1617	Signature: Time:	Signature: Time: 9:55
Printed Name: Date: 3/5 Horacio Gonzales	Printed Name: Date:	Printed Name: Date: Linda Eshelman 3/6/91
Company: FED EXP	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC.• Pink - ORIGINATOR

AnalyticalTechnologies,Inc.
Phoenix, Arizona

Chain of Custody

DATE _____ PAGE ___ OF ___

PROJECT MANAGER: BRUCE SWANTON

COMPANY: EID HAZ. RADIOACTIVE WASTE BUREAU
ADDRESS: 1190 ST. FRANCIS DR RM N2300
SANTA FE, NM 87503

BILL TO: ANALYTICAL TECHNOLOGIES INC
COMPANY: 2113 S. 48TH STREET, SUITE 107
ADDRESS: TEMPE, AZ 85282 602-438-1530

SAMPLERS: (Signature)
(505) 827-2929
PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Trihalo	SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)	TPH/CA 418.1	The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP	TPH Silica Gel	NUMBER OF CONTAINERS
MW-4	3/6/91	4:30	Water	1									✓		✓	✓					✓	✓			✓	⊗
MW-1	3/6/91		Water	2											✓											2
Trip Blank	2/27/91		Water	3																						1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NO.:		TOTAL NO. OF CONTAINERS	13
PROJECT NAME: GRC		CHAIN OF CUSTODY SEALS	Y
P.O. NO.:		INTACT?	Y
VIA:		RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☐ 2 WKS		LAB NUMBER 103608	

SAMPLE DISPOSAL INSTRUCTIONS
☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments: 13 containers including Trip Blank

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 4:30P	Signature: Time:	Signature: Time:
Printed Name: SWANTON Date 3/6/91	Printed Name: Date	Printed Name: Date
Company: EID/HAZ WASTE	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time: 1648	Signature: Time:	Signature: Linda Eskelman Time: 1:25
Printed Name: Horacio Gonzalez Date: 3/6	Printed Name: Date:	Printed Name: Linda Eskelman Date: 3/7/91
Company: FEC	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC.• Pink - ORIGINATOR

LABORATORY ANALYSIS FOR

MW-4 (DUPLICATE OF OW-11),

MW-1 AND TRIP BLANK

MW4 (DUP of OW-11)
MW 1
Trip Blank

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

ATI I.D. 103608

April 17, 1991

APR 1991
RECEIVED
HAZARDOUS WASTE
PROGRAM

New Mexico Env. Imp. Div.
1190 St. Francis Drive
Room N2300
Santa Fe, NM 87503

Project Name/Number: GRC

Attention: Bruce Swanton

On **03/07/91**, Analytical Technologies, Inc. received a request to analyze **water** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

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

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:clf
Enclosure

Analytical Technologies, Inc.

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION DATE RECEIVED : 03/07/91
PROJECT # : (NONE)
PROJECT NAME : GRC REPORT DATE : 04/15/91
ATI I.D. : 103608

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-4	WATER	03/06/91
02	MW-1	WATER	03/06/91
03	TRIP BLANK	WATER	02/27/91

----- TOTALS -----

MATRIX	# SAMPLES
WATER	3

ATI STANDARD DISPOSAL PRACTICE

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

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103608

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC

DATE RECEIVED : 03/07/91
REPORT DATE : 04/15/91

PARAMETER	UNITS	01
CYANIDE, TOTAL	MG/L	<0.01
SULFIDE, TOTAL	MG/L	<1
TURBIDITY	NTU	30

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC ATI I.D. : 103608

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CYANIDE, TOTAL	MG/L	10360801	<0.01	<0.01	NA	0.27	0.25	108
SULFIDE, TOTAL	MG/L	10399901	<1	<1	NA	8.9	8.5	94
TURBIDITY	NTU	10360204	0.86	0.86	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. : 103608

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC

DATE RECEIVED : 03/07/91
REPORT DATE : 04/15/91

PARAMETER	UNITS	01
SILVER	MG/L	<0.010
ARSENIC	MG/L	<0.005
BARIUM	MG/L	0.047
BERYLLIUM	MG/L	<0.005
CADMIUM	MG/L	<0.005
COBALT	MG/L	<0.010
CHROMIUM	MG/L	<0.010
COPPER	MG/L	0.011
MERCURY	MG/L	<0.0002
NICKEL	MG/L	<0.020
LEAD	MG/L	0.003
ANTIMONY	MG/L	<0.05
SELENIUM	MG/L	0.035
TIN	MG/L	<0.03
THALLIUM	MG/L	<0.005
VANADIUM	MG/L	0.014
ZINC	MG/L	0.025

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC ATI I.D. : 103608

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	10360801	<0.010	<0.010	NA	0.106	0.100	106
ARSENIC	MG/L	10361801	0.008	0.008	0	0.055	0.050	94
BARIUM	MG/L	10360801	0.047	0.043	9	0.146	0.100	99
BERYLLIUM	MG/L	10360801	<0.005	<0.005	NA	0.105	0.100	105
CADMIUM	MG/L	10360801	<0.005	<0.005	NA	0.102	0.100	102
COBALT	MG/L	10360801	<0.010	<0.010	NA	0.111	0.100	111
CHROMIUM	MG/L	10360801	<0.010	<0.010	NA	0.102	0.100	102
COPPER	MG/L	10360801	0.011	0.010	10	0.110	0.100	99
MERCURY	MG/L	10362001	<0.0002	<0.0002	NA	0.0050	0.0050	100
NICKEL	MG/L	10360801	<0.020	<0.020	NA	0.096	0.100	96
LEAD	MG/L	10360701	0.008	0.007	13	0.048	0.050	80
ANTIMONY	MG/L	10360801	<0.05	<0.05	NA	1.00	1.00	100
SELENIUM	MG/L	10366007	<0.005	<0.005	NA	0.036	0.050	72
TIN	MG/L	10360801	<0.03	<0.03	NA	0.99	1.00	99
THALLIUM	MG/L	10361901	<0.005	<0.005	NA	0.045	0.050	90
VANADIUM	MG/L	10360801	0.014	0.017	19	0.116	0.100	102
ZINC	MG/L	10360801	0.025	0.026	4	0.134	0.100	109

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

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

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 10360801

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/11/91
CLIENT I.D.	: MW-4	DATE ANALYZED	: 03/18/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
2,4,5-TRICHLOROPHENOXYACETIC ACID	<0.2
2,4-DICHLOROPHENOXYACETIC ACID	<0.4
2-SEC-BUTYL-4,6-DINITROPHENOL	<1.0
SILVEX (2,4,5-TP)	<0.2

SURROGATE PERCENT RECOVERIES

DICAMBA (%)	125

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	ATI I.D.	: 103608
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/11/91
PROJECT NAME	: GRC	DATE ANALYZED	: 03/18/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
2,4,5-TRICHLOROPHENOXYACETIC ACID	<0.4
2,4-DICHLOROPHENOXYACETIC ACID	<0.2
2-SEC-BUTYL-4,6-DINITROPHENOL	<0.2
SILVEX (2,4,5-TP)	<1.0

SURROGATE PERCENT RECOVERIES

DICAMBA (%)	101

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103608

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC
REF I.D. : 10360001

DATE ANALYZED : 03/18/91
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
2,4-D	<0.4	16.8	16.1	96	15.9	95	1.3
SILVEX	<0.2	3.33	4.28	129	4.35	131	1.6

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360801

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-4	DATE ANALYZED	: 03/15/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360801

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	86
BFB (%)	92
TOLUENE-D8 (%)	91

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10360801

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360802

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1	DATE ANALYZED	: 03/15/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360802

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

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

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10360802

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360803

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 02/27/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 03/15/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360803

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	84
BFB (%)	96
TOLUENE-D8 (%)	91

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10360803

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240)

		ATI I.D.	: 103608
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/15/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/15/91
PROJECT NAME	: GRC	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103608

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	85
TOLUENE-D8 (%)	96

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103608

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC
REF I.D. : 10399901

DATE ANALYZED : 03/15/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	50	100	51	102	2
TRICHLOROETHENE	<1	50	41	82	46	92	12
CHLOROBENZENE	<1	50	46	92	50	100	8
TOLUENE	<1	50	45	90	50	100	11
BENZENE	<1	50	45	90	49	98	9

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360801

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: MW-4	DATE ANALYZED	: 03/30/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ACETOPHENONE	<10
2-ACETYLAMINOFLUORENE	<10
a,a-DIMETHYLPHENETHYLAMINE	<10
4-AMINOBIPHENYL	<10
ARAMITE	<50
CHLOROBENZILATE	<10
DIALLATE	<10
2,6-DICHLOROPHENOL	<10
DIMETHOATE	<10
p-(DIMETHYLAMINO)AZOBENZENE	<10
7,12-DIMETHYLBENZO(a)ANTHRACENE	<10
3,3'-DIMETHYLBENZIDINE	<10
m-DINITROBENZENE	<10
DIPHENYLAMINE	<10
ETHYL METHANESULFONATE	<10
HEXACHLOROPHENE	<10
HEXACHLOROPROPENE	<10
ISOSAFROLE	<10
METHAPYRILENE	<10
3-METHYLCHOLANTHRENE	<10
METHYL METHANESULFONATE	<10
3-METHYLPHENOL (m-CRESOL)	<10
1,4-NAPHTHOQUINONE	<10
1-NAPHTHYLAMINE	<10
2-NAPHTHYLAMINE	<10
5-NITRO-O-TOLUIDINE	<10
4-NITROQUINOLINE-1-OXIDE	<10
N-NITROSODIETHYLAMINE	<10
N-NITROSODI-BUTYLAMINE	<10
N-NITROSOMETHYLETHYLAMINE	<200
N-NITROSOMORPHOLINE	<10
N-NITROSOPIPERIDINE	<10
N-NITROSOPYRROLIDINE	<10
PENTACHLOROBENZENE	<10
PENTACHLORONITROBENZENE	<10
PENTACHLOROETHANE	<10
PHENACETIN	<10
p-PHENYLENEDIAMINE	<10
2-PICOLINE	<10
PRONAMIDE	<10
SAFROLE	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360801

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
1,2,4,5-TETRACHLOROBENZENE	<10
2,3,4,6-TETRACHLOROPHENOL	<10
o-TOLUIDINE	<10
1,3,5-TRINITROBENZENE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360801

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: MW-4	DATE ANALYZED	: 03/30/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANINLINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360801

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<100
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	80
2-FLUOROBIPHENYL (%)	80
TERPHENYL (%)	52
PHENOL-D6 (%)	56
2-FLUOROPHENOL (%)	61
2,4,6-TRIBROMOPHENOL (%)	62

Analytical Technologies, Inc.

GC/MS - RESULTS

ATI I.D. : 10360801

TEST : ORGANOCHLORINE PESTICIDES & PCB'S (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIV.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: MW-4	DATE ANALYZED	: 03/30/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ALDRIN	<10
ALPHA BHC	<10
BETA BHC	<50
GAMMA BHC (LINDANE)	<10
DELTA BHC	<30
CHLORDANE	<10
4,4'-DDD	<10
4,4'-DDE	<10
4,4'-DDT	<10
DIELDRIN	<10
ENDOSULFAN I	<10
ENDOSULFAN II	<10
ENDOSULFAN SULFATE	<10
ENDRIN	<10
ENDRIN ALDEHYDE	<10
HEPTACHLOR	<10
HEPTACHLOR EPOXIDE	<10
METHOXYCHLOR	<10
TOXAPHENE	<10
AROCLOR 1016	<100
AROCLOR 1221	<100
AROCLOR 1232	<100
AROCLOR 1242	<100
AROCLOR 1248	<100
AROCLOR 1254	<100
AROCLOR 1260	<100
ISODRIN	<10
KEPONE	<10

Analytical Technologies, Inc.

GC/MS - RESULTS

ATI I.D. : 10360801

TEST : ORGANOPHOSPHORUS PESTICIDES (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIV.	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: MW-4	DATE ANALYZED	: 03/30/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DIETHYL PYRAZINYL PHOSPHOROTHIOATE	<10
DISULFOTON	<10
FAMPHUR	<10
METHYL PARATHION	<10
PARATHION	<10
PHORATE	<10
TETRAETHYLDITHIOPYROPHOSPATE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	ATI I.D.	: 103608
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/03/91
PROJECT NAME	: GRC	DATE ANALYZED	: 03/29/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
ACETOPHENONE	<10
2-ACETYLAMINOFLUORENE	<10
a,a-DIMETHYLPHENETHYLAMINE	<10
4-AMINOBIPHENYL	<10
ARAMITE	<50
CHLOROBENZILATE	<10
DIALLATE	<10
2,6-DICHLOROPHENOL	<10
DIMETHOATE	<10
p-(DIMETHYLAMINO)AZOBENZENE	<10
7,12-DIMETHYLBENZO(a)ANTHRACENE	<10
3,3'-DIMETHYLBENZIDINE	<10
m-DINITROBENZENE	<10
DIPHENYLAMINE	<10
ETHYL METHANESULFONATE	<10
HEXACHLOROPHENE	<10
HEXACHLOROPROPENE	<10
ISOSAFROLE	<10
METHAPYRILENE	<10
3-METHYLCHOLANTHRENE	<10
METHYL METHANESULFONATE	<10
3-METHYLPHENOL (m-CRESOL)	<10
1,4-NAPHTHOQUINONE	<10
1-NAPHTHYLAMINE	<10
2-NAPHTHYLAMINE	<10
5-NITRO-O-TOLUIDINE	<10
4-NITROQUINOLINE-1-OXIDE	<10
N-NITROSODIETHYLAMINE	<10
N-NITROSODI-BUTYLAMINE	<10
N-NITROSOMETHYLETHYLAMINE	<200
N-NITROSOMORPHOLINE	<10
N-NITROSOPIPERIDINE	<10
N-NITROSOPYRROLIDINE	<10
PENTACHLOROBENZENE	<10
PENTACHLORONITROBENZENE	<10
PENTACHLOROETHANE	<10
PHENACETIN	<10
p-PHENYLENEDIAMINE	<10
2-PICOLINE	<10
PRONAMIDE	<10
SAFROLE	<10
1,2,4,5-TETRACHLOROBENZENE	<10
2,3,4,6-TETRACHLOROPHENOL	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

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ATI I.D. : 103608

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
o-TOLUIDINE	<10
1,3,5-TRINITROBENZENE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

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TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

		ATI I.D.	: 103608
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/03/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/29/91
PROJECT NAME	: GRC	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANINLINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

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ATI I.D. : 103608

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<100
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	91
2-FLUOROBIPHENYL (%)	85
TERPHENYL (%)	109
PHENOL-D6 (%)	62
2-FLUOROPHENOL (%)	78
2,4,6-TRIBROMOPHENOL (%)	80

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103608

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC
REF I.D. : 10499906

DATE ANALYZED : 03/30/91
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,2,4-TRICHLOROBENZENE	<10	100	98	98	121	121	23
ACENAPHTHENE	<10	100	53	53	62	62	16
2,4-DINITROTOLUENE	<10	100	48	48	63	63	27
PYRENE	<10	100	54	54	58	58	7
N-NITROSO-DI-N-PROPYL AMINE	<10	100	59	59	54	54	9
1,4-DICHLOROBENZENE	<10	100	52	52	62	62	18
PENTACHLOROPHENOL	<50	200	89	44	130	65	37
PHENOL	<10	200	63	31	55	28	14
2-CHLOROPHENOL	<10	200	64	32	87	44	30
4-CHLORO-3-METHYLPHENOL	<10	200	75	37	89	45	17
4-NITROPHENOL	<50	200	71	36	104	52	38

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

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

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

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TEST : CHLORINATED HERBICIDES (EPA 8150)

		ATI I.D.	: 103600
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/11/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/18/91
PROJECT NAME	: GRC	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
2,4,5-TRICHLOROPHENOXYACETIC ACID	<0.4
2,4-DICHLOROPHENOXYACETIC ACID	<0.2
2-SEC-BUTYL-4,6-DINITROPHENOL	<0.2
SILVEX (2,4,5-TP)	<1.0

SURROGATE PERCENT RECOVERIES

DICAMBA (%)	101

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103600

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC
REF I.D. : 10360001

DATE ANALYZED : 03/18/91
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
2,4-D	<0.4	16.8	16.1	96	15.9	95	1.3
SILVEX	<0.2	3.33	4.28	129	4.35	131	1.6

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360001

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-11	DATE ANALYZED	: 03/12/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	9
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360001

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	82
BFB (%)	89
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10360001

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360002

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 03/12/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360002

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	85
BFB (%)	85
TOLUENE-D8 (%)	102

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10360002

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

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TEST : VOLATILE ORGANICS (EPA 8240)

		ATI I.D.	: 103600
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/12/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/12/91
PROJECT NAME	: GRC	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5

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GCMS - RESULTS

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ATI I.D. : 103600

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	80
BFB (%)	96
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103600

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC
REF I.D. : 10399923

DATE ANALYZED : 03/12/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	44	88	44	88	0
TRICHLOROETHENE	<1	50	44	88	53	106	19
CHLOROBENZENE	<1	50	45	90	47	94	4
TOLUENE	<1	50	45	90	47	94	4
BENZENE	<1	50	42	84	50	100	17

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: OW-11	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ACETOPHENONE	<10
2-ACETYLAMINOFLUORENE	<10
a,a-DIMETHYLPHENETHYLAMINE	<10
4-AMINOBIPHENYL	<10
ARAMITE	<50
CHLOROBENZILATE	<10
DIALLATE	<10
2,6-DICHLOROPHENOL	<10
DIMETHOATE	<10
p-(DIMETHYLAMINO)AZOBENZENE	<10
7,12-DIMETHYLBENZO(a)ANTHRACENE	<10
3,3'-DIMETHYLBENZIDINE	<10
m-DINITROBENZENE	<10
DIPHENYLAMINE	<10
ETHYL METHANESULFONATE	<10
HEXACHLOROPHENE	<10
HEXACHLOROPROPENE	<10
ISOSAFROLE	<10
METHAPYRILENE	<10
3-METHYLCHOLANTHRENE	<10
METHYL METHANESULFONATE	<10
3-METHYLPHENOL (m-CRESOL)	<10
1,4-NAPHTHOQUINONE	<10
1-NAPHTHYLAMINE	<10
2-NAPHTHYLAMINE	<10
5-NITRO-O-TOLUIDINE	<10
4-NITROQUINOLINE-1-OXIDE	<10
N-NITROSODIETHYLAMINE	<10
N-NITROSODI-BUTYLAMINE	<10
N-NITROSOMETHYLETHYLAMINE	<200
N-NITROSOMORPHOLINE	<10
N-NITROSOPIPERIDINE	<10
N-NITROSOPYRROLIDINE	<10
PENTACHLOROBENZENE	<10
PENTACHLORONITROBENZENE	<10
PENTACHLOROETHANE	<10
PHENACETIN	<10
p-PHENYLENEDIAMINE	<10
2-PICOLINE	<10
PRONAMIDE	<10
SAFROLE	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
1,2,4,5-TETRACHLOROBENZENE	<10
2,3,4,6-TETRACHLOROPHENOL	<10
o-TOLUIDINE	<10
1,3,5-TRINITROBENZENE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: OW-11	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANINLINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10360001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<100
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	90
2-FLUOROBIPHENYL (%)	80
TERPHENYL (%)	63
PHENOL-D6 (%)	76
2-FLUOROPHENOL (%)	83
2,4,6-TRIBROMOPHENOL (%)	72

Analytical Technologies, Inc.

GC/MS - RESULTS

ATI I.D. : 10360001

TEST : ORGANOCHLORINE PESTICIDES & PCB'S (EPA 8270)

CLIENT	: NEW MEXICO ENV. DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: OW-11	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ALDRIN	<10
ALPHA BHC	<10
BETA BHC	<50
GAMMA BHC (LINDANE)	<10
DELTA BHC	<30
CHLORDANE	<10
4,4'-DDD	<10
4,4'-DDE	<10
4,4'-DDT	<10
DIELDRIN	<10
ENDOSULFAN I	<10
ENDOSULFAN II	<10
ENDOSULFAN SULFATE	<10
ENDRIN	<10
ENDRIN ALDEHYDE	<10
HEPTACHLOR	<10
HEPTACHLOR EPOXIDE	<10
METHOXYCHLOR	<10
TOXAPHENE	<10
AROCLOR 1016	<100
AROCLOR 1221	<100
AROCLOR 1232	<100
AROCLOR 1242	<100
AROCLOR 1248	<100
AROCLOR 1254	<100
AROCLOR 1260	<100
ISODRIN	<10
KEPONE	<10

Analytical Technologies, Inc.

GC/MS - RESULTS

ATI I.D. : 10360001

TEST : ORGANOPHOSPHORUS PESTICIDES (EPA 8270)

CLIENT	: NEW MEXICO ENV. DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/07/91
CLIENT I.D.	: OW-11	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DIETHYL PYRAZINYL PHOSPHOROTHIOATE	<10
DISULFOTON	<10
FAMPHUR	<10
METHYL PARATHION	<10
PARATHION	<10
PHORATE	<10
TETRAETHYLDITHIOPYROPHOSPATE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

		ATI I.D.	: 103600
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/03/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/29/91
PROJECT NAME	: GRC	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
ACETOPHENONE	<10
2-ACETYLAMINOFLUORENE	<10
a,a-DIMETHYLPHENETHYLAMINE	<10
4-AMINOBIPHENYL	<10
ARAMITE	<50
CHLOROBENZILATE	<10
DIALLATE	<10
2,6-DICHLOROPHENOL	<10
DIMETHOATE	<10
p-(DIMETHYLAMINO)AZOBENZENE	<10
7,12-DIMETHYLBENZO(a)ANTHRACENE	<10
3,3'-DIMETHYLBENZIDINE	<10
m-DINITROBENZENE	<10
DIPHENYLAMINE	<10
ETHYL METHANESULFONATE	<10
HEXACHLOROPHENE	<10
HEXACHLOROPROPENE	<10
ISOSAFROLE	<10
METHAPYRILENE	<10
3-METHYLCHOLANTHRENE	<10
METHYL METHANESULFONATE	<10
3-METHYLPHENOL (m-CRESOL)	<10
1,4-NAPHTHOQUINONE	<10
1-NAPHTHYLAMINE	<10
2-NAPHTHYLAMINE	<10
5-NITRO-O-TOLUIDINE	<10
4-NITROQUINOLINE-1-OXIDE	<10
N-NITROSODIETHYLAMINE	<10
N-NITROSODI-BUTYLAMINE	<10
N-NITROSOMETHYLETHYLAMINE	<200
N-NITROSOMORPHOLINE	<10
N-NITROSOPIPERIDINE	<10
N-NITROSOPYRROLIDINE	<10
PENTACHLOROBENZENE	<10
PENTACHLORONITROBENZENE	<10
PENTACHLOROETHANE	<10
PHENACETIN	<10
p-PHENYLENEDIAMINE	<10
2-PICOLINE	<10
PRONAMIDE	<10
SAFROLE	<10
1,2,4,5-TETRACHLOROBENZENE	<10
2,3,4,6-TETRACHLOROPHENOL	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103600

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
o-TOLUIDINE	<10
1,3,5-TRINITROBENZENE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

		ATI I.D.	: 103600
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/03/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/29/91
PROJECT NAME	: GRC	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANINLINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103600

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<100
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	91
2-FLUOROBIPHENYL (%)	85
TERPHENYL (%)	109
PHENOL-D6 (%)	62
2-FLUOROPHENOL (%)	78
2,4,6-TRIBROMOPHENOL (%)	80

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103600

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC
REF I.D. : 10499906

DATE ANALYZED : 03/30/91
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,2,4-TRICHLOROBENZENE	<10	100	98	98	121	121	23
ACENAPHTHENE	<10	100	53	53	62	62	16
2,4-DINITROTOLUENE	<10	100	48	48	63	63	27
PYRENE	<10	100	54	54	58	58	7
N-NITROSO-DI-N-PROPYL AMINE	<10	100	59	59	54	54	9
1,4-DICHLOROBENZENE	<10	100	52	52	62	62	18
PENTACHLOROPHENOL	<50	200	89	44	130	65	37
PHENOL	<10	200	63	31	55	28	14
2-CHLOROPHENOL	<10	200	64	32	87	44	30
4-CHLORO-3-METHYLPHENOL	<10	200	75	37	89	45	17
4-NITROPHENOL	<50	200	71	36	104	52	38

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

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

LABORATORY ANALYSIS FOR

SMW-4 AND TRIP BLANK

SMW-4
SMW-4 Trip Blank

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

ATI I.D. 103570

April 19, 1991

APR 1991
RECEIVED
HAZARDOUS WASTE
PROGRAM

New Mexico Env. Improvement Div.
1190 St. Francis Dr.
Rm. N2300
Santa Fe, NM 87503

Project Name/Number: GRC/CMG

Attention: Bruce Swanton

On 03/06/91, Analytical Technologies, Inc. received a request to analyze water sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Appendix IX chlorinated and organophosphate pesticides were analyzed by EPA Method 8270, in our San Diego Laboratory.

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

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:clf
Enclosure

Analytical Technologies, Inc.

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

ATI I.D. : 103570

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SMW-4	WATER	03/05/91
02	SMW-4 TRIP BLANK	WATER	03/05/91

----- TOTALS -----

MATRIX	# SAMPLES
WATER	2

ATI STANDARD DISPOSAL PRACTICE

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

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103570

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01
CYANIDE, TOTAL	MG/L	<0.01
SULFIDE, TOTAL	MG/L	<1
TURBIDITY	NTU	37

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG ATI I.D. : 103570

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CYANIDE, TOTAL	MG/L	10360801	<0.01	<0.01	NA	0.27	0.25	108
SULFIDE, TOTAL	MG/L	10399901	<1	<1	NA	8.9	8.5	94
TURBIDITY	NTU	10357001	37	38	3	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. : 103570

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG

DATE RECEIVED : 03/06/91
REPORT DATE : 04/18/91

PARAMETER	UNITS	01
SILVER	MG/L	<0.010
ARSENIC	MG/L	<0.005
BARIUM	MG/L	0.042
BERYLLIUM	MG/L	<0.005
CADMIUM	MG/L	<0.005
COBALT	MG/L	<0.010
CHROMIUM	MG/L	0.020
COPPER	MG/L	0.028
MERCURY	MG/L	<0.0002
NICKEL	MG/L	<0.020
LEAD	MG/L	0.003
ANTIMONY	MG/L	<0.05
SELENIUM	MG/L	<0.005
TIN	MG/L	<0.03
THALLIUM	MG/L	<0.005
VANADIUM	MG/L	0.073
ZINC	MG/L	0.017

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG ATI I.D. : 103570

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	10357001	<0.010	<0.010	NA	0.449	0.500	90
ARSENIC	MG/L	10357001	<0.005	<0.005	NA	0.044	0.050	88
BARIUM	MG/L	10357001	0.042	0.040	5	0.982	1.00	94
BERYLLIUM	MG/L	10357001	<0.005	<0.005	NA	0.467	0.500	93
CADMIUM	MG/L	10357001	<0.005	<0.005	NA	0.486	0.500	97
COBALT	MG/L	10357001	<0.010	<0.010	NA	0.923	1.00	92
CHROMIUM	MG/L	10357001	0.020	0.020	0	0.932	1.00	91
COPPER	MG/L	10357001	0.028	0.030	7	0.491	0.500	93
MERCURY	MG/L	10355601	<0.0002	<0.0002	NA	0.0047	0.0050	94
NICKEL	MG/L	10357001	<0.020	<0.020	NA	0.923	1.00	92
LEAD	MG/L	10357001	0.003	0.004	29	0.043	0.050	80
ANTIMONY	MG/L	10357001	<0.05	<0.05	NA	0.91	1.00	91
SELENIUM	MG/L	10357001	<0.005	<0.005	NA	0.050	0.050	100
TIN	MG/L	10357001	<0.03	<0.03	NA	1.96	2.00	98
THALLIUM	MG/L	10357001	<0.005	<0.005	NA	0.042	0.050	84
VANADIUM	MG/L	10357001	0.073	0.071	3	0.995	1.00	92
ZINC	MG/L	10357001	0.017	0.016	6	0.506	0.500	98

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

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

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 10357001

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: 03/11/91
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/18/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
2,4,5-TRICHLOROPHENOXYACETIC ACID	<0.2
2,4-DICHLOROPHENOXYACETIC ACID	<0.4
2-SEC-BUTYL-4,6-DINITROPHENOL	<1.0
SILVEX (2,4,5-TP)	<0.2
SURROGATE PERCENT RECOVERIES	
DICAMBA (%)	117

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : CHLORINATED HERBICIDES (EPA 8150)

		ATI I.D.	: 103570
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/11/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/18/91
PROJECT NAME	: GRC/CMG	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
2,4,5-TRICHLOROPHENOXYACETIC ACID	<0.4
2,4-DICHLOROPHENOXYACETIC ACID	<0.2
2-SEC-BUTYL-4,6-DINITROPHENOL	<0.2
SILVEX (2,4,5-TP)	<1.0

SURROGATE PERCENT RECOVERIES

DICAMBA (%)	101

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103570

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG
REF I.D. : 10360001

DATE ANALYZED : 03/18/91
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
2,4-D	<0.4	16.8	16.1	96	15.9	95	1.3
SILVEX	<0.2	3.33	4.28	129	4.35	131	1.6

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357001

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/12/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357001

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	85
BFB (%)	114
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357001

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357002

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-4 TRIP BLANK	DATE ANALYZED	: 03/14/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357002

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BFB (%)	118
TOLUENE-D8 (%)	93

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10357002

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

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TEST : VOLATILE ORGANICS (EPA 8240)

		ATI I.D.	: 103570
CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE EXTRACTED	: 03/12/91
PROJECT #	: (NONE)	DATE ANALYZED	: 03/12/91
PROJECT NAME	: GRC/CMG	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103570

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	80
BFB (%)	96
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	ATI I.D.	: 103570
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/14/91
PROJECT NAME	: GRC/CMG	DATE ANALYZED	: 03/14/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

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ATI I.D. : 103570

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	93
BFB (%)	105
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103570

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG
REF I.D. : 10399923

DATE ANALYZED : 03/12/91
SAMPLE MATRIX :
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	44	88	44	88	0
TRICHLOROETHENE	<1	50	44	88	53	106	19
CHLOROBENZENE	<1	50	45	90	47	94	4
TOLUENE	<1	50	45	90	47	94	4
BENZENE	<1	50	42	84	50	100	17

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

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

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: 03/06/91
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ACETOPHENONE	<10
2-ACETYLAMINOFLUORENE	<10
a,a-DIMETHYLPHENETHYLAMINE	<10
4-AMINOBIPHENYL	<10
ARAMITE	<50
CHLOROBENZILATE	<10
DIALLATE	<10
2,6-DICHLOROPHENOL	<10
DIMETHOATE	<10
p-(DIMETHYLAMINO)AZOBENZENE	<10
7,12-DIMETHYLBENZO(a)ANTHRACENE	<10
3,3'-DIMETHYLBENZIDINE	<10
m-DINITROBENZENE	<10
DIPHENYLAMINE	<10
ETHYL METHANESULFONATE	<10
HEXACHLOROPHENE	<10
HEXACHLOROPROPENE	<10
ISOSAFROLE	<10
METHAPYRILENE	<10
3-METHYLCHOLANTHRENE	<10
METHYL METHANESULFONATE	<10
3-METHYLPHENOL (m-CRESOL)	<10
1,4-NAPHTHOQUINONE	<10
1-NAPHTHYLAMINE	<10
2-NAPHTHYLAMINE	<10
5-NITRO-O-TOLUIDINE	<10
4-NITROQUINOLINE-1-OXIDE	<10
N-NITROSODIETHYLAMINE	<10
N-NITROSODI-BUTYLAMINE	<10
N-NITROSOMETHYLETHYLAMINE	<200
N-NITROSOMORPHOLINE	<10
N-NITROSOPIPERIDINE	<10
N-NITROSOPYRROLIDINE	<10
PENTACHLOROBENZENE	<10
PENTACHLORONITROBENZENE	<10
PENTACHLOROETHANE	<10
PHENACETIN	<10
p-PHENYLENEDIAMINE	<10
2-PICOLINE	<10
PRONAMIDE	<10
SAFROLE	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
1,2,4,5-TETRACHLOROBENZENE	<10
2,3,4,6-TETRACHLOROPHENOL	<10
o-TOLUIDINE	<10
1,3,5-TRINITROBENZENE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: 03/06/91
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYLPHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANINLINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10

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Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

ATI I.D. : 10357001

COMPOUNDS	RESULTS
CARBOXYLIC ACID	60
CARBOXYLIC ACID	20
UNKNOWN HYDROCARBON	80
UNKNOWN HYDROCARBON	70
UNKNOWN HYDROCARBON	60

Analytical Technologies, Inc.

GC/MS - RESULTS

ATI I.D. : 10357001

TEST : ORGANOCHLORINE PESTICIDES & PCB'S (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: 03/06/91
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
ALDRIN	<10
ALPHA BHC	<10
BETA BHC	<50
GAMMA BHC (LINDANE)	<10
DELTA BHC	<30
CHLORDANE	<10
4,4'-DDD	<10
4,4'-DDE	<10
4,4'-DDT	<10
DIELDRIN	<10
ENDOSULFAN I	<10
ENDOSULFAN II	<10
ENDOSULFAN SULFATE	<10
ENDRIN	<10
ENDRIN ALDEHYDE	<10
HEPTACHLOR	<10
HEPTACHLOR EPOXIDE	<10
METHOXYCHLOR	<10
TOXAPHENE	<10
AROCLOR 1016	<100
AROCLOR 1221	<100
AROCLOR 1232	<100
AROCLOR 1242	<100
AROCLOR 1248	<100
AROCLOR 1254	<100
AROCLOR 1260	<100
ISODRIN	<10
KEPONE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10357001

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	<100
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	96
2-FLUOROBIPHENYL (%)	78
TERPHENYL (%)	44
PHENOL-D6 (%)	64
2-FLUOROPHENOL (%)	68
2,4,6-TRIBROMOPHENOL (%)	64

Analytical Technologies, Inc.

GC/MS - RESULTS

ATI I.D. : 10357001

TEST : ORGANOPHOSPHORUS PESTICIDES (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE EXTRACTED	: 03/06/91
CLIENT I.D.	: SMW-4	DATE ANALYZED	: 03/29/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DIETHYL PYRAZINYL PHOSPHOROTHIOATE	<10
DISULFOTON	<10
FAMPHUR	<10
METHYL PARATHION	<10
PARATHION	<10
PHORATE	<10
TETRAETHYLDITHIOPYROPHOSPATE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	ATI I.D.	: 103570
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE ANALYZED	: 03/29/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
ACETOPHENONE	<10
2-ACETYLAMINOFLUORENE	<10
a,a-DIMETHYLPHENETHYLAMINE	<10
4-AMINOBIPHENYL	<10
ARAMITE	<50
CHLOROBENZILATE	<10
DIALLATE	<10
2,6-DICHLOROPHENOL	<10
DIMETHOATE	<10
p-(DIMETHYLAMINO)AZOBENZENE	<10
7,12-DIMETHYLBENZO(a)ANTHRACENE	<10
3,3'-DIMETHYLBENZIDINE	<10
m-DINITROBENZENE	<10
DIPHENYLAMINE	<10
ETHYL METHANESULFONATE	<10
HEXACHLOROPHENE	<10
HEXACHLOROPROPENE	<10
ISOSAFROLE	<10
METHAPYRILENE	<10
3-METHYLCHOLANTHRENE	<10
METHYL METHANESULFONATE	<10
3-METHYLPHENOL (m-CRESOL)	<10
1,4-NAPHTHOQUINONE	<10
1-NAPHTHYLAMINE	<10
2-NAPHTHYLAMINE	<10
5-NITRO-O-TOLUIDINE	<10
4-NITROQUINOLINE-1-OXIDE	<10
N-NITROSODIETHYLAMINE	<10
N-NITROSODI-BUTYLAMINE	<10
N-NITROSOMETHYLETHYLAMINE	<200
N-NITROSOMORPHOLINE	<10
N-NITROSOPIPERIDINE	<10
N-NITROSOPYRROLIDINE	<10
PENTACHLOROBENZENE	<10
PENTACHLORONITROBENZENE	<10
PENTACHLOROETHANE	<10
PHENACETIN	<10
p-PHENYLENEDIAMINE	<10
2-PICOLINE	<10
PRONAMIDE	<10
SAFROLE	<10
1,2,4,5-TETRACHLOROBENZENE	<10
2,3,4,6-TETRACHLOROPHENOL	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103570

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
o-TOLUIDINE	<10
1,3,5-TRINITROBENZENE	<10

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	ATI I.D.	: 103570
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/06/91
PROJECT NAME	: GRC/CMG	DATE ANALYZED	: 03/29/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<10
BIS(2-CHLOROETHOXY)METHANE	<50
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<10
2-CHLORONAPHTHALENE	<50
2-NITROANILINE	<10
DIMETHYLPHTHALATE	<50
ACENAPHTHYLENE	<10
3-NITROANINLINE	<10
ACENAPHTHENE	<50
2,4-DINITROPHENOL	<10
4-NITROPHENOL	<50
DIBENZOFURAN	<50
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYLPHTHALATE	<10
4-CHLOROPHENYL-PHENYLETHER	<10
	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103570

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

COMPOUNDS	RESULTS
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL-PHENYLETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYLPHTHALATE	<10
FLUORANTHENE	<10
BENZIDINE	NA
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3'-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYLPHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	90
2-FLUOROBIPHENYL (%)	86
TERPHENYL (%)	73
PHENOL-D6 (%)	73
2-FLUOROPHENOL (%)	68
2,4,6-TRIBROMOPHENOL (%)	69

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION ATI I.D : 103570

COMPOUNDS	RESULTS
ALIPHATIC HYDROCARBON	20

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103570

TEST : SEMI-VOLATILE ORGANICS (EPA 8270)

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC/CMG
REF I.D. : 10357001

DATE ANALYZED : 03/30/91
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,2,4-TRICHLOROBENZENE	<10	200	168	84	192	96	13
ACENAPHTHENE	<10	200	102	51	114	57	11
2,4-DINITROTOLUENE	<10	200	79	40	95	48	18
PYRENE	<10	200	84	42	95	48	11
N-NITROSO-DI-N-PROPYL AMINE	<10	200	86	43	93	46	8
1,4-DICHLOROBENZENE	<10	200	89	44	98	49	11
PENTACHLOROPHENOL	<50	200	142	71	168	84	17
PHENOL	<10	200	98	49	106	53	9
2-CHLOROPHENOL	<10	200	102	51	110	55	7
4-CHLORO-3-METHYLPHENOL	<10	200	134	67	142	71	6
4-NITROPHENOL	<50	200	85	43	18	54	23

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

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

LABORATORY ANALYSIS FOR

SMW-1,2,3,5,6 AND

TRIP BLANK

SMW1-6 &
SMW6-Trip Blank

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

ATI I.D. 103568

March 15, 1991

New Mexico Env. Improvement Div.
1190 St. Francis Drive
Room N2300
Santa Fe, NM 87503

Project Name/Number: GRC/CME

Attention: Bruce Swanton

On 03/06/91, Analytical Technologies, Inc. received a request to analyze **aqueous** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602)438-1530.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

RVW:clf
Enclosure

Analytical Technologies, Inc.

CLIENT : NEW MEXICO ENV. IMPROVEMENT DIV. DATE RECEIVED : 03/06/91
PROJECT # : (NONE)
PROJECT NAME : GRC/CME REPORT DATE : 03/13/91
ATI I.D. : 103568

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SMW-1	AQUEOUS	03/05/91
02	SMW-2	AQUEOUS	03/05/91
03	SMW-3	AQUEOUS	03/05/91
04	SMW-5	AQUEOUS	03/05/91
05	SMW-6	AQUEOUS	03/05/91
06	SMW-6 TRIP BLANK	AQUEOUS	03/05/91

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	6

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.

GCMS - RESULTS

ATI I.D. : 10356801

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CME	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-1	DATE ANALYZED	: 03/08/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356801

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	87
BFB (%)	104
TOLUENE-D8 (%)	94

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10356801

COMPOUNDS	RESULTS
SULFONATED HYDROCARBON C6	500
UNKNOWN DIOL	800

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356802

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CME	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-2	DATE ANALYZED	: 03/08/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356802

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BFB (%)	115
TOLUENE-D8 (%)	95

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10356802

COMPOUNDS	RESULTS
SULFONATED HYDROCARBON C6	300
UNKNOWN DIOL	500

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356803

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CME	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-3	DATE ANALYZED	: 03/08/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356803

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BFB (%)	99
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10356803

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356804

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CME	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-5	DATE ANALYZED	: 03/08/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356804

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BFB (%)	94
TOLUENE-D8 (%)	99

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10356804

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356805

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CME	DATE EXTRACTED	: N/A
CLIENT I.D.	: [redacted]	DATE ANALYZED	: 03/08/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356805

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	84
BFB (%)	93
TOLUENE-D8 (%)	100

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10356805

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356806

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	DATE SAMPLED	: 03/05/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/06/91
PROJECT NAME	: GRC/CME	DATE EXTRACTED	: N/A
CLIENT I.D.	: SMW-6 TRIP BLANK	DATE ANALYZED	: 03/08/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<10
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10356806

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	92
BFB (%)	93
TOLUENE-D8 (%)	98

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : VOLATILE ORGANICS (EPA 8240)

ATI I.D. : 10356806

COMPOUNDS	RESULTS
NO ADDITIONAL COMPOUNDS	<5

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT	: NEW MEXICO ENV. IMPROVEMENT DIV.	ATI I.D.	: 103568
PROJECT #	: (NONE)	DATE EXTRACTED	: 03/08/91
PROJECT NAME	: GRC/CME	DATE ANALYZED	: 03/08/91
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	TR
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<10
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
TRANS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2-TRICHLOROETHANE	<1
BENZENE	<1
CIS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<1
CHLOROBENZENE	<1
ETHYLBENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1
ACETONITRILE	<100
ACROLEIN	<20
ACRYLONITRILE	<10
ALLYL CHLORIDE	<5
1,2-DIBROMO-3-CHLOROPROPANE	<5
CHLOROPRENE	<5
1,2-DIBROMOETHANE	<5
DIBROMOMETHANE	<5
DICHLORODIFLUOROMETHANE	<5

TR - Compound detected at an unquantifiable trace level

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Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 103568

TEST : VOLATILE ORGANICS (EPA 8240)

COMPOUNDS	RESULTS
1,4-DIOXANE	<150
ETHYL CYANIDE	<25
ISOBUTYL ALCOHOL	<50
METHYL IODIDE	<5
METHACRYLONITRILE	<5
PYRIDINE	<100
1,1,1,2-TETRACHLOROETHANE	<5
TRANS-1,4-DICHLORO-2-BUTENE	<5
TRICHLOROMONOFLUOROMETHANE	<5
1,2,3-TRICHLOROPROPANE	<5
METHYL METHACRYLATE	<5
ETHYL METHACRYLATE	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BFB (%)	92
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 103568

TEST : VOLATILE ORGANICS (EPA 8240)

CLIENT : NEW MEXICO ENV. IMPROVEMENT DIV.
PROJECT # : (NONE)
PROJECT NAME : GRC/CME
REF I.D. : 10399921

DATE ANALYZED : 03/08/91
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

COMPOUNDS	(a.) SAMPLE RESULT	(b.) CONC. SPIKED	(c.) SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	50	48	96	48	96	0
TRICHLOROETHENE	<1	50	47	94	43	86	9
CHLOROBENZENE	<1	50	50	100	49	98	2
TOLUENE	<1	50	48	96	48	96	0
BENZENE	<1	50	46	92	47	94	2

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

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

LABORATORY ANALYSIS FOR

OW-11 AND TRIP BLANK

OW-11
Trip Blank

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

ATI I.D. 103600

April 17, 1991

APR 1991
RECEIVED
HAZARDOUS WASTE
PROGRAM

New Mexico Env. Imp. Div.
1190 St. Francis Drive
Room N2300
Santa Fe, NM 87503

Project Name/Number: GRC

Attention: Bruce Swanton

On 03/07/91, Analytical Technologies, Inc. received a request to analyze **water** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

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

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:clf
Enclosure

Analytical Technologies, Inc.

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION DATE RECEIVED : 03/07/91
PROJECT # : (NONE)
PROJECT NAME : GRC REPORT DATE : 04/15/91
ATI I.D. : 103600

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-11	WATER	03/06/91
02	TRIP BLANK	WATER	03/06/91

----- TOTALS -----

MATRIX	# SAMPLES
WATER	2

ATI STANDARD DISPOSAL PRACTICE

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

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 103600

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC

DATE RECEIVED : 03/07/91
REPORT DATE : 04/15/91

PARAMETER	UNITS	01
CYANIDE, TOTAL	MG/L	<0.01
SULFIDE, TOTAL	MG/L	<1
TURBIDITY	NTU	36

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC ATI I.D. : 103600

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CYANIDE, TOTAL	MG/L	10360801	<0.01	<0.01	NA	0.27	0.25	108
SULFIDE, TOTAL	MG/L	10399921	<1	<1	NA	8.8	9.4	94
TURBIDITY	NTU	10360001	36	36	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. : 103600

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC

DATE RECEIVED : 03/07/91
REPORT DATE : 04/15/91

PARAMETER	UNITS	01
SILVER	MG/L	<0.010
ARSENIC	MG/L	<0.005
BARIUM	MG/L	0.037
BERYLLIUM	MG/L	<0.005
CADMIUM	MG/L	<0.005
COBALT	MG/L	<0.010
CHROMIUM	MG/L	<0.010
COPPER	MG/L	<0.010
MERCURY	MG/L	<0.0002
NICKEL	MG/L	<0.020
LEAD	MG/L	0.003
ANTIMONY	MG/L	<0.05
SELENIUM	MG/L	0.037
TIN	MG/L	<0.03
THALLIUM	MG/L	<0.005
VANADIUM	MG/L	0.010
ZINC	MG/L	0.015

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : NEW MEXICO ENVIRONMENTAL DIVISION
PROJECT # : (NONE)
PROJECT NAME : GRC ATI I.D. : 103600

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	10358301	<0.010	<0.010	NA	0.098	0.100	98
ARSENIC	MG/L	10361801	0.008	0.008	0	0.055	0.050	94
BARIUM	MG/L	10358301	0.036	0.034	6	0.141	0.100	105
BERYLLIUM	MG/L	10358301	<0.005	<0.005	NA	0.095	0.100	95
CADMIUM	MG/L	10357001	<0.005	<0.005	NA	0.486	0.500	97
COBALT	MG/L	10357001	<0.010	<0.010	NA	0.923	1.00	92
CHROMIUM	MG/L	10358301	<0.010	<0.010	NA	0.099	0.100	99
COPPER	MG/L	10358301	<0.010	0.010	NA	0.109	0.100	109
MERCURY	MG/L	10360203	<0.0002	<0.0002	NA	0.0050	0.0050	100
NICKEL	MG/L	10358301	0.286	0.309	8	0.390	0.100	104
LEAD	MG/L	10360701	0.008	0.007	13	0.048	0.050	80
ANTIMONY	MG/L	10358301	<0.05	<0.05	NA	1.03	1.00	103
SELENIUM	MG/L	10361901	<0.005	<0.005	NA	0.040	0.050	80
TIN	MG/L	10357001	<0.03	<0.03	NA	1.96	2.00	98
THALLIUM	MG/L	10357001	<0.005	<0.005	NA	0.042	0.050	84
VANADIUM	MG/L	10357001	0.073	0.071	3	0.995	1.00	92
ZINC	MG/L	10358301	0.073	0.072	1	0.171	0.100	98

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

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

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 10360001

TEST : CHLORINATED HERBICIDES (EPA 8150)

CLIENT	: NEW MEXICO ENVIRONMENTAL DIVISION	DATE SAMPLED	: 03/06/91
PROJECT #	: (NONE)	DATE RECEIVED	: 03/07/91
PROJECT NAME	: GRC	DATE EXTRACTED	: 03/11/91
CLIENT I.D.	: OW-11	DATE ANALYZED	: 03/18/91
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
2,4,5-TRICHLOROPHENOXYACETIC ACID	<0.2
2,4-DICHLOROPHENOXYACETIC ACID	<0.4
2-SEC-BUTYL-4,6-DINITROPHENOL	<1.0
SILVEX (2,4,5-TP)	<0.2

SURROGATE PERCENT RECOVERIES

DICAMBA (%)	94