GW -

MONITORING REPORTS







ATKEARNEY

March 29, 1989

Mr. Thomas D. Clark Regional Project Officer U.S. Environmental Protection Agency 1445 Ross Avenue Dallas, TX 75202-2733

Reference: EPA Contract No. 68-01-7374; Work Assignment No. R26-06-04;

Phillips Petroleum-Lee Natural Gas Plant; Buckeye, New Mexico; EPA I.D. No. NMD000709659; Comprehensive Ground-Water

Monitoring Evaluation (CME); CME Report

Dear Mr. Clark:

As you requested, we have enclosed one copy of the draft report and one copy of the cover letter for the above-referenced project. We are sending the original report and two copies of the report to Julie Wanslow at the New Mexico Environmental Improvement Division.

Because of the unusual length of time required for analysis of samples by the EID laboratory and the fact that the current contract terminates on March 31, 1989, we will be unable to respond to any comments you may have concerning this report. However, we would like to offer you a copy of the report (excluding Appendices C, D and E) on a floppy disk in "Word Perfect 5.0" format. This would allow you to make revisions to the report as you require.

As a result of this evaluation, we found several technical deficiencies which may constitute violations of 40 CFR Parts 264 and 270. Detailed lists of deficiencies and potential regulatory violations are provided in our report.

Mr. Thomas D. Clark March 29, 1989

Page 2

Please contact me or Steve Muse, the Work Assignment Manager, at (703) 548-4700, if you have any questions.

Sincerely,

Arthur Glazer

Technical Director

Enclosure

cc: J. Wanslow, EID (original and two copies)

J. Levin

D. Bean

S. Muse

A. Schaffer (w/o enclosure)

S. Strum, SAIC

COMPREHENSIVE GROUND-WATER MONITORING EVALUATION

REPORT

Phillips Petroleum-Lee Natural Gas Plant Buckeye, New Mexico EPA I.D. Number NMD000709659

Prepared for:

U.S. Environmental Protection Agency Region VI 1445 Ross Avenue Dallas, Texas 75202-2733

Prepared by:

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Contract No. 68-01-7374 Work Assignment No. R26-06-04

March 1989

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1.0 <u>INTRODUCTION</u>

1.1 Description, Objective and Scope

A Comprehensive Ground-Water Monitoring Evaluation (CME) is a detailed evaluation of the design and operation of the ground-water monitoring systems at RCRA-regulated facilities. The objective of the CME is to determine if a facility has, in place, a ground-water monitoring system which is adequately designed, constructed, and operated so as to yield representative samples of in-situ ground-water and to detect releases of hazardous constituents, or to define the rate and extent of migration of contaminants to ground water from the waste management area. This is a requirement under 40 CFR 265, Subpart F.

The purpose of this CME report is to present the findings of the CME conducted at the Phillips Petroleum - Lee Natural Gas Plant (Lee) and to identify the technical deficiencies which may constitute violations of regulations under 40 CFR Parts 265 and the applicable sections of 40 CFR 270.

1.2 Documents and Other References Used

The references used to prepare this report include the facility's RCRA Part A permit application; correspondence between the facility and EPA Region VI and the New Mexico Environmental Improvement Division (NMEID); previously conducted facility inspection reports; the facility's contractor reports; regional geologic and hydrogeologic reports; the facility's sampling and analysis plan; communications with NMEID and Phillips personnel; and interviews with Phillips personnel during the field evaluation.

1.3 Components of the Comprehensive Ground-Water Monitoring Evaluation

A CME is a two-phased process consisting of both office and field evaluation components. The office evaluation is the first phase of the CME and is intended to determine the adequacy of the design of the facility's groundwater monitoring system (GWMS). The field evaluation is the second phase of

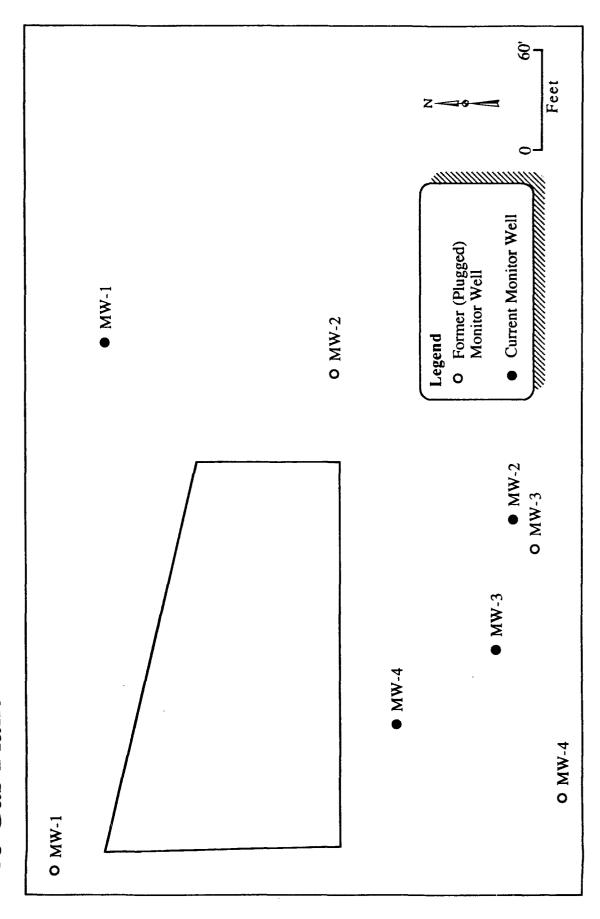
the process, and involves a field evaluation of the operation of the system, as well as verification (where possible) of the findings of the office evaluation.

To assist the evaluator in the CME process, office and field evaluation checklists (Appendices A and B, respectively) were developed using the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD) as a guide. These checklists are completed by the evaluator for each facility at which a CME is performed.

1.4 Facility Description and Operation

The Lee facility (EPA ID No. NMD000709659) is located near Buckeye, New Mexico in the southeastern part of the state (Section 30, T17S,R35E). At the Lee facility, raw natural gas is processed for recovery of natural gas liquids and sulfur. The facility operated a surface impoundment for the treatment of cooling tower blowdown water from approximately 1953 until 1984. impoundment may also have received process wastewater (7). A skimmer may also have been present for oil removal (33, 37). The blowdown water contained chromium which was used as a corrosion inhibitor until October 1983, when the facility began using a non-hazardous phosphate-type corrosion inhibitor (8). In 1984, the facility discontinued use of the surface impoundment and filled it in with caliche. In June of 1984, NMEID issued a Notice of Violation (NOV) citing improper operation of the Lee surface impoundment. Phillips subsequently submitted closure and post-closure plans for the Lee surface impoundment. In October 1984, Phillips submitted certification of closure for the Lee surface impoundment. A map depicting the surface impoundment, the former GWMS and the new GWMS is included as Figure 1-1.

Site Map Showing Former and Current Monitoring Wells Lee Gas Plant



1.5 <u>History of the Regulatory Status of the Phillips Petroleum-Lee Natural</u> Gas Plant

1.5.1 Status of the Permit Process for the Lee Facility

The Lee facility notified EPA of its hazardous waste management activities in August 1980 and submitted its Part A permit application in November 1980. In June 1982, Phillips withdrew the notification and the Part A application based on a Phillips' review of the facility process which determined that Phillips had incorrectly applied for a RCRA permit. Phillips filed an amended Part A application in March 1983, and notified EPA that the surface impoundment may, from time to time during its use, have received chromium in excess of the levels for EP Toxicity. EPA issued a Compliance Order to the Lee facility in September 1983 for operating without interim status and for failure to determine whether the cooling tower blowdown water was a hazardous waste. In July 1984, the facility submitted a closure/post-closure plan for the surface impoundment. Closure certification approval by the New Mexico Environmental Improvement Division (EID) is pending.

1.5.2 Ground-Water Monitoring Status of the Lee Facility

The Lee facility operated a surface impoundment for the disposal/treatment of cooling tower blowdown water from approximately 1953 until 1984. The facility installed four interim status monitoring wells to monitor the uppermost aquifer beneath the surface impoundment in 1984. These wells were judged to be inadequate by EID and EPA Region VI. In April 1988, Phillips plugged the original wells and installed four new monitoring wells to fulfill requirements of an EID compliance order concerning post-closure ground-water monitoring. The facility began sampling these wells in May 1988. EID considers the Lee facility to be in the detection phase of monitoring^(11,19).

2.0 KEY FINDINGS

This section presents the findings of the CME in terms of the ground-water performance standards which have not been met by the Lee facility, the technical deficiencies which were discovered during the office, and field evaluations and the regulations under 40 CFR Parts 265 and 270 which may have been violated. Table 2-1 summarizes the findings. Subsequent sections provide the basis for these findings and present further details about the facility and its operations.

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations Under 40 CFR Parts 265 and 270	Regulatory Citations
Uppermost aquifer must be correctly identified	o Failure to clearly define the extent of the uppermost aquifer in the area of the facility	\$265.90(a) \$265.91(a)(1) (a)(2) *\$270.14(c)(2)
	o Failure to adequately consider aquifers which may be hydraulically interconnected to the uppermost aquifer	\$265.90(a) \$265.91(a)(1) (a)(2) *\$270.14(c)(2)
Ground-water flow directions and rates must be properly defined	o Failure to collect data sufficient to establish ground-water flow directions and rate (relying too heavily on regional data)	\$265.90(a) \$265.91(a)(1) (a)(2) *\$270.14(c)(2)
Geologic and hydrogeologic formations underlying the site must be fully characterized	o Failure to assess significance of vertical gradients when evaluating flow rates and directions	\$265.90(a) \$265.91(a)(1) (a)(2) \$270.14(c)(2)
	o Failure to prepare flow nets	§270.14(c)(2)
	o failure to document the procedure for establishing the potentiometric surface	\$265.90(a) \$265.91(a)(1) (a)(2) *\$270.14(c)(2)
	o Failure to document the method(s) of obtaining samples during the 1984 boring program	§265.90(a) §265.91(a)(1)
	o Failure to consider temporal and seasonal variations in water levels when establishing flow directions	\$265.90(a) \$265.91(a)(1) (a)(2) \$270.14(c)(2)

* Indicates potential Class I regulatory violation.

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations Under 40 CFR Parts 265 and 270	Regulatory Citations
Geologic and hydrogeologic formations underlying the	o Failure to document the method(s) of obtaining samples during the 1984 boring program	§265.90(a) §265.91(a)(1)
site must be fully characterized (cont.)	o Failure to consider temporal and seasonal variations in water levels when establishing flow directions	\$265.90(a) \$265.91(a)(1) (a)(2) \$270.14(c)(2)
	o Failure to perform pump tests to determine hydraulic conductivity of uppermost aquifer	§270.14(c)(2)
	o Failure to collect sufficient hydrogeologic data to support selection of the geometric dimensions of the uppermost aquifer	\$265.90(a) \$265.91(a)(1) (a)(2) \$270.14(c)(2)
	o Failure to document presence or absence of confining layer	§270.14(c)(2)
	o Failure to perform sufficient pump tests to prove a lack of interconnection between aquifers	§270.14(c)(2)
	o Failure to drill sufficient borings in the site investigative program to establish accurate correlation of geologic units between boreholes	§270.14(c)(2)
	o Failure to provide geologic and hydrogeologic cross-sections concerning subsurface conditions	§270.14(c)(2)
	o Failure to prepare boring logs and field notes	§270.24(c)(2)
	o Failure to prepare geologic cross-sections, and soil maps	§270.14(c)(2)
	o Failure to perform material tests and geochemical analyses on boring samples	§270.14(c)(2)

* Indicates potential Class I regulatory violation.

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations Under 40 CFR Parts 265 and 270	Regulatory Citations
Geologic and hydrogeologic formations underlying the	o Failure to prepare structure maps of the water-bearing formations and confining layer	§270.14(c)(2)
site must be fully characterized (cont.)	o failure to adequately characterize site hydrogeology	§270.14(c)(2)
	o Failure to document qualifications of personnel supervising boring program in 1984	§270.14(c)(2)
	o Overreliance on regional geologic and hydrogeologic data in site investigation	§270.14(c)(2)
	o Failure to provide a topographic map prepared by a licensed surveyor	§270.14(c)(2)
	o Failure to prepare a contour map accurately depicting the potentiometric surface of the uppermost aquifer	§270.14(c)(2)
	o Failure to document methods or criteria used to correlate and analyze subsurface data	§270.14(c)(2)
	o Failure to provide documentation of criteria used to select boring locations	§270.14(c)(2)
	o Failure to have 1984 boring logs prepared by a qualified geologist	§270.14(c)(2)
	o Failure to prepare adequate borings logs	§270.14(c)(2)
Downgradient wells must be located so as to ensure the immediate detection of any contamination migrating from the facility	o Failure to locate downgradient monitoring wells at the edge of the hazardous waste management unit	§265.91(a)(2)

* Indicates potential Class I regulatory violation.

Ground-Water Performance Standard Requirements Which Were Not Met	Technical Deficiencies Which May Constitute Violations Under 40 CFR Parts 265 and 270	Regulatory Citations
Samples from background and down- gradient wells must be properly collected and analyzed	o Failure to transfer samples directly to containers from bailer	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Failure to make proper use of sample blanks	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Failure to document in the sampling and analysis plan the cleaning procedures for sample containers for inorganics	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Failure to use sampling methods which can detect immiscible layers	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Improper handling of samples for volatiles analysis; samples agitated as placed in containers	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)
	o Chain-of-custody form does not request time or date of collection	\$265.90(a) \$265.92(a) \$265.93(d)(4) \$270.14(c)(4)

* Indicates potential Class I regulatory violation.

3.0 <u>DISCUSSION OF THE OFFICE EVALUATION AND FIELD EVALUATION AT PHILLIPS LEE</u> NATURAL GAS PLANT

The office evaluation and field evaluation phases of a CME involve review of the available file material concerning the facility's ground-water monitoring program and GWMS design, and a site visit for the purpose of evaluating the operation of the GWMS. Checklists for both the office and field evaluation have been developed to aid the technical reviewer in the evaluation. These checklists have been completed for this CME and are attached as Appendices A and B. Findings and conclusions of the office and field evaluations are presented in Sections 5.1 and 5.2, respectively.

EPA Region VI and the New Mexico Environmental Improvement Division (EID) requested that the Kearney Team obtain replicate ground-water samples from the new monitoring wells MW-1, MW-2, MW-3, and MW-4 at the Lee facility during the facility's routine sampling event. Samples were to be analyzed for volatile organics, semi-volatile organics, turbidity and Priority Pollutant Metals. The samples for volatile and semi-volatile organics were submitted to C-E Environmental, Inc., for analysis. The samples for metals and turbidity analyses were submitted to the New Mexico Health and Environmental Department, Scientific Laboratory Division (SLD) in Albuquerque. At the request of SLD, samples submitted for metals analyses were preserved with nitric acid in the field. The Kearney Team provided sample containers and preservatives necessary for the replicate samples.

The field evaluation at the Lee facility was conducted on October 31 and November 1, 1988. The Kearney Team included Phebe Davol and Marianne Smith (Kearney/Centaur). The team arrived at the facility at 9:20 a.m. Mountain Standard Time (MST) on October 31. The team met briefly with Mike Ford who is the Staff Environmental Analyst for the Phillips Petroleum facilities in the area. The team explained to Mr. Ford that they would observe his techniques

and procedures for well evacuation, sample collection and handling, and record-keeping. Ambient air temperatures ranged from 65°F to 75°F, winds were from the south at 5 to 10 mph and skies were mostly sunny during the two-day field evaluation.

All samples were stored on ice in coolers from time of collection until they were delivered to the analytical laboratories by Federal Express on November 2, 1988.

4.0 ANALYTICAL RESULTS

The samples collected by the Kearney Team for analysis of volatiles, semivolatiles, turbidity and inorganics were shipped on the day of collection via overnight air service to the designated laboratories. The chain-of-custody and analytical request forms were completed and included with each shipment. A custody seal was affixed to each cooler prior to shipment. The laboratories were notified to expect delivery of the samples the following day.

The samples collected for analysis of organic parameters were submitted to the C-E Environmental, Inc., lab in Camarillo, CA. C-E Environmental analyzed for all CLP target compounds (volatile and semivolatile organics). In addition to the CLP target list, the samples were analyzed for 2-butanone; 1-methylnaphthalene; (o,m,p-)cresol; and 7,12-dimethylanthracene. The lab provided the standard CLP data package summarizing the results of the analyses and related QC data. A summary of the analytical results provided by CE Environmental is presented in Table 4-1. The complete data package is attached as Appendix E to this report.

The samples collected for the analysis of inorganic parameters were shipped to the EID Scientific Laboratory Division (SLD) in Albuquerque. Prior to delivery to the lab, the field team had completed all necessary analytical forms as required by SLD. The SLD lab analyzed the samples for Total Metals and for turbidity, and provided a data package summarizing the results of the analyses. A summary of the analytical results provided by SLD is included in Table 4-1. The complete data packages are included as Appendix E to this report.

High levels of volatile organic constituents were detected in MW-4. Cadmium was detected in the upgradient well, but was not detected in any of the downgradient wells. Arsenic was detected in MW-3 and MW-4 at higher levels than in the upgradient well. Lead was detected in the upgradient well at higher levels than in the downgradient well MW-3. Lead was not detected in

downgradient wells MW-2 or MW-4. Turbidity results were high for all four wells. This may indicate inadequate well development, and may cause interferences which affect the analytical results.

Table 4-1

Analytical Results Summary
Phillips-Lee CME

Sample Id#	Organics (ppb)	Inorganics	(ppm)	Turbidity (NTU)
MW - 1	None detected	Aluminum Arsenic Barium Cadmium Calcium Chromium Iron Lead Magnesium Manganese Silicon Silver Strontium Tin Zinc	21.0 0.024 1.9 0.053 610.0 0.043 23.0 0.030 13.0 0.91 22.0 0.001 1.1 0.2 0.1	77.0
MW - 2	None detected	Aluminum Arsenic Barium Boron Calcium Iron Magnesium Manganese Silicon Strontium Tin Zinc	5.0 0.021 0.9 0.2 430.0 2.6 35.0 1.1 18.0 2.2 0.1 0.2	55.0
MW - 3	None detected	Aluminum Arsenic Barium Boron Calcium Iron Lead Magnesium Manganese Silicon Strontium Tin	4.8 0.29 0.3 0.1 46.0 2.4 0.006 3.1 0.09 14.0 0.1	81.0

Table 4-1 (Cont.)

Analytical Results Summary Phillips-Lee CME

Sample Id#	Organics (ppb	Σ	<u>Inorganics</u>	s(ppm)	Turbidity (NTU)
MW - 4	Acetone	10	Aluminum	1.7	102.0
	Benzene	6700	Arsenic	0.18	
	Ethyl benzene		Barium	0.6	
	Xylenes	220	Boron	0.2	
	Phenol	49	Calcium	160.0	
	Naphthalene	4	Chromium	0.008	
	2-Methyl		Iron	3.3	
	naphthalene	2	Magnesium	18.0	
	bis(2-ethylhe	xyl)	Manganese	0.78	
	phthalate	3	Silicon	15.0	
	-		Strontium	0.9	
			Tin	0.1	
MW - 5	None detected		None detected	i	0.2
(Equipment Bla	nk)				
MW-6	Acetone	29	None detected	i	0.05
(field Blank)	1,1,1-trichlor	o -			
	ethane	18			
	Phenol	67			
	Naphthalene 2-Methylnap-	4			
	thalene	2			

5.0 SUMMARY AND CONCLUSIONS

5.1 Office Evaluation

The following sections are conclusions drawn from the CME office evaluation of the Phillips Petroleum Lee facility: Section 5.1.1 addresses the facility's evaluation of site subsurface geology; Section 5.1.2 addresses the facility's site hydrogeologic assessment; and Section 5.1.3 addresses the adequacy of the design and construction of the facility's GWMS.

5.1.1 Adequacy of the Characterization of Subsurface Geology and Related Data Gaps

Data from two subsurface investigations performed at the Lee facility were reviewed. The first investigation was completed in 1984 and the second in 1988. Both studies were conducted in order to determine appropriate locations for monitoring wells associated with the facility's former surface impoundment. While data collected during the investigations is useful and necessary, the depth of termination of the borings completed during the studies is not sufficient to adequately characterize site subsurface geology.

Several deficiencies and data gaps, which the facility should address, were noted during review of the facility's geologic information. The following is a description of these deficiencies:

- o Criteria used to select spacing or depth of termination of borings was not provided;
- o Methods of drilling and sample collection used during the 1984 study were not provided;
- o Boring samples from the 1984 study were not logged by a qualified geological professional;

- o Lithologic descriptions of the different strata encountered during the 1984 study were not complete or detailed enough;
- o Lithologic logs from both studies (especially the 1984 work) were incomplete, lacking information such as sampling intervals and depth and vertical extent of water-bearing units;
- o No geochemical or petrographic analyses were performed on samples from either study;
- o No geologic cross-sections were prepared; and
- o A site topographic map with contours intervals of two feet was not prepared.

5.1.2 Adequacy of the Characterization of the Uppermost Aquifer and Related Data Gaps

The hydrogeologic assessment inducted at the Lee facility is incomplete and identification of the uppermost aquifer has not been accomplished. The following deficiencies and data gaps identified during the office evaluation should be addressed by the facility:

- o No materials tests (e.g., sieve analysis) were performed on borings samples;
- No piezometers were installed for use in determining the vertical and horizontal gradients;
- No pump tests or slug tests were performed;
- o Values for hydraulic conductivity were obtained from a text on hydrogeology;

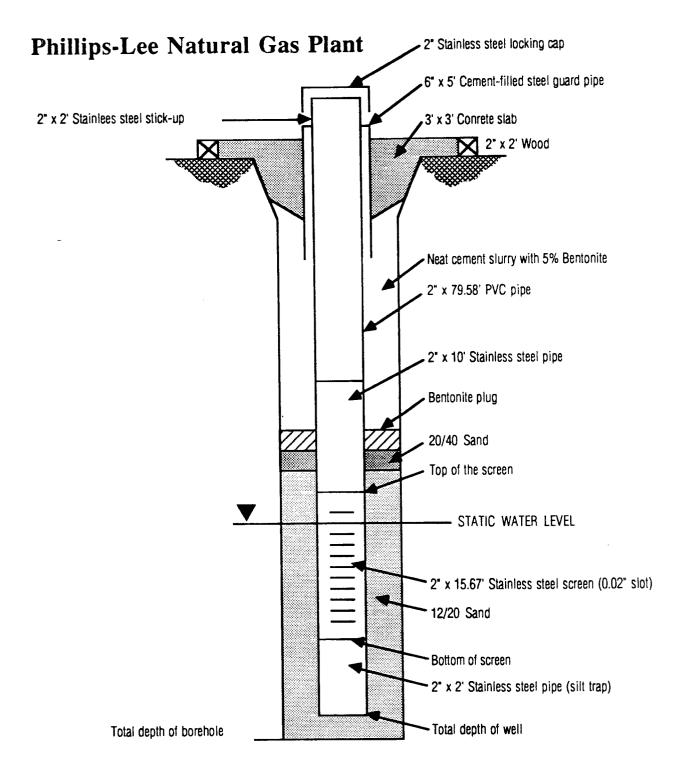
- o No hydrogeologic cross-sections were prepared;
- o Presence or absence of the first confining layer beneath the uppermost aquifer has not been documented and lack of hydraulic communication between the uppermost aquifer and underlying aquifer has not been established;
- Narrative description and calculation of ground-water flow rate was not provided;
- o The potentiometric surface map based on data collected in May 1988 does not include static water level data;
- o A vertical component of flow through unsaturated and saturated zones was not considered; and
- o Flow nets have not been prepared.

5.1.3 Adequacy of the Design and Construction of the Ground Water Monitoring Wells and Related Data Gaps

The Lee facility has closed the surface impoundment which the GWMS monitors and is awaiting approval of its closure certification by EPA and EID. This evaluation of the design and construction of the GWMS is based on requirements for detection monitoring under 40 CFR Parts 265.90 and 265.91. Except for the deficiencies noted below, the design and construction of the monitoring wells at the Lee facility meet the performance standards for such systems as discussed in the RCRA TEGD. Figure 5-1 shows the typical monitor well design for the Phillips Lee facility.

The upgradient well may be influenced by the facility, based on sampling results indicating the presence of Barium, Lead and Cadmium at levels higher than was detected in the downgradient wells.

Typical Monitor Well Design



Downgradient wells MW-2 and MW-3 are not located at the edge of the hazardous waste management area. Downgradient monitoring wells must be located so as to immediately detect any contamination migrating from the regulated unit.

5.1.4 Adequacy of the Facility's Data Evaluation and Reporting

The following deficiency was noted in the office evaluation of Phillips-Lee's data evaluation and reporting procedures:

o The facility has not recorded and reported the ground-water monitoring data as required by 40 CFR 265.94(a)(2).

5.2 Field Evaluation

The field evaluation at the Lee facility was conducted October 31 and November 1, to verify (where possible) the findings of the office evaluation and to collect ground-water samples. This section summarizes the findings of the field evaluation as follows: Section 5.2.1, ground-water monitoring system design and construction, Section 5.2.2, sample preservation and handling procedures; Section 5.2.4, chain-of-custody procedures; Section 5.2.5, implementation of quality assurance/quality control program; and Section 5.2.6, surficial well inspection. Table 5-2 is a summary of water level data collected during this CME.

5.2.1 Adequacy of the Design and Construction of the Ground-Water Monitoring System

The following deficiencies were noted pertaining to the design and construction of the Phillips-Lee monitoring wells:

o Samples from all wells were very turbid, indicating inadequate well development techniques; and

Table 5-2
Summary of Water Level
Data

	MW-1	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>
Elevation of Reference Point ⁽¹⁾	3978.77	3979.98	3979.86	3979.87
Depth of Static Water Level ⁽²⁾	94.84	97.02	96.81	96.72
Elevation of Static Water Level ⁽³⁾	3883.93	3882.96	3883.05	3883.15

⁽¹⁾ Feet above mean sea level; data provided by facility.

⁽²⁾ Feet below TOC of steel outer casing; measured on 10/31/88.

⁽³⁾ Elevation of static water level on 10/31/88.

o Based on sampling results, the upgradient well may be influenced by the facility (see Section 5.1.3).

During the field evaluation the following information presented in the facility's hydrogeologic assessment was verified:

- o Numbers and locations of monitoring wells;
- A concrete pad measuring 3 feet by 3 feet and approximately six inches thick was installed at the surface around the casing stick-up for all wells;
- o Two-inch diameter stainless steel casing inside a six-inch protective casing inside an 8-inch surface casing was visible at the surface for all wells;
- o All wells were structurally stable at the surface; and
- All wells were fitted with locking caps.

5.2.2 Adequacy of Sample Collection Procedures

The following deficiencies in sample collection procedures identified during the field evaluation:

- The owner/operator does not employ techniques capable of detecting immiscible layers prior to well evacuation;
- o Except for the samples for volatiles, samples were not transferred directly from the bailer to the sample container; samples were transferred from the bailer to a polypropylene beaker which had been rinsed with well water. The polypropylene beaker was then used to fill the sample containers. This practice increases the potential for cross-contamination between wells, and increases the

potential for loss of organics from the samples. After sampling the first well, the field team pointed out the potential problems which may be introduced by this procedure. Sampling at subsequent wells was conducted properly;

- o No equipment blanks are collected at the time of equipment decontamination; and
- o The owner/operator uses polypropylene rope instead of fluorocarbon coated wire or single-strand stainless steel wire to lower and retrieve bailers.

5.2.3 Adequacy of Sample Preservation and Handling Procedures

The owner/operator's sampling and analysis plan was reviewed prior to the field evaluation. During the field evaluation, the owner/operator was observed while collecting, handling and preserving samples to ascertain if the procedure documented in the plan were followed. The following deficiencies in the plan or in the owner/operator's implementation of the plan were identified:

- The owner/operator's sampling and analysis plan states that equipment blanks will be collected only when equipment is decontaminated by steam cleaning. Equipment blanks should be collected whenever sampling equipment is decontaminated in the field;
- The owner/operator's sampling and analysis plan states that equipment blanks will be analyzed for benzene, toluene, ethyl benzene and xylene (BTEX). Equipment blanks are intended to ensure that cross-contamination has not occurred and, therefore, should be analyzed in the laboratory for the same parameters as the environmental samples;

- The owner/operator's sampling and analysis plan states that trip blanks will be provided and analyzed only for BTEX. Trip blanks are intended to verify the effectiveness of the laboratory's sample container decontamination and, therefore, should be analyzed for the same parameters as the environmental samples; and
- The owner/operator's sampling and analysis plan includes procedures to be used by the analytical laboratory for cleansing sample containers for organics, but the cleaning procedure for sample containers for inorganics analysis is not specified.

5.2.4 Adequacy of Chain-of-Custody Procedures

Chain-of-custody procedures documented in the owner/operator's sampling and analysis plan are adequate and are implemented in the field. Only one comment is offered relative to this subject. The field logbook maintained by the owner/operator is a looseleaf notebook. Some of the information entered in the logbook is required under 40 CFR 265.92 and 265.94 and, as such, should be recorded in a bound notebook with pre-numbered pages. A bound notebook provides a more defensible record for documenting field data.

5.2.5 Adequacy of Field Implementation of the Quality Assurance/Quality Control Program

Most of the data generated through sampling and analysis of ground-water samples at the Lee facility should be considered valid and reliable. However, the deficiencies noted in Section 5.2.2, 5.2.3 and 5.2.4 of this report should be addressed by the facility immediately to ensure that all data can be relied upon to determine what impact the facility's operations have had on the quality of the ground-water.

5.3 <u>Conclusions Concerning the Adequacy of the Ground-Water Monitoring</u> Program

The Lee facility is in the detection phase of monitoring under 40 CFR Part 265, Subpart F. The detection monitoring program is not adequate due to the technical deficiencies noted in Sections 5.1 and 5.2 of this report. Table 2-1 summarizes the technical deficiencies which may constitute violations of the ground-water performance standards under regulations in 40 CFR 265, Subpart F. Based on the results of this evaluation, the ground-water monitoring system at the Phillips Lee facility is inadequate due to technical deficiencies in the following major areas:

- o The geologic and hydrogeologic investigations have not resulted in adequate or complete characterization of the uppermost aquifer (see Section 5.1.2);
- o Ground-water flow directions and rates have not been properly defined (see Section 5.1.2);
- Geologic and hydrogeologic formations underlying the site have not been fully characterized (see Section 5.1.1); and
- o The downgradient monitoring wells are not located so as to ensure the immediate detection of any contamination migrating from the hazardous waste management unit.
- o Samples from background and downgradient wells have not been properly collected and analyzed (See Section 5.2.2 and 5.2.3).
- o The upgradient well may be influenced by the unit.
- o All wells yield excessively turbid samples indicating that they should be redeveloped or replaced.

6.0 REFERENCES

- 1. Letter to B.F. Ballard Phillips Petroleum Company from Dick Whittington Regional Administrator re: compliance Order and Notice of Opportunity for Hearing, undated.
- 2. Waste Analysis plan Lee Plant Sampling and Analysis results, undated.
- 3. Waste Analysis Plan Lee Gasoline Plant, undated.
- 4. Closure and Post-Closure Compliance Review Checklist, undated.
- 6. Letter to Dianna Dutton U.S. EPA from B.F. Ballard, Phillips Petroleum, re: Lee Plant PSD Permit Application, November 26, 1979.
- 7. Potential Hazardous Waste Site Identification, March 2, 1981.
- 8. Potential Hazardous Waste Identification and Preliminary Assessment, March 3, 1981.
- 9. Letter to U.S. EPA Region VI from B.F. Ballard Phillips Petroleum, re: Removal of Facility from Active Status, June 16, 1982.
- 10. Letter to Lee Natural Gas Plant from Allyn Davis, U.S. EPA re: Part A Hazardous Waste Permit Application, August 6, 1982.
- 11. Penalty Calculation of Natural Gas Plant, February 18, 1983.
- 12. Hazardous Waste Permit Application, March 25, 1983.
- 13. Letter to Allyn Davis, U.S. EPA from B.F. Ballard, Phillips Petroleum re: RCRA Annual Report, March 31, 1983.
- 14. Letter to Allyn Davis, U.S. EPA from B.F. Ballard, Phillips, re: Closure of a surface impoundment, JUne 17, 1983.
- 15. Closure and Post Closure Plan for Hazardous Waste Facility, undated September 15, 1983.
- 16. Memorandum to Allyn Davis, Director, Air and Waste Management Division, from Dick Whittington Regional Administrator re: Delegation of Authority Pursuant to Section 3008 of the Solid Waste Disposal Act, September 28, 1983.d
- 17. Letter to R.W. Linsey, Lee Natural Gas Plant, from Bruce Galleher, State of New Mexico, re: Further Study for Possible Remedial Actions, December 8, 1983.

- 18. New Mexico Major Facilities Status Sheet for Lee Natural Gas Plant, January 1984.
- 19. Letter to J.W. Maharg Phillips from Joseph Reed, Ed L. Reed and Associates re: Lee Plant Ground Water Monitoring, April 3, 1984.
- 20. Inspection Review Worksheet, June 7, 1984.
- 21. Closure and Post Closure Plan for Hazardous Waste Facility, Updated June 14, 1984.
- 22. Closure and Post Closure Plan for Hazardous Waste Facility, July 27, 1984.
- 23. Letter to B.F. Ballard Phillips, from Steven Asher, Director, Environmental Improvement Division, re: Notice of Violation, June 15, 1984.
- 24. Geology Report, July 24, 1984.
- 25. Chemical and Physical Analyses for Water Samples, July 30, 1984.
- 26. Memorandum to J. David Duran, Program Manager Stationary Sources Section from Mike du Mond, Environmental Engineer, Enforcement Unit, re: Inspection of Phillips Petroleum, August 2, 1984.
- 27. Summary Approvability, Recommendations August 3, 1984.
- 28. Preliminary Statement August 27, 1984.
- 29. Letter to James Turner, U.S. EPA from Reese Copeland, Phillips re: RCRA Dockets, September 4, 1984.
- 30. Liquid Waste/Ground Water Surveillance, October 5, 1984.
- 31. Report of Samples Taken at Phillips-Lee, July 24, 1984.
- 32. Letter to Raymond Sisneros, Hazardous Waste Section, from B.F. Ballard, Phillips, re: Lee Plant RCRA Closure, October 29, 1984.
- 33. Site Inspection Report, May 20, 1985.
- 34. Letter to Jo Johnson-Ballard, U.S. EPA, from Richard Rawlings, Environmental Improvement Division, re: site inspection reports, August 2, 1985.
- 35. Hazardous Waste Inspection Data Sheet, August 17, 1985.
- 36. Hazardous Waste Inspection Data Sheet, August 27, 1985.

- 37. Letter to Robert Lindsey, Phillips, from Steven Cary, EID, re: Site Inspection Report, September 10, 1985.
- 38. Final Strategy Determination, September 10, 1985.
- 39. Letter to B.F. Ballard from C. Kelley Crossman, EID, re: Lee Natural Gas Plant groundwater samples, September 26, 1985.
- 40. Letter to William Rhea, Hazmat, U.S. EPA, from B.F. Ballard, re: Compliance with Section 3005(e)(2).
- 41. Letter to U.S. EPA from B.F. Ballard, Phillips, re: Request for Information, November 12, 1985.
- 42. Certification Checklist, November 14, 1985.
- 43. Summary Report Closure and Post Closure Plan Review Phillips, undated.
- 44. Letter to Steven Cary EID from Paul Sieminski, State Programs Section re: NMEID PA/SI Grant Commitments, December 10, 1985.
- 45. Letter to Phillips, from Allyn Davis, U.S. EPA re: Request for Information Pursuant to 30007 of the RCRA Act, February 28, 1986.
- 46. Facility Biennial Hazardous Waste Report for 1985.
- 47. Notice of Publication State of New Mexico Energy and Minerals Department Oil Conservation Division, March 27, 1986.
- Letter to New Mexico Health and Environment Dept. from B.F. Ballard, Phillips, re: Change in Ownership Notification, May 2, 1986.
- 49. Summary Report Closure and Post Closure Plan Review Lee Natural Gas Plant, May 13, 1986.
- 50. Groundwater Monitoring Checklist, September 15, 1987.
- 51. Memorandum to Bill Taylor, Enforcement Section, from David Peters, Hazardous Waste Section, re: RCRA Compliance Monitoring Inspections Report(s), September 15, 1986.
- 52. Map of Phillips-Lee Plant, Lea County, New Mexico, September 16, 1987.
- 53. Groundwater Monitoring Wells Static Water Levels, September 3, 1987.
- 54. Memorandum to Phillips from J. Gould re: Closure; March 4, 1988.

- 55. Report on the Installation of a Groundwater Monitoring System at Phillips Lee Plant, June 6, 1988.
- 56. Letter to Tom Clark, U.S. EPA Region VI, from Ann Anderson, A.T. Kearney, re: Phillips, PR/VSI Report, June 24, 1988.

APPENDIX A OFFICE EVALUATION CHECKLIST

Facility Name: Phillips Petroleum-Lee Natural Gas Plant

EPA I.D. Number: <u>NMD000709659</u>

Revision 1 October 1988

APPENDIX A

Office Evaluation Checklist: Technical Evaluation of the Design of the Ground-Water Monitoring System

Notes:

- 1. This checklist is adapted from OSWER Directive Number 9950.2, "Final RCRA Comprehensive Ground-Water Monitoring Evaluation (CME) Guidance Document."
- 2. One of these checklists must be completed for each CME office evaluation that is conducted; the completed checklist then must be included in the CME office evaluation report as well as the final CME report.
- 3. This checklist is a tool to be used by the technical reviewer to assure that all elements of a CME office evaluation are covered and to identify data gaps. Each line in the right-hand column should be filled out using a "Y" (YES) or "N" (NO) for each corresponding question in the left-hand column. Where the file information is incomplete, use the designation "I" (Incomplete).

Information
Provided
(Y/N/I)

A. Review of relevant documents:

1.	What	What documents were obtained for use in the Office					
	Eval	Evaluation:					
	a.	RCRA Part A permit application?	<u>Y</u>				
	Ъ.	RCRA Part B permit application?	Y				
	c.	Correspondence between the owner/operator					
		and appropriate agencies or citizens' groups?	Y				
	d.	Previously conducted facility inspection					
		reports?	Y				
	e.	Facility's contractor reports?	<u> </u>				
	f.	Regional hydrogeologic, geologic, or soil					
		reports?	Y				
	g.	The facility's Sampling and Analysis Plan?	Y				
	h.	Ground-Water Quality Assessment Program Outline					
		(or Plan, if the facility is in assessment					
		monitoring)?	Y				

Information
Provided
(Y/N/I)

Eval	uation	of the Owner/Operator's Hydrogeologic Assessment:	
1.	Did	the owner/operator use the following direct	
	tech	niques in the hydrogeologic assessment:	
	a.	Logs of the soil borings/rock corings	
		(documented by a professional geologist,	
		soil scientist, or geotechnical engineer)?	<u></u>
	ъ.	Materials tests (e.g., grain size analyses,	
		standard penetration tests)?	N
	С.	Piezometer installation for water level	
		measurements at different depths?	N
	d.	Slug tests?	N
	е.	Pump tests?	N
	f.	Geochemical analyses of soil samples?	<u> N</u>
	g.	Other (specify) (e.g., hydrochemical	N
		diagrams and wash analysis) <u>None</u>	
2.	Did	the owner/operator use the following indirect techniques	iques
	to s	supplement direct techniques data:	
	a.	Geophysical well logs?	N
	ъ.	Tracer studies?	N
	с.	Resistivity and/or electromagnetic conductance?	N
	d.	Seismic survey?	N
	е.	Hydraulic conductivity measurements of cores?	N
	f.	Aerial photography?	N

В.

Only logs from wells constructed in 1988, not for logs from wells constructed in 1984.

Ξ.	Charac	teriza	tion o	of Subsurface Geology of Site	
	1.	Soil	borin	g/test pit program:	
		a.	Were	the soil borings/test pits performed under	
			the :	supervision of a qualified professional?	<u>Y*</u>
		Ъ.	Did	the owner/operator provide documentation	
			for	selecting the spacing for borings?	Y
		С.	Were	the borings drilled to the depth of the	
			firs	t confining unit below the uppermost zone of	
			satu	ration or ten feet into bedrock?	<u> </u>
		d.	Were	the following method(s) of drilling used:	•
			0	Auger (hollow or solid stem)?	N
			0	Mud rotary?	<u>Y</u>
			0	Reverse rotary?	N
			0	Cable tool?	N
			0	Jetting?	N
			0	Other (specify) Air rotary was used to	
				penetrate caliche layer near surface.	
				followed by mud rotary to bottom of borehole.	
				Water was used as the drilling fluid.	
		e.	Were	continuous sample corings taken?	N***
		f.	Were	the samples obtained by the following methods:	
			0	Split spoon?	N
			0	Shelby tube, or similar?	N
			0	Rock coring?	N

^{*} Only the borings completed in 1988, not the borings completed in 1984.

^{**} Confining unit not identified.

^{***} Attempted but unsuccessful.

	ъ.	Streams, rivers, lakes, or wetlands near the	
		facility?	<u>Y</u>
	с.	Discharging or recharging wells near the	
		facility?	N
7.	Did	the owner/operator obtain a regional hydro-	
	geol	ogic map?	<u> </u>
	If y	es, does this hydrogeologic map indicate:	
	a.	Major areas of recharge/discharge?	N/A
	Ъ.	Regional ground-water flow direction?	N/A
	С.	Potentiometric contours which are consistent	
		with observed water level elevations?	N/A
8.	Did	the owner/operator prepare a facility site map?	Y
	If y	ves, does the site map show:	
	a.	Regulated units of the facility (e.g., landfill	
		areas, impoundments)?	Y
	Ъ.	Any seeps, springs, streams, ponds, or	
		wetlands?	<u>Y</u>
	c.	Location of monitoring wells, soil borings, or	
		test pits?	<u>Y</u>
	đ.	How many regulated land-based units does the	
		facility have (specify)?	
		If more than one regulated unit then,	One*
		o Does the waste management area encompass all	
		regulated units?	N/A
		OR	
		o Is a waste management area delineated	
		for each regulated unit?	N/A

^{*} Surface impoundment undergoing RCRA closure.

Information
Provided
(Y/N/I)

	g. Ground penetrating radar?	N
	h. Other (specify) <u>None</u>	
3.	Did the owner/operator document and present the raw	
	data from the site hydrogeologic assessment?	N
4.	Did the owner/operator document methods (criteria)	
	used to correlate and analyze the information?	N
5.	Did the owner/operator prepare the following:	
	a. Narrative description of geology?	Y
	b. Geologic cross-sections?	N
	c. Geologic and soil maps?	N*
	d. Boring/coring logs?	<u>Y</u>
	e. Structure contour maps of the differing water-	
	bearing zones and confining layer?	N**
	f. Narrative description and calculation of	
	ground-water flows?	N
	g. Water table/potentiometric map?	Y***
	h. Hydrologic cross sections?	N
6.	Did the owner/operator obtain a regional map of the	
	area and delineate the facility?	Y
	If yes, does this map illustrate:	
	Surficial coology fortures?	v

^{*} Geologic maps not prepared; regional soil map provided.

Owner/operator has not fully characterized uppermost aquifer and/has not identified a confining layer.

^{***} Potentiometric surface map inadequate.

	0	Ditch sampling?	<u>N</u>
	o	Other (specify) <u>Drill cuttings: coring</u>	
		was unsuccessful due to fine-grained	
		<u>sediments</u>	
g.	Were	the sample corings logged by a qualified	
	prof	essional in geology?	<u> </u>
h.	Does	the field boring log include the following	
	info	rmation:	
	0	Hole name/number?	<u> Y*</u>
	0	Date started and finished?	<u>Y*</u>
	o	Driller's name?	Y*
	0	Hole location (i.e., map and elevation)?	<u>Y*</u>
	0	Drill rig type and bit/auger size?	<u>Y*</u>
	0	Gross petrography (e.g., rock type) for each	
		geologic unit?	<u></u>
	o	Gross mineralogy of each geologic unit?	Y*
	o	Gross structural interpretation of each	
		geologic unit and structural features	
		(e.g., fractures, gouge material, solution	
		channels, buried streams or valleys, identifi-	
		cation of depositional material)?	N
	0	Development of soil zones and vertical	
		extent and description of soil type?	N
	0.	Depth of water-bearing unit(s) and vertical	
		extent of each?	N

^{*} Only the borings completed in 1988, not the borings completed in 1984.

	0	Depth and reason for termination of	
		borehole?	<u>N*</u>
	0	Depth and location of any contaminant	
		encountered in borehole?	Y**_
	0	Sample location/number?	<u> </u>
	0	Percent sample recovery?	<u> </u>
	0	Narrative descriptions of:	
		Geologic observations?	<u> Y***</u>
		Drilling observations?	N
i.	Were	the following analytical tests performed	
borehole? o Depth and location of any contaminant encountered in borehole? o Sample location/number? o Percent sample recovery? o Narrative descriptions of: Geologic observations? Drilling observations? i. Were the following analytical tests performed on the borehold samples: o Mineralogy (e.g., microscopic tests and x-ray diffraction)? o Petrographic analysis: - degree of crystallinity and cementation of matrix? - degree of sorting, size fraction (i.e., sieving), textural variations? - rock type(s)? - soil type? - approximate bulk geochemistry? - existence of microstructures that affect or indicate fluid flow?			
	0	Mineralogy (e.g., microscopic tests and	
		x-ray diffraction)?	N
	0	Petrographic analysis:	
		- degree of crystallinity and cementation of	
		matrix?	<u> </u>
		- degree of sorting, size fraction (i.e.,	
		sieving), textural variations?	<u>N</u>
		- rock type(s)?	<u>N</u>
		- soil type?	<u>N</u>
		- approximate bulk geochemistry?	<u>N</u>
		- existence of microstructures that affect	
		or indicate fluid flow?	<u>N</u>
	0	Falling head tests?	N

^{*} Reason for termination not provided.

^{**} Well log not provided for MW-1A. This boring was plugged and abandoned when explosive vapors were detected after penetrating the zone of saturation.

^{***} Only in 1984 logs, not in 1984 logs.

	Provided (Y/N/I)
Static head tests?	N
Settling measurements?	<u>N</u>
Centrifuge tests?	N
Column drawings?	<u> </u>

0

Information

D.	Verification	of	subsurface	geological	data
----	--------------	----	------------	------------	------

1.	Has the owner/operator used indirect geophysical	
	methods to supplement knowledge of geological	
	conditions between borehole locations?	N
2.	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?	<u> </u>
3.	Is the confining layer laterally continuous across	
	the entire site?	I*
4.	Did the owner/operator consider the chemical	
	compatibility of the site-specific waste types and	
	the geologic materials of the confining layer?	<u></u>
5.	Did the geologic assessment address or provide means	
	for resolution of any information gaps of geologic	
	data?	N
6.	Do the laboratory data corroborate the field data	
	for petrography?	N**

^{*} Confining layer not identified.

^{**} No laboratory data provided.

7. Do the laboratory data corroborate the field data for mineralogy and subsurface geochemistry?

___N*_

No laboratory data generated.

E. Presentation of geologic data 1. Did the owner/operator present geologic crosssections of the site? N__ 2. Do cross-sections: identify the types and characteristics of the geologic materials present? N/A define the contact zones between different Ъ. geologic materials? N/A note the zones of high permeability or fracture? N/A C. đ. give detailed borehole information including: location of borehole? N/A depth of termination? N/A 0 location of screen (if applicable)? N/A depth of zone(s) of saturation? N/A N/A backfill procedure? 3. Did the owner/operator provide a topographic map which was constructed by a licensed surveyor? <u>N</u>___ 4. Does the topographic map provide: contours at a maximum interval of two feet? N/A* a. Ъ. locations and illustrations of man-made features (e.g., parking lots, factory buildings, drainage ditches, storm drains, pipelines)? N/A descriptions of nearby water bodies? N/A c.

^{*} No topographic map provided.

Information
Provided
(Y/N/I)

	d.	descriptions of off-site wells?	N/A
	е.	site boundaries?	<u> N/A</u>
	f.	individual RCRA units?	N/A
	g.	delineation of the waste management area(s)?	<u>N/A</u>
	h.	well and boring locations?	<u>N/A</u>
5.		the owner/operator provide an aerial photograph cting the site and adjacent off-site features?	<u>Y</u>
6.		the photograph clearly show surface water	
	are 1	these clearly labelled?	<u>Y*</u>

^{*} Residences are not labelled, but are clearly visible.

F. Identification of the Uppermost Aquifer

1.	Groun	d-water flow direction:	
	a.	Were the well casing heights measured by a licensed	
		surveyor to the nearest 0.01 feet?	<u>Y</u>
	ъ.	Were the well water levels allowed to stabilize	
		after construction and development for a minimum	
		of 24 hours prior to measurements?	<u>Y</u>
	c.	Were the well water level measurements taken	
		to the nearest 0.01 feet?	<u>Y</u>
	d.	Were the well water level measurements taken	
		from all wells within a 24-hour period?	<u>Y</u>
	е.	Was the water level information obtained from	
		(check appropriate one):	
		o multiple piezometers placed in single	
		borehole?	<u> N</u>
		o vertically nested piezometers in closely	
		spaced separate boreholes?	N
		o monitoring wells?	<u>Y</u>
	f.	Did the owner/operator provide construction	
		details for the piezometers or wells?	<u>Y</u>
	g.	How were the static water levels measured:	
		o Electric water sounder?	<u>Y</u>
		o Wetted tape?	<u> </u>
		o Air line?	<u> </u>
		o Other (specify) None	
	h.	Was the well water level measured in wells with	
		equivalent screened intervals at an equivalent	
		depth below the saturated zone?	Y

	i.	Has the owner/operator provided a site water	
		table (potentiometric) contour map? If yes:	<u></u>
		o Do the potentiometric contours appear	
		logical and accurate based on topography	
		and presented data? (Consult water	
		level data.)	<u>Y</u>
		o Are ground-water flow-lines indicated?	<u> </u>
		o Are static water levels shown?	<u> </u>
		o Can hydraulic gradients be estimated?	<u> </u>
	j.	Did the owner/operator develop hydrologic cross-	
		sections of the vertical flow component across	
		the site using measurements from all wells?	N
	k.	Did the owner construct flow nets?	<u> </u>
	1.	Do the owner/operator's flow nets include:	
		o piezometer locations?	<u> N/A</u>
		o depth of screening?	<u> N/A</u>
		o width of screening?	<u>N/A</u>
		o measurements of water levels from all	
		wells and piezometers?	N/A
2.	Seaso	onal and temporal fluctuations in ground-water level	
	a.	Do fluctuations in static water levels occur?	_ Y
		o If yes, are the fluctuations caused by	
		any of the following:	
		Off-site well pumping?	<u> </u>
		Tidal processes or other intermittent	
		natural variations (e.g., river	
		stage)?	N
		On-site well pumping?	<u> </u>

^{*} Based on data from 5/88.

Informatior
Provided
(Y/N/I)

	Off-site, on-site construction or	
	changing land use patterns?	<u> </u>
	Deep well injection?	<u> </u>
	Seasonal variations?	<u>Y</u>
	Other (specify) None	
ъ.	Has the owner/operator documented sources and	
	patterns that contribute to or affect the ground-	
	water patterns below the waste management units?	N
с.	Do water level fluctuations alter the general	
	ground-water gradients and flow directions?	<u> </u>
d.	Based on water level data, do any head	
	differentials occur that may indicate a vertical	
	flow component in the saturated zone?	<u>N</u> *
e.	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
Hydra	ulic conductivity	
a.	How were hydraulic conductivities of the	
	subsurface materials determined?	
	o Single-well tests (slug tests)?	<u>N</u>
	o Multiple-well tests (pump tests)?	N
	o Other (specify) <u>Not determined;</u>	
	estimates submitted based on	
	values found in literature.	

3.

Data not adequate to determine.

Ъ.	If single-well tests were conducted, was it done						
	by:						
	o Adding or removing a known volume of						
	water?	N/A					
	o Pressurizing the well casing?	N/A					
С.	If single well tests were conducted in a highly						
	permeable formation, were pressure transducers and						
	high-speed recording equipment used to record						
	the rapidly changing water levels?	N/A					
d.	Since single well tests only measure hydraulic						
	conductivity in a limited area, were enough						
	tests run to ensure a representative measure						
	of conductivity in each hydrogeologic unit?	N/A					
e.	Is the owner/operator's slug test data (if						
	applicable) consistent with existing geologic						
	<pre>information (e.g., boring logs)?</pre>	N/A					
f.	Were other hydraulic conductivity properties						
	determined?	<u>N</u>					
g.	If yes, provide any of the following data, if						
	available:						
	o Transmissivity	N/A					
	o Storage coefficient	N/A					
	o Leakage	N/A					
	o Permeability	N/A					
	o Porosity	N/A					
	o Specific capacity	N/A					
	o Other (specify) N/A						

4.	Iden	ntification of the uppermost aquifer	
	a.	Has the extent of the uppermost saturated zone	
		(aquifer) in the facility area been defined?	
		If yes,	N
		o Are soil boring/test pit logs included?	<u>Y*</u>
		o Are geologic cross-sections included?	N
	ъ.	Is there evidence of confining (component,	
		unfractured, continuous, and low permeability)	
		layers beneath the site?	I * *
	с.	What is the hydraulic conductivity of the	
		confining unit (if present)? Not determined	
		How was it determined? Not determined	
	d.	Does potential for other hydraulic	
		communication exist (e.g., lateral	
		incontinuity between geologic units, facies	
		changes, fracture zones, cross-cutting	
		structures, or chemical corrosion/alteration	
		of geologic units by leachate)?	<u> </u>
		If yes or no, what is the rationale?	<u> </u>

^{*} Only lithologic logs from monitoring well boreholes from 60' to 115' deep.

^{**} Confining layer not identified.

^{***} Hydrogeologic assessment incomplete; confining layer not identified.

G.	Evaluat	tion o	f the Facility's Ground-Water Monitoring Wells'	
	Design	and C	onstruction	
	Note:	Thes	e questions should be answered for each	
		diff	erent well design present at the facility.	
	Note:	All f	our wells have same design.	
	1.	n~;11	ing methods	
-	1.		-	
		a.	What drilling method was used for the well:	N
			o Hollow-stem auger?	
			o Solid-stem auger?	N
			o Mud rotary?	<u> </u>
			o Air rotary?	<u>Y</u>
			o Reverse rotary?	<u>N</u>
			o Cable tool?	N
			o Jetting?	N
			o Air drill with casing hammer?	N
			o Other (specify)	
		ъ.	Were any cutting fluids (including water)	
			or additives used during drilling?	Y
			If yes, specify:	
			Type of drilling fluid _ Potable water	
			Source of water used <u>Not identified</u>	I
			Foam No	
			Polymers No	
			Other (specify) No	
		c.	Was the cutting fluid, or additive, identified?	Y
		đ.	Was the drilling equipment steam-cleaned prior to	
		٠.	drilling the well?	N
			Other methods Hot-water washed	

Information
Provided
(Y/N/I)

e.	Was	compressed air used during drilling?	<u> </u>	
	0	If yes, was the air filtered to remove oil?	N*	
f.	Did	the owner/operator document procedure for		
	esta	blishing the potentiometric surface?	<u>Y</u>	
	0	If yes, explain how the location was		
		established?		
		Rising water level in borehole was		
		monitored with an electronic water		
		level indicator until static con-		
		ditions were reached.		
g.	Form	nation samples		
	o	Were formation samples collected initially		
		during drilling?	<u>Y</u>	
	0	Were any continuous cores taken?	N**	
	o	If not, at what interval were samples taken?	5 ft**	
	0	How were the samples obtained:		
		- Split spoon?	N	
		- Shelby tube?	<u>N</u>	
		- Core drill?	<u>N</u>	
		- Other (specify) <u>Drill cuttings</u>		
	0	Identify any physical and/or chemical tests		
		performed on the formation samples:		
		None indicated		
Monit	oring	well construction materials		
a.	Ider	ntify construction materials (by number) and		
	diameters (ID/OD). ***			

2.

^{*} Information not provided.

^{**} No documentation was provided as to what type of sampling was performed during construction of former GWMS in 1984.

^{***} See Exhibit 5-1 in report text.

				<u>Material</u>	Diameter (ID/OD)
		0	Primary casing	PVC	2" ID
		0	Secondary or out-	Stainless steel	2" ID
			side casing (double	e)	
			construction)		
		0	Screen	Stainless Steel	2" ID
					(Slots 0.02")
	b.	How	are the sections of	casing and screen	
		co	nnected:		
		0	Pipe sections threa	ided?	<u> </u>
		0	Couplings (friction	n) with adhesive or	
			solvent?		N
		0	Couplings (friction	n) with retainer so	rews? N
		0	Other (specify)		
	c.	Were	the materials steam	-cleaned prior to	
		inst	allation?		<u> </u>
		If n	o, how were the mate	erials cleaned?	
3.	Well	intak	e design and well de	evelopment	
	a.	Was	a well intake screen	installed?	<u> </u>
		0	What is the length	of the screen for	
			the well? 15 fee	t	
			(screen extends 5'	above SWL)	
		0	Is the screen manuf	factured?	<u> </u>

Pre-packaged, factory steam-cleaned casing was used.

Information
Provided
(Y/N/I)

b .	Was	a filter pack installed?	<u>Y</u>
	0	What kind of filter pack was employed?	
		(specify) <u>Pre-packaged 12/20 grade</u>	
		silica sand	
	0	Is the filter pack compatible with	
		formation materials?	<u>Y</u>
	o	How was the filter pack installed?	
		Through a tremie pipe	
	0	What are the dimensions of the filter pack?	
		MW-1 = 6.5" x 30.77'; $MW-2 = 6.5$ " x	
		26.56'; MW-3 = $6.5''$ x $28.48'$;	
		$MW-4 = 6.5'' \times 28.83'$;	
	0	Has a turbidity measurement of the well	
		water ever been made?	<u> </u>
	0	Have the filter pack and screen been	
		designed for the <u>in-site</u> materials?	<u>Y</u>
c.	Was	the well developed?	<u> </u>
	0	What technique was used for well development:	
		- Surge block?	<u> N</u>
		- Bailer?	<u> </u>
		- Air surging?	<u> </u>
		- Water pumping?	<u>Y</u>
		- Other (specify) Overpumping using a 1.5-	
		inch stainless steel air-lift develop-	
		ment pump. Surging was used occasionally	
		to dislodge fines from the formation.	
		Surging utilized distilled water and	
		formation water.	

Information
Provided
(Y/N/I)

4.	Annula	ar space seals	
	a.	What is the annular space in the saturated zone	
		directly above the filter pack filled with:	
		- Sodium bentonite? (specify type and grit)	<u>Y</u> *
		Pellets; grit not indicated	
		- Cement? (specify neat or concrete)	N
		- Other (specify) None	
		o Was the seal installed by:	
		- Dropping material down the hole and	
		tamping?	Y**
		- Dropping material down the inside of a	
		hollow-stem auger?	<u>N</u>
		- Tremie pipe method?	N
		- Other (specify) <u>See footnote **</u>	
	Ъ.	Was a different seal used in the unsaturated	
		zone?	Y
		If yes,	
		o Was this seal made with:	
		- Sodium bentonite? (specify type and grit)	
		N/A	
		- Cement? (specify neat or concrete) N/A_	
		- Other (specify) Neat cement slurry w/5%	
		bentonite	
		o Was this seal installed by:	
		- Dropping material down the hole and	
		tamping?	N

One to three feet of 20/40 grade silica sand was placed over the filter pack, then bentonite seal. See Exhibit 5-1 in report text.

Tamping not indicated. About 1 foot of 20/40 sand was placed above the bentonite to keep it from being dislodged when the borehole was grouted.

Information
Provided
(Y/N/I)

	- Dropping material down the inside of	
	hollow stem auger?	N
	- Other (specify)Tremie pipe	
c.	Is the upper portion of the borehole sealed with a	
	concrete cap to prevent infiltration from	
	the surface?	<u>Y</u>
đ.	Is the well fitted with an above-ground protective	
	device and bumper guards?	<u>Y</u>
е.	Has the protective cover been installed with	
	locks to prevent tampering?	Y

н.	Evaluation of the Facility's Detection Monitoring Program					
	1.	Place	ement of downgradient detection monitoring wells			
		a.	Are the ground-water monitoring wells or clusters			
			located immediately adjacent to the waste			
			management area?	<u> Y</u>		
		Ъ.	How far apart are the detection monitoring wells?			
-			MW-2 is approximately 66' from MW-3 and MW-3 is			
			approximately 75' from MW-4 according to field			
			measurements. See Figure 1-1 in text of report.			
		С.	Does the owner/operator provide a rationale for			
			the location of each monitoring well or cluster?	Y*		
		d.	Has the owner/operator identified the well screen			
			lengths of each monitoring well or clusters?	<u>Y</u>		
		е.	Does the owner/operator provide an explanation			
			for the well screen lengths of each monitoring			
			well or cluster?	<u>Y</u>		
		f.	Do the actual locations of monitoring wells			
			or clusters correspond to those identified			
			by the owner/operator?	Y**		
	2.	Place	ement of upgradient monitoring wells			
		a.	Has the owner/operator documented the location			
			of each upgradient or background monitoring			
			well or cluster?	Y		
		ъ.	Does the owner/operator provide an explanation			
			for the location(s) of the upgradient or background			
			monitoring wells?	<u> Y</u>		

^{*} Location based on data from former GWMS.

^{**} Confirmed during field evaluation.

Information
Provided
(Y/N/I)

Wh	at length screen has the owner/operator	
em	ployed in the background monitoring well(s)?	
	15.33 feet	
Do	es the owner/operator provide an explanation	
fo	or the screen length(s) chosen?	
Do	es the actual location of each background	
mo	nitoring well or cluster correspond to that	
id	dentified by the owner/operator?	

Confirmed during field evaluation.

I.	Evalua	Evaluation of the Facility's Assessment Monitoring Program					
	1.	If the facility is in detection monitoring, has the owner/operator prepared a ground water quality assessment program outline?	<u> </u>				
	2.	Does the owner/operator maintain a copy of the outline at the facility? (If so, try to obtain a copy of the outline during the field evaluation)	N				
	3.	Does the outline meet the requirements orf 40 CFR Part 265.93(a)?	<u>Y</u>				
	4.	If the facility is in assessment monitoring, does the owner/operator have a ground-water quality assessment program plan which has been approved by EPA or the appropriate state agency?	N/A_				
	5.	Does the owner/operator maintain a copy of the plan at the facility? (If so, try to obtain a copy of the plan during the field evaluation.)	<u> N/A</u>				
	6.	Does the assessment plan specify: a. The number, location, and depth of wells? b. The rationale for their placement and identify the basis that will be used to select subsequent sampling locations and depths in later assessment	N/A				
		phases?	N/A				

7.	Does	the list of monitoring parameters include all	
	hazar	dous waste constituents from the facility?	N/A
	a.	Does the water quality parameter list include	
		other important indicators not classified	
		as hazardous waste constituents?	N/A
	Ъ.	Does the owner/operator provide documentation	
		for the listed wastes which are not included?	N/A
8.	Does	the owner/operator's assessment plan specify	
	the p	rocedures to be used to determine the rate	
	of co	nstituent migration in the ground water?	N/A
9.	Has t	he owner/operator specified a schedule of	
	imple	mentation in the assessment plan?	N/A
10.	Have	the assessment monitoring objectives been	
	clear	ly defined in the assessment plan?	<u> N/A</u>
	а.	Does the plan include analyses and/or	
		re-evaluation to determine if significant	
		contamination has occurred in any of the	
		detection monitoring wells?	<u>N/A</u>
	ъ.	Does the plan provide for a comprehensive	
		program of investigation to fully	
		characterize the rate and extent of	
		contaminant migration from the facility?	N/A
	c.	Does the plan call for determining the	
		concentrations of hazardous wastes and	
		hazardous waste constituents in the ground	
		water?	N/A

Information
Provided
(Y/N/I)

11.	Does	the assessment plan identify the	
	inves	tigatory methods that will be used in the	
	asses	sment phase?	N/A
	a.	Is the role of each method in the evaluation	
		fully described?	N/A
	b.	Does the plan provide sufficient descriptions	
		of the direct methods to be used?	N/A
	С.	Does the plan provide sufficient descriptions	
		of the indirect methods to be used?	N/A
	d.	Will the method contribute to the further	
		characterization of the contaminant movement?	N/A
12	Are t	the investigatory techniques utilized in the	
12.		sment program based on direct methods?	N/A
	a.s.	Does the assessment approach incorporate	
	a.	indirect methods to further support direct	
		methods?	N/A
	ъ.	Will the planned methods called for in the	11721
	υ.	assessment approach ultimately meet performance	
		standards for assessment monitoring?	N/A_
		-	N/A
	c.	Are the procedures well defined?	N/A
	d.	Does the approach provide for monitoring wells	
		similar in design and construction to the detection	37 /4
		monitoring wells?	<u> N/A</u>
	e.	Does the approach employ taking samples during	
		drilling or collecting core samples for further	37 /4
		analysis?	<u> N/A</u>

13.	Are	Are the indirect methods to be used based on			
	reli	able and accepted geophysical techniques?	N/A		
	a.	Are they capable of detecting subsurface			
		changes resulting from contaminant migration	•		
		at the site?	N/A		
	Ъ.	Is the measurement at an appropriate level			
		of sensitivity to detect ground-water quality			
		changes at the site?	N/A		
	С.	Is the method appropriate considering the			
		nature of the subsurface materials?	N/A		
	d.	Does the approach consider the limitations			
		of these methods?	N/A_		
	e.	Will the extent of contamination and constituent			
		concentration be based on direct methods and			
		sound engineering judgment? (using indirect			
		methods to further substantiate the findings)	N/A		
14.	Does	s the assessment approach incorporate any			
	math	nematical modeling to predict contaminant			
	move	movement?			
	а.	Will site specific measurements be utilized			
		to accurately portray the subsurface?	<u> N/A</u>		
	ъ.	Will the derived data be reliable?	N/A		
	С.	Have the assumptions been identified?	N/A		
	d.	Have the physical and chemical properties of			
		the site-specific wastes and hazardous waste			
		constituents been identified?	N/A		

J. Conclusions

1.	Subsu	urface geology:	
	a.	Has sufficient data been collected to adequately	
		define petrography and petrographic variation?	N*
	Ъ.	Has the subsurface geochemistry been adequately	
		defined?	N*
	c.	Was the boring/coring program adequate to	
		define subsurface geologic variation?	N*
	d.	Was the owner/operator's narrative description	
		complete and accurate in its interpretation of	
		the data?	N*
	е.	Does the geologic assessment address or provide	
		means to resolve any information gaps?	<u>N*</u>
2.	Groun	nd-Water flowpaths:	
	a.	Did the owner/operator adequately establish the	
		horizontal and vertical components of ground-	
		water flow?	<u>N*</u>
	Ъ.	Were appropriate methods used to establish	
		ground-water flowpaths?	<u>N*</u>
	С.	Did the owner/operator provide accurate	
		documentation?	<u>N*</u>
	d.	Are the potentiometric surface measurements	
		valid?	<u></u>
	e.	Did the owner/operator adequately consider	
		the seasonal and temporal effects on the	
		ground water?	<u>N</u> *

^{*} See Table 2-1 and Section 5.1.1 of this report.

,,	f.	Were sufficient hydraulic conductivity tests	
		performed to document lateral and vertical	
		variation in hydraulic conductivity in the	
		entire hydrogeologic subsurface below the site?	<u>N</u> *
3.	Uppe	ermost aquifer:	
	a.	Did the owner/operator adequately define the	
		uppermost aquifer?	<u> </u>
4.	Moni	toring well construction and design:	
	a.	Do the design and construction of the owner/	
		operator's ground-water monitoring wells permit	
		depth discrete ground-water samples to be taken?	Y
	b .	Are the samples representative of ground-water	
		quality?	Y**
	С.	Are the ground-water monitoring wells	
		structurally stable?	<u>Y</u>
	d.	Does the ground-water monitoring well's design	
		and construction permit an accurate assessment	
		of aquifer characteristics?	<u>Y**</u>
5.	Dete	ection monitoring:	
	a.	Downgradient wells:	
		Do the location and screen lengths of the ground-w	ater
		monitoring wells or clusters in the detection	
		monitoring system allow the immediate detection	
		of a release of hazardous waste or constituents	
		from the hazardous waste management area to the	
		uppermost aquifer?	Y

^{*} See Table 2-1 and Section 5.1.1 of this report.

^{**} Only for the upper portion of the aquifer.

	D.	Do the location and screen lengths of the	
		upgradient (background) ground-water monitoring	
		wells ensure the capability of collecting	
		ground-water samples representative of	
		upgradient (background) ground-water quality	
		including any ambient heterogeneous chemical	
		characteristics?	<u>Y</u>
5.	Asses	sment monitoring:	
	а.	Has the owner/operator adequately characterized	
		site hydrogeology to determine contaminant	
		migration?	N/A
	b.	Is the detection monitoring system adequately	
		designed and constructed to immediately detect	
		any contaminant release?	N/A
	c.	Are the procedures used to make a first	
		determination of contamination adequate?	N/A
	d.	Is the assessment plan adequate to detect,	
		characterize, and track contaminant migration?	N/A
	е.	Will the assessment monitoring wells, given	
		site hydrogeologic conditions, define the extent	
		and concentration of contamination in the	
		horizontal and vertical planes?	N/A
	f.	Are the assessment monitoring wells adequately	
		designed and constructed?	N/A
	g.	Are the sampling and analysis procedures	
		adequate to provide true measures of	
		contamination?	N/A
	h.	Do the procedures used for evaluation of	
		assessment monitoring data result in determinations	
		of the rate of migration, extent of migration, and	
		hazardous constituent composition of the contaminant	
		plume?	N/A

i.	Are the data collected at sufficient frequency	
	and duration to adequately determine the rate	
	of migration?	N/A
j.	Is the schedule of implementation adequate?	<u>N/A</u>
k.	Is the owner/operator's assessment monitoring	
	plan adequate?	<u> N/A</u>
	o If the owner/operator had to implement his	
	assessment monitoring plan, was it implemented	
	satisfactorily?	N/A

APPENDIX B

FIELD EVALUATION CHECKLIST
FOR
PHILLIPS PETROLEUM
LEE NATURAL GAS PLANT
BUCKEYE, NEW MEXICO

Facility Name: Phillips Petroleum - Lee Natural Gas Plant

EPA I.D. Number: <u>NMD000709659</u>

Revision 1 July, 1988

APPENDIX B

Field Evaluation Checklist: Technical Evaluation of the Operation of the Ground-Water Monitoring System

Notes:

- This checklist is adapted from OSWER Directive Number 9950.2, "Final RCRA Comprehensive Ground-Water Monitoring Evaluation (CME) Guidance Document."
- One of these checklists must be completed for each CME field evaluation that is conducted; the completed checklist then must be included in the CME report.
- 3. This checklist is a tool to be used by the technical reviewers to assure that all elements of a CME field evaluation are covered and to identify data gaps. Each line in the right-hand column should be filled out using a "Y" (YES) or "N" (NO) for each corresponding question in the left-hand column. Where the information is incomplete or unavailable at the time of the field evaluation, use the designation "U" (UNKNOWN). As appropriate, attempt to obtain the necessary information after the field evaluation, or indicate in the CME report that the information is unavailable. Specify in the report where missing information constitutes violations of 40 CFR Parts 265 or 270.

Note:	Resp	onses	in this section apply to	all wells in	the system.
A.	Grou	nd-wat	ter monitoring system des	sign:	
	Do t	he nur	mbers, depths, and locati	ions of	
	moni	toring	g wells correspond with t	those	
	repo	rted i	in the facility's hydroge	eologic assess	ment Y
В.	Moni	toring	g well construction:		
	1.	Ide	ntify construction mater:	ials and	
		well	l diameters:		
				<u>Material</u>	Diameter (ID/OD)
		а.	Primary casing	PVC *	2" ID
		ъ.	Secondary or outside		
			casing (guard casing)	Steel	6" OD
		С.	Surface casing	Steel	
	2.	Is	the upper portion of the	borehole	
		sea	led with concrete to pre-	vent	

Is the well fitted with an above-

ground protective device?

Y

As-built drawings indicate a ten foot section of stainless steel casing between the screen and the bottom of the PVC and a two foot section of stainless steel pipe at the top of the PVC. Two-inch stainless steel casing was visible at the surface.

Information
Provided
(Y/N/U)

4. Is the protective cover fitted with locks to prevent tampering?

Υ___

B-2

II.	Review	of	Sample	Collection	Procedures

A.	Meas	urement of well depth elevations:	
	1.	Are measurements made of both depth to standing water and depth to the bottom of the well?	Y
	2.	Are measurements taken to the nearest 0.01 feet?	<u> </u>
	3.	What measuring device is used? Olympic Model 150 Electric well probe and wetted steel tape	
	4.	Is there a reference point established by a licensed surveyor?	<u> </u>
	5.	Is the measuring equipment properly cleaned between well locations to prevent cross-contamination?	Y
В.	Dete	ction of immiscible layers:	
	1.	Are procedures used which will detect	N

Information
Provided
(Y/N/U)

	2.	Are procedures used which will detect	
		dense-phase immiscible layers?	<u>N</u> *
C.	Sampl:	ing of immiscible layers:	
	1.	Are the immiscible layers sampled	
		separately prior to well evacuation?	<u>N**_</u>
	2.	Do the procedures used minimize mixing	
		with water-soluble phases?	N
D.	Well	evacuation:	
	1.	Are low-yielding wells evacuated to	
		dryness?	N/A_
	2.	Are high-yielding wells evacuated so	
		that at least three casing volumes are	
		removed?	<u> </u>
	3.	What device is used to evacuate the wells?	
		Pre-cleaned Dedicated Teflon hailer	

A dark dense-phase immiscible layer was detected in MW-4 in the first bailer withdrawn from the well during smpling. Subsequent withdrawals did not indicate presence of immiscibles. An interface probe is not used to identify the presence of immiscible layers prior to well evacuation.

The inspection team checked field parameters on the immisicible layer detected in MW-4. Volume was insufficient to submit for laboratory analysis.

Information
Provided
(Y/N/U)

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

<u>Y</u>

Information
Provided
(Y/N/U)

E. Sample withdrawa	al	:
---------------------	----	---

1.	For low-yielding wells, are samples for volatile, pH, and oxidation/reduction	
	potential drawn first after the well	
	recovers?	<u> </u>
2.	Are sampling devices either bottom valve	
	bailers or positive gas displacement	
	bladder pumps?	<u>Y</u>
3.	If bailers are used, is fluorocarbon	
	resin-coated wire, single-strand stainless	
	steel wire, or monofilament used to raise	
	and lower the bailer?	<u>N**</u>
,	TE 11. Jan and about	
4.	If bladder pumps are used, are they	
	operated in a continuous manner to prevent	
	aeration of the sample?	<u> N/A</u>
5.	If bailers are used, are they lowered	
٠.	slowly to prevent degassing of the water?	Y
	stowty to prevent degassing of the water;	
6.	If bailers are used, are the contents	
	transferred to the sample container in a	
	way that minimizes agitation and aeration?	N

Initially, the facility o/o was using the first bailer volume to run field parameters before collecting the volatiles sample. The inspection team commented on this, and the o/o subsequently changed this procedure.

Retrieval line is braided propylene rope.

Information Provided (Y/N/U)

7.	Is care taken to avoid placing clean sampling equipment on the ground or other					
	contaminated surfaces prior to insertion into the well?	Y				
8.	If dedicated sampling equipment is not					
	used, is equipment disassembled and					
	thoroughly cleaned between samples?	<u>N/A</u>				
9.	If samples are for inorganic analysis,					
	does the cleaning procedure for sampling					
	equipment include the following sequential					
	steps:					
	a. Nonphosphate detergent wash?	Y				
	b. Dilute acid rinse (HNO ₃ or HCl)?	N*				
	c. Tap water rinse?	N**				
	d. Type II reagent-grade water?	<u> </u>				
10.	If samples are for organic analysis,					
	does the cleaning procedure for sampling					
	equipment include the following					
	sequential steps:					
	a. Nonphosphate detergent wash?	<u>Y</u>				
	b. Tap water rinse?	<u>Y</u>				
	c. Distilled/deionized water rinse?	N**				

^{*} Tap Water

^{**} Methanol.

^{***} Distilled water.

		Provided (Y/N/U)
	d. Acetone rinse?	N*
	e. Pesticide-grade hexane rinse?	<u>N*</u>
11.	Is sampling equipment thoroughly dry	
	before use?	<u> </u>
12.	Are equipment blanks taken to ensure	
	that sample cross-contamination has not	
	occurred?	<u>N</u>
13.	If volatile samples are taken with a	
	positive gas displacement bladder pump,	
	are pumping rates below 100 ml/min?	N/A_
In-s	itu or field analyses:	
1.	Are the following labile (chemically unstable)	
	parameters determined in the field:	
	a. pH?	<u>Y</u>
	b. Temperature?	<u>Y</u>
	c. Specific conductivity?	<u>Y</u>
	d. Redox potential?	N
	e. Chlorine?	N
	f. Dissolved oxygen?	N
	g. Turbidity?	N
	h. Other (specify) None	

F.

2. Are the in-situ determinations made after well evacuation and sample removal?

_Y___

Information

^{*} Distilled water.

Information
Provided
(Y/N/U)

3.	If a sample is withdrawn from the well, are parameters measured from a split portion?	<u> Y</u>
4.	Is monitoring equipment calibrated according to manufacturers' specifications and	
	consistent with SW-846?	<u>Y</u>
5.	Is the date, procedure, and maintenance for equipment calibration documented in the	
	owner/operator's field logbook?	Y

III. Review of Sample Preservation and Handling Procedures

Α.	Samp	ole containers:	
	1.	Are samples transferred from the sampling device directly to their compatible containers?	N*
	2.	Are sample containers for metals (inorganics) analyses polyethylene with polypropylene caps?	<u> </u>
	3.	Are sample containers for organics analyses glass bottles with fluorocarbon resin-lined	
		caps?	<u>Y</u>
	4.	If glass bottles are used for metals samples, are the caps fluorocarbon resin-lined?	N/A
	5.	Are the sample containers for metal analyses cleaned using these sequential steps:	
		a. Nonphosphate detergent wash?	<u> </u> **
		b. 1:1 nitric acid rinse?	_ <u>I</u>
		c. Tap water rinse?	<u> </u>
		d. 1:1 hydrochloric acid rinse?	
		e. Tap water rinse?	I

Samples were collected in polyethylene beakers and transferred to appropriate containers. The beakers were rinsed with well water prior to collecting the samples.

^{**} Procedures for decontamination of sample containers for metals analyses were not provided in the Sampling and Analysis plan.

		Provided (Y/N/U)
	f. Distilled/deionized water rinse?	<u> </u>
5 .	Are the sample containers for organic analyses	
	cleaned using these sequential steps:	
	a. Nonphosphate detergent/hot water wash?	<u> </u>
	b. Tap water rinse?	<u> </u>
	c. Distilled/deionized water rinse?	Y
	d. Acetone rinse?	<u> </u>
	e. Pesticide-grade hexane rinse?	<u> </u>
7.	Are trip blanks used for each sample container	
	type to verify cleanliness?	N*

Information

^{*} VOA vials only.

В.	Samp	le preservation procedures:	
	1.	Are samples for the following analyses cooled	
		to 4°C:	
		a. TOC?	
		ъ. тох? <u>- ч</u>	<u></u>
		c. Chloride?Y	<u> </u>
		d. Phenols?	I/A_
		e. Sulfate?Y	
		f. Nitrate?	<u> </u>
		g. Coliform bacteria?	<u> </u>
		h. Cyanide?	N/A_
		i. Oil and grease?	N/A
		j. Hazardous constituents (Modified Appendix IX)?	<u>/*</u>
	2.	Are samples for the following analyses field	
		acidified to pH <2 with HNO ₃ :	
		<u> </u>	N/A
		<u> </u>	N/A
		·	N/A
		<u> </u>	N/A_
		e. Dissolved metals?	<u>Y</u>
		f. Fluoride?	N**
		g. Endrin?	<u>Y</u>
		h. Lindane?	Y
		i. Methoxychlor?	<u>Y</u>
		j. Toxaphene?	Υ
		k. 2,4, D?	<u>Y</u>
		1. 2,4,5, TP Silvex?	Y
		m. Radium?	<u>Y</u>
		n. Gross alpha?	Y

^{*} Purgeables and pesticides/herbicides only.

		Provided (Y/N/U)
	o. Gross beta?	<u>Y</u>
3.	Are samples for the following analyses	
	field-acidified to pH <2 with H_2SO_4 :	
	a. Phenols?	N/A
	b. Oil and grease?	N/A
4.	Is the sample for TOC analysis field-acidified	<u>N*</u>
	to pH <2 with HC1?	
5.	Is the sample for TOX analysis preserved with	
	1 ml of 1.1 M sodium sulfite?	<u>N</u> *
6.	Is the sample for cyanide analysis preserved with NaOH to pH >12?	<u> </u>
Spec	ial handling considerations:	
1.	Are organic samples handled without filtering?	Y
2.	Are samples for volatile organics analyses	
	transferred to the appropriate vials to eliminate	•
	headspace over the sample?	<u>Y</u>
3.	Are samples for metals analyses split into two	
	portions?	N

Information

C.

^{*} Acidified to pH <2 with $\rm H_2SO_4$ with no headspace.

Information
Provided
(Y/N/U)

4.	Is the sample for dissolved metals filtered through a 0.45-micron filter?	<u>Y</u>
5.	Is the second portion analyzed for total metals without being filtered?	N*
6.	Is one equipment blank prepared each day of ground-water sampling?	N**_

^{*} Samples are not analyzed for total metals.

^{**} No equipment blanks were prepared.

IV. Review of Chain-of Custody Procedures

A.	Sample labels:				
	1.	Are sample labels used?	<u>Y</u>		
	2.	Do labels contain the following information:			
		a. Sample identification number?	Y		
		b. Name of collector?	<u>Y</u>		
		c. Date and time of collection?	Y		
		d. Place of collection?	Y		
		e. Parameter(s) requested and			
		preservatives used?	<u> Y</u>		
	3.	Do the labels remain legible even if wet?	Y		
В.	Sampl	e seals:			
	1.	Are sample seals placed on containers or cooler			
		to ensure that the samples are not altered?	<u>Y</u>		
C.	Field	logbook:			
	1.	Is a field logbook maintained by the			
		owner/operator?	<u> Y</u>		
	2.	Does the logbook document the following:			
		a. Purpose of sampling (e.g., detection or			
		assessment monitoring)?	_ N		
		b. Location of well(s)?	Y		
		c. Total depth of each well?	Y		

đ.	Static water level depth and measurement	
	technique?	<u>Y</u>
e.	Presence of immiscible layers and detection	
	method?	N
f.	Collection method for immiscible layers	
	and sample identification numbers?	N
g.	Well evacuation procedures?	<u>Y</u>
h.	Sample withdrawal procedure?	Y
i.	Date and time of collection?	Y
j.	Well sampling sequence?	<u>Y</u>
k.	Types of sample containers and sample	
	<pre>identification number(s)?</pre>	N*
1.	Preservative(s) used?	<u>Y</u>
m.	Parameters requested?	<u> </u>
n.	Field analysis data and method(s)?	Y
٥.	Sample distribution and transporter?	N
p.	Field observations?	
	o Unusual well recharge rates?	N
	o Equipment malfunction(s)?	N
	o Possible sample contamination?	N
	o Sampling rate?	N

Only sample identification number.

Information
Provided
(Y/N/U)

D.	Chain-of-custody record:				
	1.	Is a	chain-of-custody record included with		
		each	sample?	<u> </u>	
	2.	Does	it document the following:		
		a.	Sample number?	<u> Y</u>	
		ъ.	Signature of collector?	<u> </u>	
		c.	Date and time of collection?	<u>N*</u>	
		d.	Sample type?	<u> </u>	
		е.	Station location?	<u>Y</u>	
		f.	Number of containers?	<u>Y</u>	
		g.	Parameters requested?	<u>Y</u>	
		h.	Signatures of persons involved		
			in the chain-of-possession?	<u> </u>	
		i.	Inclusive dates of possession?	<u> </u>	
Ε.	Sampl	e ana	lysis request sheet:		
	1.	Does	a sample analysis request sheet		
		acco	mpany each sample?	<u>Y</u>	
	2.	Does	the request sheet document the		
		foll	owing:		
		a.	Name of person receiving the sample?	Y	
		Ъ.	Date of sample receipt?	Y	
		С.	Laboratory sample number (if different		
			than field number)?	Y	
		đ.	Analyses to be performed?	Y	
			-		

Form does not request date or time of collection.

Information
Provided
(Y/N/U)

v.	Review	of Quality	y Assurance/Quality Control Program			
	A.	Is the validity and reliability of the laboratory and field-generated data ensured by a Quality				
		Assurance	/Quality Control program?	<u> </u>		
	В.	Does the	Quality Assurance/Quality Control			
		program i	nclude:			
		1. Doc	umentation of any deviations from			
		app	roved procedures?	<u> </u>		
		2. Doc	umentation of analytical results for:			
		a.	Blanks?	<u>Y*</u>		
		ъ.	Standards?	<u> </u>		
		С.	Duplicates?	<u>Y</u>		
		d.	Spiked Samples?	<u> </u>		
		е.	Detectable limits for each parameter			
			being analyzed?	Y		
	C.	Are appro	oved statistical methods used?			
	D.	Are QC sa	amples used to correct data?	N		
	E.	Are all d	data critically examined to ensure it			
		has been	properly calculated and reported?	Y		

See Section 5.2.3 of the report text.

Information
Provided
(Y/N/U)_

VI.	Surfie	Surficial Well Inspection and Field Observations				
	A.	Are the wells adequately maintained?	<u> </u>			
	В.	Are the monitoring wells protected and secure?	<u> </u>			
	C.	Do the wells have surveyed casing elevations?	<u>Y</u>			
-	D.	Are the ground-water samples turbid?	<u> </u>			
-	E.	Have all physical characteristics of the site been noted in the inspector's field notes (i.e., surface waters, topography, surface features)?				
	F.	Has a site sketch been prepared by the field inspector with a scale, north arrow, location(s) of buildings, location(s) of regulated units, location of monitoring wells, and a rough	N			
		depiction of the site drainage pattern?	N			

^{*} Some samples were turbid upon visual inspection and analytical results verify this.

APPENDIX C

FIELD LOG

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Name Koarny/Centaur Marianne Smith & Aleke Duel

Address 225 Remeters lare-Phone 703/685-7932

Sulf Self of Sec 30 TITS R35E) rauch

Projects Hillips 66 Lee Plant Fickeye, Man Menco

18535830444

32°48' N 103°29'W

LAG Plant GOA ID NO. - NAD 000 797.659

Field Log Phillips Lee CME R26-06-04 Oct 31, 1908 - Oct (MS)

Publishing Co., Inc.

Meredith, N.H. 03263

This book is published on a fine 50% collon-content ledger paper, specially treated for maximum archival service, and protected by a water resistant surface sizing.

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Mondy 10/31/88

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1-2 That 1-3 Viewell Ist built to be sompted

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Conduct 5400 at 650 F bottom of this well (3) in largher) bo them of the weed. Pump at the Total dept property by the stander of made fragion some the grand to the day of son 3 mx dapor 60° F/ (60° 30) ~ 15.5°C 303- 1 = 1,000 in 11 | 1000 in 11.62 FULT 1531.66 FEL

Grand Elw. 3777.63,

Blood Go Elw. 3779.98,

Top 6" County Elav. 3979.98,

Top 2" Stl 9,08 Elev. 3980.59, Welledinsters - Location Surveyor Well #1 8/0 may 5 1390. 02 FE 6 Top 6 "Casing Elev. 3976.77" Top 6 "Casing Elev. 3976.77" 2"(d) = ("(r") 2, 248 fx for one week yolyna, 17(1)2h Il # 2 Eleptons & Lacks - (B) - (B) - (B) =521.1

9.09 FNL + 1597.74 FEL

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Six SS Cap Edin 3977.86

Top 6 Casing Ele 1 3979.86

Top 8" Sti. P. geether. 3980.37 Wall #3 Elovations & Locations CO2 and Had second - which thought post 1/2 MW. 2 Sound MM. Sound MM. 2 Sound MM. 1 # 4 8 Ignations It Locations 55 Cap Elev. 3978. 23' 6" Casing Elev. 3979.87' 2"-SHP. P. pe Elev: 3980.29' + 16 71. 23 FEC en mitasker well utin puts of 1029 Journ NW resier of ferren Senfore information & downer of ferren 1030 St Journ NE Mu-10 Coffeed & FRP but in background HADSO'O brodsproff follows will 1030 march to HW-A Comployed Rugged 1015 97.00 depth to which (2nd Dones grand

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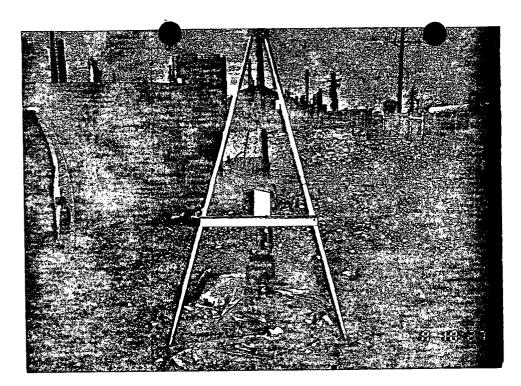
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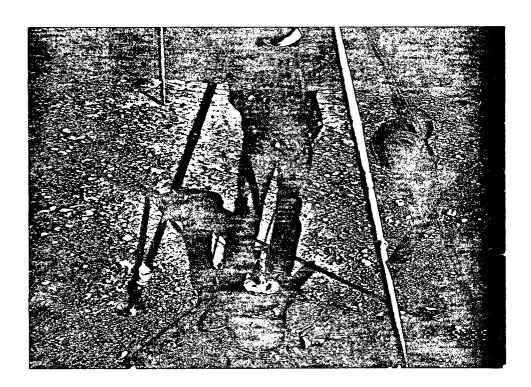
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APPENDIX D

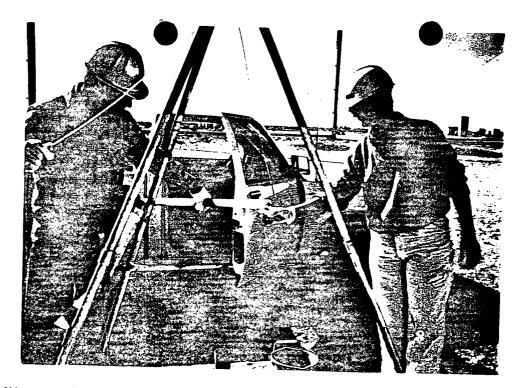
PHOTOGRAPH LOG PHILLIPS LEE CME



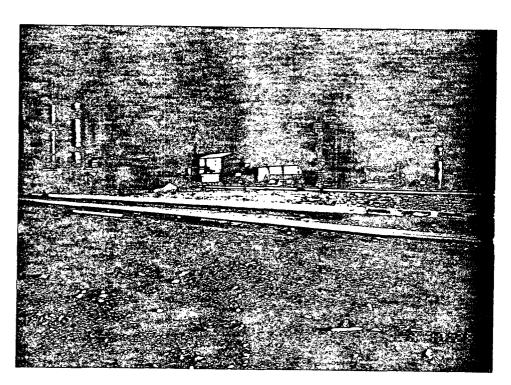
D.1 View facing west of tripod used for purging at Phillips-Lee, prior to unlocking the well cap at MW-1. Tank in left background was used during well installation for mixing bentonite slurry.



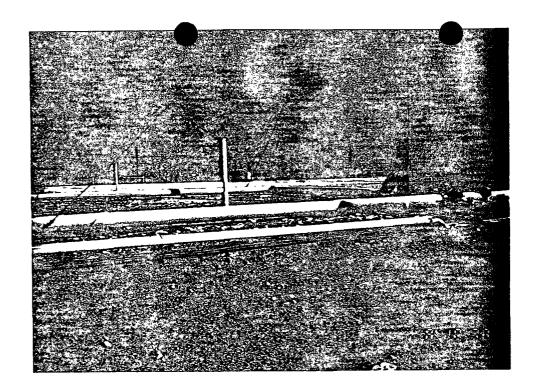
D.2 Facility operator measuring static water level at MW-1; facing north.



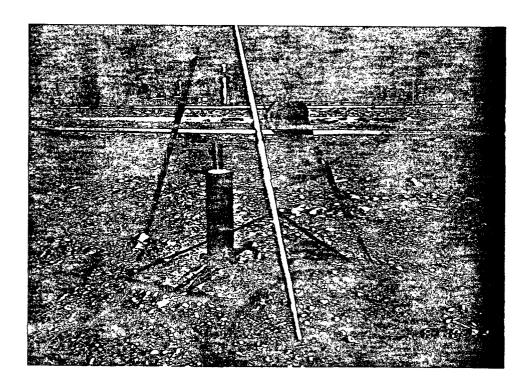
D.3 View of first bailer withdrawn from MW-1, facing south. Note moderate turbidity of sample.



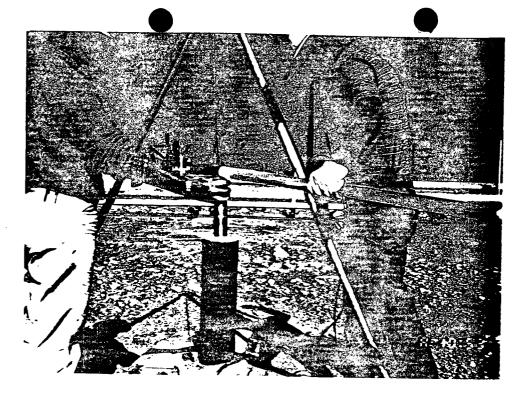
D.4 View from MW-2 facing northwest of Phillips-Lee facility showing location of former surface impoundment (between lateral pipes).



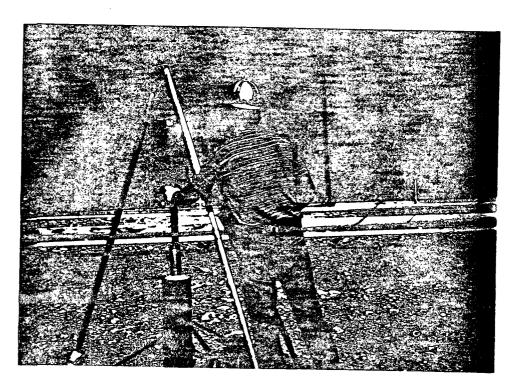
D.5 View facing northeast toward MW-1 from MW-2 showing eastern edge of former surface impoundment. Process pipelines overlie. The former surface impoundment, and the flare stack can be seen on the left. MW-1 is visible in the far background adjacent to the tank.



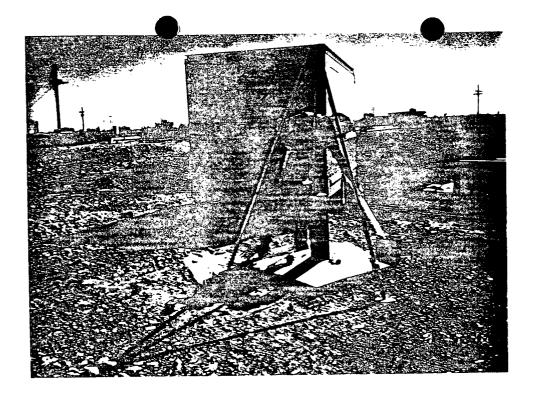
D.6 View of equipment set up prior to purging MW-2. Note former surface impoundment is beyond lateral pipe in background.



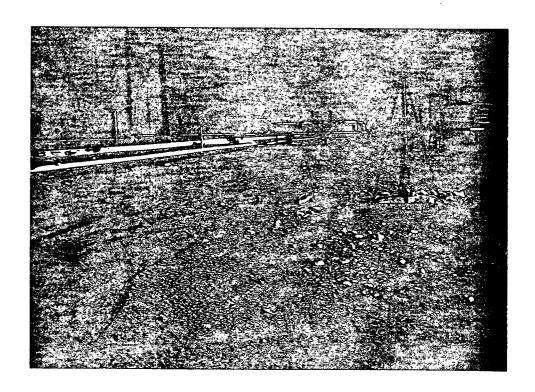
D.7 View facing north of first bailer during purging at MW-2. Note the sample is not turbid.



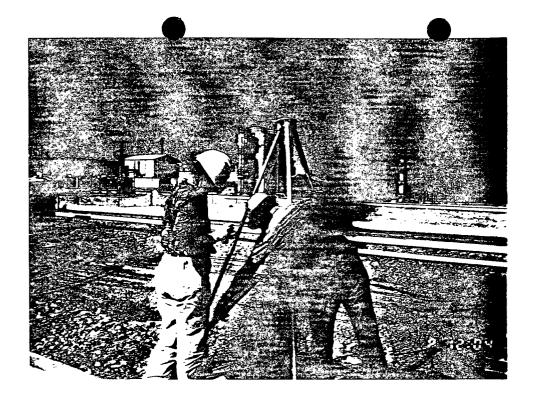
D.8 View facing north of last bailer withdrawn while purging MW-2. Note water is moderate to very turbid.



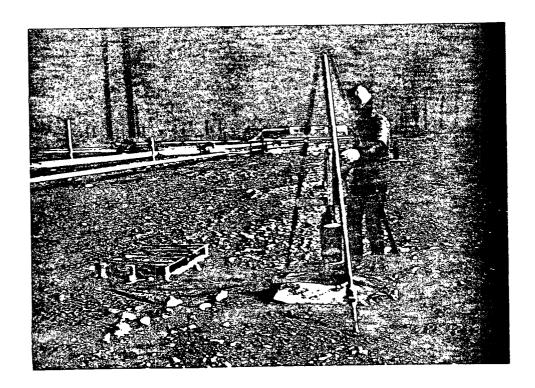
D.9 Purging MW-2, facing southeast. Note low spot in the background that reportedly collects precipitation during rainfall events.



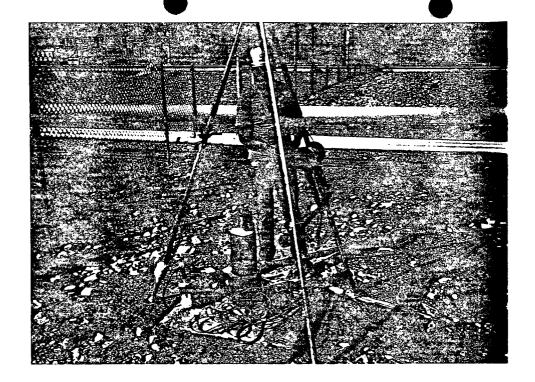
D.10 View facing northeast from monitoring well #3looking toward MW-2. Note low area to the left. Former surface impoundment is located to the left of the lateral pipes.



D.11 View facing northwest during purging of MW-3.



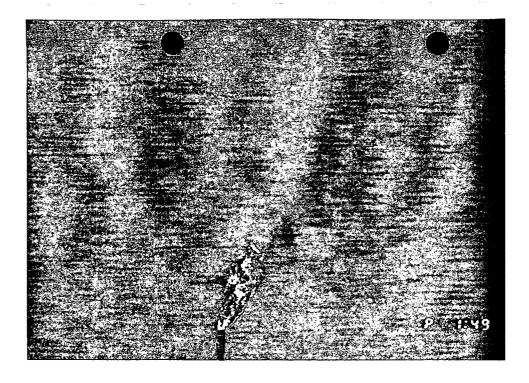
D.12 Purging MW-3, facing east. Note former surface impoundment is to the left of the lateral pipes. MW-2 is visible in the background.



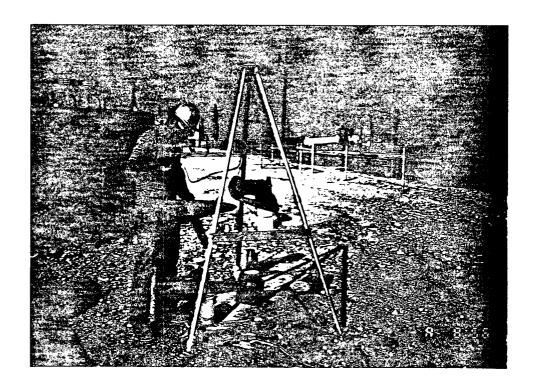
D.13 View facing northwest of equipment set up prior to unlocking well cap at MW-4. Former surface impoundment is to the right background and facility is to the left. Bailer retrieval line is lying on concete apron.



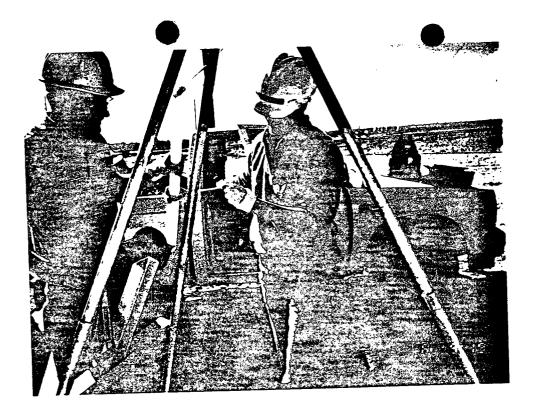
D.14 First bailer retrieved from MW-4 during purging. Note dark sediment in the bottom of the bailer. View is to the southeast.



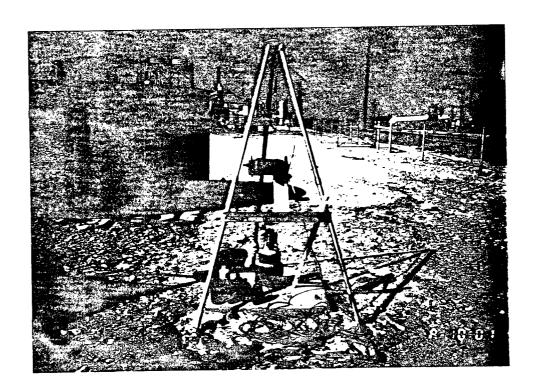
D.15 View facing east showing flare located near MW-2.



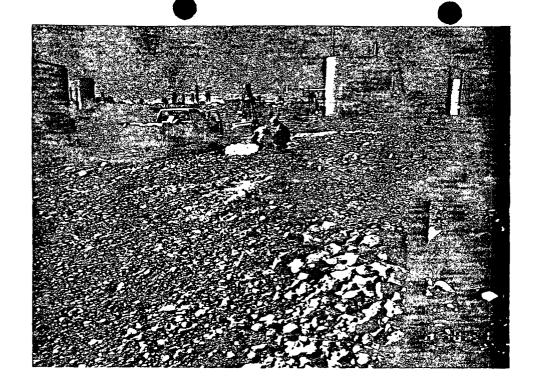
D.16 View facing west showing equipment set up prior to sampling at MW-1, and showing pre-cleaned, dedicated bailer being attached to new polypropylene rope. Note facility operator collects sample in polyethylene located on the corner of the pad.



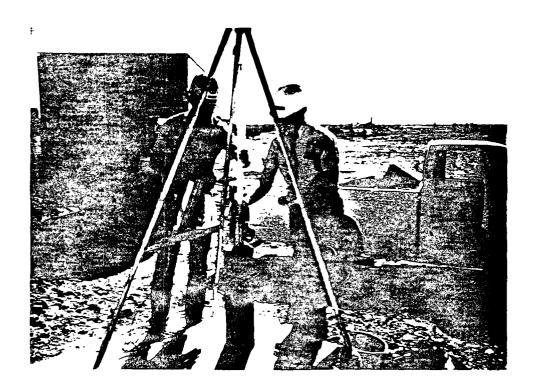
D.17 View facing south, showing technique used to collect VOA samples from MW-1.



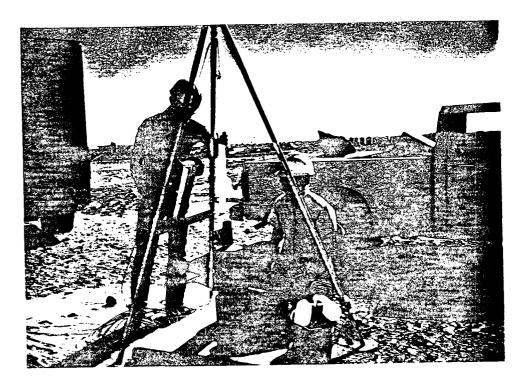
D.18 View facing west showing facility sample containers on pad after completing sample collection at MW-1. The bailer used to sample has just been removed from the retrieval line.



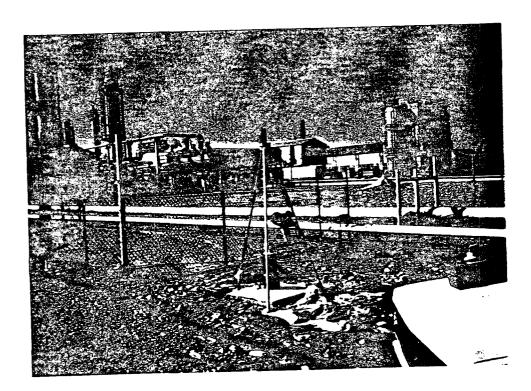
D.19 View facing southwest showing equipment set-up prior to sampling at MW-2. Note guards for underground pipe in the right foreground.



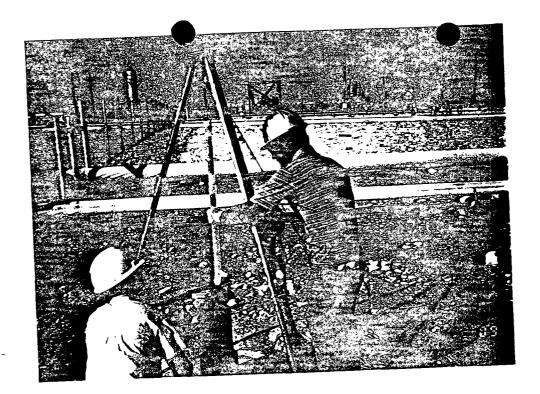
D.20 View facing southwest showing first bailer retrieval from MW-2, preparing to collect VOA samples.



D.21 View facing southeast showing first bailer retrieved while sampling MW-3. Note facility sample containers are in the center foreground.



D.22 Sampling equipment set-up for MW-4, facing northwest. Main plant area is located in the background.



D.23 First bailer retrieved while sampling at MW-4; facing north. Former surface impoundment is located in the background between the lateral pipes.

APPENDIX E

ANALYTICAL RESULTS PHILLIPS LEE CME

COMBUSTION ENGINEERING

December 5, 1988

In reply refer to EMSI88-1851

Steve Muse A.T. Kearney 225 Reinekers Lane, Suite 300 Alexandria, VA 22314

Dear Mr. Muse:

Enclosed are the results for the analysis of twenty-four (24) water samples that were received on October 27 through November 3, 1988 from the following sites:

- 1. Lusk (R26-06-5)
- 2. Artesis (R26-06-02)
- 3. Lee (R26-06-04)
- 4. Eunice (R26-06-03)

The samples were analyzed for turbidity, volatile and semivolatile CLP target compounds. In addition to the CLP target compound list, the samples were also analyzed for 2-Butanone, 1-Methylnaphthalene, (o,m,p) Cresol, and 7,12-Dimethylanthracene. All samples were analyzed and extracted within the contractual holding times. Since all samples carried the same identification, a suffix of three alphabetic letters for the site was added into the original sample ID in order to differentiate between them.

The results of the analysis are summarized on Form I, while the QC results are reported on Form II and III. A copy of the seven EPA defined qualifers is also enclosed for your reference.

If you have any questions, please do not hesitate to call.

Sincerely,

Leon Levan

Program Manager

LL/rt

G.O: 51407-0452

51407-0459

51407-0465

51407-0466

If gel permation chromatography, "GPC Cleanup" was performed, enter "Y" for yes. Otherwise, enter "N" for no, if GPC was not performed.

Enter pH for semivolatile and pesticides/PCBs, reported to 0.1 pH units.

"Date Received" is the date of sample receipt at the laboratory, as noted on the Traffic Report (i.e., the VTSR). It should be entered as MM/DD/YY.

"Date Extracted" and "Date Analyzed" should be entered in a similar fashion. For pesticide/PCB samples, the date of analysis should be the date of the first GC analysis performed. The date of sample receipt will be compared with the extraction and analysis dates of each fraction to ensure that contract holding times were not exceeded.

If a sample has been diluted for analysis, enter the "Dilution Factor" as a single number, such as 100 for a 1 to 100 dilution of the sample. Enter 0.1 for a concentration of 10 to 1. If a sample was not diluted, enter 1.

For positively identified TCL compounds, the contractor shall report the concentrations detected as <u>uncorrected</u> for blank contaminants.

For volatile and semivolatile results, report analytical results to one significant figure if the value is less than 10, and two significant figures above 10.

Report all pesticides/PCB results to two significant figures.

The appropriate concentration units, ug/L or ug/kg, must be entered.

If the result is a value greater than or equal to the quantitation limit, report the value.

Under the column labeled "Q" for qualifier, flag each result with the specific Data Reporting Qualifiers listed below. The Contractor is encouraged to use additional flags or footnotes. The definition of such flags must be explicit and must be included in the Case Narrative.

For reporting results to the USEPA, the following contract specific qualifiers are to be used. The seven qualifiers defined below are not subject to modification by the laboratory. Up to five qualifiers may be reported on Form I for each compound.

The seven EPA-defined qualifiers to be used are as follows:

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture

and a 1 to 10 dilution factor, the sample quantitation limit f_{ℓ} phenol (330 U) would be corrected to:

$$(330 \text{ U}) \times \text{df}$$
 where D = $100 - 7 \text{ moisture}$

and df = dilution factor

at 24% moisture,
$$D = \frac{100-24}{100} = 0.76$$

(330 U) x 10 = 4300 U rounded to the appropriate number of significant figures

For soil samples subjected to GPC clean-up procedures, the CRQ; is also multiplied by 2, to account for the fact that only hal: of the extract is recovered.

- Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identificati criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for both dilution and percent moisture as discussed for the U flag, so that if a sample with 24Z moisture and a 1 to 10 dilution factor has a calculated concentration of 300 ug/L and a sample quantitation limit of 430 ug/kg, report the concentration as 300J on Form I.
- C This flag applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides >10 mg/ul in the final extract shall be confirmed by GC/MS.
- B This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified TCL compound.
- This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and re-analyzed according to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

- This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is remanalyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag.
- A This flag indicates that a TIC is a suspected aldol-condensation product.
- The other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the Sample Data Summary Package and the Case Narrative. If more than one is required, use "Y" and "Z", as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample.

The combination of flags "BU" or "UB" is expressly prohibited. Blank contaminants are flagged "B" only when they are also detected in the sample.

If analyses at two different dilution factors are required (see Exhibit D), follow the data reporting instructions given in Exhibit D and with the "D" and "E" flags above.

2. Form I VOA-TIC and Form I SV-TIC

Fill in all header information as above.

Report Tentatively Identified Compounds (TIC) including CAS number, compound name, retention time, and the estimated concentration (criteria for reporting TICs are given in Exhibit D, Section IV). Retention time must be reported in minutes and decimal minutes, not seconds or minutes:seconds.

If in the opinion of the mass spectral interpretation specialist, no valid tentative identification can be made, the compound shall be reported as unknown.

Include a Form I VOA-TIC or SV-TIC for every volatile and semivolatile fraction of every sample and method blank analyzed, even if no TICs are found. Total the number of TICs found, including aldol-condensation products (but see below), and enter this number in the "Number TICs found If none were found, enter "O" (zero).

If the name of a compound exceeds the 28 spaces in the TIC column, truncate the name to 28 characters. If the compound is an unknown, restrict description to no more than 28 characters (i.e., unknown hydrocarbon, etc.).

1.0 NARRATIVE

A. T. KEARNEY

Contract Nos. 51407-0452, 51407-0459, 51407-0465, 51407-0466

Introduction

The results of analysis of twenty-four (24) water samples (MW-1ART through MW-6ART, MW-1EUN through MW-6EUN, MW-1LEE through MW-6LEE, and MW-1LUS through MW-6LUS) are discussed in this narrative. The samples were received on October 27 and 31, and November 2 and 4, 1988. All samples were received intact.

Sample Extraction and Analysis

The samples were analyzed for volatile organics on November 2, 3, 7 and 8, 1988, within the holding time deadline.

The semivolatile samples were extracted on October 21, November 2, 3, 7 and 16, 1988, and analyzed on November 10-18, 1988.

Analysis for six additional compounds was requested. Methylethyl ketone in the volatile fraction and 1-Methylnaphthalene, (o,m,p)-Cresol and 7,12-Dimethylbenzanthracene in the semivolatile fraction.

Surrogate Recoveries

For the volatile sample MW-4LEE, recovery of 1,2-Dichloroethane-d4 was outside QC limits. For the semivolatile sample MW-2LUS, recovery of 2-Fluorophenol was outside QC limits. For sample MV-3ART, three of the six surrogate compounds were outside QC limits. The sample re-extracted and analyzed with Phenol-d5 diluted out and 2-Fluorophenol below QC limits. For sample MW-6LEE recovery of Phenol-d5 was higher than the QC limits. Besides the above exceptions, the recoveries of surrogates for the remaining samples were within the QC limits.

Matrix Spike/Matrix Spike Duplicate Recoveries

For the volatile sample MW-4ART MS/MSD, only the RPD for 1,1-Dichloroethene was outside QC limits.

Conclusion

The reported data appears good and meets all contractual requirements, except where noted. However, should there be questions or other matters which require clarification, please contact Leon Levan or Sue Ozdemir.

Leon Levan

Project Manager

QC Coordinator

/2-6-88 Date

ENVIRONMENTAL MONITORING AND SERVICES, INC. Analytical Results Summary for A.T. KEARNEY PHILLIPS - LEE PLANT RFS: 80465

Printed on: 05-DEC-88

Client Sample I.D.	EMSI Number	Date Received	Rep	Method	Analyte	Result	Detection Limit (*)		Date Analyzed	Dil Factor
MW-1	CAT-880024	11/02/88	 0rig	# # # # # # # # # #	TURBIDITY	0.77	.020	NTO	11/29/88	1.0
MW-2	CAT-880025	11/02/88	Orig		TURBIDITY	55.0	.020 NTU	NTU	11/29/88	1.0
MW-3	CAT-880026	11/02/88	Orig		TURBIDITY	81.0	.020 NTU	NTU	11/29/88	1.0
MW-4	CAT-880027	11/02/88	0119		TURBIDITY	102.	.020 NTU	NTU	11/29/88	1.0
			đng		TURBIDITY	102.	.020 NTU	NTO	11/29/88	1.0
MW~5	CAT-880028	11/02/88	0ri9		TURBIDITY	. 200	. 020	NTU	11/29/88	1.0
MW-6	CAT-880029 11/02/88	11/02/88	Orig		TURBIDITY	0.00	.020 NTU	NTO	11/29/88	1.0

⁻ To obtain the true detection limit, multiply this value by the value under the "Dil Factor" column.

⁻ Not detected at the true detection limit. Q

VOLATILE ORGANICS ANALYSIS DATA SHEET

71-43-2----Benzene

108-88-3-----Toluene

100-42-5-----Styrene

75-25-2-----Bromoform

591-78-6----2-Hexanone

108-90-7-----Chlorobenzene

100-41-4-----Ethylbenzene

1330-20-7----Total Xylenes

10061-02-6----Trans-1,3-Dichloropropene

79-34-5----1,1,2,2-Tetrachloroethane

108-10-1----4-Methyl-2-Pentanone

127-18-4----Tetrachloroethene

IALYSIS DATA SHEET

Lab Name: EMSI		Contract: 0465	0466		-1155
Lab Code: <u>EMSI</u>	Case No.: ATK-2	SAS No.:	SDG	No.:	
Matrix: (soil/water)	WATER	Lab Sa	ample ID:		
Sample wt/vol:	5.0 (g/mL) MI	Lab F	le ID:	1107	788C06
Level: (low/med)	LOW	Date I	Received:	11/0	02/88
% Moisture: not dec.		Date A	analyzed:	11/0	07/88
Column: (pack/cap)	CAP	Diluti	on Factor	: 1.0	00
CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/			Q
74-83-9 75-01-4 75-09-2 67-64-1 75-15-0 75-35-4 75-34-3 540-59-0 67-66-3 107-06-2 78-93-3 71-55-6 56-23-5 108-05-4 75-27-4 78-87-5 10061-01-5 79-01-6 124-48-1	ChloromethaneBromomethaneVinyl ChlorideChloroethaneMethylene ChloroethaneCarbon Disulf:1,1-Dichloroethane1,2-Dichloroethane1,2-Dichloroethane1,2-Dichloroethane1,1-TrichloroethaneCarbon TetrachaneVinyl AcetateBromodichloroethane1,2-Dichloroethane1,2-Dichloroethane1,2-Dichloroethane1,2-Dichloroethane	oride ide thene thane thane roethane hloride methane oropropene ne methane		10 10 10 50 55 55 55 50 55 55 55 55 55 55 55 55	מממממממממממממממממממממ

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Contract:	0465 0466	
Case No.: ATK-2 SAS No.:	SDG 1	No.:
WATER	Lab Sample ID:	
	Lab File ID:	110788C06
LOW	Date Received:	11/02/88
	Date Analyzed:	11/07/88
CAP	Dilution Factor	: 1.00
COMPOUND NAME	RT EST.	CONC. Q
	Case No.: ATK-2 SAS No.: WATER 5.0 (g/mL) ML LOW CAP CONCER (ug/L	Case No.: ATK-2 SAS No.: SDG WATER Lab Sample ID: Lab File ID: LOW Date Received: Date Analyzed: CAP Dilution Factor CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

\$*/tt	TO THE POST OF	& Dan
Date Received //14/188 No.	P-597 code (59)	53400 (X 53300) 300 [59500 [
COLLECTION DATE & TIME. Y	e 11 01 171 15	COLLECTION SITE DESCRIPTION Phillips - LEE mw-1
COLLECTED BY: M. Smith (Kenney/Centau)		Trinings Lee MW-1
TO: Jim Ashby		OWNER: Phillips
GROUND WATER & HAZARDO NEW MEXICO EID/HED		SITE LOCATION: County: LEA
PO BOX 968 - RUNNELS B SANTA FE, NM 87504-0	· -	Township, Range, Section, Tract: (10N06E24342)
ATIN: Juli Wansle PEONE:	STATION/ WELL	[1 8 5+3 5 E+3 0+4 4 4] CODE: [M W -
- TA	- 	21° 14 181' 1811 10 131° 1-12191' IW
SAMPLING CONDITIONS:		
Dipped Tap	Water Level: Discha	Ground water
pH(00400) Conductivity(Un		0010) Conductivity at 25°C (00094)
7.2 540	umho 65°F %	umho
FIELD COMMENTS: UP madient	w211	_
AMPLE FIEL CR	II TAR ANA	LYSIS REQUESTED:
	۸ . الارد: س وارا	iliFiel - DO NOT FILER
Freserved Pb (<0.1 to 0.1)) ater	AP Scan box next to metal if AA
Non-Filter	* 4 1	guired.
	CAL RESULTS (
PLEMENT ICAP VALUE Aluminum 2L	AA VALUE SILICO	
Barium (1.7)	(Silver	<0.1 ×0.001
Beryllium <0.1 Boron <0.1	Stront Stront	ium /// 0.2
Cadnium <a td="" <=""><td>KY 0.053 Vanadi</td><td><u> </u></td>	KY 0.053 Vanadi	<u> </u>
Calcium 610. Chromium <0.1	V Got 9043 Arseni	C (Y 0.024)
Cobalt <0.05	Seleni	<u> </u>
Copper < 0.1 Iron 23. X	X<0.05 Mercur	Y
Lead <u><0.1</u>	X 0,030	
Magnesium 13. Manganese 0.91 X		— <u> </u>
Molybdenum <0.1 Nickel <0.1	X<0.05	
TAB COMMENTS:	5.0m2 HNO3 adial at SLD.	DIGESTED. ((1))
Ca(1et) = 0.06		olija former.
Children by ICAP Analys	st: <u> </u>	Reviewer:
Smith Moster Analysis Da	ate: (/12/14/88	Date Reviewed:

DATE RECEIVED 1/14/88 N	AB USER 59300	D 59600 1 OTHE	ER: 5	3300	Eil)
Collection DATE	SITE Sample location Phillips	-LEE				
Collection TIME 09/5	ATION Collection site description		-			
Marine Smith Klarney Centary						
Prelie Paval						
GROUND WATER & HAZARDOUS WASTE BUREAU (1823)						
FINAL NM ENVIRONMEN	NT IMPROVEMENT DIVISION/HE	ED Dean				
PO Box 968 Santa Fe, NM 8750	GROUND Y	ייוי/יוזי	<u>:- 123::3 W</u>	ASTE		
Attn: Julie	Wandow		ਹੈ ਹੈ ਹੈ	\ U		
•			tion/	MW-1	/	
SAMPLING CONDITIONS		0-	"Phi	11,05		
	Water level 94.84 f-+	Discharge		Sample typ	е	
pH (00400) 7.2	Conductivity (Uncorrected) 540 µmho	Water Temp. (00010) 65°F	*	Conductivit	y aı 25°C	(00094) µmho
Field comments Upana	dient well		7			
10						· · · · · · · · · · · · · · · · · · ·
DAMOLE SIEL DATE ATMENT						
No. of samples 1 Whole sample						
submitted	(Non-filtered) 0.45 μmen	mbrane filter A: 2 ml	H ₂ SO ₄ /	L added		
NA: No acid added	GARAGE (MS)	•	÷			
ANALYTICAL RESULTS from						
NF, NA	Units Date analyzed	F, NA			Units I	Date analyzed
Conductivity (Corrected) 25°C (00095)	μmho	☐ Calcium (00915) ☐ Magnesium (00925)			mg/l mg/l	·
		☐ Sodium (00930)			mg/l	
☐ Total non-filterable residue (suspended)		Potassium (00935)			mg/l	
(00530)	mg/l		131			
Traff K. Dill W	——————————————————————————————————————	☐ Bicarbonate (00440)	P	ECEINED	mg/l	
* Other: TURBIDITY	7760 11/19	☐ Chloride (00940)			mg/l	
☐ Other:	7700 mgn 11hig	•	- RI NOV		-	
	Ziti	☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300)	i∛OV	2 0 15%	mg/l mg/l ; mg/l	
☐ Other:	Ziti "mgn	☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300)	i∛OV	2 0 15%	mg/l mg/l ; mg/l	
☐ Other: ☐ Other: ☐ NF, A-H₂SO₄ ☐ Nitrate-N + , Nitrate-N	7760 July	☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300)	i∛OV	2 0 198	mg/l mg/l ; mg/l	
☐ Other:		☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300) ☐ Other: ☐ F, A-H₂ SO₄ ☐ Nitrate-N + Nitrate-N	i∛OV	2 0 15%	mg/l mg/l ; mg/l	
☐ Other: ☐ Other: ☐ Nitrate-N + , Nitrate-N total (00630) ☐ Ammonia-N total (00610)	7760 July	☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300) ☐ Other: ☐ F, A-H₂ SO₄ ☐ Nitrate-N + Nitrate-N ☐ dissolved (00631)	i∛OV	2 0 198 S WASTE SI	mg/l mg/l ; mg/l	
☐ Other: ☐ Other: ☐ NF, A-H₂SO₄ ☐ Nitrate-N + , Nitrate-N total (00630) ☐ Ammonia-N total (00610) ☐ Total Kjeldahl-N		☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300) ☐ Other: ☐ F, A-H₂ SO₄ ☐ Nitrate-N + Nitrate-N	i∛OV	Z C ICA	mg/l mg/l mg/l mg/l	
☐ Other: ☐ Other: ☐ Other: ☐ Other: ☐ NF, A-H₂SO₄ ☐ Nitrate-N + , Nitrate-N total (00630) ☐ Ammonia-N total (00610) ☐ Total Kjeldahl-N (☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue ☐ (dissolved) (70300) ☐ Other: HA ☐ F, A-H₂ SO₄ ☐ Nitrate-N + Nitrate-N ☐ dissolved (00631) ☐ Ammonia-N dissolved	i∛OV	2 0 10% S WASTE SI	mg/l mg/l ma/l mg/l	
☐ Other: ☐ Other: ☐ NF, A-H₂SO₄ ☐ Nitrate-N + , Nitrate-N total (00630) ☐ Ammonia-N total (00610) ☐ Total Kjeldahl-N	mg/!	☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue (dissolved) (70300) ☐ Other: HA F, A-H₂ SO₄ ☐ Nitrate-N +, Nitrate-N dissolved (00631) ☐ Ammonia-N dissolved (00608) ☐ Total Kjeldahl-N (i∛OV	2 0 10% S WASTE SI	mg/l mg/l mg/l mg/l	
☐ Other: ☐ Other: ☐ Nitrate-N +, Nitrate-N total (00630) ☐ Ammonia-N total (00610) ☐ Total Kjeldahl-N (Chloride (00940) Sulfate (00945) Total filterable residue (dissolved) (70300) Other: HA F, A-H ₂ SO ₄ Nitrate-N + Nitrate-N dissolved (00631) Ammonia-N dissolved (00608)	i∛OV	2 0 10% S WASTE SI	mg/l mg/l ma/l mg/l	
☐ Other: ☐ Other: ☐ Nitrate-N +, Nitrate-N total (00630) ☐ Ammonia-N total (00610) ☐ Total Kjeldanl-N () ☐ 'Chemical oxygen demand (00340)		☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue (dissolved) (70300) ☐ Other: HA F, A-H₂ SO₄ ☐ Nitrate-N +, Nitrate-N dissolved (00631) ☐ Ammonia-N dissolved (00608) ☐ Total Kjeldahl-N (ZARDOU.	2 0 16 MASTE SI	mg/l	
Other: NF, A-H₂SO₄ Nitrate-N + , Nitrate-N total (00630) Ammonia-N total (00610) Total Kjeldahl-N () Chemical oxygen demand (00340) Total organic carbon () Other: Other:		☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue (dissolved) (70300) ☐ Other: HA F, A-H₂ SO₄ ☐ Nitrate-N +, Nitrate-N dissolved (00631) ☐ Ammonia-N dissolved (00608) ☐ Total Kjeldahl-N () ☐ Other:	i-lOV ZARĐOU:	2 0 199 S WASTE SE	mg/l	
Other: NF, A-H₂SO₄ Nitrate-N + , Nitrate-N total (00630) Ammonia-N total (00610) Total Kjeldanl-N () Chemical oxygen demand (00340) Total organic carbon () Other: Dother:	mg/l	☐ Chloride (00940) ☐ Sulfate (00945) ☐ Total filterable residue (dissolved) (70300) ☐ Other: HA F, A-H₂ SO₄ ☐ Nitrate-N +, Nitrate-N dissolved (00631) ☐ Ammonia-N dissolved (00608) ☐ Total Kjeldahl-N () ☐ Other: Analyst	ZARDOU.	2 0 16 MASTE SI	mg/l	
Other: NF, A-H₂SO₄ Nitrate-N + , Nitrate-N total (00630) Ammonia-N total (00610) Total Kjeldahl-N () Chemical oxygen demand (00340) Total organic carbon () Other: Other:	mg/l	Chloride (00940) Sulfate (00945) Total filterable residue (dissolved) (70300) Other: HA F, A-H ₂ SO ₄ Nitrate-N +, Nitrate-N dissolved (00631) Ammonia-N dissolved (00608) Total Kjeldahl-N () Other: Analyst	ZARDOU.	E WASTE S	mg/l	

wnn

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

SCIENTIFIC LABORATORY DIVISION

Albuquerque, NM 87106 — (50) 1-2555

700 Camino de Salud NE

Albuquerque, NM 87106	Telephone: (505)841-2500
- 11 -	Telephone. (303)841-2300
Date Lab TAD Cod User	☐ 59400 ☐ 53400 💢 53300
Received // 4/88 No. IP-599 User	☐ 59300 ☐ 59500 ☐
COLLECTION DATE & TIME: YY mm dd hh	mm COLLECTION SITE DESCRIPTION 45 Phillips - CEE MW-Z
COLLECTED BY:	The second of th
M. Smith (Keaney (Centaux)	
TO:	OWNER: Philips
	Onstalles Fright
Jim Ashby	
GROUND WATER & HAZARDOUS WASTE BUR	
NEW MEXICO EID/HED PO BOX 968 - RUNNELS BUILDING	County: LEA
SANTA FE, NM 87504-0968	Township, Range, Section, Tract: (10N06E24342)
•	[1 8 5+3 5 E+3 0+4 4 4
ATTN: Julie Wanslow	
PHONE: STATI	ON/ WELL CODE: MW-12
TAMITMINE TANK	
SAMPLING CONDITIONS:	ITUDE: [3 2 ° 4 8 ' N 1 0 3 °]- 2 9 W
Bailed □ Pump Water Level:	Discharge: Sample Type:
Dipped Tap 94.84FT	Ground water
pH(00400) Conductivity(Uncorr.) Wate	r Temp. (00010) Conductivity at 25°C
7,2 540 µmho 6	(00094)
FIELD COMMENTS: Down Gradient well	Timio ,
SAMPLE FIELD TREATMENT Check proper boxes:	FIRE ACIDIFIEL - DO NOT FILE
WPN: Water WPF: Water	I ICAP Scan
Preserved w/HNO, Preserved w/HNO,	Mark box next to metal if AA
Non-Filtered Filtered 5	is required.
ANALYTICAL RE	SULTS (MG/L)
ELEMENT ICAP VALUE AA VALUE	ELEMENT ICAP VALUE AA VALUE
Aluminum 5.0	Silicon 18.
Barium 0.9 (m5) X (0.9)	Silver <a><a><a><a><a><a><a><a><a><a><a><a><a><
Beryllium <0.1 Boron 0.2	Strontium 2.2 Tin 0.1
Cadmium <0.1 X <0.001	Vanadium <0.1
Calcium 430.	Zinc 0.2
Chromium <0.1 TX <0.005	Arsenic XO.031
Cobalt < 0.05	Selenium
Copper < 0. X < 0. 0.5 Iron	Mercury
Lead $\langle 0.1 \rangle$	RECEIVED
Magnesium 35.	
Manganese 1. X	FEB 1 7 1989
Molybdenum <0.	
Nickel <0.1 X < 0.05	HAZARDOUS WASTE SECTION
LAB COMMENTS: 5.0 - 4NO3 addit at	HAZARDOUS WASTE SECTION DIGESTED. 11/16/189
oc Reliniquished by ICAP Analyst:	Reviewer: Din Lappin
South 11/03/88 ICAP Analyst: 17/14/	Date Reviewed: 2/9/89
7.3 TV ANIGHYDID DOLE. T / / / (THE MENTERCY. DO 11.0

SCIENTIFIC LABORATORY DIVISION
700 Camino de Salud NE Albuquerque, NM 87106 — (5 41-2555

WNA

GENERAL WATER CHEMISTRY and NITROGEN ANALYSIS

DATE RECEIVED //	4 188 N	8WC-457	USER 5930	o 🗆 59600 💢 C	THER: 5	3 3 00	
Collection DATE		SITE	Sample location	Phillips - LEE			
Collection TIME		ATION	Collection site description			·	
Collected by - Person/A		men Centar	1	$m\omega-2$			
. :		7			RECE	IVED	
- · · ·	• • • • • • • • •	r Dean					
SEND SHO	NVIRONMEN	A HAZARDOUS IT IMPROVEME	WASTE BUREA NT DIVISION/H	U ED	NOV 2	1 1983	
REPORT POB	ox 968 a Fe, NM 8750	4-0068					
تن : Attn	. 0 .	ekindore	· · · · · · · · · · · · · · · · · · ·	CPOI	ND WATER!	TAZIALDUS WAST	r E
	0		,		Station/	REAU 2	
					weti code ///	W-2-	
SAMPLING COI		14/etes to val		100	ρ_r	1111185	
1 /	□ Pump □ Tap	Water level 97,	02 ft	Discharge		Sample type Evound L	inter
pH (00400) _	6.8	Conductivity (Unco	orrected)	Water Temp. (00010)	74	Conductivity at 25	
Field comments	010	25		68°F	X		μmho
	Down &	ralient	. well		<u> </u>		
	· · · · · · · · · · · · · · · · · · ·						
SAMPLE FIELD	TREATMENT	Chack prope	ar haves				
No. of samples	1 MA	·	F: Filtered in	field with	-111 60 (
submitted	1 DO NO	(Non-filtered)	0.45 μmei	mbrane filter	ml H ₂ SO ₄ /		
NA: No acid	d added 🗆 C	Other-specify:		•			
ANALYTICAL R	ESULTS from	SAMPLES					
NF, NA			Units Date analyze	d F, NA		Units	Date analyzed
☐ Conductivity (C 25°C (00095)	orrected)		bo	☐ Calcium (00915)		mg/i	
25 0 (00033)			µmho	 ☐ Magnesium (00925) ☐ Sodium (00930) 		mg/lmg/l _	
 Total non-filtera residue (susper 			•	☐ Potassium (00935)		RECEIVE DON	
(00530)		>2000	mg/l	☐ Bicarbonate (00440) ☐ Chloride (00940)		mg/l .	
Other: TURA	אין עופ	7000	-1117	□ Sulfate (00945)	IVO	JV Z 18mgU.	
□ Other:	/			☐ Total filterable residue ☐ (dissolved) (70300)		ma/l	
NF, A-H ₂ SO ₄				Other:		BUS WASTE SECT	ION
☐ Nitrate-N+, Nit	rate N			F, A-H ₂ SO ₄	*****	······································	
total (00630)			mg/l	□ Nitrate-N+, Nitrate-	N		
☐ Ammonia-N tota ☐ Total Kjeldahl-N			mg/l	dissolved (00631)		mg/l	
()			mg/l	Ammonia-N dissolve (00608)	e d	mg/l	
☐ Chemical oxyge demand (00340			mg/l	☐ Total Kjeldahl-N			
☐ Total organic ca				Other:	· ·	mg/l .	
() □ Other:			mg/l	-			
☐ Other:				Analyst		- 1 .T	wed by
Laboratory remarks				1 1 1 1	111	4 84 45	
l	Analyze	Turbidity	immed. as	to shaking.			
COC Re	linguiste	l by U1	nume Som	# 11-03-89	at 5	pm	
L	<u>U</u>	/				·	

Albuquerque, NM 87106	Telephone: (505)841-2500
	Telephone. (505)641-2500
Date Lab TO-101 User	☐ 59400 ☐ 53400 ※ 53300
Received // 1/ 1/ 1/ 1/ 1/ No(1/ -60/ Code COLLECTION DATE & TIME: yy mm dd hh m	☐ 59300 ☐ 59500 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
[22]	Philips-LEE mw-3
COLLECTED BY:	7111175
Month (Kenney/Centare)	
TO:	OWNER: Ph.II.P.2
Jim Ash by	
GROUND WATER & HAZARDOUS WASTE BURE	AU SITE LOCATION:
NEW MEXICO EID/HED	County: LEA
PO BOX 968 - RUNNELS BUILDING SANTA FE, NM 87504-0968	Township, Range, Section, Tract: (10N06E24342)
	[1]8 5+3 5 E+3 0+4 4 4
ATIN: Julie Wanslow	_
PHONE: STATIO	N/ WELL CODE: [M W - 3
_ IATITUDE IONGI	TUDE: [3]21° 4181′ N1110131°] - [2191′] W
SAMPLING CONDITIONS:	1002. [-]-] [[] [M] [[] [] []
Bailed Pump Water Level:	Discharge: Sample Type:
☐ Dipped ☐ Tap 96.01 F7	Temp. (00010) Conductivity at 25 C
pH(00400) Conductivity(Uncorr.) Water	1 (6666)
	(00094) umho
FIELD COMMENTS: Down gradient well	
SAMPLE FIELD TREATMENT	LAB ANALYSIS REQUESTED:
Check proper boxes:	Field Acidified - Do Not Filter
WPN: Water	ICAP Scan
Preserved w/HNO3 Preserved w/HNO3 Non-Filtered Filtered	Mark box next to metal if AA is required.
ANALYTICAL RES	
ELEMENT ICAP VALUE Aluminum 4.8	ELEMENT ICAP VALUE AA VALUE Silicon /4.
Barium a3 X O14	Silver <0.1 <0.001
Beryllium <0.	Strontium O.
Boron Oil	Tin 0.1
Cadmium ${46}$.	Vanadium <o. <o. <="" td="" zinc=""></o. >
Calcium 46. Chromium <0. \ \tau \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Zinc < 0.1 Arsenic $ = \sqrt{0.29} $
Cobalt < 0.05	Selenium
Copper . <0.1 x < 0.05	Mercury
Iron 2.4×1 Lead $< 0.1 \square \times 0.006$	<u> </u>
Lead <0. Tro. orb	
Manganese 019 A	RECEIVE
Molybdenum < o.	**************************************
Nickel <0.1 X < 0.05	EB,
LAB COMMENTS: 5.0ml HNO3 add	ed at SLD. HAKARDO. 11/14/89 DIGESTED.
The state of the s	ous we
COC Rexinguistal	
In M Smith 11/03/88 ICAP Analyst: 17/14/ at 50 m. Analysis Date: 12/14/	Reviewer: The Salar
Analysis Date: V12/14/	Date Reviewed: 2/6/59
w, J	

	700 Camino de S	BORATORY DIVISION FAILUR NE M 87106 — (50 11-	• •			VATER CHEMIST OGEN ANALYSIS	
DATE RECEIVED //	4188 1	8411-4579	USER 5930	o □ 59600 D OT	HER:	3300	
Collection DATE		SITE	Sample location PV	1/2 =			
Collection TIME		INFORM- ► ATION		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
Collected by - Person/A		arrey Centre	Collection site descriptio	$M\omega - 3$	RECET	A E D	
Marianne	mit (Ma	arrey centre	<u>k</u>		RECEI		·
FINAL NM E REPORT PO B	UND WATER	& HAZARDOUS NT IMPROVEME 14-0968	WASTE BUREA NT DIVISION/H			BUNEAU	
		• • • • •			Station/ well code M((1-3	
0 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	IDITIONS				Owner (i)	111 100	
SAMPLING CON	D Pump	Water level		Discharge	rn	Sample type /	
	□ Тар	96	,81 fr	O.Sona.ge		Ground water	<u>ئے</u>
pH (00400) 7	,3	Conductivity (Unco	prrected) 2 µmho	Water Temp. (00010) 68°F	×	Conductivity at 25°C (00094) µmho
Field comments	Davia	grabent	- (1080				
No. of samples submitted NA: No acid ANALYTICAL R	X NF	Other-specify:	□ F: Filtered in 0.45 μme	mbrane filter A: 21	ml H₂SO₄/l		
NF. NA			Units Date analyze				ate analyzed
Conductivity (C 25°C (00095)	orrected)		µmho	☐ Calcium (00915) ☐ Magnesium (00925)		mg/l mg/l	
☐ Total non-filtera	blo			☐ Sodium (00930)		mg/l	
residue (susper				☐ Potassium (00935) ☐ Bicarbonate (00440)		mg/l	
(00530) Other: Turk	,, d, ty	154	mg/l ////	☐ Chloride (00940)		MECETY EDG/	
☐ Other:	,			□ Sulfate (00945) □ Total filterable residue	A L	mg/l	
☐ Other:				(dissolved) (70300)	14(OV 22 1984	
NF, A-H ₂ SO ₄				→ D Other:	HAZADO		
				F, A-H ₂ SO ₄	MAKAKU	MIS WASTE CEUTIC	
☐ Nitrate-N + , Nit total (00630)	rate-N		mg/l	□ Nitrate-N+, Nitrate-N			
☐ Ammonia-N tot	al (00610)		mg/i	dissolved (00631)		mg/l	
☐ Total Kjeldahl-N	!		mg/l	☐ Ammonia-N dissolved	đ		
☐ Chemical oxyg				─ (00608) □ Total Kjeldahl-N		mg/l	
demand (0034)			mg/l	- ()		mg/l	
()		· · · · · · · · · · · · · · · · · · ·	mg/l	Other:			
☐ Other: ☐ Other:				Analyst		eported Reviewed	by
Laboratory remarks	Amalus o	Turbidit	media	tedy atte st	King		
COCK	Celinguish	ed by M.	come Some	11/3/88 Q	5 pm		
SI D 700				•	• •		

700 Camino de Salud NE Albuquerque, NM 87106	HEAVY MEIAL ANALYSIS FURINI Telephone: (505)841-2500
Date Received // 4 88 No. + CP-603 Code COLLECTION DATE & TIME: YY mm dd hh	☐ 59300 ☐ 59500 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
COLLECTED BY:	
M Smith (Kearney Century)	
TO: Jin Ashby	OWNER: Phillips
GROUND WATER & HAZARDOUS WASTE BUR NEW MEXICO EID/HED PO BOX 968 - RUNNELS BUILDING SANTA FE, NM 87504-0968	County: LEA Township, Range, Section, Tract: (10N06E24342)
ATTN: Julie Wanslow PHONE: STATION	[/ 8 5+3 5 E+3 6+4 4 4 ON/ WELL CODE: [A] [- 4
	ITUDE: [3]2]" 4 8
SAMPLING CONDITIONS:	110bE. 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
⊠ Bailed ☐ Pump Water Level:	
☐ Dipped ☐ Tap 96.72 ft pH(00400) Conductivity(Uncorr.) Wate:	r Temp. (00010) Conductivity at 25°C
	(9°F 20 umho
	umho
FIELD COMMENTS: Down gradient well	
SAMPLE FIELD TREATMENT Check proper boxes: WPN: Water	IAB ANALYSIS REQUESTED: Field Acid, Field - Do Not Filth M ICAP Scan Mark box next to metal if AA is required.
ANALYTICAL RE	
ELEMENT ICAP VALUE Aluminum 1.7 Barium 0.6	ELEMENT ICAP VALUE AA VALUE Silicon /5. Silver <0.) X<0.00.
Beryllium <0.1 Boron 0.2	Strontium 0.9 Tin 0.1
Cadmium <0.1 \square $\times < 0.001$ Calcium $ 60.$	Vanadium <0.1
Chromium <0,1	Arsonic Vacuation
Cobalt <0.05	Sele ium
Copper $\frac{\langle 0.1 \rangle}{3.3}$ $\frac{1}{3}$	Mercu.ry
Lead $\frac{2.3}{\langle 0.1 \rangle}$ $\square \times \langle 0.005 \rangle$	Drop.
Magnesium 18.	-RECEIVED
Manganese <u>0.78 y</u> Molybdenum <0.1'	FEBT 7.194
Nickel $\frac{\langle 0, 0 \rangle}{\langle 0, 0 \rangle}$	
LAB COMMENTS: 5.0ml HW	03 added at SLD. WASIENDING DIGESTED.
oc redinguisted M Smith 11/03/88 ICAP Analyst:	Reviewer: 14. 11111111
\$ 50M - Analysis Date: 12/14	Date Reviewed: 36/4

announce:							WATER CHEM ROGEN ANALY	
DATE RECEIVED /	11 4188 1	AB W.F 458	USER D	9300	☐ 59600 🛣 OT	THER: 5	3300 E	ID
Collection DATE 98 1/ 0 / Collection TIME		SITE INFORM-	Sample location		illips - LEE			
1400		ATION	Collection site desc	notion				
Collected by - Person		earnes)			mw-4		RECEIVE)
SEND GRO	ENVIRONMEN Box 968 ta Fe, NM 8750	& HAZARDOUS NT IMPROVEME	S WASTE BUF ENT DIVISION	REAU N/HEI	D	GROUNT	NOV 21 TOO WITEP/HAZI DE	G::3 WASTE
					` .			
SAMPLING CO	ONDITIONS					P_h	illips	
Bailed Dipped	☐ Pump ☐ Tap	Water level 96	,72 ft	C	Discharge		Sample type Ground	water
pH (00400) 7	./	Conductivity (Unc			Water Temp. (00010) 6 9 F	%	Conductivity at 25	°C (00094) µmho
Field comments	D- 4	1 . 4	- //			7	<u></u>	
	Down g	iadient	well					
SAMPLE FIEL	D TREATMEN	T - Check prop	er boxes					
SAMPLE FIELD TREATMENT — Check proper boxes No. of samples submitted / NF: Whole sample (Non-filtered) □ F: Filtered in field with □ A: 2 ml H₂SO₄/L added								
submitted (Non-filtered) 0.45 μmembrane filter 2.1.1.12004/2.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.								
ANALYTICAL	DESILITS from	CAMPLEC						
NF. NA	NESULIS IIOII	ISAMPLES	Units Date ana	ivzed	F, NA		Units	Date analyzed
☐ Conductivity (Corrected)				☐ Calcium (00915)			
25°C (00095)	Confected)		_µmhо		☐ Magnesium (00925)		RECEIVED!	
					☐ Sodium (00930)		mg/l	
Total non-filter residue (susp					☐ Potassium (00935)		mg/l .	
(00530)			mg/l]	☐ Bicarbonate (00440)			
Other: Tu	1811 17	<i>3</i> (^			☐ Chloride (00940) ☐ Sulfate (00945)	HAZADO	mg/l	
Other:	/		- - :		☐ Total filterable residue	STICE OF THE	OUS WASTE SEC	1100
☐ Other:			<u> </u>		(dissolved) (70300)		ma/i	CLORA
NF, A-H ₂ SO ₄	· · · · · · · · · · · · · · · · · · ·		<u> </u>		□ Other:			
☐ Nitrate-N+, N	litrate-N				F, A-H ₂ SO ₄			
total (00630)				1	☐ Nitrate-N + , Nitrate-N			
☐ Ammonia-N to	, ,		_ mg/l		dissolved (00631)		mg/l	
☐ Total Kjeldahl-	N		mo/l		☐ Ammonia-N dissolve	d		
☐ Chemical oxy			_ mg/l		(00608)	·	mg/l .	
demand (003-		· · · · · · · · · · · · · · · · · · ·	mg/l		☐ Total Kjeldahl-N	·	-a1	
☐ Total organic (carbon	•	ma/l		U Other:		mg/l .	

SLD 726 (8/85)

Laboratory remarks
Analy 72

☐ Other:

□ Other:

DISTRIBUTION: WHITE — EID, GW&HW Bureau

CANARY - WS System

Analyst

PINK — EID Local Office

Date Reported

GOLDENROD - SLE

Reviewed by

Albuquerque, NM 87106 Telephone: (505)841-2500 Lab_ 59400 53400 Date User **X** 53300 114188 No. ICP-605 ☐ 59500 Received 59300 Code COLLECTION DATE & TIME: COLLECTION SITE DESCRIPTION yy mm | dd | hh | mm 09 00 Phill, DS - LEE MW-5 COLLECTED BY: MSmith (kearney / Centaur) OWNER: Phillips TO: Jim Ashby GROUND WATER & HAZARDOUS WASTE BUREAU SITE LOCATION: > NEW MEXICO EID/HED County: LEA PO BOX 968 - RUNNELS BUILDING SANTA FE, NM 87504-0968 Township, Range, Section, Tract: (10N06E24342) 111815+3151E+310+414141 Julie Wanslow STATION/ WELL CODE: PHONE: LATITUDE, LONGITUDE: 3121° 14181′ | M 110131° 1-12191′ | W SAMPLING CONDITIONS: □ Bailed ☐ Pump Water Level: Discharge: Sample Type: qsT 💢 Distilled water □ Dipped pH(00400) [Conductivity(Uncorr.)] Water Temp.(00010) Conductivity at 25 C (00094) °c umho umho PIELD COMMENTS: EQUIPMENT Blank SAMPLE FIELD TREATMENT LAB ANALYSIS REQUESTED: Field AcidiFiel - DO NOT FI/ter Check proper boxes: WPN: Water Preserved w/HNO3 Mark box next to metal if AA WPF: Water Preserved w/HNO3 Non-Filtered Filtered is required. ANALYTICAL RESULTS (MG/L) ELEMENT ICAP VALUE AA VALUE ELEMENT ICAP VALUE AA VALUE Silicon Aluminum <0.1 <0.1 Y <0.1 Barium <0.1 Silver <0.1 X<0.001 Beryllium Strontium <0.1 <0.1 Boron Tin CO.1 <0.1 □ X < 0.001 Vanadium Cadmium <0./ <0.1 Zinc Calcium **C**0.1 □X < 0.005 Chromium Arsenic X < 0.005 <0.1 Sele um X <0.005 Cobalt KO.05 × <0.05 Mercu. y Copper CO.1 CO.1 Iron RECEIVED 1 X < 0.005 Lead <0.1 ZO.1 Magnesium Manganese 20.05 X Molybdenum <0.1 HAZARDOUS WASTE SECTION Nickel X <0.05 C0.1 5.0 ml HNO3 added at SLD. LAB COMMENTS: TOC: Relinquished Reviewer: 74 M Smith 1/03/86 ICAP Analyst:_ Spm. Analysis Date: Date Reviewed:

HEAVY METAL ANALYSIS FORM

700 Camino de Salud NE

OWMY SCIENTIFIC LABORATORY DIVISION GENERAL WATER CHEMISTRY 700 Camino de Salud NE and NITROGEN ANALYSIS Albuquerque, NM 87106 -- (50 USER CODE DATE RECEIVED ろろひひ OTHER: 59300 **59600** SITE INFORM- > Sample location -LEE **ATION** Collection site description MW 5 AttN: Chris Dear **GROUND WATER & HAZARDOUS WASTE BUREAU** SEND NM ENVIRONMENT IMPROVEMENT DIVISION/HED FINAL PO Box 968 REPORT GROUND WATER THAT THE Santa Fe, NM 87504-0968 BURLAU MW-5 well code Phillips **SAMPLING CONDITIONS Bailed** □ Pump Water level Sample type Discharge distilled Dipped ☐ Tap pH (00400) Conductivity (Uncorrected) Conductivity at 25°C (00094) Water Temp. (00010) °C μ mho µmho. Field comments EQUIPMENT SAMPLE FIELD TREATMENT — Check proper boxes No. of samples Whole sample Filtered in field with □ F: □ A: 2 ml H₂SO₄/L added submitted (Non-filtered) 0.45 µmembrane filter

ANALYTICAL RESULTS from SAMPLES			
NF, NA	Units Date analyzed	F, NA	Units Date analyzed
Conductivity (Corrected) 25°C (00095) Total non-filterable	_µmho	□ Calcium (00915) □ Magnesium (00925) □ Sodium (00930) □ Potassium (00935)	mg/l mg/l RECc!Vmg/l
residue (suspended) (00530) Other: TuRBiDity Other: Other:	mg/l//	□ Bicarbonate (00440) □ Chloride (00940) □ Sulfate (00945) □ Total filterable residue (dissolved) (70300) □ Others	HAZARDOUS WASTE SECTION
NF, A-H ₂ SO ₄		Other:	
 Nitrate-N + , Nitrate-N total (00630) Ammonia-N total (00610) Total Kjeldahl-N () Chemical oxygen demand (00340) Total organic carbon () Other: 	mg/l _ mg/l _ mg/l _ mg/l	F, A-H ₂ SO ₄ Nitrate-N + , Nitrate-N dissolved (00631) Ammonia-N dissolved (00608) Total Kjeldahl-N () Other:	mg/l mg/l mg/l
□ Other:		Analyst	Date Reported Reviewed by
Laboratory remarks Analyse Tunbridity im COC Relinguisted by	med. after Mariane 8	shaking. mith 11/3/83	8 @ 5 pm

• DAMES CARRES • TIP	*** ***		III A I IAIR	- 1 / m / 1 1 1 / m	TOID FURIVE
111	uquerque, NM 87106	_	Telep	hone: (505)841	2500
Date	Lab	TAD USET	□ 59400	53400	(\$\overline{\chi}\$ 53300
Received	1/14/88 No.	ICP-607 User	: ∏ 59300	T 59500	
COLLECTION	DATE & TIME:	yy mm dd hh	mm COLL	ECTION SITE	DESCRIPTION
				illips - LEE	MW-6
COLLECTED	BY:			· · · · · · · · · · · · · · · · · · ·	
_	(Kearney/c	- L.			· · · · · · · · · · · · · · · · · · ·
-10. 8 may	770	- Cum			
TO: Tim	Ashby		OWNE	R: Phillips	
10.	· Ashby		OWNE	W. THUILE	
	/				
CROTTUTO	WATED CHATA	RDOUS WASTE BUR	est come	T OCUMTON.	
		RDOUS WASTE BUR		LOCATION:	
	XICO EID/HED		Coun	ty: <u>LEA</u>	
	968 - RUNNEL				
SANTA .	FE, NM 8750	4-0968			Tract: (10N06E24342)
	1 1	0 _		18 15+315 E+3	30+41414
ATTN:	Julie Wan	Now			
PHONE:		STATI	ON/ WELL CODE:		
				. /	0 /
_		LATITUDE, LONG	ITUDE: 3 2 9 4	181 N11013	1 1-12191 16
SAMPLING CO	SMOITIONS:				
☐ Baile	ed Pump	Water Level:	Discharge:	Samp	ole Type:
adid 🗍	gsT 🕅 be			10,5	Tilled water
pH(00400)	Conductivity	(Uncorr.) Wate	r Temp. (00010)		vity at 25°C
				(00094)	
		umho	°c	(00001)	umho
PIPLD COMM	ENTS: FIELD				7
11210 001111	mild. Field	BLANE			
CIMDIA BIA	LD TREATMENT		LAB ANALYSIS	DEOUESTES:	
	per boxes:	· }	Field Acidif		wit Ella
		WPF: Water			No Fite
WPM:	70 LET				
	:: (17)10		ICAP SC		16 33
Non Filter	w/HNO, Pre	served w/HNO,	Mark box no	ext to metal	l if AA
Non-Filte:	w/HNO, Pre			ext to metal	if AA
Non-Filte:	w/HNO ₃ Pre red Fil	served w/HNO3 tered	Mark box no is required	ext to metal	if AA
Non-Filte:	w/HNO ₃ Pre red Fil	served w/HNO ₃ tered	Mark box no is required SULTS (MG/L	ext to metal d)	
ELEMENT	w/HNO ₃ Pre red Fil Al ICAP VALUE	served w/HNO3 tered	Mark box no is required SULTS (MG/LELEMENT	ext to metald. .) ICAP VALUE	AA VALUE
ELEMENT Aluminum	w/HNO ₃ Pre red Fil Al ICAP VALUE <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE	Mark box no is required SULTS (MG/LELEMENT Silicon	ext to metald.	AA VALUE
ELEMENT Aluminum Barium	w/HNO ₃ Pre red Fil Al ICAP VALUE	served w/HNO ₃ tered	Mark box no is required SULTS (MG/LELEMENT Silicon Silver	ext to metald. .) ICAP VALUE	
ELEMENT Aluminum	w/HNO ₃ Pre red Fil Al ICAP VALUE <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium	ext to metald. Cap value	AA VALUE
ELEMENT Aluminum Barium	w/HNO ₃ Pre red Fil Al ICAP VALUE <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE	Mark box no is required SULTS (MG/LELEMENT Silicon Silver	ext to metald.	AA VALUE
ELEMENT Aluminum Barium Beryllium	W/HNO ₃ Pre Fil Al ICAP VALUE 	served w/HNO ₃ tered NALYTICAL RE AA VALUE X < 0, 1	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium	ext to metald.	AA VALUE
ELEMENT Aluminum Barium Beryllium Boron	W/HNO3 Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE	Mark box no is required SULTS (MG/L ELEMENT Silicon Silver Strontium Tin	ext to metald. Cap value Co. Co.	AA VALUE
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium	W/HNO3 Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium	ext to metald. Cap Value Co. Co.	<u>AA VALUE</u> \(\frac{1}{2} < 0.00 \)
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium	W/HNO ₃ Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0.	served w/HNO ₃ tered NALYTICAL RE AA VALUE X < 0, 1	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic	ext to metald. Cap value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt	W/HNO ₃ Pre red Fil Al ICAP VALUE <o. <o.<="" <o. ="" td=""><td>Served W/HNO₃ tered NALYTICAL RE AA VALUE X < 0.001 T × < 0.005</td><td>Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium</td><td>ext to metald. Cap value Co. Co. </td><td><u>AA VALUE</u> \(\frac{1}{2} < 0.00 \)</td></o. >	Served W/HNO ₃ tered NALYTICAL RE AA VALUE X < 0.001 T × < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium	ext to metald. Cap value Co. Co.	<u>AA VALUE</u> \(\frac{1}{2} < 0.00 \)
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper	W/HNO ₃ Pre red Fil Al ICAP VALUE <pre></pre>	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic	ext to metald. Cap value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron	W/HNO ₃ Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 TY < 0.005 D.05 X < \$0.05	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury	ext to metal d. Cap Value	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead	W/HNO ₃ Pre Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0.	Served W/HNO ₃ tered NALYTICAL RE AA VALUE X < 0.001 T × < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury	ext to metal d. Cap Value	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium	W/HNO ₃ Pre Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 TY < 0.005 D.05 X < \$0.05	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury	ext to metal d. Cap value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese	W/HNO ₃ Pre red Fil Al ICAP VALUE <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.0\$	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 TY < 0.005 D.05 X < \$0.05	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury	ext to metal d. Cap value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum	W/HNO ₃ Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 0.05 X < 30.05 M	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury ————————————————————————————————————	ext to metald. Cap Value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese	W/HNO ₃ Pre red Fil Al ICAP VALUE <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.0\$	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 TY < 0.005 D.05 X < \$0.05	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury ————————————————————————————————————	ext to metald. Cap Value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel	W/HNO ₃ Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 X < 0.005 X < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury ————————————————————————————————————	ext to metald. Cap Value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum	W/HNO ₃ Pre red Fil Al ICAP VALUE <0. <0. <0. <0. <0. <0. <0. <0.	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 X < 0.005 X < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury ————————————————————————————————————	ext to metal d. Cap value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel	W/HNO ₃ Pre Fil Al ICAP VALUE <o. <o.<="" <o. ="" td=""><td>Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 X < 0.005 X < 0.005</td><td>Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury ————————————————————————————————————</td><td>ext to metald. Cap Value Co. Co. </td><td>AA VALUE \(\cdot \cdot</td></o. >	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 X < 0.005 X < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury ————————————————————————————————————	ext to metald. Cap Value Co. Co.	AA VALUE \(\cdot
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel	W/HNO ₃ Pre red Fil Al ICAP VALUE <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury FE- HAZARDOI	ext to metal d. Cap Value Co. Co.	AA VALUE \(\) < 0.00 \(\) \(\) < 0.00 \(\) \(\) < 0.00 \(\)
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel LAB COMMEN	W/HNO ₃ Pre Fil Al ICAP VALUE <o. <o.<="" <o. ="" td=""><td>Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 X < 0.005 X < 0.005 X < 0.005 X < 0.005</td><td>Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury FE- HAZARDOI</td><td>ext to metald. Cap Value Co. Co. </td><td>AA VALUE \(\) < 0.00 \(\) \(\) < 0.00 \(\) \(\) < 0.00 \(\)</td></o. >	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury FE- HAZARDOI	ext to metald. Cap Value Co. Co.	AA VALUE \(\) < 0.00 \(\) \(\) < 0.00 \(\) \(\) < 0.00 \(\)
ELEMENT Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel LAB COMMEN	W/HNO ₃ Pre red Fil Al ICAP VALUE <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	Served W/HNO3 tered NALYTICAL RE AA VALUE X < 0.001 X < 0.005 X < 0.005	Mark box no is required SULTS (MG/I ELEMENT Silicon Silver Strontium Tin Vanadium Zinc Arsenic Selenium Mercury FE- HAZARDOI Re	ext to metal d. Cap Value Co. Co.	AA VALUE \(\langle 0.00 \) \(

700 Camino de	BORATORY DIVISION Salud NE M 87106 — (505) 841-2555	W II' G	and NITR	NATER CHEMISTRY OGEN ANALYSIS		
DATE RECEIVED 1/14 188 K	AB W 4585 USER 5930	0 □ 59600 DX C	THER: 5	3300		
Collection DATE 99 11 01 Collection TIME	SITE INFORM-	illips-LEE				
Collected by Person/Agency /	ent aur) Collection site description	$m\omega - 6$		CEINED		
FINAL NM ENVIRONME REPORT PO Box 968 To Santa Fe, NM 8750 Attn: Julia	R & HAZARDOUS WASTE BUREA NT IMPROVEMENT DIVISION/H	VU IED	Station/ well code	NOV 21 WASTE BURRALL MW-6		
SAMPLING CONDITIONS □ Bailed □ Pump	Water level	Discharge	1 70	Sample type		
☐ Dipped 🙇 Tap				0.5Tilled with		
pH (00400)	Conductivity (Uncorrected) µmho	Water Temp. (00010)	°C	Conductivity at 25°C (00094)		
Field comments Fie	id Blank					
SAMPLE FIELD TREATMEN	T — Check proper boxes					
No. of samples submitted	F: Whole sample (Non-filtered)	field with A: 2 mbrane filter	mlH₂SO₄/	L added		
NA: No acid added	NA: No acid added □ Other- <i>specify</i> :					
ANALYTICAL RESULTS from		.15	·			
NF. NA	Units Date analyze			Units Date analyzed		
Conductivity (Corrected) 25°C (00095)	μmho	☐ Calcium (00915) ☐ Magnesium (00925)		mg/l mg/l		
☐ Total non-filterable		☐ Sodium (00930)		mg/l		
residue (suspended)		☐ Potassium (00935) ☐ Bicarbonate (00440)	mg/l KECETYF mg/l		
Other: TURBIDIT	1 0.03 mg/1 ////61	☐ Chloride (00940)		mg/l		
6 Other:		□ Sulfate (00945) □ Total filterable residu	1.53	<u></u>		
Other:		(dissolved) (70300)		mg/l		
NF, A-H ₂ SO ₄		☐ Other:	HAZ: PDC	NOTE OF BUILDING		
☐ Nitrate-N+, Nitrate-N		F, A-H ₂ SO ₄				
total (00630)	mg/l	□ Nitrate-N+, Nitrate-				
☐ Ammonia-N total (00610)	mg/l	dissolved (00631)		mg/l		
()	mg/l	Ammonia-N dissolv (00608)	ea	mg/l		
☐ Chemical oxygen demand (00340)	mg/l	☐ Total Kjeldahl-N		3		
☐ Total organic carbon	mg/l	Other:		mg/l		
□ Other:		Analyst	Date 8	eported Reviewed by		
Other:			.,	14/5/		
Laboratory remarks Avalyze TURBIDITY immed, after shaking.						
COC Relinguished by Manaire Smith 11/03/88 @ 5pm						
<u> </u>						

MW-1LEE Lab Name: EMSI Contract: 0452 0459 Matrix: (soil/water) WATER Lab Sample ID: Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588S12 Level: (low/med) LOW Date Received: 11/02/88 % Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: ___ Dilution Factor: 1.0

CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

108-95-2Phenol	10	U
111-44-4bis(2-Chloroethyl)Ether	10	Ū
95-57-82-Chlorophenol	10	Ū
541-73-11,3-Dichlorobenzene	10	Ü
106-46-71,4-Dichlorobenzene	10	บ
	10	Ü
95-50-11,2-Dichlorobenzene	10	Ü
95-19-72-Mothylphopol	10	บั
108-60-1bis(2-Chloroisopropyl)Ether_	10	ָ ^ט
106-44-54-Methylphenol	10	บ
621-64-7N-Nitroso-Di-n-Propylamine	10	Ū
67-72-1Hexachloroethane	10	Ū
98-95-3Nitrobenzene	10	U
78-59-1Isophorone	10	Ū
88-75-52-Nitrophenol	10	Ū
105-67-92,4-Dimethylphenol	10	Ū
65-85-0Benzoic Acid	50	U
111-91-1bis(2-Chloroethoxy)Methane	10	บ
120-83-22,4-Dichlorophenol	10	Ū
120-82-11,2,4-Trichlorobenzene	10	U
91-20-3Naphthalene	10	Ū
106-47-84-Chloroaniline	10	lυ
87-68-3Hexachlorobutadiene	10	ט
59-50-74-Chloro-3-Methylphenol	10	U
91-57-62-Methylnaphthalene	10	U
77-47-4Hexachlorocyclopentadiene	10	U
88-06-22,4,6-Trichlorophenol	10	ַ
95-95-42,4,5-Trichlorophenol	50	U
91-58-72-Chloronaphthalene	10	ט
88-74-42-Nitroaniline	50	U
131-11-3Dimethyl Phthalate	10	ט
208-96-8Acenaphthylene	10	ַ
606-20-22,6-Dinitrotoluene	10	U
		l

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

EPA	SAMPLE	NO

Lab Name: EMSI	Contract: 0452 0459 MW-1LEE
Lab Code: EMSI Case No.: ATK-2	SAS No.: SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID:
Sample wt/vol: 1000 (g/mL) ML	Lab File ID: <u>111588S12</u>
Level: (low/med) LOW	Date Received: 11/02/88
% Moisture: not dec dec	Date Extracted: 11/03/88
Extraction: (SepF/Cont/Sonc) CON	<u>-</u>
GPC Cleanup: (Y/N) N pH:	
CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L Q
99-09-23-Nitroaniline 83-32-9Acenaphthene 51-28-52,4-Dinitrophen 100-02-74-Nitrophenol 132-64-9Dibenzofuran 121-14-22,4-Dinitrotolu 84-66-2Diethylphthalat 7005-72-34-Chlorophenyl- 86-73-7Fluorene 100-01-64-Nitroaniline 534-52-14,6-Dinitro-2-M 86-30-6N-Nitrosodiphen 101-55-34-Bromophenyl-p 118-74-1Hexachlorobenze 87-86-5Pentachlorophen 85-01-8Phenanthrene 120-12-7Anthracene 84-74-2Butylphtha 206-44-0	10

57-97-6----7,12 imethylbenzanthracene 10 U

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

UNKNOWN

1. 000-00-0

10.47

EPA SAMPLE NO.

J

10

MW−	1	LEE	

Lab Name: EMSI	Contract: 0452 0459					
Lab Code: EMSI Case No.: ATK-2	SAS No.: SDG No.:					
Matrix: (soil/water) WATER	Lab Sample ID:					
Sample wt/vol: 1000 (g/mL) MI	Lab File ID: <u>111588512</u>					
Level: (low/med): LOW	Date Received: 11/02/88					
% Moisture: not dec dec	Date Extracted: 11/03/88					
Extraction: (SepF/Cont/Sonc) CO	Date Analyzed: 11/15/88					
GPC Cleanup: (Y/N) N pH: _	Dilution Factor: 1.0					
CONCENTRATION UNITS: Number TICs found: 1 (ug/L or ug/Kg) UG/L						
CAS NUMBER COMPOUND NA	AME RT EST. CONC. Q					

VOLATILE ORGANI ANALYSIS DATA SHEET

EPA SAMPLE NO.

	MW-2LEE
0166	i l

Lab Name: EMSI		Contract:	0465 046	56	MW-	-2LEE
Lab Code: EMSI	Case No.: ATK-2	SAS No.:		SDG	No.:	
Matrix: (soil/water)	WATER	1	Lab Samp	le ID:		
Sample wt/vol:	<u>5.0</u> (g/mL) M	<u>IL</u> 1	Lab File	ID:	110	788C07
Level: (low/med)	LOW	1	Date Rece	eived:	11/0	02/88
% Moisture: not dec	·	1	Date Anal	lyzed:	11/0	07/88
Column: (pack/cap)	CAP	1	Dilution	Factor	: 1.0	00
CAS NO.	COMPOUND		ration tor ug/Kg		-	Q
74-83-9 75-01-4 75-09-2 75-09-2 75-15-0 75-35-4 75-34-3 540-59-0 67-66-3 107-06-2 78-93-3 71-55-6 56-23-5 108-05-4 75-27-4 78-87-5 10061-01-5 79-01-6 124-48-1 79-00-5 71-43-2 10061-02-6 75-25-2	Carbon Disulf1,1-Dichloroe1,2-Dichloroe1,2-Dichloroe1,2-Dichloroe2-Butanone1,1-TrichloroeCarbon TetracVinyl AcetateBromodichloroe1,2-Dichloropcis-1,3-DichlTrichloroetheDibromochloroe1,1,2-Trichloroethe	coride			10 10 10 50 55 55 55 55 55 55 50 15 55 55 55 50 15 55 55 55 55 55 55 55 55 55 55 55 55	ממממממממממממממממממממ

591-78-6----2-Hexanone

108-88-3-----Toluene

100-42-5----Styrene_

127-18-4----Tetrachloroethene

108-90-7-----Chlorobenzene

100-41-4-----Ethylbenzene_

1330-20-7----Total Xylenes

79-34-5----1,1,2,2-Tetrachloroethane_

U

U

U

U

U

U

U U

10

5

5

5

5

5

5

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: EMSI		Contract: 04	465 0466	MW-2LI	EE
	Case No.: ATK-2			3 No.:	
Matrix: (soil/wate	r) WATER	Lal	b Sample ID:		
Sample wt/vol:		Lal	b File ID:	1107880	207
Level: (low/med	l) <u>LOW</u>	Dat	te Received:	11/02/8	<u>88</u>
% Moisture: not de	:c	Dat	te Analyzed:	11/07/8	38
Column (pack/cap) CAP	Di	lution Facto	or: <u>1.00</u>	
Number TICs found:	0		ATION UNITS: ug/Kg) <u>UG/</u> 1	-	
CAS NUMBER	COMPOUND NA	ME	RT EST	r. conc.	Q

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

				!	
					MW-2LEE
Lab	Name:	EMSI	Contract:	0452 0459	

Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID:

 Matrix: (soil/water)
 WATER
 Lab Sample ID:

 Sample wt/vol:
 1000 (g/mL)
 ML Lab File ID:
 111588S13

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

108-95-2Phenol	10	U
111-44-4bis(2-Chloroethyl)Ether	10	Ū
95-57-82-Chlorophenol	10	Ū
541-73-11,3-Dichlorobenzene	10	U
106-46-71,4-Dichlorobenzene	10	U
100-51-6Benzyl Alcohol	10	ט
95-50-11,2-Dichlorobenzene	10	Ü
95-48-72-Methylphenol	10	Ū
108-60-1bis(2-Chloroisopropyl)Ether	10	U
106-44-54-Methylphenol	10.	Ū
621-64-7N-Nitroso-Di-n-Propylamine	10	บ
67-72-1Hexachloroethane	10	U
98-95-3Nitrobenzene	10	Ū
78-59-1Isophorone	10	U
88-75-52-Nitrophenol	10	U
105-67-92,4-Dimethylphenol	10	Ū
	50	Ü
111-91-1bis(2-Chloroethoxy)Methane	10	Ū
120-83-22,4-Dichlorophenol	10	U
120-82-11,2,4-Trichlorobenzene	10	Ü
91-20-3Naphthalene	10	Ü
106-47-84-Chloroaniline	10	Ü
87-68-3Hexachlorobutadiene	10	U
59-50-74-Chloro-3-Methylphenol	10	ט
91-57-62-Methylnaphthalene	10	Ü
77-47-4Hexachlorocyclopentadiene	10	U
88-06-22,4,6-Trichlorophenol	10	שׁ
95-95-42,4,5-Trichlorophenol		Ü
91-58-72-Chloronaphthalene	10	บ
88-74-42-Nitroaniline	50	Ü
131-11-3Dimethyl Phthalate	10	บ
208-96-8Acenaphthylene	10	Ü
606-20-22,6-Dinitrotoluene	10	Ü
000-20-2		
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab	Name:	EMSI	·		Contract:	0452 0459	_	MW-2LEE
Lab	Code:	EMSI	Case No.:	ATK-2	SAS No.:		SDG	No.:

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588S13

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

(ug/L or ug/Kg) Og/L

	T	,
99-09-23-Nitroaniline	50	U
83-32-9Acenaphthene	10	Ū
51-28-5	50	U
100-02-7Dibenzofuran	50	ן די
	10	บ
121-14-22,4-Dinitrotoluene	10	Ū
84-66-2Diethylphthalate	10	U
84-66-2Diethylphthalate 7005-72-34-Chlorophenyl-phenylether	10	Ü
86-73-7Fluorene	10	U
100-01-64-Nitroaniline	50	Ū
534-52-14,6-Dinitro-2-Methylphenol	50	Ū
86-30-6N-Nitrosodiphenylamine (1)	10	บ
101-55-34-Bromophenyl-phenylether	10	Ū
118-74-1Hexachlorobenzene	10	ט
87-86-5Pentachlorophenol	50	Ū
85-01-8Phenanthrene	10	U
120-12-7Anthracene	10	Ū
84-74-2Di-n-Butylphthalate	10	Ū
206-44-0Fluoranthene	10	Ū
129-00-0Pyrene	10	Ū
85-68-7Butylbenzylphthalate	10	บ
91-94-13,3'-Dichlorobenzidine	20	บ
56-55-3Benzo(a) Anthracene	10	บ
218-01-9Chrysene	10	บ
117-81-7bis(2-Ethylhexyl)Phthalate	10	บ
117-84-0Di-n-Octyl Phthalate	10	บ
205-99-2Benzo(b) Fluoranthene	10	ט
207-08-9Benzo(k)Fluoranthene	10	ט
50-32-8Benzo(a) Pyrene	10	Ū
193-39-5Indeno(1,2,3-cd)Pyrene	10	Ū
53-70-3Dibenz(a,h)Anthracene	10	Ü
191-24-2Benzo(g,h,i) Perylene	10	บ
90-12-01-Methylnaphthalene	10	บ
108-39-4meta-Cresol	10	Ü
	1	1
	I	

57-97-67,12_Dimethylbenzanthracene	10	U
		1

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

COMPOUND

UNKNOW

UNKNOWN KETONE

EPA SAMPLE NO.

MW-	2	т	F	Ē
1.1 AA	4	ᅩ	ياد	Ľ

				MW-2LEE
Lab Name:	EMSI	Contract:	0452 0459	

Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588S13

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: ___ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 2

CAS NUMBER

1. 000-00-0

2. 000-00-0

NAME	RT	EST. CONC.	Q
	6.90 9.72	14 8.0]]]

Q

1.A			EPA	SAMPLE		
$T.\Delta TTT.T$	ORGANT	AMATVETE	אישארו	ರಗಾವರು		

		•		MW-3LEE
Lab Na	me: EMSI	_ Contract:	0465 0466	

Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.: Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110788C08

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ Date Analyzed: 11/07/88

Column: (pack/cap) CAP Dilution Factor: 1.00

> CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

74-87-3Chloromethane	10	U
74-83-9Bromomethane	10	U
75-01-4Vinyl Chloride	10	U
	10	ט
75-00-3Chioroethane 75-09-2Methylene Chloride	5	ט
	2	J
75-15-0Carbon Disulfide	. 5	U
75-35-41.1-Dichloroethene	5	U
75-34-31,1-Dichloroethane	5	ט
540-59-01,2-Dichloroethene (total)	5	Ū
67-66-3Chloroform -	5	U
107-06-21,2-Dichloroethane	5	ט
78-93-32-Butanone	10	บ
71-55-61,1,1-Trichloroethane	5	ט
56-23-5Carbon Tetrachloride	. 5	U
108-05-4Vinyl Acetate	10	U
108-05-4Vinyl Acetate	5	U
78-87-51,2-Dichloropropane	5	ט
10061-01-5cis-1.3-Dichloropropene	5	ט
79-01-6Trichloroethene	5	U
124-48-1Dibromochloromethane	5	Ü
79-00-51,1,2-Trichloroethane	5	Ū
71-43-2Benzene	· 5	U
10061-02-6Trans-1,3-Dichloropropene	5	Ū
	5	ט
75-25-2Bromoform 108-10-14-Methyl-2-Pentanone	10	ט
	10	ט
591-78-62-Hexanone 127-18-4Tetrachloroethene	5	ט
79-34-51,1,2,2-Tetrachloroethane	5.	U
108-88-3Toluene	5	ט
108-90-7Chlorobenzene	5 5	ט
100-41-4Ethylbenzene	5	ט
100-42-5Styrene	5.	U
1330-20-7Total Xylenes	5	U
		1

VOLATILE ORGANI ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-3LEE	
}	

Lab Name: EMSI		Contract: <u>0465 046</u>	6			
Lab Code: EMSI	Case No.: ATK-2	SAS No.:	SDG No.:			
Matrix: (soil/wate	er) <u>WATER</u>	Lab Sample	e ID:			
Sample wt/vol:		Lab File	ID: <u>110788C08</u>			
Level: (low/med	l) <u>LOW</u>	Date Rece	ived: <u>11/02/88</u>			
% Moisture: not de	ec	Date Anal	yzed: <u>11/07/88</u>			
Column (pack/cap) CAP	Dilution	Factor: <u>1.00</u>			
CONCENTRATION UNITS: (umber TICs found: 0 (ug/L or ug/Kg) UG/L						
CAS NUMBER	COMPOUND NA	ME RT	EST. CONC. Q			
1		I I	l l			

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab File ID: <u>111588S14</u>

•	-	MW-3LEE
Lab Name: EMSI	Contract: 0452 0459	

Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML

Level: (low/med) LOW : Date Received: 11/02/88

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

Dilution Factor: 1.0 GPC Cleanup: (Y/N) N pH: ____

> CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) <u>UG/L</u>

108-95-2Phenol 111-44-4bis(2-Chloroethyl)Ether 10			
111-44-4	108-95-2Phenol	10	U
95-57-8			U
541-73-11,3-Dichlorobenzene 10 U 106-46-71,4-Dichlorobenzene 10 U 100-51-6Benzyl Alcohol 10 U 95-50-11,2-Dichlorobenzene 10 U 95-48-72-Methylphenol 10 U 106-44-5bis(2-Chloroisopropyl)Ether 10 U 106-44-5bis(2-Chloroisopropyl)Ether 10 U 621-64-7Nitroso-Di-n-Propylamine 10 U 67-72-1	95-57-82-Chlorophenol		_
106-46-71,4-Dichlorobenzene	541-73-11.3-Dichlorobenzene		1 -
10	106-46-71.4-Dichlorobenzene		1
95-48-7	100-51-6Benzyl Alcohol		
95-48-72-Methylphenol 10 U 108-60-1bis(2-Chloroisopropyl)Ether 10 U 106-44-54-Methylphenol 10 U 621-64-7Nitroso-Di-n-Propylamine 10 U 98-95-3Nitrobenzene 10 U 98-95-3Isophorone 10 U 88-75-52-Nitrophenol 10 U 105-67-92,4-Dimethylphenol 10 U 65-85-0Benzoic Acid 50 U 111-91-1bis(2-Chloroethoxy)Methane 10 U 120-83-22,4-Dichlorophenol 10 U 120-82-11,2,4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 106-47-84-Chloroaniline 10 U 87-68-3Hexachlorobutadiene 10 U 91-57-62-Methylphenol 10 U 91-57-62-Methylnaphthalene 10 U 91-57-62,4,6-Trichlorophenol 10 U 88-06-22,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	95-50-11,2-Dichlorobenzene		1
108-60-1bis (2-Chloroisopropyl) Ether 10 U 106-44-54-Methylphenol 10 U 621-64-7N-Nitroso-Di-n-Propylamine 10 U 67-72-1Hexachloroethane 10 U 98-95-3Nitrobenzene 10 U 78-59-1Isophorone 10 U 88-75-52-Nitrophenol 10 U 105-67-92,4-Dimethylphenol 10 U 65-85-0Benzoic Acid 50 U 111-91-1bis (2-Chloroethoxy) Methane 10 U 120-83-22,4-Dichlorophenol 10 U 120-82-11,2,4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 106-47-8	05 40 7 2 Nobbeelshamel	_	1
106-44-54-Methylphenol 10 U 621-64-7Nitroso-Di-n-Propylamine 10 U 67-72-1Hexachloroethane 10 U 98-95-3Nitrobenzene 10 U 78-59-1Isophorone 10 U 88-75-52-Nitrophenol 10 U 105-67-92,4-Dimethylphenol 10 U 65-85-0Benzoic Acid 50 U 111-91-1bis(2-Chloroethoxy)Methane 10 U 120-83-22,4-Dichlorophenol 10 U 120-82-11,2,4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 91-20-3Naphthalene 10 U 87-68-3	108-60-1bis(2-Chloroisopropyl)Ether		1
621-64-7Nitroso-Di-n-Propylamine 10 U 67-72-1Hexachloroethane 10 U 98-95-3Nitrobenzene 10 U 78-59-1Isophorone 10 U 88-75-5	106-44-5	10	
98-95-3	621-64-7N-Nitroso-Di-n-Propylamine	10	ט
98-95-3Nitrobenzene 10 U 78-59-1Isophorone 10 U 88-75-52-Nitrophenol 10 U 105-67-92,4-Dimethylphenol 10 U 65-85-0Benzoic Acid 50 U 111-91-1bis(2-Chloroethoxy)Methane 10 U 120-83-22,4-Dichlorophenol 10 U 120-82-11,2,4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 106-47-84-Chloroaniline 10 U 87-68-3Hexachlorobutadiene 10 U 99-50-74-Chloro-3-Methylphenol 10 U 91-57-62-Methylnaphthalene 10 U 77-47-4Hexachlorocyclopentadiene 10 U 88-06-22,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	67-72-1Hexachloroethane	10	•
78-59-1	98-95-3Nitrobenzene	1	
88-75-5	78-59-1Isophorone		
105-67-92, 4-Dimethylphenol 10 65-85-0Benzoic Acid 50 111-91-1bis(2-Chloroethoxy)Methane 10 120-83-22, 4-Dichlorophenol 10 120-82-11, 2, 4-Trichlorobenzene 10 91-20-3Naphthalene 10 106-47-84-Chloroaniline 10 87-68-3Hexachlorobutadiene 10 59-50-74-Chloro-3-Methylphenol 10 91-57-62-Methylnaphthalene 10 77-47-4Hexachlorocyclopentadiene 10 88-06-22, 4, 6-Trichlorophenol 10 91-58-72-Chloronaphthalene 10 91-58-72-Nitroaniline 50 131-11-3Dimethyl Phthalate 10 208-96-8Acenaphthylene 10	0.0 75 5	10	
65-85-0Benzoic Acid 50 U 111-91-1bis(2-Chloroethoxy)Methane 10 U 120-83-22,4-Dichlorophenol 10 U 120-82-11,2,4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 87-68-3Hexachlorobutadiene 10 U 87-68-3	105-67-92,4-Dimethylphenol	I .	1
111-91-1bis (2-Chloroethoxy) Methane 10 U 120-83-22, 4-Dichlorophenol 10 U 120-82-11, 2, 4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 106-47-8	65-85-0Benzoic Acid	50	U
120-83-22,4-Dichlorophenol 10 120-82-11,2,4-Trichlorobenzene 10 91-20-3Naphthalene 10 106-47-84-Chloroaniline 10 87-68-3Hexachlorobutadiene 10 59-50-74-Chloro-3-Methylphenol 10 91-57-6	111-91-1bis(2-Chloroethoxy)Methane	10	Ū
120-82-11,2,4-Trichlorobenzene 10 U 91-20-3Naphthalene 10 U 106-47-8A-Chloroaniline 10 U 87-68-3	120-83-22,4-Dichlorophenol	10	U
91-20-3Naphthalene 10 U 106-47-84-Chloroaniline 10 U 87-68-3Hexachlorobutadiene 10 U 59-50-74-Chloro-3-Methylphenol 10 U 91-57-62-Methylnaphthalene 10 U 77-47-4Hexachlorocyclopentadiene 10 U 88-06-22,4,6-Trichlorophenol 10 U 95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	120-82-11,2,4-Trichlorobenzene	10	U
106-47-84-Chloroaniline 10 U 87-68-3Hexachlorobutadiene 10 U 59-50-74-Chloro-3-Methylphenol 10 U 91-57-62-Methylnaphthalene 10 U 77-47-4Hexachlorocyclopentadiene 10 U 88-06-22,4,6-Trichlorophenol 10 U 95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U		10	U
59-50-74-Chloro-3-Methylphenol 10 U 91-57-62-Methylnaphthalene 10 U 77-47-4Hexachlorocyclopentadiene 10 U 88-06-22,4,6-Trichlorophenol 10 U 95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U		10	U
91-57-62-Methylnaphthalene 10 U 77-47-4Hexachlorocyclopentadiene 10 U 88-06-22,4,6-Trichlorophenol 10 U 95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	87-68-3Hexachlorobutadiene	10	U
91-57-62-Methylnaphthalene 10 U 77-47-4Hexachlorocyclopentadiene 10 U 88-06-22,4,6-Trichlorophenol 10 U 95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	59-50-74-Chloro-3-Methylphenol	10	U
77-47-4		10	U
88-06-22,4,6-Trichlorophenol 10 U 95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U		10	ט
95-95-42,4,5-Trichlorophenol 50 U 91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	88-06-22,4,6-Trichlorophenol		U
91-58-72-Chloronaphthalene 10 U 88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	95-95-42,4,5-Trichlorophenol	50	ַ
88-74-42-Nitroaniline 50 U 131-11-3Dimethyl Phthalate 10 U 208-96-8Acenaphthylene 10 U	91-58-72-Chloronaphthalene		U
208-96-8Acenaphthylene 10 U	88-74-42-Nitroaniline	50	U
208-96-8Acenaphthylene 10 U	131-11-3Dimethyl Phthalate	10	U
606-20-22,6-Dinitrotoluene 10 U	208-96-8Acenaphthylene	10	_
	606-20-22,6-Dinitrotoluene	10	Ŭ

SEMIVOLATILE ORGA CS ANALYSIS DATA SHEET

MW-3LEE

Lab Name: EMSI Contract: 0452	0459	
Lab Code: EMSI Case No.: ATK-2 SAS No.:	SDG	No.:
Matrix: (soil/water) <u>WATER</u> Lab S	ample ID:	
Sample wt/vol: 1000 (g/mL) ML Lab F	ile ID:	111588S14
Level: (low/med) LOW Date	Received:	11/02/88
% Moisture: not dec dec Date	Extracted:	11/03/88
Extraction: (SepF/Cont/Sonc) CONT Date	Analyzed:	11/15/88
GPC Cleanup: (Y/N) N pH: Dilut	ion Factor	: 1.0
CONCENTRATI CAS NO. COMPOUND (ug/L or ug		Q
99-09-23-Nitroaniline 83-32-9Acenaphthene 51-28-52,4-Dinitrophenol 100-02-74-Nitrophenol 132-64-9Dibenzofuran 121-14-22,4-Dinitrotoluene 84-66-2Diethylphthalate 7005-72-34-Chlorophenyl-phenylether 86-73-7Fluorene 100-01-64-Nitroaniline 534-52-14,6-Dinitro-2-Methylphenol 86-30-6N-Nitrosodiphenylamine (1) 101-55-34-Bromophenyl-phenylether 118-74-1Hexachlorobenzene 87-86-5Pentachlorophenol 85-01-8Phenanthrene 120-12-7Anthracene 84-74-2Di-n-Butylphthalate 206-44-0Fluoranthene 129-00-0		50 U U U U U U U U U U U U U U U U U U U

108-39-4----meta-Cresol

57-97-6----7,12 imethylbenzanthracene_

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(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

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EPA SAMPLE NO.

Lab Name: EMSI Contr	act: 0452 0459
Lab Code: EMSI Case No.: ATK-2 SAS	No.: SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID:
Sample wt/vol: 1000 (g/mL) ML	Lab File ID: <u>111588S14</u>
Level: (low/med) LOW	Date Received: 11/02/88
% Moisture: not dec dec	Date Extracted: 11/03/88
Extraction: (SepF/Cont/Sonc) CONT	Date Analyzed: 11/15/88
GPC Cleanup: (Y/N) N pH:	Dilution Factor: 1.0
	NCENTRATION UNITS:

VOLATILE ORGANICS ANALYSIS DATA SHEET

		•			
					MW-4LEE
Lab Name:	EMSI	Contract:	0465	0466	

Matrix: (soil/water) WATER Lab Sample ID:

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ Date Analyzed: <u>11/07/88</u>

Column: (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

74-87-3	Chloromethane	10	บ
74-83-9	Bromomethane	10	บั
75-01-4	Vinyl Chloride	10	Ū
75 00 0	0 h 1 h b	10	Ū
75-09-2	Chioroethane Methylene Chloride	5	Ü
67-64-1	Acetone	10	
75-15-0	Carbon Disulfide	5	ן ט
75-35-4	1,1-Dichloroethene	5	Ū
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	บ
71-55-6	1,1,1-Trichloroethane	5	ש
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	- 5	U
79-01-6	Trichloroethene	5	U .
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	1100	E
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	ט
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5		4	J
1330-20-7	Total Xylenes	230	E
	•		

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

					MW-4LEE
Lab	Name:	EMSI	Contract:	0465 0466	

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 110788C09

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. Date Analyzed: 11/07/88

Column (pack/cap) CAP Dilution Factor: 1.00

> CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 8

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0 2. 000-00-0 3. 000-00-0 4. 000-00-0 5. 000-00-0 6. 000-00-0 7. 000-00-0 8. 000-00-0	UNKNOWN UNKNOWN UNKNOWN UNKNOWN UNKNOWN UNKNOWN UNKNOWN ISOMER ISOMER	2.03 2.37 4.00 4.63 7.10 9.60 15.04 34.01	120 110 160 35 140 210 67	カ カ カ カ カ カ

VOLATILE ORGANI ANALYSIS DATA SHEET

COMPOUND

CAS NO.

EPA SAMPLE NO.

Q

ab Name: EMSI	Contrac	ct: <u>0465 0466</u>	MW-4 LEEDL
ab Code: EMSI	Case No.: <u>ATK-2</u> SAS No	o.: SDG 1	No.:
Matrix: (soil/water)	WATER	Lab Sample ID:	
Sample wt/vol:	2.5 (g/mL) ML	Lab File ID:	110788C14
Level: (low/med)	LOW	Date Received:	11/02/88
Moisture: not dec.	· 	Date Analyzed:	11/07/88
Column: (pack/cap)	CAP	Dilution Factor	: 30.0
	CON	CENTRATION UNITS:	

(ug/L or ug/Kg) UG/L

		,,, <u>, .</u>	~
74-87-3	Chloromethane	600	U
74-83-9	Bromomethane	600	Ū
75-01-4	Vinyl Chloride	600	Ū
75-00-3	Chloroethane	600	Ū
75-09-2	Methylene Chloride		BDJ
67-64-1	Acetone	110	DJ
75-15-0	Carbon Disulfide	300	Ū
75-35-4	1,1-Dichloroethene	300	Ū
75-34-3	1,1-Dichloroethane	300	Ū
540-59-0	1,2-Dichloroethene (total)		ט
67-66-3	Chloroform	300	บั
107-06-2	1,2-Dichloroethane	300	Ŭ
~~ ~~ ~			Ū
71-55-6	1 1 1-Trichloroethane	300	Ü
56-23-5	Carbon Tetrachloride	300	Ü
108-05-4	Vinvi Acetate	1 600	Ü
75-27-4	Bromodichloromethane	300	Ü
78-87-5	1,2-Dichloropropane	300	Ü
10061-01-5-	cis-1,3-Dichloropropene	300	Ū
79-01-6	Trichloroethene	300	Ü
124-48-1	Trichloroethene	300	Ü
79-00-5	1,1,2-Trichloroethane	- 300	Ü
71-43-2	Benzene	6700	D
10061-02-6-	Trans-1,3-Dichloropropene	- 300	บั
			Ü
108-10-1	Bromoform 4-Methyl-2-Pentanone	- 600	ΰ
591-78-6	2-Hexanone	- 600	ΰ
127-18-4	2-Hexanone Tetrachloroethene	300	Ü
	1,1,2,2-Tetrachloroethane		Ü
108-88-3	Toluene	300	Ü
108-90-7	Chlorobenzene	300	υ
100-41-4	Ethylbenzene	160	LQ
100-42-5	Styrene	300	U
1330-20-7	Total Xylenes	- 220	XTG
1330-20-70-	Total vitelies	-	I LOO A
		_ !	

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.
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Lab Name:EMSI		Contract:	0465 046	6	MW-4LE	EDL
Lab Code: EMSI	Case No.: ATK-2	SAS No.:		SDG	No.:	
Matrix: (soil/wate	r) WATER_		Lab Sampl	e ID:		
Sample wt/vol:	2.5 (g/mL) ML	_ _	Lab File	ID:	1107880	214
Level: (low/med	LOW LOW		Date Rece	ived:	11/02/8	8
% Moisture: not de	ec		Date Anal	yzed:	11/07/8	18
Column (pack/cap) <u>CAP</u>		Dilution	Factor	: 30.0	
Number TICs found:	0		VTRATION U			
CAS NUMBER	COMPOUND NA	ME	RT	EST.	CONC.	Q

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

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- 1		

Lab Name: EMSI Contract: 0452	MW-4LEE 2 0459
Lab Code: EMSI Case No.: ATK-2 SAS No.:	
	Sample ID:
	File ID: <u>111588S15</u>
Level: (low/med) LOW Date	Received: <u>11/02/88</u>
	Extracted: 11/03/88
	Analyzed: 11/15/88
	tion Factor: 1.0
CONCENTRATI	ON UNITS:
•	g/Kg) <u>UG/L</u> Q
108-95-2Phenol 111-44-4bis(2-Chloroethyl)Ether 95-57-82-Chlorophenol 541-73-11,3-Dichlorobenzene 106-46-71,4-Dichlorobenzene 100-51-6Benzyl Alcohol 95-50-11,2-Dichlorobenzene 95-48-72-Methylphenol 108-60-1bis(2-Chloroisopropyl)Ether 106-44-5	10 U U U U U U U U U U U U U U U U U U U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: EMSI Contract: 0452 0459	7M	W-4LEE
Lab Code: EMSI Case No.: ATK-2 SAS No.: S	DG No.	:
Matrix: (soil/water) WATER Lab Sample I	D:	
Sample wt/vol: 1000 (g/mL) ML Lab File ID:	11:	1588S15
Level: (low/med) LOW Date Receive	d: <u>11</u>	/02/88
% Moisture: not dec dec Date Extract	ed: <u>11</u> ,	/03/88
Extraction: (SepF/Cont/Sonc) CONT Date Analyze	d: <u>11</u> /	/15/88
GPC Cleanup: (Y/N) N pH: Dilution Fac	tor: <u>1</u>	. 0
CONCENTRATION UNIT CAS NO. COMPOUND (ug/L or ug/Kg) UG		Q
99-09-23-Nitroaniline	50 10 50 50	U U U U
132-64-9Dibenzofuran	10	U

99-09-23-Nitroaniline	5.0	
22-22-0	_ 50	U
33-32-9Acenaphthene	_ 10	U
51-28-52,4-Dinitrophenol	50	U
100-02-74-Nitrophenol	_ 50	U
132-64-9Dibenzofuran	_ 10	U
121-14-22,4-Dinitrotoluene	_ 10	U
34-66-2Diethylphthalate	_ 10	U
7005-72-34-Chlorophenyl-phenylether	_ 10	U
86-73-7Fluorene	10	U
LOO-01-64-Nitroaniline	50	U
534-52-14,6-Dinitro-2-Methylphenol	50	ប
36-30-6N-Nitrosodiphenylamine (1)	10	U
101-55-34-Bromophenyl-phenylether	10	U
118-74-1Hexachlorobenzene	_	Ū
37-86-5Pentachlorophenol	50	Ū
35-01-8Phenanthrene	10	Ū
120-12-7Anthracene	10	υ
34-74-2Di-n-Butylphthalate	- 10	Ü
206-44-0Fluoranthene	- 10	Ü
129-00-0Pyrene	- 1 10	Ϊ́υ
35-68-7Butylbenzylphthalate	- 10	ชื่
31-04-1Bucytpenzylphchalace	- 10	_
91-94-13,3'-Dichlorobenzidine	_ 20	U
56-55-3Benzo(a)Anthracene		U
218-01-9Chrysene	_ 10	U
117-81-7bis(2-Ethylhexyl)Phthalate	_ 3	J
117-84-0Di-n-Octyl Phthalate	 1	U
205-99-2Benzo(b)Fluoranthene	_ 10	U
207-08-9Benzo(k)Fluoranthene	_ 10	U
50-32-8Benzo(a) Pyrene	_ 10	U
193-39-5Indeno(1,2,3-cd)Pyrene	_ 10	U
53-70-3Dibenz(a,h)Anthracene	10	U
191-24-2Benzo(q,h,i)Perylene	10	U
00-12-01-Methylnaphthalene	_ 10	U
70 12 0 1100117111001101101101101		

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

					MW-4LEE
Lab	Name:	EMSI	Contract:	0452 0459	

Lab Code: EMSI Case No.: ATK-2 SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588S15

Date Received: 11/02/88 Level: (low/med) LOW

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: 6

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CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0 2. 000-00-0 3. 000-00-0 4. 000-00-0 5. 000-00-0 6. 000-00-0	DIMETHYL BENZENE ISOMER UNKNOWN CHLORINATED METHYL ETHYL BENZENE ISOMER METHYL ETHYL BENZENE ISOMER TRIMETHYL BENZENE ISOMER TRIMETHYL BENZENE ISOMER	6.92 8.02 8.34 8.72 8.99 9.55	52 12 12 10 14 10	J J J J J

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name:EMSI		Contract: 0465 0466	MW	-5LEE
Lab Code: EMSI C	Case No.: ATK-2	SAS No.: SI	OG No.:	
Matrix: (soil/water)	WATER	Lab Sample II): <u> </u>	
Sample wt/vol:	5.0 (g/mL) ML	Lab File ID:	110	788C10
Level: (low/med)	LOW	Date Received	i: <u>11/</u>	02/88
Moisture: not dec.		Date Analyzed	1: <u>11/</u>	07/88
Column: (pack/cap)	CAP	Dilution Fact	tor: <u>1.</u>	00
CAS NO.	COMPOUND	CONCENTRATION UNITS (ug/L or ug/Kg) UG/		Q
74-83-9 75-01-4 75-09-2 67-64-1 75-15-0 75-35-4 75-34-3 540-59-0 67-66-3 107-06-2 78-93-3 108-05-4 75-27-4 79-01-6 124-48-1 79-00-5 124-48-1 79-00-5 1061-02-6 75-25-2 108-10-1 591-78-6 127-18-4 108-88-3 108-90-7	Carbon Disulfice1,1-Dichloroethe1,2-Dichloroethe2-Butanone1,1,1-Trichloroethe2-Butanone1,2-Dichloroethe2-Butanone1,2-Dichlorome1,2-Dichlorome1,2-Dichlorome1,2-Dichlorome1,2-Dichlorome1,1,2-Trichloroether	ride	100002055555555555555555555555555555555	מממממממממממממממממממממממממממ

VOLATILE ORGANIC ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: EMSI	Contract: 0465 0466 MW-5LEE
Lab Code: EMSI Case No.: ATK-2	SAS No.: SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID:
Sample wt/vol: $5.0 \text{ (g/mL)} \text{ MI}$	Lab File ID: 110788C10
Level: (low/med) LOW	Date Received: 11/02/88
Moisture: not dec	Date Analyzed: 11/07/88
Column (pack/cap) <u>CAP</u>	Dilution Factor: 1.00
Number TICs found: 0	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L
CAS NUMBER COMPOUND NA	AME RT EST. CONC. Q

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab	Name:	EMSI		····		Contract:	0452	0459	_	MW-	-5LEE	
Lab	Code:	EMSI	Case	No.:	ATK-2	SAS No.:			SDG	No.:		

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588516

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

108-95-2-----Phenol 10 U
111-44-4-----bis(2-Chloroethyl)Ether 10 U

108-95-2Phenol	10	ט
111-44-4bis(2-Chloroethyl)Ether	10	ן מ
95-57-82-Chlorophenol	10	ן דו
541-73-11.3-Dichlorobenzene	10	ט
106-46-71.4-Dichlorobenzene	10	U
100-51-6Benzyl Alcohol	10	Ū
95-50-11,2-Dichlorobenzene	10	U
05 40 5	10	Ū
108-60-1bis(2-Chloroisopropyl)Ether	10	ן ט
106-44-54-Methylphenol	10	Ū
621-64-7N-Nitroso-Di-n-Propylamine	10	υ.
67-72-1Hexachloroethane	10	U
98-95-3Nitrobenzene	10	บ
78-59-1Isophorone	10	U
88-75-52-Nitrophenol	10	U
105-67-92,4-Dimethylphenol	10	U
65-85-0Benzoic Acid	50	U
111-91-1bis(2-Chloroethoxy)Methane	10	บ
120-83-22,4-Dichlorophenol	10	U
120-82-11,2,4-Trichlorobenzene	10	U
91-20-3Naphthalene	10	U
106-47-84-Chloroaniline	10	ַ
87-68-3Hexachlorobutadiene	10	U
59-50-74-Chloro-3-Methylphenol	10	U
91-57-62-Methylnaphthalene	10	U
77-47-4Hexachlorocyclopentadiene	10	ט
88-06-22,4,6-Trichlorophenol	10	Ū
95-95-42,4,5-Trichlorophenol	50	U
91-58-72-Chloronaphthalene	10	U
88-74-42-Nitroaniline	50	U
131-11-3Dimethyl Phthalate	10	ַ
208-96-8Acenaphthylene	10	U
606-20-22,6-Dinitrotoluene	10	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ΞT		
		MW-5LEE
	0450	IAM SILL

Lab Name: EMSI	Contract	: 0452 0459	MW-5LEE
Lab Code: EMSI C	ase No.: ATK-2 SAS No.	: SDG	No.:
Matrix: (soil/water)	WATER	Lab Sample ID:	
Sample wt/vol:	1000 (g/mL) ML	Lab File ID:	111588516
Level: (low/med)	LOW	Date Received:	11/02/88
% Moisture: not dec.	dec	Date Extracted:	11/03/88
Extraction: (SepF/C	ont/Sonc) <u>CONT</u>	Date Analyzed:	11/15/88
GPC Cleanup: (Y/N)	<u>N</u> pH:	Dilution Factor	r: 1.0
CAS NO.	•	ENTRATION UNITS: L or ug/Kg) <u>UG/L</u>	Q
83-32-9 51-28-5 100-02-7 132-64-9 121-14-2 84-66-2 7005-72-3 86-73-7 100-01-6 534-52-1 86-30-6 101-55-3 118-74-1 87-86-5 85-01-8 120-12-7 84-74-2 206-44-0 129-00-0 85-68-7 91-94-1 56-55-3 218-01-9 117-81-7 117-84-0 205-99-2 207-08-9 50-32-8 193-39-5	4-Nitroaniline4,6-Dinitro-2-MethylpheN-Nitrosodiphenylamine4-Bromophenyl-phenylethHexachlorobenzenePentachlorophenolPhenanthreneAnthraceneDi-n-ButylphthalateFluoranthenePyreneButylbenzylphthalate3,3'-DichlorobenzidineBenzo(a)Anthracene	cher	50 U U U U U U U U U U U U U U U U U U U

(1) - Cannot be separated from Diphenylamine

191-24-2----Benzo(g,h,i)Perylene_ 90-12-0----1-Methylnaphthalene_

108-39-4----meta-Cresol

FORM I SV-2

1/87 Rev.

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(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS



EPA SAMPLE NO.

MW-5LEE	
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Lab Name: EMSI Contract: 0452 0459 Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.: Matrix: (soil/water) WATER Lab Sample ID: Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588S16 Level: (low/med) LOW Date Received: 11/02/88 % Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88 Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88 GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: __1

(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	UNKNOWN CHLORINATED	8.02	8.0	J

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: EMSI	Contract	: 0465 0466	MW-6LEE
Lab Code: EMSI	Case No.: ATK-2 SAS No.	: SDG	No.:
Matrix: (soil/water)	WATER	Lab Sample ID:	
Sample wt/vol:	5.0 (g/mL) ML	Lab File ID:	110788C11
Level: (low/med)	LOW	Date Received:	11/02/88
% Moisture: not dec.		Date Analyzed:	11/07/88
Column: (pack/cap)	CAP	Dilution Factor	: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3	10 10 10 2 29 5 5 5 5	ממממ ממממ
74-83-9Bromomethane 75-01-4Vinyl Chloride 75-00-3Chloroethane 75-09-2Methylene Chloride 67-64-1Acetone 75-15-0Carbon Disulfide 75-35-41,1-Dichloroethene 75-34-31,2-Dichloroethene 540-59-01,2-Dichloroethene (total) 67-66-3Chloroform	10 10 2 29 5 5 5	ם ט ט ט ע
75-01-4Vinyl Chloride 75-00-3Chloroethane 75-09-2Methylene Chloride 67-64-1Acetone 75-15-0Carbon Disulfide 75-35-41,1-Dichloroethene 75-34-31,1-Dichloroethane 540-59-01,2-Dichloroethene (total) 67-66-3Chloroform	10 10 2 29 5 5 5 5	ם מ ם ם ב
75-00-3Chloroethane 75-09-2Methylene Chloride 67-64-1Acetone 75-15-0Carbon Disulfide 75-35-41,1-Dichloroethene 75-34-31,2-Dichloroethene (total) 67-66-3Chloroform	10 2 29 5 5 5 5	U BJ U U U
75-09-2Methylene Chloride 67-64-1Acetone 75-15-0Carbon Disulfide 75-35-41,1-Dichloroethene 75-34-31,2-Dichloroethene (total) 67-66-3Chloroform	2 29 5 5 5 5	BJ U U U
67-64-1	29 5 5 5 5	U U U
75-15-0Carbon Disulfide 75-35-41,1-Dichloroethene 75-34-31,1-Dichloroethane 540-59-01,2-Dichloroethene (total) 67-66-3Chloroform	5 5 5 5 5	ם ט
75-35-41,1-Dichloroethene	5 ⁻ 5 5 5	ם ט
75-34-31,1-Dichloroethane	5 5 5	U U
540-59-01,2-Dichloroethene (total) 67-66-3Chloroform	5 5	U
67-66-3Chloroform	5	1 -
	•	שו
107-06-21,2-Dichloroethane	5	Ü
78-93-32-Butanone	10	Ü
71-55-61,1,1-Trichloroethane	18	١
56-23-5Carbon Tetrachloride	5	ט .
108-05-4Vinyl Acetate	10	Ü
75-27-4Bromodichloromethane	5	Ü
78-87-51,2-Dichloropropane	5	Ü
10061-01-5cis-1,3-Dichloropropene	5	Ü
70.03-6 myichlorocthon	5 5	Ü
79-01-6Trichloroethene 124-48-1Dibromochloromethane	5 5	Ü
70 00 E		ט
79-00-51,1,2-Trichloroethane	5 5 5	מ
	ב	ט
10061-02-6Trans-1,3-Dichloropropene	5 5	ט
108-10-14-Methyl-2-Pentanone	10	ם
591-78-62-Hexanone		ט
	10	_
127-18-4Tetrachloroethene	5	U
79-34-51,1,2,2-Tetrachloroethane	5	Ü
108-88-3Toluene	5	U
108-90-7Chlorobenzene	5	Ü
100-41-4Ethylbenzene	5	Ū
100-42-5Styrene	5	U
1330-20-7Total Xylenes	5	Ū

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6LEE

Lab Name: EMSI	Contract: 0465 0466
Lab Code: EMSI Case No.: ATK-2	SAS No.: SDG No.:
Matrix: (soil/water) <u>WATER</u>	Lab Sample ID:
Sample wt/vol: 5.0 (g/mL) ML	Lab File ID: <u>110788C11</u>
Level: (low/med) LOW	Date Received: 11/02/88
Moisture: not dec.	Date Analyzed: 11/07/88
Column (pack/cap) CAP	Dilution Factor: 1.00
Number TICs found: 0	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>
CAS NUMBER COMPOUND NA	ME RT EST. CONC. Q

SEMIVOLATILE ORGA CS ANALYSIS DATA SHEET

Lab Name: EMSI Contract: 0452	MW-6LEE
Lab Code: EMSI Case No.: ATK-2 SAS No.:	SDG No.:
Matrix: (soil/water) WATER Lab S	ample ID:
Sample wt/vol: 1000 (g/mL) ML Lab F	ile ID: <u>111588S17</u>
Level: (low/med) LOW Date	Received: <u>11/02/88</u>
% Moisture: not dec dec Date	Extracted: <u>11/03/88</u>
Extraction: (SepF/Cont/Sonc) CONT Date	Analyzed: <u>11/15/88</u>
GPC Cleanup: (Y/N) N pH: Dilut	ion Factor: 1.0
CAS NO. COMPOUND CONCENTRATION (ug/L or ug	
108-95-2Phenol 111-44-4bis(2-Chloroethyl)Ether 95-57-82-Chlorophenol 541-73-11,3-Dichlorobenzene 106-46-71,4-Dichlorobenzene 100-51-6Benzyl Alcohol 95-50-11,2-Dichlorobenzene 95-48-72-Methylphenol 108-60-1bis(2-Chloroisopropyl)Ether 106-44-54-Methylphenol 621-64-7N-Nitroso-Di-n-Propylamine 67-72-1Hexachloroethane 98-95-3Nitrobenzene 78-59-1Isophorone 88-75-52-Nitrophenol 105-67-92,4-Dimethylphenol 65-85-0Benzoic Acid 111-91-1bis(2-Chloroethoxy)Methane 120-83-22,4-Dichlorophenol 120-82-11,2,4-Trichlorobenzene 91-20-3Naphthalene 106-47-84-Chloro-3-Methylphenol 91-57-64-Chloro-3-Methylphenol 91-57-64-Chloro-3-Methylphenol 91-57-64-Chloro-3-Methylphenol 91-57-64-Chloro-3-Methylphenol 91-57-64-Chloro-3-Methylphenol 91-58-74-Chloro-3-Methylphenol 91-58-7	10 U U 10

SEMIVOLATILE ORGA CS ANALYSIS DATA SHEET

1	EPA	SAMPLE	N
1			

MW-6LEE

Lab Name: EMSI Contra	ct: 0452 0459
Lab Code: EMSI Case No.: ATK-2 SAS N	so.: sdg No.:
Matrix: (soil/water) WATER	Lab Sample ID:
Sample wt/vol: 1000 (g/mL) ML	Lab File ID: <u>111588S17</u>
Level: (low/med) <u>LOW</u>	Date Received: 11/02/88
<pre>% Moisture: not dec dec</pre>	Date Extracted: 11/03/88
Extraction: (SepF/Cont/Sonc) CONT	Date Analyzed: 11/15/88
GPC Cleanup: (Y/N) N pH:	Dilution Factor: 1.0
	ICENTRATION UNITS: J/L or ug/Kg) UG/L Q
99-09-2	10

57-97-6----7,1 imethylbenzanthracene 10 U

(1) - Cannot be separated from Diphenylamine

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6LEE

Lab	ab Name: EMSI		Contract:	0452 0459			
Lab	Code:	EMSI	Case No.:	ATK-2	SAS No.:	SDG	No.:

Matrix: (soil/water) WATER Lab Sample ID:

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 111588S17

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ dec. ___ Date Extracted: 11/03/88

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/15/88

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Number TICs found: __5

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000-00-0	DIMETHYL BENZENE ISOMER METHYL ETHYL BENZENE ISOMER METHYL ETHYL BENZENE TRIMETHYL BENZENE ISOMER TRIMETHYL BENZENE ISOMER	6.88	50	ງ
2. 000-00-0		8.30	10	ງ
3. 000-00-0		8.69	10	ງ
4. 000-00-0		8.95	12	ງ
5. 000-00-0		9.54	8.0	ງ

E

				,	MW-6LEE
Lab	Nâme:	EMSI	Contract:	0465 0466	
	D.		*		

Lab Code: EMSI Case No.: ATK-2 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID:

Level: (low/med) LOW Date Received: 11/02/88

% Moisture: not dec. ____ Date Analyzed: 11/07/88

Column: (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

	COMPOUND (dg/ L OI dg	3/ Kg) <u>0G/ L</u>	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	บ
75-01-4	Vinyl Chloride	10	Ū
75 00 3		1 70	Ū
75-09-2	Methylene Chloride	- 2	BJ
67-61-1	actono	29	
75-15-0	Carbon Disulfide	- 5	lυ
75-35-4	1.1-Dichloroethene	5	Ū
75-34-3	1,1-Dichloroethane (total)	5	บ
540-59-0	1.2-Dichloroethene (total)	5	ט
67-66-3	Chloroform	5	ט
107-06-2	Chloroform 1,2-Dichloroethane	5	ט
78-93-3	2-Butanone	10	ט
71-55-6	2-Butanone 1,1,1-Trichloroethane	18	
	tarbon retrachioride	1 5	ַ ט
108-05-4	Vinyl Acetate	10	U
75-27-4	Vinyl AcetateBromodichloromethane	5	U
78-87-5	1.2-Dichloropropane	1 5	ט
10061-01-5	cis-1.3-Dichloropropene	1 5	ט
79-01-6	Trichloroethene	5	ט
124-48-1	Dibromochloromethane	5 5	ט
79-00-5	1,1,2-Trichloroethane	5	ט
71-43-2	Benzene	5	ט
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	Bromoform4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1.1.2.2-Tetrachloroethane	5	ט
108-88-3	Toluene	_ 5	U
108-90-7	Chlorobenzene	5	ט
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Styrene	5	U
			_

ODESSA, TEXAS 79762 4001 PENBROOK

April 5, 1989

Groundwater Monitoring Analyses
Artesia, Eunice, Lee and Lusk Plants

Mr. Dave Boyer Environmental Bureau Chief New Mexico Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87501

Dear Mr. Boyer:

Per your request, attached please find copies of the fourth quarter groundwater monitoring analyses for the above referenced plants.

If you should have any questions regarding this information, please contact me at (915) 367-1316.

Very truly yours,

Michael D. Ford

Environmental Analyst

Michael D. Ford

MDF

Attachments



의 있 의 의 Page FACILITY Received: 02/02/89 WORK ID COMPANY INVOICE . O CLIENT REPORT Radian 4th quarte reagent blank ストリン SAMPLE IDENTIFICATION MW-2 duplicate TAKEN ATTEN TRANS TYPE UPS Odessa, Phillips Petroleum PHILLIPS P Linda Bendele under separate cover Austin 3 and 2 SAMPLES RAS AS G BAE EPA60 HOC DG302 Í DG601C C Austin PREPARED Radian Analytical Services specific matrix was not within acceptable limits indicating @ Indicates that spike recovery for this analysis on the Potential error for such low values ranges between 50 and Previously Reported on Unknown compounds present in GC samples 01,02, and 03 an interferent present. Footnotes and Comments Silver, Specific conductance Digestion, Digestion, <u>Arsenic, graphite AA</u> Vitrate, colorimetric Sodium Manganese, ICPES Mercury, cold vapor Fluoride, EPA method 602 Chrumium, ICPES Chloride, Cadmium, Barium, Indicates a value less 03/01/89 09:22:46 PHONE ATTEN graphite ICPES 8501 Mc-pac Bi 512-454-4797 PO Box 201088 ICPES ICPES <u> Austin, TX 78720-1088</u> ICPES IC method method CODES and NAMES used 6010 3020 02/27/89 than 5 times the detection limit PHEN SE G SO4 IC TOC TOX TURB XYLEN on this report <u>Selenium, graphite AA</u> Total phenolics Work Order # 89-02-026 Sulfate, Xulenes, Turbidity Total organic CERTIFIED BY CONTACT BENDELE EPA 602 halides 100%

Page 2 Received: 02/02/89

Austin REPORT Results By Test

RAS

Work Order # 89-02-026

₹ ! ! !	# F L	Sample	1	ME	 <u>K</u>	Sample	- WM - 22	<u> </u>	 Sample
02	· 	SAMPLE :	03	02	2	SAMPLE	02	01	SAMPLE
590 2000	620	Test: MHO	<0.03	<0.03	<0.03	Test: CR E	<0.03	0 03	Test: AG E
0.90		Test: MN E		02/06/89	02/06/89	Test: DG3020	0.023	0, 057	Test: AS G
9.6		Test: NA E	02/06/89	02/05/89	02/06/89	Test: DG6010	0. 57	0.22	Test: BA E
0.21		Test: NO3 mg/L as N 1.6		<0.04	0.10*	Test: FE E	⟨0, 005	⟨0, 005	Test: CD E
<0.002	·	Test: PB G		0.5*	0.5*	Test: F IC	450	29	Test: CL IC

RADIAN

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Pagë 3 Received: 02/02/89	RAS -	Austin Results By	REPORT Test	Work Order # 89-02-026 Continued From Above	89-02-026 m Above
SAMPLE :	Test: NHO	Test: MN E	Test: NA E	Test: NO3	Test: PB G
	2000				(A) M
	2000				
	2000				
SAMPLE				Test: <u>504 IC</u>	Test: TOC
01	6. 91	⟨0.005	<0.005	ಜ	J 5
3	6. 93				4*
	6. 95				4*
	7.00				**
02	6.71	0.018*	<0.005	20	22
33 E N	ь. 70				23
	6.71				21
	6. 56		र [ा] 4 केटिल		21
The second secon				nickije mingratorije dan septemblika izvije maja je septemblika izvije inde salam side septemblika izvije dan s	

Page 4 Received: 02/02/89

Austin REPORT Results By Test

RAS

Work Order # 89-02-026

Sample Id
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71 2 1
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Page 5 Received: 02/02/89 SAMPLE ID MW-1

Austin REPO

70 AG S

REPORT

Work Order # 89-02-026

FRACTION O1J TEST CODE EPA602
Date % Time Collected 01/31/89

1602 NAME EPA method 602

Category

VERIFIED ____CL

ANALYST INSTRMT

541-73-1 108-90-7 106-46-7 100-41-4 108-88-3 71-43-2 CAS# INJECTED 02/03/89 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT 0.6* 0.7* 7.5 8 B B 0.40 0.20 0.20 0.30 0.30 0.30 STINO

SURROGATES

95-50-1

1,2-Dichlorobenzene

S

0.40

98-05-8 a, a, a-Trifluorotoluene 105% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT - DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

.

Page 6 Received: 02/02/89

SAMPLE ID MW-1

RAS

REPORT

Work Order # 89-02-026 Continued From Above

Austin REPO

FRACTION O1J TEST CODE EPA602
Date % Time Collected 01/31/89

NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute otherwise noted. Quantitated as chlorobenzene unless

Page 7 Received: 02/02/89 SAMPLE ID MW-1 SAMPLE ID MW-1 ANAL YST INSTRMT ANALYST INSTRMT NOTES AND DEFINITIONS FOR THIS REPORT * = less than 5 times the detection limit ND = not detected at detection limit N\A = not available NA = not analyzed DET LIMIT = DETECTION LIMIT HACH 403 403 Turbidity ANALYTE ANALYTE Mercury ANALYZED 02/02/89 ANALYZED 02/08/89 RAS RESULT RESULT DET LIMIT FRACTION 01A FRACTION OIL TEST CODE HG C Date % Time Collected 01/31/89 Date & Time Collected 01/31/89 Austin B Results by Sample DET LIMIT 0.0002 TEST CODE TURB REPORT VERIFIED VERIFIED SLINO ONITS NAME Turbidity NAME Mercury, cold vapor RH Ę Work Order # 89-02-026 Category Category



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Page 8 Received: 02/02/89	RAS - Austin REPORT Results by Sample	Work Order # 89-02-026 Continued From Above
SAMPLE ID MW-1	FRACTION O1A TEST CODE TURB Date % Time Collected 01/31/89	NAME Turbidity Category
NOTES AND DEFINITIONS FOR T DET LIMIT = DETECTION ND = not detected at d NA = not analyzed * = less than 5 times N\A = not available	THIS REPORT N LIMIT detection limit s the detection limit	
SAMPLE ID MW-1	Date & Time Collected 01/31/89	NAME Xylenes, EPA 602 Category
		CL
INSTRMTG	INJECTD 02/03/89 FILE #UN	UNITS ug/L
CAS # 106-42-3 108-38-3 95-47-6	COMPOUND RESULT DET LIMIT p-Xylene-A 0.5* 0.20 m-Xylene 0.9* 0.20 o-Xylene 0.7 0.10	
8-80-85	SURROGATES a,a,a-Trifluorotoluene <u>105</u> % recovery	
ND DEF	THIS REPORT. N LIMIT detection limit	
NA = not analyzed * = less than 5 time N\A = not available Second column confir	zed 5 times the detection limit lable confirmation NOT performed	
ss other		

Received: 02/02/89

SAMPLE ID MW-1

RAS

REPORT

Work Order # 89-02-026 Continued From Above

Austin REPu Results by Sample

FRACTION OIJ TEST CODE XYLENE
Date & Time Collected 01/31/89

NAME Xylenes, EPA 602

Category

Chlorobenzene and p-xylene co-elute. Q = daily EPA standard recovery outside 95% confidence interval. Quantitated as chlorobenzene unless otherwise noted



Page 10 Received: 02/02/89 SAMPLE ID MW-2

RAS - Austin

REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 02J TEST CODE EPA602 NAMI
Date & Time Collected 01/31/89

PA602 NAME EPA method 602

Category

cted 01/31/89

VERIFIED CL

Ug/L

ANALYST INSTRMT 541-73-1 106-46-7 100-41-4 108-90-7 108-89-3 95-50-1 71-43-2 CAS# INJECTED 02/03/89 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT (1) 4 8 8 0.40 0.20 0. 20 0, 30 0.30 0.40 0 SLINO 30

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 112% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

1. The state of

N\A = not available

Second column confirmation NOT performed

unless otherwise noted.

Page 11 Received: 02/02/89

SAMPLE ID MW-2

RAS Austin REPO

REPORT

Work Order # 89-02-026 Continued From Above

NAME EPA method 602

Category

FRACTION <u>02J</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>01/31/89</u>

A-Chlorobenzene and p-rylene co-elute Quantitated as chiorobenzene unless otherwise noted.

	SAMPLE ID MW-2	Page 12 Received: 02/02/89
		RAS
	FRACTION 021	Austin REPu Results by Sample
111erted 01/31/89	FRACTION 021 TEST CODE HG C	REPORT Sample
	NAME Mercury, cold vapor	Work Order # 89-02-026

NAME Turbidity Category	FRACTION <u>02A</u> TEST CODE TURB Date & Time Collected <u>01/31/89</u>	SAMPLE ID MW-2 FRACTION 02A Date & Time Col
		DET LIMIT = DETECTION LIMIT ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection limit N\A = not available
	<u> 202</u>	Mercury ND 0.0002
	17	ANALYTE RESULT DET LIMIT
UNITS ug/ml	UN	ANALYST KCP ANALYZED 02/08/89
RHH	VERIFIED	

ANALYST _____LKM INSTRMT ___HACH

Turbidity

18

1.0

The standard

ANALYTE

RESULT DET LIMIT

ANALYZED 02/02/89

VERIFIED

ONITS

UTN



Austin Results by Sample FRACTION 02A TEST CODE TURB Date & Time Collected 01/31/89 FRACTION 02J TEST CODE XYLENE TODE TURB NAME Turbidit Cat On limit ON limit VERIFIED CL VALUE VALUE

Page 14 Received: 02/02/89

SAMPLE ID MW-2

Austin

RAS

Results by Sample

REPORT

Work Order # 89-02-026 Continued From Above

FRACTION 02J TEST CODE XYLENE Date % Time Collected 01/31/89

NAME Xylenes, EPA 602 Category

Chlorobenzene and p-xylene co-elute = daily EPA standard recovery outside 95% confidence interval. otherwise noted. Quantitated as chlorobenzene unless



Page 15 Received: 02/02/89

SAMPLE ID MW-2 duplicate

Austin

REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 03B TEST CODE EPA602
Date & Time Collected 01/31/89 NAME EPA method 602

Category

ANALYST INSTRMT 명 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 02/03/89 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Toluene Benzene FILE # RESULT DET LIMIT N S 3 E 8 B VERIFIED 0.30 0.40 0.20 0.20 0.30 0.30 0.40 SLINO 5

SURROGATES

3-30-86 a, a, a-Trifluorotoluene 111% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

not detected at detection limit

analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.



Pagě 16 Received: 02/02/89

SAMPLE ID MW-2 duplicate

RAS

REPORT

Work Order # 89-02-026 Continued From Above

Austin REPO Results by Sample

FRACTION 03B TEST CODE EPA602
Date & Time Collected 01/31/89 Category

NAME EPA method 602

A-Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless otherwise noted.

Pagě 17 Received: 02/02/89

SAMPLE ID MW-2 duplicate

RAS Austin

REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 03B TEST CODE XYLENE Date % Time Collected 01/31/89

NAME Xylenes, EPA 602 Category

VERIFIED P

ANALYST INSTRMT B

INJECTD 02/03/89

SLINO

106-42-3 108-38-3 **CAS** # 95-47-6 p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0. <u>20</u> 0. <u>20</u> 0. 10

SURROGATES

a, a, a-Trifluorotoluene 111% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

98-08-8

ND = not detected at detection limit

NA = not analyzed less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available

Q = daily EPA standard recovery outside unless otherwise noted

95% confidence interval.

Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless

otherwise noted



Pagě 18 Received: 02/02/89

> RAS Austin

> > REPORT

Work Order # 89-02-026

SAMPLE ID reagent blank

Results by Sample

FRACTION 04A TEST CODE EPA602 No Date % Time Collected not specified TEST CODE EPA602 NAME EPA method 602

Category

VERIFIED P

ANALYST INSTRMT (C) 541-73-1 100-41-4 106-46-7 108-90-7 108-88-3 95-50-1 71-43-2 CAS# INJECTED 02/03/89 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Toluene Benzene RESULT DET LIMIT 8 3 R S B E 0.40 0.30 0.30 0.30 0.20 0.40 0.20 SLINA

SURROGATES

3-80-86 a, a, a-Trifluorotoluene N/A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

not detected at detection limit

analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

Pagè 19 Received: 02/02/89

SAMPLE ID reagent blank

RAS

Austin

REPORT

Work Order # 89-02-026 Continued From Above

Kesults by Sample

FRACTION 04A TEST CODE EPA602 NA Date & Time Collected not specified NAME EPA method 602 Category

A-Chlorobenzene and pryylene comelute otherwise noted. Quantitated as chlorobenzene unless

Pagé 20

SAMPLE ID reagent blank Received: 02/02/89

> RAS Austin

> > REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 04A TEST CODE XYLENE Not specified NAME Xulenes, EPA 602

Category

VER IF JED P

ANALYST INSTRMT

INJECTD 02/03/89

SLINO

106-42-3 108-38-3 95-47-6 p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0.20 0.20

SURROGATES

a, a, a-Trifluorotoluene N/A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

98-08-8

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available

= daily EPA standard recovery outside unless otherwise noted.

95% confidence interval.

Chlorobenzene and p-xylene co-elute

Quantitated as chlorobenzene unless

Received: 02/02/89

RAS Austin REPC 02/27/89 16:59:13

REPORT

Work Order # 89-02-027

P.O. # INVOICE	WORK ID TAKEN TRANS	COMPANY COMPANY	ATTEN	REPORT TO
under separate cover	Lee MW 3 and 4 MF UPS	PHILLIPS P Phillips Petroleum Odessa, TK	Linda Bendele	Radian Bl. 1 Austin
(a) TO	* 1 71	<u> </u>		PR

PHONE	ATTEN			ВЧ	REPARED
512-454-4797		Austin, TX 78720-1088	PO Box 201058	8501 Mc-pac 81.	Radian Analytical Services

CONTACT BENDELE

Unknown compounds present in GC sample MW3

Footnotes and Comments

Potential error for such low values ranges between 50 and 100%. * Indicates a value less than 5 times the detection limit

an interferent present. specific matrix was not within acceptable limits indicating Indicates that spike recovery for this analysis on the

TEST CODES and NAMES used on this report

의정입외

reagent blank trip blank

Mω-3

SAMPLE IDENTIFICATION

4th quarter

PHEN G	lωl	MHO C	 	DG6010 EPA602	CR E	CD E	AS G	AG E
pH Total phenolics	Sodium, ICPES Nitrate, colorimetric	Specific conductance Manganese, ICPES	PES	Digestion, method 6010 EPA method 602	Chromium, ICPES Digestion, method 3020	Cadmium, ICPES Chloride, IC	<u>Arsenic, graphite AA</u> Barium, ICPES	Silver, ICPES
						1-1-1-1	IIII Iro	ırn ř

XYLENE	TURB	TOX	TOC	S04 IC	SE G	
Xulenes, EPA 602	rbic	Total organic halides	Total organic carbon	ulfate, I	Selenium, graphite AA	

Page 2 Received: 02/02/89

Austin REPORT
 Results By Test

RAS

Work Order # 89-02-027

-	-									
₩-4 02		ME-3	SAMPLE Id	MW-4 02	01	SAMPLE Id	MW-4	01	SAMPLE Id	
1400 1400	1100	1100 1100	Test: MHU	⟨0.03	(0, 03	Test: CR E	₹0.03	€0.03	Test: AG E	
) journ ; juu-n		0.061	Test: MN E	02/06/89	02/06/89	T#st: DG3020 date complete	0.14	0.24	Test: AS G	
· (**4.30***; 140		240	Test: NA E	02/06/89	02/05/89	Test: D&6010	0. 55	0.14	Test:BA E	* # # # # # # # # # # # # # # # # # # #
0. 22		0.31	Test: NO3	2.6	0.073*	Test: FE E	<0.005	<0.005	Test: <u>CD E</u>	
0.002*		0.002*	Test: PB &	1. 2	1.0*	Test: F IC	240	110	Test: CL IC	



Page Received: 02/02/89 Sample MW-3 MW-4 Sample SAMPLE SAMPLE ស 01 Test: 190 Test: PH pH units 6 83 6. 93 c. 85 7. N 7.07 7. 20 1400 1400 7 23 8 RAS Austin Test: ME Test: PHEN <0.005 as phenol Results By Test 0.52 REPORT Test: NA E est SE G ⟨0, 005 <0.005 ug/ml Test: NO3 Test: <u>SD4 IC</u> Work Order # 89-02-027 Continued From Above 25 Test: PB G Test: TOC

Page 4 Received: 02/02/89

RAS

Austin REPORT Results By Test

Work Order # 89-02-027

	₩ -3			MW-4				
SAMPLE	2				02			****
lest: iLiX	0. 02*	0.01*	0.01*	0.01*	0. 03*	0. 03*	0. 03*	0. 03*
ng/L		Tr	~					-8-
and the section of th								
		,						
		·.						
		· · · · · · · · · · · · · · · · · · ·						



Page 5 SAMPLE ID MW-3 Received: 02/02/89

> Austin Results by Sample

REPORT

Work Order # 89-02-027

FRACTION OIL TEST CODE EPA60
Date & Time Collected 01/31/89 TEST CODE EPA602

NAME EPA method 602 Category

								INSTRMTG	
95-50-1	541-73-1	196-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAST	IMUECTE	
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene-A	Ethylbenzene	Toluene	Benzene	COMPOUND	INJECTED 02/03/89	
ND ND	ND	No	NO	1. 9	0.4*	2.9	RESULT		<
0.40	0.40	0. 30	0. 30	0, 30	0, 20	0, 20	RESULT DET LIMIT	UNITSuq/L	VERIFIEDCL

SURROGATES

98-0E-E a, a, a-Trifluorotoluene 123% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

Page 6 Received: 02/02/89

SAMPLE ID MW-3

RAS

REPORT

Work Order # 89-02-027 Continued From Above

Austin REPU Results by Sample

FRACTION OLD TEST CODE EPA602
Date & Time Collected 01/31/89 NAME EPA method 602

Category

A-Chlorobenzene and p-rylene co-elute Quantitated as chlorobenzene unless otherwise noted.

less not	02/02 MW-3 LIMIT	RAS - Austin REPORT Results by Sample FRACTION 011 TEST CODE HG C Date % Time Collected 01/31/89 AMALYZED 02/08/89 AMALYZED 02/08/89 AMALYZED 02/08/89 AMALYZED 02/08/89 FOR THIS REPORT. CTION LIMIT d at 4stection limit	NAME Mercury, cold vapor Category UNITS U9/M1
AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection limit N\A = not available	SAMPLE ID MW-3 ANALYST KCP INSTRMT 403	Date % Time Collected 01/31/89 WALYZED 02/08/89 RESULT DET LIMIT	H
AND DEFINITIONS FOR THIS DET LIMIT = DETECTION LIMI ND = not detected at detected NA = not analyzed * = less than 5 times the N\A = not available	40	RESULT DET LIMIT O. 0002	
	AND DEFIDET LIMIT ND = not NA = not * = less N\A = not	FOR THIS CTION LIMI d at debec d times the ble	
		VERIFIE	.DLM
VERIFIED LM	INSTRMT HACH	444LYZED 02/02/89	UTN STING
LKM HACH 6MALYZED 02/02/89 UNITS		ANALYTE RESULT DET LIMIT	
LKM HACH ANALYTE RESULT DET LIMIT VERIFIED LM UNITS LM LKM ANALYTE RESULT DET LIMIT		Turbidity 46 1.0	



Page 8 SAMPLE ID MW-3 SAMPLE ID MW-3 Received: 02/02/89 NOTES AND DEFINITIONS FOR THIS REPORT ANALYST NOTES AND DEFINITIONS FOR THIS REPORT INSTRMT Second column confirmation NOT performed NA = not analyzed DET LIMIT = DETECTION LIMIT ND = not detected at detection limit DET LIMIT = DETECTION LIMIT N\A = not available * = less than 5 times the detection limit N\A = not available NA = not analyzed unless otherwise noted less than 5 times the detection limit not detected at detection limit 106-42-3 108-38-3 8-80-86 95-47-6 CAS # INJECTD 02/03/89 p-Xylene-A COMPOUND RAS m-Xylene o-Xylene a, a, a-Trifluorotoluene FRACTION <u>OLV</u> TEST CODE XYLENE Date % Time Collected <u>OL/31/89</u> FRACTION <u>OIA</u> TEST CODE TURB Date & Time Collected <u>O1/31/89</u> Austin Results by Sample RESULT SURROGATES FILE # DET LIMIT 0 20 0 20 0 10 REPORT 123% recovery VERIFIED UNITS NAME Xulenes, EPA 602 NAME Turbidity Continued From Above Work Order # 89-02-027 Category Category



Page 9 Received: 02/02/89

SAMPLE ID MW-3

Austin

70 26 00

REPORT

Results by Sample

Work Order # 89-02-027 Continued From Above

NAME Xulenes, EPA 602

Category

FRACTION OLD TEST CODE XYLENE Date % Time Collected 01/31/89

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute. otherwise noted. Quantitated as chlorobenzene unless

SAMPLE ID MW-4 Page 10 Received: 02/02/89

> RAS Austin

REPORT

Work Order # 89-02-027

Results by Sample

FRACTION 02J TEST CODE EPA602
Date % Time Collected 01/31/89

VERIFJED

CL

NAME EPA method 602 Category

ANALYST INSTRMT 541-73-1 108-85-3 106-46-7 108-90-7 100-41 4 95-50-1 71-43-2 C45# INJECTED 02/03/89 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1, 4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene Toluene RESULT DET LIMIT 21000 5900 7204 1:0 100 200 200 100 ONITS 150 150 150

SURROGATES

98-05-B a, a, a-Trifluorotoluene 96% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

ND = not detected at defection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed

less than 5 times the detection limit

Second column confirmation NDf performed N\A = not available unless otherwise noted

Page 11 Received: 02/02/89

SAMPLE ID MW-4

RAS Austin REPO

REPORT

FRACTION <u>02J</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>01/31/89</u>

Work Order # 89-02-027 Continued From Above

NAME EPA method 602

Category

A-Chlorobenzene and p-yylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

Turt	AZ	INSTRMT HACH		SAMPLE ID MW-4	NOTES AND DEFINITIONS FOR DET LIMIT = DETECTION ND = not detected at NA = not analyzed * = less than 5 times N\A = not available	Manage of the state of the stat	AN	INSTRMT 403		SAMPLE ID MW-4	Page 12 Received: 02/02/89
Turbidity <u>17</u> 1.0	ANALYTE RESULT DET LIMIT	AMALYZED 02/02/89		FRACTION <u>O2A</u> TEST C	ICMS FOR THIS REPORT. DETECTION LIMIT ected at detection limit lyzed n 5 times the detection limit ailable	Mercury <u>ND</u> <u>0.0002</u>	ANALYTE RESULT DET LIMIT	AMALYZED 02/08/89		FRACTION <u>021</u> TEST Date & Time Collected	RAS - Austin Results by
State of the state		UNITS	VERIFIED	ODE TURB 01/31/89		<u> </u>	17	UNITS	VERIFIED	01/31/89	REPORT Sample
		NTU	LM	NAME Turbidity Category				uq/ml	RHH	NAME Mercury, cold vapor Category	Work Order # 89-02-027

RADIAN

Page 13 Received: 02/02/89 SAMPLE ID MW-4 SAMPLE ID MW-4 NOTES AND DEFINITIONS FOR THIS REPORT NOTES AND DEFINITIONS FOR THIS REPORT. ANALYST INSTRMT Second column confirmation NOT performed N\A = not available * = less than 5 times the detection limit NA = not analyzed ND = not detected at detection limit DET LIMIT = DETECTION LIMI N\A = not available NA = not ND = not detected at detection limit DET LIMIT = DETECTION LIMIT * = less than 5 times the detection limit unless otherwise noted analyzed 106-42-3 108-38-3 95-47-6 CAS # 8-80-85 INJECTD 02/03/89 p-Xylene-A COMPOUND RAS SAS m-Xylene o-Xylene a, a, a-Trifluorotoluene FRACTION <u>02J</u> TEST CODE XYLENE Date & Time Collected <u>01/31/89</u> FRACTION <u>O2A</u> TEST CODE <u>TURB</u>
Date & Time Collected 01/31/89 Austin Results by Sample RESULT 430* SURROGATES DET LIMIT 50 REPORT 95% recovery VERIFIED UNITS NAME Xylenes, EPA 602 NAME Turbidity Continued From Above Work Order # 89-02-027 Category Category

Received: 02/02/89

SAMPLE ID MW-4

Austin

REPORT

Work Order # 89-02-027 Continued From Above

Results by Sample

FRACTION 02J TEST CODE XYLENE Date & Time Collected 01/31/89 NAME Xulenes, EPA 602 Category

Q = daily EPA standard recovery outside

Chlorobenzene and p-xylene co-elute. 95% confidence interval.

Quantitated as chlorobenzene unless otherwise noted



SAMPLE ID trip blank Received: 02/02/89

> RAS Austin

> > REPORT

Work Order # 89-02-027

FRACTION <u>O3A</u> TEST CODE <u>EPA602</u>
Date % Time Collected <u>O1/31/89</u> Results by Sample

NAME EPA method 602

Category

FILE # VERIFIED S

ANALYST INSTRMT BM 541-73-1 108-88-3 100-41 4 106-45-7 108-90-7 95-5C-1 71-43-2 CAST INJECTED 02/03/89 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene Toluene RESULT DET LIMIT S R 3 0.40 0.40 0.30 0.30 0.30 0.20 0.20 SLING

SURROGATES

98-05-B a, a, a-Trifluorotoluene 97% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT not detected at detection limit

not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted

Page 16 Received: 02/02/89

SAMPLE ID trip blank

RAS

REPORT

Work Order # 89-02-027 Continued From Above

Austin REPU Results by Sample

FRACTION <u>03A</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>01/31/89</u>

NAME EPA method 602

Category

A-Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless

otherwise noted.

SAMPLE ID trip blank Received: 02/02/89 Page 17

> 70 26 50 Austin Results by Sample

REPURT

Work Order # 89-02-027

NAME Xylenes, EPA 602

Category

FRACTION <u>03A</u> TEST CODE XYLET Date & Time Collected <u>01/31/89</u> TEST CODE XYLENE

VERIFIED 2

ANALYST INSTRMT

INJECTD 02/03/89

FILE

SLINO **U9/**L

p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0.10 0.20 0.20

108-38-3 106-42-3

CAS #

95-47-6

98-08-8

a, a, a-Trifluorotoluene

9/% recovery

SURROGATES

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

NA = not analyzed ND = not detected at detection limit

* = less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available

Q = daily EPA standard recovery outside unless otherwise noted

Chlorobenzene and p-xylene co-elute 95% confidence interval.

Quantitated as chlorobenzene unless otherwise noted



Page 18 Received: 02/02/89

SAMPLE ID reagent blank

RAS

REPORT

Work Order # 89-02-027

Austin Results by Sample

FRACTION <u>04A</u> TEST CODE <u>EPA602</u> No Date & Time Collected <u>not specified</u> NAME EPA method 602

Category

ANALYST INSTRMI 541-73-1 108-90-7 106-46-7 100-41-4 108-88-3 95-5C-1 71-43-2 C45+ INJECTED 02/03/89 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT ND 3 G **VERIFIED** 0.30 0.30 0.30 0.20 0.20 0.40 SLINO 2

SURROGATES

98-08-E a, a, a-Trifluorotoluene N/A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at intection limit

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

SAMPLE ID reagent blank Page 19 Received: 02/02/89

> Austin REPC Results by Sample

REPORT

Work Order # 89-02-027 Continued From Above

FRACTION 04A TEST CODE EPA602 NA Date & Time Collected not specified NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless



Page 20

SAMPLE ID reagent blank Received: 02/02/89

> Austin Results by Sample

REPORT

Work Order # 89-02-027

FRACTION <u>O4A</u> TEST CODE XYLENE No Date & Time Collected not specified TEST CODE XYLENE NAME Xylenes, EPA 602

Category

VERIFIED CL

ANALYST INSTRMT

INJECTD 02/03/89

FILE

SLINO

p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0.10 0.20 0 20

108-38-3 106-42-3

CAS #

95-47-6

SURROGATES

8-80-84

a, a, a-Trifluorotoluene

N/A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted

daily EPA standard recovery outside

95% confidence interval.

Chlorobenzene and p-xylene co-elute.

Quantitated as chlorobenzene unless otherwise noted

Paga Received: 01/31/89

REPORT Radian
TO Bl. 1 Austin

ATTEN Linda Bendele

WORK ID INVOICE . О TAKEN TRANS **BAA1** under separate cover UPS Lee coliforns MF FACILITY

Odessa,

COMPANY

CLIENT

PHILLIPS P

SAMPLES

Phillips Petroleum

의임입의 Lee MW-1 Lee MW-4 SAMPLE IDENTIFICATION ee MW-2 ee MW-3

> Austin 02/13/89 17:14:37 REPORT

RAS

Work Order # 89-01-290

PREPARED <u>Radian Analytical Services</u>
BY <u>8501 Mo-pac</u> 81 ATTEN PHONE 512-454-4797 Austin: TX 78720-1088 PO Box 2010E8

CERTIFIED BY

CONTACT BENDELE

Footnotes and Conments

Potential error for such low values ranges between 50 and 100% Indicates a value less than 5 times the detection limit.

an interferent present. specific matrix was not within acceptable limits indicating Indicates that spike recovery for this analysis on the

COLI T Total coliform TEST CODES and NAMES used on this report

4th Quarker

,

Page 2 Received: 01/31/89

R A S

Austin REPORT Results By Test

Work Order # 89-01-290

Sample Id	colonies/100 mL
01	20
Lee MW-1	
30	1100
Lee MW-2	2
03	70
Lee MW-3	720
Lee MW-4	

RADIAN

e 1 Pived: 02/03/89 EPORT Phillips Petroleum TO Radian Austin Austin Austin PHILLIPS P LIENT PHILLIPS P Phillips Petroleum ILITY Odessa, TX VOICE Under separate cover UPS	REPORT 03/03/89 19:12:38 EPARED Radian Analytical Services BY 8501 Mo-pac B1. PO Box 201088 AUSTIN, TX 78720-1088 AUSTIN, TX 78720-1088 Indicates and Comments Indicates a value less than 5 time tential error for such low values Indicates that spike recovery for ecific matrix was not within accept interferent present. IEST CODES and NAMES Used	Work Order # 89-02-208 CERTIFIED BY CONTACT BENDELE CONTACT BENDELE CONTACT BENDELE Tanges between 50 and 100%. This analysis on the table limits indicating On this report
ID Lee and Eunice radiochemistru KEN MF	and Comments es a value less error for such	detection limit
under separate cover	dicates that spike recovery ific matrix was not within nterferent present.	analysis limits
IDENTIFICATION ALPHA BETA RA 226 MW-1 MW-2 MW-4	TEST CODES and NAMES used on alpha radiation m 226	nis report
the Harly		

Page 2 (eceived: 02/03/89)

RAS -Austin REPORT Results By Test

Work Order # 89-02-208

SAMPLE Id	Test: ALPHA_BG1/	Test: BETA	Test:RA 226
01	2	45 (4)	0. 93(, 05)
Lee MW-1		pCi/L	pCi/L
2		28 (3)	0.80(.05)
Lee MW-2		pCi/L	pCi/L
		17 (2)	0.45(.04)
Lee MW-3	••	pCi/L	pCi/L
04	8.9 (1.2)	12 (1)	0.57(.04)
Lee MW-4		pCi/L	pCi/L
05	17 (3)	19 (3)	0.24(.03)
Eunice MW-1		pCi/L	pCi/L
06	11 (2)	29 (3)	1.62(.07)
Eunice MW-2		pCi/L	PC1/L
	7 (2)	15 (3)	0. 35(. 03)
Eunice MW-3		pCi/L	pCi/L
08	7 (2)	24 (4)	0. 28(. 03)
Eunice MW-4		pCi/L	pCi/L

Page 3

Received: 02/03/89

RAS - Austin Test Methodology

REPORT

Work Order # 89-02-208

TEST CODE ALPHA NAME Gross alpha radiation

confidence level. The value in parentheses is a + or - one sigma value. Results are thus expressed as: value (+ on the ingma). One sigma = one standard deviation, 68%

TEST CODE BETA NAME Gross beta radiation

confidence level. expressed as: value (+ or - 1 sigma). One sigma = one standard deviation, 68% The value in parentheses is a + or - one sigma value. Results are thus

TEST CODE RA 226 NAME Radium 226

expressed as: 68% confidence level. The value in parentheses is a + or - one sigma value. value (+ or - one sigma). One sigma = one standard deviation, Results are thus

Page 1

Client: Radian

B1.1 Austin Olb LEE MW-1 02B-LEE MW-2 03B>LEE MW-3 04B LEE MW-4

EPA METHOD 8080

Lab No: 89-02-028

RESULTS IN ug/L

CAS #	COMPOUND	01B	02B	03B	04B
58-89-9	gamma-BHC, (Lindane)	<0.002	<0.038	<0.002	<0.019
72-20-8	Endrin	<0.002	<0.038	<0.002	<0.019
8001-35-2	Toxaphene	<0.10	<1.9	<0.10	<0.95
72-43-5	Mèthoxychlor	<0.010	<0.19	<0.010	<0.095

SURROGATE RECOVERIES	(results	in % rec	overy)	
Dibutylchlorendate	65	95	99	100
2,4,5,6-Tetrachloro-m-xylene	53	104	79	96

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

B = DETECTED IN REAGENT BLANK; BACKGROUND SUBTRACTION NOT PERFORMED.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

 $N\setminus A = NOT AVAILABLE.$

NS = NOT SPIKED.

J = DETECTED AT LESS THAN THE SPECIFIED DETECTION LIMIT.

4th Quarles



06A REAGENT BLANK

Client: Radian

Bl.1 Austin

EPA METHOD 8080

Lab No: 89-02-028

RESULTS IN ug/L

CAS #	COMPOUND	06A
58-89-9	gamma-BHC, (Lindane)	<0.002
72-20-8	Endrin	<0.002
8001-35-2	Toxaphene	<0.10
72-43-5	Methoxychlor	<0.010

SURROGATE RECOVERIES (results in % recovery)

Dibutylchlorendate 103 2,4,5,6-Tetrachloro-m-xylene 89

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

B = DETECTED IN REAGENT BLANK; BACKGROUND SUBTRACTION NOT PERFORMED.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

 $N\setminus A = NOT AVAILABLE.$

NS = NOT SPIKED.

J = DETECTED AT LESS THAN THE SPECIFIED DETECTION LIMIT.

Page 1

Client: Radian

Bl.1

Austin

02A LEE MW-2 03A LEE MW-3 04A LEE MW-4

Ola LEE MW-1

EPA METHOD 8150

Lab No: 89-02-028

RESULTS IN ug/L

CAS	COMPOUND	OlA	02A	03A	04A
94-75-7	2,4-D	<0.47	<2.4	<0.48	<0.48
93-72-1	2,4,5-TP (Silvex)	<0.14	<0.71	<0.14	<0.14

SURROGATE RECOVERIES (results in % recovery) 2,4-Dichlorophenyl acetic acid 103 133 100 116

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

C = RESULT CONFIRMED BY SECOND COLUMN ANALYSIS.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

 $N \setminus A = NOT AVAILABLE.$

NS = NOT SPIKED.

05A REAGENT BLANK

Client: Radian

B1.1

Austin

EPA METHOD 8150

Lab No: 89-02-028

RESULTS IN ug/L

CAS # COMPOUND

05A

94-75-7 2,4-D

<0.50

93-72-1 2,4,5-TP (Silvex)

<0.15

SURROGATE RECOVERIES (results in % recovery)

2,4-Dichlorophenyl acetic acid 102

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

C = RESULT CONFIRMED BY SECOND COLUMN ANALYSIS.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

 $N\setminus A = NOT AVAILABLE.$

NS = NOT SPIKED.

ODESSA, TEXAS 79762 4001 PENBROOK

January 19, 1989

Quarterly Groundwater Monitoring Analyses Artesia, Eunice, Lee and Lusk Plants

Mr. Dave Boyer Environmental Bureau Chief New Mexico Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87501

Dear Mr. Boyer:

Per your request, attached please find copies of the third quarter groundwater monitoring analyses for the above referenced plants.

If you should have any questions regarding this information, please contact me at (915) 367-1316.

Very truly yours,

Michael D. Ford

Environmental Analyst

Michael D. Food

MDF

Attachments

Page 1 Received: 11/03/88

Austin REPORT 12/12/88 12:06:17

RAS

Work Order # 88-11-014

SAMPLE OI Lee MW- O3 Lee MW- O3 Lee MW- O4 reagent	P.O. # INVOICE	WORK ID TAKEN TRANS	CLIENT COMPANY FACILITY	REPORT TO ATTEN
SAMPLE IDENTIFICATION ee MW-2 ee MW-2 dup reagent blank	under separate cover	NE NE	PHILLIPS P Phillips Petroleum Odessa, TX	Radian B1.1 Austin Linda Bendele
AG E ALPHA AS G			ES 4	
Silver, ICPES Gross alpha rad Arsenic, graphi Barium, ICPES	* Indicates a va Potential error @ Indicates that specific matrix an interferent p	ootnotes and	PHONE <u>512-454</u>	PREPARED Radian BY 8501 Mo PO Box AUstin,

			10.15	SAMPLES 4		
@ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present.	ndicates a ential err	Footnotes and Comments	<u>Unknown compounds present in Lee MW-2 and Lee MW-2 dup for</u>	PHONE 512-454-4797 CONTACT BENDELE	ATTEN AUSTIN, TX 78720-1088 CERTIFIED BY	PREPARED Radian Analytical Services BY 8501 Mo-pac 51. PO Box 201088

Specific conductance Fluoride, IC Chloride, Cadmium, ICPES Gross beta radiation Barium, Mercuru, cold vapor EPA method 602 Digestion, method 6010 Digestion, method Manganese, Iron, ICPES hromium, ICPES ICPES graphite AA C ICPES iation DDES and NAMES used 3020 PH G PHEN RA 226 SE G 504 I TURB XYLENE on this report Radium 226 Selenium, graphite AA DH Total phenolics Sulfate, Lead, graphite AA Xulenes, EPA 602 Turbidity <u>Total organic carbon</u>

BETA

3rd QT-11/88

<u>D64010</u> <u>EPA602</u> FE E

Sodium,

ICPES

Nitrate, colorimetric

Page 2 Received: 11/03/88

Austin REPORT
Results By Test

RAS

Work Order # 88-11-014

E E E E E E E E E E E E E E E E E E E	Sample Id	Sample Id Lee MW-1	Sample Id Lee MW-1
02	SAMPLE :	SAMPLE : 02	SAMPLE 1
₹0. 04	Test: <u>FE E ug/m1</u> 0.14*	Test: <u>CD E</u>	Test: AG E
20c	Test: F IC mg/L 0.4*	Test: <u>CL IC</u> <u>mq/L</u> 27	Test: ALPHA 6 (1) 6 (1) 2.6 (0.9) 2.6 (0.9)
540 2300 2300	Test: MHO	Test: <u>CR E</u> vg/m1 (0.03	Test: AS G vg/ml <0.002 0.007*
0. 93	Test: MN E	Test: DG3020 date complete 11/14/88 11/14/88	Test: <u>BA E</u> <u>vg/m1</u> 0.19 0.57
84	Test: NA E	Test: <u>DG6010</u> date complete 11/11/88 11/11/88	Test: <u>BETA</u> 13 (2) 14 (2) 14 (2) 16 (2)

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Received: 11/03/88

Austin REPORT
Results By Test

RAS

Work Order # 88-11-014 Continued From Above

Lee MW-2	02	Lee MW-1	SAMPLE Id		SAMPLE Sample Id
	0.15	in in	Test: ND3		Test: FE E
	<0.002	<0,002	Test: PB G		Test: F IC
7. 80 6. 81 6. 86	7. 20 7. 24 6. 92	7. 28 7. 24	Test:PH units	2200 2200	Test: MHO
	<0.005	<0.005	Test: PHEN		Test: MN E
pCi/L	0. 95(. 08)	1.7 (0.1)	Test: RA 226	·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ··	Test: NA E

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Austin REPORT REPORT

RAS

Work Order # 88-11-014

SAMPLE I		1			02	, , , , , , , , , , , , , , , , , , ,			
Test: SE G	<0.004				<0.004				
Test: 504 IC	<u></u>				22				
Test: TOC	4*	*c	₩	щ	25	286	24	22 82 83	

Page 5 Received: 11/03/88

SAMPLE ID Lee MW-1

Austin

RAS

REPORT

Work Order # 88-11-014

Category

FRACTION OIJ TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 11/01/88 Category Results by Sample

VERIFIED C

ANALYST INSTRMT 541-73-1 108-90-7 106-46-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 11/07/88 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Benzene Toluene RESULT DET LIMIT R 0.40 0.30 0, 30 0.30 0, 20 0.20 0.40 ONITS

SURROGATES

8-30-86 a, a, a-Trifluorotoluene 98% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

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Page 6 Received: 11/03/88

SAMPLE ID Lee MW-1

RAS

Austin REPO

REPORT

Work Order # 88-11-014 Continued From Above

FRACTION OLD TEST CODE EPA602
Date & Time Collected 11/01/88

NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute otherwise noted. Quantitated as chlorobenzene unless

Page 7 Received: 11/03/88	RAS - Austin REPORT Results by Sample	Work Order # 88-11-014
SAMPLE ID Lee MW-1	FRACTION OIL TEST CODE HG C Date & Time Collected 11/01/88	NAME Mercury, cold vapor Category
	VERIFIED	RHH
INSTRMT 403	ANALYZED 11/16/88	UNITS ug/ml
	ANALYTE RESULT DET LIMIT	
	MercuryND0,0002	
NOTES AND DEFINITIONS DET LIMIT = DETEC ND = not detected NA = not analyzed * = less than 5 t N\A = not availab	ITIONS FOR THIS REPORT. = DETECTION LIMIT etected at detection limit nalyzed han 5 times the detection limit available	
SAMPLE ID Lee MW-1	FRACTION OIA TEST CODE TURB	NAME Turbidity
	VERIFIED	T
ANALYST TAM INSTRMT HACH	ANALYZED 11/03/88	UNITS STINU
	ANALYTE RESULT DET LIMIT	
	Turbidity 27 1.0	



Page 8 Received: 11/03/88	RAS - Austin REPORT Results by Sample	Work Order # 88-11-014 Continued From Above
SAMPLE ID Lee MW-1	FRACTION OIA TEST CODE TURB Date & Time Collected 11/01/88	NAME Turbidity Category
NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	EPORT. ion limit etection limit	
SAMPLE ID Lee MW-1	FRACTION OIJ TEST CODE XYLENE Date & Time Collected 11/01/88	NAME Xulenes, EPA 602 Category
ANALYST <u>CL</u> INSTRMT <u>D</u>	VERIFIED INJECTD 11/07/88 FILE #UN	EDCL UNITSuq/L
CAS # 106-42-3 108-38-3 95-47-6	COMPOUND RESULT DET LIMIT p-Xylene-A ND 0.20 m-Xylene ND 0.20 o-Xylene ND 0.10	
8-80-86	SURROGATES a,a,a-Trifluorotoluene 98% recovery	
" '	THIS REPORT. LIMIT detection limit	
7 11	the detection limit	
ORCOLO COLORE CONTRA		

Page 9 Received: 11/03/88

SAMPLE ID Lee MW-1

Austin

Results by Sample

Work Order # 88-11-014 Continued From Above

Category

= daily EPA standard recovery outside FRACTION <u>01J</u> TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected <u>11/01/88</u>
Category

Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless 95% confidence interval. otherwise noted

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SAMPLE ID Lee MW-2

RAS

REPORT

Work Order # 88-11-014

Results by Sample

FRACTION 02J TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 11/01/88 Category

VERIFIED Ω

	0.40	N.D	1,2-Dichlorobenzene	95-50-1	
	0.40	ND	1,3-Dichlorobenzene	541-73-1	
	0.30	ND	1,4-Dichlorobenzene	106-46-7	
	0.30	ND	Chlorobenzene-A	108-90-7	
	0.30	ND	Ethylbenzene	100-41-4	
	0.20	1. 5	Toluene	108-88-3	
	0. 20	NO	Benzene	71-43-2	
	DET LIMIT	RESULT	COMPOUND	CAS#	
ug/L	ONITS		INJECTED 11/07/88 FILE # _	c CL	ANAL YST I NSTRMT
ļ.	VENITED CL	<			

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 110% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

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N\A = not available

Second column confirmation NOT performed unless otherwise noted

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SAMPLE ID Lee MW-2

RAS

Work Order # 88-11-014 Continued From Above

Austin REPO

FRACTION 02J TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 11/01/88 Category

A-Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted

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Page 12 Received: 11/03/88	RAS - Austin REPORT Results by Sample	Work Order # 88-11-014
SAMPLE ID Lee MW-2	FRACTION 02I TEST CODE HG C Date & Time Collected 11/01/88	NAME Mercury, cold vapor Category
	VERIFIED	RHH
ANALYST KCP	ANALYZED 11/16/88	UNITSug/ml
	ANALYTE RESULT DET LIMIT	
	Mercury <u>ND</u> 0.0002	
NOTES AND DEFINITIONS FO DET LIMIT = DETECTI ND = not detected a NA = not analyzed * = less than 5 tim N\A = not available	IONS FOR THIS REPORT. DETECTION LIMIT ected at detection limit lyzed n 5 times the detection limit ailable	
SAMPLE ID Lee MW-2	FRACTION <u>O2A</u> TEST CODE TURB Date & Time Collected <u>11/01/88</u>	NAME Turbidity Category
	VERIFIED	L
ANALYST TAM INSTRMT HACH	ANALYZED 11/03/88	UNITS NTU
	ANALYTE RESULT DET LIMIT	
	Turbidity 10 10	

RADIAZ

NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available Second column confirmation unless otherwise noted.	8-80-86	CAS # 106-42-3 108-38-3 95-47-6	ANALYSTCL INSTRMTD	SAMPLE ID Lee MW-2	NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	SAMPLE ID Lee MW-2	Page 13 Received: 11/03/88
R THIS REPORT. ON LIMIT t detection limit rmation NOT performed noted.	SURROGATES a,a,a-Trifluorotoluene <u>110</u> % recovery	COMPOUND RESULT DET LIMIT p-Xylene-A ND 0.20 m-Xylene ND 0.20 o-Xylene ND 0.10	VERIFIED INJECTD 11/07/88 FILE #UN	FRACTION <u>02J</u> TEST CODE XYLENE Date & Time Collected <u>11/01/88</u>	THIS REPORT. LIMIT	FRACTION <u>O2A</u> TEST CODE TURB Date & Time Collected <u>11/01/88</u>	RAS - Austin REPORT Results by Sample
			ED <u>CL</u>	NAME Xylenes, EPA 602 Category		NAME Turbidity Category	Work Order # 88-11-014 Continued From Above

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SAMPLE ID Lee MW-2

Austin

Work Order # 88-11-014 Continued From Above

Results by Sample

Category

PRACTION 02J TEST CODE XYLENE NAME Xylenes, EPA 602

Date & Time Collected 11/01/88

Category

Q = daily EPA standard recovery outside

Chlorobenzene and p-xylene co-elute. 95% confidence interval. Quantitated as chlorobenzene unless otherwise noted.

: " # .

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SAMPLE ID Lee MW-2 dup Received: 11/03/88

> RAS Austin

> > REPORT

Work Order # 88-11-014

NAME EPA method 602

Category

FRACTION <u>03A</u> TEST CODE <u>EPA6</u> Date & Time Collected <u>11/01/88</u> Results by Sample TEST CODE EPA602

ANALYST INSTRMT 541-73-1 108-90-7 106-46-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 11/07/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Toluene Benzene RESULT DET LIMIT GN S S E 8 VERIFIED 0. 20 0.20 0.40 0.40 0.30 0.30 0.30 SLINO 12 <u> 1/6</u>

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 113% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

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SAMPLE ID Lee MW-2 dup

RAS Austin

Results by Sample REPORT

Work Order # 88-11-014 Continued From Above

FRACTION <u>03A</u> TEST CODE <u>EPA602</u> NAME <u>EPA method 602</u>

Date & Time Collected <u>11/01/88</u> Category

Category

A-Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless otherwise noted.

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SAMPLE ID Lee MW-2 dup Received: 11/03/88

> RAS Austin

> > REPORT

Work Order # 88-11-014

FRACTION <u>O3A</u> TEST CODE XYLENE Date & Time Collected <u>11/01/88</u> Results by Sample

NAME Xylenes, EPA 602 Category

VERIFIED 2

ANAL YST INSTRMT

INJECTD 11/07/88

FILE #

SLINO

106-42-3 108-38-3 95-47-6 CAS # p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0. <u>20</u> 0. <u>20</u>

SURROGATES

a, a, a-Trifluorotoluene 113% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

98-08-B

ND = not detected at detection limit

NA = not analyzed

* " less than 5 times the detection limit

N\A = not available

Q = daily EPA standard recovery outside Second column confirmation NOT performed unless otherwise noted

95% confidence interval.

Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless

otherwise noted.

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RAS Austin

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Work Order # 88-11-014

SAMPLE ID reagent blank

Results by Sample

FRACTION <u>04A</u> TEST CODE <u>EPA602</u> No Date & Time Collected <u>not specified</u> TEST CODE EPA602 NAME EPA method 602 Category

			S.	VERIFIED	
ANALYSTCL	INJECT	INJECTED 11/07/88		STINU	ug/L
	CAS#	COMPOUND	RESULT I	DET LIMIT	
	71-43-2	Benzene	ND	0.20	
	108-88-3	Toluene	ND	0. 20	
	100-41-4	Ethylbenzene	MD	0.30	
	108-90-7	Chlorobenzene-A	NO	0.30	
	106-46-7	1,4-Dichlorobenzene	ND	0.30	
	541-73-1	1,3-Dichlorobenzene	ND	0.40	
	95-50-1	1,2-Dichlorobenzene	ND	0.40	

SURROGATES

98-08-8 a, a, a-Trifluorotoluene N\A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

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N\A = not available

Second column confirmation NOT performed

unless otherwise noted

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SAMPLE ID reagent blank

Austin

Results by Sample

FRACTION <u>04A</u> TEST CODE <u>EPA602</u> NA Date & Time Collected <u>not specified</u>

NAME EPA method 602

Category

Work Order # 88-11-014 Continued From Above

A-Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

. .

Page 20 SAMPLE ID reagent blank Received: 11/03/88

> RAS Austin

Work Order # 88-11-014

Results by Sample

FRACTION <u>04A</u> TEST CODE <u>XYLENE</u> No Date & Time Collected <u>not specified</u> NAME Xylenes, EPA 602 Category

VERIFIED C

INSTRMT

INJECTD 11/07/88

FILE

SLINO

106-42-3 108-38-3 95-47-6 p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0. <u>20</u> 0. <u>20</u> 0. 10

SURROGATES

a, a, a-Trifluorotoluene N\A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

98-08-8

NA = not analyzed ND = not detected at detection limit

N\A = not available * = less than 5 times the detection limit

Second column confirmation NOT performed unless otherwise noted.

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute otherwise noted Quantitated as chlorobenzene unless

RADIAN

RAS

Work Order # 88-11-014

Page 21 Received: 11/03/88 Austin REPORT
 NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

SPR602

N20 N10

RADIAN

SAMPLE IDENTIFICATION O1 Lee MW-3 O3 Lee MW-4 dup O4 trip blank O5 reagent blank STREAGENT blank	WORK ID Lee TAKEN MF TRANS UPS TYPE P.O. # INVOICE under separate cover	REPORT Radian TO B1.1 AUSTIN AUSTIN ATTEN Linda Bendele CLIENT PHILLIPS P COMPANY Phillips Petroleum FACILITY Odessa, TX	Page 1 RAS Received: 11/03/88
AG E ALPHA AS G BA E CD E CCL IC CR E DG3020 DG4010 EPA6010 FE E NO3 PB G		ES 5	ı
Silver, ICPES Gross alpha radiation Arsenic, graphite AA Barium, ICPES Gross beta radiation Cadmium, ICPES Chloride, IC Chromium, ICPES Digestion, method 3020 Digestion, method 6010 EPA method 602 Iron, ICPES Fluoride, IC Mercury, cold vapor Specific conductance Manganese, ICPES Sodium, ICPES Sodium, ICPES Sodium, ICPES Nitrate, colorimetric Lead, graphite AA	Footnotes and Comments * Indicates a value less than 5 Potential error for such low va @ Indicates that spike recovery specific matrix was not within an interferent present.	PREPARED Radian Analytical Ser BY 8501 Mo-pac Bl. PO Box 201088 AUSTIN, TX 78720-1088 PHONE 512-454-4797 Phenolic samples diluted due t	Austin REPORT 12/12/88 11:53:03
S USED ON this report PH PHEN RA 226 Radium 226 SE G Selenium, graphite AA SO4 IC TOC TOC TOTAL Organic carbon TURB Turbidity XYLENE Xylenes, EPA 602	5 times the detection limit. alues ranges between 50 and 100%. y for this analysis on the acceptable limits indicating	Services CERIAFIED BY CONTACT BENDELE e to colorimetry interference.	Work Order # 88-11-015

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Austin REPORT
 Results By Test

RAS

Work Order # 88-11-015

Tee MW-4	Sample Id	MW-4	Lee MM-3	Sample Id	Lee MW-3	Sample Id
02		03 -	02	SAMPLE	02 01	SAMPLE
2 <u>5</u>	0. 10*	1 1	<0.005 <0.005	Test: CD E	<0.03	Test: AG E
O. 55	0.6*		180 28	Test: CL IC mg/L	3.5 (0.8) pci/L 4 (1) pci/L	Test: ALPHA
680 700 730	1300 690	<0.03	<0. 03 <0. 03	Test: CR E	0. 31 0. 14	Test: AS G
0. 79	0. 024*		11/14/88 11/14/88	Test: DG3020	0. 072 0. 50	Test: BA E
130	130	11/11/88	11/11/88	Test: D66010	5 (1) pci/L 8 (2) pci/L	Test: BETA

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Austin REPORT
 Results By Test

RAS

Work Order # 88-11-015 Continued From Above

Lee MW-4	Sample Id Sample Id O1	SAMPLE :
0.07*	Test: ND3 mg/L as N 0.13	Test: FE E
<0.002	Test: PB G	Test: F IC
7. 66 7. 48 7. 41 7. 18 7. 12 7. 13	Test: PH units 7.06 7.59	Test: MHO 1200 1300 1300
0.06	Test: PHEN mg/L as phenol	Test: MN E
0.65(.06) pci/L	Test: RA 226 0.36(.06) pci/L	Test: NA E

RAS

Austin REPORT Results By Test

Work Order # 88-11-015

Page 4 Received: 11/03/88

Sample Id Lee MW-4 Lee MW-3 SAMPLE **2** 21 Test: SE G <0.004 <0.004 uq/ml Test: <u>504 IC</u> mg/L as <u>504</u> 딸 44 Test: TOC

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Received: 11/03/88

SAMPLE ID Lee MW-3

REPORT

RAS

Austin

Work Order # 88-11-015

Results by Sample

FRACTION O1J TEST CODE EPA602
Date & Time Collected 11/01/88

NAME EPA method 602 Category

VERIFIED P

ANALYST INSTRMT 71-43-2 CAS# INJECTED 11/07/88 COMPOUND FILE # RESULT DET LIMIT 0. 20 UNITS

108-88-3

Benzene

Toluene

0.20

Chlorobenzene-A

Ethylbenzene

0.30

0.30

0.40 0.30

541-73-1

95-50-1

1, 2-Dichlorobenzene

1,3-Dichlorobenzene

1,4-Dichlorobenzene

106-46-7

108-90-7

100-41-4

B 0

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SURROGATES

98-08-8 a, a, a-Trifluorotoluene 99% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

m not detected at detection limit

NA = not analyzed

* less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

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Page 6 Received: 11/03/88

SAMPLE ID Lee MW-3

Austin REPO

RAS

REPORT

Work Order # 88-11-015 Continued From Above

FRACTION O1J TEST CODE EPA602
Date & Time Collected 11/01/88

NAME EPA method 602

A-Chlorobenzene and p-xylene co-elute otherwise noted Quantitated as chlorobenzene unless

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SAMPLE ID Lee MW-3 Received: 11/03/88 RAS

Page 7

Austin REP REPORT

Work Order # 88-11-015

FRACTION OIL TEST CODE HG C Date & Time Collected 11/01/88

NAME Mercury, cold vapor Category

VERIFIED 垩

ANALYZED 11/16/88

ANALYST INSTRMT

SLINO

uq/ml

RESULT DET LIMIT

ANALYTE

Mercury

B 0. 0002

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

SAMPLE ID Lee MW-3

FRACTION <u>OIA</u> TEST CODE TURB Date & Time Collected <u>11/01/88</u>

NAME Turbidity

Category

VERIFIED

ANALYST INSTRMT HACH

ANALYZED 11/03/88

UNITS

ANALYTE RESULT DET LIMIT

Turbidity lo

NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available Second column confirmation unless otherwise noted.	8-80-85	CAS # 106-42-3 108-38-3 95-47-6	ANALYSTCL INSTRMTD	SAMPLE ID Lee MW-3	NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	SAMPLE ID Lee MW-3	Page 8 Received: 11/03/88
R THIS REPORT. ON LIMIT t detection limit es the detection limit rmation NOT performed noted.	SURROGATES a,a,a-Trifluorotoluene <u>99</u> % recovery	COMPOUND RESULT DET LIMIT p-Xylene-A ND 0.20 m-Xylene ND 0.20 o-Xylene ND 0.10	VERIFIED FILE #UN	FRACTION OLD TEST CODE XYLENE Date & Time Collected 11/01/88	THIS REPORT. J LIMIT detection limit the detection limit	Date & Time Collected 11/01/88	RAS - Austin REPORT Results by Sample
	ħ		EDCL	NAME Xylenes, EPA 602 Category		NAME Turbidity Category	Work Order # 88-11-015 Continued From Above

Page 9 Received: 11/03/88

SAMPLE ID Lee MW-3

REPORT

RAS

Austin REPO

Work Order # 88-11-015 Continued From Above

FRACTION 01J TEST CODE XYLENE NAME Xylenes, EPA 602

Date & Time Collected 11/01/88 Category

Category

Chlorobenzene and p-xylene co-elute. Q = daily EPA standard recovery outside 95% confidence interval. otherwise noted. Quantitated as chlorobenzene unless

Received: 11/03/88

SAMPLE ID Lee MW-4

RAS

Austin

Work Order # 88-11-015

Results by Sample REPORT

FRACTION <u>02J</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>11/01/88</u> NAME EPA method 602 Category

VERIFIED P

ANALYST INSTRMT 541-73-1 108-86-3 106-46-7 108-90-7 100-41-4 95-50-1 71-43-2 CAS# INJECTED 11/07/88 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT 7800 530* 3 B S 200 200 SLINO 150 150 150 100 100

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 101% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

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SAMPLE ID Lee MW-4 Received: 11/03/88

RAS

Austin REPO

REPORT

Work Order # 88-11-015 Continued From Above

FRACTION <u>02J</u> TEST CODE <u>EPA602</u> Date & Time Collected <u>11/01/88</u> NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute otherwise noted Quantitated as chlorobenzene unless

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		INSTRMT HACH		SAMPLE ID Lee MW-4	NOTES AND DEFINITIONS FO DET LIMIT = DETECTI ND = not detected a NA = not analyzed * = less than 5 tim N\A = not available			ANALYST KCP INSTRMT 403			SAMPIF ID DO MIL-A	Page 12 Received: 11/03/88
Turbidity <u>22</u> 1.0	ANALYTE RESULT DET LIMIT	ANALYZED 11/03/88		FRACTION <u>O2A</u> TEST CODE TURB Date & Time Collected <u>11/01/88</u>	IONS FOR THIS REPORT. DETECTION LIMIT ected at detection limit lyzed n 5 times the detection limit ailable	Mercury ND 0.0002	ANALYTE RESULT DET LIMIT	ANALYZED 11/16/88		Date & Time Collected 11/01/88	EBACTION OCI TEST CODE	RAS - Austin REPORT Results by Sample
		UNITSUTU	VERIFIEDLM	01/88 NAME Turbidity Category				UNITSuq/ml	VERIFIED RHH	01/88 Category Cold vapor		Work Order # 88-11-015

NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available Second column confirmation unless otherwise noted.	8-80-86	CAS # 106-42-3 108-38-3 95-47-6	ANALYSTCL INSTRMTD	SAMPLE ID Lee MW-4	NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed # = less than 5 times the d N\A = not available	SAMPLE ID Lee MW-4	Page 13 Received: 11/03/88
ON LIMIT t detection limit ts the detection limit rmation NOT performed noted.	SURROGATES a,a,a-Trifluorotoluene <u>101</u> % recovery	COMPOUND RESULT DET LIMIT p-Xylene-A ND 100 m-Xylene ND 100 o-Xylene ND 50	VERIFIED INJECTD 11/07/88	Date & Time Collected 11/01/88	THIS REPORT. LIMIT detection limit the detection limit	FRACTION <u>O2A</u> TEST CODE TURB Date & Time Collected <u>11/01/88</u>	RAS - Austin Results by Sample
	u		ED <u>CL</u>	NAME Xylenes, EPA 602 Category		NAME Turbidity Category	Work Order # 88-11 Continued From Abo

Page 14 Received: 11/03/88

SAMPLE ID Lee MW-4

RAS

Austin REPO

REPORT

Work Order # 88-11-015 Continued From Above

FRACTION 02J TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 11/01/88 Category

Chlorobenzene and p-xylene co-elute. Q = daily EPA standard recovery outside 95% confidence interval. Quantitated as chlorobenzene unless otherwise noted

Page 15 SAMPLE ID trip blank Received: 11/03/88

> RAS Austin Results by Sample

Work Order # 88-11-015

FRACTION <u>04A</u> TEST CODE <u>EPA602</u> NAME <u>EPA method 602</u>
Date & Time Collected <u>11/01/88</u> Category

Category

ANALYST INSTRMT CAS# INJECTED 11/07/88 COMPOUND FILE # RESULT DET LIMIT VERIFIED SLINO CF

Benzene N 0.20

Toluene 0.20

Ethylbenzene 0.30

Chlorobenzene-A 0.30

108-90-7

100-41-4

108-88-3

71-43-2

1,4-Dichlorobenzene 0.30

541-73-1

1,3-Dichlorobenzene

0.40

95-50-1

106-46-7

1,2-Dichlorobenzene 0.40

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 100% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

not detected at detection limit

not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

· .

Page 16 Received: 11/03/88

SAMPLE ID trip blank

RAS Austin

Work Order # 88-11-015 Continued From Above

Results by Sample

FRACTION <u>04A</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>11/01/88</u>

NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

Page 17

SAMPLE ID trip blank Received: 11/03/88

> RAS Austin

REPORT

Work Order # 88-11-015

NAME Xulenes, EPA 602

Category

FRACTION <u>04A</u> TEST CODE XYLEI Date & Time Collected <u>11/01/88</u> Results by Sample TEST CODE XYLENE

VERIFIED CF

ANALYST INSTRMT

INJECTD 11/07/88

FILE #

SLINO

106-42-3 108-38-3 95-47-6 p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0.20

CAS #

SURROGATES

8-80-86

a, a, a-Trifluorotoluene 100% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed less than 5 times the detection limit

N\A = not available

۵ Second column confirmation NOT performed daily EPA standard recovery outside unless otherwise noted

95% confidence interval.

Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

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Page 18 Received: 11/03/88

> RAS Austin

> > REPORT

Work Order # 88-11-015

SAMPLE ID reagent blank

Results by Sample

FRACTION <u>05A</u> TEST CODE <u>EPA602</u> No Date & Time Collected <u>not specified</u> TEST CODE EPA602 NAME EPA method 602 Category

								ANALYST CL INSTRMT D	
95-50-1	541-73-1	106-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAS#	INJECT	
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene-A	Ethylbenzene	Toluene	Benzene	COMPOUND	FILE #	
UN	ND	ND	ND	ND	ND	D			<u> </u>
0.40	0.40	0. 30	0. 30	0. 30	0.20	0.20	RESULT DET LIMIT	UNITS ug/L	VERIFIEDCL

SURROGATES

8-80-8 a, a, a-Trifluorotoluene NIA% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

; ;

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

Page 19 Received: 11/03/88

SAMPLE ID reagent blank

RAS

REPORT

Work Order # 88-11-015 Continued From Above

Austin REPO

FRACTION <u>O5A</u> TEST CODE <u>EPA602</u> No Date & Time Collected not <u>specified</u> NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless otherwise noted.

1

Page 20 SAMPLE ID reagent blank Received: 11/03/88

> RAS Austin

> > REPORT

Work Order # 88-11-015

FRACTION 05A Results by Sample TEST CODE XYLENE NAME Xylenes, EPA 602

Date & Time Collected not specified

Category

VERIFIED S

ANALYST INSTRMT

INJECTD 11/07/88

FILE #

SLIND uq/L

108-38-3 106-42-3 95-47-6 p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMIT 0. 20 0. 20 0. 10

CAS #

SURROGATES

a, a, a-Trifluorotoluene NIA% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

98-08-8

NA = not analyzed ND = not detected at detection limit

less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available

= daily EPA standard recovery outside unless otherwise noted 95% confidence interval.

Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted

; ; ;

Page 21
Received: 11/03/88

9750 710 710

SPR602 SPR602

RAS

Work Order # 88-11-015

Austin REPORT
 NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

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RAS

Work Order # 88-11-008

•		•		•	•	•
	PHONE	ATTEN			ВҮ	PREPARED
	512-454-4797		S I		o-pac B1.	Radian Analytical Services

CERTIFIED BY

CONTACT BENDELE

es and Comments

stes a value less than 5 times the detection limit. al error for such low values ranges between 50 and 100%.

rferent present. ites that spike recovery for this analysis on the matrix was not within acceptable limits indicating

TEST CODES and NAMES used on this report

- Austin REPORT

Work Order # 88-11-008

Sample Id : colonies/100 mL
01 4100
Cee MW-1 02 1 2900
1 04 1 88 88 88 88 88 88 88 88 88 88 88 88 8

Page 1 Received: 11/30/88

RAS

Austin REPORT 12/07/88 14:43:11

Work Order # 88-12-002

REPORT	Radian	PRE
, I	Austin	
ATTEN	Linda Bendele	
CL IENT	PHILLIPS P Phillips Petroleum SAMPLES 4	
FACILITY	Odessa, TX	
WORK ID	Lee, coliform	F00
TAKEN		*
TRANS	UPS	Pot
TYPE	etainissanussanus siene eternistyspanistys, mas eliministe eternistissanus aspainistalistas eternistissanus et	
P. O. #		@ H
INVOICE	under separate cover	spe

ARED	Radian Analytical Services
ΥB	
	PO Box 201088
	sin :
TTEN	
HONE	512-454-4797

CERTIFIED BY CONTACT BENDELE

tnotes and Comments

ential error for such low values ranges between 50 and 100%. ndicates a value less than 5 times the detection limit.

u I interferent present. cific matrix was not within acceptable limits indicating ndicates that spike recovery for this analysis on the

COLI T Total coliform TEST CODES and NAMES used on this report

3nd Om-11/88

Lee MW-2

Lee MW-4

SAMPLE IDENTIFICATION

. #

Page 2 Received: 11/30/88

RAS

Austin REPORT Rest

Work Order # 88-12-002

PI atdwes	SAMPLE	Test:COLI T
	2	2700
	25	800
	<u>ස</u>	200
138 138 14	04	100
Lee MW-4		

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3nf QTR - 12/88	SAMPLE IDENTIFICATION OF FIG. 199-4 OF FUNICE MM-1 OF FUNICE MM-2 OF FUNICE MM-2 OF FUNICE MM-3	< :	TRANS	TAKEN	Phillips Petroleum Odessa, TX	ndele samo re	REPORT Radian TO Bi.i Austin	Received: 12/21/88
	TEST CODES and NAMES used	@ Indicates that spike recovery for specific matrix was not within accepan interferent present.	* Indicates a value less than 5 tim Potential error for such low values	Footnotes and Comments	Analyses performed by Gascoune Labo	ATTEM PHONE 512-454-4797		Austin REPORT 12/22/88 09:36:04
	on this report	this analysis on the ptable limits indicating	imes the detection limit. es ranges between 50 and 100%.		Laboratories.	CONTACT BENDELE	Jewny ()	Work Order # 88-12-146

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	86	RAS - Austin REPORT Work Order Results By Test	Work Order # 88-12-146
SAMPLE Id		Test: IUX	
	2	0.49	
1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		0.05	
		0.03*	
		0 07	
	02 	0. 13	
i de		0.21	٠
		0.24	
		0.10	
	03	O. 13	
r 60 2		0.03*	
No. one.		0.01*	
		0.03*	
	04	0.08	
(n n n E E E		0.02*	

	07 Eunice MW-3			- -	Eunice MW-2			·	Eunice MW-1				Page 3 Received: 12/21/88		
0.68	0.34	0. 54	0 47	0. 07	0.05	0.14	0.19	0. 11	0.06	0.04*	0 39	0.01*	0. 07	Test: IOX	RAS - Austin REPORT Results By Test
															Work Order # 88-12-146 Continued From Above

Pasticiles/Harbuiles 32d OTS, Lee

Notes and Jefinitions

Data Flags:

TERMS USED IN THIS REPORT:

The analysis will meet Analyte - A chemical for which a sample is to be analyzed. EPA method and QC specifications.

Compound - See Analyte.

specified by EPA. Note, the detection limit may vary from that specified by EPA by the laboratories' method detection limits to verify that they meet or are lower than those Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their concentration factor. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise standard methods for analysis of environmental samples.

Conversely, a sample which A sample prepared to the specifications of the method will have a factor of 1. A sample diluted 10 times to bring the analytes Factor - The concentration or dilution factor by which the sample extract or digestate is concentrated 10 times more than specified will have a factor of 0.1. the instrument calibration range will have a factor of 10. differs from that specified by a given EPA method.

Generally, it will be soil, water, air, oil, or solid - The sample material. Matrix waste. Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Inita

7/6n	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ng/M3	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
Eg/Kg	milligrams per kilogram (parts per million); soils/solids
æ	percent; usually used for percent recovery of QC standards
soyun	conductance unit; microohms/centimeter
ml/hr	milliliters per hour; rate of settlement of matter in water
NTO	turbidity unit; nephelometric turbidity unit

Notes and Definitions

Data Flags:

- The asterisk(*) is used to flag results which are less than five times uncertainty of the analysis will increase exponentially as the method These results should be considered the method specified detection limit. Studies have shown that the detection limit is approached. approximate.
 - This flag indicates that a spike is an analytical and/or postdigestion spike. These spikes have not been subjected to the extraction or digestion step.
- This flag indicates that the analyte was detected in the reagent blank Since traces of the background contaminant will vary from sample to sample, the sample results are not corrected from the amount in the
- column of dissimilar phase to resolve compounds of interest from in-This flag Most methods of gas chromatography recommend reanalysis on a second indicates that the analyte has been confirmed on a second column. terferences that may occur and for analyte confirmation.
- bration range of the instrument. Therefore two analyses are performed, ference. The potential source of the interference is included in the the sample diluted so that higher levels fall into calibration range. dilution factor. In an analysis some compounds can exceed the calione at the concentration of some of the analytes, and a second with This flag identifies analytes identified in analysis at a secondary The reported value is estimated because of the presence of interreport narrative. M

Notes and Definitions

Data Flags:

- calibration range for that specific analysis. Usually if one or more This flag identifies a GC/MS result whose concentration exceeds the compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed. G
- data indicate the presence of a compound that meets the identification This flag is used either when estimating a concentration for tentatively identified compounds criteria but the result is less than the sample quantitation limit. where a response factor of 1 is assumed, or when the mass spectral Indicates an estimated value for GC/MS data.
 - A result or value is not available for this parameter, usually a detection limit. N/N
- NA This analyte was not analyzed.
- is not calculated when a result is less than five times the The relative percent differ A spike recovery is not calculated when the result is greater than four times the spike added concentration because the spike added concentration is considered insignificant. Applies to RPD and spike recovery results. detection limit. ence (RPD) Z
 - at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample. This flag (or <) is used to denote analytes which are not detected 2

Notes and Definitions

Data Flags:

NR This analyte was not requested by the client.

This analyte or surrogate was not added (spiked) to the sample for analysis. this

column of dissimilar phase to resolve compounds of interest from in-This flag This flag Most methods of gas chromatography recommend reanalysis on a second is applicable for samples from a regular sampling program. indicates that the analyte has been confirmed previously. terferences that may occur and for analyte confirmation.

tical QC spike, and surrogate recoveries; and to RPD(relative percent This flag is applied to matrix spike, analy-This quality control standard is outside method or laboratory specdifference) values for duplicate analyses and matrix spike/matrix spike duplicate result. ified control limits.

This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.

column of dissimilar phase to resolve compounds of interest from in-Most methods of gas chromatography recommend reanalysis on a second terferences that may occur and for analyte confirmation. indicates that second column was not requested.

Page 1

Client: PHILLIPS 66

PHILLIPS 66

ODESSA, TEXAS 77480

Lad

01A 8811291016 MW-1 02A 8811291137 MW-2

03A 8811291231 MW-3 03B 8811291231 MW-3 DUPL

EPA METHOD 8080

Lab No: A8-12-001

RESULTS IN ug/L

CAS #	COMPOUND	01A	02A	03 A	03B
58-89-9 72-20-8 8001-35-2	gamma-BHC,(Lindane) Endrin Toxaphene	<0.009 <0.009 <0.047	0.43* <0.19 <0.94	<0.009 <0.009 <0.047	<0.009 <0.009 <0.047
72-43-5	Methoxychlor	<0.47	<9.4	<0.47	<0.47

SURROGATE RECOVERIES	(results	in % red	covery)	
Dibutylchlorendate	93	87	104	106
2,4,5,6-Tetrachloro-m-xylene	81	96	80	81

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

B = DETECTED IN REAGENT BLANK; BACKGROUND SUBTRACTION NOT PERFORMED.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

 $N\setminus A = NOT AVAILABLE.$

NS = NOT SPIKED.

J = DETECTED AT LESS THAN THE SPECIFIED DETECTION LIMIT.

Client: PHILLIPS 66

PHILLIPS 66

ODESSA, TEXAS 77480

EPA METHOD 8080

04A 881129151 MW-4 05A REAGENT BLANK

Lab No: A8-12-001

RESULTS IN ug/L

CAS #	COMPOUND	04A	05A
58-89-9	gamma-BHC, (Lindane)	0.02 J	<0.010
72-20-8	Endrin	<0.047	<0.010
8001-35-2	Toxaphene	<0.24	<0.050
72-43-5	Methoxychlor	<2.4	<0.50

SURROGATE RECOVERIES	(results in	% recovery)
Dibutylchlorendate	114	95
2,4,5,6-Tetrachloro-m-xylene	93	72

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

B = DETECTED IN REAGENT BLANK; BACKGROUND SUBTRACTION NOT PERFORMED.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

NA = NOT AVAILABLE.

NS = NOT SPIKED.

J = DETECTED AT LESS THAN THE SPECIFIED DETECTION LIMIT.

06A RECOVERY CHECK

Client: PHILLIPS 66

PHILLIPS 66

ODESSA, TEXAS 77480

EPA METHOD 8080

Lab No: A8-12-001

RESULTS IN %

CAS #	COMPOUND	06A
58-89-9	gamma-BHC, (Lindane)	105
72-20-8	Endrin	NS
8001-35-2	Toxaphene	NS
72-43-5	Methoxychlor	110

SURROGATE RECOVERIES (results in % recovery)

Dibutylchlorendate 104 2,4,5,6-Tetrachloro-m-xylene 75

NOTES AND DEFINITIONS FOR THIS REPORT.

QC = OUTSIDE CONTROL LIMITS.

* = LESS THAN 5 TIMES THE DETECTION LIMIT.

B = DETECTED IN REAGENT BLANK; BACKGROUND SUBTRACTION NOT PERFORMED.

ND = NOT DETECTED AT DETECTION LIMIT.

NA = NOT ANALYZED.

 $N\setminus A = NOT AVAILABLE.$

NS = NOT SPIKED.

J = DETECTED AT LESS THAN THE SPECIFIED DETECTION LIMIT.



ANALYTICAL DATA SUMMARY

PHILLIPS 66 Associate Laboratory Data for Radian Work Order: 8901039

Method: EPA 8150 Herbicides		Matrix: water	ter	
Results in: Sample ID:	ug/L Lee	ug/L Lee	ug/L Lee MW-3	ug/L Lee MM-4
2,4-D	<1.0	<1.0	<1.0	<1.0
2,4,5-TP (Silvex)	<0.2	<0.2	<0.2	<0.2

For a detailed description of flags and technical terms in this report refer to the glossary.

£ :

ODESSA, TEXAS 79762 4001 PENBROOK

December 8, 1988

Quarterly Groundwater Monitoring Analyses Artesia, Eunice, Lee and Lusk Plants

Mr. Dave Boyer Environmental Bureau Chief New Mexico Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87501

Dear Mr. Boyer:

Per your request, attached please find copies of the second quarter groundwater monitoring analyses for the above referenced plants. I have also included additional information on the Lee Plant water supply wells for your reference.

If you should have any questions regarding this information, please contact me at (915) 367-1316.

Very truly yours,

Michael D. Ford

Environmental Analyst

MDF

Attachments

DEC 10 109 CILLS SANTA SE

Received: 09/01/88

Austin 5tin REPORT 09/13/88 09:34:43

Work Order # 88-09-003

CLIENT PHILLIPS P	ATTEN Linda Bendele	Austin	TO B1. 1	REPORT Radian
SAMPLES 8		, performerent des establishment des		
	ATTEN		YE	PREPARED

PARED Radian Analytical Services 8501 Mo-pac B1

PO Box 201088 Austin, TX 78720-1088

512-454-4797

CERTIFIED

FACILITY

Odessa, TX

Phillips Petroleum

œ

COMPANY

WORK ID

Lee,

TRANS TAKEN

UPS

TYPE

INVOICE P.O. #

under

separate

COVET

CONTACT BENDELE

** Possible interference Unknown compounds present in sample Lee MW-4

Footnotes and Comments

Potential error for such * Indicates a value less low values ranges between 50 and than 5 times the detection limit 100%

an interferent present. specific matrix was not within acceptable limits indicating @ Indicates that spike recovery for this analysis on the

EST CODES and NAMES used on this report

XYLENE EPA602 EPA method Xulenes, EPA 602

trip blank

tee Hwe4 duplicate

THE MW-4

C-MM BB Lee MN-2 'n

SAMPLE IDENTIFICATION

readent blank

30/6- 410 pmc

Received: 09/01/88

SAMPLE ID Lee MW-1

Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION OIA TEST CODE EPA602
Date % Time Collected 08/30/88

NAME EPA method 602

Category

			س مر	Jus				ANALYSTCL	_
95-50-1	541-73-1	106-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAS#	INJECTED	
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene-A	Ethylbenzene	Toluene	Benzene	COMPOUND	INJECTED 09/09/88 FILE # _	
Z Z	ND	ND	UN	ND	ND	1.0	RESULT DET LIMIT		VE
0. 40	0.40	0. 30	0. 30	0. 30	0. 20	0, 20	ET LIMIT	_ ONITS _	VERIFIED
								ug/L	CL

SURROGATES

a, a, a-Trifluorotoluene 97% recovery

MOTES AND DEFINITIONS FOR THIS REPORT.

ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

SAMPLE ID Lee MW-1 Page 3 Received: 09/01/88

Austin REPL Results by Sample

REPORT

Work Order # 88-09-003 Continued From Above

FRACTION <u>01A</u> TEST CODE <u>EPA602</u> NAME <u>EPA method 602</u>
Date & Time Collected <u>08/30/88</u> Category

A-Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

RAS Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION <u>OIA</u> TEST CODE XYLENE Date % Time Collected <u>O8/30/88</u>

SAMPLE ID Lee MW-1

NAME Xulenes, EPA 602 fatedor A

VERIFJED

INSTRMT ANALYST

INJECTD 09/09/88

FILE

SLINO

106-42-3 108-38-3 95-47-6 CAS # m-Xylene-A COMPOUND p-Xylene o-Xylene RESULT ND, Q DET LIMIT 0. 20 0. 20 0. 10

SURROGATES

98-08-8

a, a, a-Trifluorotoluene 97% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not * = less than 5 times the detection limit analyzed

Second column confirmation NOT performed N\A = not available unless otherwise noted

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless otherwise noted

SAMPLE ID LEE MW-2

RAS

Austin

Work Order # 88-09-003

Results by Sample

FRACTION <u>O2A</u> TEST CODE <u>EPA602</u>
Date % Time Collected <u>OB/30/88</u> NAME EPA method 602

·								ANALYST CL.	
95-50-1	541-73-1	106-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAS#	INJECT	
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene-A	Ethylbenzene	Toluene	Benzene	COMPOUND	INJECTED <u>09/09/88</u> FILE #	
UN	UD	ND	ND	ND	ND	din	RESULT		<
0. 40	0. 40	0. 30	0. 30	0.30	0.20	0.20	DET LIMIT	UNITSUg/L	VERIFIEDCL

SURROGATES

8-80-86 a, a, a^lTrifluorotoluene 137**% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

less than 5 times the detection limit analyzed

N\A = not available

Second column confirmation NOT performed

unless otherwise noted.

SAMPLE ID Lee MW-2

RAS Austin Results by Sample

REPORT

Work Order # 88-09-003 Continued From Above

NAME EPA method 602

A-Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless FRACTION <u>02A</u> TEST CODE <u>EPA602</u>
Date % Time Collected <u>08/30/88</u>

otherwise noted.

SAMPLE ID Lee MW-2 Received: 09/01/88

Page 7

Austin Results by Sample

RAS

REPORT

Work Order # 88-09-003

FRACTION <u>O2A</u> TEST CODE XYLEI Date & Time Collected <u>O8/30/88</u> TEST CODE XYLENE NAME Xulenes, EPA 602

Category

VERIFIED P

ANALYST INSTRMT

INJECTD 09/09/88

FILE #

UNITS

m-Xylene-A COMPOUND p-Xylene o-Xylene RESULT ZD, O DET LIMIT 0.20 0. 20

106-42-3 108-38-3 95-47-6

98-08-B

a, a, a-Trifluorotoluene SURROGATES 137**% recovery

MOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* " less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted.

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute.

Quantitated as chlorobenzene unless otherwise noted

Page 8 Received: 09/01/88

SAMPLE ID LEE MW-3

RAS - Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION <u>03A</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>08/30/88</u>

NAME EPA method 602

fategory (ategory

VERIFIED CL

INSTRMT ANALYST 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 09/09/88 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,3-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Benzene Toluene RESULT DET LIMIT 0.3* S B 0.20 0.20 0.40 0.40 0.30 0.30 0.30 UNITS

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 98% recovery

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit
N\A = not available

Second column confirmation NOT performed unless otherwise noted.

SAMPLE ID Lee MW-3

Received: 09/01/88

RAS

Austin REPO

Work Order # 88-09-003 Continued From Above

NAME EPA method 602 Category

A-Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted

FRACTION 03A TEST CODE EPA602 Date % Time Collected 08/30/88

Page 10 Received: 09/01/88

SAMPLE ID Lee MW-3

Austin

RAS

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION <u>03A</u> TEST CODE XYLE TEST CODE XYLENE NAME Xulenes, EPA 602 Category

VERIFIED S

ANALYST JUSTRMT

INJECTD 09/09/88

FILE #

SLINO

106-42-3 108-38-3 95-47-6 m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 0. 20 0. 10

8-80-86

a, a, a-Trifluorotoluene SURROGATES 98% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

NA = not analyzed less than 5 times the detection limit

ND = not detected at detection limit

N\A = not available

Second column confirmation NOT performed

0 = daily EPA standard recovery outside unless otherwise noted.

Chlorobenzene and p-xylene co-elute 95% confidence interval.

otherwise noted Quantitated as chlorobenzene unless

SAMPLE ID Lee MW-4

Austin

RAS

REPORT

Work Order # 88-09-003

FRACTION <u>04A</u> TEST CODE <u>EPA6</u> Date & Time Collected <u>08/31/88</u> Results by Sample TEST CODE EPA602

NAME EPA method 602

Category

VERIFIED P

INJECTED 09/09/88 FILE

INSTRMT ANALYST

SLINO

uq/L

71-43-2 CAS# COMPOUND RESULT DET LIMIT

Toluene Benzene 6800 45 200

Ethylbenzene

370

Chlorobenzene-A

108-90-7

100-41-4

108-88-3

1,4-Dichlorobenzene

1,3-Dichlorobenzene 1,2-Dichlorobenzene B 8 ניו N 0 0

541-73-1

95-50-1

106-46-7

SURROGATES

98-08-8

a, a, a-Trifluorotoluene 94% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

NA II not detected at detection limit analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

State In

88/10/90 : 04/01/88

SAMPLE ID LAB MW-4

RAS

REPORT

Work Order # 88-09-003 Continued From Above

Category

FRACTION <u>O4A</u> TEST CODE <u>EPA60</u>
Date % Time Collected <u>OB/31/88</u> Austin REPO TEST CODE EPA602 NAME EPA method 602

A-Chlorobenzene and p-xylene co-elute

Quantitated as chlorobenzene unless

otherwise noted.

SAMPLE ID Lee MW-4

Austin

REPORT

Results by Sample

Work Order # 88-09-003

FRACTION <u>04A</u> TEST CODE XYLEI Date % Time Collected <u>08/31/88</u> TEST CODE XYLENE NAME Xulenes, EPA 602

Category

VERIFIED C

106-42-3 108-38-3 95-47-6 CAS #

INJECTD 09/09/88

AMALYST INSTRMT

FILE #

UNITS

m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 0.50 1.0

SURROGATES

a, a, a-Trifluorotoluene 94% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

98-08-8

ND = not detected at detection limit

NA = not analyzed

* # less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

= daily EPA standard recovery dutside 95% confidence interval.

Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless

otherwise noted

SAMPLE ID Lee MW-4 duplicate

Austin

BAS

REPORT

Work Order # 88-09-003

FRACTION 05A Results by Sample

Date & Time Collected 08/31/88 TEST CODE EPA602 NAME EPA method 602 (ategory

INSTRMT ANALYST 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 09/09/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene Toluene FILE RESULT DET LIMIT 10,000 VERIFIED 200 400 400 300 300 300 200 UNITS 5 ug/L

SURROGATES

a, a, a-Trifluorotoluene 93% recovery

8-80-86

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

NA = not not detected at detection limit analyzed

N\A = not available * = less than 5 times the detection limit

Second column confirmation NOT performed unless otherwise noted.

Page 15 Received: 09/01/88

SAMPLE ID Lee MW-4 duplicate

Austin

Results by Sample

REPORT

Work Order # 88-09-003 Continued From Above

A-Chlorobenzene and p-xylene co-elute. otherwise noted. Quantitated as chlorobenzene unless

NAME EPA method 602

FRACTION <u>05A</u> TEST CODE <u>EPA602</u>

Date & Time Collected <u>08/31/88</u>

Category

SAMPLE ID Lee MW-4 duplicate Received: 09/01/88

RAS SAS Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION 05A TEST CODE XYLE TEST CODE XYLENE NAME Xylenes, EPA 602

Category

VERIFIED P

INJECTD 09/09/88

ANALYST INSTRMT

SLINO ug/L

106-42-3 95-47-6 m-Xylene-A COMPOUND p-Xylene o-Xylene RESULT DET LIMIT 500 200

SURROGATES

a, a, a-Trifluorotoluene 93% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

8-80-86

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

Second column confirmation NOT performed N\A = not ayailable

= daily EPA standard recovery outside unless otherwise noted

95% confidence interval.

Chlorobenzene and p-xylene co-elute.

Quantitated as chlorobenzene unless

otherwise noted

SAMPLE ID trip blank

RAS

Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION <u>07A</u> TEST CODE <u>EPA602</u> No Date & Time Collected <u>not specified</u> TEST CODE EPAGO2 NAME EPA method 602 figo 64 P.

VERIFIED CL

ANALYST 밀 541-73-1 106-46-7 108-90-7 108-88-3 100-41-4 95-50-1 71-43-2 CAS# INJECTED 09/09/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethy Ibenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT R 8 an 8 B S 0.20 0.30 0.20 0.40 0.30 0.30 0.40 SLINA

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 94% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

SAMPLE ID trip blank

RAS

Austin Results by Sample

REPORT

FRACTION <u>07A</u> TEST CODE <u>EPA602</u> NAME <u>EPA method 602</u>

Date & Time Collected <u>not specified</u> Category

Category

Work Order # 88-09-003 Continued From Above

A-Chlorobenzene and p-xylene co-elute otherwise noted. Quantitated as chlorobenzene unless

SAMPLE ID trip blank

Austin

REPORT

Work Order # 88-09-003

NAME Xulenes, EPA 602

Category

FRACTION O7A TEST CODE XYLENE No Date % Time Collected not specified Results by Sample

VERIFIED CL

INSTRMT **DNALYST** B

INJECTD 09/09/88

FILE #

STING

UQ/L

106-42-3 108-38-3 95-47-6 CAS # m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT ND, Q DET LIMIT 0.10 0. 20 0.20

SURROGATES

a, a, a-Trifluorotoluene 94% recovery

MOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

8-80-86

not detected at detection limit

NA = not analyzed

* # less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available

Q = daily EPA standard recovery outside unless otherwise noted.

95% confidence interval.

Chlorobenzene and p-xylene co-elute.

Quantitated as chlorobenzene unless

Received: 09/01/88

RAS

REPORT

Work Order # 88-09-003

SAMPLE ID reagent blank

Austin Results by Sample

FRACTION <u>OBA</u> TEST CODE <u>EPASO2</u> NAME <u>EPA method 602</u>
Date % Time Collected <u>not specified</u> Category

Category

ANALYST 541-73-1 108-90-7 106-46-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 09/09/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene Toluene FILE RESULT DET LIMIT VERIFIED 0. 20 0.40 0.30 0.20 0.40 0.30 0, 30 UNITS C

SURROGATES

98-08-8 a, a, a-Trifluorotoluene NIA% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

not detected at detection limit

not analyzed

less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available unless otherwise noted

SAMPLE ID reagent blank

RAS

Austin REPO Results by Sample

REPORT

FRACTION OBA TEST CODE EPA602 No Date & Time Collected not specified

NAME EPA method 602

Category

Work Order # 88-09-003 Continued From Above

A-Chlorobenzene and p-xylene co-elute otherwise noted. Quantitated as chlorobenzene unless

edo . ecue es : Received: 09/01/88

SAMPLE ID reagent blank

RAS

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION OBA TEST CODE XYLENE Not specified NAME Xulenes, EPA 602 Category

VERIFIED

ANALYST INSTRMT

INJECTD 09/09/88

FILE

SLINA

106-42-3 95-47-6 CAS # m-Xylene-A COMPOUND o-Xylerie p-Xylene RESULT ND, O DET LIMIT 0.20

8-80-86

a, a, a-Trifluorotoluene SURROGATES

N\A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

NA = not analyzed not detected at detection limit

NNA = not available less than 5 times the detection limit

Second column confirmation NOT performed

daily EPA standard recovery outside unless otherwise noted.

Chlorobenzene and p-xylene co-elute 95% confidence interval.

Quantitated as chlorobenzene unless

otherwise noted

Page Received: 09/01/88

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

SPR 602 SPR 602 SPR 602 SPR 602 SPR 602 SPR 602

RAS

Austin REPORT
 NonReported Work

Work Order # 88-09-003

RADIAN

REPORT <u>Radian</u> TO <u>Bl. 1</u> Austin ATTEN Linda Bendele		PREPARED <u>Radian Analytical Services</u> BY <u>8501 Mo-pac Bl.</u> PO Box <u>201088</u> Austin, TX 78720-1088	CERTIFIED BY
PHILLI Philli Odessa		PHONE 512-454-4797	CONTACT BENDELE . t within control limits.
		Previously Reported on 10/06/88. Footnotes and Comments	
TYPE P. O. # 12363		* Indicates a value less than 5 tim Potential error for such low values	times the detection limit. ues ranges between 50 and 100%
	_	@ Indicates that spike recovery . specific matrix was not within a an interferent present.	for this analysis on the acceptable limits indicating
SAMPLE IDENTIFICATION		TEST CODES and NAMES	sed on this report
ME-1	AS F	ICPES SE SO4	Selenium IC Sulfate, Total of
ee MU-4	1 1		Total organic
	ω	ICPES	- !
308/6- 412 pmc	066010	tion, method 60	
רחוי		Fluoride, IC	
-	ig c	ł	
-3 13	M Z	Manganese, ICPES	
ZIZ	NO3 F	—	
סרו נ	PB G	ad, graphite AA	
	PHEN	Total phenolics	

Page 2 Received: 09/01/88

Austin REPORT Results By Test

RAS

Work Order # 88-09-002

B B B B B B B B B B B B B B B B B B B	Sample Id					D D D D D D D D D D D D D D D D D D D	Sample Id	Lee MW-4			D D Z	Sample Id
2	SAMPLE	05 duplic	04	03	02	01	SAMPLE	04 :	 	02	2	SAMPLE
514	Test: MHO	<0.03	⟨0.03	⟨0.03	⟨0.03	⟨0.03	Test: CR E	⟨0.03	⟨0.03	(0. 03	⟨0.03	Test: AG E
0.19	Test: MN E		09/09/88	09/09/88	09/09/88	09/06/88	Test: DG3020	0. 156	0. 336	0. 010	0.004*	Test: AS G
16	Test: NA E	09/12/88	09/12/88	09/16/88	09/16/88	09/16/88	Test: DG6010	0.41	0.07	0. 57	0.12	Test: BA E
1.7	Test: NO3		1.7	<0.040	<0.04	0.04*	Test:FE E	⟨0.005	0.008*	<0.005	⟨0, 005	Test: CD E
0.004*	Test: PB G		0.79*	0.86*	<u></u>	0. 26*	Test: F IC	190	æ	580	27	Test: CL IC

+5)

RADIAN

Lee MW-4	- 04		100 m					.02				Sample Id SAMPLE Test	Page 3 Received: 09/01/88
1280 1250	834 1270	812	807	83	2230	2270	2210	2240	504	502	510	Test: MHD	RAS -
	0.62			0.04*			-	1.0				Test: MN E	Austin Results By To
	150			160				120				Test: NA E	REPORT Test
	0. 12			0.10				0.14			-	Test: NO3	Work Order # 88-09-002 Continued From Above
	0. 003*		. .	0.003*		.		0.004*				Test: PB G	88-09-002 m Above

RADIAN

Received: 09/01/88 Sample Id Lee MW-1 Samp le Lee MW-3 Lee MW-2 SAMPLE SAMPLE ဌ හ 01 Test: PH est: 附 PH units umhos/cm 6.85 7. 55 6.80 6.80 7.60 7. 21 7. 21 1240 7. 19 7. 22 RAS mg/L as pheno Austin est: PHEN est: ME 0.016* <0.005 Results By Test <0.005 uq/ml est: SE G est: NA E <0.004 <0.004 0.004 m/bn uq/ml Test: 504 est: NO3 Work Order # 88-09-002 Continued From Above mq/L as N 304 IC 20 42 ႘ှ est: PB G est: TOC ಜ್ಞ 14^ چ 27 25 42 39 34 uq/ml

Page 5 Received: 09/01/88 Sample Id Sample Lee MW-4 Lee MW-1 Lee MW-2 SAMPLE SAMPLE ස 24 01 Test: PH Test: TOX <0.01 <0.01 <0.01 <0.01 pH units 0.06 7.61 7.02 7. 00 7.06 7. 01 7.66 RAS Test: PHEN Austin REPORT REPORT <0.005 Test:SE G <0.004 Test: <u>504 IC</u> Work Order # 88-09-002 Continued From Above **8** Test: TOC

 ∞

Page 6 Received: 09/01/88

RAS Austin REPORT REPORT

Work Order # 88-09-002 Continued From Above

			K –			7 0 0 0	E T		_		Sample Id
			04				8		·		
0.01*	0.01*	0.01*	0.01*	0.01*	0.02*	0.01*	0.01*	0.06	0.05	0.05	mg/L
			*				-	. =	-		
									-	-	
						•					
				-	_					_	
						,					
	٠										

ANALYST MJS	NOTES AND DEFINITIONS DET LIMIT = DETEC ND = not detected NA = not analyzed * = less than 5 t N\A = not availab SAMPLE ID Lee MW-1	ANALYST KCP INSTRMT 403	Page 7 Received: 09/01/88 SAMPLE ID Lee MW-1
ANALYZED <u>09/01/88</u> ANALYTE RESULT DET LIMIT Turbidity <u>22</u> 1.0	IONS FOR THIS REPORT. DETECTION LIMIT ected at detection limit n 5 times the detection limit ailable FRACTION 01A TEST CODE TURB Date & Time Collected 08/30/88	ANALYZED 09/14/88 ANALYTE RESULT DET LIMIT Mercury ND 0.00018	RAS - Austin REPORT Results by Sample FRACTION OIL TEST CODE HG C Date & Time Collected 08/30/88
UNITS NTU	NAME Turbidity Category	UNITSuq/ml	Work Order # 88-09-002 NAME Mercuru, cold vapor Category

CORPORATION		
Page 8 Received: 09/01/88	RAS - Austin REPORT REPORT	Work Order # 88-09-002 Continued From Above
SAMPLE ID Lee MW-1	FRACTION OIA TEST CODE TURB Date % Time Collected 08/30/88	NAME Turbidity Category
NOTES AND DEFINITIONS FOR THIS DET LIMIT = DETECTION LIM ND = not detected at dete NA = not analyzed * = less than 5 times the N\A = not available	REPORT IT ction 1 detect	
SAMPLE ID Lee MW-2	FRACTION 021 TEST CODE HG C Date & Time Collected 08/30/88	NAME Mercury, cold vapor Category
	VERIFIED	RHH
ANALYST KCP	ANALYZED 09/14/88	UNITSuq/ml
ANALYTE	RESULT DET LIMIT	
	THIS REPORT. LIMIT detection limit the detection limit	
1 1 a b 1 e		

Met	ANALYTE	INSTRMT 403		SAMPLE ID Lee MW-3	NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	ANALYTE	INSTRMT 2100A		SAMPLE ID Lee MW-2	Page 9 Received: 09/01/88
Mercury ND 0.00018	YTE RESULT DET LIMIT	ANALYZED <u>09/14/88</u>	VERIFIED	Date & Time Collected 08/30/88	THIS REPORT. N LIMIT detection limit s the detection limit	YTE RESULT DET LIMIT dity 12 1.0	ANALYZED 09/01/88	VERIFIED	PRACTION OZA TEST CODE TURB Date & Time Collected 08/30/88	RAS - Austin REPORT Results by Sample
		UNITS ug/ml	ED RHH	NAME Mercury, cold vapor Category			UNITS NTU	ED LM	NAME Turbidity Category	Work Order # 88-09-002

RADIAN

SAMPLE ID Lee MW-3 Page 10 Received: 09/01/88 SAMPLE ID Lee MW-3 ANALYST MY NOTES AND DEFINITIONS FOR THIS REPORT. N\A = not available NA = not analyzed ND = not detected at detection limit * = less than 5 times the detection limit DET LIMIT = DETECTION LIMIT N S S M Turbidity ANALYTE ANALYZED 09/01/88 RESULT DET LIMIT FRACTION <u>O3A</u> TEST CODE TURB Date & Time Collected <u>O8/30/88</u> FRACTION <u>031</u> TEST CODE HG C Date & Time Collected <u>08/30/88</u> Austin Results by Sample VERIFIED SLINO NAME Turbidity NAME Mercury, cold vapor Continued From Above Work Order # 88-09-002 NIC Category Category

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

NA = not available

		ANALYST
RB NAME Turbidity Category	FRACTION 04A TEST CODE TURB Date & Time Collected 08/31/88	SAMPLE ID Lee MW-4
	THIS REPORT. ULIMIT detection limit the detection limit	NOTES AND DEFINITIONS FOR T DET LIMIT = DETECTION ND = not detected at d NA = not analyzed * = less than 5 times N\A = not available
	TE RESULT DET LIMIT	ANALYTE
UNITSuq/ml	ANALYZED <u>09/14/88</u>	ANALYST KCP INSTRMT 403
VERIFIED <u>RHH</u>	VER I	
C NAME Mercury, cold	FRACTION 04I TEST CODE HG C Date & Time Collected 08/31/88	SAMPLE ID Lee MW-4
Work Order # 88-09-002	RAS - Austin REPORT Results by Sample	Page 11 Received: 09/01/88

Page 12 Received: 09/01/88

SAMPLE ID Lee MW-4

RAS

Austin REPO

FRACTION <u>04A</u> TEST CODE <u>TURB</u>
Date & Time Collected <u>08/31/88</u>

REPORT

Work Order # 88-09-002 Continued From Above

NAME Turbidity

Category

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit less than 5 times the detection limit not analyzed

RAS

Received: 09/01/88

Austin REPORT: 10/21/88 15:03:25

Work Order # 88-09-004

CILITY	CLIENT	ATTEN		ă	REPORT
etroleum	PHILLIPS P SAMPLES 4	Linda Bendele	Austin	B1. 1	Radian
					PRE

PARED	Radian Analytical Services
γŒ	ŀ
	PO Box 201088
	Austin, TX 78720-1088
ATTEN	
PHONE	512-454-4797

CERTIFIED BY

CONTACT BENDELE

Footnotes and Comments

WORK ID

Lee,

radiochemistry

TAKEN

TRANS TYPE

UPS

INVOICE

under separate cover

SAMPLE IDENTIFICATION

Potential error for such low values ranges between 50 and 100%. * Indicates a value less than 5 times the detection limit.

specific matrix was not within acceptable limits indicating @ Indicates that spike recovery for this analysis on the an interferent present.

BETA ALPHA Gross alpha radiation Radium 226 beta radiation TEST CODES and NAMES used on this report

Lee MW-1 Lee MW-2 BE MW-3

and Otr - 9/86

RAS

Page 2 Received: 09/01/88

Austin REPORT Results By Test

Work Order # 88-09-004

SAMPLE Id		Test: ALPHA	Test: BETA	Test: RA 226
	2	39 (11)		1.6 (0.1)
Lee MW-1		pCi/L		pCi/L
_	02	17 (3)		0.7 (0.1)
Lee MW-2		pCi/L		pCi/L
	읍 	5 (1)		0.6 (0.1)
Lee MW-3		pCi/L		pCi/L
	04 :	17 (3)		0.5 (0.1)
Lee MW-4		pCi/L	-	pCi/L



(A)

Received: 09/01/88

RAS Austin

lest Methodology REPORT

Work Order # 88-09-004

TEST CODE ALPHA NAME Gross alpha radiation

confidence level. expressed as: value (+ or -The value in parentheses is a + or - one sigma value. 1 sigma). One sigma = one standard deviation, Results are thus 7.89

TEST CODE BETA NAME Gross beta radiation

expressed as: confidence level. The value in parentheses is a + or - one sigma value. value (+ or - 1 sigma). One sigma — one standard deviation, 68% Results are thus

TEST CODE RA 226 NAME Radium 226

68% confidence level. expressed as: The value in parentheses is a + or - one sigma value. value (+ or - one sigma). One sigma = one standard deviation, Results are thus

Pesticille/Herbrielle

Data Flags:

TERMS USED IN THIS REPORT:

EPA method and QC specifications. Analyte - A chemical for which a sample is to be analyzed. The analysis will meet

Compound - See Analyte.

concentration factor. (Refer to Factor, below) specified by EPA. Note, the detection limit may vary from that specified by EPA by the laboratories' method detection limits to verify that they meet or are lower than those quantitation specified by EPA for a method. Radian staff regularly assess their Detection Limit - The method specified detection limit, which is the lower limit

standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified. EPA Method - The EPA specified method used to perform an analysis. EPA has specified

of the method will have a factor of 1. A sample diluted 10 times to bring the analytes within the instrument calibration range will have a factor of 10. Conversely, a sample differs from that specified by a given EPA method. A sample prepared to the specifications Factor - The concentration or dilution factor by which the sample extract or digestate is concentrated 10 times more than specified will have a factor of 0.1. Conversely, a sample which

waste. Matrix -The sample material. Generally, it will be soil, water, air, oil, or solid

the analytical summary. Radian Work Order - The unique Radian identification code assigned to the samples reported in

Units .

UTU	ml/hr	sount	æ	mg/Kg	mg/L	ug/M3	ug/Kg	ug/L
turbidity unit; nephelometric turbidity unit	milliliters per hour; rate of settlement of matter in water	conductance unit; microohms/centimeter	percent; usually used for percent recovery of QC standards	milligrams per kilogram (parts per million);soils/solids	milligrams per liter (parts per million); liquids/water	micrograms per cubic meter; air samples	micrograms per kilogram (parts per billion); soils/solids	micrograms per liter (parts per billion); liquids/water

MAIGAS

Notes and Definitions

Data Flags:

- detection limit is approached. These results should be considered uncertainty of the analysis will increase exponentially as the method The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the
- This flag indicates that a spike is an analytical and/or postextraction or digestion step. digestion spike. These spikes have not been subjected to the
- Since traces of the background contaminant will vary from sample to This flag indicates that the analyte was detected in the reagent blank sample, the sample results are not corrected from the amount in the

Ø

- ဂ Most methods of gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. indicates that the analyte has been confirmed on a second column. This flag
- dilution factor. In an analysis some compounds can exceed the calireport narrative. ference. The potential source of the interference is included in the The reported value is estimated because of the presence of inter-This flag identifies analytes identified in analysis at a secondary bration range of the instrument. Therefore two analyses are performed, sample diluted so that higher levels fall into calibration range at the concentration of some of the analytes, and a second with

Notes and Definitions

Data Flags:

This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more extract is diluted and re-analyzed. compounds have a response greater than full scale, the sample or

N/A A result or value is not available for this parameter, usually a detection limit. criteria but the result is less than the sample quantitation limit. data indicate the presence of a compound where a response factor of 1 is assumed, or when the mass spectral when estimating a concentration for tentatively identified compounds Indicates an estimated value for GC/MS data. that meets the identification This flag is used either

NA This analyte was not analyzed.

NO N detection limit. ence (RPD) spike added concentration is considered insignificant. Applies to RPD and spike recovery results. The relative percent differ is greater than four times the spike added concentration because the is not calculated when a result is less than five times the A spike recovery is not calculated when the result

at or above the specified detection limit. The value to the right of This flag (or <) is used to denote analytes which are not detected the < symbol is the method specified detection limit for the sample.

Data Flags: NR This and

IR This analyte was not requested by the client.

S this analysis. This analyte or surrogate was not added (spiked) to the sample for

O This quality control standard is outside method or laboratory specspike duplicate result. difference) values for duplicate analyses and matrix spike/matrix terferences that may occur and for analyte confirmation. Most methods of gas chromatography recommend reanalysis on a second tical QC spike, and surrogate recoveries; and to RPD(relative percent indicates that the analyte has been confirmed previously. column of dissimilar phase to resolve compounds of interest from inis applicable for samples from a regular sampling program. ified control limits. This flag is applied to matrix spike, analy-This flag This flag

This flag indicates that a specific result been obtained using the Method of Standard Addition. from a metals analysis has

い

terferences that may occur and for analyte confirmation. column of dissimilar phase to resolve compounds of interest from in-Most methods of gas chromatography recommend reanalysis on a second indicates that second column was not requested. This flag

C

ANALYTICAL DATA SUMMARY

Phillips 66
Associate Laboratory Data for Radian Work Order: 8811001

Method: EPA 608 Pesticides		Matrix: water	ř		
<pre>Factor: Results in: Sample ID:</pre>	1.0 ug/L Method Blank	1.0 ug/L Lee MW=1	1.0 ug/L Lee	1.0 ug/L Lee	1.0 ug/L Lee
	-				
Lindane	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Endrin	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toxaphene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

For a detailed description of flags and technical terms in this report refer to the glossary.

ANALYTICAL DATA SUMMARY

Phillips 66
Associate Laboratory Data for Radian Work Order: 8811001

Method: EPA 8150 Herbicides		Matrix: water	ter		
Factor:	1.0	1.0	1.0	1.0	1.0
Results in: Sample ID:	ug/L Method	ug/L Lee	ug/L Lee	ug/L	ug/L
-	Blank	MN 1	Mu-2	MW-3	W-4)
	-				
2,4-D	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-TP (Silvex)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	-				

For a detailed description of flags and technical terms in this report refer to the glossary.

heer.



ODESSA, TEXAS 79762 4001 PENBROOK

August 11, 1988

Notification of Discharge Gasoline Plant

CERTIFIED MAIL
RETURN RECEIPT NO. P-512 089 614

Mr. Dave Boyer Environmental Bureau Chief New Mexico Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87501

Dear Mr. Boyer:

In compliance with Section 1-203 of the Water Quality Control Commission regulations, this is to notify you of a discharge of hydrocarbon material to the uppermost aquifer at our Lee Gasoline Plant.

As you are aware, we recently completed installation of new groundwater monitoring well systems at our four southeastern New Mexico plants (Artesia, Eunice, Lee and Lusk). The new systems were installed as a result of a Compliance Order issued by the New Mexico Environmental Improvement Division. The first set of samples from the new wells were taken during the month of May. Analysis results were recently received by this office (copies attached).

You will note from the analyses that water in the No. 4 well at Lee Plant shows some evidence of hydrocarbon contamination. Hydrocarbon contamination was also detected in the original upgradient well located approximately 250 feet north of the No. 4 well. We have requested our consultants on this project (Geoscience Consultants, Ltd. of Albuquerque) provide you with a copy of their document entitled "Report on the Installation of a Ground-Water Monitoring System at Phillips 66 Natural Gas Company Lee Plant" for additional detailed information.

Phillips has contracted GCL to perform a contamination assessment of the Lee Plant site. GCL plans to conduct a soil gas vapor survey as the first step in this project. We would like to schedule a meeting with you and your staff to further discuss our strategies for remediation of this problem. Please contact Mike Ford of this office to schedule a meeting date.

Questions regarding this information should be directed to Mike Ford of this office at (915) 367-1316.

Very truly yours,

Manager, Permian Basin Region

LLF:MDF

Attachments

aoe

Received: 05/12/88

RAS Perimeter

Ser REPORT 06/13/88 :16: 14: 44

Work Order # P8-05-035

REPORT Mike Selke ATTEN 5 Mike Selke Geoscience Consultants, Ltd Albequerque, NM 87102 PHONE

=ACILITY COMPANY

Seescience Consultants,

Albequerque, NM

87102

* = Matrix interference

CLIENT

GEDSCIENCE

SAMPLES

WORK ID

TRANS TAKEN

> H.S. PHILLIPS

Dubuk

Fed Ex (see file for

'8)

TYPE

Aqueous

88-0190-700

INVOICE P. D.

under separate cover

EXT GC

Extraction for GC Pesticides/PCBs

EST CODES and NAMES used on this report

PREPARED Radian Analytical Services
BY Bldg 900 Perimeter Park
Morrisville NC 27560

919-481-0212

CERTIFIED BY

CONTACT M DAY

8805130902 8805130948 8805121843 8805110936 8805110851 8805111655 <u> 3805110920</u> 3805111811/ 8805121041 3805110955 3805131420 rip Blank **IDENTIFICATION** ARTIGNA ARTES/H ARTISSIA ARTESIA **WSK** LUSK 1VSK *lusk* DW-4 MH-3W - 3 BM - 2 m4- 5 MH-3 BW-2

Method Blank

ST QIR-5/88

RAS Perimeter

REPURT

Work Order # P8-05-055

AMPLE ID 8805121843

ANALYST INSTRMT

Results by Sample

FRACTION 09A TEST CODE 8080 Date & Time Collected 05/12/88

NAME Pesticides/PCBs. Category

309-00-02 1024-57-3 319-86-8 959-98-8 319-85-7 BLACKLEY GC1 319-84-6 76-44-8 60-57-1 58-89-9 72-55-9 CAS EXTRCTD INJECTD gamma-BHC heptachlor epoxide 05/16/88 endosulfan I heptachlor (lindane) delta-BHC alpha-BHC beta-BHC COMPOUND dieldrin 4, 4'-DDE DRGANICS ANALYSIS DATA SHEET aldrin PESTICIDES by METHOD 8080 RESULT FILE # DET LIMIT 0.010 0.010 0.010 VERIFIED STINU 돚 ug/L

33213-65-9

72-54-8

72-20-8

50-29-3

53469-21-9

11141-16-5

12674-11-2 11104-28-2

8001-35-2

1031-07-8 7421-93-4

endosulfan sulphate

0.050 0.020 0.020

0.50 0.10

0.20 0.20 toxaphene chlordane endrin aldehyde

endosulfan II

4, 4'-DDD

0.010

0. 030

endrin

4, 4 '-DDT

57-74-9

11097-69-1 12672-29-6

11096-82-5

PCB-1260 PCB-1254 PCB-1248 PCB-1242 PCB-1232 PCB-1221 PCB-1016

Page 30 Received: 05/12/88

RAS Perimeter

Results by Sample

REPORT

Work Order # P8-05-035 Continued From Above

SAMPLE ID 8805121843

FRACTION <u>09A</u> TEST CODE <u>8080</u>
Date & Time Collected <u>05/12/88</u>

NAME Pesticides/PCBs.

Category

SURROGATE RECOVERY

RECOVERY

dibutyl chlorendate 136 %

tetrachlorometaxylene

NOTES AND DEFINITIONS FOR THIS REPORT:

at specified detection limit

x minimum detection limit

RAS Perimeter

Results by Sample REPORT

Work Order # P8-05-035

SAMPLE ID 8805130902

05/12/88

Date & Time Collected 05/13/88 TEST CODE 8080

NAME Pesticides/PCBs.

Category

DRGANICS ANALYSIS DATA SHEET PESTICIDES by METHOD 8080

ANALYST INSTRMT

33213-65-9 11097-69-12672-29-6 53469-21-9 11141-16-5 11104-28-2 12674-11-2 11096-82-5 8001-35-2 7421-93-4 309-00-02 1031-07-8 1024-57-3 319-86-8 319-85-7 959-98-8 319-84-6 57-74-9 BLACKLEY 50-29-3 76-44-8 58-89-9 72-54-8 60-57-1 72-55-9 72-20-8 CAS GC1 EXTRCTD INJECTD endosulfan sulphate gamma-BHC heptachlor epoxide endrin aldehyde 05/16/88 endosulfan II endosulfan I heptachlor (lindane) delta-BHC alpha-BHC chlordane toxaphene PCB-1248 PCB-1242 dieldrin PCB-1260 PCB-1254 PCB-1232 PCB-1221 4, 4'-DD1 beta-BHC PCB-1016 4, 4'-DDD 4, 4'-DDE COMPOUND aldrin endrin RESULT FILE # DET LIMIT 0 010 0. 020 0. 020 0. 050 0. 050 0.010 0. 030 0.010 0.010 0.010 0.20 0.10 0.50 0.10 0.10 0. 20 0. 20 VERIFIED SLINO **1/6** ¥

RAS Perimeter

Results by Sample REPORT

Work Order # P8-05-035 Continued From Above

3AMPLE ID 8805130902

FRACTION 10A TEST CODE 8080
Date & Time Collected 05/13/88

NAME Pesticides/PCBs. Category

SURROGATE RECOVERY

COMPOUND

RECOVERY

dibutyl chlorendate

tetrachlorometaxylene

NOTES AND DEFINITIONS FOR THIS REPORT: DET LIMIT = detection limit

ND = not detected at specified detection limit.

NR = not required for analysis. compound peak saturated.

estimated value less than 3

x minimum detection limit.

Work Order # P8-05-033

MPLE ID 8805130948

RAS Perimeter Results by Sample

REPORT

FRACTION 11A TEST CODE 8080 Date & Time Collected 05/13/88 NAME Pesticides/PCBs.

DRGANICS ANALYSIS DATA SHEET PESTICIDES by METHOD 8080

INSTRMT BLACKLEY EXTRCTD <u>05/16/88</u>
INJECTD <u>06/05/88</u> FILE # VERIFIED UNITS ¥

12672-29-6		53469-21-9	11,41-16-5	11104-28-2	12674-11-2	8001-35-2	57-74-9		7421-93-4	50-29-3	33213-65-9	72-54-8	72-20-8	60-57-1	72-55-9	959-98-8		309-00-02	319-86-8	76-44-8			319-84-6	CAS #
3))	PCB-1248	PCB-1242	PCB-1232	PCB-1221	PCB-1016	toxaphene	chlordane	endosulfan sulphate	endrin aldehyde	4,4'-DDT	endosulfan II	4, 4, - ppp	endrin	dieldrin	4, 4'-DDE	endosulfan I	heptachlor epoxide	aldrin	delta-BHC	heptachlor	beta-BHC	gamma-BHC (lindane)	alpha-BHC	COMPOUND
	Z	N _R	NR.	N ₂	NR.	ND	B	N	S	N	B	B	N	N	R	B	B	8	N	B	31	8	ND	RESULT
	0.10	0.10	0.20	0.20	0.10	0.50	0.050	0.050	0.020	0.020	0.030	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	DET LIMIT

Page 36 : **12/88** Received: 05/12/88



REPORT

Work Order # P8-05-035 Continued From Above

3AMPLE ID 8805130948

RAS Perimeter Results by Sample FRACTION 11A TEST CODE 8080
Date & Time Collected 05/13/88

NAME Pesticides/PCBs. Category

SURROGATE RECOVERY

COMPOUND

RECOVERY

dibutyl chlorendate

tetrachlorometaxylene

AND DEFINITIONS FOR THIS REPORT DET LIMIT = detection limit

OTES

not detected at specified detection limit

not required for analysis.

estimated value less than 3 x minimum detection limit.



RAS Perimeter

REPORT

Work Order # P8-05

SAMPLE ID 8805131420

Results by Sample

FRACTION 12A TEST CODE 8080 Date & Time Collected 05/13/88

NAME Pesticides/PCBs Category

ANALYST INSTRMT BLACKLEY GC1 EXTRCTD <u>05/16/88</u>
INJECTD <u>06/05/88</u> ORGANICS ANALYSIS DATA SHEET PESTICIDES by METHOD 8080 FILE # VERIFIED SLINA ng/L ¥

heptachlor endo	gamma—BHC
heptachlor delta-BHC aldrin lor epoxide andosulfan I 4,4'-DDE	alpha-BHC (lindane)
000000000000000000000000000000000000000	0.010

309-00-02

319-86-8

319-85-7

58-89-9

76-44-8

319-84-6

CAS

COMPOUND

RESULT

DET LIMIT

1024-57-3

959-98-8

endosulfan sulphate endrin aldehyde endosulfan II toxaphene chlordane PCB-1232 PCB-1221 PCB-1016 4, 4 '-DDT 景 3 8 3 0.20 0.50 0.10 0.20 0.010 0.010 0.030 0. 020 0. 020 0. 050 0.050

33213-65-9

72-54-8

4, 4 '-DDD

dieldrin

endrin

60-57-1

72-55-9

72-20-8

11096-82-5 11097-69-1 12672-29-6 53469-21-9 11141-16-5

> PCB-1254 PCB-1248 PCB-1242

> > 0.10

0. 20

12674-11-2 11104-28-2

8001-35-2

1031-07-B

57-74-9

7421-93-4

50-29-3

eceived: 05/12/88

JAMPLE ID 8805131420

RAS Perimeter

REPORT

Results by Sample

FRACTION 12A TEST CODE 8080 Date & Time Collected 05/13/88

Work Order # P8-05 Continued From Above

NAME Pesticides/PCBs

Category

SURROGATE RECOVERY

RECOVERY

dibutyl chlorendate 143 %

tetrachlorometaxylene

AND DEFINITIONS FOR THIS REPORT DET LIMIT = detection limit

not detected at specified detection limit

NR = not required for analysis

S = compound peak saturated.

estimated value less than 3 x minimum detection limit.

Page

RAS Perimeter REPORT 06/14/88 14:02:48

Work Order # P8-05-536

Previously Reported on 06/13/88.	AKEN W S Dubuk RANS Fed Ex (see file for #'5) TYPE Aqueous O # 88-0190-700 Under separate cover	F P DI C M # M C M C M C M C M C M C M C M C M
ATTEN PHONE 919-481-0212	ATTEN W.S. Dubuk CLIENT GEOSCIENCE SAMPLES 15 COMPANY Geoscience Consultants, Ltd. FACILITY 500 Copper NW	ATT COMPA FACILI
PREPARED Radian Analutical Servi BY Bidg 900 Perimeter Par Morrisville, NC 27560	REPORT Mike Selke TO Geoscience Consultants, Ltd. Albequerque, NM 87102	REPO
06/14/88 14: 02: 48	Received: 05/12/88	Receiv

CONTACT M DAY

51 QTR-5/08

TEST CODES and NAMES used on this report

RAS Perimeter

REPORT

Work Order # P8-05 36

SAMPLE ID 8805121844

Results by Sample

FRACTION 09A TEST CODE 509B Date % Time Collected 05/12/88

圣所 GC of Herbicides

Category

DRGANICS ANALYSIS DATA SHEET HERBICIDES

EXTRCTD 05/18/88 INJECTD 05/26/88

BLACKLEY

FILE

VERIFIED

SLINO

(Silvex) COMPOUND 2, 4, 5-T 2,4-D RESULT 0.10 0 10 0.50 LIMIT

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = detection limit.

ND = not detected at specified d

NR = not required for analysis.

S = compound peak saturated.

J = estimated value less than 3 detection

limit

limit.

93-76-5 93-72-1 94-75-7

CAS #

× minimum detection

SAMPLE ID 8805130903

Received: 05/12/88

RAS Perimeter

REPORT

Work Order # P8-05 536

Results by Sample

ERACTION 10A TEST CODE 509B Date & Time Collected 05/13/88

香 GC of Herbicides

Category

DROANICS ANALYSIS DATA SHEET

EXTRCTD 05/20/88 INJECTD 05/26/88

ANALYST INSTRMT

FILE

VER IF IED 돗

UNITS

93-72-1 94-75-7 93-76-5 CAS # 2, 4, 5-TP (Silvex) COMPOUND 12, 4, 5-T 2,4-0 RESULT 0.67 DE T 0 10 0 10 0.50 LIMIT

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = detection limit.

ND = not detected at specified detection.

NR = not required for analysis.

S = compound peak saturated.

J = estimated value less than 3 x minimum. minimum detection limit.

Timit

Page 25

RAS Perimeter

REPORT

Work Order # P8-05. 36

SAMPLE ID 8805130949

Received: 05/12/88

FRACTION 11A TEST CODE 509B Date & Time Collected 05/13/88 Results by Sample

NAME GC of Herbicides nobeten

ORGANICS ANALYSIS DATA SHEET HERBICIDES

FILE #

VERIFIED

93-76-5 93-72-1 94-75-7 EXTRCTD CAS # 05/20/88 05/26/88 2, 4, 5-TP (Silvex) COMPOUND 2, 4, 5-T 2, 4-D 0. 27 J RESULT S DET. LIMIT 0.50 0.10 0 10 SLINO

NOTES

AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = detection limit

ND = not detected at specified detection

NR = not required for analysis.

S = compound peak saturated.

J = estimated value less than 3 x minimum limit

minimum detection limit

Page 27

Received: 05/12/88

RAS Perimeter

REPORT

Work Order # P8-05-06

SAMPLE ID 8805131420

Results by Sample

FRACTION 12A TEST CODE 509B Date & Time Collected 05/13/88

NAME GC of Herbicides
Category

DRGANICS ANALYSIS DAȚA SHEET HERBICIDES

EXTRCTD 05/20/88 05/26/88 FILE VERIFIED SLINA

93-76-5 93-72-1 94-75-7 CAS # 2,4,5-TP (Silvex) COMPOUND 2, 4, 5-1 2,4-p RESULT B DET. 0.50 0.10 0.10 LIMIT

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = detection limit.

ND = not detected at specified detection.

NR = not required for analysis.

S = compound peak saturated.

J = estimated value less than 3 x minimum.

minimum detection limit.

limit

Page 1 Received: 05/14/88 ORTORATION

Work Order # 88-vu-066

tants, Ltd.	RAS
PREPARED Ra	Austin 06/29/88
<u>Radian Analyti</u> 8501 Mo-pac Bl	REPORT 13: 27: 11

REPORT Geoscience Consul

500 Copper NW Suite 200 Albuguergue

ATTEN Austin, PO Box 201088 TX 78720-1088 cal Services

CERTIFIED BY

analuses Unknown compounds p

FACILITY COMPANY

Geoscience Consultants,

GEOSCIENCE

SAMPLES

PHONE

Ltd.

ATTEN

Mike Selke

MM 87102

WORK ID

Phillips

TRANS TAKEN

Fed Ex

USM

TYPE

88-0190-700

INV

Footnotes and Commer Duplicate of report

Potential error for * Indicates a value

an interferent present. specific matrix was not @ Indicates that spi

reagent blank trip blank Lee #4

15T QTR-5/88

MN		HG C	FIC	T	EPA602	06010	03020	CR E	COLIT	CL IC	CB E	BETA	BA E	AS G	ALPHA	AG E	
Manganese, J'TES	Specific conductance	Mercury, cold vapor	Fluoride, IC	Iron, ICPES	EPA method 602	Digestion, method 6010	Digestion, method 3020	Chromium, ICPES	Total coliform	Chloride, IC	Cadmium, ICPES	Gross beta radiation	Barium, ICPES	Arsenic, graphite AA	Gross alpha radiation	Silver, ICPES	TEST CODES and I
				- Annual of Annu		XYLENE	E BRUT	TOX	TOC	504 IC	SE G	PHEN	FH	PH G	NO3	N/A	NAMES used

Sulfate,

Xulenes, EPA 602

Turbidity

lotal organic halides <u> Total organic carbon</u> Selenium, graphite AA

Total phenolics

Nitrate, colorimetric

Lead, graphite AA

Sod i um,

report

512-454-4797 CONTACT GIBSON	IBSON
compounds present in Lee #1 and Lee #4 in EPA602	PA602
6/27/88.	
tes a value less than 5 times the detection limit. Lerror for such low values ranges between 50 and 100%	limit. 50 and 100%
matrix was not within accentable limits indication	n the

RAS Austin REPORT REPORT

Work Order # 88-02-066

	0 0 1 2 4				F	□ □	Sample Id	Lee #4	T 4	,	Sample Id	Lee #4	T 100 m		Sample Id
-	····	8	·· wa, a.		e . **** *	<u></u>	SAMPLE		2	2	SAMPLE		_단	2	SAMPLE
		05/23/88				05/23/88	Test: D66010	er der gebreite de set de	₹0.003	0.007*	Test: CD E		<0.003	⟨0, 003	Test: AG E
		· · · · · · ·				0. 037	Test: FE E	endersteller anderste der traus des este fallen des des este complémentation par voienne ver	180	<u>ب</u>	Test: CL IC	pCi/L	(1.9)	(4.6	Test: ALPHA
~- ,		1. 0*				0.68*	Test: F IC		2100	>24,000	Test: COLI T .		0. 130	0.004	Test: AS G
	1250	1230	470	470	470	470	Test: MHU		0.028	0.004*	Test: CR E		0.38	0. 22	Test: BA E
	,	0. 57				0.12	Test: MN E	es e estadores estadores estadores estadores estadores estadores estadores e estadores en estado	05/16/88	05/16/88	Test: DG3020	pCi/L	7. 1 (2.0)	(9.6	Test: BETA

Page 3 • Neceived: 05/14/88 31 JANS 00 X 7 0 X 7 - 0 Z Test: D@6010 RAS Austin Results By Test rest: FF REPORT Test: MHU Work Order # 88-vj-066 Continued From Above Test: MN E

Sample Id

date complete

uq/ml

PS.

		radion serve des que de destante des radiones des radiones construires e secretarios de la compansión de la co		1240
SANPLE Id	Test: NA E	Test: NO3	Test: PB G	Test: PH
*		_n_	<0.002	7. 55
######################################	en removed de		;	7. 53
	en der der ver			7. 50
		`,		7. 55
Z0 #2	5	<0.1	0.010	7. 52
r •• ••				7. 50
				7. 43
	ner man galler etc			7. 43

CORPO	7 7 9 2			
Received: 05/14/88	RAS -	Austin REPORT REPORT	REPORT Test	Work Order # 88-vu-066
SAMPE Id SAMPLE	Test: SE G	Test: SO4 IC	Test: TOC	Test: TOX
	<0.003	យ	<u></u>	<0.02
			4*0	<0.02
or was as			ترا *	<0.02
			○1@	0.02*
	<0.003	34	Ω	0.05*
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			rJ **	⟨0.02
			P.J ≫k	0.03*
	-		7•_] ≫*	⟨0.02
-				

Page 5 Received: 05/14/88

SAMPLE ID Lee #1

RAS Austin

Results by Sample

NAME EPA method 602

FRACTION OLD TEST CODE EPA602
Date & Time Collected 05/13/88 Category

VERIFIED _

NALYSTD	TOBUNI	INJECTED 05/17/88 FILE # _	A marin disease of the manifestary (Palmage to Magazine)	UNITSU
	CAS#	COMPOUND	RESULT D	DET LIMIT
	71-43-2	Benzene	220	A
	108-88-3	Toluene	0.8*	0.2
	100-41-4	Ethylbenzene	8.2	0.3
	108-90-7	Chlorobenzene-A	ND	0.3
	106-46-7	1,4-Dichlorabenzene	ND	0.3
	541-73-1	1,3-Dichlorobenzene	ND	0.4
	95-50-1	1,2-Dichlorobenzene	S S	0.4

SURROGATES

a, a, a-Trifluorotoluene 110% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. NA = not analyzed ND = not detected at detection limit DET LIMIT = DETECTION LIMIT * = less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available 's otherwise noted

Page 6 Received: 05/14/88

SAMPLE ID Lee #1

Austin Results by Sample

Pate & Time Collected 05/13/88

Work Order # 88-vy-066 Continued From Above

NAME EPA method 602 Category

A-Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless

Page 7 Received: 05/14/88	RAS - Austin REPORT Results by Sample	Work Order # 88-vu-066
SAMPLE ID Lee #1	FRACTION OIL TEST CODE HG C	NAME Mercury, cold vapor
	新闻 新	
	VERIFIED	ZD DMC
INSTRMT 403	ANALYZED 05/23/88	UNITSuq/ml
	ANALYTE RESULT DET LIMIT	.:
	Mercury ND 0.00012	
NOTES AND DEFINITIONS DET LIMIT = DETECTED ND = not detected NA = not analyzed * = less than 5 t	ITIONS FOR THIS REPORT. = DETECTION LIMIT etected at detection limit nalyzed han 5 times the detection limit available	
SAMPLE ID LEP #1	FRACTION OIA TEST CODE TURB Date & Time Collected 05/13/88	NAME Turbidity Category
	VERIH IED	:DLM
ANALYST MUS	ANALYZED 05/14/88	UNITS STINU
	AMALYTE RESULT DET LIMIT	
	Turbidity 88 10	

CORPORATION

SAMPLE ID Lee #1 SAMPLE ID Lee #1 Received: 05/14/88 NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT - DETECTION LIMIT ND = not detected at detection limit N/A = not available less than 5 times 00 N analyzed the detection limit 器 FRACTION OLD TEST CODE XYLENE Date & Time Collected 05/13/88 FRACTION OIA TEST CODE TURB Austin Results by Sample NAME Xulenes, EPA 602 NAME Turbidity Work Order # 88-vo-066 Continued From Above Category Category

AMALYST INJECTD 05/17/88 FILE VERIFIED ... SLIN

CAS # COMPOUND RESULT DET LIMIT 106-42-3 p-Xylene 2.2 0.2 108-38-3 m-Xylene-A 0.9* 0.2 95-47-6 a-Xylene 1.1 0.1

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

98-08-8

a, a, a-Trifluorotoluene

110% recovery

SURROGATES

NA = not analyzed * = less than 5 times the detection limit

NA = not available

Second column confirmation NOT performed

un is otherwise noted

SAMPLE ID Lee #1

RAS

Austin

Results by Sample

FRACTION OIJ TEST CODE XYLENE
Date & Time Collected 05/13/88

NAME Xylenes, EPA 602

REPORT

Work Order # 88-vu-066 Continued From Above

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and m-xylene co-elute. otherwise noted. Quantitated as chlorobenzene unless

Received. 05/14/88

SAMPLE ID Lee #4

R S Austin

REPURT

Work Order # 88-vy-066

Results by Sample

TEST CODE EPAGOS

PRACTION 02J TEST CODE EPAGE Date & Time Collected 05/13/88 NAME EPA method 602 Category

INSTRMI 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 05/17/88 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1, 4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT 6200 140 H K 8 S 50 VERIFIED BLINA CL

SURROGATES

8-80-88 a, a, a-Trifluorotoluene 115% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT - DETECTION LIMIT

not detected at detection limit

analyzed

less than 5 times the detection limit

NNA = not available

Second column confirmation NOT performed ű s otherwise noted

SAMPLE ID Lee #4

Page 11 Received: 05/14/88

RAS

Austin REPI

REPORT

Work Order # 88-v--066 Continued From Above

PRACTION 02J TEST CODE EPA602
Date & Time Collected 05/13/88

NAME EPA method 602 Category

A-Chlorobenzene and m-xylene co-elute otherwise noted. Quantitated as chlorobenzene unless

SAMPLE ID Lee #4 SAMPLE ID Lee #4 ANALYST INSTRUT AWALYST NOTES AND DEFINITIONS FOR THIS REPORT INSTRMT N\A = not available NA = not ND = not * = less than 5 times DET LIMIT = DETECTION LIMIT 87W analyzed detected at detection limit ANALYTE Mercury the detection limit ANALYZED 05/14/88 ANALYZED 05/23/88 RESULT FRACTION <u>O2A</u> TEST CODE TURB Date & Time Collected <u>05/13/88</u> PACTION 021 TEST CODE HG C E Results by Sample DET LIMIT 0.00012 VERIFIED VERIFIED UNITS UNITS NAME Turbidity NAME Mercury, cold vapor DMC nd/wj NTC Category Category

Turbidity

18

1.0

ANALYTE

RESULT DET LIMIT

CORTORATI

RAS

Austin

REPURT

Work Urder # 88-v--066

SAMPLE ID Lee #4 SAMPLE ID Lee #4 Page 13 Received: 05/14/88 INSTRMT NOTES AND DEFINITIONS FOR THIS REPORT NOTES AND DEFINITIONS FOR THIS REPORT ND = not detected at detection limit NA = not analyzed ND = not detected at detection limit DET LIMIT = DETECTION LIMIT N\A = not available * = less than 5 times the detection limit NA = not analyzed Second column confirmation NOT performed N\A = not available DET LIMIT = DETECTION LIMIT less than 5 times the detection limit s otherwise noted CORPORATION 106-42-3 108-38-3 8-80-84 95-47-6 CAS # INJECTD 05/17/88 m-Xylene-A RAS COMPOUND a-Xylene p-Xylene a, a, a-Trifluorotoluene Date & Time Collected 05/13/88 FRACTION <u>O2A</u> TEST CODE <u>TURB</u>
Date & Time Collected <u>05/13/88</u> Austin Results by Sample RESULT DET LIMIT SURROGATES FILE # REPORT 115% recovery VERIFIED ___ UNITS NAME Xylenes, EPA 602 NAME Turbidity S Work Order # 88-v-066 Continued From Above Category Category

CORTORATION

Received: 05/14/88

SAMPLE ID Lee #4

Austin

RAS

REPORT

Results by Sample

Work Order # 88-vy-066 Continued From Above

NAME Xylenes, EPA 602 Category

= daily EPA standard recovery outside FRACTION <u>OZU</u> TEST CODE XYLEI Date & Time Collected <u>O5/13/88</u>

Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless 95% confidence interval. otherwise noted.

Page 15

Received: 05/14/88

RAS Austin

Results by Sample

Work Order # 88-vu-066

SAMPLE ID trip blank

FRACTION <u>O3A</u> TEST CODE <u>EPA602</u> No Date & Time Collected not <u>specified</u> TEST CODE EPA602 NAME EPA method 602 (ategory

AMALYST INSTRMT 541-73-1 108-90-7 100-41-4 106-46-7 E-88-3 95-50-1 71-43-2 CAS# INJECTED 05/17/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Benzene Toluene RESULT DET LIMIT 0.6* E 8 S 8 S 3 VERIFIED 0.2 UNITS 0.2 0.4 0.4 0.3 0.3 0.3 F

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 102% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

ND = not DET LIMIT = DETECTION LIMIT detected at detection limit

analyzed

less than 5 times the detection limit

NNA = not available

Second column confirmation NOT performed E,

otherwise noted.

Page 16 Received: 05/14/88 SAMPLE ID trip blank

RAS

Austin REPURESUITS by Sample

REPORT

Work Order # 88-vu-066 Continued From Above

FRACTION OBA TEST CODE EPA602 No Date & Time Collected not specified

rected not specified NAME EPA method 602

A-Chlorobenzene and m-xylene co-elute. otherwise noted Quantitated as chlorobenzene unless

Page 17 Received SAMPLE 1

Received: 05/14/88
SAMPLE ID trip blank

RAS - Austin

REPORT

Work Order # 88-v--066

Results by Sample

FRACTION <u>O3A</u> TEST CODE XYLENE NAME Xulenes, EPA 602
Date & Time Collected not specified Category Category

VERIFIED CL

ANALYST RW
INSTRMT D

INJECTD 05/17/88

FILE #

CHIND

CAS # COMPOUND RESULT DET LIMIT 106-42-3 p-Xylene ND 0.2 108-38-3 m-Xylene-A ND 0.2 95-47-6 a-Xylene ND 0.1

SURROGATES

a, a, a-Trifluorotoluene 102% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

8-80-85

ND = not detected at detection limit

NA = not analyzed

* — less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless

otherwise noted.

RAS

REPORT

Work Order # 88-v.-7666

SAMPLE ID readent blank Received: 05/14/88

FRACTION 04A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected not specified Category Austin Results by Sample

VERIFIED

ANALYST CL INSTRMT D	INJEC:	INJECTED 05/17/88 FILE # _		UNITSUq/L
	CAS#	COMPOUND	RESULT DE	TLIMIT
	71-43-2	Benzene	ND	0.2
	108-88-3	Toluene	ND	0.2
	100-41-4	Ethylbenzene	ND	<u>0.3</u>
	108-90-7	Chlorobenzene-A	ND	0.3
	106-46-7	1,4-Dichlorobenzene	ND	0.3
	541-73-1	1,3-Dichlorobenzene	S	0.4
	95-50-1	1,2-Dichlorobenzene	ND	0.4
	***************************************			Michael Colonia of the Charles of the Colonia of th

SURROGATES

a, a, a-Trifluorotoluene N\A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* - less than S times the detection limit

N\A = not available

Second column confirmation NOT performed un. is otherwise noted.

Page 19 Received: 05/14/88

RAS

CORPORATION

Austin

REPORT

Work Order # 88-u--066 Continued From Above

Category

SAMPLE ID reagent blank

FRACTION <u>04A</u> TEST CODE <u>EPA602</u> Not Specified Results by Sample TEST CODE EPA602 NAME EPA method 602

A-Chlorobenzene and m-xylene co-elute otherwise noted. Quantitated as chlorobenzene unless

Page 20

RAS Austin

REPORT

Work Order # 88-v--066

Category

SAMPLE ID readent blank Received: 05/14/88

Results by Sample

FRACTION <u>04A</u> TEST CODE <u>XYLENE</u> N Date & Time Collected <u>not specified</u> TEST CODE XYLENE NAME XULENES, EPA 602

VERIFIED

INSTRMI ANALYST

INJECTD 05/17/88

FILE #

UNITS

106-42-3 108-38-3 95-47-6 CAS # m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 002

8-80-B

a, a, a-Trifluorotoluene SURROGATES N\A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

analyzed

NA = not available * = less than 5 times the detection limit

Second column confirmation NOT performed unless otherwise noted.

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and m-xylene co-elute.

Quantitated as chlorobenzene unless otherwise noted.

850 N20 N10

SPARE SPARE SPR602

SPR602 SPR602

RAS

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE Austin REPORT NonReported Work

Work Order # 88-vu-066

Received: 05/14/88 CORPORATION

RAS

Austin

tin REPORT 06/30/88 12:48:30

Work Order # 88-vu-067

REPORT TO ATTEN CLIENT COMPANY	Geoscience Consultants, Ltd. 500 Copper NW Suite 200 Albuquerque, NM 87102 Mike Selke GEOSCIENCE SAMPLES 6 Geoscience Consultants, Ltd.	mis 3
ATTEN CLIENT COMPANY	SAMPLES Consultants, Ltd	
MORK ID	11105	
TAKEN	WSD Fed Ex	। याच
P. D. #		*
INVOICE	INVOICE under separate cover	3

PHONE			PARED
512-454-4797	Austin, TX 78720-1088	20108	Radian Analytical Services

CERTIFIED CONTACT GIBSON

A602 analyses. iknown compounds present in Lee #2, Lee #3, and Lee #3 dup in

potnotes and Comments eviously Reported on 06/29/88

stential error for such Indicates a value less low values ranges between 50 and than 5 times the detection limit. 100%

an interferent present. specific matrix was not within acceptable limits indicating & Indicates that spike recovery for this analysis on the

SAMPLE IDENTIFICATION

င္တ		င္မ	1	
trip	iD (I)	תו תו	מפ	000
D	#3	#10	#12	#2
lank	ជួក២	d Lib	(~	j
		1		
. /		,		

151 DTR -5/88

06 reagent blank

TEST CODES and NAMES used

FEEE FIG	D W	CR E	BA E BETA CD E	GHA	AG E
EPA method 602 Iron, ICPES Fluoride, IC Mercuru, cold vapor Specific conductance Manganese, ICES	FF1	Chloride, IC Total coliform Chromium, ICPES	Barium, ICPES Gross beta radiation Cadmium, ICPES	a 1 o C ,	TEST CODES and N
	TURB	10C TOX	PHEN SE Q	NO3	NAMES used
	dity es, EPA 6	Total organic of Total organic of the Total organic or	pH Total phenolics Selenium, graph	1.9	on this report

TURB XYLENE	TOC	SO4 IC	SHEN	PH G	ir t	N F
dity es, EPA 6	Total organic carbon Total organic halides	lfate, IC	Total phenolics Selenium, oranhita AA	<u>pH</u> <u>qraphite AA</u>		Sodium, ICPES

CORPORATION

Page 2 Received: 05/14/88

RAS

Austin REPORT REPORT

Work Order # 88-vy-067

0.017	810		0.046	05/23/88	Lee #3
· —(ac a)	1180				
	1180				
. 40-00-10-	1170		4		T 10 10 10 10 10 10 10 10 10 10 10 10 10
0.4	1170	0. 80*	0.1	05/23/88	
Test: MN E	Test: MHO	lest: F IC	Test: FE E	Test: D06010	SAMPLE I
	A CHAIR AND			And principles of the state of	A THE THE PARTY OF
					Lee #3 dup
was also so as	0.007*				Lee #3 04 1
05/16/88	0.012*	240	60	Ç0, 003	
05/16/88	0.005*	930	190	<0.003	
Test: DG3020	Test: CR E	Test: COLI T	Test: CL IC	Test: CD E	SAMPLE I
gGi/L		<.	pci/L		Lee #3
3.3 (1.3)	0.060	0.130	(p(1)	<0.003	02
8.8 (2.2)	0. 26	0.013	3 (1)	<0.003	
Test: BETA	Test: BA E	Test: AS G	Test: ALPHA	Test: AG E	SAMPLE

CORPORATION

Page 3 • Received: 05/14/88

RAS

Austin REPORT REPORT

Work Order # 88-v--067 Continued From Above

SAMPLE Id	Test: D06010	Test: FE E	Test: F IC	Test: MHU	Test: MN E
				810	
				810	
. www. a.				018	
04	05/16/88				
SAMPE I SAMPLE	Test: NA E	Test: NO3	Test: PB G	Test: PH	Test: PHEN
01	64	0.37	0.002*	7.26	⟨0. 005
## ## ## ## ## ## ## ## ## ## ## ## ##				7. 19	
				7. 18	
				7. 19	
	170	O. N	0.004*	8, 13	⟨0, 005
#4				8.08	
				8.06	

Page 4
Received: 05/14/88 0077077 RAS Austin REPORT REPORT

Work Order # 88-vs-067 Continued From Above

Sample I	SAMPLE	Test: NA E	Test: NO3	Test: PB G	Test: PH	Test: PHEN
	and the second second			- :	8.05	
Sample Id	SAMPLE	Test: SE &	lest: <u>504 IC</u>	Test: IOC	Test: TOX	
	2	<0.003	40	80A	0.02*	
10 10 10	-			Ó	0. 02*	
	* · • • • • • • • • • • • • • • • • • •			60	0, 03*	
				70	<0.02	
- - - -	502	<0.003	46	160	⟨0.02	
T 10 10 11	- · - · · · · -			<u> </u>	Ç0, 02	
	को क्या लोक			120	0. 03*	
	*** *** * **			135	⟨0, 02	

CORPORATION

Page 5 Received: 05/14/88

SAMPLE ID Lee #2

器 Austin

REPORT

Work Order # 88-vu-067

Results by Sample

NAME FPA method 602

FRACTION OLV TEST CODE EPA602
Date & Time Collected 05/13/88 Category

VERIFIED CL

INSTRMTD	INJECT	INJECTED 05/17/88	A PARTY OF THE PAR	BLINO	l/bn
VT.	CAS#	COMPOUND	RESULT I	L DEL LIWIT	
,	71-43-2	Benzene	NO	0.2	
	108-88-3	foluene	0.6*	0.2	
	100-41-4	Ethylbenzene	0.4*	0.3	
	108-50-7	Chlorobenzene-A	ND	0.3	
	106-46-7	1,4-Dichlorobenzene	ND	0.3	
	541-73-1	1,3-Dichlorobenzene	ND	0.4	
	95-50-1	1,2-Dichlorobenzene	ND	0.4	

SURROGATES

8-80-8 a, a, a-Trifluorotoluene 113% recovery

MOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

otherwise noted

Received: 05/14/88

SAMPLE ID LEE #2

RAS

Austin

Results by Sample

REPURT

Work Order # 88-vu-067 Continued From Above

FRACTION OLD TEST CODE EPA602
Date & Time Collected 05/13/88

NAME EPA method 602 Category

A-Chlorobenzene and m-xylene comelute otherwise noted. Quantitated as chlorobenzene unless

SAMPLE ID Lee #5 SAMPLE ID Lee #2 Received: 05/14/88 ANALYST INSTRMT ANALYST INSTRMT NOTES AND DEFINITIONS FOR THIS REPORT NyA = not available * # less than 5 times ND = not detected at detection limit MA = not analyzed DET LIMIT = DETECTION LIMIT 2100A Turbidity ANALYTE ANALYTE Mencury the detection limit ANALYZED 05/14/88 ANALYZED 05/23/88 RAS RESULT DET LIMIT RESULT 3 3 FRACTION OIA TEST CODE TURB Date & Time Collected 05/13/88 FRACTION OIL TEST CODE HG C Date & Time Collected 05/13/88 Austin K Results by Sample DET LIMIT 0.00012 電岩 VERIFIED VERIFIED _ UNITS UNITS NAME Turbidity NAME Mercuru, cold vapor Work Order # 88-vy-067 Category fategory)

SAMPLE ID Lee #2 Received: 05/14/88 NOTES AND DEFINITIONS FOR THIS REPORT. ND = not detected at detection limit DET LIMIT = DETECTION LIMIT R R FRACTION OIA TEST CODE TURB Date & Time Collected 05/13/88 Austin Results by Sample REPORT NAME Turbidity Continued From Above Work Order # 88-vs-067 Category

SAMPLE III Lee #2 PRACTION OID TEST CODE XYLENE Date & Time Collected 05/13/88 NAME Xulenes, EPA 602 (Jategory

* = less than 5 times NA = not analyzed

the detection limit

N\A = not available

VERIFIED _ 2

ANALYST INSTRMI

INJECTD 05/17/88

FILE #

SLINA

106-42-3 CAS # 95-47-6 m-Xylene-A COMPOUND a-Xylene p-Xylene 0.3* 0.2 0.4* 0.2 0.4* 0.22

NOTES AND DEFINITIONS FOR THIS REPORT

8-80-85

a, a, a-Trifluorotoluene

113% recovery

SURRUGATES

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

analyzed

= less than 5 times the detection limit

NVA = not available

Second column confirmation NOT performed otherwise noted

Page 9
Received: 05/14/88

SAMPLE ID Lee #2

RAS

Austin Keru Results by Sample

REPORT

Work Urder # 88-v--067 Continued From Above

NAME Xylenes, EPA 602 Category

Q = daily EPA standard recovery outside 95% confidence interval. FRACTION OID TEST CODE XYLENE Date & Time Collected 05/13/88

Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless

otherwise noted.

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RAS - Austin

REPORT

SAMPLE ID Lee #3

Results by Sample

FRACTION 02/ TEST CODE EPA602
Date & Time Collected 05/12/88 NAME EPA method 602 Category

			VE	VERIFIED CL
ANALYST RUINSTRMT RU	INJECTE	INJECTED 05/17/88 FILE # _		UNITSuq/L
	CAS#	COMPOUND	RESULT D	RESULT DET LIMIT
	71-43-2	Benzene	ND	0.2
	108-88-3	Toluene	0.8*	0. 2
	100-41-4	Ethylbenzene	0.6*	0.3
	108-90-7	Chlorobenzene-A	ND	0.3
	106-46-7	1,4-Dichlorobenzene	ND	0.3
	541-73-1	1,3-Dichlorobenzene	ND	0.4
	95-50-1	1,2-Dichlorobenzene	ND	0. 4

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 108% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

NNA = not available

Second column confirmation NOT performed an. as otherwise noted.

Page II Received: 05/14/88

SAMPLE ID Lee #3

RAS

Austin REPO

FRACTION OZY TEST CODE EPA60 Date & Time Collected 05/12/88

TEST CODE EPA602

NAME EPA method 602

Category

REPORT

Work Order # 88-v--067 Continued From Above

A-Chlorobenzene and m-xylene co-elute Guantitated as chlorobenzene unless otherwise noted.

SAMPLE ID Lee #3 Page 12 • Received: 05/14/88 SAMPLE ID Lee #3 NOTES AND DEFINITIONS FOR THIS REPORT. ANALYST INSTRMI NA = not analyzed NVA = not available * - less than 5 times the detection limit ND = not detected at detection limit DET LIMIT = DETECTION LIMIT ANALYTE Mercury ANALYZED 05/23/BB RESULT FRACTION <u>OZA</u> TEST CODE TURB Date & Time Collected <u>O5/12/88</u> FRACTION 021 TEST CODE HG C Date & Time Collected 05/12/88 Austin K Results by Sample DET LIMIT 0.00012 REPORT VERIFIED SLIND NAME Turbidity NAME Mercury, cold vapor DMC Work Urder # 88-00-067 ug/ml Category Category

AMALYST

IMSTRMI

2100A

Turbidity

5.72

1.0

ANALYTE

RESULT DET LIMIT

AMALYZED 05/14/88

VERIFIED

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UNITS

Page 13 CReceived: 05/14/88

RAS Austin

Results by Sample REPORT

Continued From Above Work Order # 88-00-067

SAFE II Lee #3

FRACTION <u>OZA</u> TEST CODE TURB Date & Time Collected <u>O5/12/88</u>

NAME Turbidity
Category

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

MA = not analyzed

4 = less than 5 times the detection limit

NyA = not available

SAMPLE ID Lee #3

FRACTION <u>02J</u> TEST CODE XYLENE Date & Time Collected <u>05/12/88</u> NAME Xulenes, EPA 602

Category

VERIFIED

INSTRMI ANALYST

INJECTD 05/17/88

FILE #

SLINA

106-42-3 108-38-3 95-47-6 m-Xylene-A COMPOUND p-Xylene o-Xylene RESULT 00 DET LIMIT 0 2 2

8-80-84

a, a, a-Trifluorotoluene SURRUGATES 108% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

MA = not analyzed

* = less than 5 times the detection limit

MVA = not available

Second column confirmation NOT performed 1

is otherwise noted

Page 14 Received: 05/14/88

REPORT

RAS

Austin REPURESULTS by Sample

Work Order # 88-vu-067 Continued From Above

SAMPLE ID Lee #3

FRACTION OZJ TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected 05/12/88 Category

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and m-xylene co-elute. atherwise noted. Quantitated as chlorobenzene unless

Category

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Received: 05/14/68

SAMPLE ID Lee #2 dup

RAS - Aust

Austin

REPORT

Work Order # 88-vy-067

Results by Sample

FRACTION 03A TEST CODE EPA602 NAME EPA method 602 Date & Time Collected 05/13/88 Category

VERIFIED ____CL

CAS# INJECTED 05/17/88 COMPOUND FILE # RESULT DET LIMIT STIND

ANALYST

INSTRMT

71-43-2 Benzene <u>ND</u> 0.2
108-88-3 Toluene <u>0.2*</u> 0.2

 100-41-4
 Ethylbenzene
 ND
 0.3

 108-90-7
 Chlorobenzene-A
 ND
 0.3

 106-46-7
 1,4-Dichlorobenzene
 ND
 0.3

 541-73-1
 1,3-Dichlorobenzene
 ND
 0.4

SURROGATES

95-50-1

1, 2-Dichlorobenzene

0

98-08-8 a.a.a-Trifluorotoluene 103% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT
ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

sa otherwise noted.

CORPORATION

Page 16 • Neceived: 05/14/88

SAMPLE ID Lee #2 dup

otherwise noted.

RAS

REPURT

Work Order # 88-vu-067 Continued From Above

A-Chlorobenzene and m-xylene co-elute Quantitated as chlorobenzene unless Austin Results by Sample

FRACTION <u>O3A</u> TEST CODE <u>EPA602</u>
Date & Time Collected <u>05/13/88</u>

NAME EPA method 602 Category

Received: 05/14/88

RAS Austin

REPURT

Work Urder # 88-vy-067

NAME Xulenes, EPA 602

Category

SAMPLE ID Lee #2 dup

FRACTION 03A TEST CODE XYLE Results by Sample TEST CODE XYLENE

VERIFIED

F

D INJECTO	05/17/88
- agrandum and and an	
	,

ANALYS

SLINA

106-42-3 93-47-6 CAS # m-Xylene-A COMPOUND p-Xylene o-Xylane RESULT DET LIMIT 00 0

SURROGATES

a, a, a-Trifluorotoluene 103% recovery

8-80-35

NOTES AND DEFINITIONS FOR THIS REPORT. NA = not analyzed DET LIMIT = DETECTION LIMIT less than 5 times the detection limit not detected at detection limit

Second column confirmation NOT performed N/A = not available unless otherwise noted.

= daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and m-xylene co-elute Quantitated as chlorobenzene unless otherwise noted

Page 18 Composition Received: 05/14/88

RAS - Austin

REPORT

Work Order # 88-vu-067

Results by Sample FRACTION 04A TEST

SAMPLE ID Lee #3 dup

FRACTION 04A TEST CODE EPA602 NAME EPA method 602 Date & Time Collected 05/12/88 Category

								ANALYST RW	
95-50-1	541-73-1	106-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAS#	INJECTE	
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene-A	Ethylbenzene	Toluene	Benzene	COMPOUND	INJECTED 05/17/88 FILE # _	
ND	ND	ND	ND	0 3*	0.6*	ND	RESULT DET LIMIT	o service deleteration of the service of the service between the s	VE.
0.4	0.4	0.3	0.3	0.3	0.2	0. 2	ET LIMIT	UNITS	VERIFIED CL

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 107% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

NVA = not available

Second column confirmation NOT performed un' is otherwise noted.

Page 19 Received: 05/14/88 CORPORATION

SAMPLE ID Lee #3 dup

Austin REPURES Bample

Work Order # 88-us-067 Continued From Above

NAME EPA method 602 Category

FRACTION 04A TEST CODE EPA602
Date & Time Collected 05/12/88

A-Chlorobenzene and m-xylene co-elute. otherwise noted. Quantitated as chlorobenzene unless

Page 20 Received: 05/14/88 CORPORATION

RAS Austin

REPURT

Work Order # 88-02-067

Results by Sample

SAMPLE ID Lee #3 dup

NAME Xulenes, EPA 602 Category

FRACTION OAA TEST CODE XYLENE
Date & Time Collected 05/12/88

VERIFIED

IMSTRMI ANALYST

INJECTD 05/17/88

FILE

UNITS

106-42-3 109-38-3 95-47-6 m-Kylene-A COMPOUND o-Xylene p-Xylene RESULT 0.84 0.6* DET LIMIT 0 0 0 0 0.1

8-80-86

a, a, a-Trifluorotoluene SURROGATES

107% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

not detected at detection limit

not analyzed

NVA = not available less than 5 times the detection limit

Second column confirmation NOT performed

= daily EPA standard recovery outside unless otherwise noted

95% confidence interval.

Chlorobenzene and m-xylene co-elute Guantitated as chlorobenzene unless

otherwise noted

CORPORATION

Page 21 Received: 05/14/88

SAMPLE III trip blank

Austin

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REP137

Work Order # 88-va-067

Results by Sample

PRACTION OSA TEST CODE EPAGOS NA Date & Time Collected not specified TEST CODE EPA602 NAME EPA method 602 Category

ANALYST IMSTRMT 71-43-2 CAS# INJECTED 05/17/88 COMPOUND Benzene FILE # RESULT DET LIMIT VERIFIED 0.2 0.2 SLIND CL

108-88-3 100-41-4 Ethylbenzene Toluene 0.3

106-46-7 108-90-7 1,4-Dichlorobenzene Chlorobenzene-A

0.3

541-73-1 95-50-1 1,2-Dichlorobenzene 1,3-Dichlorobenzene E 0.4 0.4 0.3

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 94% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

analyzed

less than 5 times the detection limit

NNA = not available

Second column confirmation NOT performed

ב is otherwise noted

002702

Page 22 Received: 05/14/88

SAMPLE ID trip blank

RAS

Austin KEru Results by Sample

REPORT

Work Order # 88-vu-067 Continued From Above

FRACTION 05A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected not specified Category

A-Chlorobenzene and m-xylene co-elute Quantitated as chlorobenzene unless otherwise noted.

ORPORATION

Racelved: 05/14/88

SAMPLE III trip blank

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REPURT

Work Order # 88-00-067

Category

FRACTION 05A TEST CODE XYLENE NAME Xylenes, EPA 602
Date & Time Collected not specified Category Results by Sample

VERIFIED CL

INSTRMI ANALYST

INJECTD 05/17/88

FILE

UNITS

106-42-3 108-38-3 95-47-6 CAS # m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 000

SURROGATES

8-80-86

a, a, a-Trifluorotoluene

94% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

Second column confirmation NOT performed NVA = not available less than 5 times the detection limit

daily EPA standard recovery outside unless otherwise noted

Chlorobenzene and m-xylene co-elute 95% confidence interval

Quantitated as chlorobenzene unless otherwise noted

RAS Austin

REPORT

Work Order # 88-us-067

SAMPLE ID reagent blank

Results by Sample

FRACTION <u>06A</u> TEST CODE <u>EPA602</u> No Date & Time Collected not <u>specified</u> EPA602 NAME EPA method 602 Category

ANALYST INSTRMI 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 05/17/88 1,3-Dichlorobenzene 1, 4-Dichlorobenzene 1,2-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT VERIFIED 0.4 0.3 0.3 0.3 0.2 0.2 UNITS CL

SURRUGATES

98-08-8 a, a, a-Trifluorotoluene N\A% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

ND = not detected at detection limit DETECTION LIMIT

analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed is otherwise noted

SAMPLE ID readent blank Received: 05/14/88

RAS

Austin REPO

REPURT

Work Order # 88-vu-067 Continued From Above

A-Chlorobenzene and m-xylene co-elute. Quantitated as chloropenzene unless otherwise noted FRACTION 06A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected not specified Category

CORPORATION

Results by Sample 帝另

RES

PUSTIN

Work Order # 88-vu-067

SAMPLE ID reagent blank

Date & Time Collected not specified FRACTION OGA TEST CODE XYLENE NAME Xulenes, EPA 602 Category

VERIFIED 2

109-38-3 106-42-3 CAS # INJECTD 05/17/88 m-Kylene-A COMPOUND p-Xylene o-Xylene RESULT FILE # DET LIMIT

AWALYST INSTRMI

SLINA <u>-/ bn</u>

a, a, a-Trifluorotoluene SURRUGATES NIA% recovery

8-80-85

NOTES AND DEFINITIONS FOR THIS REPORT. NA = not DET LIMIT = DETECTION LIMIT - not detected at detection limit analyzed

N\A = not available less than 5 times the detection limit

Second column confirmation NOT penformed 0 = daily EPA standard recovery outside unless otherwise noted.

Chlorobenzens and m-xylene co-elute 95% confidence interval. Quantitated as chlorobenzene unless otherwise noted.

Page 27 Received: 05/14/88

RAS

Austin REPORT NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

SPARE SPARE SPR602 SPR602 SPR602 02K 710 SPR602

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Work Order # 88-42-067

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Page 5 Received: 02/02/89

SAMPLE ID MW-1

70 AS Austin Results by Sample

REPORT

Work Order # 89-02-026

FRACTION OLD TEST CODE EPA602
Date % Time Collected 01/31/89

NAME EPA method 602

Category

VERIFIED C

ANALYST TRMT INJECTED 02/03/89

UNITS

COMPOUND Benzene RESULT DET LIMIT 0.20

Toluene 0. C¥ 0.20

Ethylbenzene 0.7*

0.30

Chlurobenzene-A N 0.30 0.30

1,3-Dichlorobenzene 1,4-Dichlorobenzene ND

541-73-1

95-50-1

106-46-7

108-99-7

100-41-4

108-88-3

71-43-2

CAS#

1, 2-Dichtorobenzene S 0.40

SURROGATES

3-30-8F a,a,a-Trifiuorotoluene 105% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted

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RADIAN

NOTES AI DE ND NA			ANAL YST INSTRMT	SAMPLE ID MW-1	NOTES AT NO NOTES AT NO	SAMPLE ID MW-1	Page 8
ND DEFINITIONS FOR F LIMIT = DETECTION = not detected at = not analyzed = less than 5 times	8-80-86	CAS # 105-42-3 108-38-3 95-47-6	NB N	ID MW-1	ND DEFINITIONS FOR I LIMIT = DETECTION = not detected at = not analyzed = less than 5 times = not available	[D MW-1	Pağe 8 Received: 02/02/89
THIS REPORT LIMIT detection limit	a, a, a-1	COMPOUND p-Xylene-A m-Xylene o-Xylene	INJECTD <u>02,</u>	D	THIS REPORT detection limit	D:	RAS - f
mit on limit	SURROGATES a,a-Trifluorotoluene	RESULT 0.5* 0.9*	02/03/89 FILE	FRACTION <u>Oly</u> TEST of Date & Time Collected	nit on limit	FRACTION <u>OIA</u> TEST (Date & Time Collected	Austin Results by
	AIES 105% recovery	DET LIMIT 0 20 0 20 0 10	##	TEST CODE XYLENE		TEST CODE TURB ollected 01/31/89	REPORT y Sample
	Į.		UNITSug/L	NAME Xylenes, EPA 602 Category		NAME Turbidity Category	Work Order # 89-02- Continued From Abov
				602		_	89-02- m Abov

Page 2 Received: 02/02/89

Austin REPORT
Results By Test

RAS

Work Order # 89-02-026

			·		
	SAMPLE Id 01	MW-1 0	Sample Id	MM-1	SAMPLE Id
0. N	2	63	F	02	<u>—</u>
600 590 2000	Test: MHD 400 600	<0.03 <0.03 <0.03	Test: CR E	(0. 03	Test: A3 E
0. 90	Test: MN E	02/06/89 02/06/89	Test: DG3020	0 057 0 023	Test: AS G
96	Test: NA E	02/06/89 02/06/89 02/06/89	Test: DG5010	0. 22 0. 57	Test: BA E
0. 21	Test: NO3 mg/L as N 1.6	0.10*	Test: FE E	<0.005 <0.005	Test: CD E
<0.002	Test: PB G	0. 5* *	Test:F IC	29 450	Test: CL IC

Received: 11/03/88

SAMPLE ID Lee MW-1

RAS Austin

Work Order # 88-11-014

Results by Sample

NAME EPA method 602

FRACTION 01J TEST CODE EPA602
Date & Time Collected 11/01/88

Category

			VE.	ERIFIED	CL
STRMT CL	INJECT	FILE # _		UNITS _	1 / p u
	CAS#	COMPOUND	RESULT I	DET LIMIT	
	71-42-2	Benzene	ND	0.20	
	108-88-3	Tolvene	ND	0.20	
	100-41-4	Ethylbenzene	ND	0.30	
	108-90-7	Chlorobenzene-A	ND	0.30	
	106-46-7	1,4-Dichlorobenzene	N:D	0.30	
	541-73-1	1,3-Dichlorobenzene	ND	0.40	
	95-50-1	1,2-Dichlorobenzene	UD	0.40	

SURROGATES

8-30-86 a, a, a-Trifluorotoluene 98% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

 $N\setminus A = not available$

Second column confirmation NOT performed

unless otherwise noted.

3nd Qh 11/88

ZADIAN

 Page 8	RAS - Austin REPORT
Received: 11/03/88	Results by Sample
 SAMPLE ID Lee MW-1	FRACTION 01A TEST CODE TURB Date & Time Collected 11/01/88
NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	THIS REPORT. N LIMIT detection limit s the detection limit
SAMPLE ID Lee MW-1	FRACTION OIJ TEST CODE XYLENE Date & Time Collected 11/01/88
ANALYST CL INSTRMT D	INJECTD 11/07/88
CAS # 106-42-3 108-38-3 95-47-6	COMPOUND RESULT DET LIMIT p-Xylene-A ND 0.20 m-Xylene ND 0.20 o-Xylene ND 0.10
8-80-86	SURROGATES a, a-Trifluorotoluene 98%
D DEFINITIONS FOR LIMIT = DETECTION = not detected at = not analyzed less than 5 times	THIS REPORT. N LIMIT detection limit s the detection limit
> 1 10 + 1/1/10 C	

Second column confirmation NOT performed unless otherwise noted.

Page 2 Received: 11/03/88

Austin REPORT Results By Test

RAS

Work Order # 88-11-014

Cee MM-5	Lee m ME-1	Sample Id	Lee MW-1	Sample Id	Lee MW-1	Sample Id
02	2	SAMPLE	22 22	SAMPLE :	22 	SAMPLE
<0.04	0.14*	Test: FE E	<0.005 <0.005	Test: CD E	<0.03	Test: AG E
}	0.4*	Test: F IC	27 480	Test: CL IC	6 (1) pci/L 2.6 (0.9) pci/L	Test: ALPHA
2300	540 540 550	Test: MHO	<0.03 <0.03	Test: CR E	<0.002 0.007*	Test: AS G
0. 93	0. 12	Test: MN E	11/14/88 11/14/88	Test: DG3020	0. 19 0. 57	Test: BA E
84	19	Test: NA E	11/11/88	Test: DG6010	13 (2) pci/L 14 (2) pci/L	Test: BETA

Received: 09/01/88

SAPLE ID Lee MW-1

RAS

Work Order # 88-09-003

Austin Results by Sample

FRACTION 01A TEST CODE EPA602 NAME EPA method 602
Date % Time Collected 08/30/88 Category

Category

541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 71-43-2 95-50-1 CAS# INJECTED 09/09/88 1,4-Dichlorobenzene 1, 2-Dichlorobenzene 1,3-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE Benzene Toluene RESULT DET LIMIT B GN S 0 VER IF JED 0.20 0.20 0.40 0.40 0.30 0.30 0.30 SLINA

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 97% recovery

IES AND DEFINITIONS FOR THIS REPORT ND = not detected at detection limit Second column confirmation NUT performed N\A = not available NA = not DET LIMIT = DETECTION LIMIT unless otherwise noted than 5 times the detection limit analyzed

and Quarley - 5/88

Pecalved: 09/01/88

SAMPLE ID Lee MW-1

RAS Austin Results by Sample

REPORT

Work Order # 88-09-003

FRACTION OIA TEST CODE XYLED Date % Time Collected 08/30/88 TEST CODE XYLENE

NAME Xylenes, EPA 602

Category

VERIFIED

SLINO

106-42-3 108-38-3 95-47-6 CAS #

m-Xylene-A

o-Xylene

COMPOUND

INJECTD 09/09/88

FILE #

p-Xylene

RESULT DET LIMI'I

0. 20 0. 20 0. 10

SURROGATES

a, a, a-Trifluorotoluene 97% recovery

DOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

8-80-8⁴

ND = not detected at detection limit

NA = not analyzed

* # less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless

RADIAN

Page 2 Received: 09/01/88

RAS

Austin

REPORT

Work Order # 88-09-002

Results By Test

Sample Id Sample Sample Lee MW-1 Lee MW-1 Lee MW-4 69 Lee MW-4 _ _ _ Lee MW-1 Lee MW-3 duplic Lee MW-3 ee MW-2 エピージ E-MM SAMPLE SAMPLE SAMPLE 2 05 S 2 2 2 Test: CR E est: AG E est: 語 <0.03 **(**0. 03 60.03 <0.03 **(**0.03 **(**0.03 <0.03 <0.03 (0.03 umhos/sm 514 m/en Test: DG3020 Test: MN E est: AS G 09/09/88 09/09/88 09/09/88 09/06/88 0.004* 0.010 0.156 0.336 0.19 ug/ml · _) Test: DG6010 est: NA E est: BA E 09/12/88 09/12/88 09/16/88 09/16/88 09/16/88 0.41 0.57 0. 12 0.07 16 ug/m] Test: CD E est: NO3 est: FE E <0.040 <0.005 0.008* ⟨0,005 <0.005 <0.04 N se 7/b 0.04* Test: CL 84:158 G 0.004*0.79* 0.86* 0.26* 1.4 190 580 27 \mathfrak{Z} m/bn 7

Received: 05/14/88

SAMPLE ID Lee #1

Austin Results by Sample

RAS

REPORT

Work Urder # 88-00-066

FRACTION OLD TEST CODE EPA602
Date & Time Collected 05/13/88 NAME EPA method 602 Category

AMALYST INSTRICT 541-73-1 108-90-7 106-46-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 05/17/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorabenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # faluene RESULT DET LIMIT 0.8* 220 S H N E VERIFIED 0.2 0.3 0.3 0.4 0.4 03 SLINN 2

SURRIGATES

8-80-86 a, a, a-Trifluorotoluene 110% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed ٦ is otherwise noted

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Page 8 Received: 05/14/88

RAS Austin

Results by Sample REPURT

Continued From Above Work ()rder # 88-vo-066

SAMPLE ID Lee #1

FRACTION OIA TEST CODE TURB Date & Time Collected 05/13/88

NAME Turbidity
Category

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT - DETECTION LIMIT

NA = not analyzed # = less than 5 times the detection limit

ND = not detected at detection limit

N\A = not available

STAPLE ID Lee #1

PRACTION OID TEST CODE XYLENE NAME Xulenes, EPA 602
Date & Time Collected 05/13/88
Category

Category

FILE # VERIFIED CL

AMALYST INSTRMI

INJECTD 05/17/88

SLIN

106-42-3 109-38-3 95-47-6 m-Xylene-A COMPOUND o-Xylene p-Xylene 2.2 0.2 0.9* 0.2

SURROGATES

0.2

a, a, a-Trifluorotoluene 110% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

98-08-8

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

NNA = not available

Second column confirmation NOT performed is otherwise noted

		·		,	•	Sample	Tee #4			Sample	1		Sample	Page 2 Received: 05/14/88
	92 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-				01	SAMPLE !		02	01	SAMPLE	02	0	SAMPLE	05/14/88
151 Querly	05/23/88				05/23/88	Test: DG6010		⟨0, 003	0.007*	Test: CD E	<0.003	<0.003	Test: AG E	RAS -
ley 5/88	— ω				0.037	Test: FE E		180	28 8	Test: CL IC	(1.9 pci/L	G4. 6	Test: ALPHA	Austin Results By
	1. 0*				0.68*	Test: F IC		2100	>24,000	Test: COLI I .	0. 130	0.004	Test: AS G	REPORT Test
1250	1230	470	470	470	470	Test: MHU		0.028	0.004*	Test: CR E	0.38	0.22	Test: BA E	Work Order # 88-02-066
	0.57				0.12	Test: MN E	The professional state of the same with the same state of the same state of the same state of the same state of	05/16/88	05/16/88	Test: DG3020	7.1 (2.0) pci/L	(9. b	Test: BETA	88-4-066

SAMPLE ID MW-2 Page 10 Received: 02/02/89

Austin

RAS

REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 02J TEST CODE EPA602
Date & Time Collected 01/31/89 NAME EPA method 602

Category

*

ANAL YST

VER 1F 1ED CL

INJECTED 02/03/89 FILE # SLINO

CAS# COMPOUND RESULT DET LIMIT

108-89-3 71-43-2 Benzene Toluene 0.20 0.20

100-41-4 Ethylbenzene رم 4 0.30

106-46-7 108-90-7 1,4-Dichlorobenzene Chlorobenzene-A S 0.30 0.30

541-73-1 95-50-1 1,3-Dichlorobenzene 1,2-Dichlorobenzene Z N 0.40

SURROGATES

8--69-86 a, a, a-Trifluorotoluene 112% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

NA = not analyzed ND = not detected at detection limit

* = less than 5 times the detection limit N\A = not available

Second column confirmation NOT performed unless otherwise noted

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Page 15 Received: 02/02/89

SAMPLE ID MW-2 duplicate

RAS Austin

REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 03B TEST CODE EPA602
Date & Time Collected 01/31/89

NAME EPA method 602 Category



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INJECTED 02/03/89 FILE # SLINO

ANALYST IMSTRMT

CAS# COMPOUND RESULT DET LIMIT

108-88-3 71-43-2 Toluene Benzene R N 0.20 0.20

100-41-4 Ethylbenzene 24 0.30

106-46-7 108-90-7 1,4-Dichlorobenzene Chlorobenzene-A Zi. S 0.30 0.30

541-73-1 95-50-1 1,3-Dichlorobenzene 1,2-Dichlorobenzene ND Sign 0.40 0.40

SURROGATES

3-02-E a, a, a-Trifluorotoluene 111% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted



1 "

Page 17 Received: 02/02/89

SAMPLE ID MW-2 duplicate

RAS Austin

REPORT

Work Order # 89-02-026

Results by Sample

FRACTION 03B TEST CODE XYLENE Date % Time Collected 01/31/89

NAME Xylenes, EPA 602 Category

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ANALYST INTRMT

INJECTU 02/03/89

FILE #

UNITS

106-42-3 108-38-3 CAS # 95-47-6 p-Xylene-A COMPOUND m-Xylene o-Xylene RESULT DET LIMI1 0 20 0 20

SURROGATES

a, a, a-Trifluorotoluene 111% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT ND = not detected at detection limit

98-08-8

N\A = not available * = less than 5 times the detection limit NA = not analyzed

Second column confirmation NOT performed unless otherwise noted

= daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute Quantitated as chlorobenzene unless

otherwise noted

Page 2 Received: 02/02/89

Austin REPORT Results By Test

RAS

Work Order # 89-02-026

۲۵ ع ع	mple MW-1	Sample MW-1 MW-2 MW-2 d	Sample MW-1
02	SAMPLE 1d 01	e Id 01 02 03 duplicate	SAMPLE 1
600 590 2000	Test: MHO 400 620	(0. 03 (0. 03 (0. 03	Test: A3 E
0. 90	Test: MN E	02/06/89 02/06/89 02/06/89	
9.6	Test: <u>NA E</u> 23	02/06/89 02/06/89 02/06/89	r-+ c+
0.21	Test: ND3 mg/L as N 1.6	0. 10* (0. 04	Test: CD E (0.005 (0.005
<0.002	Test: <u>PB G</u> vg/ml <0.002	0.5* 0.5*	Test: CL IC ma/L 29 450 Test: F IC

Påge 10 SAMPLE ID Lee MW-2 Received: 11/03/88

Austin

RAS

Work Order # 88-11-014

FRACTION <u>02J</u> TEST CODE <u>EPA602</u>

Date & Time Collected <u>11/01/88</u> Results by Sample

NAME EPA method 602 Category

VERIFIED

P

ANALYST TRMT 541-73-1 100-41-4 108-88-3 106-46-7 108-90-7 71-43-2 95-50-1 CAS# INJECTED 11/07/88 1, 2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE Toluene RESULT DET LIMIT B ND 3 B 0.20 0.20 0.30 0.30 0.30 0.40 SLINO

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 110% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

30/10th 11/88

Page 15

Received: 11/03/88 SAMPLE ID Lee MW-2 dup

REPORT

Work Order # 88-11-014

Austin

RAS

Results by Sample

FRACTION 03A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 11/01/88 Category

ANAL YST MSTRMT 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 71-43-2 95-50-1 CAS# INJECTED 11/07/88 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Benzene Toluene RESULT DET LIMIT 3 NO R E 8 VERIFIED 0.20 0.20 0.40 0.40 0.30 0.30 0.30 CNITS 2

SURROGATES

8-80-86 a, a, a-Trifluorotoluene 113% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

RADIAN

CAS # COMPOUND RESULT DET LIMIT 106-42-3 p-Xylene-A ND 0.20 109-38-3 m-Xylene ND 0.20 75-47-6 o-Xylene ND 0.10 SURROGATES SURROGATES 98-08-8 a,a,a-Trifluorotoluene 110% recovery ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection limit NA = not available NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT NA = not analyzed * NA = not available NOTES AND DEFINITIONS FOR THIS REPORT.	Page 13 Received: 11/03/88 SAMPLE ID Lee MW-2 NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d NA = not available SAMPLE ID Lee MW-2 INJE INJE	S - Austin REPORT Results by Sample FRACTION 02A TEST CODE TURB Date & Time Collected 11/01/88 FRACTION 02J TEST CODE XYLENE Date & Time Collected 11/01/88 PELE # CTD 11/07/88 PELE # UNITED TO THE TORK TO THE TEST CODE TO	NAME Turbidity Category NAME Xylenes, EPA 602 Category Category
CL CAS # COMPOUND CAS # CAS # COMPOUND CAS # CAS # CAS # COMPOUND CAS # CAS	SAMPLE ID Lee MW-2	TEST Collecte	NAME <u>Xulenes, EPA 6</u> Category
CAS # COMPOUND RESULT DET LIMIT 106-42-3 p-Xylene-A ND 0.20 108-38-3 m-Xylene ND 0.20 108-38-3 m-Xylene ND 0.20 95-47-6 o-Xylene ND 0.10 AND DEFINITIONS FOR THIS REPORT. PET LIMIT = DETECTION LIMIT ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection limit NA = not available		VERIFI 11/07/88	<u></u>
AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection limit N\A = not available	CAS # 106-42-3 108-38-3 95-47-6	COMPOUND RESULT DET -Xylene-A ND m-Xylene ND o-Xylene ND	
AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection limit N\A = not available	98-88	SURROGATES a, a-Trifluorotoluene 110%	
	AND DEFINITIONS FOR DET LIMIT = DETECTION ND = not detected at NA = not analyzed * = less than 5 times N\A = not available	EPORT. ion limit etection limit	

RADIAN

Received: 11/03/88

SAMPLE ID Lee MW-2 dup

REPORT

RAS

Austin

Work Order # 88-11-014

Results by Sample

FRACTION <u>O3A</u> TEST CODE XYLENE Date & Time Collected 11/01/88 NAME Xulenes, EPA 602 Category _

VERIFIED CL

STRMT D

INJECTD 11/07/88

FILE #

UNITS ug/L

 CAS #
 COMPOUND
 RESULT DET LIMIT

 106-42-3
 p-Xylene-A
 ND
 0.20

 108-38-3
 m-Xylene
 ND
 0.20

 95-47-6
 o-Xylene
 ND
 0.10

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

98-08-8

a, a, a-Trifluorotoluene

113% recovery

SURROGATES

N\A = not available Second column confirmation NOT performed unless otherwise noted.

* = less than 5 times the detection limit

Q = daily EPA standard recovery outside 95% confidence interval

Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless otherwise noted.

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Page 2 Received: 11/03/88

RAS Austin REPORT
Results By Test

Work Order # 88-11-014

02 i	Lee MW-1	SAMPLE :	Sample Id 01 i	SAMPLE Sample Id O1 Lee MW-1 D2
<0.04	0.14*	Test: FE E	Test: <u>CD E</u> vg/m1 <0.005 <0.005	Test: A3 E (0.03
<u> 1</u> *	0.4*	Test: F IC	Test: <u>CL IC</u>	Test: ALPHA 6 (1) 6 (1) 9ci/L 2.6 (0.9) pci/L
540 2300 2300	540 540 550	Test: MHO	Test: <u>CR E</u>	Test: AS G
0. 93	0.12	Test: MN E	Test: <u>DG3020</u> date complete 11/14/88 11/14/88	Test: BA E v9/m1 0.19 0.57
84	19	Test: NA E	Test: <u>DG6010</u> date complete 11/11/88 11/11/88	Test: BETA 13 (2) pci/L 14 (2) pci/L

Perelyed: 09/01/88

SAMPLE ID Lee MW-2

RAS Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION 02A TEST CODE EPA602
Date % Time Collected 08/30/88 NAME EPA method 602 Category

STRMT CAS# INJECTED 09/09/88 COMPOUND FILE # RESULT DET LIMIT VERIFIED 0.20 UNITS 2

541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 71-43-2 1,4-Dichlorobenzene 1,3-Dichlorobenzene Chlorobenzene-A Ethylbenzene Toluene Benzene 3 B

0.30

0.30

0.20

SURROGATES

95-50-1

1,2-Dichlorobenzene

S

0.40

0.30

98-08-B a, a, a-Trifluorotoluene 137**% recovery

MOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted

Ind Quarter 9/80

RADIAN

Feceived: 09/01/88

SAPPLE ID Lee MW-2

RAS - Austin

REPORT

Work Order # 88-09-003

Results by Sample
FRACTION 02A TEST CODE XYLENE
Date & Time Collected 08/30/88

NAME Xylenes, EPA 602

Category

20,000

VERIFIED

F

STRMT CL

INJECTD 09/09/88

FILE # _

UNITS UN

CAS # COMPOUND RESULT DET LIMIT 106-42-3 p-Xylene ND, Q 0.20 108-38-3 m-Xylene-A ND 0.20 95-47-6 o-Xylene ND 0.10

98-08-8

SURROGATES

a, a, a-Trifluorotoluene 137**% recovery

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit
NA = not analyzed

NA = not analyzed
* = less than 5 times the detection limit

N\A = not available
Second column confirmation NOT performed unless otherwise noted.

Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and p-xylene co-elute. Quantitated as chlorobenzene unless

otherwise noted.

RADIAN

Page 2 Received: 09/01/88

RAS

Austin

REPORT

Work Order # 88-09-002

Results By Test

Lee MW-1 Sample Id Sample Id Sample Lee MW-1 Lee MW-3 duplic Lee MW-4 Lee Lee MW-1 Lee MW-4 Lee MW-3 Cee MW-3 ee MW-2 MW-N SAMPLE SAMPLE SAMPLE ದ R est: MHO est: AG E est: CR E <0.03 <0.03 <o.>
6.03 €0.03 <0.03 **(**0.03 **♦**0.03 (O. 03 <o. 03 mhos/sm 514 Test: DG3020 Test: AS G 09/09/88 est: ME 09/09/88 09/09/88 09/06/88 0.004* 0.010 0.336 0.19 uq/ml Test: DG6010 est: BA E est: NA E 09/16/88 09/12/88 09/12/88 09/16/88 09/16/88 0.41 0.57 0.07 16 Test: CD E est: NO3 est: FE E <0.040 <0.005 0.008* <0.005 <0.005 mq/L as N <0.04 0.04* m/bn Test: CL est: est: PB G 0.004* 0.79% 0.26* 0.86* 190 580 83 27

CORPORATION

SAMPLE ID Lee #2 Received: 05/14/88

> RES Austin

REPORT

Work Order # 88-vy-067

FRACTION OLD TEST CODE EPA602
Date & Time Collected 05/13/88 Results by Sample NAME FPA method 602

VERIFIED ____CL

Category

ANALYST INSTRIAL 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 05/17/88 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Benzene FILE # Toluene RESULT DET LIMIT 0.6* 0.4* B E Z 0.3 0 23 0.4 0.4 0.3 0.3 0.2 S.L.I.MO

SURRUGATES

8-80-86 a, a, a-Trifluorotoluene 113% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed is otherwise noted

15/ Quarter 5/08

CORPORATION

Page 15 Received: 05/14/88

SAMPLE ID Lee #2 dup

RAS

REPORT

Work Order # 88-vu-067

FRACTION 03A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 05/13/88 Category Austin REPO

VERIFIED

ANALYST RW	INJECT:	INJECTED 05/17/88 FILE # _		STIND	υ α / L
	CAS#	COMPOUND	RESULT D	DET LIMIT	
	71-43-2	Benzene	ND	0. 2	
	108-88-3	Toluene	0.2*	0.2	
	100-41-4	Ethylbenzene	ND	0.3	
	108-90-7	Chlorobenzene-A	ND	0.3	
	106-46-7	1,4-Dichlorobenzene	ND	0.3	
	541-73-1	1,3-Dichlorobenzene	N.	0.4	
	95-50-1	1,2-Dichlorobenzene	N	0.4	

NOTES AND DEFINITIONS FOR THIS REPORT.

8-08-8

a, a, a-Trifluorotoluene

103% recovery

SURROGATES

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

NVA = not available

Second column confirmation NOT performed

35 otherwise noted.

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Page 8 Received: 05/14/88

RAS Austin Results by Sample

REPURT

Work ()rder # 88-03-067 Continued From Above

SAMPLE ID Lee #2

FRACTION OIA TEST CODE TURB Date & Time Collected 05/13/88

NAME Turbidity
Category

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

= less than 5 times the detection limit NNA = not available

STATE III Lee #2

FRACTION OLD TEST CODE XYLENE Date & Time Collected 05/13/88

NAME Xylenes, EPA 602 (ategory

VERIFIED CF

ANALYST INSTRMI

INJECTD 05/17/88

FILE #

UNITS

106-42-3 109-38-3 CAS # 95-47-6 m-Xylene-A COMPOUND o∽Xylene p-Xylene RESULT DET LIMIT 0.3* 0.4* 0.2

9-08-8

a, a, a-Trifluorotoluene SURRUGATES 113% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

MD = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

NVA = not available

Second column confirmation NOT performed is otherwise noted.

ORPORATIO

Page 17 Received: 05/14/88

SAMPLE ID Lee #2 dup

RAS - Austin

REPORT

Work Urder # 88-vu-067

Results by Sample

FRACTION OBA TEST CODE XYLENE Date & Time Collected 05/13/88

NAME Xulenes, EPA 602

Category

VERIFIED CL

INSTRMT D

INJECTD 05/17/88

FILE #

UNITS UG

CAS # COMPOUND RESULT DET LIMIT 106-42-3 p-Xylene ND 0.2 100-38-3 m-Xylene-A ND 0.2 93-47-6 a-Xylene ND 0.1

8--80--38

SURROGATES 103% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

N\A = not available Second culumn confirmation NOT performed

unless otherwise noted. Q = daily EPA standard recovery outside 95% confidence interval.

Chlorobenzene and m-xylene co-elute. Quantitated as chlorobenzene unless

otherwise noted.

CORPORATION

Page 2 Received: 05/14/88	88	RAS	Austin Results By	REPORT Test	Work Order # 88-v067	88-22-067
James Prances		Test: AG E	Test: ALPHA	Test: AS G	Test: BA E	Test: BETA
	<u></u>	CO 003	31 (11)	0.013	0. 26	8.8 (2.2)
	ନ୍ତ 	<0.003	pci/L Cl. A pci/L	0. 130	0.060	9C1/L 3.3 (1.3)
SAMPLE Id		Test: CD E	Test: CL IC	Test: COLI I	Test: CR E	Test: DG3020
	01	<0.003	190	930	0.005*	05/16/88
# # A (<u>ව</u>	<0.003	60	240	0.012*	05/16/88
	04				0.007*	
Lee #3 dup	_	THE REPORT OF THE PROPERTY OF		andra and andra and andra and andra and andra andra andra andra and andra and andra andra andra andra andra andra	Ager i de galacie que desgrado que de galacie de galacie de galacie de la composição de la composição de galacie de galac	
SAMPLE Id	- 	Test: DG6010	Test: FE E	Test: F IC	Test: MHD	Test: MN E
‡	2	05/23/88	0.1	0.80*	1170	0.4
T T T	n +5=5-n				1170	
					1180	
					1180	
# # #	୍ଲ 	05/23/88	0.046	1. 7*	810	0.017
	-		· · · · · · · · · · · · · · · · · · ·			-

Page 5

Received: 02/02/89 SAMPLE ID MW-3

> RAS Austin Results by Sample

REPORT

Work Order # 89-02-027

FRACTION OLD TEST CODE EPA602
Date & Time Collected 01/31/89

NAME EPA method 602 Category

		1 :	VE.	VERIFIEDCL	
INSTRMT	INJECTE	INJECTED 02/03/89		UNITS	uq/L
	CAST	COMPOUND	RESULT D	DET LIMIT	
	71-43-2	Benzene	2.9	0.20	
	108-88-3	Toluene	0.4*	0. 20	
	100-41-4	Ethylbenzene	1. 9	0.30	
	108-90-7	Chlorobenzene-A	NO	0. 30	
	196-46-7	1,4-Dichlorobenzene	NO	0.30	
	541-73-1	1,3-Dichlorobenzene	NE	0.40	
	95-50-1	1,2-Dichlorobenzene	ND	0.40	

SURROGATES

a, a, a—Trifluorotoluene 123% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

* = less than 5 times the detection limit NA = not analyzed

N\A = not available

Second column confirmation NDT performed unless otherwise noted.

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Page 8 Received: 02/02/89	RAS - Austin REPORT Results by Sample	Work Order # 89-02-027 Continued From Above
SAMPLE ID MW-3	FRACTION OIA TEST CODE TURB	NAME Turbidity
NOTES AND DEFINITIONS FOR DET LIMIT = DETECTION ND = not detected AND = not analyzed NA = less than 5 time N\A = not available	THIS REPORT. THIS REPORT. This is the detection limit	
SAMPLE ID MW-3	FRACTION OIJ TEST CODE XYLENE Date % Time Collected 01/31/89	NAME Xylenes, EPA 602 Category
		CL
INSTRMTG	INJECTD <u>02/03/89</u>	UNITSVg/L
CAS # 106-42-3 108-38-3 95-47-6	COMPOUND RESULT DET LIMIT p-Xylene-A ND 0.20 m-Xylene 0.6* 0.20 o-Xylene 1.4 0.10	
8-80-86	SURROGATES a,a,a-Trifluorotoluene <u>123</u> % recovery	· .
DEFI	THIS REPORT. N LIMIT detection limit	
NA = not analyzed * = less than 5 times	s the detection limit	
ond column conf nless otherwise	irmation NOT performed .	

	· · · · · · · · · · · · · · · · · · ·													70 T9
MW-4				- 3	₹ Î	Sample Id	7W-4	Z E U	Sample Id		MW-4	K 9	Sample Id	Page 2 Received: 02/02/89
	02 			· •••	01	SAMPLE	02 ;	2	SAMPLE		02 	2	SAMPLE	02/02/89
3 4 00	1400	1100	1100	1100	1100	Test: MHO	<0.03	<0.03	Test: CR E		(0 03	60 03	Test: AG E	RAS -
	junk junk				0.061	Test: MN E	02/06/89	02/06/89	Test: DG3020	AND THE PROPERTY AND A PARTY OF THE PARTY AND A PARTY	0.14	0.24	Test: AS G	Austin Results By
The second secon	140				240	Test: NA E	02/06/89	02/05/89	Test: DG6010		0. 55	0.14	Test: BA E	REPORT Test
	0. 22				0.31	Test: NO3	2.6	0.073*	Test:FE E	THE THE PASSE OF T	<0.005	⟨0, 005	Test: CD E	Work Order # 89-02-027
	0.002*		•		0.002*	Test: PB G	1.2	1. 0*	Test: F IC		240	110	Test: CL IC	89-02-027

Received: 11/03/88

Page 5

SAMPLE ID Lee MW-3

RAS Austin

REPORT

Work Order # 88-11-015

NAME EPA method 602

Category

FRACTION <u>01J</u> TEST CODE <u>EPA602</u>

Date & Time Collected <u>11/01/88</u> Results by Sample

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								ANALYST CL
95-50-1	541-73-1	106-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAS#	· INJECTE
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene~A	Ethylbenzene	Toluene	Benzene	COMPOUND	FILE # _
N	ND	ND	ND	ND	1.0	5. 5	RESULT D	
0.40	0.40	0. 30	0. 30	0. 30	0. 20	0.20	DET LIMIT	UNITS UQ/L

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 99% recovery

NOTES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT NA = not analyzed ND = not detected at detection limit Second column confirmation NOT performed N\A = not available * = less than 5 times the detection limit unless otherwise noted

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RADIAN

			÷				
NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available Second column confirmation unless otherwise noted.	8-80-86	CAS # 106-42-3 108-38-3 95-47-6	ANALYST CL INSTRMT D	SAMPLE ID Lee MW-3	NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	SAMPLE ID Lee MW-3	Page 8 Received: 11/03/88
R THIS REPORT. ON LIMIT t detection limit es the detection limit rmation NOT performed noted	SURROGATES a,a,a-Trifluorotoluene <u>99</u> % recovery	COMPOUND RESULT DET LIMIT p-Xylene-A ND 0.20 m-Xylene ND 0.20 o-Xylene ND 0.10	VERIFIED FILE #UN	FRACTION OIJ TEST CODE XYLENE Date & Time Collected 11/01/88	THIS REPORT. LIMIT detection limit the detection limit	FRACTION OIA TEST CODE TURB Date & Time Collected 11/01/88	RAS - Austin REPORT Results by Sample
•	1		EDCL	NAME Xylenes, EPA 602 Category		NAME Turbidity Category	Work Order # 88-11-015 Continued From Above

Page 2 Received: 11/03/88

Austin REPORT Results By Test

RAS

Work Order # 88-11-015

	ample Id	Lee MW-4	Sample Id	Lee MW-3	Sample Id
2	SAMPLE :	02 03	SAMP	02 01	SAMPLE
2 2	Test: FE E	<0.005 <0.005	Test: CD E	(0. 03	Test: AG E
0.5*	Test: <u>F IC</u>	28	Test: CL IC	3.5 (0.8) pci/L 4 (1) pci/L	Test: ALPHA
700 730	Test: MHD 1300 690	<0.03 <0.03 <0.03	Test: CR E	0. 31 0. 14	Test: AS G
0.79	Test: MN E	11/14/88	Test: DG3020	0. 072 0. 50	Test: BA E
130	Test: NA E 130	11/11/88 11/11/88	Test: DG6010	5 (1) pci/L 8 (2) pci/L	Test: BETA

(C)

SEMPLE ID Lee MW-3 Seceived: 09/01/88

Austin

RAS

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION 03A TEST CODE EPA60
Date & Time Collected 08/30/88 TEST CODE EPA602 NAME EPA method 602 Category

CAS# INJECTED 09/09/88 COMPOUND FILE # RESULT DET LIMIT **VERIFIED** ONITS C

108-88-3 71-43-2 Toluene Benzene 0.3* 0.20 0.20

100-41-4 Ethylbenzene E 0.30

Chlorobenzene-A NU 0.30

1,4-Dichlorobenzene 0.30

541-73-1

1,3-Dichlorobenzene

S

0.40

95-50-1

106-46-7

108-90-7

1,2-Dichlorobenzene 0.40

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 98% recovery

HOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

and 9th 5/88

Beceived: 09/01/88

SAMPLE ID Lee MW-3

Austin

RAS

Work Order # 88-09-003

Results by Sample

FRACTION <u>O3A</u> TEST CODE XYLEI Date & Time Collected <u>O8/30/88</u> TEST CODE XYLENE

NAME Xulenes, EPA 602 Category

VERIFIED

INJECTD 09/09/88

FILE #

SLINO

106-42-3 108-38-3 95-47-6 CAS # m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 0. 20

WHITES AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMIT

98-08-B

a, a, a-Trifluorotoluene

98% recovery

SURROGATES

ND = not detected at detection limit

NA = not analyzed * = less than 5 times the detection limit

Second column confirmation NOT performed N\A = not available

₽ unless otherwise noted 95% confidence interval daily EPA standard recovery outside

Chlorobenzene and p-xylene co-elute

otherwise noted Quantitated as chlorobenzene unless

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1 E E E E E E E E E E E E E E E E E E E	01	SAMPLE :	Lee MW-3 duplic i	AE - 4		02	01	SAMPLE		03	02	01	SAMPLE :	Page 2 Received: 09/01/88
	514	Test: MHO	(0.03	< 0.03	<0.03	<0.03	⟨0.03	Test: CR E	<0.03	(0.03	⟨0.03	€0.03	Test: AG E	RAS -
,	0.19	Test: MN E		09/09/88	09/09/88	09/09/88	09/06/88	Test: <u>DG3020</u>	0. 156	0. 336	0.010	0. 004*	Test: AS G	Austin Results By
	16	Test: NA E	88/21/60	09/12/88	09/16/88	09/16/88	09/16/88	Test: DG6010	0.41	0.07	0. 57	0.12	Test: BA E	REPORT Test
	1.7	Test: NO3		1.7	<0.040	⟨0.04	0.04*	Test: FE E	<0.005	0.008*	⟨0.005	<0.005	Test: CD E	Work Order # 88-09-002
-	0.004*	Test: PB G		0.79*	0.86*	1.4	0. 26*	Test: F IC	190	8	580	27	Test: CL IC	88-09-002

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SAMPLE ID Lee #3

- Austin

RAS

REPORT

NAME EPA method 602

Category

Results by Sample
FRACTION 02J TEST CODE EPA602
Date & Time Collected 05/12/88

VERIFIED CL

WALYST RW	INJEC.	INJECTED 05/17/88 FILE # _		BLINN	-l/pu
	CAS#	COMPOUND	RESULT D	DET LIMIT	
	71-43-2	Benzene	ND	0. 2	
	108-88-3	Toluene	0.8*	0.2	
	100-41-4	Ethylbenzene	0.6*	0.3	
	108-90-7	Chlorobenzene-A	ND	0.3	
	106-46-7	1,4-Dichlorobenzene	ND	0.3	
	541-73-1	1,3-Dichlorobenzene	ND	0.4	
	95-50-1	1,2-Dichlorobenzene	ND	0.4	

SURROGATES

98-08-8 a.a.a-Trifluorotoluene 108% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit N\A = not available Second column confirmation NOT performed on vs otherwise noted.

151 Quarter 5/88

Page 18 Received: 05/14/88

SAMPLE ID Lee #3 dup

RAS - Austin

REPORT

Work Urder # 88-43-067

Results by Sample
TION <u>04A</u> TEST CODE

FRACTION <u>04A</u> TEST CODE <u>EPA602</u> NAME Date & Time Collected <u>05/12/88</u>

VERIFIED

NAME EPA method 602

AMALYST RW	INJECT	INJECTED 05/17/88		CNITS	uq/l
	CAS#	COMPOUND	RESULT	DET LIMIT	
	71-43-2	Benzene	ND	0.2	
	108-88-3	Toluene	0.6*	0.2	
,	100-41-4	Ethylbenzene	0.3*	0.3	
	108-90-7	Chlorobenzene-A	ND	0.3	
	106-46-7	1,4-Dichlorobenzene	ND	0.3	
	541-73-1	1,3-Dichlorobenzene	ND	0.4	
	95-50-1	1,2-Dichlorobenzene	N N	0.4	

SURRUGATES

98-08-8 a.a.a-Trifluorotoluene 107% recovery

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

un' \s otherwise noted.

Page 13 Received: 05/14/88

RAS Austin

Results by Sample REPORT

Work Order # 88-vz-067 Continued From Above

SAMPLE III Lee #3

FRACTION <u>O2A</u> TEST CODE <u>TURB</u>
Date & Time Collected <u>O5/12/88</u>

NAME Turbidity Category

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

NA = not analyzed ND = not detected at detection limit

4 = less than 5 times the detection limit NVA = not available

SAMPLE ID Lee #3

Pate & Time Collected 05/12/88 NAME Xylenes, EPA 602 Category

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AMALYST INSTRMT

INJECTD 05/17/88

SLINA

106-42-3 108-38-3 CAS # 95-47-6 m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT 1.00 DET LIMIT 0.2

NOTES AND DEFINITIONS FOR THIS REPORT

9B-0B-B

a, a, a-Trifluorotoluene

108% recovery

SURROGATES

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

* = less than 5 times the detection limit

MNA = not available

Second column confirmation NOT performed is otherwise noted

Page 20 Received: 05/14/88

SAMPLE ID Lee #3 dup

RAS Austin

REPORT

Work Ulider # 88-02-067

FRACTION <u>04A</u> TEST CODE XYLENE Date & Time Collected <u>05/12/88</u> Results by Sample NAME Xylenes, EPA 602 Category

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FILE

STINU

m-Kylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 0. 6 0. 8 0. 8 0.2

105-42-3 109-38-3 0AS #

95-47-6

SURROGATES

8-80-86

a, a, a-Trifluorotoluene 107% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

Second column confirmation NOT performed N/A = not available less than 5 times the detection limit

= daily EFA standard recovery outside unless otherwise noted.

Chlorobenzene and m-xylene co-elute 95% confidence interval.

otherwise noted. Guantitated as chlorobenzene unless

Received: 05/14/88 Lee #3 Lee #2 Lee E O Sample Id Lee #2 Lee #3 L B B # 心 # #3 dup SAMPLE SAMPLE SAMPLE 2 0 2 S 01 2 date complete est: DG6010 05/23/88 05/23/88 est: CD E est: AG E <0.003 **(0.003** 00 003 (O. 003 m/pu vg/ml RAS Austin est. FE est: CL IC est: ALPHA (1.1) Results By Test 0.046 pci/L pCi/L 190 ug/ml 60 colonies/100 est: F est: CU est: AS G 0.80* 0.013 0. 130 <u>.</u> }* 240 930 m/bn mg/ lest: MHO est: CR E est: BA E Work Order # 88-vu-067 0.007* 0.012* 0.005* 0.060 umhus/cm 0.26 1170 1180 1180 1170 810 [W/5n date complete 8.8 (2.2) [est: DG3020 est: BETA est: ME 05/16/88 05/16/88 0.017 pci/L (1.3) pCi/L

SAMPLE ID MW-4 Page 10 Received: 02/02/89

> Austin Results by Sample

REPORT

Work Order # 89-02-027

FRACTION 02J TEST CODE EPA602 NAME EPA method 602
Date % Time Collected 01/31/89 Category

VER IF JED

ALYST BM	I:iJEC	FILE # _		UNITSUQ/L	
	C40#	COMPOUND	RESULT DE	DET LIMIT	
	71-43-2	Ben1ene	21000	100	
	108-89-3	; Toluene	5900	100	
	100-41 4	Ethylbenzene	720+	150	
	108-90-7	Chlorobenzene-A	ND.	150	
	106-46-7	1,4-Dichlarobenzene	Rio	150	
	541-73-1	1,3-Dichlorobenzene	NO.	200	
	95-50-1	1,2-Dichlorobenzena	1:0	200	

SURROGATES

98-05-8 a, a, a-Trifluorotoluene _ 96% recovery

NOTES AND DEFINITIONS FOR THIS REPORT N\A = not available DET LIMIT = DETECTION LIMIT Second column confirmation NOT performed * = less than 5 times the detection limit NA = not analyzed ND = not detected at defection limit unless otherwise noted

4th Quertes 2/89

Ved: 02/02/89 E ID MW-4 E ID MW-4 E ID MW-4 E ID MW-4 NA = not detected at detection 1 NA = not analyzed * = less than 5 times the detect NA = not available FRMT G CAS # COMPOUN 106-42-3 p-Xylene 109-38-3 m-Xylene 109-38-3 m-Xylene 109-38-3 m-Xylene 109-38-3 m-Xylene 109-38-3 m-Xylene 109-38-3 m-Xylene 109-38-3 than 5 times the detect NA = not analyzed * = less than 5 times the detect NA = not available NA = not available		CORPORATIO	> + 4
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DEFINITIONS FOR THIS REPORT LIMIT = DETECTION not detected at dissection 1 not analyzed less than 5 times the detect not available MW-4 BM CAS # 106-42-3 p-xylene 108-38-3 p-xylene 108-42-47-6 p-xylene 108-38-3 p-xylene	SAMPLE ID MW-4	D MW-4	FRACTION 02A TEST CODE TURB Date & Time Collected 01/31/89
GAS # COMPOUN CAS # COMPOUN 106-42-3 p-Xylene 108-38-3 m-Xylene 108-38-3 m-Xylene 108-58-3 m-Xylene 108-108-58-3 m-Xylene 108-38-3 m-Xylene	AND DET L NA = 1	D DEFINITIONS FOR T LIMIT = DETECTION = not detected at a not analyzed less than 5 times = not available	REPORT. IT ction limit detection
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AND DEFINITIONS FOR THIS REPORT. DET LIMIT = DETECTION LIMI) ND = not detected at detection limit NA = not analyzed * = less than 5 times the detection lim NA = not available		CAS # 106-42-3 108-38-3 95-47-6	OMPOUND RESULT DET Xylene-A 430* m-Xylene 560 o-Xylene 560
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Page 2 Received: 02/02/89

Austin REPORT REPORT

RAS

Work Order # 89-02-027

SAMPLE Id O1 MW-3 O2 MW-4 Sample Id SAMPLE Sample Id O1	Test: AG E 19/m1 (0.03	Test: AS G 0.24 0.14 Test: DG3020 date complete 02/06/89	Test: BA E	
-	Test: CR E		Test:	D66010
	⟨0, 03	02/06/89	02/	05/89
MW-3 02	⟨0.03	02/06/89	02,	/06/89
SAMPLE Id	Test: MHO	Test: MN E	Tes	t: NA E
MW-3	1100	0. 061		240
	1100			
02	1400	}		140
Σ !	1 400			

Received: 11/03/88

SAMPLE ID Lee MW-4

RAS Austin

REPORT

Work Order # 88-11-015

Results by Sample

FRACTION 02J TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 11/01/88 Category

VERIFIED

								ANALYST CL
95~50-1	541-73-1	106-46-7	108-90-7	100-41-4	108-88-3	71-43-2	CAS#	INJECTE
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene-A	Ethylbenzene	Toluene	Benzene	COMPOUND	INJECTED 11/07/88 FILE # _
N	ND	ND	ND	530*	ND	7800	RESULT D	
200	200	150	150	150	100	100	DET LIMIT	UNITS ug/L

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 101% recovery

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA II not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted.

3rd Querty-11/88

RADIAN

	>:	Carl Dala # 00-11-015
Received: 11/03/88	Results by Sample	Continued From Above
SAMPLE ID Lee MW-4	FRACTION 02A TEST CODE TURB Date & Time Collected 11/01/88	NAME Turbidity Category
NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed * = less than 5 times the d N\A = not available	THIS REPORT. LIMIT detection limit the detection limit	
SAMPLE ID Lee MW-4	FRACTION 02J TEST CODE XYLENE Date & Time Collected 11/01/88	NAME Xylenes, EPA 602 Category
ANALYSTCL INSTRMTD	VERIFIED VERIFIED INJECTD 11/07/88	CL ug/L
CAS # 106-42-3 108-38-3 95-47-6	COMPOUND RESULT DET LIMIT p-Xylene-A ND 100 m-Xylene ND 100 o-Xylene ND 50	
8-80-86	SURROGATES a,a,a-Trifluorotoluene <u>101</u> % recovery	
NOTES AND DEFINITIONS FOR THIS R DET LIMIT = DETECTION LIMIT ND = not detected at detect NA = not analyzed	THIS REPORT. detection limit	
less	the detection limit	
Second column confirmation unless otherwise noted.	rmation NOT performed noted.	

Page 2 Received: 11/03/88

RAS Austin REPORT Results By Test

Work Order # 88-11-015

Lee MW-4 02	SAMPLE id 01		SAMPLE Id 01 Lee MW-3 02 Lee MW-4 Sample Id
2 2	Test: FE E	<0.005 <0.005	Test: AG E va/m1 (0.03 (0.03 Test: CD E va/m1
0.5*	Test: <u>F IC</u> 0.6*	1 80	Test: ALPHA 3.5 (0.8) pci/L 4 (1) pci/L Test: CL IC mg/L
680 700 730	Test: MHO 1300	<0.03 <0.03 <0.03	Test: AS G 0.31 0.14 Test: CR E 0.9/m1
0.79	Test: MN E ug/m1 0.024*	11/14/88 11/14/88	Test: BA E 0.072 0.50 Test: DG3020 date complete
130	Test: <u>NA E</u> 130	11/11/88 11/11/88 11/11/88	Test: BETA 5 (1) pci/L 8 (2) pci/L Test: DG6010 date complete

Page 11 Paceived: 09/01/88

SAMPLE ID Lee MW-4

RAS

Austin

REPORT

Work Order # 88-09-003

Results by Sample

FRACTION <u>04A</u> TEST CODE <u>EPA602</u>
Date % Time Collected <u>08/31/88</u> Category

VERIFIED

F

NAME EPA method 602

541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 09/09/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND Toluene Benzene FILE # RESULT DET LIMIT 6300 370 200 12 0 UNITS n

SURROGATES

98-08-8 a, a, a-Trifluorotoluene 94% recovery

HOTES AND DEFINITIONS FOR THIS REPORT.

ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed

than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed unless otherwise noted

Ind Qto 1/88

Received: 09/01/88

SAMPLE ID Lee MW-4 duplicate

Austin

Work Order # 88-09-003

Results by Sample

FRACTION 05A TEST CODE EPA602 NAME EPA method 602
Date & Time Collected 08/31/88 Category Category

VERIFIED

ALYST BM	INJECTED	FILE #		UNITS	ug/L
	CAS#	COMPOUND	RESULT	RESULT DET LIMIT	_
	71-43-2	Benzene	10, 000	200	
	108-88-3	Toluene	ND	200	
	100-41-4	Ethylbenzene	ND	300	
	108-90-7	Chlorobenzene-A	ND	300	
	106-46-7	1,4-Dichlorobenzene	ND	300	
	541-73-1	1,3-Dichlorobenzene	ND	400	
	95-50-1	1,2-Dichlorobenzene	CGN	400	_

SURROGATES

98-08-8 a, a, a-Trifluorotoluene

NOTES AND DEFINITIONS FOR THIS REPORT.

DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

N\A = not available * = less than 5 times the detection limit

Second column confirmation NOT performed

unless otherwise noted.

Received: 09/01/88

RAS Austin

REPORT

Work Order # 88-09-003

NAME Xylenes, EPA 602

Category

SAMPLE ID Lee MW-4 duplicate FRACTION <u>05A</u> TEST CODE XYLER Date & Time Collected <u>08/31/88</u> Results by Sample TEST CODE XYLENE

VERIFIED

밀

INJECTD 09/09/88

FILE #

SLINO

106-42-3 108-38-3 m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT <u>200</u>

SURROGATES

a, a, a-Trifluorotoluene

93% recovery

8-80-86

95-47-6

CAS #

MOTES AND DEFINITIONS FOR THIS REPORT

ND = not detected at detection limit DET LIMIT = DETECTION LIMIT

NA = not analyzed

* = less than 5 times the detection limit

N\A = not available

Second column confirmation NOT performed

unless otherwise noted.

Q = daily EPA standard recovery outside 95% confidence interval

Chlorobenzene and p-xylene co-elute

Quantitated as chlorobenzene unless

otherwise noted

Received: 09/01/88

SAMPLE ID Lee MW-4

Results by Sample

RAS

Austin

REPORT

Work Order # 88-09-003

FRACTION <u>04A</u> TEST CODE XYLEI Date % Time Collected <u>08/31/88</u> TEST CODE XYLENE NAME Xulenes, EPA 602 Category

VERIFIED F

INJECTD 09/09/88

UNITS

m-Xylene-A COMPOUND o-Xylene p-Xylene RESULT DET LIMIT 1.0

106-42-3 108-38-3

CAS #

95-47-6

SURROGATES

a, a, a-Trifluorotoluene 94% recovery

MOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

98-08-8

ND = not detected at detection limit

NA = not analyzed

N\A = not available * = less than 5 times the detection limit

Second column confirmation NOT performed unless otherwise noted

95% confidence interval. daily EPA standard recovery dutside

Chlorobenzene and p-xylene co-elute

Quantitated as chlorobenzene unless otherwise noted

Page 2 Received: 09/01/88

Austin REPORT Results By Test

RAS

Work Order # 88-09-002

Lee MW-1	Sample Id	MW-Ω				T E	Sample Id				X	Sample Id
01	SAMPLE	05 duplic :	94	ස	≈	01	SAMPLE	04	ස	8	01	SAMPLE
514	Test: MHO	<0.03	<0.03	⟨0. 03	<0.03	<0.03	Test: CR E	<0.03	<0.03	<0.03	<0.03	Test: AG E
0. 19	Test: MN E		09/09/88	09/09/88	09/09/88	09/06/88	Test: DG3020	0. 156	0. 336	0.010	0.004*	Test: AS G
16	Test: NA E	09/12/88	09/12/88	09/16/88	09/16/88	09/16/88	Test: DG6010	0.41	0.07	0. 57	0. 12	Test: BA E
17	Test: ND3		1.7	<0.040	<0.04	0.04*	Test: FE E	<0.005	0.008*	⟨0.005	(0.005	Test: CD E
0.004*	Test: PB G		0.79*	0.86*	1.4	0. 26*	Test: F IC	190	83	580	27	Test: CL IC

Page 10 Received: 05/14/88

SAMPLE ID Lee #4

28.28 Austin

REPORT

Work Order # 88-v--066

Results by Sample

FRACTION 02J TEST CODE EPA602 Date & Time Collected 05/13/88

NAME EPA method 602

(ategory

ANALYST INSTRMT 541-73-1 106-46-7 108-90-7 100-41-4 108-88-3 95-50-1 71-43-2 CAS# INJECTED 05/17/88 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1, 4-Dichlorobenzene Chlorobenzene-A Ethylbenzene COMPOUND FILE # Taluene Benzene RESULT DET LIMIT 6200 140 50 K E E E VERIFIED STIND CL

SURROGATES

8-80-8 a, a, a-Trifluorotoluene 115% recovery

NOTES AND DEFINITIONS FOR THIS REPORT DET LIMIT = DETECTION LIMIT

ND = not detected at detection limit

NA = not analyzed

NNA = not available less than 5 times the detection limit

Second column confirmation NOT performed otherwise noted

15) Querter \$/88

SAMPLE ID Lee #4 Received: 05/14/88 SAMPLE ID Lee #4 NOTES AND DEFINITIONS FOR THIS REPORT ANALYST INSTRMT N\A = not available NA = not analyzed ND = not detected at detection limit * = less than 5 times the detection limit DET LIMIT = DETECTION LIMIT 106-42-3 108-38-3 CAS # 95-47-6 8-80-84 INJECTD 05/17/88 m-Xylene-A COMPOUND p-Xylene o−Xylene a, a, a-Trifluorotoluene Pate & Time Collected 05/13/88 FRACTION <u>O2A</u> TEST CODE TURB Date & Time Collected <u>O5/13/88</u> Results by Sample RESULT DET LIMIT SURROGATES REPORT 115% recovery VERIFIED ___ UNITS NAME Xylenes, EPA 602 NAME Turbidity Continued From Above Work Order # 88-vu-066 Category Category

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT

NA = not analyzed

N\A = not available

ND = not detected at detection limit

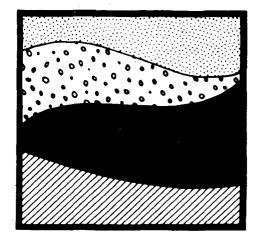
Second column confirmation NOT performed

s otherwise noted

* = less than 5 times the detection limit

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	05/23/88				05/23/88	Test: DG6010		(0, 003	0.007*	Test: CD E		£00 053	₹0, 003	Test: AS E	RAS -
15/ Quarter &	:- ω				0. 037	Test: FE E		180	28	Test: CL IC	pCi/L	6 () bc1/c	(4.6	Test: ALPHA	Austin Results By
5) \$\delta 88	1. 0*				0. 68*	Test: F IC		2100	>24,000	Test: COLI I	0. 400	0 130	0.004	Test: AS G	REPURT Test
1250	1230	470	470	4/()	470	Test: MHU		0.028	0.004*	Test: CR E	Ç. 01	0 33	0. 22	Test: BA E	Work Order # 88-vu-066
	0.57				0. 12	Test: MN E		05/16/88	05/16/88	lest: DG3020	pCi/L	7 1 (2 0)	(9.6	Test: BETA	88-2-066

GCL



REPORT ON THE INSTALLATION
OF A GROUND-WATER MONITORING SYSTEM
AT PHILLIPS' LEE PLANT

STITUTE OF PROVESSOON	
SUBMITTED BY:	DATE:
AIPG Scissis	6-6-88
GCL Program Manager	
Michiell See Sional Sional See	6-6-88
GCL Project Director	

FORM/REPTSIGN.FRM

REPORT ON THE INSTALLATION OF A GROUND-WATER MONITORING SYSTEM AT PHILLIPS 66 NATURAL GAS COMPANY LEE PLANT

June 6, 1988

Prepared for:

BRUCE G. STEARNS PHILLIPS PETROLEUM COMPANY Phillips 66 Natural Gas Company Bartlesville, Oklahoma 74004

Prepared by:

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EASTERN REGIONAL OFFICE 1109 Spring Street Suite 706 Silver Spring, Maryland 20910 (301) 587-2088 FAX (301) 588-0605

OIL CONSERVATION DIVISION

SANTA FE

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1.0 EXECUTIVE SUMMARY

In April of 1988, Phillips 66 Natural Gas Company was issued a Compliance Order/Schedule by the New Mexico Environmental Improvement Division (NMEID) to install and sample for water quality, four ground-water monitor wells at the Lee Plant in southeastern New Mexico. The monitor wells modify a former ground-water monitoring system which was previously installed around an abandoned wastewater evaporation pond.

The four new monitor wells were installed before May 2, 1988 by Larry's Drilling Company from Hobbs, New Mexico under the supervision of Geoscience Consultants, Ltd. (GCL). Air-rotary drilling techniques were employed. The four previously existing monitor wells were plugged with a cement/bentonite slurry and abandoned. Hydrogeologic information that was generated during the drilling and well installation has been evaluated and is included in this report.

The monitor wells were sampled on May 13, 1988 by GCL. Samples have been submitted to Radian Analytical Services in Austin, Texas and Morrisville, North Carolina. Results of the analyses are pending and will be reported to NMEID within 7 days after receipt.

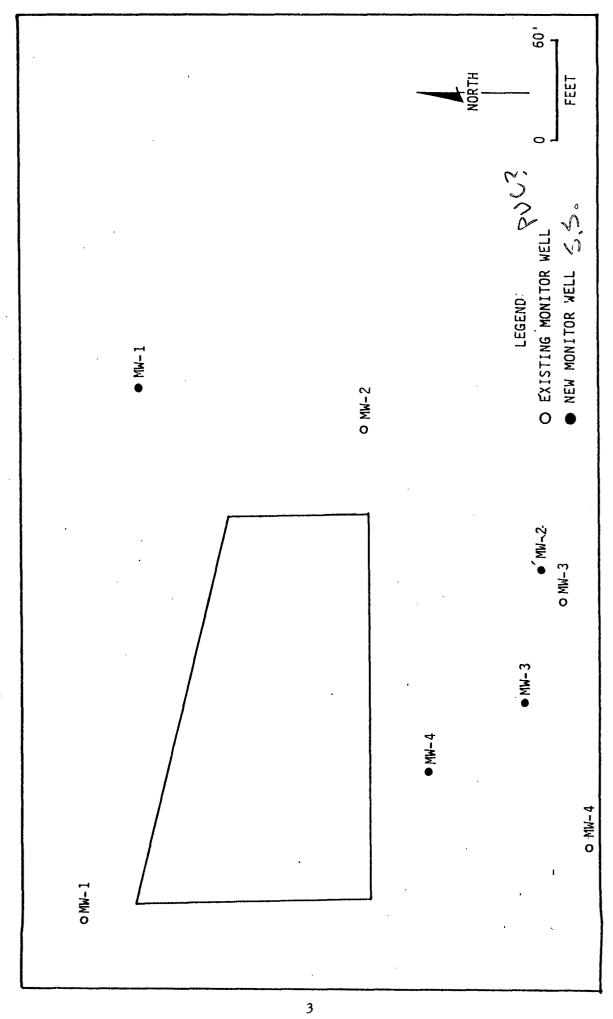


2.0 INTRODUCTION

In response to a Compliance Order issued by NMEID, Phillips 66 Natural Gas Company has modified the existing ground-water monitoring system at it's Lee Plant in southeastern New Mexico. Four new wells were constructed to replace the former monitoring system. The former monitor wells were plugged and abandoned.

A ground-water monitoring system was previously installed at the site around the wastewater evaporation ponds which are no longer in use. The system was designed so that one well was located upgradient and three wells were located downgradient from the wastewater management unit at the Lee Plant (Figure 2-1). The wells were composed entirely of 5-inch diameter PVC and had screen lengths of approximately 30 feet.

Monitor well locations for the new ground-water monitoring system were selected by Phillips after discussions with NMEID. The 2-inch combination stainless steel/PVC design is discussed in detail in Section 3.2. Rotary drilling was selected as the most effective method for penetrating the hard caliche zone that was known to exist near the surface at the site. At the Lee Plant, potable water was used as the drilling fluid for installation of the monitor wells.



SITE MAP SHOWING EXISTING AND NEW GROUND-WATER MONITORING SYSTEMS LEE GAS PLANT FIGURE 2-1

3.0 METHODS OF INVESTIGATION

3.1 ROTARY DRILLING

Boreholes for the ground-water monitor wells at Phillips 66 Lee Plant were drilled with an Ingersoll Rand TH-60 rotary drill rig. Prior to setting up on each of the four proposed borehole sites, the drill rig and all down-hole tools were thoroughly cleaned with a hot-water washer generating water temperatures of at least 180 degrees Fahrenheit. The boreholes were drilled using potable water as a drilling fluid. This method of drilling was selected over air rotary drilling methods because it greatly decreased the potential for borehole sloughing and caving that was known to have occurred on previously drilled wells in the area. Specifications for selected field equipment and material are presented in Appendix A.

Prior to moving the drill rig onto each borehole site a 3500 gallon portable mud pit was mobilized to the proposed location by HOMCO, an oil field service company located in Hobbs, New Mexico. Portable pits were necessary at this plant because all of the proposed borehole sites were located areas where frequent traffic by heavy equipment and tank trucks occurred. The portable pit was completely drained of fluids and solids by a vacuum truck and was thoroughly steam cleaned prior to use on each borehole. Water for drilling was acquired from the plant water supply system.

Drilling of surface casing was accomplished by advancing a 12-inch diameter rotary drill bit downward while drill cuttings were simultaneously blown upward and out of the borehole with compressed air. The initial, large diameter borehole was advanced to 15 feet below the surface and the drill rods retreived. Fifteen feet of 8-inch surface casing was then installed and cemented in place so that the rest of the borehole could be drilled with water as a drilling fluid. Cementing of the surface casing was necessary to prevent erosion of the site by circulating drilling fluid. Samples of the drill cuttings were collected at 5-foot intervals and the lithology logged by GCL's on-site geologist. Lithologic logs are presented in Appendix B.

After the cement around the surface casing had cured, the borehole was reentered using a 6.5-inch diameter drill bit. The borehole was drilled to the target depth using potable water to circulate cuttings out of the borehole and into the portable pit. The clays of the formation generated a "natural mud" during this process. Core drilling at this site was attempted but was unsuccessful in recovering any core. The fine-grained, unconsolidated sediments that were encountered at this site could not be retained in the core barrel.

After the target depth of each borehole was attained, the drill rods were retrieved and temporary PVC surface casing was installed in the borehole. Fluids and fine-grained sediments were then bailed from the cased hole. The rising water level within the borehole was monitored with an electronic water-level indicator until static conditions were reached. In several cases this required leaving the borehole overnight so that recovery of the water level was complete and the screen depth for the monitor well could be selected accurately.

3.2 MONITOR WELL DESIGN AND INSTALLATION

Monitor wells installed at the Lee Plant in 1988 are composed of 2-inch diameter PVC and stainless steel (Figure 3-1). Monitor well completion diagrams are located in Appendix C. In order to ensure that any seasonal fluctuations in the water table do not elevate the water in the monitor well above the screened interval, each 15-foot long stainless steel screen (.02-inch slots) was emplaced so that the upper 5 feet was above the static water level. A 2-foot long silt trap was also installed below the screen. A 10-foot long stainless-steel riser was installed above the screen to minimize the potential of ground water contacting PVC. The well head was secured by a cement-filled, 6-inch by 5-foot steel guard pipe with a locking cap installed on the top of the inner 2-inch well casing.

The monitor well was installed by inserting the pre-packaged, factory steam-cleaned well casing into the cased borehole one section at a time. When the entire column of well casing had been inserted into the borehole

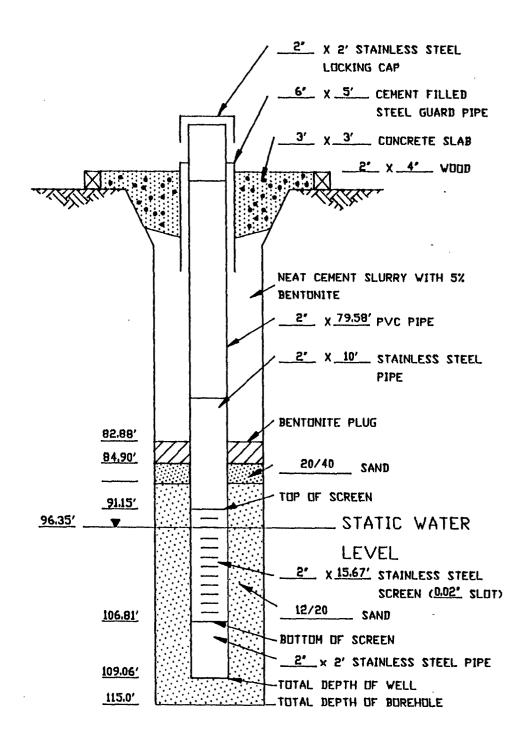


FIGURE 3-1
TYPICAL MONITOR WELL DESIGN
PHILLIPS LEE PLANT

and the temporary PVC casing was removed. With the 2-inch well casing suspended from the rotary table to ensure correct alignment, installation of the filter pack was initiated. The filter pack consisted of prepackaged, graded silica sand (12-20) and was installed to a level 2 to 3 feet above the top of the screen through a tremie pipe. An additional 1 to 3 feet of 20-40 silica sand was installed above the filter pack to inhibit downward migration of bentonite and cement from the overlying annular seal. The seal was composed of bentonite pellets and was emplaced above the 20-40 sand by slowly pouring the pellets into the open borehole from the surface. About 1 foot of 20-40 sand was placed above the bentonite to ensure that the seal was not displaced when the The borehole was then backfilled with a neat borehole was grouted. cement slurry (containing 5 percent bentonite) into the borehole annulus through the tremie pipe. The lower end of the tremie pipe was always kept below the level of cement in the borehole to ensure that no voids were left in the grout. The well head for each well was completed as shown in Appendix C.

During well construction activities for the upgradient monitor well, explosive vapors were recorded and the work immediately ceased pursuant to the criteria set forth in the Health and Safety Plan developed for the project. The borehole (MW-1A), which had penetrated the zone of saturation, was abandoned according to the procedures for monitor well plugging outlined in Section 3.4. An alternate location for the upgradient monitor well was selected in the field. Hydrocarbon vapors were not detected during the drilling of this location, but vapors were recorded during completion activities. Because the levels did not exceed criteria set forth in the Health and Safety Plan, the well (MW-1B) was completed as a monitor well.

3.3 WELL DEVELOPMENT

The monitor wells at the Lee Plant were developed by the overpumping method using a GCL 1.5-inch, stainless steel, air-lift development pump (Figure 3-2). The pump was inserted into the well with the bottom of the pump positioned at various intervals within the screen in order to

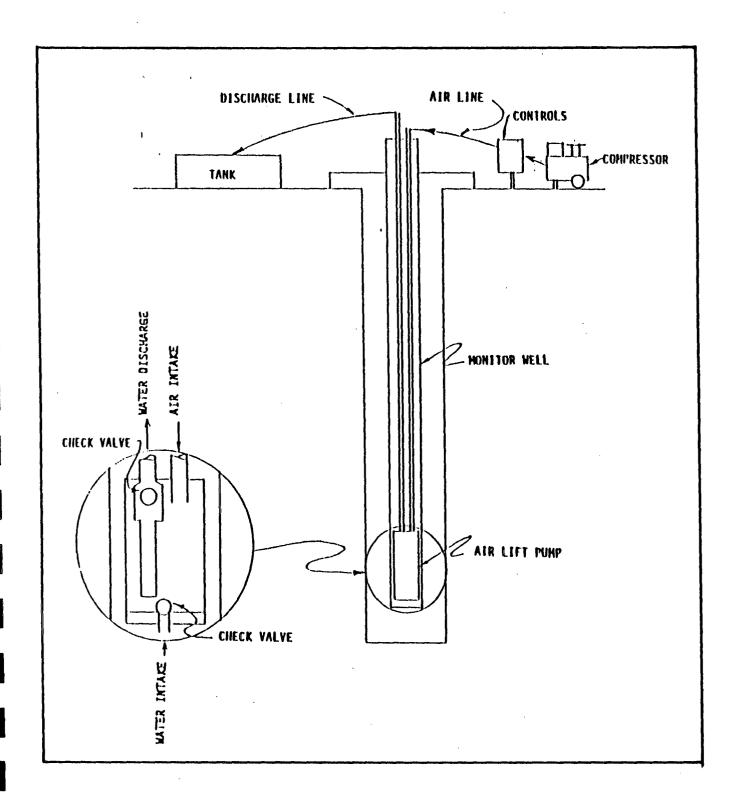


FIGURE 3-2 AIR LIFT PUMPING SYSTEM

achieve uniform development. A check valve at the bottom of the pump allowed water and silt to enter the pump when the compressed air system was relaxed. When the system was pressurized, all fluids and material that were in the pump chamber were discharged to the surface and placed in the mud pit that was used for drilling each hole.

The presence of very fine sand and silt in the uppermost water-bearing unit, combined with a well yield of less than one-quart per minute, made development time-consuming and difficult. In order to enhance the development of the wells, surging was occasionally used while pumping the wells. Periodically, several gallons of either distilled water or relatively clear water that had already been purged from the well was poured down the well. The surging dislodged fines in the surrounding formation sediments for removal by pumping.

Water developed from several of the wells was still slightly turbid when development was terminated. It is possible that an extended period (weeks or months) of pumping would produce water with low or no turbidity. However, it is also possible that no amount of pumping would result in the production of clear, silt-free water from the fine-grained saturated unit.

3.4 WELL PLUGGING

Four 5-inch monitor wells at the Lee Plant were abandoned. The wells were plugged by pumping a neat cement slurry containing 5 percent bentonite into the well casing through a tremie pipe. The tremie pipe was placed in the well so that the discharge end was at or near the bottom of the well casing. The slurry was mixed at the surface in a 55-gallon drum and pumped through the tremie pipe with a diaphragm pump. Cement was then circulated to the surface from the bottom of the tremie pipe to ensure that a proper seal was attained with the slurry. All four wells required more cement than volumetric calculations predicted. This suggests that the slurry extends beyond the well casing and screen into the filter pack and formation, thus forming a very effective seal.



Figure 3-3 shows a typical abandoned well. Boring MW-1A was plugged in the same manner as described above.

3.5 SAMPLING

On May 13, 1988, all four wells were sampled according to protocol outlined in the June 2, 1988 Sampling and Analysis Plan for Phillips 66 Natural Gas Company Artesia, Eunice, Lee and Lusk Gasoline Plants. Results of analyses being conducted by Radian Analytical Services are pending.

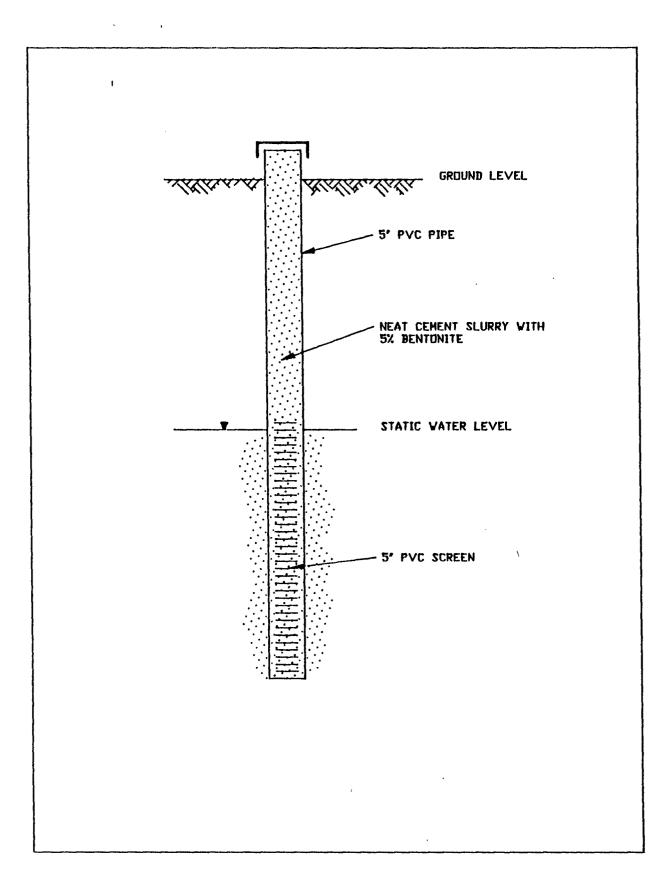


FIGURE 3-3
TYPICAL PLUGGED AND ABANDONED MONITOR WELL

4.0 REGIONAL GEOLOGY AND HYDROLOGY

4.1 REGIONAL GEOLOGY

The Lee Plant is located in southern Lea County, New Mexico in the Llano Estacado (Staked Plains) part of the High Plains section (Figure 4-1) of the Great Plains physiographic province (Fenneman, 1931). Shallow depressions and small sand dunes are the only significant topographic features in an otherwise flat, treeless plain. The depositional surface of the Llano Estacado exhibits low relief, sloping uniformly to the southeast at a topographic gradient of about .003. Total relief in Lea County is about 1300 feet with an altitude ranging from 2900 to 4200 feet above sea level (Nicholson and Clebsch, 1961). Drainage patterns are poorly defined.

Rock exposures in the area are poor and range in age from Triassic to Quaternary (Figure 4-2). The region is covered by Quaternary-Age eolian deposits ranging in thickness from 1 to 5 feet. Beneath these windblown deposits, a layer of dense, well developed caliche forms a cap over the Ogallala Formation. The caliche can range from several feet up to 60 feet in thickness, and decreases in induration with depth (Nicholson and Clebsch, 1961).

The Tertiary Ogallala Formation underlies the Llano Estacado in southeast New Mexico. It is composed of terrestrial sediments which unconformably overly the Triassic section. Outcrops of the Ogallala occur along the face of Mescalero Ridge to the south of the Lee Plant. The Ogallala ranges in thickness from several inches up to 300 feet and is composed primarily of unconsolidated, calcareous sand, clay, silt and gravel.

Jurassic-Age rocks have not been observed in the area and rocks of Cretaceous Age have been almost completely removed by erosion (Nicholson and Clebsch, 1961). Rocks of the Triassic Dockum Group are the oldest rocks that crop out in the region. The Dockum Group may be divided into the Chinle Formation and the Santa Rosa Sandstone. The Chinle Formation ranges in thickness from zero to 1270 feet and is composed primarily of red and green claystone with minor siltstone and fine-grained sandstone.

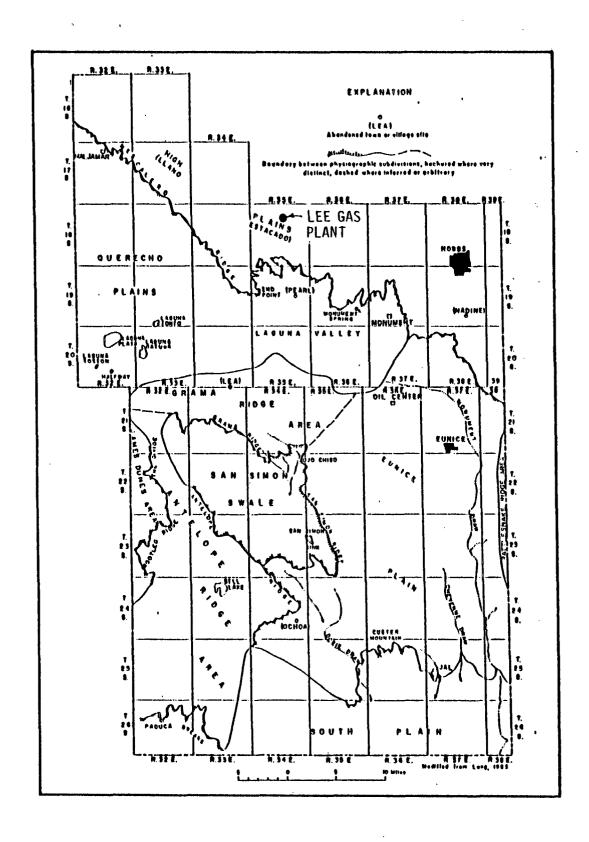


FIGURE 4-1
PHYSIOGRAPHIC SUBDIVISIONS OF SOUTHERN LEA COUNTY, NEW MEXICO
(FROM NICHOLSON AND CLEBSCH, 1961)

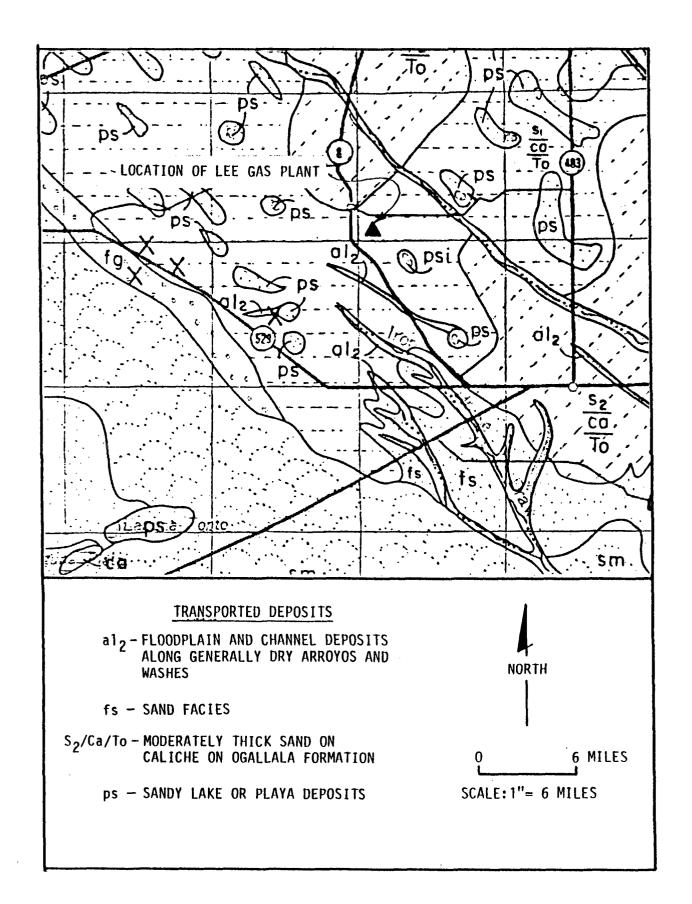


FIGURE 4-2
SURFICIAL GEOLOGY OF SOUTH EAST NEW MEXICO
(FROM HUNT, 1977)



The Santa Rosa Sandstone is typically reddish in color, fine- to coarse-grained, and contains minor shale lenses. Thickness ranges from 140 feet to more than 300 feet.

Southeastern New Mexico and west Texas are underlain by large subsurface structural basins with highly complex geology. Southern Lea County includes parts of the Delaware Basin and the Central Basin Platform (Figure 4-3). The northwestern edge of the Delaware Basin is coincident with the position of the reef-edge as it existed throughout Permian time. The Artesia-Vacuum arch reflects this ancient reef trend; the Lee site is located at the eastern limit of this trend. Triassic rocks in the area exhibit a regional dip of less than one degree to the southeast (Nicholson and Clebsch, 1961). Variations in this regional trend occur in the collapse structures and unconformities which are common to the area.

4.2 REGIONAL HYDROLOGY

Recharge in the region occurs primarily as a result of infiltration from short drainages and temporary lakes that form as a result of heavy rainfall events (Nicholson and Clebsch, 1961). Discharge takes place principally in the form of evapo-transpiration and pumping from wells; very small volumes of ground water discharge at springs.

Potable water supplies in the Llano Estacado region are derived primarily from aquifers hosted by Quaternary alluvium and the Tertiary Ogallala Formation. Ground water occurring in Triassic sediments is potable, but has a poorer quality and is hosted on lithologic units which produce lower well yields than younger formations in the area. The Ogallala Formation mantles the High Plains in the Lee Plant area and has a saturated thickness ranging from 25 to 175 feet (Nicholson and Clebsch, 1961). Ground water in these shallow aquifers flows to the southeast at a low hydraulic gradient.

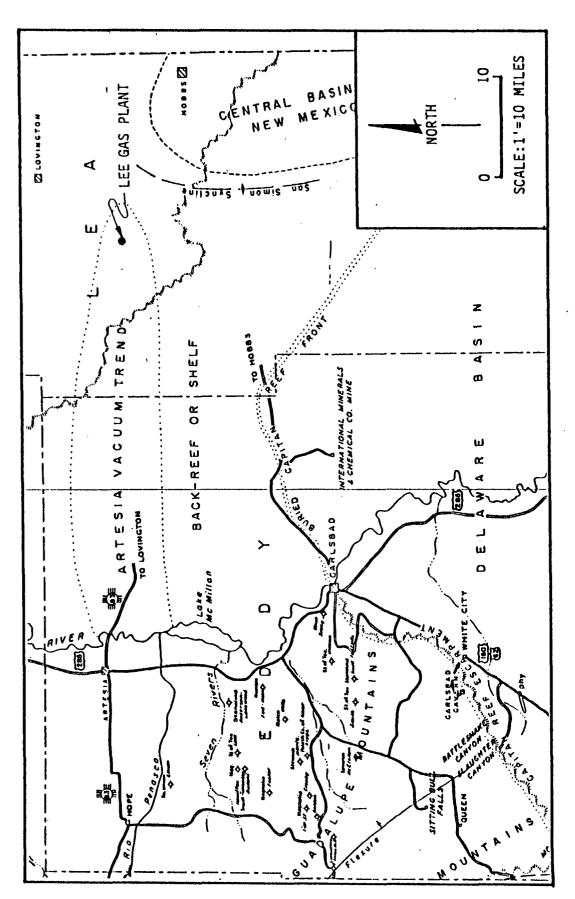


FIGURE 4-3
MAP OF SOUTHEASTERN NEW MEXICO SHOWING STRUCTURAL FEATURES
(FROM NEW MEXICO GEOLOGICAL SOCIETY, 1954)

5.0 SITE GEOLOGY AND HYDROLOGY

5.1 SITE GEOLOGY

Two primary lithologic sequences were encountered at Phillips Lee Plant: an upper, caliche-cemented fine-grained silty sand and sandy silt and an underlying coarser sand. A "topsoil", probably backfill material used during facility construction or modification, was also identified during drilling.

Surficial lithologies at the Lee Plant are both natural and anthropogenic. Aeolian sheet sands consisting of poorly-sorted fine sand are present and typically less than 5 feet thick. Backfill material consisting of poorly sorted fine sand to fine pebble-sized sediment was present at the locations of monitor wells MW-2, MW-3, and MW-4.

Beneath the thin surficial deposits, sediments characterized by highly variable clast size and poor sorting are present. Although the dominant sediment consists of fine-grained, poorly sorted sand, clay-, silt-, and gravel-rich sands are present which have very limited lateral continuity. Caliche in this sedimentary sequence ranged from highly-developed stage IV in the upper horizon to stage I at approximately 20 to 35 feet below the ground surface. Consolidation of the sediments in this sequence was related to the presence and degree of development of interstitial caliche and, to a lesser degree, the presence of interstitial clay. With few local exceptions, the degree of consolidation decreased with depth.

The lower coarser-grained sand unit, in which each of the new monitor wells at the Lee Plant was completed, comprised the second primary lithology. The coarser sand lacked notable silt and clay particle fractions. The contact between the two lithologies was sharp and occurred at a depth of 35-65 feet. As much as 80 feet of the lower unconsolidated sand was penetrated during drilling at the site (MW-4). The yellowish-brown to brown color, higher percentage of medium-grained sand, and the relative vertical homogeneity distinguished it from the overlying sediments.

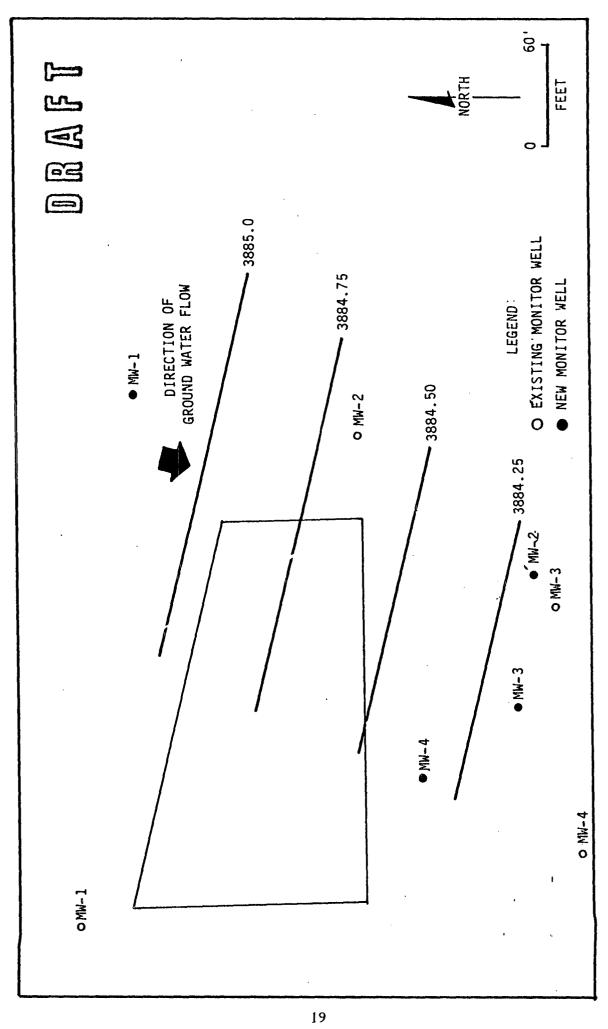


Hunt (1977) and Nicholson and Clebsch (1961) identified the outcrop in the Lee Plant area as Tertiary Ogallala Formation. The description provided by Hunt (1977) correlates particularly well with observations recorded by GCL personnel during the investigation.

5.2 SITE HYDROLOGY

Shallow ground water at the Lee Plant occurs under water table conditions. Based on May, 1988 data, ground water flows to the south with a hydraulic gradient of 0.003 (Figure 5-1). The uppermost saturated zone beneath the site is a water-bearing fine-grained unit within the Ogallala Formation. The water table occurs at depths below the land surface ranging from 96.40 feet in MW-2 to 94.08 feet in MW-1.

During development of the monitor wells, low well yields were observed. Wells may yield a sustainable pumping rate of up to 2 gallons per minute. This pumping rate is consistent for the fine-grained sediments that occur beneath the site, which typically exhibit hydraulic conductivities of 10^{-2} to 10^2 gallons per day per square foot (Figure 5-2).



CONTOUR MAP OF WATER TABLE BENEATH LEE GAS PLANT FIGURE 5-1

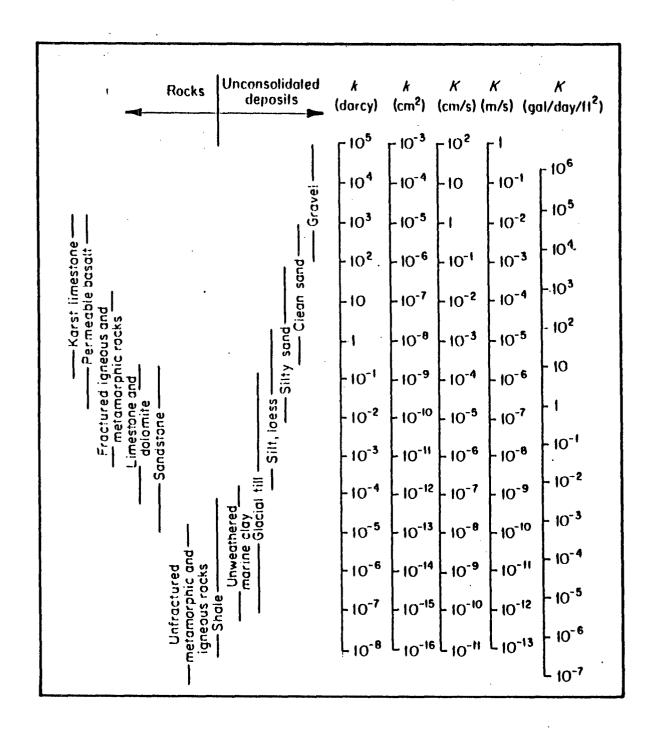


FIGURE 5-2
RANGE OF VALUES OF HYDRAULIC CONDUCTIVITY AND PERMEABILITY

(FROM FREEZE AND CHERRY, 1979)

6.0 REFERENCES

- Fenneman, N.M., 1931. "Physiography of Western United states", New York, McGraw-Hill Book Company, 534 p.
- Freeze, R.A. and Cherry, J.A., 1979, <u>GROUNDWATER</u> Prentice-Hall, Inc., Englewood cliffs, N.J.
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- Nicholson, A., and Clebsch, A., 1961. "Geology and Ground-Water Conditions in Southern Lea County, New Mexico", Ground-Water Report 6, New Mexico Institute of Mining & Technology, State Bureau of Mines and Mineral Resources, Socorro, New Mexico.
- Phillips Petroleum Company, 1988, Sampling and Analyses Plan for Phillips 66 Natural Gas Company Artesia, Eunice, Lee and Lusk Gasoline Plants.

APPENDIX A

SPECIFICATIONS OF SELECTED FIELD EQUIPMENT AND MATERIALS

VOLCLAY TABLETS

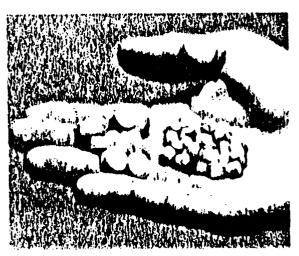
GENERAL DESCRIPTION: A pre-formed compressed tablet made of high swelling sodium bentonite. Falls through standing water. Forms a flexible, permanent, non-toxic seal where water flows and hydrostatic pressures are involved.

PROPERTIES OF VOLCLAY TABLETS:

- Increased hardness and density provides better settling characteristics. Can be placed in a dry or wet borehole with the same ease as pea gravel.
- Will swell up to 15 times its dry volume when hydrated by fresh water.
- Will provide in place expansive seal.
- Will not shrink or crack with time.

FUNCTIONS OF VOLCLAY TABLETS:

- Seal all types of plezometers.
- Seal surface casing for water wells and well pits.
- Provide an intermediate seal preventing interaquiler transfer.
- Seal at the uppermost aquifer and prevent entrance of surface water into aquifer.
- Seal abandoned wells maintaining aquifer yield and artesian head.



PHYSICAL PROPERTIES:

- Density: 2.3-2.5
- Composition: Bentonite a hydrous silicate of alumina comprised essentially of the clay mineral montmorillonite.
- Purity: Montmorillonite content about 90% minimum.
 Contains small portions of feldspar, blottle, selenite, etc.
- pH: 8.5 to 10.5
- Dry bulk density: 82 lbs./ft.3

DISCOUNT SCHEDULE 30% F.O.B. Albuquerque

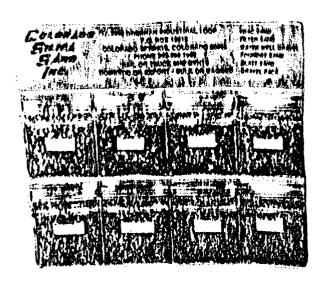
PART NO.	TABLET SIZE	PACKAGE	WEIGHT	LIST PRICE
VC50	1/2 "	5 gal. pall	50 lb.	\$39.53
VC25	1/4 "	5 gal. pall	50 lb.	55.46

VOLCLAY TABLETS REFERENCE TABLE

HOLE DIA. IN.	CASING SIZE	WEIGHT OF PELLETS (LBS./FT.)
4	None	. 7
5	None	' 11
. 6	None	16
7	None	22
8	None	28
6	4	.7
6	41/2	5
6	5	21/2
8	5	. 15
8	6	91/4
10	6	25
10	8	12
12	8	34
12	10	32

COLORADO SILICA SAND

MONITORING WELL GRAVEL PACK



Less screen plugging
Less infiltration of formation fines
More uniform flow through gravel pack
Better well development

DISCOUNT SCHEDULE 30% F.O.B. Albuquerque

PRODUCT NO.	SAND SIZE	LIST PRICE
SS812	8/12	\$9.74
SS1020	10/20	9.34
SS1640	16/40	9.56

Packaging - 100 lb., 3-ply bag

GRAVEL PACK SELECTION TO SCREEN SIZE

10 SLOT	20 SLOT	30 SLOT	40 SLOT
16/40	10/20	10/20	8/12

- 1. It's pure and inert (contains no phosphorus).
- 2. It's organic-free.
- Its roundness and sphericity means easy handling and uniform placement in the well. This gravel pack will not bridge or plug the screen slots. This insures a uniform representative sample of water for the total depth of the formation.
- 4. Controlled gradation assures representative infiltration to the well.
- Colorado's monitoring well gravel pack does not absorb nor release chemicals that could distort the actual existing conditions of the monitoring results.

Colorado Silica Sand, Inc.

3250 Drennan Industrial Loop P.O. Box 15615 Colorado Springs, Colorado 80935 Phone (303) 390-7969 TWX: 910-920-4992

CONVERSION CHART

OPEN1NG	S	v.s.	TYLER
Hillimeters	Inches	STANDARD	MESII
5.66	0.223	3-1/2	3-1/2
4.76	0.187	4	4
4.00	0.157	5	5
3.36	0.132	6	6
2.83	0.111	7	7
2.38	0.0937	8	8 .
2.00	0.0787	10	9
1.68	0.0661	12	10
1.41	0.0555	14	12
1,19	0.0469	16	14
1.00	0.0394	18	16
.841	0.0331	20	20
.707	0.0278	25	24
.595	0.0234	30	28
.500	0.0197	35	32
.120	0.0165	40	35
.354	0.0139	45	42
.297	0,0117	50	48
.250	0.0098	60	60
.210	0.0083	70	65
.177	0.0070	80	80
.149	0.0059	100	100
.125	0.0049	120	115
,105	0.0041	140	150
.088	0.0035	170	170
.074	0.0029	200	200

THE MAINSTAY OF OUR BUSINESS Standard Products

We have two distinctly different types of deposits to serve a complete spectrum of industries. Our Colorado Springs deposits are unique in that the sand sizes range from 4 mesh to 100 mesh. Our Gove Canyon Sand is better suited to serve the finer size applications and exotic specialty sands.

COLORADO SPRINGS SAND Chemical Determination	Sample Size Designation Mesh				
Description	-4+8	-8 -1-12	-10 +20	-20 +40	-40
SiO ₂ , % (Coffeen Method)	97.3	98.2	97.8	94.5	83.9
۸۱٫۵, %	0.45	0.49	1.20	3.20	7.08
MgO, %	0.01	0.01	0.01	0.01	0.03
CaO, %	0.02	0.02	0.03	0.03	0.07
K ₂ O, %	0.17	0.21	0.60	2.12	4.96
Na,O, %	0.05	0.06	0.17	0.34	0.58
Fe ₂ O ₃ , %	0.15	0.14	0.12	0.17	0.79
TiÔ,, %	0.02	0.02	0.02	0.02	0.14
LOI, %	0.26	0.40	0.33	0.21	0.43
Feldspar	1.50	1.80	5.10	15.60	34.60
Acid Soluble, 15% HCl, %	0.28	0.07	0.34	0.32	0.98
Mud Acid Solubility (3HF:12HCI)	1.10	1.41	2.26	4.44	6.21
Acid Demand at Ph 3	2.80	0.31	0.31	3.80	5.60
at Ph 5	0.80	0.90	1.00	1.60	2.80
at Ph 7	0.40	0.50	0.60	1.10	1.80
Specific Gravity	2.63	2.64	2.62	2.63	2.61
AWWA Porosity	45.20	45.20	45.60	47.10	48.20

GOVE CANYON SAND Chemical Determination	Sample Size Me	_
Description	-20 +40	-40 +140M
Fe ₂ O ₃	0.040	0.053
∎ CaO ຶ	0.025	0.055
Al ₂ O ₃	0.12	0.37
MgO	0.013	0.022
■ Na₂O	0.010	0.013
K,Õ	0.048	0.19
TiO,	0.013	0.012
LOI (1000°C)	0.30	0.18
SiO, (by difference)	99.43	99.10
Acid Solubility (15% HCL)	0.15	0.22
Mud Acid Solubility (3HF:12HCI)	2.2	5.1
Acid Demand at pH 3	6.3	6.5
at pH 5	5.5	4.9
_ at pH 7	4.3	3.8
Specific Gravity	2.62	2.58
Bulk Density—uncompacted #/fl³	89.6	93.3
compacted	97.0	98.7
AWWA Porosity	44.7	
Krumbein Roundness	.6	8
Sphericity	.6	8
No apparent fusion at 2810°F		





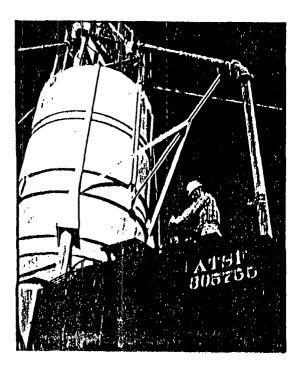
OUR TOP OF THE LINE Specialty Sands

Modern filtration and gravel pack methods require a filter medium that is 98% within specifications. This type of screening efficiency was virtually unheard of several years ago. Today, we produce these exotic materials on a daily basis. In fact, if you order a specialty sand, we'll screen it to a 99% spec to further assure satisfaction after shipping and handling.

Additional Exotic Sand Tests	Sample D	esignation	Specification
Test	10-14	10-16	Limit
Mud-Acid Soluble, Wt. %:			
Frac Sand	1.74	1.96	2.00 Max.
Gravel Pack Sand	0.91	0.89	1.00 Max.
Gravel Pack Crush Strength			
Gove Canyon 20-40 %	3.20		4.00 Max.

Sizo	98-100% Passing	98-100% Retained	
6-9	#6 sieve	#10 sieve	
8-12	#8	#12	
10-14	#10	#14	Note: Materials processed to your Uniformity Coefficient and
10-16	#10	#16	Effective Size, by separate quotation.
16-20	#16	#20	A Word of Caution—Since test results do vary, it is
20-30	#20	#30	recommended that you confirm with your own lab your
20-40	#20	#40	specification requirements and the physical and chemical characteristics of this product. We give no warranty for our
40-60	#40	#60	products either expressed or implied.

Warning: This material contains free silica—do not breathe dust. May cause delayed lung injury. Wear government approved respirators and follow OSHA Safety and Health Standards for Silica.



Common Applications of CSSI Products:

Water Well Gravel Pack Waste Water Treatment Filtration Water Filtration Hydro-fracturing Sand Oil and Gas Well Gravel Pack Industrial Grout Sandblasting Sand Foundry Sand Glass Sand

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STAINLESS STEEL PRODUCTS

- Stainless steel provides high strength, long life and minimum interference with sample analyses.
- The material of choice when organic contaminants are present.
- Continuous slot construction produces high per cent open area. Greater volume of water can enter a shorter length of screen which allows more representative sampling.
- Flush joints between screen and casing mean sampling devices won't hang up inside. Filter pack and backfill won't bridge outside.
- Patented locking cap available for protection of the well

- Coarse thread minimizes make-up time and reduces chance of cross-threading.
- Chemically inert O-ring creates a stronger, tighter seal for leak-proof screen and casing joints.
- Readily available in type 304 stainless steel. 316 stainless steel and other metals available upon request.
- Drive points available in 1¼ in, and 2 in, diameter.
- Screen and casing individually wrapped for sanitary protection during shipment. Special cleaning procedures are used on each screen and length of casing prior to packaging.

SCREENS

SCREEN	DIAMET	ER (IH.)	SHIP WT	OPEN AREA (IN.º)		
SIZE	0.0.	1.D.	(LB/FT)	10-SLOT (.010°)	\$0-\$LOT ("020")	
11/4 INCH	1.660	1.130	3.0	9.7	17.0	
8 INCH	2.375	1.900	4.0	13.2	23.1	
4 INCH	4.500	4.000	6.0	25.8	44.9	
5 INCH	5.563	5.000	7.5	31.3	54.6	
6 INCH	6.625	6.065	9.0	29.5	52.9	

CASING

CASING SIZE	CASING O.D. (IN.)	11111113 I.D. (IN.)	SHIP WT (LB/FT)			
11/4 INCH	1.660	1.380	1.2			
& INCH	2.375	2.067	1.7			
4 INCH	4.500	4.026	4.0			
5 INCH	5.563	5.047	6.5			
6 INCH	6.625	6.065	7.7			

■ Casing is Schedule 55 and meets ASIM spec A319 or A778.

MATERIALS STRENGTH DATA

	O.D.	1.0.	Wf		STRENGTH		
HOMINAL SIZE	(111.)	(114.)	LB/FT	COLLAPSE (PSI)	TENSILE (LB)	(ra), COLUMH	JOINT TENSILE (LB)
2" sched. 40 casing	2.375	2.067	3.653	3,596	85,900	6,350	15,900
9" sched. 5 casing	2.375	2.245	1,604	896	37,760	3,000	15,900
2" wire wound screen	2.375	1.900	4.0	1,665	10,880	810	15,900
4" sched. 40 casing	4,500	4.026	10.790	2,672	254,400	69,000	81,750
4" sched. 5 casing	4,500	4.334	3.915	315	92,000	26,800	81,750
4" wire wound screen	4.500	4.000	6.0	249	16,320	4,500	81,750
5" sched. 40 casing	5.563	5.047	14.6	2,231	343,200	145,490	91,500
5" sched. 5 casing	5.563	5.345	6.4	350	148,800	66,660	91,500
5" wire wound screen	5.560	5.030	4.8	134	38,600	13,040	91,500
6" sched. 40 casing	6.625	6.065	19.0	1,949	444,800	270,000	94,500
6" sched. 5 casing	6.625	6.407	7.6	129	178,400	113,660	94,500
6" wire wound screen	6.620	6.090	5.5	176	54,000	19,170	94,500

^{1.} For all column calculations: span = 20 ft, hinged one end, fixed other end.

Q. For stainless steel: Tensile strength = 80,000 psi

PVC PLASTIC PRODUCTS

- Sonic welcied wires and rods produce a high-strength PVC screen with continuous slots.
- More open area per given slot size than any other non-metallic screen available.
 - Resists corrosion from salts and gases commonly found in either fresh or salt waters.
 - The only continuous slot non-metallic screen available without a restricting pipe base.
 - Coarse threads reduce make up time and lessen chances of cross-threading.
 - Chemically inert O-ring produces tight, leak-proof joints.

- Thermally attached fittings avoid need for field solvent welding which can jeopardize sample accuracy.
- PVC product threads are compatible with stainless steel product threads.
- Stainess steel locking cap can be used with PVC casing.
- Screen and casing individually wrapped for sanitary protection during shipment. Special cleaning procedures are used on each piece prior to packaging.

CREENS

SCREEN	DIAMET	ER (IN.)	SHIP WT	OPEN AREA		
SIZE	Ø.b.	I.b.	(LB/FT)	10-SLOT (.0107)	\$0-\$LOT (.0\$0-)	
2 INCH	2.375	1.875	0.8	6.8	12.8	
4 INCH	4.620	4.000	1.7	11.9	22.2	
5 INCH	5.563	4.810	2.5	13.1	24.7	
6 INCH	6.625	5.690	3.2	13.2	25.0	

CASING

CASIFIG SIZE	CASING O.D. (IN.)	1111111G 1.D. (1N.)	SHIP WT (LB/FT)
2 INCH	2.375	2.067	0.7
4 INCH	4.500	4.026	2.0
5 INCH	5.563	5.033	2.7
6 INCH	6.625	5.993	3.5

- 9 and 4 inch casing are Schedule 40; 5 and 6 inch sizes are SDR91.
- All casing meets ASIM F480 81 specifications.

MATERIALS STRENGTH DATA

	0.5.	1,0,	Wr		STRENGTH				
HOMINAL SIZE	(IN.)	(04.)	LR/FT	COLLAPSE (PSI)	TEHSILE (LR)	(rg), COLUMH	JOINT TENSILE (LB)		
2" sched. 40 casing	2.375	2.067	.64	307	7,500	90	1,800		
2" sched. 80 casing	2.375	1.939	.88	947	9,875	125	1,800		
2" wire wound screen	2.375	1.875	.8	99	1,800	Ω5	1,800		
4" sched. 40 casing	4.500 4.500	4.026	1.9	158	22,200	1,030	6,050		
4" sched. 80 casing		3.826	2.6	191	30,850	1,375	6,050		
4" wire wound screen	4.620	4.000	1.7	79	2,250	150	6,050		
5" sdr-91 casing	5.563	5.033	2.8	110	30,870	2,200	6,050		
5" sched. 80 casing	5.563	4.813	3.9	324	42,780	2,940 307	6,050 6,050		
5" wire wound screen	5.560	4.810	2.5	79	4,610				
6" sdr-21 casing	6.625	5.993	4.0	110	43,840 ·	4,440	4,000		
6" sched. 80 casing	6.625	5.761	5.4	292	58,830	5,760	4,000		
6" wire wound screen	6.620	5.680	3.7	87	5,770	552	4,000		

For all column calculations, span = 90 ft, hinged one end, fixed other end. 2. For PVC, $Y_D = 2,000psl$, E = 415,000psl, $\mu = .5$.



WATER LEVEL INDICATOR

- Electronic indicator operates with two AA cell batteries.
- Insulated wire is marked every 5 ft. for easy reading.
 Also available in metric markings, marked every meter.
- Probe's contact surfaces are sized and spaced to provide accurate, instant response when the water level is located. On contact, the bright red light in the housing flashes on, goes off when contact is broken.
- Probe is %-inch diameter to fit smallest monitoring well.

Recommended specifications format

STAINLESS STEEL WELL SCREENS AND CASING

- General: The well screen shall be of the continuous slot, whe-wound design. It shall be fabricated by circumferentially wrapping a triangularly shaped wire around a circular array of internal rods. The wire configuration must produce niet slots with sharp outer edges, widening inwardly so as to minimize clogging. For maximum collapse strength, each functure between the horizontal wire and the vertical rods will be fusion welded under water by the electrical resistance method. End fittings will be welded in the screen body. The well screen shall be manufactured by Johnson Division, St. Paul, Minnesota or an equal approved by the engineer.
- Material and Fittings: The well screen and attached end
 fittings shall be fabricated from a corrosion-resistant Type
 stainless steel. End fittings provided with the screen
 hall be double entry Stub ACME flush screw threads with
 Viton O-ring on male end fitting.
- 3 Slot size: The screen slot size will be selected on the basis a mechanical size analysis of either the natural water-

- bearing sediments or the artificially introduced filter pack material.
- 4. Casing: The well casing shall be Type 304 stainless steel pipe. End fittings shall be double entry Stub ACME flush screw threads. The pipe must meet ASTM A312 or A778 Specification.
- 5. Cleaning: Screens shall be cleaned in the following manner prior to packaging:
 - A. Immerse for 5 minutes in static bath of Troy 2108 acid mix.
 - B. Pressure rinse/wash with a prescribed mixture of Troy 9709 detergent and cool water:
 - C. Rinse with warm water.
 - D. Allow to air dry.
- Casing shall be steam cleaned and allowed to air dry prior to packaging.
- 7. Packaging: Screen(s) and Casing shall be individually and separately wrapped in 4-mil protective polyethylene prior to shipment.

PYC WELL SCREENS AND CASING

- 1. Peneral: The well screen shall be of the continuous slot, ire-wound design. It shall be fabricated by circumferentially wrapping a trapezoidal wire around a circular array of internal rods. The wire configuration must produce inlet ots with sharp outer edges, widening inwardly so as to minimize clogging. For maximum collapse strength, each juncture between the horizontal wire and the vertical rods lill be made by sonic welding. The well screen shall be anufactured by Johnson Division, St. Paul, Minnesota, or an equal approved by the engineer.
- 2. Material and filtings: The well screen and attached end tings shall be completely fabricated of PVC material. End tings provided with the screen shall be double entry Stub ACME flush screw threads with Viton O-ring on male end (fillings shall be attached by thermal welding to reen.
- Stot size: The screen stot size will be selected on the basis
 of a mechanical size analysis of either the natural waterbearing sediments or the artificially introduced gravel pack
 material.
- 4. Casing: The well casing shall be Type 1, grade 1, 1120 PVC pipe and meet ASTM F480-81 specifications. The minimum wall thickness must be Schedule 40 or SDR 21, whichever is greater. End fittings provided with the pipe shall be double entry Stub ACME flush screw threads.
- Cleaning: Casing shall be cleaned in following manner prior to packaging:
 - A. Scrub casing while it is soaking in Troy 2702 detergent.
 - B. Rinse with warm water.
 - C. Allow to air dry.
- Packaging: Screen(s) and casing shall be individually and separately wrapped in 4-mil protective polyethylene prior to shipment.

APPENDIX B LITHOLOGIC LOGS OF BOREHOLES

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			◆ TEXACO	132
		1		● MW-1
• WATER	WELL			1
		MW-4	MW-3 ● MW	-2
1/4	1/41/	41/4	S_30 T_179	R_35E

Dage	4	of	4
Page		OΤ	4

SITE ID: Lee (Buckeye) LO	CATION ID: MW-18
SITE COORDINATES (ft.): _280.98	FSL & 1390.02 FEL
N	E
GROUND ELEVATION (ft. MSL): 397	
STATE: New Mexico COUNT	Y: Lea
DRILLING METHOD: Rotary/Water	
DRILLING CONTR.: Larry Felkins	Drilling
DATE STARTED: 4/28/88	DATE COMPLETED: 4/29/88
FIELD REP.: Linley	
COMMENTS:	

LOCATION DESCRIPTION:

		 	DRILLING TIME	SAMPLE TYPE	
DEPTH	VISUAL %	LITH	SCALE:	AND INTERVAL	LITHOLOGIC DESCRIPTION
0				0' - 5'	Caliche; white (N9) to v pale orng (10 YR 8/2) consolidated, sbang to sbrndd. Fn sand to pebble size clasts.
5			 	5' - 10'	
			 	 	to 3/4" in diameter.
10	 		 	10' - 15' 	Caliche; as above but clasts up to 1/4" in diameter.
15	 		} { 	 15' - 20'	Caliche; as above.
20	 			 20' - 25'	 <u>Caliche</u> ; as above.
	! !				Cartelle, as acove.
25	 			 25' - 30' 	
30	1			30' - 35'	
1 	\			1	

					LITHOLOGIC LOG
		,			
		·			Page <u>2</u> of <u>4</u>
				1	SITE ID: Lee (Buckeye) LOCATION ID: MW-1B
		•		į	SITE COORDINATES (ft.): 280.98 FSL & 1390.02 FEL
				<u> </u>	NEE
			•	i	STATE: New Mexico COUNTY: Lea
				į	DRILLING METHOD: Rotary/Water
				ļ	DRILLING CONTR.: <u>Larry Felkins Drilling</u>
				Į.	DATE STARTED: 4/28/88 DATE COMPLETED: 4/29/88
1/4	1/4	1/4	1/4 S_30_T_	175 R 35E	FIELD REP.: <u>Linley/Selke</u> COMMENTS:
LOCATIO	ON DESCRIPTION	N:			•
DEPTH	VISUAL % 1		DRILLING TIME	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
35			!	35' - 40' 	Sandstone; grsh red (5 R 4/2) cons, ang to sbang clasts. V fn to fn grain, mod sorted. Clasts up to 1/4" in diameter.
40 				40' - 45' 	Sandy Silt/Sandstone: grsh orng pnk (5 YR 7/2) uncons, sbang to sbrndd. Silt to fn grain size sand. Mod sorted. Sandstone contact at 43-44: Clasts up to 1/8" in diameter.
45 				 45' - 50' 	Sandy Silt; grsh orng pnk (5 YR 7/2) uncons, sbrndd to rndd. Silt to fin sand, well sorted. Hinor uphole contamination w/sandstone; sand fraction 40%.
 50 				 50' - 55' 	Silty Sand; grsh orng pnk (5 YR 7/2) uncons, sbrndd to rndd, well sorted, silt to fn grain sand; silt fraction 40%.
55			·	 55' - 60' 	Silty Sand; grsh orng pnk (5 YR 7/2) uncons to semicons, sbrndd to sbang. Mod sorted, silt to med fn grain sand; silt fraction ~30-35%.
60				 60' - 65' 	Sand; mod ylsh (10 YR 5/4) uncons, sbrndd to rndd, well sorted, v fn to med sand.
65			1 -1 -1 -1 -1	 65' - 70' 	
1					

					LITHOLOGIC LOG
		1			Page 3 of 4 SITE ID: <u>Lee (Buckeye)</u> LOCATION ID: <u>MW-18</u> SITE COORDINATES (ft.): <u>280.98 FSL & 1390.02 FEL</u> NE GROUND ELEVATION (ft. MSL): <u>3977.51'</u>
1/4	41/4	1/4 _	1/4 s <u>_30</u> t_	175 R_35E	STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/28/88 DATE COMPLETED: 4/29/88 FIELD REP.: Linley COMMENTS:
LOCATIO	ON DESCRIPTI	ON:			
DEPTH	VISUAL %	LITH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
70				70' - 75'	Sand; as above.
75	; ; ; ; ; ;			75' - 80'	Sand; as above.
80] 	 80' - 85' 	Sand; as above.
85	 		1 1 1 1	 85' - 90' 	<u>Sand;</u> as above.
90	1			 90' - 95' 	Sand; as above.
95				95' - 100' 	Sand; as above.
100				 100' - 105' 	Sand; mod yish brn (10 YR 5/4) uncons, sbrndd to rndd, well sorted, fn to med sand.

					LITHOLOGIC LOG
···			•	· · · · · · · · · · · · · · · · · · ·	Page <u>4</u> of <u>4</u>
		ı			SITE ID: Lee (Buckeye) LOCATION ID: MW-18 SITE COORDINATES (ft.): 280.98 FSL & 1390.02 FEL
1/4	1/4	1/4 _	1/4 S_30_1_	17s R 35E	GROUND ELEVATION (ft. MSL): 3977.51' STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/28/88 DATE COMPLETED: 4/29/88 FIELD REP.: Linley COMMENTS:
LOCATIO	ON DESCRIPTI	ION:			
DEPTH	VISUAL %	LITH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
105				105' - 110' 	Sand; as above.
110				110' - 115' 	Sand; as above.
115	 			i 1 1 1	
120	 	 		; 	
125	; 	 -	 		
130			 	 	
135	 		 - - -	 	

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	• MW-1	Ì
• WATER WELL		
	MW-4	
1/41/4	_1/41/4	Т

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Page	1	of	4

SITE ID: Lee (Buc	keye) LOCATION ID: MW-2
SITE COORDINATES (ft.): 11.82 FNL & 1531.66 FEL
N	E
GROUND ELEVATION (ft. MSL): 3977.63
	COUNTY: Lea
DRILLING METHOD: _	Rotary/Water
DRILLING CONTR.: _	Larry Felkins Drilling
DATE STARTED: 4/2	1/88 DATE COMPLETED:
FIELD REP.: Linle	y/Selke

| LOCATION DESCRIPTION:

DEPTH	VISUAL %	LITH	DRILLING TIME	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
0		244244		0' - 5'	Top Soil (Oil Stained) 1-3' Caliche 3-5; dusky yish brn (10 YR 2/2) to very pale orng (10 YR 8/2) semicons to cons, sbang to sbrndd; top soil has hydrocarbon staining from oil trucks and flair stacks. Poorly sorted; clasts from fn sand to pebbles; clasts up to 3/4" in diameter
5	 	~\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		 5′ - 10′ 	Caliche; v pale orng (10 YR 8/2) to mod brn (5 YR 4/4) cons, sbang to sbrndd. Poorly sorted, fn sand to pebble size clasts. Clasts up to 3/4" in diameter.
10	1 		1 	 10' - 15' 	<u>Caliche</u> ; as above.
15	 		 	 15' - 20' 	Caliche; as above.
20			 	 20' - 25' 	Caliche/Clay (Top Soil); dusky brn (5 YR 2/2) to v pale orng (10 YR 8/2) semicons, sbang to sbrndd, poorly sorted. Clay to pebble size clasts; clasts up to 1/2" in diameter. Clay fraction 35-40%.
25	 		1 1 1 1	 25' - 30' 	
30	 			 30' - 35' 	Caliche/Clay (Top Soil); as above. Clay fraction -25-30%.

					LITHOLOGIC LOG
1/4	1/6	_1/4 _	1/4	17 <u>S</u> R_35 <u>E</u>	Page 2 of 4 SITE ID: Lee (Buckeye) LOCATION ID: MW-2 SITE COORDINATES (ft.): 11.82 FNL & 1531.66 FEL NE GROUND ELEVATION (ft. MSL): 3977.63 STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/21/88 DATE COMPLETED: FIELD REP.: Linley COMMENTS:
LOCATIO	ON DESCRIPTIO	N:			
DEPTH	VISUAL X		DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
35				35' - 40' 	Sandy Silt; mod yish brn (10 YR 5/4) uncons, sbrndd to sbang. Poorly sorted, silt to gravel size clasts. Clasts up to 1/4" in diameter. Minor sandstone clasts.
40				 40' - 45' 	Sandy Silt; grysh orng pnk (5 YR 7/2) uncons, mod well sorted, sbrndd to rndd, silt to fn sand size grains.
45				 45' - 50' 	Sandy Silt; as above.
50				 50' - 55' 	Sandy Silt; as above.
55		18 (84) 85 (188) 188 (188) 188 (188) 188 (188) 188 (188) 188 (188) 188 (188) 188 (188) 188 (55' - 60' 	Sandy Silt/Caliche; grah orng pnk (5 YR 7/2) to mod brn (5 YR 4/4) uncons to cons. Poorly sorted, silt to pebble size clasts. Clast up to 1/2". Caliche cons contact at 57'.
60				60' - 65' 	Silty Sand; mod brn (5 YR 4/4) to grsh orng (10 YR 7/4) semicons, poorly sorted silt to fn gravel size clasts. Minor claiche and sandstone clasts.
65				65' - 70'	Sand; mod brn (5 YR 4/4) uncons., well sorted, v fn to med sand, sbrndd to rndd.

		· · · · · ·			LITHOLOGIC LOG
1/4	1/4		1/4 S_ <u>31</u> T_	175 R 35E	SITE ID: Lee (Buckeye) LOCATION ID: MW-2 SITE COORDINATES (ft.): 11.82 FNL & 1531.66 FEL N E GROUND ELEVATION (ft. MSL): 3977.63' STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/21/88 DATE COMPLETED: FIELD REP.: Linley COMMENTS:
LOCATIO	N DESCRIPT	ION:		····	
	VISUAL %	 LITH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
70				•	Sand/Caliche; mod brn (5 YR 4/4) to v fn orng (10 YR 8/2) uncons, mod sorted, v fn to med fn gravel. Caliche clast up to 1/2". Caliche contact at 72'.
75				 75' - 80' 	
80	 			 80' - 85' 	Sand; mod brn (5 YR 4/4) uncons, well sorted, v fn to med sand, sbrndd to rndd.
85	 			 85' - 90' 	Sand; as above.
90	 			 90' - 95' 	Sand; as above.
95				95' - 100' 	Sand; as above.
100				100' - 105'	Sand; mod brn (5 YR 4/4) uncons, well sorted, fn to med sand, sbrndd to rndd.

					LITHOLOGIC LOG
 		•			
 					Page _4_ of _4_
		1			SITE ID: Lee (Buckeye) LOCATION ID: MW-2
[-				1	SITE COORDINATES (ft.): 11.82 FNL & 1531.66 FEL N E
				į	GROUND ELEVATION (ft. MSL): 3977.63'
" 				 	STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water
I !				ļ	DRILLING CONTR.: Larry Felkins Drilling
a i	•	· · · · · · · · · · · · · · · · · · ·			DATE STARTED: 4/21/88 DATE COMPLETED: FIELD REP.: Linley
1/4	1/4	1/4_	1/4 s <u>_31</u> t_	175 R 35E	COMMENTS:
<u> </u>					
LOCATIO	ON DESCRIPTI	ION:			•
DEPTH	VISUAL %	LITH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
105				105' - 110'	Sand; as above.
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1	; [
110		l		110' - 115'	Sand; as above.
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			• TEX	NCO 132	Page <u>1</u> of <u>4</u>
		1		● MW-1	SITE ID: Lee (Buckeye) LOCATION ID: MW-3 SITE COORDINATES (ft.): 9.09 FNL & 1597.74 FEL N E
•	R WELL	1/4 _	MW-4 • • • • • • • • • • • • • • • • • • •	MW-2 175 R 35E	GROUND ELEVATION (ft. MSL): 3977.88' STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/22/88 DATE COMPLETED: 4/27/88 FIELD REP.: Linley COMMENTS:
LOCATIO	ON DESCRIPT	ION:			
DEPTH	VISUAL %	LITH	DRILLING TIME	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
0				0' - 5'	Top Soil/Caliche; grysh brn (5 YR 3/2) to v pale orng (10 YR 8/2) cons to semicons, sbrndd to ang, poorly sorted, fn sand to fn pebbles. Clasts up to 1/2" in diameter. Top soil stained with hydrocarbons.
5		1/1/2/2/1/1/1/1/2/2/2/2/2/2/2/2/2/2/2/2	 	 5' - 10' 	
10		12/1/1/1/1		 10' - 15' 	
15	 		1 	 15' - 20' 	Caliche/Clay: v pale orng (10 YR 8/2) to grysh brn (5 YR 3/2) to mod brn (5 YR 4/4) semi to cons, poorly sorted, fn sand to med gravel clast. Clasts up to 1/8", sbrndd to ang.
20	 			 20' - 25' 	Caliche/Silty Sand; mod yish brn (10 YR 5/4) to pale yish brn (10 YR 6/2) semi to uncons, sbrndd to sbang. Poorly sorted, silt to fn pebble size grains. Clasts up to 1/4". Caliche gravel fraction ~40%
25 	 			 25' - 30' 	Silty Sand; mod ylsh brn (10 YR 5/4) uncons, sbrndd to rndd, well sorted, silt to fn sand.
30	1			30' - 35' 	<u>Silty Sand;</u> as above.

				7	LITHOLOGIC LOG
1/4	1/61	1/4 _	1/4	175 R 35E	Page 2 of 4 SITE ID: Lee (Buckeye) LOCATION ID: MW-3 SITE COORDINATES (ft.): 9.09 FNL & 1597.74 FEL N
LOCATIO	N DESCRIPTION:	:		V-14-14-14-14-14-14-14-14-14-14-14-14-14-	
DEPTH	VISUAL % LI	1 1 TH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
35				35' - 40'	<u>Silty Sand/Sandstone</u> ; mod ylsh brn (10 YR 5/4) uncons to cons. Poorly sorted, rndd to ang, silt to fn pebble size clasts. Sandstone contact at 38'.
40				40' - 45'	
45				 45' - 50' 	
50				 50' - 55' 	Silty Sand; grsh orng pnk (5 YR 7/2) uncons, well sorted, sbrndd to rndd, silt to v fn sand.
55				 55' - 60' 	Silty Sand/Sandstone; grsh orng pnk (5 YR 7/2) uncons to cons., silt to med gravel size clasts sand contact at 57'.
60				 60' - 65' 	Sand; mod brn (5 Y 4/4) uncons, well sorted, v fn to med sand, sbrndd to rndd grains.
65				 65' - 70' 	Sand; as above.
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					LITHOLOGIC LOG
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<u> </u>				!	Page <u>3</u> of <u>4</u>
				\ 	SITE ID: Lee (Buckeye) LOCATION ID: MW-3 SITE COORDINATES (ft.): 9.09 FNL & 1597.74 FEL
				<u> </u>	N E E GROUND ELEVATION (ft. MSL): 3977.88
1				ļ	STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water
				į	DRILLING CONTR.: Larry Felkins Drilling
¶ ├			····		DATE STARTED: 4/22/88 DATE COMPLETED: 4/27/88 FIELD REP.: Linley
1/4	1/4 _	1/4 _	1/4	175 R 35E	COMMENTS:
LOCATIO	ON DESCRIPT	ion:			-
DEPTH	VISUAL %	LITH	DRILLING TIME	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
70				70' - 75'	Sand; as above.
					·
1	 	l	1	 	·
75				 75' - 80'	Sand; as above.
	•				<u> 50110</u> , 43 61007€.
	} 		{ }	 	<u>;</u>
80	! !		}	1 1 80' - 85'	Sand; as above.
	į				
	! 			 	
85	 			85' - 90'	
	į				
	1			1	
90	<u> </u>			90' - 95'	
j	<u> </u>				
4	!		1		
95	1)]	 95' - 100'	Sand; as above.
=	1		1	1	
	į		81 81 81 84	į	
100				100' - 105'	
	1			1	sbrndd.
	1			1	
	!	f.::::::::::::::::::::::::::::::::::::	3	1	1

	LITHOLOGIC LOG							
1/4	1/4		1/4 s <u>31</u> t_	175 R 35E	Page 4 of 4 SITE ID: Lee (Buckeye) LOCATION ID: MW-3 SITE COORDINATES (ft.): 9.09 FNL & 1597.74 FEL NE GROUND ELEVATION (ft. MSL): 3977.88 STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/22/88 DATE COMPLETED: 4/27/88 FIELD REP.: Linley COMMENTS:			
LOCATIO	N DESCRIPT	lon:			-			
DEPTH	VISUAL X		DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION			
105				105' - 110'	Sand; as above.			
110				110' - 115'	Sand; as above.			
115		 			 			
120			} 					
125								
130	 	1	 	\ 				
135	1		 	 				

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	● TEXACO 132
	• MW-1
WATER WELL	1
	MW-4 ● • MW-2 MW-3
1/41/4	1/41/4

Page	1	of	4
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SITE ID: Lee (Buckeye) LOC	ATION ID: MW-4				
SITE COORDINATES (ft.): 5.10 FSL	& 1671.23 FEL				
N	E				
GROUND ELEVATION (ft. MSL): 3977					
STATE: New Mexico COUNTY	: <u>Lea</u>				
DRILLING METHOD: Rotary/Water					
DRILLING CONTR.: Larry Felkins	Drilling				
DATE STARTED: 4/22/88	DATE COMPLETED:				
FIELD REP.: Linley					
COMMENTS: Hydrocarbon odor ~68-85'					

LOCATION DESCRIPTION:

DEPTH	VISUAL %	LITH	DRILLING TIME	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION
0				0' + 5'	Caliche/Top Soil; grsh brn (5 YR 8/2) to v pale orng (10 YR 8/2) cons, to semicons, sbrndd to ang, poorly sorted, fn sand to fn pebbles. Clasts up to 1/4". Top soil stained w/hydrocarbons (waste oil).
5	 			5′ - 10′	Caliche; v pale orng (10 YR 7/2) cons, sbrndd to sbang, poorly sorted, v fn grain to med gravel clasts. Clasts up to 1/4".
10	 		 	 10' - 15' 	Caliche; as above.
15	! 			15' - 20' 	Caliche/Sand; v pale orng (10 YR 7/2) to mod yish brn (10 YR 6/2) uncons silt to medium sand. Caliche/sand contact at 15-16'.
20	 			20' - 25' 	Silty Sand; mod yish brn (10 YR 5/4) uncons, well sorted, sbrndd to rndd, silt to fn sand.
25				25' - 30' 	Silty Sand/Sandstone; pale yish orng (10 YR 6/2) uncons, well sorted, sbrndd to sbang, silt to fn sand. Sandstone contact at 29' very thin.
30	1			30' - 35' 	Silty Sand; pale yish orng (10 YR 6/2) uncons, well sorted, sbrndd to rndd. Silt to fn sand.

	LITHOLOGIC LOG						
4							
					Page <u>2</u> of <u>4</u>		
1/4	1/4	1/4	1/4	175 R 35E	SITE ID: Lee (Buckeye) LOCATION ID: MW-4 SITE COORDINATES (ft.): 5.10 FSL & 1671.23 FEL N E GROUND ELEVATION (ft. MSL): 3977.86' STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/22/88 DATE COMPLETED: FIELD REP.: Linley COMMENTS: Hydrocarbon odor ~68-85'		
LOCATIO	N DESCRIPTI	ON:					
DEPTH	VISUAL %	LITH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION		
35					Sand; mod ylsh brn (10 YR 5/4) uncons, sbrndd to rndd, well sorted, v fn to med sand.		
40				40' - 45'	 		
45				 45' - 50' 	Sand; as above.		
50				, 50' - 55' 	Sand/Sandstone; mod yish brn (10 YR 5/4) uncons, to semicons, mod sorted. V fn to med sand, sandstone at 54'; clasts up to 1/4".		
55	 			 55' - 60' 			
60				 60' - 65' 	Sand; as above.		

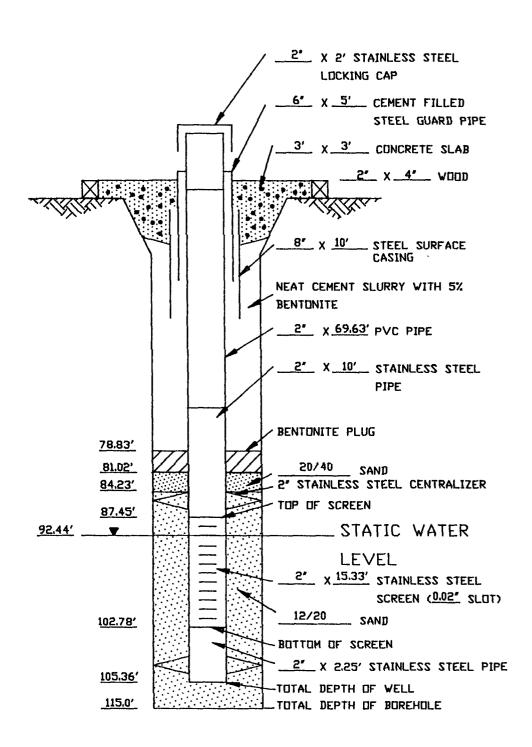
65' - 70'

Sand; as above.

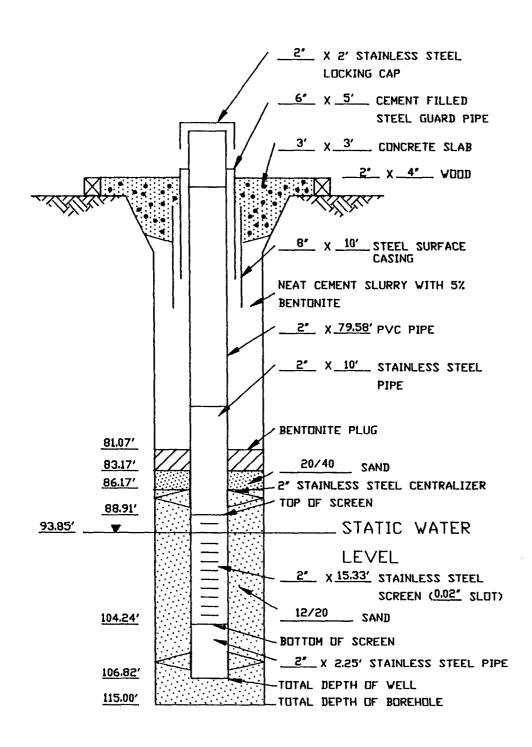
		•		1	LITHOLOGIC LOG
l ■					;
					į
				}	Page <u>3</u> of <u>4</u>
				1	SITE ID: Lee (Buckeye) LOCATION ID: MW-4
		1		1	SITE COORDINATES (ft.): 5.10 FSL & 1671.23 FEL
j		•		i	N E
			•	l	GROUND ELEVATION (ft. MSL): 3977.86'
•				!	STATE: New Mexico COUNTY: Lea
<u>.</u>				1	DRILLING METHOD: <u>Rotary/Water</u> DRILLING CONTR.: <u>Larry Felkins Drilling</u>
				<u> </u>	DATE STARTED: 4/22/88 DATE COMPLETED:
·					FIELD REP.: Linley
1/4	1/4	_1/4 _	1/4 s <u>_30</u> T	175 R 35E	COMMENTS:
					
1 1004710					,
LUCATIO	ON DESCRIPTION	N:			
		İ	DRILLING TIME	SAMPLE TYPE	i i
DEPTH	VISUAL % 1	LITH	SCALE:	AND INTERVAL	LITHOLOGIC DESCRIPTION
70				70' - 75'	Sand; as above.
				70 75	<u> </u>
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	l 🕌		 		1
=			Į.		
75				754 004	lounds as about
75	! 機 ! 機			75' - 80'	<u>Sand;</u> as above.
	i 👹		į		į į
	! #]		
□ 80				80' - 85'	Sand; as above.
	}]]	} !
ŀ					
j	i 🖁				i i
85	l 🖁		!	85' - 90'	Sand; as above.
	! 🕸				!
I			1	j 1	1
	1 (i)		7 1) }	
90			ĺ	90' - 95'	Sand; as above.
_	1			l	1
	ļ <i>ģ</i>			<u>[</u>	
_	1 B		; 	 	
) ≡ 95	1 12		i	1 95' - 100'	Sand; as above.
	j k		Í	İ	
	1		j	1	1
			3	İ	1
100			4 4	1 1001 - 1051	Conde med how (E VD ///) (means well sented to be sed as 1 and 1
1			1	100' - 105'	Sand; mod brn (5 YR 4/4) uncons, well sorted, fn to med sand, rndd to sbrndd.
			Í	i	
	1 8		j	ĺ	İ
_!	ļ į		1	Į.	Į.
	_t££	أم نفله فعف	.L	<u> </u>	1

	LITHOLOGIC LOG						
1/4	1/4			17s R 35E	Page 4 of 4 SITE ID: Lee (Buckeye) LOCATION ID: MW-4 SITE COORDINATES (ft.): 5.10 FSL & 1671.23 FEL N E GROUND ELEVATION (ft. MSL): 3977.86 STATE: New Mexico COUNTY: Lea DRILLING METHOD: Rotary/Water DRILLING CONTR.: Larry Felkins Drilling DATE STARTED: 4/22/88 DATE COMPLETED: FIELD REP.: Linley COMMENTS:		
LOCATIO	N DESCRIPTI	ON:			-		
DEPTH	VISUAL %	LITH	DRILLING TIME SCALE:	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION		
105					Sand; as above. Sand; as above.		
115	, , , , , , , , , , , , , , , , , , ,	 					
120				·			
125			 	 			
130	 	 	 	 			
			[-				

APPENDIX C WELL COMPLETION DIAGRAMS

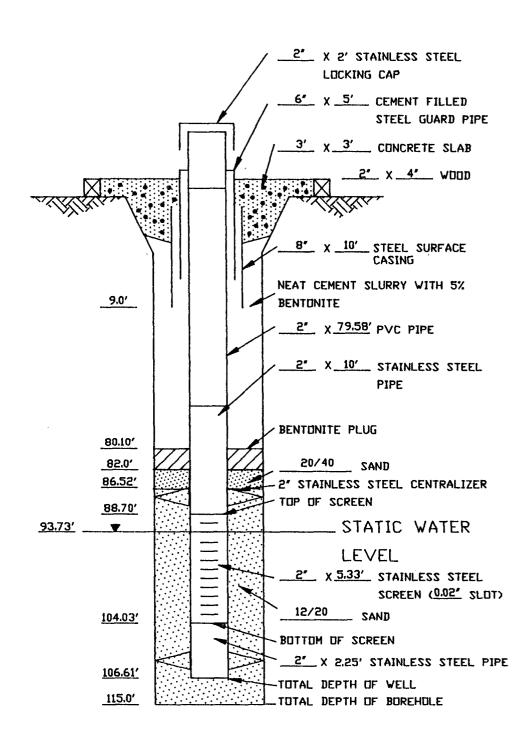


GROUND WATER MONITOR WELL COMPLETION DIAGRAM
MONITOR WELL MV-18
PHILLIPS LEE PLANT



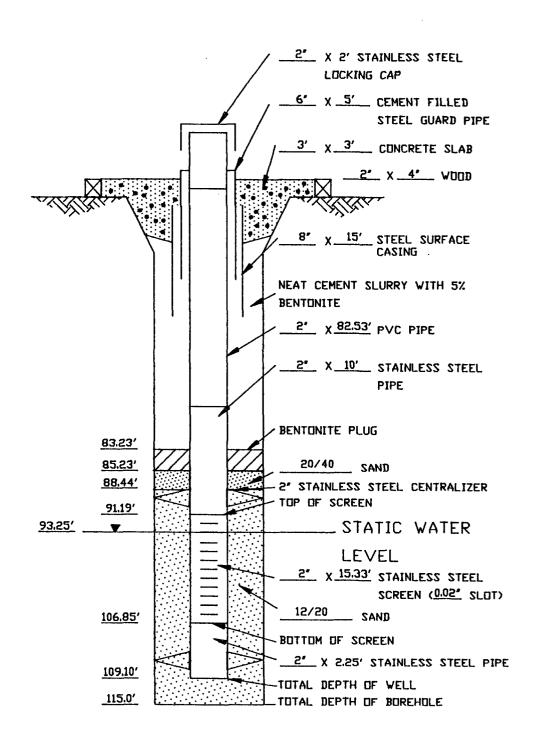
GROUND WATER MONITOR WELL COMPLETION DIAGRAM

MONITOR WELL MW-4
PHILLIPS LEE PLANT



GROUND WATER MONITOR WELL COMPLETION DIAGRAM

MONITOR WELL MW-3
PHILLIPS LEE PLANT



GROUND WATER MONITOR WELL COMPLETION DIAGRAM
MONITOR WELL MW-2
PHILLIPS LEE PLANT



PHILLIPS 66 NATURAL GAS COMPANY

A SUBSIDIARY OF PHILLIPS PETROLEUM COMPANY

ODESSA, TEXAS 79762 4001 PENBROOK

1953 (1) 1953 (1)

May 8, 1986

Monitor Well Analyses

Ligo and Lusk Gasoline Plants

Mr. Roger C. Anderson New Mexico Oil Conservation Division P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Roger:

Attached please find copies of the chemical analyses performed on water samples from the monitoring wells at Lee and Lusk Gasoline Plants.

If you have any questions regarding these results, please contact me at (915) 367-1316.

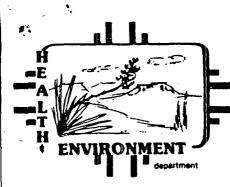
Yours truly,

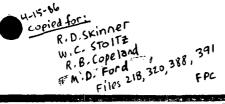
Michael D. Food

Michael D. Ford Environmental Analyst

MDF:ggp

Attachments





STATE OF NEW MEXICO

TONEY ANAYA GOVERNOR

DENISE D. FORT DIRECTOR

ENVIRONMENTAL IMPROVEMENT DIVISION P.O. Box 968. Santa Fe. New Mexico 87504-0968

P.O. Box 968, Santa Fe, New Mexico 87504-0968 (505) 984-0020

ENVIRONMENT CONTROL APR 121986 B. F. 64444 DGF MEM MAR

8 April 1986

B.F. Ballard
Director, Environmental Control
10 D4 Phillips Building
Phillips Petroleum Company
Bartlesville, Oklahoma 74004

Dear Mr. Ballard:

Enclosed please find the results of analyses on the samples EID split with Phillips at your plants in Artesia, Eunice, Lee and Lusk, New Mexico.

If you have any questions regarding these results, please contact me at (505) 827-2931.

Sincerely,

Ann Claassen

Water Resource Specialist Hazardous Waste Section

RESULTS OF SAMPLING

PHILLIPS PETROLEUM GAS REFINERIES

ARTESIA, EUNICE, LEE AND LUSK

Attached are the results for the New Mexico Environmental Improvement Division's samples taken at the Phillips plants in August 1986. At each plant, samples were taken from each of the RCRA wells (4 wells per plant). At Lusk and Artesia, samples were also taken from surface impoundments. Table 1 identifies each sample.

All samples were collected by Alice Barr with the assistance of Kelley Crossman. The samples were appropriately preserved and shipped under chain-of-custody to the State Laboratory in Albuquerque for analysis. Table 2 gives the analytical procedure for each parameter. Note that calcium and magnesium are reported under both General Chemistry and Metals. The Gen. Chem results were obtained by the Water Chemistry Section using wet analytical techniques; the Metals results were obtained by the Metals Section using ICAP.

All results are in milligrams per liter (mg/l), except as follows:

pH conductivity temperature organics pH units micromhos/cm (lab cond. at 25 °C) degrees Celcius

parts per billion

Abbreviations and symbols used to report the results are as follows:

Cond. GEN. CHEM. ND NR PPB Temp. TDS

TOC

conductivity general chemistry

not detected (see below) not reported

parts per billion temperature (in Celcius) total dissolved solids

(total filterable residue) total organic carbon

less than
spreader than
approximately
tentative identification

The value of many metals is reported as ND (none detected). The detection limits, in mg/l, were as follows:

Arsenic 0.005
Mercury 0.0005
Selenium 0.005
Manganese 0.05
All others 0.1

TABLE 1. SAMPLE IDENTIFICATION, PHILLIPS PETROLEUM PLANTS

NOTE: The designation of a well as upgradient or downgradient is Phillip's designation.

Phillips Petroleum -- Artesia

MW-1	
MW-3	
MW-6	
PND-1,w	
PND-4,s	
PND-2,s	
PND-3,,w	
Blank	

monitoring well 1, downgradient monitoring well 3, upgradient monitoring well 6, downgradient first RCRA pond, surface water first RCRA pond, sediment second pond (middle), sediment third pond, surface water Field blank using deionized water

Phillips Petroleum -- Eunice

monitoring well 1, upgradient monitoring well 2, downgradient monitoring well 3, downgradient monitoring well 4, downgradient

Phillips Petroleum -- Lee

MW-1	
MW-2	
MW-3	
MW-4	
Blank	

monitoring well 1, upgradient monitoring well 2, downgradient monitoring well 3, downgradient monitoring well 4, downgradient Field blank using deionized water

Phillips Petroleum -- Lusk

MW-1
MW-2
MW-3
MW-4
R-PND,w
R-PND,s
O-PND,s

monitoring well 1, upgradient monitoring well 2, downgradient monitoring well 3, downgradient monitoring well 4, downgradient RCRA pond, surface water RCRA pond, sediment Oily pond next to RCRA pond, sludge

TABLE 2. ANALYTICAL METHODS

PARAMETER	PRESERVATION	ANALYTICAL METHOD
Gen. Chem.	***************************************	
Field pH	none	Hach Mini pH Meter
Field Cond.	none	Yellow Springs S-C-T Meter
Calcium	ice	EPA Method 215.2
Magnesium	ice	EPA Methods 130.2 and 215.2
Sodium	ice	Std. Methods 325(b)
Potassium	ice	Std. Methods 325(b)
Bicarbonate	ice	EPA Method 310.1
Chloride	ice	EPA Method 325.2
Sulfate	ice	EPA Method 375.2
TDS	ice	EPA Method 160.1
Fluoride	ice	EPA Method 340.2
Nitrate-N	ice, H ₂ SO ₄	EPA Method 352.2
TOC	ice, H ₂ SO ₄	EPA Method 415.1
Metals		
Arsenic	HNO ₃	EPA Method 206.2
Mercury	HNO ₃	EPA Method 245.1
Selenium	HNO ₃	EPA Method 270.2
All others (ICAP Scan)	HNO ₃	EPA Method 207
Organics		
GC/MS Purgeables	lce	EPA Method 624
•		

PHILLIPS PETROLEUM -- LEE

	MVV-1	MW-2	MW-3	MW-4	Blank'
GEN CHEM					
Field pH	7.9	7.3	7.4	7.5	-
Field Cond.	345	475	490	468	-
Field Temp.	23	25	25	23	<u>.</u>
Lab pH	8.1	8.21	7.96	7.97	7.25
Lab Cond.	385	453	487	415	34
Calcium	24.0	41.6	60.0	60.0	4.0
Magnesium	12.2	16.6	19.5	12.0	4.9
Sodium	32.2	36.8	25.3_	16.1	0 0
Potassium	0.82	1.56	1.17	0.78	0
Bicarbonate	120.9	199	157.4	156	7
Chloride	32.5	32.3	41.9	34.2	1.6
Sulfate	43.8	43.4	41.7	39.2	4.3
TDS	233	323	328	310	20
Fluoride	1.78	0.79	0.63	0.56	0.10
Nitrate-N	0.63	0.96	1.91	2.45	1.70
TOC	44.9	8.13	1.4	2.51	<1
METALS					
Arsenic	0.008	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND
Aluminum	1.5	0.4	0.4	0.2	ND
Barium	0.1	0.1	0.1	0.2	ND
Beryllium	ND	ND	ND	ND	ND
Boron	0.1	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND
Calcium	33	70	53	67	3.3
Chromium	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND
Iron	0.9	0.4	0.7	0.3	ND
Lead	ND	ND	ND	ND	ND
Magnesium	5.7	11	8.1	11	0.4
Manganese	0.5	0.4	0.14	0.4	ND
Molybdenum	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND
Silicon	12	14	13	13	2.0
Silver	ND	ND	ND	ND	ND
Strontium	0.3	0.6	0.5	0.6	ND
Tin	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND
Ytrrium	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND

^{*} Sample containers filled in the field from NMEID deionized water container.

PHILLIPS PETROLEUM -- LEE

Gas Chromatograph/Mass Spectrometer Purgeable Screen Results in [brackets] are tentative (unconfirmed) results.

SAMPLE	ORGANICS DETECTED	РРВ
MW-1	Benzene Toluene m-Xylene o-Xylene [Tetrahydrofuran] [Butanone]	47 17 1 6 [>500] [>500]
MW-2	Tetrahydrofuran Butanone [Pentene] [Cyclohexane]	[>20] [>20] [5] [40]
MW-3	[Tetrahydrofuran]	[>50]
MW-4	[Tetrahydrofuran]	[>200]
Blank*	Trichloromethane Bromodichloromethane Bibromochloromethane Bromoform	25 7 5 4

^{*} Sample containers filled in the field from NMEID deionized water container.



THWESTERN LABORATORIES

Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

C-1950-W

36762 Report No. _

9-23-85 Report Date ___

8-28-85

Date Received

Delivered By A. Hubble

Report of tests on:

Water

Client:

Phillips Petroleum Company

Identification:

Lee Plant, Well No. 1

•	mg/L
ArsenicLess than	0.05
BariumLess than	1
CadmiumLess than	0.01
ChromiumLess than	0.05
Lead	0.05
MercuryLess than	0.002
SeleniumLess than	0.01
SilverLess than	0.05
NickelLess than	0.2
Cyanide	0.003

Technician: JDN, GMB, LT, MT

3cc Phillips Petroleum Co.

Attn: Mike Ford

is to ane for the exclusive use of the climit to whom they are addressed. The use of our name must receive our prior written approval. Our letters and records all ϵ

SwL

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Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

File No. C-1950-W

Report No. ______36763

Report Date _____9-23-85

Report of tests on:

Water

Date Received

8-28-85

Client:

Phillips Petroleum Company

Delivered By ___ A. Hubble

Identification:

Lee Plant, Well No. 2

		mg/L
ArsenicLess	than	0.05
BariumLess	than	1
CadmiumLess	than	0.01
ChromiumLess	than	0.05
LeadLess	than	0.05
MercuryLess	than	0.002
SeleniumLess	than	0.01
SilverLess	than	0.05
NickelLess	than	0.2
CyanideLess	than	0.001

Technician:

JDN, GMB, LT, MT

Copies

3cc Phillips Petroleum Co.

Attn: Mike Ford

SOUTHWESTERN LABORATORIES



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Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

File No. ______ C-1950-W

Report No. 36764

Report Date 9-23-85

Report of tests on:

Water

Date Received 8-28-85

Client:

Phillips Petroleum Company

Delivered By ___A_ Hubble

Identification:

Lee Plant, Well No. 3

	mg/L
ArsenicLess than	0.05
BariumLess than	1
CadmiumLess than	0.01
ChromiumLess than	0.05
LeadLess than	0.05
MercuryLess than	0.002
SeleniumLess than	0.01
SilverLess than	0.05
NickelLess than	0.2
CvanideLess than	0.001

Technician: JDN, GMB, LT, MT

Troles 3cc Phillips Pet. Co.

Attn: Mike Ford

Hary M. Burch

119904

SWL

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Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701

Client No. 3355796

C-1950-W File No.

Report No. _

36765

Report Date ____

9-23-85

Report of tests on:

Water

Date Received 8-28-85

Client:

Phillips Petroleum Company

Delivered By A. Hubble

Identification:

Lee Plant, Well No. 4

		mg/L
ArsenicLess	than	0.05
BariumLess	than	1
CadmiumLess	than	0.01
ChromiumLess	than	0.05
LeadLess	than	0.05
MercuryLess	than	0.002
SeleniumLess	than	0.01
SilverLess	than	0.05
NickelLess	than	0.2
CvanideLess	than	0.001

Technician: JDN, GMB, LT, MT

Copies

3cc Phillips Petroleum Co. Attn: Mike Ford

TABLE I

VOLATILE ORGANIC ANALYSIS OF LEE MONITORING WELL WATERS

Sample received: August 28, 1985

Analysis	Concentration, ppb			
	M.W. #1	M.W. #2	M.W. #3	M.W. #4
Chloromethane	2.6	2.5	2.9	4.5
Vinyl Chloride	<1.	<1.	<1.	<1.
Chloroethane	<1.	<1.	<1.	<1.
Bromomethane	<1.	<1.	<1.	<1.
1,1-dichloroethylene	<1.	<1.	<1.	<1 .
Methylene Chloride	7.0	5.7	4.7	6.0
trans-1,2-dichloroethylene	<1.	<1.	<1.	<1.
1,1-dichloroethane	<1.	<1.	<1.	<1.
Chloroform	1.4	1.4	1.3	1.5
1,2-dichloroethane	<1.	<1.	<1.	<1.
1,1,1-trichloroethane	<1.	<1.	<1.	<1.
Benzene	4.6	<1.	6.1	1.4
Carbontetrachloride	<1.	<1.	<1.	<1.
1,2-dichloropropane	<1.	<1.	20.	<1.
Bromodichloromethane	<1.	<1.	<1.	<1.
·Trichloroethylene	<1.	<1.	<1.	<1.
2-chloroethylvinyl Ether	<1.	<1.	<1.	<1.
trans-1,3-dichloropropene	<1.	<1.	<1.	<1.
cis-1,3-dichloropropene	<1.	<1.	<1.	<1.
1,1,2-trichloroethane	<1.	<1.	<1.	<1.
Toluene	2.1	<1.	161.	<1.
Dibromochloromethane	<1.	<1.	<1.	<1.
1,1,2,2-tetrachloroethylene	<1.	<1.	<1.	<1.
Chlorobenzene	<1.	<1.	<1.	<1.
Ethylbenzene	<1.	<1.	<1.	<1.
Bromoform	<1.	<1.	<1.	<1.
1,1,2,2-tetrachloroethane	<1.	<1.	<1.	<1.
Fluorobenzene	<1.	<1.	<1.	<1.
31509-36-	1	2	3	4

Attachment to Olb-20-86

TABLE I

SEMIVOLATILE ORGANIC ANALYSES OF LEE MONITORING WELL WATERS

Sample received: August 28, 1985

Analysis	Concentration, ppb			
	M.W. #1	M.W. #2	M.W. #3	M.W. #4
Bis(2-chloroethyl)ether	<20	<20	<20	<20
1,3-dichlorobenzene	<20	<20	<20	<20
1,4-dichlorobenzene	<20	<20	<20	<20
1,2-dichlorobenzene	<20	<20	<20	<20
Bis(2-chloroisopropyl)ether	<20	<20	<20	<20
N-nitorsodi-n-propylamine	<20	<20	<20	<20
Nitrobenzene	<20	<20	<20	<20
Hexachloroethane	<20	<20	<20	<20
Isophorone	<20	<20	<20	<20
n-nitrosodimethylamine	<20	<20	<20	<20
Bis-(2-chloroethoxy)methane	<20	<20	<20	<20
1,2,4-trichlorobenzene	<20	<20	<20	<20
Naphthalene	<20	<20	<20	<20
Hexachlorobutadiene	<20	<20	<20	<20
Hexachlorocyclopentadiene	<20	<20	<20	<20
2-chloronaphthalene	<20	<20	<20	<20
2,6-dinitrotoluene	<20	<20	<20	<20
Dimethylphthalate	<20	<20	<20	<20
Acenaphthylene	<20	<20	<20	<20
Acenaphthene	<20	<20	<20	<20
2,4-dinitrotoluene	<20	<20	<20	<20
Diethylphthalate	<20	<20	<20	40
Fluorene	<20	<20	<20	<20
4-chlorophenylphenylether	<20	<20	<20	<20
N-nitrosodiphenylamine	<20	<20	<20	53
4-bromophenylphenylether	<20	<20	<20	<20
Hexachlorobenzene	<20	<20	<20	<20
Phenanthrene	<20	<20	<20	<20
Anthracene	<20	<20	<20	<20
Dibutyl phthalate	<20	<20	<20	<20
Fluoranthene	<20	<20	<20	<20
Pyrene	<20	<20	<20	<20
Benzylbutylphthalate	<20	<20	<20	<20
Bis(2-ethylhexyl)phthalate	<20	<20	<20	<20
Benzidine	<20	<20	<20	<20
Di-n-octylphthalate	<20	<20	<20	<20
Benzo(b&k)fluoranthene	<20	<20	<20	<20
Benzo(a)pyrene	<20	<20	<20	<20
3-3'-dichlorobenzidine	<20	<20	<20	<20
Chrysene & benzo(a)anthracene	<20	<20	<20	<20
Indeno(1,2,3-c,d)pyrene	<20	<20	<20	<20
Dibenzo(a,h)anthracene	<20	<20	<20	<20
Benzo(g,h,i)perylene	<20	<20	<20	<20
Phenol	<20	<20	<20	<20
2-chlorophenol	<20	<20	<20	<20
2-nitrophenol	<20	<20	<20	<20
2,4-dimethylphenol	<20	<20	<20	<20
2,4-dichlorophenol	<20	<20	<20	<20
4-chloro-3-methylphenol	<20	<20	<20	<20
2,4,6-trichlorophenol	<20	<20	<20	<20
2,4-dinitrophenol	<20	<20	<20	<20
4-nitrophenol	<20	<20	<20	<20
2-methyl-4,6-dinitrophenol	<20	<20	<20	<20
Pentachlorophenol	<20	<20	<20	<20
31509-36-	1	2	3	4



May 8, 1986

Monitor Well Analyses
Les and Lusk Gasoline Plants

Mr. Roger C. Anderson New Mexico Oil Conservation Division P. O. Box 2088 Santa Fe, New Mexico 87501

Dear Roger:

Attached please find copies of the chemical analyses performed on water samples from the monitoring wells at Lee and Lusk Gasoline Plants.

If you have any questions regarding these results, please contact me at (915) 367-1316.

Yours truly,

Michael D. Fol

Michael D. Ford Environmental Analyst

MDF:ggp

Attachments

Gali, File:



PHILLIPS PETROLEUM COMPANY

BARTLESVILLE, OKLAHOMA 74004 PHONE: 918 661-6600 CABLE CODE: PHILPETROL TELEX: 49-2455

HAZARDOUS WASTE SECTION

1000 - 1000

ENGINEERING AND SERVICES

March 21, 1986

Lusk, Lee, Eunice and Artesia Plants Supplemental Sampling Results

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jack Ellvinger, Environmental Supervisor Hazardous Waste Section New Mexico Environmental Improvement Division P. O. Box 968 Harold-Runnels Building Santa Fe, NM 87501-0968

Dear Mr. Ellvinger:

Samples were procured from the Iusk, Iee, Eunice and Artesia Plants' water sampling wells and surface impoundments in the Fall of 1985 during a joint sampling effort by Phillips and the New Mexico Environmental Improvement Division (EID). Each sample that was procured was split between Phillips and the EID. Results of the analysis of Phillips' samples are attached.

Referring to the attached data, please note that for the Lusk, Lee and Eunice Plants, "well #1" corresponds to the "upgradient" well; in the case of the Artesia Plant, "well #3" is the upgradient well. Samples from monitoring wells #1 and #2 at the Eunice Plant were lost because the containers holding these samples froze and broke while being stored in a laboratory refrigerator prior to analysis. Analyses of the samples for metals were performed by Southwestern Laboratories of Midland, Texas. Analyses of the samples for volatile and semivolatile compounds were performed by the Phillips Research Center, located in Bartlesville, Oklahoma.

Phillips requests that EID provide Phillips a copy of all analytical results from the analysis of EID's split samples from the Lusk, Lee, Eunice and Artesia Plants.

It is Phillips' understanding that EID is currently preparing a public notice which, when published by EID in a local newspaper (or broadcast via radio or television), will extend to the public and to Phillips the opportunity to submit comments on the closure plans previously submitted by Phillips for the Lusk, Lee, Dunice and Artesia Plants. The Lusk plan is dated January 23, 1984; the other three plans are dated July 27, 1984. Following the comment period and after any questions are adequately addressed, EID will proceed with the administrative actions necessary to RCRA-close the Lusk, Lee, Eunice and Artesia Plants.

Mr. Jack Ellvinger, Environmental Supervisor March 21, 1986 Page 2

If you have any questions regarding the Lusk, Lee, Eunice or Artesia Plants, please contact either Frank Collis at (918) 661-1063 or W. C. Stoltz at (918) 661-5613.

Very truly yours,

B. F. Ballard, Director Environment Control

10 D4 Phillips Building

BFB:FPC:tsv/B:002

Enclosure

SwL

SOUTHWESTERN LABORATORIES

Materials, environmental and geotechnical engineering, nondestructivé, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

He No. C-1950-W

Report No. 36762

Report Date 9-23-85

Date Received _

8-28-85

Delivered By _

A. Hubble

Report of tests on:

Water

≥ent:

Phillips Petroleum Company

dentification:

Lee Plant, Well No. 1

	mg/L
ArsenicLess than	0.05
BariumLess than	1
CadmiumLess than	0.01
ChromiumLess than	0.05
Lead	0.05
MercuryLess than	0.002
SeleniumLess than	0.01
SilverLess than	0.05
NickelLess than	0.2
Cyanide	0.003

conscan: JDN, GMB, LT, MT

es 3cc Phillips Petroleum Co.
Attn: Mike Ford

SOUTHWESTERN LABORATORIES

Sary M. Burch

19904

SOUTHWESTERN LABORATORIES

Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

C-1950-W File No.

36763 Report No. _

9-23-85 Report Date _

Report of tests on:

Water

Date Received __

8-28-85

Client:

Phillips Petroleum Company

Delivered By A. Hubble

Identification:

Lee Plant, Well No. 2

		mg/L
ArsenicLess	than	0.05
BariumLess	than	ı
CadmiumLess	than	0.01
ChromiumLess	than	0.05
LeadLess	than	0.05
MercuryLess	than	0.002
SeleniumLess	than	0.01
SilverLess	than	0.05
NickelLess	than	0.2
CyanideLess	than	0.001

Technican: JDN, GMB, LT, MT

3cc Phillips Petroleum Co.

Attn: Mike Ford

SOUTHWESTERN LABORATORIES

Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

Fie No. ______ C-1950-W

36764 Report No.

Report Date _____9-23-85

Report of tests on:

Water

Date Received 8-28-85

Phillips Petroleum Company

Delivered By ___A_ Hubble

dentification:

Lee Plant, Well No. 3

		mg/L
ArsenicLes	s than	0.05
BariumLes	ss than	1
Cadmi umLes	ss than	0.01
ChromiumLe:	ss than	0.05
LeadLes	ss than	0.05
MercuryLe:	ss than	0.002
SeleniumLe	ss than	0.01
SilverLe	ss than	0.05
NickelLe	ss than	0.2
Cyanida	es than	0.001

isannican: JDN, GMB, LT, MT

3cc Phillips Pet. Co. Attn: Mike Ford



SOUTHWESTERN LABORATORIES

Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services

1703 W. Industrial Avenue [915 - 683-3348] • P.O. Box 2150 • Midland, Texas 79701 Client No. 3355796

Fie No. C-1950-W

Report No. ______36765

Report Date _____ 9-23-85

9-29

8-28-85

Date Received _

Derivered By A. Hubble

Report of tests on:

Water

Clent:

Phillips Petroleum Company

Identification:

Lee Plant, Well No. 4

		mg/L
ArsenicLess	than	0.05
BariumLess	than	1
CadmiumLess	than	0.01
ChromiumLess	than	0.05
LeadLess	than	0.05
MercuryLess	than	0.002
SeleniumLess	than	0.01
SilverLess	than	0.05
NickelLess	than	0.2
CyanideLess	than	0.001

Technician: JDN, GMB, LT, MT

Comes 3cc Phillips Petroleum Co.

Attn: Mike Ford

Lay H Burch

TABLE I

VOLATILE ORGANIC ANALYSIS OF LEE MONITORING WELL WATERS

Sample received: August 28, 1985

Analysis	Concentration, ppb					
	M.W. #1	M.W. #2	M.W. #3	M.W. #4		
Chloromethane	*276	2.5	-2+793	4757	1 1 1 1	
Vinyl Chloride	<1.	<1.	<1.	<1.		
Chloroethane	<1.	<1.	<1.	<1.		
Bromomethane	<1.	<1.	<1.	<1.		
1,1-dichloroethylene	<1.	<1.	<1.	<1.		
Methylene-Chloride	3:0	-5.73	A THE	6.0-		
trans-1,2-dichloroethylene	<1.	<1.	<1.	<1.		
1,1-dichloroethane	<1.	<1.	<1.	<1.		
Chloroform	x174	1.4	17:45	2055		
1,2-dichloroethane	<1.	<1.	<1.	<1.		
1,1,1-trichloroethane	<1.	<1.	<1.	<1.		
Benzene	4.6	<1.	6.1	1.4		
Carbontetrachloride	<1.	<1.	<1.	<1.		
1,2-dichloropropane	<1.	· <1.	202	<1.	2 2 2	
Bromodichloromethane	<1.	<1.	<1.	<1.		
Trichloroethylene	<1.	-<1.	<1.	<1.		
2-chloroethylvinyl Ether	<1.	<1.	<1.	<1.		
trans-1,3-dichloropropene	<1.	<1.	<1.	<1.		
cis-1,3-dichloropropene	<1.	<1.	<1.	<1.		
1,1,2-trichloroethane	<1.	<1.	<1.	<1.		
Toluene	2.1	<1.	161.	<1.		
Dibromochloromethane	₹1.	<1.	<1.	<1.		
1,1,2,2-tetrachloroethylene	<1.	<1.	<1.	<1.		
Chlorobenzene	<1.	<1.	<1.	<1.		
Ethylbenzene	<1.	<1.	<1.	<1.		
Bromoform	<1.	<1.	<1.	<1.		
1,1,2,2-tetrachloroethane	<1.	<1.	<1.	<1.		
Fluorobenzene	<1.	<1.	<1.	<1.		
31509-36-	1	2	3	4		

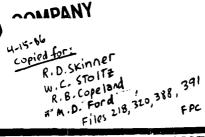
Attachment to 01b-20-86

TABLE I
SEMIVOLATILE ORGANIC ANALYSES OF LEE MONITORING WELL WATERS

Sample received: August 28, 1985

Analysis	Concentration, ppb			
	M.W. ≠1	M.W. #2	M.W. #3	M.W. #4
Bis(2-chloroethyl)ether	<20	<20	<20	<20
1,3-dichlorobenzene	<20	<20	<20	<20
1,4-dichlorobenzene	<20	<20	<20	<20
1,2-dichlorobenzene	<20	<20	<20	<20
Bis(2-chloroisopropyl)ether	<20	<20	<20	<20
N-mitorsodi-m-propylamine	<20	<20	<20	<20
Nitrobenzene	<20	<20	<20	<20
Hexachloroethane	<20	<20	<20	<20
Isophorone	<20	<20	<20	<20
n-nitrosodimethylamine	<20	<20	<20	<20
Bis-(2-chloroethoxy)methane	<20	<20	<20	<20
1,2,4-trichlorobenzene	<20	<20	<20	<20
Naphthalene	<20	<20	<20	<20
Hexachlorobutadiene	<20	<20	<20	<20
Hexachlorocyclopentadiene	<20	<20	<20	<20
2-chloronaphthalene	<20	<20	<20	<20
2,6-dinitrotoluene	<20	<20	<20	<20
Dimethylphthalate	<20	<20	<20	<20
Acenaphthylene	<20	<20	<20	<20
Acenaphthene	<20	<20	<20	<20
2,4-dinitrotoluene	<20	<20	<20	<20
-Diethylphthalate-	<20	<20	<20	4Q
Fluorene	₹20	<20	<20	<20
4-chlorophenylphenylether	<20	<20	<20	<20
N-nitrosodiphenylamine .	<20	<20	<20	53
4-bromophenylphenylether	<20⁻	<20	<20	<20
Hexachlorobenzene	<20	<20	<20	<20
Phenanthrene	<20	<20	<20	<20
Anthracene	<20	<20	<20	<20
Dibutyl phthalate	<20	<20	<20	<20
Fluoranthene	<20	<20	<20	<20
Pyrene	<20	<20	<20	<20
Benzylbutylphthalate	<20	<20	<20	<20
Bis(2-ethylhexyl)phthalate	<20	<20	<20	<20
Benzidine	<20	<20	<20	<20
Di-n-octylphthalate	<20	<20	<20	<20
Benzo(b&k)fluoranthene Benzo(a)pyrene	<20	<20	<20	<20
	<20 `	<20	<20	<20
3-3'-dichlorobenzidine Chrysene & benzo(a)anthracene	<20	<20	<20	<20
Indeno(1,2,3-c,d)pyrene	<20 <20	<20	<20	<20
Dibenzo(a,h)anthracene	<20 <20	<20	<20	<20
Benzo(g,h,i)perylene		<20	<20	<20
Phenol	<20	<20	<20	<20
2-chlorophenol	<20 <20	<20	<20	<20
2-mitrophenol		- <20	<20	<20
2,4-dimethylphenol	<20 <20	<20 <20	<20	<20
2,4-dichlorophenol	<20	<20	<20	<20
4-chloro-3-methylphenol	<20	<20 <20	<20 <20	<20 <20
2,4,6-trichlorophenol	<20	<20	<20	
2,4-dinitrophenol	<20	<20	<20	<20 <20
4-mitrophenol	<20	<20	<20	<20
2-methyl-4,6-dinitrophenol	<20	<20	<20	<20
Pentachlorophenol	<20	<20	<20	<20
				140
31509-36-	1	2	3	4





STATE OF NEW MEXICO

TONEY ANAYA
GOVERNOR

DENISE D. FORT DIRECTOR

ENVIRONMENTAL IMPROVEMENT DIVISION

P.O. Box 968, Santa Fe, New Mexico 87504-0968 (505) 984-0020

BNVIRCHMENT CCRTROL APR 121996 BLE BAGGE

8 April 1986

B.F. Ballard
Director, Environmental Control
10 D4 Phillips Building
Phillips Petroleum Company
Bartlesville, Oklahoma 74004

Dear Mr. Ballard:

Enclosed please find the results of analyses on the samples EID split with Phillips at your plants in Artesia, Eunice, Lee and Lusk, New Mexico.

If you have any questions regarding these results, please contact me at (505) 827-2931.

Sincerely,

Ánn Claassen

Water Resource Specialist

Hazardous Waste Section



ENVIRONMENTAL IMPROVEMENT DIVISION P.O. Box 968 Santa Fe, New Mexico 87504 505-984-0020

4/7/86

Dare

Here is a summary of our results for Phillips Artisia, Eunice, Les + Zusk. I have the original lab sheets if you want to see them.

- Am C. x 2931

Copymanly

RESULTS OF SAMPLING

PHILLIPS PETROLEUM GAS REFINERIES

ARTESIA, EUNICE, LEE AND LUSK

1985

Attached are the results for the New Mexico Environmental Improvement Division's samples taken at the Phillips plants in August 1986: At each plant, samples were taken from each of the RCRA wells (4 wells per plant). At Lusk and Artesia, samples were also taken from surface impoundments. Table 1 identifies each sample.

All samples were collected by Alice Barr with the assistance of Kelley Crossman. The samples were appropriately preserved and shipped under chain-of-custody to the State Laboratory in Albuquerque for analysis. Table 2 gives the analytical procedure for each parameter. Note that calcium and magnesium are reported under both General Chemistry and Metals. The Gen. Chem results were obtained by the Water Chemistry Section using wet analytical techniques; the Metals results were obtained by the Metals Section using ICAP.

All results are in milligrams per liter (mg/l), except as follows:

pH conductivity temperature organics pH units micromhos/cm (lab cond. at 25 °C)

degrees Celcius parts per billion

Abbreviations and symbols used to report the results are as follows:

Cond. GEN. CHEM. ND NR PPB Temp. conductivity general chemistry

not detected (see below) not reported

parts per billion temperature (in Celcius) total dissolved solids

(total filterable residue) total organic carbon

TOC < > ~

TDS

less than greater than approximately tentative identi

tentative identification

The value of many metals is reported as ND (none detected). The detection limits, in mg/l, were as follows:

Arsenic 0.005
Mercury 0.0005
Selenium 0.005
Manganese 0.05
All others 0.1

TABLE 1. SAMPLE IDENTIFICATION, PHILLIPS PETROLEUM PLANTS

NOTE: The designation of a well as upgradient or downgradient is Phillip's designation.

Phillips Petroleum -- Artesia

MW-1 MW-3 MW-6 PND-1,w PND-4,s PND-2,s PND-3,,w	monitoring well 1, downgradient monitoring well 3, upgradient monitoring well 6, downgradient first RCRA pond, surface water first RCRA pond, sediment second pond (middle), sediment third pond, surface water
PND-3,,w	
Blank	Field blank using deionized water

Phillips Petroleum -- Eunice

MW-1	monitoring well 1, upgradient
MW-2	monitoring well 2, downgradient
MW-3	monitoring well 3, downgradient
MW-4	monitoring well 4, downgradient

Phillips Petroleum -- Lee

MW-1	monitoring well 1, upgradient
MW-2	monitoring well 2, downgradient
MW-3	monitoring well 3, downgradient
MW-4	monitoring well 4, downgradient
Blank	Field blank using deionized water

Phillips Petroleum -- Lusk

MW-1 MW-2	monitoring well 1, upgradient monitoring well 2, downgradient
MW-3 MW-4 R-PND,w	monitoring well 3, downgradient monitoring well 4, downgradient RCRA pond, surface water
R-PND,s O-PND,s	RCRA pond, sediment Oily pond next to RCRA pond, sludge

TABLE 2. ANALYTICAL METHODS

PARAMETER	PRESERVATION	ANALYTICAL METHOD
Gen. Chem.		
Field pH	none	Hach Mini pH Meter
Field Cond.	none	Yellow Springs S-C-T Meter
Calcium	ice	EPA Method 215.2
Magnesium	ice	EPA Methods 130.2 and 215.2
Sodium	ice	Std. Methods 325(b)
Potassium	ice	Std. Methods 325(b)
Bicarbonate	ice	EPA Method 310.1
Chloride	ice	EPA Method 325.2
Sulfate	ice	EPA Method 375.2
TDS	ice	EPA Method 160.1
Fluoride	ice	EPA Method 340.2
Nitrate-N	ice, H ₂ SO ₄	EPA Method 352.2
TOC	ice, H ₂ SO ₄	EPA Method 415.1
Metals		
Arsenic	HNO ₃	EPA Method 206.2
Mercury	HNO ₃	EPA Method 245.1
Selenium	HNO ₃	EPA Method 270.2
All others (ICAP Scan)	HNO ₃	EPA Method 207
Organics		
GC/MS Purgeables	lce	EPA Method 624

PHILLIPS PETROLEUM -- LEE

Σ.

	MW-1	MW-2	MW-3	MW-4	Blank*
GEN CHEM Field pH Field Cond. Field Temp. Lab pH Lab Cond. Calcium Magnesium Sodium Potassium Bicarbonate Chloride Sulfate TDS Fluoride Nitrate-N TOC	7.9 345 23 8.1 385 24.0 12.2 32.2 0.82 120.9 32.5 43.8 233 1.78 0.63 44.9	7.3 475 25 8.21 453 41.6 16.6 36.8 1.56 199 32.3 43.4 323 0.79 0.96 8.13	7.4 490 25 7.96 487 60.0 19.5 25.3 1.17 157.4 41.9 41.7 328 0.63 1.91 1.4	7.5 468 23 7.97 415 60.0 12.0 16.1 0.78 156 34.2 39.2 310 0.56 2.45 2.51	- 7.25 34 4.0 4.9 0 0 7 1.6 4.3 20 0.10 1.70
METALS Arsenic Mercury Selenium Aluminum Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Molybdenum Nickel Silicon Silver Strontium Tin Vanadium Ytrrium Zinc	0.008 ND ND 1.5 0.1 ND 0.1 ND 33 ND ND ND ND ND 0.9 ND 5.7 0.5 ND ND 12 ND 0.3 ND ND ND 12 ND 0.3 ND ND ND ND ND ND ND ND ND ND ND ND ND	ND ND 0.4 ND ND ND ND ND ND ND ND ND ND ND ND ND	ND ND 0.4 0.1 ND ND ND ND ND ND ND ND ND ND ND ND ND	ND ND 0.2 0.2 ND ND ND ND ND ND ND ND ND ND 11 0.4 ND ND 13 ND ND ND ND ND ND ND ND ND ND ND ND ND	ND ND ND 33 ND ND 0.4 ND ND ND ND ND ND ND ND ND ND ND ND ND

^{*} Sample containers filled in the field from NMEID deionized water container.

PHILLIPS PETROLEUM -- LEE

Gas Chromatograph/Mass Spectrometer Purgeable Screen Results in [brackets] are tentative (unconfirmed) results.

SAMPLE	ORGANICS DETECTED	РРВ
MW-1	Benzene Toluene m-Xylene o-Xylene [Tetrahydrofuran] [Butanone]	47 17 1 6 [>500] [>500]
MW-2	Tetrahydrofuran Butanone [Pentene] [Cyclohexane]	[>20] [>20] [5] [40]
MW-3	[Tetrahydrofuran]	[>50]
MW-4	[Tetrahydrofuran]	[>200]
Blank*	Trichloromethane Bromodichloromethane Bibromochloromethane Bromoform	25 7 5 4

^{*} Sample containers filled in the field from NMEID deionized water container.