Sampling Report

March 2001

Los Alamos National Laboratory
Los Alamos, New Mexico

Prepared for:

U.S. Environmental Protection Agency
Region 6

EPA Contract No. 68-W6-0063

Work Assignment No. 002B1065G

14421

RECEIVED BY ER-RPD
AUG 06 2001

NOTE: Photo 2.17 - App. H. missing 8-6-01 called & spoke w/ Linda Causey to enter w/o Reference Only

Los Alamos Environmental Restoration Records Processing Facility

ER Record I.D.# 70669

LOS ALAMOS NATIONAL LABORATORY
ENVIRONMENTAL RESTORATION
Records Processing Facility
ER Records Index Form

ER ID NO. 70669 *Date Received:* 8/6/01 *Processor:* YCA *Page Count:* 62

Privileged: (Y/N) N *Record Category:* P

FileFolder: N/A

Correction: (Y/N) N *Corrected No.* 0 *Corrected By Number:* 0

Administrative Record: (Y/N) Y

Refilmed: (Y/N) N *Old ER ID Number:* 0 *New ER ID Number:* 0

Miscellaneous Comments:
REFERENCE CITED

THIS FORM IS SUBJECT TO CHANGE. CONTACT THE RPF FOR LATEST VERSION. (JUNE 1997)

SAMPLING REPORT
LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

Prepared for:

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202

Prepared by:

TechLaw, Inc.
750 North St. Paul Street, Suite 600
Dallas, Texas 75201

EPA Contract No. 68-W6-0063
Work Assignment No. 002BT065G

March 2001

TABLE OF CONTENTS

Section		Page
1.0	INTRODUCTION	1
1.1	Objective	1
1.2	Site Background	1
1.2.1	Historical and Current Operations	1
1.2.2	Geographical Setting	2
1.2.3	Geology and Hydrology	3
2.0	SITE INVESTIGATION ACTIVITIES	5
2.1	Participants	5
2.2	Effluent	5
2.2.1	Effluent Sampling Procedure	6
2.2.2	Deviations from the Field Sampling Plan	6
2.3	Groundwater	6
2.3.1	Groundwater Sampling Procedures	7
2.3.2	Deviations from the Field Sampling Plan	8
2.4	Springs and Surface Waters in the Pajarito Canyon Watershed	8
2.4.1	Spring and Surface Water Sampling Procedures	9
2.4.2	Deviations from the Field Sampling Plan	10
2.5	Sediment	10
2.5.1	Sediment Sampling Procedures	10
2.5.2	Deviations From Field Sampling Plan	11
3.0	LABORATORY RESULTS SUMMARY	13
3.1	Effluent Sampling Results	13
3.1.1	TA-50 Radioactive Waste Water Treatment Plant	13
3.2	Groundwater Sampling Results	13
3.2.1	Mortandad Canyon	13
3.2.2	Drinking Water Production Wells	14
3.2.3	Technical Area 3 (TA-3)	15
3.2.4	Comparison of Groundwater Results	16
3.3	Spring and Surface Water Sampling Results	16
3.4	Sediment Sampling Results	16
3.4.1	Acid Canyon	16
3.4.2	Bayo Canyon	17
3.4.3	Sandia Canyon	18
3.4.4	Mortandad Canyon	18
3.4.5	Cañada del Buey	19
3.4.6	Pajarito Canyon	19
3.4.7	Ancho Canyon	20

4.0 QUALITY ASSURANCE SUMMARY 21
4.1 Quality Assurance/Quality Control Samples 21
4.2 Deviations from the Field Sampling Plan 22
4.3 Laboratory and Analytical Methods 23
4.4 Data Validation 24

5.0 CONCLUSIONS 25
5.1 Sampling Activities 25
5.2 Analytical Results 25
5.2.1 Effluent Samples 25
5.2.2 Groundwater Samples 26
5.2.3 Spring and Surface Water Samples 27
5.2.4 Sediment Samples 27
5.2.5 Drinking Water Production Wells 28
5.2.6 Technical Area 3 Monitoring Well 28

6.0 RECOMMENDATIONS 31

7.0 REFERENCES 33

LIST OF TABLES

Table 1 Participants
Table 2 Well Location and Time Sampled
Table 3 Summary of Well Information
Table 4 Field Parameter Measurements
Table 5 Summary of Preliminary Analytical Results for Water Samples-Volatile Organic Compounds
Table 6 Summary of Preliminary Analytical Results for Water Samples-Total Metals
Table 7 Summary of Preliminary Analytical Results for Water Samples-Dissolved Cations
Table 8 Summary of Preliminary Analytical Results for Water Samples-General Chemistry
Table 9 Summary of Preliminary Analytical Results for Water Samples-Radionuclides
Table 10 Summary of Preliminary Analytical Results for Water Samples-Explosives
Table 11 Summary of Preliminary Analytical Results for Sediment Samples-Inorganics
Table 12 Summary of Preliminary Analytical Results for Sediment Samples-PCBs
Table 13 Summary of Preliminary Analytical Results for Sediment Samples-Radionuclides

TABLE OF CONTENTS
(continued)

LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	Aerial View and Digital Elevation Model
Figure 3	Aerial View/Sample Locations- Mortandad Canyon
Figure 4	Aerial View/Sample Locations- Upper Pajarito Canyon
Figure 5	Aerial View/Sample Locations- Middle Pajarito Canyon
Figure 6	Aerial View/Sample Locations- Acid Canyon
Figure 7	Aerial View/Sample Locations- Bayo Canyon
Figure 8	Aerial View/Sample Locations- Mortandad/Sandia Canyons
Figure 9	Aerial View/Sample Locations- Lower Pajarito/Cañada del Buey
Figure 10	Aerial View/Sample Locations- Ancho Canyon

LIST OF APPENDICES

APPENDIX A	Field Logbooks
APPENDIX B	Chronological Summary of Field Activities
APPENDIX C	Generalized Well Construction and Lithologic Descriptions
APPENDIX D	Comparative Standards Description
APPENDIX E	Comparison of Analytical Results
APPENDIX F	Analytical Data
APPENDIX G	Chain-of-Custody Forms
APPENDIX H	Photographs
APPENDIX I	Trend Analysis

ABBREVIATIONS AND ACRONYMS LIST

α	Gross Alpha
β	Gross Beta
ATS	Aurora Technical Services
DOE	U.S. Department of Energy
DCG	Derived Concentration Guides
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
H^3	Tritium
MCL	Maximum Contaminant Level
MSSL	Medium-Specific Screening Level
LANL	Los Alamos National Laboratory
μg/ℓ	microgram per liter
MK	Morrison Knudson Corporation
μm	micrometer
NMED OB	New Mexico Environment Department Oversight Bureau
NMWQCC	New Mexico Water Quality Control Commission
NPDES	National Pollutant Discharge Elimination System
PMC	Program Management Company
PRG	Preliminary Remediation Goals
QC	Quality Control
SOW	Statement of Work
Sr-90	Strontium-90
TA	Technical Area
TDS	Total Dissolved Solids
TechLaw	TechLaw, Inc.
TKN	Total Kjedahl Nitrogen
TSS	Total Suspended Solids
U	Uranium
UC	University of California
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WHL	Wildlife Habitat Limits

DISCLAIMER

This report was prepared for the U.S. Environmental Protection Agency (EPA) Region 6, by TechLaw, Inc. in fulfillment of Contract No. 68-W6-0063, Work Assignment No. 002BT065G. Any opinions, findings, and conclusions expressed herein are those of the contractor and not necessarily those of the EPA or cooperating agencies. Mention of any company or product names is not to be considered an endorsement by the EPA.

This report is intended to assist EPA personnel in documenting the collection of samples during sampling activities conducted at Los Alamos National Laboratories between December 6, 1999 and December 17, 1999. EPA personnel must exercise their technical judgement in using this report, as well as other relevant information, in determining what additional actions may be needed.

ACKNOWLEDGMENTS

The data contained within this report was collected between December 6 and December 17, 1999. Thanks are due to David Rogers of Los Alamos National Laboratory who provided the support and cooperation necessary to make the sampling event a success. The Los Alamos National Laboratory field support personnel, Max Maes and Consuelo Montoya, should be recognized for their long hours and hard work under stressful conditions in providing support and equipment necessary for the successful completion of the field activities. TechLaw, Inc. would like to thank Aurora Technical Services and Program Management Company for their sampling support.

Special thanks are also due to the New Mexico Environment Department's DOE Oversight Bureau located in White Rock, New Mexico for their assistance and support, especially Michael Dale, Bob Wingo, Chris Hanlon-Mayer, and Steve Yanicak.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) requested that TechLaw, Inc. (TechLaw) provide support to the agency by collecting effluent, groundwater, spring, and sediment samples at Los Alamos National Laboratory, Los Alamos, New Mexico. The University of California (UC) operates Los Alamos National Laboratory (LANL) as a prime contractor to the U.S. Department of Energy (DOE), which owns LANL. The facility has been in operation since 1943 and was responsible for the development of the first atomic bomb. The facility is approximately 43 square miles in size and consists of mesa tops intersected by steep canyons. LANL is located approximately 35 miles northwest of Santa Fe, New Mexico (Figure 1).

LANL has been performing investigations/cleanups on former waste sites within the facility for the past fourteen years, as required by their hazardous waste permit issued in 1990. Several of the hazardous waste sites located on the mesa tops and in the canyons have released hazardous hazardous constituents and radionuclides to the environment. Some of the canyons impacted by the release of contaminants continue onward to the Pueblo of San Ildefonso.

1.1 Objective

The objective of this work assignment was to collect effluent, groundwater, spring, and sediment samples from various locations at LANL. Groundwater samples were collected from one main/deep-aquifer monitoring well and several shallow alluvial wells located in Mortandad Canyon and drinking-water production wells located on LANL property at various locations. Spring samples were collected from areas of the Pajarito Canyon watershed. Effluent samples were collected from Gaging Station 1 located downstream of Technical Area 50 Radioactive Waste Water Treatment Plant in Mortandad Canyon. Sediment samples were collected in Acid, Bayo, Sandia, Mortandad, Pajarito and Ancho Canyons, and Cañada del Buey. The sampling locations and analytical suites per location were identified in the EPA Statement of Work (SOW).

1.2 Site Background

1.2.1 Historical and Current Operations

The facility began operations as Los Alamos Laboratory in March 1943 at the inception of Project Y of the Manhattan Project. The goal of this project was to develop the world's first nuclear weapon. When the first nuclear bomb was detonated at Trinity Site in southern New Mexico in 1945, more than 3,000 civilian and military personnel were working at Los Alamos Laboratory. In 1947, Los Alamos Laboratory became Los Alamos Scientific Laboratory, which in turn became Los Alamos National Laboratory in 1981.

LANL's original mission to design, develop, and test nuclear weapons has broadened and evolved as technologies, US priorities, and the world community have changed. LANL is now a multiprogram laboratory with the central mission of reducing nuclear danger. The central

mission at LANL has evolved beyond nuclear weapons testing and development to include five major elements to reduce nuclear danger:

- stockpile stewardship activities which ensure safe, secure, and reliable weapons;
- stockpile management projects which provide capabilities ranging from dismantlement to the recertification of existing nuclear weapons;
- nuclear materials management which ensures the availability or safe disposition of plutonium, highly enriched uranium, and tritium;
- effective nonproliferation and counterproliferation technologies to keep nuclear weapons, nuclear materials, and nuclear weapons knowledge out of the wrong hands; and
- environmental stewardship projects to provide for the remediation and reduction of wastes from the nuclear weapons complex.

LANL plans to continue its role in defense, particularly in nuclear weapons technology, and will increasingly use its multi-disciplinary capabilities to solve important civilian problems (including initiatives in areas of health, national infrastructure, energy, education, and the environment) and industrial collaborations.

1.2.2 Geographical Setting

LANL and the nearby communities of Los Alamos and White Rock are located in Los Alamos County, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 35 miles northwest of Santa Fe. The 43-square mile facility is situated on the Pajarito Plateau, which consists of a series of finger-like mesas separated by east-west oriented canyons cut by perennial and intermittent streams (Figure 1). Mesa tops range in elevation from approximately 7,800 feet on the flanks of the Jemez Mountains to about 6,200 feet at their eastern termination above White Rock Canyon and the Rio Grande River.

Most LANL and community developments are confined to mesa tops. The surrounding land is largely undeveloped, and large tracts of land north, west, and south of LANL are held by the Santa Fe National Forest, Bureau of Land Management, Bandelier National Monument, General Services Administration, and Los Alamos County. The Pueblo of San Ildefonso borders LANL to the northeast.

LANL is divided into Technical Areas (TAs) that are used for office building sites, experimental areas, and waste disposal locations. However, these uses account for only a small part of the total land area held by LANL. Most land provides buffer areas for security and safety and is held in reserve for future use.

1.2.3 Geology and Hydrology

Most of the finger-like mesas in the Los Alamos area are formed from Bandelier Tuff, which includes ash fall, ash fall pumice, rhyolitic tuff, and epiclastic fluvial deposits of the Cerro Toledo Interval. The tuff is more than 1,000 feet thick in the western part of the plateau and thins to approximately 260 feet eastward above the Rio Grande. It was deposited as a result of major eruptions in the Jemez Mountains' volcanic center approximately 1.2 to 1.6 million years ago.

On the western part of Pajarito Plateau, the Bandelier Tuff overlaps onto the Tschicoma Formation, which consists of older volcanics that form the Jemez Mountains. The tuff is underlain by the conglomerate of the Puye Formation in the central plateau and near the Rio Grande. Chino Mesa basalts interfinger with the conglomerate along the river. These formations overlie the sediments of the Santa Fe Group, which extend across the Rio Grande Valley and are more than 3,300 feet thick.

Surface water in the Los Alamos area occurs primarily as short-lived or intermittent reaches of streams. However, two perennial streams exist on LANL property and are supplied by springs which emanate from the Bandelier Tuff. Perennial springs on the flanks of the Jemez Mountains supply base flow into upper reaches of some canyons, but the volume is insufficient to maintain surface flows across the LANL facility before they are depleted by evaporation, transpiration, and infiltration.

Groundwater in the Los Alamos area occurs in four modes: (1) water in shallow alluvium in canyons; (2) perched water (a body of groundwater above a less permeable layer that is separated from the underlying main body of groundwater by an unsaturated zone); and (3) the main aquifer of the Los Alamos area. The fourth mode consists of water which exists in and above the Bandelier Tuff and discharges from the Bandelier Tuff via fractures and surge deposits.

The main aquifer of the Los Alamos area is considered the only aquifer in the area capable of serving as a municipal water supply; however, local surface waters and groundwaters were used for drinking water purposes prior to 1949, and process water as recently as 1996. Water in the main aquifer is under slight artesian conditions under the eastern part of the Pajarito Plateau near the Rio Grande. The source of recharge to the aquifer is presently uncertain. Isotopic and chemical composition of some waters from wells near the Rio Grande suggest that the source of water underlying the eastern part of the Pajarito Plateau may be the Sangre de Cristo Mountains. In addition, recent hydrochemical data derived from deep boreholes drilled in the central and western parts of LANL suggest that some recharge to the main aquifer may be derived from canyon-bottom aquifers (i.e., man-made constituents detected). Groundwater flow along the Rio Grande rift from the north is another possible recharge source. The main aquifer discharges into the Rio Grande through seeps and springs in White Rock Canyon as well as by converging with the alluvial aquifers associated with the river. The 11.5-mile reach of the river in White Rock Canyon between Otowi Bridge and the mouth of the Rito de los Frijoles receives an estimated 4,300 to 5,500 acre feet annually from the aquifer.

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 SITE INVESTIGATION ACTIVITIES

TechLaw sampling team members arrived at the LANL facility on the morning of December 6, 1999. All LANL training and administrative requirements were completed by team members by December 7, 1999.

Field activities began on December 6, 1999. TechLaw collected sediment samples from Acid Canyon, Bayo Canyon, Cañada del Buey, Mortandad Canyon, Pajarito Canyon, and Ancho Canyon. Groundwater was collected from shallow, canyon-bottom wells in Mortandad Canyon located west of Pueblo of San Ildefonso on LANL property and several main-aquifer production wells located on LANL property. Five springs were sampled in the Pajarito Canyon watershed. Effluent samples were collected at Gaging Station-1, located downstream of Technical Area 50 Radioactive Waste Water Treatment Plant, in Mortandad Canyon. New Mexico Environment Department DOE Oversight Bureau (NMED OB), and LANL personnel collected split samples at various sample locations during the field activities. Field activities ended on December 17, 1999. A copy of the field log books maintained during the field activities is included in Appendix A. Appendix B presents a summary of field activities completed during each day of field work.

2.1 Participants

During the two weeks of sample collection activities, numerous personnel from various agencies and companies participated or observed the sampling operations. These groups included EPA Region 6, New Mexico Environmental Department (NMED), NMED OB, TechLaw, Aurora Technical Services (ATS), and the Pueblo of San Ildefonso. Table 1 presents a complete list of personnel that participated in and/or observed the sampling operations.

2.2 Effluent

The collection and analysis of effluent was completed to provide analytical data on effluent being discharged into canyons located at the LANL facility. Effluent data only provides information on the effluent being discharged at the time of sampling and is not meant to characterize the waste stream. The effluent sampling location was selected by EPA and NMED OB personnel.

One sample of effluent being discharged into Mortandad Canyon by the TA-50 Radioactive Waste Water Treatment Plant was collected at Gauging Station-1 in Mortandad Canyon during the first week of sampling. The sample was analyzed for anions, nitrate/nitrite as nitrogen, total phosphorous, ammonia, Total Kjedahl Nitrogen (TKN), total metals, perchlorate, strontium-90, tritium (low level), stable nitrogen isotopes, dissolved uranium isotopes, and dissolved cations.

2.2.1 Effluent Sampling Procedure

TA-50 Radioactive Waste Water Treatment Plant

The TA-50 Radioactive Waste Water Treatment Plant operates two storage/treatment tanks, each with a capacity of approximately 25,000 gallons. Waste water at the plant is accumulated in one of the 25,000 gallon tanks until the tank is full. When the tank is full, the waste water is redirected to the second 25,000 gallon storage tank. The waste water in the full storage tank is batch treated and discharged into Mortandad Canyon. However, prior to discharging the treated waste water, TA-50 personnel test the effluent to make sure that the effluent does not exceed limits established in the plant's National Pollutant Discharge Elimination System (NPDES) permit. If the results indicate that the treated waste water is within the NPDES limits, then the treated waste water is discharged into Mortandad Canyon. If the treated waste water exceeds the limits of the NPDES permit, then the facility repeats the treatment process until it is within the limits of the NPDES permit. When the second storage tank is filled, the waste water is then redirected back to the first storage tank, and the process is repeated. The plant also has a third storage tank used as a backup to the two primary storage/treatment tanks.

One sample (GS-1) was collected at Gaging Station-1 in Mortandad Canyon while the TA-50 plant was discharging effluent into the canyon. This sample was collected by lowering the intake of a peristaltic pump directly into the stream channel of Mortandad Canyon while the TA-50 plant was discharging. The pump was used to collect the samples beginning with the non-filtered analyses containers and finishing with the filtered analyses containers. The filtered sample material was passed through a new in-line 0.45 micrometer (μm) filter while filling the sample containers. All sample containers were filled slowly to avoid aeration. The sampling team transferred the samples to a sample cooler containing ice in order to maintain the samples at approximately 4°C. The samples were secured and stored inside the sample cooler until arrival at the NMED OB White Rock Office where they were transferred to a sample storage refrigerator. Samples were ultimately packaged in coolers with ice and shipped to the analytical laboratory for analysis.

All waste generated during sampling activities were managed by LANL.

2.2.2 Deviations from the Field Sampling Plan

No deviations from the Field Sampling Plan occurred during the effluent sampling activities. All effluent samples were collected as prescribed in the Field Sampling Plan.

2.3 Groundwater

The collection and analysis of groundwater samples was completed to provide data to determine the presence or absence of contamination in groundwater at the different sample locations. Eight shallow groundwater monitoring wells, one main aquifer monitoring well, and four drinking water production wells were sampled during the groundwater sampling activities. Depending on

the well, groundwater monitoring wells were analyzed for anions, nitrate/nitrite as nitrogen, total phosphorous, ammonia, TKN, total metals, perchlorate, strontium-90, tritium (low level), stable nitrogen isotopes, VOCs, and dissolved cations. Depending on the well, drinking water production wells were analyzed for nitrate/nitrite, total phosphorous, ammonia, TKN, total arsenic, total uranium, perchlorate, strontium-90, VOCs, total barium, and explosives. The groundwater sampling locations were selected by EPA and NMED OB personnel.

Wells sampled during the groundwater sampling activities are located in Mortandad Canyon (8 wells sampled; see Figure 2), and drinking water production water wells are located on Pajarito Mesa (4 wells sampled). One shallow monitoring well, 03-MW-1, was sampled in TA-3 behind building SM-30. The well locations and the date and time each was sampled is presented in Table 2. Generalized well construction diagrams for each of the wells sampled is presented in Appendix C. Visual representations of the groundwater well locations can be viewed in Figures 3, 5, and 8.

2.3.1 Groundwater Sampling Procedures

The physical condition of the outside of each well was inspected upon arrival at each wellhead. The well casing diameter, static water level depth, and total well depth were measured in order to calculate the volume of water contained inside the well (one well volume). If the total depth of a well could not be measured because of a dedicated pump inside the well or the depth of the well was too great, the construction information for the well was used to verify the total depth of the well. A minimum purge volume (volume of groundwater to be removed before samples could be collected) was then calculated by multiplying the volume of water contained inside the well by three.

Once these initial measurements and calculations were made, purging activities began. The majority of shallow monitoring wells sampled contained dedicated bladder pumps that were used to purge and sample the wells. Shallow monitoring wells that did not contain dedicated bladder pumps were purged and sampled using a peristaltic pump. The main aquifer wells including TW-8 and the drinking water production wells each contained a dedicated centrifugal pump. Samples from the main aquifer wells were collected from ports adjacent to the wellhead. Water quality parameters consisting of pH, temperature, specific conductivity, and turbidity were measured during the purging activities. Samples were not collected until the measured water quality parameters remained consistent over the last three intervals measured. Although RCRA guidance recommends measuring dissolved oxygen in addition to the other water quality parameters mentioned above, it is believed that each well was purged adequately in order to facilitate the collection of a sample representative of the adjacent screened interval. Table 3 presents well data including the water level measured in each well, the total depth of each well, the calculated purge volume for each well, and the actual volume purged before sampling activities commenced. The final water quality parameter measurements for each well sampled is presented in Table 4.

After the well was purged, sample containers were filled beginning with the VOC containers, proceeding to the non-filtered analyses containers, and finishing with the filtered analyses containers. The filtered groundwater was passed through a new in-line 0.45 μm filter while filling the sample containers. All sample containers were filled slowly to avoid aeration. The sample containers were placed in a sample cooler to maintain the samples at approximately 4°C. The samples were secured and stored inside the sample cooler until reaching the NMED OB White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis. All waste generated during sampling activities were managed by LANL.

2.3.2 Deviations from the Field Sampling Plan

Deviations from the Field Sampling Plan occurred during the groundwater sampling activities. Following are the specific deviations that occurred.

- Well MT-4 was sampled after the first well volume was purged, since the water quality parameters had stabilized.
- Well MCO-4B was not sampled as planned. Water was unable to be recovered from the well, so it was determined that the water was below the pump intake or the bladder pump was not functioning properly. Well MCO-5 was substituted for this well.
- Well MCO-2 was sampled after the first well volume was purged, since the water quality parameters had stabilized. This well had a slow recovery time.
- Well MCO-7 was sampled after one well volume was purged, since the water quality parameters had stabilized. This well had a slow recovery time.
- Well MCO-7.7B was sampled after one well volume was purged, since the water quality parameters had stabilized. This well had a slow recovery time.

2.4 Springs and Surface Waters in the Pajarito Canyon Watershed

The collection and analysis of spring and surface water samples was completed to provide analytical data to determine the presence or absence of contamination in groundwater discharging to the ground surface at the different sampling locations. The springs discharge from the Bandelier Tuff and the canyon-bottom alluvium. Nine springs and two spring-fed surface water streams were scheduled to be sampled during the spring and surface water sampling activities. Due to the lack of adequate flow, only five springs were actually sampled. The spring water was analyzed for anions, perchlorate, explosives, ammonia, nitrate/nitrite as nitrogen, total phosphorous, TKN, and dissolved cations. The spring sampling locations were selected by EPA and NMED personnel.

2.4.1 Spring and Surface Water Sampling Procedures

TechLaw sample team members divided into two sampling teams. Team A sampled upper Pajarito springs and surface waters and was led by Mr. Bret Kendrick. Team B sampled middle and lower Pajarito springs and surface waters and was led by Mr. Jim Housley. The sampling locations are presented in Figures 4 and 5.

Middle Pajarito Canyon Springs

TA-18 Spring is located just inside of the Technical Area 18 restricted area on the south-facing slope of Threemile Canyon (a south-connecting tributary to the middle portion of Pajarito Canyon). The samples were collected using a peristaltic pump. The intake for the peristaltic pump was placed directly in a small pool at the spring's point of origin. Spring water was pumped directly into the appropriate sample containers. For the filtered analytical parameters, the water was filtered using the peristaltic pump and an in-line 0.45 μm filter.

PA-6.7 is a surface-water sampling station located in middle Pajarito Canyon, just below its confluence with Twomile Canyon. The samples were collected using a peristaltic pump. The intake hose was placed in the water and pumped to the appropriate containers. For the filtered analytical parameters, the water was filtered using the peristaltic pump and an in-line 0.45 μm filter.

Upper Pajarito Canyon Springs and Surface Waters

Homestead Spring is located in upper Pajarito Canyon. The samples were collected using a peristaltic pump. The intake for the peristaltic pump was placed directly in a small pool at the spring's point of origin. Spring water was pumped directly into the appropriate sample containers. For the filtered analytical parameters, the water was filtered using the peristaltic pump and an in-line 0.45 μm filter.

Starmer's Spring is located in Starmer Gulch, an informally named southern tributary to upper Pajarito Canyon. The samples were collected using a peristaltic pump. The intake for the peristaltic pump was placed directly in a small pool at the spring's point of origin. Spring water was pumped directly into the appropriate sample containers. For the filtered analytical parameters, the water was filtered using the peristaltic pump and an in-line 0.45 μm filter.

Bulldog Spring and Kieling Spring are located in a small tributary to Pajarito Canyon informally named "Arroyo deLaDelfe" and "North Ancho East Basin." The samples were collected using a peristaltic pump. The intake for the peristaltic pump was placed directly in a small pool at the spring's point of origin. Spring water was pumped directly into the appropriate sample containers. For the filtered analytical parameters, the water was filtered using the peristaltic pump and an in-line 0.45 μm filter.

BU-0.01 is a surface-water sampling station located at the mouth of "Arroyo de LeDelfe," and was sampled using a peristaltic pump. The intake hose was placed in the water and pumped to the appropriate containers. For the filtered analytical parameters, the water was filtered using the peristaltic pump and an in-line 0.45 μm filter.

PA-8.9 is another surface-water sampling station located in upper Pajarito Canyon, just below its confluence with Starmer Gulch, and was sampled using a peristaltic pump in the manner mentioned for BU-0.01 above.

All spring sample containers were filled beginning with the non-filtered analyses containers and finishing with the filtered analyses containers. All sample containers were filled slowly to avoid aeration. The sample containers were placed in a sample cooler which contained ice in order to maintain the samples at approximately 4°C. The samples were secured and stored inside the sample cooler until reaching the NMED White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis. All waste generated during sampling activities were managed by LANL.

2.4.2 Deviations from the Field Sampling Plan

Two springs and one area of spring-fed surface water which were to be sampled were found to be either dry or to have such low flow that no sample was collected. They were: Threemile (B) Spring, Charlie's Spring, and Stream Area TM-0.4.

2.5 Sediment

The collection and analysis of sediment samples was completed to provide data to determine the presence or absence of contamination in sediment and the potential for such contamination to be transported to different locations via surface-water runoff. Stream banks and beds were sampled in seven canyons to acquire a total of fifty samples. Depending on the canyon, sediment samples were analyzed for PCBs, total metals, total uranium, strontium-90, isotopic plutonium, gamma spectroscopy, isotopic uranium, and gross alpha/beta. The sediment sampling locations were selected by EPA and NMED personnel.

Ten sediment samples were to be collected from Acid Canyon; ten from Bayo Canyon; ten from Sandia Canyon; five from Mortandad Canyon; five from Cañada del Buey; five from Pajarito Canyon, and five from Ancho Canyon. The sediment sample locations can be viewed in Figures 6 through 10.

2.5.1 Sediment Sampling Procedures

The sediment sampling areas were located on stream banks where alluvial deposits were available for human contact and a potential for downstream transport exists. When the sampling area was located, a strata consisting of fine grained sediment was marked for collection. An area

representative of the entire strata was removed using clean stainless-steel equipment such as chisels and trowels. Once removed, the sample was homogenized in a stainless-steel bowl with a stainless-steel trowel. If there was an excess of gravel and rootlets in the sediment, the sample was sieved before containerizing. Sample collection equipment was decontaminated between sample stations.

The sample containers were placed in a sample cooler to maintain the samples at approximately 4°C. The samples were secured and stored inside the sample cooler until reaching the NMED White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis. All waste generated during sampling activities were managed by LANL.

2.5.2 Deviations From Field Sampling Plan

The following deviations from the field sampling plan occurred:

- Six samples were collected from Sandia Canyon instead of the planned ten.
- Four samples were collected in Bayo Canyon instead of the planned ten.
- Six samples were collected in Mortandad Canyon instead of the planned five.
- Nine samples were collected from Cañada del Buey instead of the planned five.
- Four samples were collected from Pajarito Canyon instead of the planned five.

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 LABORATORY RESULTS SUMMARY

3.1 Effluent Sampling Results

3.1.1 TA-50 Radioactive Waste Water Treatment Plant

One effluent sample was collected from the TA-50 Radioactive Waste Water Treatment Plant approximately ¼-mile downstream of the plant's outfall at Gauging Station-1 located in Mortandad Canyon (Figure 2). The sample was analyzed for total metals/mercury, dissolved cations, anions, ammonia, TKN, nitrate/nitrite, total phosphorous, perchlorate, strontium-90, low-level tritium, and stable nitrogen isotopes. Analytical results obtained from these samples are presented in Tables 6 through 9 and in Appendix F.

Inorganic results for total metals identified six analytes at concentrations greater than the detection limits and results for dissolved cations identified seven inorganic analytes at concentrations greater than detection limits. There were no concentrations of inorganic or dissolved cations detected which exceeded the EPA drinking water standards or MSSLs. Results of the total metals and dissolved cations analyses are summarized in Tables 6 and 7 respectively.

The TA-50 sample, GS-1, was analyzed for general chemistry parameters as specified by EPA. These parameters included ammonia, bicarbonate, carbonate, TKN, nitrate/nitrite, total phosphorous, inorganic chloride, fluoride, sulfate, perchlorate, and stable nitrogen isotope ratios. Results of these analyses are summarized in Table 8.

The TA-50 sample, GS-1, was analyzed for radiochemistry as specified by EPA. These radionuclides include Strontium-90 (Sr-90), and Tritium (H^3). Results of these analyses are summarized in Table 9.

3.2 Groundwater Sampling Results

3.2.1 Mortandad Canyon

Eight groundwater wells located in Mortandad Canyon were sampled (Figure 3). Seven of the eight were monitoring wells completed in the shallow aquifer (water table at depths ranging from 6 to 60 feet bgs) and one well (TW-8) was completed in the main aquifer (water table at approximately 1,000 feet bgs). Samples collected from these wells were analyzed for total metals, mercury, anions, ammonia, TKN, nitrate/nitrite, total phosphorous, perchlorate, low-level tritium, stable nitrogen isotopes, strontium-90, and dissolved cations. Analytical results obtained from these samples are presented in Tables 6 through 9 and in Appendix F.

Inorganic results for total metals identified twelve inorganic analytes at concentrations greater than the detection limits and results for dissolved metals identified nine inorganic analytes at concentrations greater than detection limits. Total arsenic was detected at concentrations of 3.3 $\mu g/\ell$ in MCO-1 to 13.4 $\mu g/\ell$ in MCO-2. The EPA drinking water standard is .05 $\mu g/\ell$. Total

cadmium was detected at a concentration of 7.6 µg/ℓ in MCO-7 which exceeded the EPA and NMED drinking water standard of 5 µg/ℓ. Total thallium concentrations were detected ranging from 2.4 µg/ℓ to 5.4 µg/ℓ in MCO-1, MCO-2, MCO-3, MCO-6, MCO-7, and MT-4, which exceeded the EPA and NMED drinking water standard of 2 µg/ℓ. Dissolved iron was detected in MCO-2 at a concentration of 12,400 µg/ℓ which exceeded the EPA MSSL of 11,000. Dissolved manganese was detected at a concentration of 1,730 µg/ℓ which exceeds the EPA MSSL of 1,700 µg/ℓ. Results of the total metals and dissolved metals analyses are summarized in Table 6 and Table 7 respectively.

All of the Mortandad Canyon groundwater samples were analyzed for general chemistry parameters as specified by EPA. These parameters included ammonia, bicarbonate, carbonate, TKN, nitrate/n nitrite, total phosphorous, inorganic chloride, fluoride, sulfate, perchlorate, and stable nitrogen isotope ratios. Elevated nitrate plus nitrite was found in 4 of the 7 shallow monitoring wells, with 3 wells (MCO-6, MCWB-7,7B, and MT-4) exceeding the EPA and NM drinking water standard of 10 mg/ℓ. Perchlorate was found in 6 of the 7 shallow monitoring wells, exceeding the EPA provisionary drinking water standard of 4-18 ug/ℓ. No perchlorate or nitrate plus nitrite was detected in well TW-8, which is completed in the regional/deep drinking water aquifer. Results of these analyses are summarized in Table 8.

NMED and LANL reported that the preliminary analytical results for perchlorate collected from monitoring wells completed in the shallow alluvial aquifer in Mortandad Canyon appear too high. As a result, a chemist on staff with TechLaw performed a cursory review of the analytical data for the perchlorate results in question. Based on the cursory review, he concluded that two scenarios are possible: 1) the results are correct or 2) the results are biased high based on resolution problems of the analytical instruments. In any case, these analytical results, and those results reported by NMED and LANL, support the presence of perchlorate in the shallow alluvial aquifer at concentrations exceeding the EPA provisionary drinking water standard.

All of the Mortandad Canyon groundwater samples were analyzed for radiochemistry as specified by EPA. These radionuclides include Strontium 90 (Sr-90), and Tritium (H^3). Elevated tritium above background levels was detected in all of the shallow monitoring wells (except MCO-2). One monitoring well, MT 4, at 20,004 pCi/ℓ, exceeded both the EPA and NMED drinking water standard (20,000 pCi/ℓ). Elevated Sr-90 was detected above background in 4 of the 7 shallow monitoring wells. Monitoring wells MCO-3, MCO-5, and MCO-6 exceeded the EPA and NMED drinking water standard for SR-90 (8 pCi/ℓ), with the results ranging from 44.6 pCi/ℓ to 84 pCi/ℓ. No elevated tritium or Sr-90 was found in monitoring well TW-8, which is completed in the regional drinking water aquifer. The results of these analyses are summarized in Table 9.

3.2.2 Drinking Water Production Wells

Four production wells were sampled. Two of the production wells, PM-2 and PM-5, in the regional aquifer were sampled for VOCs, total barium, perchlorate, and explosives.

Analysis of PM-2 detected three compounds with VOC concentrations above detection limits. 1,2-dichloroethene was detected at 6 µg/ℓ which is below the EPA drinking water standard of 7 µg/ℓ. Trichloroethene was detected at 4 µg/ℓ which is below the EPA drinking water standard of 5 µg/ℓ. 4-methyl-2-pentanone was detected at 26 µg/ℓ which is below the EPA MSSL of 160 µg/ℓ. There is no EPA drinking water standard associated with this compound. Results of VOC analysis are presented in Table 5.

There was one inorganic analyte from PM-2 which detected a concentration higher than the detection limit; however, no concentrations of inorganic analytes were above regulatory limits. The results for total metals are shown in Table 6.

Analysis of PM-5 detected VOC concentrations above the detection limits for three compounds. A concentration of 1,2-dichloroethene was detected at 5 µg/ℓ which is below the EPA drinking water standard of 7 µg/ℓ. Trichloroethene was detected at 3 µg/ℓ which is below the EPA drinking water standard of 5 µg/ℓ. 4-methyl-2-pentanone was detected at a concentration of 24 µg/ℓ which is below the EPA MSSL of 160 µg/ℓ. There is no EPA drinking water standard associated with this compound. Results of VOC analysis are presented in Table 5.

There was one inorganic analyte from PM-5 which detected a concentration higher than the detection limit; however, no concentrations of inorganic analytes were above regulatory limits. The results for total metals are shown in Table 6.

The last two production wells, O-4 and PM-1, were analyzed for nitrate/nitrite, total phosphorous, ammonia, TKN, total arsenic, total uranium, perchlorate, and strontium-90. None of these wells had constituents above EPA drinking water standards. The results of these analyses can be viewed in Tables 6 through 8.

3.2.3 Technical Area 3 (TA-3)

One groundwater well located behind building SM-30 at TA-3 was sampled. The well, 03-MW-1, was sampled for VOCs, dissolved cations, anions, perchlorate, and low-level tritium. Analytical results obtained from these samples are presented in Tables 5 through 9 and in Appendix F.

VOC concentrations found in the well above the EPA drinking water standards include: 1,1-dichloroethene at 510 µg/ℓ, 1,1-dichloroethane at 340 µg/ℓ, 1,2-dichloroethene at 120 µg/ℓ, chloroform at 47 µg/ℓ, 1,1,1-trichloroethane at 22,000 µg/ℓ, 1,2-dichloroethane at 200 µg/ℓ, and trichloroethene at 310 µg/ℓ. Results of VOC analysis are presented in Table 5.

Results for dissolved cations revealed nine analytes with concentrations above detection limits; however, there were no detections which exceeded the established EPA MSSLs for these analytes. Results of the dissolved cations analysis are presented in Table 7.

The samples were analyzed for general chemistry parameters as specified by EPA. These parameters included bicarbonate, carbonate, inorganic chloride, fluoride, sulfate, and perchlorate. Results of these analyses are summarized in Table 8.

Tritium was detected at a concentration of 1,804 pCi/ℓ in monitoring well 03-MW-1, which is elevated above background levels (see Table 9), but does not exceed the EPA drinking water standard of 20,000 pCi/l.

3.2.4 Comparison of Groundwater Results

Analytical results for groundwater samples collected during the sampling event are presented in Tables 5 through 10. Included on each table are various water quality standards, guidelines, and limits established by EPA, NMED, and DOE. These water quality standards, guidelines, and limits are included on each table to facilitate easy comparison with the analytical results; however, these water quality standards, guidelines, and limits may not apply to the locations sampled and are presented only as comparison data. A description of the EPA, NMED, and DOE water quality standards, guidelines, and limits used for comparison is included in Appendix D.

3.3 Spring and Surface Water Sampling Results

Five springs and three spring fed surface water bodies were sampled throughout the Pajarito Canyon watershed. The samples collected from the springs were analyzed for anions, ammonia, TKN, nitrate/nitrite, total phosphorous, perchlorate, explosives, and dissolved cations. Analytical results obtained from these samples are presented in Tables 7, 8, and 10, and in Appendix F.

No explosives were detected at concentrations above detection limits in the samples collected from springs and surface water bodies.

Inorganic results for dissolved cations concentrations identified nine inorganic analytes at concentrations greater than detection limits; however, there were no concentrations of dissolved cations that exceeded established regulatory limits. Results of dissolved cation analyses are presented in Table 7.

3.4 Sediment Sampling Results

3.4.1 Acid Canyon

Ten sediment samples were collected throughout Acid Canyon as presented in Figure 6. The samples were analyzed for PCBs, total metals, total uranium, strontium-90, isotopic plutonium, and gamma spec. Analytical results obtained from these samples are presented in Tables 11 through 13.

PCB contamination was detected in Acid Canyon in the form of Aroclor-1254 in concentrations ranging from 37 µg/ℓ to 635 µg/ℓ; however, there were no detections exceeding EPA Region 6 residential soil standards. Detection limits of the Aroclors ranged from 34 to 44 µg/ℓ. Results of PCB analyses are presented in Table 12.

Inorganic analytical results for total metals identified fifteen analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the Acid Canyon sediment samples were analyzed for radiochemistry as specified by EPA. These radionuclides include plutonium-238, plutonium-239/240, strontium-90, cesium-137, actinium-228, americium-241, lead-210, lead-212, lead-214, potassium-40, thallium-208, and thorium-234. Seven out of the 11 samples collected for plutonium-239/240 analysis exhibited concentrations above EPA residential soil standards (2.5 pCi/g), ranging from 27.5 pCi/g to 184 p/g. Nine out of eleven samples taken were above background values established by LANL. Four out of eleven samples collected for cesium-137 analysis exhibited concentrations above background values established by LANL (.9 pCi/g) and were also above the EPA residential soil standard. Cesium-137 concentrations for these samples ranged from .93 pCi/g to 7.10 pCi/g. Six of the eleven samples collected for americium-241 analysis exhibited concentrations above EPA residential soil standards (1.9 pCi/g). Americium-241 concentrations detected for these samples ranged from 3.35 pCi/g to 29.3 pCi/g. One (20.7 pCi/l) out of eleven soil samples analyzed for Strontium 90 exceeded EPA residential soil standards (14 pCi/l). All of the samples collected for potassium-40 analysis exhibited concentrations above EPA soil standards, however, the established natural background concentration in soils at LANL for Potassium 40 is 38.6 pCi/g, which is above the EPA residential soil standard. Results of these analyses are summarized in Table 13. A comparison of preliminary analytical results of radionuclides collected by EPA, NMED, and LANL is presented in Appendix E.

3.4.2 Bayo Canyon

Four sediment samples were collected throughout Bayo Canyon and are presented in Figure 7. The samples collected from the canyon were analyzed for PCBs, total metals, total uranium, strontium-90, isotopic plutonium, isotopic uranium gross alpha/beta, and gamma spec. Analytical results obtained from these samples are presented in Tables 11 through 13.

Depending on the specific Aroclor, detection limits ranged from 32 to 34 µg/ℓ. Sediment sample BC-2 detected Aroclor-1260 at 39 µg/ℓ. No other PCBs were detected above the detection limits in the samples collected from Bayo Canyon. Results of these analyses are presented in Table 12.

Inorganic analytical results for total metals identified twelve analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the Bayo Canyon sediment samples were analyzed for radiochemistry as specified by EPA. These radionuclides include plutonium-238, plutonium-239/240, uranium-234, uranium-

235, uranium-238, strontium-90, gross alpha/beta, cesium-137, actinium-228, americium-241, lead-210, lead-212, lead-214, potassium-40, thallium-208, and thorium-234. All samples collected for cesium-137 and potassium-40 analysis exhibited concentrations above EPA residential soil standards; however, all of the detected concentrations were below the background values established by LANL. Results of these analyses are summarized in Table 13.

3.4.3 Sandia Canyon

Six sediment samples were collected throughout Sandia Canyon and are illustrated in Figure 8. The samples collected from the canyon were analyzed for PCBs, total metals, total uranium, isotopic uranium, and gross alpha/beta. Analytical results of these samples are presented in Tables 11 through 13.

PCB contamination in the form of Aroclor1260 was detected in Sandia Canyon. The concentrations ranged from 48 µg/ℓ to 140 µg/ℓ with detection limits ranging from 33 to 35 µg/ℓ. No other PCBs were detected above the detection limits in the samples collected from Sandia Canyon. Results of PCB analyses are presented in Table 12.

Inorganic analytical results for total metals identified twelve analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the Sandia Canyon sediment samples were analyzed for radiochemistry as specified by EPA. These radionuclides include Uranium-234, Uranium-235, Uranium-238, and Gross Alpha/Beta. None of the samples collected exceeded the background values established by LANL. Results of these analyses are summarized in Table 13.

3.4.4 Mortandad Canyon

Six sediment samples were collected throughout Mortandad Canyon and are presented in Figure 8. The samples collected from the canyon were analyzed for PCBs, total metals, total uranium, strontium-90, isotopic plutonium, isotopic uranium, gamma spec., and gross alpha/beta. Analytical results obtained from these samples are presented in Tables 11 through 13.

There were no PCBs above detection limits in the samples collected from Mortandad Canyon. The detection limits for samples from Mortandad Canyon ranged from 31 to 34 µg/ℓ. Results of PCB analysis are presented in Table 12.

Inorganic analytical results for total metals identified eleven analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the Mortandad Canyon sediment samples were analyzed for radiochemistry as specified by EPA. These radionuclides include plutonium-238, plutonium-239/240, uranium-234, uranium-235, uranium-238, strontium-90, gross alpha/beta, cesium-137, actinium-228, americium-241,

lead-210, lead-212, lead-214, potassium-40, thallium-208, and thorium-234. Two samples collected for plutonium-239/240 analysis exhibited concentrations above EPA residential soil standards and background values established by LANL. Plutonium-239/240 concentrations detected for these samples ranged from 67 pCi/g to 106 pCi/g. However, EPA believes that these two results were mistakenly switched by the analytical lab (contracted by Tech Law) with the two soil samples (ACS-12-1 and ACS-12-2) collected from Acid Canyon. Therefore, EPA believes that the plutonium-239/240 is not present in samples MC-5A & MC-5B at concentrations above EPA residential soil standards and background values established by LANL. Three samples collected for cesium-137 analysis exhibited concentrations above EPA residential soil standards. However, none of these samples collected for cesium-137 analysis exhibited concentrations above the background values established by LANL. Cesium-137 concentrations detected in these samples ranged from 0.124 pCi/g to 0.44 pCi/g. All of the samples collected for potassium-40 analysis exhibited concentrations above EPA residential soil standards; however, all of the detected concentrations were below the background values established by LANL. Results of these analyses are summarized in Table 13.

3.4.5 Cañada del Buey

Nine sediment samples were collected throughout Cañada del Buey and are illustrated in Figure 9. The samples collected from the canyon were analyzed for PCBs, total metals, total uranium, strontium-90, isotopic plutonium, isotopic uranium, gamma spec., and gross alpha/beta. Analytical results obtained from these samples are presented in Tables 11 through 13.

There were no PCBs above detection limits in the samples collected from Cañada del Buey. The detection limits for samples collected from Cañada del Buey ranged from 35 to 41 $\mu g/\ell$. Results of PCB analysis are presented in Table 12.

Inorganic analytical results for total metals identified thirteen analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the sediment samples at Cañada del Buey were analyzed for radiochemistry as specified by EPA. These radionuclides include plutonium-238, plutonium-239/240, uranium-234, uranium-235, uranium-238, strontium-90, gross alpha/beta, cesium-137, actinium-228, americium-241, lead-210, lead-212, lead-214, potassium-40, thallium-208, and thorium-234. Four samples collected for cesium-137 analysis and nine samples collected for potassium-40 analysis exhibited concentrations above EPA residential soil standards; however, all of the detected concentrations were below the background values established by LANL. Results of these analyses are summarized in Table 13.

3.4.6 Pajarito Canyon

Four sediment samples were collected throughout Pajarito Canyon and are shown in Figure 9. The samples collected from the canyon were analyzed for PCBs, total metals, total uranium,

strontium-90, isotopic plutonium, isotopic uranium, gamma spec., and gross alpha/beta. Analytical results obtained from these samples are presented in Tables 11 through 13.

There were no PCBs above detection limits in the samples collected from Pajarito Canyon. The detection limits for samples collected from Pajarito Canyon ranged from 32 to 38 µg/l. Results of PCB analysis are presented in Table 12.

Inorganic analytical results for total metals identified fifteen analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the sediment samples at Pajarito Canyon were analyzed for radiochemistry as specified by EPA. These radionuclides include plutonium-238, plutonium-239/240, uranium-234, uranium-235, uranium-238, strontium-90, gross alpha/beta, cesium-137, actinium-228, americium-241, lead-210, lead-212, lead-214, potassium-40, thallium-208, and thorium-234. Three samples collected for cesium-137 analysis and four samples collected for potassium-40 analysis exhibited concentrations above EPA residential soil standards; however, all of the detected concentrations were below the background values established by LANL. Results of these analyses are summarized in Table 13.

3.4.7 Ancho Canyon

Five sediment samples were collected throughout Ancho Canyon and are illustrated in Figure 10. The samples collected from the canyon were analyzed for PCBs, total metals, total uranium, strontium-90, isotopic plutonium, isotopic uranium, gamma spec., and gross alpha/beta. Analytical results obtained from these samples are presented in Tables 11 through 13.

There were no PCBs above detection limits in the samples collected from Ancho Canyon. The detection limits for samples collected from Ancho Canyon ranged from 31 to 34 µg/l. Results of PCB analysis are presented in Table 12.

Inorganic analytical results for total metals identified fifteen analytes at concentrations greater than the detection limits; however, none of the analytes were detected at concentrations above EPA residential soil standards. Results of inorganic analyses are presented in Table 11.

All of the sediment samples at Ancho Canyon were analyzed for radiochemistry as specified by EPA. These radionuclides include plutonium-238, plutonium-239/240, uranium-234, uranium-235, uranium-238, strontium-90, gross alpha/beta, cesium-137, actinium-228, americium-241, lead-210, lead-212, lead-214, potassium-40, thallium-208, and thorium-234. Five samples collected for cesium-137 analysis and five samples collected for potassium-40 analysis exhibited concentrations above EPA residential soil standards; however, all of the detected concentrations were below the background values established by LANL. Results of these analyses are summarized in Table 13.

4.0 QUALITY ASSURANCE SUMMARY

4.1 Quality Assurance/Quality Control Samples

Data Quality Objectives (DQOs) for this work assignment required that certain quality control (QC) samples be collected during the sampling activities conducted for this work assignment. The types of QC samples collected included field duplicate samples, field blank samples, matrix spike/matrix spike duplicate samples, equipment blanks, and trip blanks. Dependent on the location sampled, QC samples were analyzed for VOCs, total metals, dissolved metals, general chemistry, dissolved uranium isotopes, dissolved strontium-90, gross alpha, gross beta, stable nitrogen isotopes, and tritium.

Field Duplicate Samples

The purpose of the field duplicate samples is to verify laboratory analytical procedures and sampling techniques. Two field duplicate samples were collected of groundwater, one in Mortandad Canyon (MCO-1) and one (SD-30) in TA-3 behind building SM-30 at 03-MW-1. These samples were collected concurrently with samples MCO-3 and SM-30 by alternating the filling sample containers. The sample containers were filled slowly to avoid aeration. These samples were handled in an identical manner as the corresponding sample. The sample containers were placed in a sample cooler to maintain the samples at approximately 4°C. The samples were secured and stored inside the sample cooler until reaching the NMED White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis.

Four field duplicates samples were collected of sediment. ACS-18-3 was collected as a duplicate of ACS-18-1, BC-5 was collected as a duplicate of BC-2, CC-9 was collected as a duplicate of CC-2, and PC-5 was collected as a duplicate of PC-2. These samples were collected concurrently with its corresponding sample by alternating the filling sample containers. These samples were handled in an identical manner as the corresponding sample. The sample containers were placed in a sample cooler which contained ice in order to maintain the samples at approximately 4°C. The samples were secured and stored inside the sample cooler until shipped to the analytical laboratory for analysis.

Field Blank Samples

The purpose of the field blank samples was to check for contamination resulting from ambient conditions. Two field blank samples (MCO-FB and FB-6.7) were collected during the sampling operations conducted at the LANL facility. These samples were collected by pouring reagent grade water into appropriate sample containers. The sample containers were filled slowly to avoid aeration. The samples were secured and stored inside the sample cooler until reaching the NMED White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis.

Matrix Spike/Matrix Spike Duplicate Samples

These samples were collected to ensure that the laboratory had sufficient volume of sample material to conduct matrix spike and matrix spike duplicate sample analysis for QC purposes. Three matrix spike/matrix spike duplicate samples were collected for groundwater and surface water during the sampling operations conducted at the LANL facility. These samples were collected by filling one extra sample container for each analytical parameter. The locations where these samples were collected were MCO-5, TA-18, and SM-30. The samples were secured and stored inside the sample cooler until reaching the NMED White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis.

Four matrix spike/matrix spike duplicate samples were collected for sediment during the sampling operations conducted at the LANL facility. These samples were collected by filling one extra sample container for total metals and PCB analyses. The locations where these samples were collected were ACS-4S, SC-6, CC-4, and AC-5. The samples were secured and stored inside the sample cooler until reaching the NMED White Rock Office where they were transferred to a sample storage refrigerator. The samples were packed in coolers containing ice and shipped to the analytical laboratory for analysis.

Trip Blank Samples

The purpose of the trip blank samples was to detect the presence of contaminants that may have been introduced to samples during transport and storage. All trip blanks were pre-prepared by the analytical laboratory and shipped to the sampling team at the LANL facility. One trip blank sample was submitted to the analytical laboratory. The trip blank sample was placed inside the sample cooler shipped to the laboratory which contained sample(s) to be analyzed for VOCs.

Equipment Rinsate Blanks

The purpose of the equipment rinsate blank is to measure the efficiency of the decontamination process. Three equipment rinsate blanks were collected after sampling equipment was used and decontaminated. These samples were collected by using the rinsate to fill one extra container for each analytical parameter. The samples were labeled as ACS-EB, CC-EB, and AC-EB.

4.2 Deviations from the Field Sampling Plan

Deviations from the Field Sampling Plan occurred during the sampling activities. Following are the specific deviations that occurred.

- Only two field duplicate samples were collected for groundwater instead of the three samples required because of dry and low yielding groundwater wells and slow recovery rates. The Field Sampling Plan required one field duplicate sample to be collected for every ten samples collected (10%).

- Only four field duplicate samples were collected for sediment instead of the five samples required. The Field Sampling Plan required one field duplicate sample to be collected for every ten samples collected (10%).

- Only two field blank samples were collected instead of the seven samples required because of a lack of reagent grade water. The Field Sampling Plan required one field blank sample to be collected for every ten samples collected (10%).

- Only four matrix spike/matrix spike duplicate samples were collected for sediment instead of the five samples required. The Field Sampling Plan required one matrix spike/matrix spike duplicate sample to be collected for every ten samples collected (10%).

4.3 Laboratory and Analytical Methods

The analyses were performed by four separate laboratories: Quanterra Laboratory in Earth City, Missouri, Southwest Laboratories in Oklahoma, Coastal Science Laboratories, Inc. in Austin, Texas, and American Analytical and Technical Services, Inc. located in Baton Rouge, Louisiana.

The following identifies the analyses, analytical methods used, and the corresponding laboratory performing the analyses.

Parameter	Method Number	Laboratory
Chloride	EPA 300.0	Southwest-Oklahoma
Fluoride	EPA 300.0	Southwest-Oklahoma
Sulfate	EPA 300.0	Southwest-Oklahoma
Bicarbonate Alkalinity	EPA 300.0	Southwest-Oklahoma
Metals (Total & Mercury)	SW-846 6010B/7470	Southwest-Oklahoma
Ammonia Nitrogen	EPA 350.3	Southwest-Oklahoma
Nitrate/Nitrite Nitrogen	EPA 353.2	Southwest-Oklahoma
Total Kjedahl Nitrogen	EPA 351.3	Southwest-Oklahoma
Total Phosphorous	EPA 365.2	Southwest-Oklahoma
Volatile Organic Compounds	SW-846 8260B	Southwest-Oklahoma
PCBs	SW-846 8082A	Southwest-Oklahoma
Gamma Spec.	EPA 901.1	Quanterra-Earth City
Gross Alpha/Beta	EPA 900.0	Quanterra-Earth City
Isotopic Plutonium	EPA 908.0	Quanterra-Earth City
Isotopic Uranium	EPA 908.0	Quanterra-Earth City
Strontium-90	ASTM 05811-95	Quanterra-Earth City
Tritium	EPA 906.0	Quanterra-Earth City
Stable Nitrogen Isotopes	Isotopic Speciation	Coastal Laboratories
Perchlorate	EPA 300	American Analytical

4.4 Data Validation

All analytical results and corresponding data were provided by the analytical laboratories in Contract Laboratory Program (CLP)-like data packages. Upon receipt of these data packages, TechLaw staff performed a quality control check to ensure that all of the elements required in a CLP-like data package were present. Elements of a CLP-like data package include but are not limited to case narratives, sample results, calibration data, instrument tuning data, instrument printouts, QC summary forms, raw data and blank data.

Analytical data received by TechLaw will be transferred to EPA Region 6 for validation. The analytical data reported in this report has not been validated and should be treated as such.

2969 • 1030 • 1103

5.0 CONCLUSIONS

5.1 Sampling Activities

TechLaw sampled effluent, groundwater monitoring and drinking water production wells, and springs and spring-fed surface water located on and off of LANL property from December 6 to December 17, 1999. TechLaw also collected sediment samples in Acid Canyon, Sandia Canyon, Bayo Canyon, Mortandad Canyon, Cañada del Buey, Pajarito Canyon, and Ancho Canyon. NMED OB and LANL personnel collected split samples at various sample locations during the field activities.

During the sampling event, LANL provided equipment and personnel necessary for obtaining samples of effluent, groundwater, sediment, and springs. Equipment included electronic water level indicators, pumps, pump controllers, electrical battery, instruments used to measure field parameters, and sediment sieves. The LANL field team measured the depth to groundwater in each well using an electronic water level indicator. The LANL team measured the depth of groundwater to the top of the well casing. In general, sampling activities conformed with accepted EPA sampling procedures.

5.2 Analytical Results

Analytical results are presented in Table 5 through Table 13. Tables comparing analytical results from split samples collected during the field activities are presented in Appendix E. These tables compare the analytical results of split samples collected by NMED and LANL personnel to the EPA results. The tables also include various water quality standards, guidelines, and limits established by EPA, NMED, and DOE. A description of the EPA, NMED, and DOE water quality standards, guidelines, and limits used for comparison is included in Appendix D.

5.2.1 Effluent Samples

Analytical results from effluent samples collected at GS-1 indicate the effluent from the TA-50 Radioactive Wastewater Treatment Plant had a strontium-90 concentration of 11pCi/ℓ which exceeds the 8 pCi/ℓ limit established by EPA for drinking water. However, radionuclides identified under the Atomic Energy Act, are currently excluded from EPA regulation. However, the newly issued EPA discharge permit does require LANL to sample for tritium.

Also, perchlorate was found in the effluent sample at 1,500 μg/ℓ. The provisionary EPA standard for drinking water is currently 4-18 μg/ℓ. Perchlorate was not analyzed by EPA in the 1998 effluent samples. In addition, it should be pointed out that the EPA perchlorate samples contained higher concentrations than the sample results obtained by LANL and NMED, which generally range from 25-500 μg/ℓ. However, perchlorate still exists in the discharged effluent at concentrations above the EPA provisionary drinking water standard. EPA intends to collect additional effluent samples in 2001.

5.2.2 Groundwater Samples

Analytical results from groundwater samples collected during the sampling event were compared to various water quality standards, guidelines, and limits established by EPA, NMED, and DOE. Trends in the groundwater quality within Mortandad Canyon, and Pajarito Canyon were identified and are discussed below.

- Elevated nitrate/nitrite as nitrogen concentrations (11.4 mg/ℓ to 24.5 mg/ℓ) within the alluvial aquifer of Mortandad Canyon were identified. These elevated concentrations are above the New Mexico Maximum Contaminant Level (10 mg/ℓ) and are attributable to past effluent discharges from the TA-50 Radioactive Wastewater Treatment Plant (WWTP).

- Elevated total cadmium was identified in one of the seven of the monitoring wells sampled from the alluvial aquifer in Mortandad Canyon. This concentration (7.6µg/ℓ) was slightly above the EPA and NMED drinking water standard (5ug//l). Cadmium was not analyzed in the 1998 EPA sampling event.

- Elevated total thallium concentrations (2.4 µg/ℓ to 5.4 µg/ℓ) within the alluvial aquifer of Mortandad Canyon were identified. Analytical results reveal that the concentrations are slightly above the EPA and NMED drinking water standard of 2µg/ℓ. Thallium was not analyzed in the 1998 EPA sampling event.

- Elevated tritium concentrations were detected in monitoring well MT-4 which exceeded the EPA and NMED drinking water standard (20,000 pCi/l). Adjacent wells also contain elevated tritium levels above background which can be attributed to the TA-50 wastewater releases.

- Elevated strontium-90 concentrations (44.6 pCi/ℓ to 84 pCi/ℓ) within the alluvial aquifer of Mortandad Canyon were identified in 3 of the 7 monitoring wells. These concentrations were above the EPA and NMED drinking water standard (8 pCi/l), as well as the DOE standard for drinking water systems (40 pCi/l). These elevated concentrations are a result of the TA-50 effluent discharges.

- Perchlorate was found in all of the alluvial monitoring wells (except MCO-2, which is hydraulically upgradient of the effluent discharge) in Mortandad Canyon. The concentrations ranged from 1,100 µg/ℓ to 4,400 µg/ℓ. The EPA provisionary drinking water standard is 4-18 µg/ℓ. As was the case with the effluent result, it appears that the EPA analytical results may be high in comparison to the results obtained by NMED and LANL. LANL and NMED perchlorate results over the past year have generally ranged from 50 µg/ℓ to 450 µg/ℓ in the alluvial monitoring wells, which exceeds the EPA provisionary drinking water standard.

5.2.3 Spring and Surface Water Samples

Analytical results of spring samples collected from Pajarito Canyon revealed no elevated contaminant levels of any analytes above regulatory limits.

5.2.4 Sediment Samples

Analytical results from sediment samples collected from Acid Canyon, Sandia Canyon, Bayo Canyon, Mortandad Canyon, Cañada del Buey, Pajarito Canyon, and Ancho Canyon contained radionuclides which exceeded EPA residential soil standards. However, only Acid Canyon had radionuclides exceedances which can be attributed to LANL operations. The radionuclides found in the other canyons are found naturally in the soils surrounding LANL and are within the established background concentrations for those radionuclides.

- Acid Canyon contained radionuclides with levels above the EPA residential soil standards. These radionuclides include plutonium-239/240 (27.5 pCi/g to 184 pCi/g), cesium-137 (0.079 pCi/g to 7.10 pCi/g), americium-241 (3.30 pCi/g to 29.3 pCi/g), lead-210 (1.55 pCi/g to 2.4 pCi/g), and potassium-40 (26.0 pCi/g to 32.7 pCi/g). However, it should be noted that lead-210 and potassium-40 are radionuclides found in nature with the concentrations being lower than established background concentrations.

- Sandia Canyon contained one radionuclide, uranium-235, which was above the EPA residential soil standard at a concentration of 0.16 pCi/g; however, the concentration found was below the LANL established background concentration of 0.2 pCi/g.

- Bayo Canyon contained three radionuclides which exceeded the EPA residential soil standards. These radionuclides include cesium-137 (0.06 pCi/g to 0.83 pCi/g), lead-210 (1.9 pCi/g to 4.0 pCi/g), and potassium-40 (26.8 pCi/g to 32.6 pCi/g; however, the concentrations found were below the LANL established background concentrations for those radionuclides.

- Mortandad Canyon contained four radionuclides which exceeded the EPA residential soil standards. These radionuclides include plutonium 239/240 (67 pCi/g to 106 pCi/g), cesium-137 (0.124 pCi/g to 0.44 pCi/g), lead-210 (1.5 pCi/g to 3.7 pCi/g), and potassium-40 (26.9 pCi/g to 32.8 pCi/g). In regard to the plutonium exceedances, after carefully reviewing the results from Acid Canyon and Mortandad Canyon and comparing the results with samples collected by NMED and LANL, EPA believes that the plutonium results were mistakenly switched (by the analytical laboratory) with the two plutonium results collected from Acid Canyon, samples ASC-12-1 and ASC-12-2. In addition, NMED OB personnel re-sampled Station MC-5A on December 29, 2000. Results from this re-sampling indicate that concentrations of plutonium-239/240, plutonium-238, cesium-137, strontium-90, and americium-241 are at or below the LANL established background concentrations.

- Cañada del Buey contained three radionuclides which were above the EPA residential soil standards. These radionuclides include cesium-137 (0.10 pCi/g to 0.21 pCi/g), lead-210 (1.5 pCi/g to 3.8 pCi/g), and potassium-40 (21.0 pCi/g to 35.7 pCi/g). However, for cesium-137 and potassium-40 the results were below the established background concentrations at LANL for those radionuclides.

- Pajarito Canyon contained three radionuclides which were above the EPA residential soil standard. These radionuclides include cesium-137 (0.052 pCi/g to 0.41 pCi/g), lead-210 (2.5 pCi/g to 3.4 pCi/g), and potassium-40 (20.1 pCi/g to 25.3 pCi/g). However, for cesium-137 and potassium-40 the results are below the established background concentrations at LANL for those constituents.

- Ancho Canyon contained three radionuclides which were above the EPA residential soil standards. These radionuclides include cesium-137 (0.16 pCi/g to 0.39 pCi/g), lead-210 (2.9 pCi/g to 4.2 pCi/g), and potassium-40 (22.2 pCi/g to 29.9 pCi/g). However, the cesium-137 and potassium-40 results are within the LANL established background concentrations for those radionuclides.

5.2.5 Drinking Water Production Wells

Four production/drinking water wells were sampled: PM-1, PM-2, PM-5 and O-4. None of the wells contained radionuclides or hazardous constituents above EPA drinking water standards. However, two wells had organic constituents detected slightly below the EPA drinking water standards.

- Production well PM-2 had three volatile organics detected above the analytical detection limit but below EPA drinking water standards. They are: 1,2-dichloroethane at 6 μg/ℓ with a EPA drinking water standard of 7 μg/ℓ; trichloroethene at 4 μg/ℓ with a EPA drinking water standard of 5 μg/ℓ; 4-methyl-2-pentanone at 26 μg/ℓ, there is currently no EPA drinking water standard for this constituent, but there is a EPA media specific screening level number of 160 μg/ℓ.

- Production well PM-5 had three volatile organics detected above the analytical detection limit but below EPA drinking water standards. They are: 1,2-dichloroethane at 5 μg/ℓ with a EPA drinking water standard of 7 μg/ℓ; trichloroethene at 3 μg/ℓ with a EPA drinking water standard of 5 μg/ℓ; 4-methyl-2-pentanone at 24 μg/ℓ, there is currently no EPA drinking water standard for this constituent, but there is a EPA media specific screening level number of 160 μg/ℓ.

5.2.6 Technical Area 3 Monitoring Well

One groundwater well (03-MW-1) located behind building SM-30 in TA-3 was sampled. The well contained hazardous constituents above the EPA drinking water standards and had elevated tritium above background levels.

- The following volatile organics were detected above EPA drinking water standards: 1,1-dichloroethene at 510 $\mu g/\ell$ with an EPA drinking water standard of 7 $\mu g/\ell$; 1,2-dichloroethene at 120 $\mu g/\ell$ with an EPA media specific screening level of 61 $\mu g/\ell$;trichloroethane at 22,000 $\mu g/\ell$ with an EPA drinking water standard of 200 $\mu g/\ell$; 1,2-dichloroethane at 200 $\mu g/\ell$ with an EPA drinking water standard of 5 $\mu g/\ell$; and, trichloroethene at 300 $\mu g/\ell$ with an EPA drinking water standard of 5 $\mu g/\ell$. Also, 1,1-dichloroethane was found at 340 $\mu g/\ell$, which is below the EPA media specific screening level of 810 $\mu g/\ell$.

- Tritium was detected at 1,804 pCi/ℓ which is below the EPA drinking water standard but above background levels.

THIS PAGE INTENTIONALLY LEFT BLANK

6.0 RECOMMENDATIONS

In general, the alluvial groundwater in Mortandad Canyon exceeded the EPA drinking water standards (known as MCL's) for strontium-90, nitrates, and perchlorate. Perchlorate was not analyzed in the 1998 sampling event conducted by EPA (TechLaw); however, it is likely that the contaminant has been present for several years. The major source of the contamination is the TA-50 Radioactive Wastewater Treatment Plant, which as been in operation since the mid 1960's. Currently, the groundwater from the alluvial aquifer is not being used for drinking water and therefore no human exposure is occurring. However, there is evidence suggesting that groundwater in the alluvial aquifer is migrating downward towards intermediate perched aquifers and potentially to the main aquifer. Recent laboratory data from LANL found perchlorate in well R-15 in a perched zone (646 ft bgs) at 12 µg/l. The monitoring well TW-8, which is screened in the main aquifer, did not detect radionuclide or chemical contamination above EPA drinking water standards; however, NMED and LANL low-level tritium results (elevated levels, but well below EPA's standard of 20,000 pCi/l) for TW-8 do suggest that tritium-contaminated shallow groundwater communicates (or is in communication) with the regional aquifer.

The shallow groundwater near building SM-30 in TA-3 exceeded the EPA drinking water standards for several chlorinated volatile organic constituents. The constituents are: 1,1-dichloroethene, 1,2 dichloroethene, chloroform, trichloroethane, 1,2-dichloroethane, and trichloroethene. The vertical and horizontal extent of the groundwater contamination in this area has not been determined.

Four production/drinking water wells were sampled and none of the wells contained radionuclides or hazardous constituents above EPA drinking water standards. However, two wells (PM-2 & PM-5) had chlorinated volatile organic constituents detected slightly below the EPA drinking water standards.

The springs and surface water bodies sampled in Pajarito watershed contained no chemical constituents above EPA drinking water standards.

The south fork of Acid Canyon contained three radionuclides with levels above the EPA residential soil standards. These radionuclides include: plutonium-239/240, cesium-137, and americium-241. The source of this contamination was a former LANL outfall that released untreated radioactive waste in the late 1940's. This area was partially excavated by DOE in 1960's and 1970's. Acid Canyon is currently owned by Los Alamos County.

The following are EPA recommendations pertaining to the sampling performed at LANL in December of 1999:

- LANL should minimize the amount of perchlorate waste being sent to the TA-50 Wastewater Treatment Plant and continue the minimization of radioactive waste. Perchlorate is very persistent and mobile in water and is similar to tritium in migration characteristics and is very difficult to remove. The current treatment technology at TA-

50, which is reverse osmosis, still contains perchlorate in the effluent at 24 $\mu g/l$ or greater. If LANL cannot reduce the concentration of perchlorate being released, then it may be necessary to add an additional treatment unit to the existing system. The EPA web site for perchlorate is www.epa.gov/ogwdw/ccl/perchlor/.html.

- LANL should perform "hot spot" removals of soils/sediments in the south fork of Acid Canyon. Removals should be based on cumulative radionuclide risk per "hot spot" using a drainage hiker scenario. At a minimum, the remaining risk levels in the soil should be no greater than 10^{-4} to 10^{-5} risk per "hot spot" location. Furthermore, consultation with NMED, Los Alamos County and the general public on the amount of soil removed and the radionuclide concentration left in place at the "hot spots" is recommended.

- The vertical and horizontal extent of soil and groundwater contamination behind building SM-30 at TA-3 needs to be addressed. Even though there was a removal of contaminated soil in the mid-1990's, monitoring well 03-MW-1 still has significant VOC contamination and there are uncertainties regarding groundwater flow and the extent of soil/groundwater contamination in this area.

- Continued characterization (lateral & vertical extent of groundwater) and monitoring of the aquifers in Mortandad Canyon is needed to understand the flow regimes and interconnection of the alluvial system with the intermediate and main aquifers. Also, LANL should work closely with NMED on groundwater models being developed at the lab.

- Periodic monitoring of the drinking water wells for chlorinated volatile organics should be continued. Low levels were detected in wells PM-2 and PM-5. Additional monitoring should verify whether the contaminants detected by EPA sampling are actually present.

7.0 REFERENCES

Daniel B. Stevens & Associates, Inc. September 1998. Report on Alluvial Well Completions 1996-1998.

Los Alamos National Laboratory. June 1994. National Pollutant Discharge Elimination System Permit No. NM0028355.

Los Alamos National Laboratory. January 1995. Geologic and Hydrologic Records of Observation Wells, Test Holes, Test Wells, Supply Wells, Springs, and Surface Water Stations in the Los Alamos Area.

Los Alamos National Laboratory. September 1997. Environmental Surveillance and Compliance at Los Alamos during 1996.

New Mexico Environment Department. January 1995. New Mexico Environment Department Drinking Water Regulations.

New Mexico Water Quality Control Commission Regulations. January 1995. State of New Mexico Standards for Interstate and Intrastate Streams.

State of New Mexico. November 1996. New Mexico Water Quality Control Commission Regulations.

U.S. Department of Energy. January 7, 1993. DOE Order 5400.5 - Radiation Protection of the Public and the Environment.

U.S. Environmental Protection Agency, Region 6. July 1999. EPA Region 6, Human Health Media-Specific Screening Levels.

U.S. Environmental Protection Agency. 1986. Test Methods for Evaluating Solid Waste, Third Edition. SW-846. U.S. EPA, Washington, D.C. September 1986 (and updates in July 1992; September 1994; January 1995; June 1997).

U.S. Environmental Protection Agency. October 1996. Drinking Water Regulations and Health Advisories. EPA 822-B-96-002.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLES

TABLE 1: Participants

Representative/Associated Agency	Name
U.S. Environmental Protection Agency, Region 6	Rich Mayer, Work Assignment Manager
Los Alamos National Laboratory	David Rogers
	Max Maes
	Consuelo Montoya
	Danny Katzman
	Steve Reneau
	Bill Turney
	Harvey Decker
New Mexico Environment Department	Steve Yanicak, Oversight Bureau
	Michael Dale, Oversight Bureau
	Bob Wingo, Oversight Bureau
	Chris Hanlon-Meyer
	Bruce Wedgeworth
San Ildefonso Pueblo Department of Environmental and Cultural Preservation	Naomi Archuleta, Pueblo water quality
	Noah Kaniatobe, Pueblo GIS tech
TechLaw, Inc.	Bret Kendrick, Project Manager
	Jim Housley
Program Management Company (PMC)	Steve Calhoun
	Deborah Steven
Aurora Technical Service (ATS)	Jenny Harris

TABLE 2: Well Location and Time Sampled

Well No.	Location	Aquifer Monitored	Date Sampled	Time Sampled (hours)
MCO-2	Mortandad Canyon	Alluvial Aquifer	12/07/99	1530
MCO-3	Mortandad Canyon	Alluvial Aquifer	12/07/99	1400
MCO-5	Mortandad Canyon	Alluvial Aquifer	12/08/99	1045
MCO-6	Mortandad Canyon	Alluvial Aquifer	12/08/99	1200
MCO-7	Mortandad Canyon	Alluvial Aquifer	12/08/99	1350
MCWB-7.7B	Mortandad Canyon	Alluvial Aquifer	12/08/99	1510
MT-1	Mortandad Canyon	Alluvial Aquifer	12/07/99	1105
TW-8	Mortandad Canyon	Regional Aquifer	12/08/99	1545
PM-1	Pajarito Mesa	Regional Aquifer	12/13/99	2011
PM-2	Pajarito Mesa	Regional Aquifer	12/13/99	1550
PM-5	Pajarito Mesa	Regional Aquifer	12/13/99	1510
O-1	Pajarito Mesa	Regional Aquifer	12/13/99	2040
SM-30	Technical Area-3	Perched Aquifer	12/17/99	1210

TABLE 3: Summary of Well Information

Well No	Location	Date Sampled	Water Level (feet)	Total Well Depth (feet)	Calculated Purge Volume (gallons)	Volume Purged (gallons)	Purge/Sample Method	Comments
MCO 2	Mortandad Canyon	12/07/99	6.35	9.25	0.45	3.94	Peristaltic Pump	None
MCO-3	Mortandad Canyon	12/07/99	5.95	10.83	7	7.91	Peristaltic Pump	None
MCO-5	Mortandad Canyon	12/08/99	26.20	46.00	22.50	9.94	Dedicated Bladder Pump	Sampled after first well volume purged and parameters stable.
MCO 6	Mortandad Canyon	12/08/99	39.00	47.00	13.86	9.92	Dedicated Bladder Pump	Sampled after first well volume purged and parameters stable.
MCO-7	Mortandad Canyon	12/8/99	41.73	69.00	10.36	14.05	Dedicated Bladder Pump	Sampled after first well volume purged and parameters stable.
MCWB-7.7B	Mortandad Canyon	12/08/99	60.08	70.00	3.76	9.46	Dedicated Bladder Pump	Sampled after first well volume purged and parameters stable.
MT-4	Mortandad Canyon	12/07/99	59.61	75.34	2.34	10.69	Dedicated Bladder Pump	Sampled after first well volume purged and parameters stable
TW-8	Mortandad Canyon	12/08/99	NA	1065	NC	530	Dedicated Pump	Well was purged continuously for 7 hours and 6 minutes at 1 liter every 6 seconds
SM-30	Technical Area-3	12/17/99	22.27	NA	NC	6.74	Peristaltic Pump	Well was developed on 12/13/99.

NA Information not available
NC Not Calculated

UNI • 9909O4 • 9909

TABLE 4: Field Parameter Measurements

Well No.	Location	Water Quality Parameter				
		pH[a]	Temperature[b]	Dissolved Oxygen[c]	Specific Conductivity[d]	Turbidity[e]
MCO-2	Mortandad Canyon	7.66	8.2	0.20	0.242	15
MCO-3	Mortandad Canyon	6.17	4.2	NA	563	NA
MCO-5	Mortandad Canyon	6.97	7.3	NA	0.400	1
MCO-6	Mortandad Canyon	7.06	7.8	NA	0.413	1
MCO-7	Mortandad Canyon	6.92	8.5	NA	0.509	5.10
MCWB-7.7B	Mortandad Canyon	6.94	9.0	NA	0.509	0
MT-4	Mortandad Canyon	6.34	10.4	NA	560	NA
TW-8	Mortandad Canyon	7.70	17.0	NA	0.112	1
SM-10	Technical Area-3	5.89	13.3	2.21	0.149	4

a pH measured in standard units.
b Temperature measured in degrees Celcius (°C).
c Dissolved oxygen measured in milligrams per liter (mg/l)
d Specific conductivity measured in milli-Seimens per centimeter (mS/cm).
e Turbidity measured in national turbidity units (NTUs)
NA Not available due to instrument limitations.

TABLE 5: Summary of Preliminary Analytical Results for Water Samples - Volatile Organic Compounds
Los Alamos National Laboratory, New Mexico

Compound	Sample Location, Result, and Date Collected								
	Reference				Regional Aquifer (Production Wells)		TA-3 Building SM-30		QA/QC
	EPA MCL[a]	EPA MSSL[b]	NM MCL[c]	NM WQCC[d]	PM-2 (12/13/99)	PM-5 (12/13/99)	SM-30 (12/17/99)	SD-30[e] (12/17/99)	Trip Blank
Chloromethane		1.5			<5	<5	<100	<100	<5
Vinyl Chloride	2	0.02	2	1	<5	<5	<100	<100	<5
Bromomethane		8.7			<5	<5	<100	<100	<5
Chloroethane					<5	<5	<100	<100	<5
1,1-Dichloroethene	7	0.046	7	5	<5	<5	510	<100	<5
Acetone		610			<5	<5	<100	<100	<5
Carbon Disulfide		1000			<5	<5	<100	<100	<5
Methylene Chloride		4.3		100	<5	<5	<100	<100	<5
1,1-Dichloroethane		810		25	<5	<5	340	<100	<5
1,2-Dichloroethene	7	61			6	5	120	110	<5
2-Butanone		1900			<5	<5	<100	<100	<5
Chloroform		0.16		100	<5	<5	47 J	<100	<5
1,1,1-Trichloroethane	200	790	200	60	<5	<5	22000 E	1200	<5
Carbon Tetrachloride	5	0.17	5	10	<5	<5	<100	<100	<5
Benzene	5	0.42	5	10	<5	<5	<100	<100	<5
1,2-Dichloroethane	5	0.12	5	10	<5	<5	200	<100	<5
Trichloroethene	5	1.6	5	100	4 J	3 J	310	82 J	<5
1,2-Dichloropropane	5	0.16	5		<5	<5	<100	<100	<5
Bromodichloromethane		0.18			<5	<5	<100	<100	<5
cis-1,3-Dichloropropene		0.081			<5	<5	<100	<100	<5
4-Methyl-2-Pentanone		160			26 B	24 B	<100	93000 BE	<5
Toluene	1000	720	1000	750	<5	<5	<100	<100	<5
trans-1,3-Dichloropropene		0.081			<5	<5	<100	<100	<5
1,1,2-Trichoroethane	5	0.2	5	10	<5	<5	<100	<100	<5
Tetrachloroethene	5	1.1	5	20	1 J	3 J	50 J	<100	<5

TABLE 5
(continued)

Compound	Sample Location, Result, and Date Collected								
	Reference				Regional Aquifer (Production Wells)		TA-3 Building SM-30		QA/QC
	EPA MCL[a]	EPA MSSL[b]	NM MCL[c]	NM WQCC[d]	PM-2 (12/13/99)	PM-5 (12/13/99)	SM-30 (12/17/99)	SD-30[e] (12/17/99)	Trip Blank
2-Hexanone					<5	<5	<100	<100	<5
Dibromochloromethane		0.13			<5	<5	<100	<100	<5
Chlorobenzene	100	39			<5	<5	<100	<100	<5
Ethylbenzene	700	1300	700	750	<5	<5	<100	<100	<5
Xylene (total)	10000	1400	10000	620	<5	<5	<100	<100	<5
Styrene	100	1600	100		<5	<5	<100	480	<5
Bromoform		8.5			<5	<5	<100	<100	<5
1,1,2,2-Tetrachloroethane		0.055		10	<5	<5	<100	<100	<5

* All results are reported in micrograms per liter (µg/ℓ).
a EPA Maximum Contaminant Levels (EPA MCL) for inorganic chemicals in the water supply.
b EPA Region 6 Human Health Medium-Specific Screening Levels (EPA MSSL) for chemicals in tap water (June 1999).
c New Mexico Maximum Contaminant Levels (NM MCL) for chemicals in community and nontransient, non-community water systems.
d New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/ℓ total dissolved solids (TDS) concentration or less.
e Duplicate sample of SM-30.

B The compound was detected in the associated blank as well as the sample.
E The reported value is estimated because the concentration exceeded the calibration range of the instrument.
J The reported value is estimated.

TABLE 6: Summary of Preliminary Analytical Results for Water Samples - Total Metals[a]
Los Alamos National Laboratory, New Mexico

Analyte	Sample Location, Result, and Date											
	Reference					Mortandad Canyon						
	NPDES Limits[b]	EPA MCL[b]	EPA MSSL[c]	NM MCL[d]	NM WQCC[e]	MCO-1[f] (12/7/99)	MCO-2 (12/7/99)	MCO-3 (12/7/99)	MCO-5 (12/8/99)	MCO-6 (12/8/99)	MCO-7 (12/8/99)	MCWB-7.7B (12/8/99)
Antimony		6	15			<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic	40	50	0.045	50	100	3.3 B	13.4	<3.3	<3.3	<3.3	<3.3	<3.3
Barium		2000	2600		1000	48.6	121	49.5	92.4	87.0	237	149
Beryllium		4	73	4		<0.30	0.65 B	<0.30	<0.30	<0.30	<0.30	<0.30
Cadmium	200	5	18	5	10	0.54 B	<0.30	0.85 B	0.46 B	0.92 B	7.6	<0.30
Cobalt	1000		2200		50	<1.7	2.2 B	<1.7	<1.7	<1.7	<1.7	<1.7
Copper	1600	1300	1400		1000	10.2 B	6.0 B	10.0 B	2.4 B	2.7 B	1.2 B	<1.0
Lead	400	15	15		50	<2.1	<2.1	<2.1	<2.1	2.4 B	<2.1	<2.1
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nickel			730	100	200	10 B	8.0 B	10.3 B	8.2 B	9.3 B	7.8 B	5.2
Selenium	50	50	180	50	50	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9
Silver			180		50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium		2		2		3.0 B	2.6 B	5.4 B	<2.3	2.4 B	2.7 B	<2.3
Uranium					5000	19.2 B	21.2 B	16.7 B	<10.5	21.2 B	20.0 B	NA
Vanadium	100		260			<0.90	2.8 B	<0.90	<0.90	<0.90	2.4 B	1.3 B
Zinc	95400		11000		10000	15.5 B	14.5 B	16.9 B	4.7 B	11.9 B	7.8 B	5.3 BE

TABLE 6
(continued)

Analyte	Sample Location, Result, and Date											
	Reference					Mortandad Canyon			Regional Aquifer (Production Wells)			
	NPDES Limit	EPA MCL	EPA MSSL	NM MCL	NM WQCC	MT-4 (12/7/99)	TW-8 (12/8/99)	GS-1 (12/9/99)	PM-1 (12/13/99)	PM-2 (12/13/99)	PM-5 (12/13/99)	O-4 (12/13/99)
Antimony		6				<5.0	<5.0	<5.0	NA	NA	NA	NA
Arsenic	40	50	0.045	50	100	<3.3	<3.3	<3.3	<3.3	NA	NA	<3.3
Barium		2000	2600		1000	139	6.9 B	28.0	NA	24.0 B	29.0	NA
Beryllium		4	73	4		<0.30	<0.30	<0.30	NA	NA	NA	NA
Cadmium	200	5	18	5	10	0.92 B	<0.30	0.90 B	NA	NA	NA	NA
Cobalt	1000		2200		50	<1.7	<1.7	<1.7	NA	NA	NA	NA
Copper	1000	1300	1400		1000	2.5 B	<1.0	19.0 B	NA	NA	NA	NA
Lead	400	15	15		50	<2.1	4.4	<2.1	NA	NA	NA	NA
Mercury	10	2	11	2	2	<0.10	<0.10	<0.10	NA	NA	NA	NA
Nickel			730	100	200	6.1 B	<0.80	3.8 0	NA	NA	NA	NA
Selenium	50	50	180	50	50	<2.9	<2.9	<2.9	NA	NA	NA	NA
Silver			180		50	<2.0	<2.0	<2.0	NA	NA	NA	NA
Thallium		2		2		3.1 B	<2.3	<2.3	NA	NA	NA	NA
Uranium					5000	27.4 B	NA	NA	<10.5	NA	NA	<10.5
Vanadium	100		260			1.2 B	5.5 B	2.5 B	NA	NA	NA	NA
Zinc	95400		11000		10000	6.9 B	468 E	273 E	NA	NA	NA	NA

TABLE 6
(continued)

Analyte	Sample Location, Result, and Date					
	Reference					QA/QC Samples
	NPDES Limit	EPA MCL	EPA MSSL	NM MCL	NM WQCC	MCO-FB (12/09/99)
Antimony		6				<5.0
Arsenic	40	50	0.045	50	100	<3.3
Barium		2000	2600		1000	<0.40
Beryllium		4	73	4		<0.30
Cadmium	200	5	18	5	10	<0.30
Cobalt	1000		2200		50	<1.7
Copper	1600	1300	1400		1000	<1.0
Lead	400	15	15		50	<2.1
Mercury	10	2	11	2	2	<0.10
Nickel		-	730	100	200	<0.80
Selenium	50	50	180	50	50	<2.9
Silver		-	180		50	<2.0
Thallium		2		2		<2.3
Vanadium	100		260			<0.90
Zinc	95400		11000		10000	8.1 BE

* All results reported in micrograms per liter (µg/l)
a National Pollutant Discharge Elimination System (NPDES) permit limits for discharges from the TA-50 Radioactive Wastewater Treatment Plant
b EPA Maximum Contaminant Levels (EPA MCL) for inorganic chemicals in the water supply.
c EPA Region 6 Human Health Medium-Specific Screening Levels (EPA MSSL) for inorganic chemicals in tap water (July 1999)
d New Mexico Maximum Contaminant Levels (NM MCL) for inorganic chemicals in community and nontransient, non community water systems
e New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/l total dissolved solids (TDS) concentration or less
f MCO-1 is a duplicate sample of MCO-3

NA Not Analyzed.
B The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
E The reported value is estimated because of the presence of interference.

TABLE 7; Summary of Preliminary Analytical Results for Water Samples - Dissolved Cations[a]
Los Alamos National Laboratory, New Mexico

Parameter	Sample Location, Result, and Date								
	Reference		Mortandad Canyon						
	EPA MSSL[b]	NM WQCC[c]	MCO-1[d] (12/7/99)	MCO-2 (12/7/99)	MCO-3 (12/7/99)	MCO-5 (12/8/99)	MCO-6 (12/8/99)	MCO-7 (12/8/99)	MCWB-7.7B (12/8/99)
Aluminum	37000	5000	<32.1	100 B	<32.1	<32.1	<32.1	450 B	<32.1
Calcium			77800	21700	79100	32100	31900	28000	22700
Iron	11000	1000	<24.2	12400	<24.2	<24.2	<24.2	<24.2	<24.2
Magnesium			4560	5490	4740	3230	3130	6720	5750
Manganese	1700	200	<1.2	1730	<1.2	<1.2	<1.2	<1.2	<1.2 E
Potassium			9400 E	3530 E	9900 E	18300 E	18300 E	23700 E	7640
Sodium			44600 E	31500 E	45600 E	63490 E	65800 E	80800 E	87900
Silicon			21800	36500	22300	17700	17600	18600	17100
Strontium	22000		143	121	147	136	135	185	156

TABLE 7
(continued)

Parameter	Sample Location, Result, and Date						
	Reference		Mortandad Canyon			TA-3, Building SM-30	
	EPA MSSL[a]	NM WQCC[b]	MT-4 (12/7/99)	TW-8 (12/8/99)	GS-1 (12/9/99)	SM-30 (12/17/99)	SD-30[d] (12/17/99)
Aluminum	37000	5000	38.3 B	<32.1	<32.1	494 N	928 N
Calcium			24000	11700	83100	9260	9350
Iron	11000	1000	<24.2	<24.2	<24.2	277 N	457 N
Magnesium			5830	4180	3440	2280 E	2400 E
Manganese	1700	200	<1.2	1.7 BE	11.1 E	4.6 B	5.2 B
Potassium			6950 E	1740 B	6110	1500 B	1560 B
Sodium			94900 E	12600	45700	26900	26700
Silicon			18500	32600	22400	6800	7680
Strontium	22000		154	53.3	85.9	54.7	54.9

TABLE 7
(continued)

Parameter	Sample Location, Result, and Date									
	Reference		Upper and Middle Pajarito Canyon Springs and Surface Water							
	EPA MSSL[a]	NM WQCC[b]	Homestead (12/10/99)	Starmer (12/10/99)	Bulldog (12/10/99)	Kleing (12/10/99)	BU-0.01 (12/10/99)	PA-8.9 (12/10/99)	TA-18 (12/10/99)	PA-6.7 (12/10/99)
Aluminum	37000	5000	196 B	121 B	70.9 B	44.8 B	47.3 B	139 B	251	121 B
Calcium			7910	10300	21700	20900	21000	10800	11800	12900
Iron	11000	1000	123	63.7 B	29.9 B	<24.2	<24.2	75.1 B	461	79.8 B
Magnesium			2820	3570	5950	6110	6010	3500	3710	4140
Manganese	1700	200	4.0 B	1.5 B	1.5 B	<2.4	1.7 B	6.2 B	128 E	2.0 B
Potassium			2190 B	2380 B	3620	3390	3490	2490 B	3050	2470 B
Sodium			8160	10600	28300	23800	26500	11900	16800	15800
Silicon			16900	16900	23800	18000	20700	18000	19800	13800
Strontium	22000		62.3	78.6	133	141	131	77.4	810	90.2

TABLE 7
(continued)

Parameter	Sample Location, Result, and Date		
	Reference		QA/QC Samples
	EPA MSSL[a]	NM WQCC[b]	MCO-FB (Dissolved) (12/09/99)
Aluminum	37000	5000	<32.1
Calcium			537 B
Iron	11000	1000	<24.2
Magnesium			72.9 B
Manganese	1700	200	<1.2 E
Potassium			<353
Sodium			2300
Silicon			<89.0
Strontium	22000		1.6

* All results reported in micrograms per liter (µg/l)
a EPA Region 6 Human Health Medium-Specific Screening Levels (EPA MSSL) for inorganic chemicals in tap water (July 1999)
b New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/l total dissolved solids (TDS) concentration or less
c MCO-1 is a duplicate sample of MCO-3.
d SD-30 is a duplicate sample of SM-30.

B The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
E The reported value is estimated because of the presence of interference.
N Spike recovery not within control limits

TABLE 8: Summary of Preliminary Analytical Results for Water Samples - General Chemistry
Los Alamos National Laboratory, New Mexico

Parameter	Sample Location, Result, and Date									
	Reference			Mortandad Canyon						
	EPA MCL[a]	NM MCL[b]	NM WQCC[c]	MCO-1[d] (12/7/99)	MCO-2 (12/7/99)	MCO-3 (12/7/99)	MCO-5 (12/8/99)	MCO-6 (12/8/99)	MCO-7 (12/8/99)	MCWB-7.7B (12/8/99)
Ammonia (mg/l)				<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bicarbonate (mg/l)				98.0	160	98.0	172	182	194	176
Carbonate (mg/l)				<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
TKN (mg/l)				<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrate-Nitrite (mg/l)		10		1.5	<0.10	0.72	9.6	11.4	1.8	24.5
Total Phosphorus (mg/l)				0.11	0.48	0.11	<0.10	0.25	0.24	<0.10
Inorganic Chloride (mg/l)	250		250	12.8	6.0	12.9	12.5	13.1	21.0	21.3
Fluoride (mg/l)	4	4	1.6	0.53	0.82	0.53	1.2	1.3	1.3	1.1
Sulfate (mg/l)	500		600	167	1.5	173	310	310	28.9	22.9
Perchlorate (mg/l)	4-18[e]			3.0	<0.5	4.4	1.1	1.1	1.8	1.7
$\delta^{15}N_{air}$ - NO_3/NO_2 (no units)				NA	NA	3.3	-3.4	NA	-2.1	NA

TABLE 8
(continued)

Parameter	Sample Location, Result, and Date											
	Reference			Mortandad Canyon			Regional Aquifer (Production Wells)				TA-3, Building SM-30	
	EPA MCL	NM MCL	NM WQCC	MT-4 (12/7/99)	TW-8 (12/8/99)	GS-1 (12/9/99)	PM-1 (12/13/99)	PM-2 (12/13/99)	PM-5 (12/13/99)	O-4 (12/13/99)	SM-30 (12/17/99)	SD-30[a] (12/17/99)
Ammonia (mg/l)				<0.10	<0.10	1.1	<0.10	NA	NA	<0.10	NA	NA
Bicarbonate (mg/l)				180	104	100	NA	NA	NA	NA	400	540
Carbonate (mg/l)				<20.0	<20.0	<20.0	NA	NA	NA	NA	<20.0	<20.0
TKN (mg/l)				<1.0	<1.0	3.1	6.4	NA	NA	7.0	NA	NA
Nitrate-Nitrite (mg/l)		10		12.6	<0.10	1.1	0.45	NA	NA	0.35	NA	NA
Total Phosphorus (mg/l)				<0.10	0.10	0.32	<0.10	NA	NA	<0.10	NA	NA
Inorganic Chloride (mg/l)	250		250	21.8	1.7	33.1	NA	NA	NA	NA	22.4	22.2
Fluoride (mg/l)	4	4	1.6	1.1	0.16	0.61	NA	NA	NA	NA	<0.10	<0.10
Sulfate (mg/l)	500		600	23.3	2.1	161	NA	NA	NA	NA	5.6	5.6
Perchlorate (mg/l)	4-18[b]			1.4	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
$\delta^{15}N_{NO_3}$ - NO_3/NO_2 (per mil)				-4.8	0.7	NA	NA	NA	NA	NA	NA	NA

TABLE 8
(continued)

Parameter	Sample Location, Result, and Date										
	Reference			Upper and Middle Pajarito Canyon Springs and Surface Water							
	EPA MCL	NM MCL	NM WQCC	Homestead (12/10/99)	Starmer (12/10/99)	Bulldog (12/10/99)	Kieling (12/10/99)	BH-0.01 (12/10/99)	PA-8.9 (12/10/99)	TA-18 (12/10/99)	PA-6.7 (12/10/99)
Ammonia (mg/l)				<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bicarbonate (mg/l)				36.0	42.0	82.0	82.0	74.0	46.0	46.0	52.0
Carbonate (mg/l)				<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
TKN (mg/l)				<1.0	<1.0	2.5	<1.0	1.7	4.8	<1.0	<1.0
Nitrate-Nitrite (mg/l)		10		<0.10	1.1	0.20	0.59	0.18	<0.10	<0.10	<0.10
Total Phosphorus (mg/l)				<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10
Inorganic Chloride (mg/l)	250		250	3.6	7.4	19.5	22.7	20.8	7.2	16.0	13.2
Fluoride (mg/l)	4	4	1.6	<0.10	<0.10	0.29	0.16	0.22	<0.10	0.10	0.13
Sulfate (mg/l)	500		600	2.7	5.1	13.5	12.3	13.0	4.9	7.1	7.9
Perchlorate (mg/l)	4-18*			0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
$\delta^{15}N_{air}$ - NO_3/NO_2 (no units)				NA	NA	NA	NA	NA	NA	NA	NA

TABLE 8
(continued)

Parameter	Sample Location, Result, and Date				
	Reference			QA/QC Samples	
	EPA MCL	NM MCL	NM WQCC	MCO-FB (12/09/99)	FB 6.7 (12/10/99)
Ammonia (mg/l)				<0.10	<0.10
Bicarbonate (mg/l)				<20.0	<20.0
Carbonate (mg/l)				<20.0	<20.0
TKN (mg/l)				<1.0	<1.0
Nitrate-Nitrite (mg/l)		10		<0.10	<0.10
Total Phosphorus (mg/l)				<0.10	<0.10
Inorganic Chloride (mg/l)	250		250	<0.20	<0.20
Fluoride (mg/l)	4	4	1.6	<0.10	<0.10
Sulfate (mg/l)	500		600	<0.20	<0.20
Perchlorate (mg/l)	4-18*			<0.5	<0.5

a EPA Maximum Contaminant Levels (EPA MCL) for inorganic chemicals in the water supply.
b New Mexico Maximum Contaminant Levels (NM MCL) for inorganic chemicals in community and nontransient, non-community water systems
c New Mexico Water Quality Control Commission (NM WQCC) standards for groundwater of less than 10,000 mg/l total dissolved solids (TDS) concentration or less
d MCO-1 is a duplicate sample of MCO-3
e SD-30 is a duplicate sample of SM-30.

$\delta^{15}N_{air}$ - NO_3/NO_2 Stable nitrogen isotope ratio found in the nitrate/nitrite fraction of the sample.
NA Not Analyzed.
* 4-18 ppb is a provisional standard established by EPA

TABLE 9: Summary of Preliminary Analytical Results for Water Samples - Radionuclides[a]
Los Alamos National Laboratory, New Mexico

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCL[b]	NM MCL[b]	NM WHL[c]	DOE DCGI[d]	DOE DCGI[e]	MCO-1[f] (12/7/99)			MCO-2 (12/7/99)			MCO-3 (12/7/99)		
						Result	Sigma Error	MDC[g]	Result	Sigma Error	MDC[g]	Result	Sigma Error	MDC[g]
Strontium 90	8	8		1000	40	84	17	3	0.33	0.53	0.90	NR	NR	NR
Tritium (H^3)	20000	20000	20000	2000000	80000	4311	144	--	83	10	--	4298	144	--

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
	EPA MCL	NM MCL	NM WHL	DOE DCGI	DOE DCGI	MCO-5 (12/8/99)			MCO-6 (12/8/99)			MCO-7 (12/8/99)		
						Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Strontium 90	8	8		1000	40	45.6	9.0	0.8	44.6	8.9	0.7	186.3	0.77	1.0
Tritium (H^3)	20000	20000	20000	2000000	80000	9959	329	--	10016	332	--	17325	572	--

TABLE 9
(continued)

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon								
						MCWB-7.7B (12/8/99)			MI-4 (12/7/99)			IW-8 (12/8/99)		
	EPA MCL	NM MCL	NM WHL	DOE DCG1	DOE DCG2	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Strontium-90	8	8		1000	40	0.69	0.45	0.78	-0.01	0.37	0.64	0.19	0.40	0.67
Tritium (H^3)	20000	20000	20000	2000000	80000	19717	651	--	20001	661	--	16	6	--

Parameter	Sample Location and Date Collected													
	Reference					Mortandad Canyon			Regional Aquifer (Production Wells)					
						GS-1 (12/9/99)			FM-1 (12/13/99)			O-4 (12/13/99)		
	EPA MCL	NM MCL	NM WHL	DOE DCG1	DOE DCG2	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Strontium-90	8	8		1000	40	11.0	2.3	0.8	0.33	0.39	0.65	0.44	0.43	0.70
Tritium (H^3)	20000	20000	20000	2000000	80000	3115	102	--	NA	NA	NA	NA	NA	NA

TABLE 9
(continued)

Parameter	Sample Location and Date Collected										
	Reference					TA-3, Building SM-30					
						SM-30 (12/17/99)			SD-30[b] (12/17/99)		
	EPA MCL	NM MCL	NM WHL	DOE DCGI	DOE DCGI	Result	Sigma Error	MDC	Result	Sigma Error	MDC[f]
Strontium-90	8	8		1000	40	NA	NA	NA	NA	NA	NA
Tritium (H^3)	20000	20000	20000	2000000	80000	1803	60.7	--	1810	60.7	--

[1] All results are reported in pico Curies per liter (pCi/l)
a EPA proposed Maximum Contaminant Levels (EPA MCLs) for Radiochemicals in the water supply.
b New Mexico Maximum Contaminant Levels (NM MCLs) for Beta Particle and Photon Radioactivity from manmade radionuclides in community water systems
c New Mexico Standards for Interstate and Intrastate Streams for Wildlife Habitat Limits (NM WHLs)
d Department of Energy Derived Concentration Guides for water ingestion in uncontrolled areas.
e Department of Energy Derived Concentration Guides for drinking water systems
f Minimum Detected Count
g MCO-1 is a duplicate sample of MCO-3
h SD-30 is a duplicate sample of SM-30.

NA Not Analyzed
NR Not Reported due to the recovery for the tracer was not within QC limits. The sample could not be re-analyzed due to insufficient sample volume.
-- Value not available.

TABLE 10: Summary of Preliminary Analytical Results for Water Samples - Explosives[a]
Los Alamos National Laboratory, New Mexico

Parameter	Sample Location, Result, and Date Collected											
	Reference	Regional Aquifer (Production Wells)		Upper and Middle Pajarito Canyon Springs and Surface Water								
	EPA MSSL[a]	PM-2 (12/13/99)	PM-5 (12/13/99)	Homestead (12/10/99)	Starmer (12/10/99)	Bulldog (12/10/99)	Kieling (12/10/99)	BH-0.01 (12/10/99)	PA-8.9 (12/10/99)	TA-18 (12/10/99)	PA-6.7 (12/10/99)	FB 6.7 (12/10/99)
HMX	1800	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0
RDX	0.61	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0	<14.0
TNB		<7.30	<7.30	<7.30	<7.30	<7.30	<7.30	<7.30	<7.30	<7.30	<7.30	<7.30
DNB		<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
TETRYL		<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
NB		<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00
1NT		<6.40	<6.40	<6.40	<6.40	<6.40	<6.40	<6.40	<6.40	<6.40	<6.40	<6.40
4ADNT		<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00	<7.00
2ADNT		<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0
26DNT		<9.40	<9.40	<9.40	<9.40	<9.40	<9.40	<9.40	<9.40	<9.40	<9.40	<9.40
24DNT		<5.70	<5.70	<5.70	<5.70	<5.70	<5.70	<5.70	<5.70	<5.70	<5.70	<5.70
2NT		<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0
4NT		<7.90	<7.90	<7.90	<7.90	<7.90	<7.90	<7.90	<7.90	<7.90	<7.90	<7.90
3NT		<8.00	<8.00	<8.00	<8.00	<8.00	<8.00	<8.00	<8.00	<8.00	<8.00	<8.00

- All results reported in micrograms per liter (µg/l)
- [a] EPA Region 6 Human Health Medium-Specific Screening Levels (EPA MSSL) for inorganic chemicals in tap water (July 1999)

TABLE 11: Summary of Preliminary Analytical Results for Sediment Samples - Inorganics
Los Alamos National Laboratory, New Mexico

Analyte	Sample Location, Depth, and Date Collected										
	Reference			Acid Canyon							
	EPA MSSL[a] Industrial	EPA MSSL Residential	LANL Bkground	ACS-18-1 0-26 cm (12/6/99)	ACS-18-2 26-45 cm (12/6/99)	ACS-18-3[b] 0-26 cm (12/6/99)	ACS-35-0 2-10 cm (12/6/99)	ACS-12-1 0-30 cm (12/6/99)	ACS-12-2 30-62 cm (12/6/99)	ACS-48-0 0-12 cm (12/6/99)	ACS-3-1 0-28 cm (12/6/99)
Antimony	31	31	0.83	<0.32 N	<0.35 N	<0.31 N	<0.32 N	<0.27 N	<0.31 N	<0.31 N	<0.29 N
Arsenic	360	22	3.98	2.2	3.1	2.3	1.8	2.0	2.8	1.9	2.3
Barium	100000	5400	127	36.2	43.3	51.9	27.4	40.2	51.4	36.5	41.9
Beryllium	2200	150	1.31	0.60	0.67	0.63	0.45 B	0.61	0.73	0.48 B	0.62
Cadmium	1600	39	0.4	1.1	2.2	1.2	0.39	2.5	3.2	0.55	0.61
Cobalt	29000	3400	4.73	1.4 B	1.9 B	1.7 B	0.98 B	1.7 B	2.2 B	1.4 B	1.5 B
Copper	76000	2900	11.2	8.0	10.4	9.7	29.6	11.6	28.1	4.9 B	4.9 B
Lead	2000	400	19.7	37.1	48.1	50.0	38.4	57.7	66.0	25.3	19.4
Mercury	610	23	0.1	0.45	0.58	0.57	0.03 B	0.67	1.2	0.31	0.19
Nickel	41000	1600	9.38	8.3	8.0	8.0	3.8	7.4	13.8	3.1	3.9
Selenium	10000	390	0.3	0.48 B	0.55 B	0.45 B	0.57 B	0.36 B	0.70	0.41 B	0.53 B
Silver	10000	390	1	0.18 BE	1.3 E	0.61 BE	<0.14 E	0.80 BE	3.9 E	0.22 BE	<0.13 E
Thallium	180	7	0.73	<0.40	<0.44	<0.39	<0.40	<0.34	0.62 B	<0.39	<0.37
Uranium				3.0 B	<1.3	3.8 B	<1.2	2.2 B	6.4	<1.6 B	1.0 B
Vanadium	14000	550	19.7	6.9	9.4	8.0	5.2	6.7	10.9	6.1	6.0
Zinc	100000	23000	60.2	49.5	46.7	52.7	61.8	51.6	53.6	38.1	39.3

TABLE 11
(continued)

Analyte	Sample Location, Depth, and Date Collected										
	Reference			Acid Canyon			Sandia Canyon				
	EPA MSSL Industrial	EPA MSSL Residential	LANL Bkground	ACS-3-2 37-62 cm (12/6/99)	ACS-3-3 62-89 cm (12/6/99)	ACS-3-4 89-104 cm (12/6/99)	SC-1 0-17 cm (12/13/99)	SC-2 0-3 cm (12/13/99)	SC-3 8-19 cm (12/13/99)	SC-4 2-12 cm (12/13/99)	SC-5 0-18 cm (12/13/99)
Antimony	31	31	0.83	<0.28 N	<0.29 N	<0.31 N	<0.28 N	<0.29 N	<0.27 N	<0.28 N	<0.28 N
Arsenic	360	22	3.98	2.0	2.5	3.0	2.4	1.8	1.6	1.8	2.4
Barium	100000	5400	127	49.5	56.9	56.4	83.0	57.8	47.3	54.2	65.8
Beryllium	2200	150	1.31	0.56	0.84	2.3	0.73	0.66	0.48 B	0.55	0.73
Cadmium	1000	39	0.4	0.41	2.5	10.5	<0.03	0.41	0.07 B	0.08 B	0.11 B
Cobalt	29000	3400	4.73	1.5 B	3.2	5.3	2.7	2.0 B	1.5 B	2.6	2.3 B
Copper	76000	2900	11.2	2.6 B	31.6	81.0	5.3	4.7 B	6.4	6.1	8.9
Lead	2000	400	19.7	9.0	98.2	42.3	9.7	10.5	16.0	19.9	17.4
Mercury	610	23	0.1	0.03 B	0.81	2.2	0.00 B	0.00 B	0.00	0.00	0.00
Nickel	41000	1600	9.38	3.7	11.6	31.4	4.7	4.6	3.0	3.8	5.2
Selenium	10000	390	0.3	0.46 B	<0.35	0.43 B	<0.34	<0.36	<0.33	<0.34	<0.34
Silver	10000	390	1	<0.13 E	2.5 E	8.3 E	<0.12	<0.13	0.21 B	0.43 B	0.42 B
Thallium	180	7	0.73	<0.35	0.87 B	0.83 B	<0.35	<0.37	<0.34	<0.35	<0.35
Uranium				<1.0	<1.0	3.4 B	1.7 BN	<1.0 N	<0.99 N	<0.99 N	<1.0 N
Vanadium	14000	550	19.7	5.3	8.8	9.9	10.3	5.5	5.2	6.2	9.7
Zinc	100000	23000	60.2	34.2	50	50.5	29.8	21.3	28.8	31.5	45.6

TABLE 11
(continued)

Analyte	Sample Location, Depth, and Date Collected										
	Reference			Sandia Canyon	Bayo Canyon					Mortandad Canyon	
	EPA MSSL Industrial	EPA MSSL Residential	LANL Background	SC-6 0-12 cm (12/13/99)	BC-1 0-14 cm (12/13/99)	BC-2 14-27 cm (12/13/99)	BC-3 10-22 cm (12/13/99)	BC-4 4-11 cm (12/13/99)	BC-5' 14-27 cm (12/13/99)	MC-1 0-5 cm (12/14/99)	MC-2 0-8 cm (12/14/99)
Antimony	31	31	0.83	<0.28 N	<0.29	0.72 BN	<0.28	<0.29 N	<0.29 N	<0.29 N	<0.27 N
Arsenic	360	22	3.98	2.5	2.0	1.7	1.4	1.6	1.7	2.8	2.0
Barium	100000	5400	127	65.2	46.6	33.3	29.8	32.7	37.2	78.9	47.4
Beryllium	2200	150	1.31	0.67	0.55	0.47 B	0.43 B	0.40 B	0.53	0.73	0.50 B
Cadmium	1000	39	0.4	0.06 B	0.08 B	0.13 B	0.12 B	0.14 B	0.04 B	0.05 B	0.17 B
Cobalt	29000	3400	4.73	2.4 B	1.5 B	1.4 B	1.1 B	1.4 B	1.5 B	3.2	1.5 B
Copper	76000	2900	11.2	7.6	7.9	4.1 B	3.2 B	3.4 B	4.5 B	7.1	3.6 B
Lead	2000	400	19.7	17.5	8.8	8.3	7.2	7.4	8.7	10.2	8.0
Mercury	610	23	0.1	0.00	0.00 B	0.00 B	0.00 B	0.00 B	0.00 B	0.00 B	0.00 B
Nickel	41000	1600	9.38	4.8	5.3	3.4	2.3	2.2	3.3	6.6	2.7
Selenium	10000	390	0.3	<0.34	<0.36	<0.35	<0.35	<0.32	<0.35	<0.35	<0.33
Silver	10000	390	1	0.33 B	<0.13	<0.13	<0.13	<0.12	<0.13	<0.13	<0.12
Thallium	180	7	0.73	<0.35	<0.37	<0.36	<0.36	<0.33	<0.36	<0.36	<0.34
Uranium				<1.0 N	2.0 B	<1.0	1.3 B	1.2 BN	<1.0 N	<1.0 N	<0.98 N
Vanadium	14000	550	19.7	10.6	5.8	5.6	3.6	4.7	6.6	11.7	4.9
Zinc	100000	23000	60.2	55.0	21.6	28.1	16.2	16.2	32.0	37.6	19.3

TABLE 11
(continued)

Analyte	Sample Location, Depth, and Date Collected										
	Reference			Mortandad Canyon				Canada del Buey			
	EPA MSSL Industrial	EPA MSSL Residential	LANL Bkground	MC-3 15-24 cm (12/14/99)	MC-4 0.5 cm (12/14/99)	MC-5A 0-13 cm (12/14/99)	MC-5B 22-30 cm (12/14/99)	CC-1 10-17 cm (12/15/99)	CC-2 5-15 cm (12/15/99)	CC-3 1-13 cm (12/15/99)	CC-4 0.2 cm (12/15/99)
Antimony	31	31	0.83	<0.27 N	<0.28 N	<0.28 N	<0.28 N	<0.32 N	<0.29 N	<0.33 N	<0.32 N
Arsenic	360	22	3.98	1.5	1.8	1.9	1.5	2.3	3.0	1.7	2.4
Barium	100000	5400	127	39.3	30.2	56.2	33.8	90.6	128	58.0	102
Beryllium	2200	150	1.31	0.39 B	0.33 B	0.48 B	0.39 B	0.59 B	0.84	0.39 B	0.67
Cadmium	1000	39	0.4	0.61	<0.03	0.24 B	0.25 B	1.1	0.15 B	<0.04	<0.04
Cobalt	29000	3400	4.73	1.5 B	1.8 B	2.0 B	1.1 B	3.1	5.0	2.8 B	4.6
Copper	76000	2900	11.2	2.8 B	3.3 B	3.7 B	2.6 B	9.8	8.3	3.4 B	5.1 B
Lead	2000	400	19.7	6.7	7.8	8.1	5.3	11.5	14.1	7.9	9.5 B
Mercury	610	23	0.1	0.00	0.00 B	0.00 B	0.00 B	0.00 B	0.03 B	0.02 B	0.03 B
Nickel	41000	1600	9.38	2.5	2.5	3.0	2.1	6.0	8.0	4.0	5.8
Selenium	10000	390	0.3	<0.33	<0.34	<0.35	<0.34	<0.39	<0.36	<0.41	<0.39
Silver	10000	390	1	<0.12	<0.12	<0.13	<0.12	<0.14	<0.13	<0.15	<0.14
Thallium	180	7	0.73	<0.34	<0.39	<0.36	<0.35	<0.40	0.57 B	<0.42	0.59 B
Uranium				<0.99 N	1.1 BN	1.8 BN	<0.99 N	<1.2 N	1.3 BN	<1.2 N	1.4 B
Vanadium	14000	550	19.7	4.7	9.1	6.6	4.1	8.9	15.9	8.7	13.8
Zinc	100000	23000	60.2	16.8	61.0	18.0	16.5	28.0	152	28.1	28.9 E

TABLE 11
(continued)

Analyte	Sample Location, Depth, and Date Collected										
	Reference			Canada del Buey						Pajarito Canyon	
	EPA MSSL Industrial	EPA MSSL Residential	LANL Background	CC-5A 18-26 cm (12/15/99)	CC-5B 30-39 cm (12/15/99)	CC-6 0-7.5 cm (12/15/99)	CC-7 0-7 cm (12/15/99)	CC-8 20-33 cm (12/15/99)	CC-9[4] 5-20 cm (12/15/99)	PC-1 0-17 cm (12/16/99)	PC-2 0-24 cm (12/16/99)
Antimony	31	31	0.83	<0.30 N	<0.33 N	<0.34 N	<0.32 N	<0.35 N	<0.30 N	<0.29	<0.28
Arsenic	360	22	3.98	2.3	2.8	2.8	2.6	2.5	2.8	4.0	2.9
Barium	100000	5400	127	116	120	115	102	107	126	162	110
Beryllium	2200	150	1.31	0.68	0.81	0.70	0.70	0.67	0.76	1.2	0.75
Cadmium	1000	39	0.4	0.05 B	0.05 B	0.12 B	<0.04	0.63	0.98	0.08 B	<0.03
Cobalt	29000	3400	4.73	4.3	4.9	4.4	4.0	4.1	4.5	6.1	4.3
Copper	76000	2900	11.2	5.7	7.5	6.3 B	6.0	5.5 B	7.3	13.4	6.5
Lead	2000	400	19.7	15.3 B	27.0 B	11.0 B	9.7 B	10.4 B	14.4 B	18.6 B	11.7 B
Mercury	610	23	0.1	0.03 B	0.03 B	0.03 B	0.03 B	0.03 B	0.03 B	0.02 B	<0.02
Nickel	41000	1600	9.38	9.3	7.7	6.8	7.5	6.5	7.1	11.1	6.8
Selenium	10000	390	0.3	<0.36	<0.41	<0.42	<0.39	<0.43	<0.36	<0.36	0.43 B
Silver	10000	390	1	<0.13	<0.15	0.23 B	<0.14	<0.16	<0.13	<0.13	<0.12
Thallium	180	7	0.73	0.62 B	0.68 B	<0.43	<0.40	<0.44	<0.37	0.83 B	0.52 B
Uranium				2.3 B	1.7 B	1.2 B	2.2 B	<1.2	<1.1	2.5 B	1.0 B
Vanadium	14000	550	19.7	12.2	20.0	10.7	13.2	10.2	12.1	20.4	15.5
Zinc	100000	23000	60.2	35.8 E	46.0 E	25.1 E	33.1 E	21.7 E	14.1 E	56.0	36.2

TABLE 11
(continued)

Analyte	Sample Location, Depth, and Date Collected										
	Reference			Pajarito Canyon			Ancho Canyon				
	EPA MSSL Industrial	EPA MSSL Residential	LANL Background	PC-3 0-21 cm (12/16/99)	PC-4 0-5 cm (12/16/99)	PC-5' 0-24 cm (12/16/99)	AC-1 0-5 cm (12/16/99)	AC-2 0-17 cm (12/16/99)	AC-3 5-16 cm (12/16/99)	AC-4 0-7 cm (12/16/99)	AC-5 10-24 cm (12/16/99)
Antimony	31	31	0.83	<0.31	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.29
Arsenic	360	22	3.98	4.0	3.8	3.2	2.2	2.5	2.3	1.8	2.0
Barium	100000	5400	127	166	148	119	77.0	70.1	80.0	51.8	51.2
Beryllium	2200	150	1.31	1.2	0.99	0.79	0.70	0.65	0.74	0.48 B	0.47 B
Cadmium	1000	39	0.4	0.10 B	0.05 B	<0.03	0.06 B	0.03 B	0.01 B	0.03 B	0.01 B
Cobalt	29000	3400	4.73	5.8	5.3	4.9	2.7	2.5 B	3.0	2.0 B	2.3 B
Copper	76000	2900	11.2	13.1	11.2	6.9	11.3	9.5	8.2	5.3	4.5 B
Lead	2000	400	19.7	21.8 B	30.9	11.3 B	11.4 B	11.4 B	12.2 B	8.3 B	9.5 B
Mercury	610	23	0.1	0.03 B	0.02 B	0.02 B	0.13	0.06	0.05	0.05	0.01
Nickel	41000	1600	9.38	11.3	10.0	7.5	4.6	4.5	5.4	3.6 B	3.6 B
Selenium	10000	390	0.3	<0.38	0.40 B	<0.34	0.34 B	0.43 B	0.53 B	0.45 B	<0.35
Silver	10000	390	1	<0.14	0.14 B	<0.12	<0.12	<0.12	<0.13	<0.12	0.43 B
Thallium	180	7	0.73	0.55 B	0.59 B	<0.35	<0.35	<0.35	0.50 B	<0.35	<0.36
Uranium				2.3 B	2.0 B	1.2 B	4.2	1.8 B	1.6 B	2.1 B	1.1 B
Vanadium	14000	550	19.7	22.6	20.5	16.8	8.9	9.4	10.9	8.5	8.4
Zinc	100000	23000	60.2	58.4	41.1	36.5	33.3	31.8	40.4	28.1	27.5

TABLE II
(continued)

Analyte	Sample Location, Depth, and Date Collected					
	Reference			QA/QC Samples		
	EPA MSSL[a] Industrial	EPA MSSL Residential	LANL Bkground	AC-EB (12/16/99)	ACS-EB (12/06/99)	CC-EB (12/15/99)
Antimony	31	31	0.83	<5.0	<5.0	<5.0
Arsenic	360	22	3.98	<3.3	<3.3	<3.3
Barium	100000	5400	127	0.92 B	<0.40	0.46 B
Beryllium	2200	150	1.31	<0.30	<0.30	<0.30
Cadmium	1000	39	0.4	0.53 B	<0.30	<0.30
Cobalt	29000	3400	4.73	<1.7	<1.7	<1.7
Copper	76000	2900	11.2	26.3 B	<1.0	10 B
Lead	2000	400	19.7	<2.1	<2.1	<2.1
Mercury	610	23	0.1	<0.10	<0.10	<0.10
Nickel	41000	1600	9.38	3.0 B	<0.80	1.6 B
Selenium	10000	390	0.3	<2.9	<2.9	<2.9
Silver	10000	390	1	<2.0	<2.0	<2.0
Thallium	180	7	0.73	<2.3	<2.3	<2.3
Uranium				<10.5	<10.5	<10.5
Vanadium	14000	550	19.7	<0.90	<0.90	<0.90
Zinc	100000	23000	60.2	38.5	4.2 B	18.0 B

a All results reported in micrograms per liter (µg/l)
a EPA Region 6 Human Health Medium Specific Screening Levels (EPA MSSL) for inorganic chemicals in tap water (July 1999)
b ACS-18-3 is a duplicate sample of ACS-18-1
c BC-5 is a duplicate sample of BC-2.
d CC-9 is a duplicate sample of CC-2.
e PC-5 is a duplicate sample of PC-2.

B The reported values were obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the instrument detection limit (IDL)
N Spike Recovery not within control limits
E The reported value is estimated because of the presence of interference

TABLE 12: Summary of Preliminary Analytical Results for Sediment Samples - PCBs
Los Alamos National Laboratory, New Mexico

PCB	Sample Location, Depth, and Date Collected									
	Reference		Acid Canyon							
	EPA MSSL[a] Industrial	EPA MSSL Residential	ACS-18-1 0-26 cm (12/6/99)	ACS-18-2 26-46 cm (12/6/99)	ACS-18-3[b] 0-26 cm (12/6/99)	ACS-35 0 2-10 cm (12/6/99)	ACS-12-1 0-30 cm (12/6/99)	ACS-12-2 30 62 cm (12/6/99)	ACS-48 0 0-12 cm (12/6/99)	ACS-3-1 0-28 cm (12/6/99)
Aroclor-1016	34000	3900	<40	<41	<39	<41	<34	<38	<38	<35
Aroclor-1221	680	220	<40	<41	<39	<41	<34	<38	<38	<35
Aroclor-1232	680	220	<40	<41	<39	<41	<34	<38	<38	<35
Aroclor-1242	680	220	<40	<41	<39	<41	<34	<38	<38	<35
Aroclor-1248	680	220	<40	<41	<39	<41	<34	<38	<38	<35
Aroclor-1254	9800	1100	117	323	124	<41	367	635	107	37
Aroclor-1260	680	220	<40	<41	<39	<41	<34	<38	<38	<35

PCB	Sample Location, Depth, and Date Collected									
	Reference		Acid Canyon			Sandia Canyon				
	EPA MSSL Industrial	EPA MSSL Residential	ACS-3-2 37-62 cm (12/6/99)	ACS-3-3 62-89 cm (12/6/99)	ACS-3-4 89-104 cm (12/6/99)	SC-1 0-17 cm (12/13/99)	SC-2 0-3 cm (12/13/99)	SC-3 8-19 cm (12/13/99)	SC-4 2-12 cm (12/13/99)	SC-5 0-18 cm (12/13/99)
Aroclor-1016	34000	3900	<35	<35	<37	<33	<35	<34	<34	<33
Aroclor-1221	680	220	<35	<35	<37	<33	<35	<34	<34	<33
Aroclor-1232	680	220	<35	<35	<37	<33	<35	<34	<34	<33
Aroclor-1242	680	220	<35	<35	<37	<33	<35	<34	<34	<33
Aroclor-1248	680	220	<35	<35	<37	<33	<35	<34	<34	<33
Aroclor-1254	9800	1100	33	625	344	<33	<35	<34	<34	<33
Aroclor-1260	680	220	<35	<35	<37	<33	<35	48	48	140

TABLE 12
(continued)

PCB	Sample Location, Depth, and Date Collected									
	Reference		Sandia Canyon	Bayo Canyon					Mortandad Canyon	
	EPA MSSL Industrial	EPA MSSL Residential	SC-6 0-12 cm (12/13/99)	BC-1 1-14 cm (12/13/99)	BC-2 14-27 cm (12/13/99)	BC-3 10-22 cm (12/13/99)	BC-4 4-11 cm (12/13/99)	BC-5' 14-27 cm (12/13/99)	MC-1 0-5 cm (12/14/99)	MC-2 0-8 cm (12/14/99)
Aroclor-1016	34000	3900	<33	<34	<34	<33	<32	<34	<32	<33
Aroclor-1221	680	220	<33	<34	<34	<33	<32	<34	<32	<33
Aroclor-1232	680	220	<33	<34	<34	<33	<32	<34	<32	<33
Aroclor-1242	680	220	<33	<34	<34	<33	<32	<34	<32	<33
Aroclor-1248	680	220	<33	<34	<34	<33	<32	<34	<32	<33
Aroclor-1254	9800	1100	<33	<34	<34	<33	<32	<34	<32	<33
Aroclor-1260	680	220	58	<34	39	<33	<32	<34	<32	<33

PCB	Sample Location, Depth, and Date Collected									
	Reference		Mortandad Canyon				Canada del Buey			
	EPA MSSL Industrial	EPA MSSL Residential	MC-3 15-24 cm (12/14/99)	MC-4 0-5 cm (12/14/99)	MC-5A 0-13 cm (12/14/99)	MC-5B 22-30 cm (12/14/99)	CC-1 10-17 cm (12/15/99)	CC-2 5-15 cm (12/15/99)	CC-3 1-13 cm (12/15/99)	CC-4 0-2 cm (12/15/99)
Aroclor-1016	34000	3900	<34	<33	<34	<31	<39	<35	<37	<37
Aroclor-1221	680	220	<34	<33	<34	<31	<39	<35	<37	<37
Aroclor-1232	680	220	<34	<33	<34	<31	<39	<35	<37	<37
Aroclor-1242	680	220	<34	<33	<34	<31	<39	<35	<37	<37
Aroclor-1248	680	220	<34	<33	<34	<31	<39	<35	<37	<37
Aroclor-1254	9800	1100	<34	<33	<34	<31	<39	<35	<37	<37
Aroclor-1260	680	220	<34	<33	<34	<31	<39	<35	<37	<37

TABLE 12
(continued)

PCB	Sample Location, Depth, and Date Collected									
	Reference		Canada del Buey						Pajarito Canyon	
	EPA MSSL Industrial	EPA MSSL Residential	CC-5A 18-26 cm (12/15/99)	CC-5B 30-39 cm (12/15/99)	CC-6 0-7.5 cm (12/15/99)	CC-7 0-7 cm (12/15/99)	CC-8 20-33 cm (12/15/99)	CC-9[a] 5-22 cm (12/15/99)	PC-1 0-17 cm (12/16/99)	PC-2 0-24 cm (12/16/99)
Aroclor-1016	34000	3900	<36	<41	<40	<38	<41	<35	<36	<33
Aroclor-1221	680	220	<36	<41	<40	<38	<41	<35	<36	<33
Aroclor-1232	680	220	<36	<41	<40	<38	<41	<35	<36	<33
Aroclor-1242	680	220	<36	<41	<40	<38	<41	<35	<36	<33
Aroclor-1248	680	220	<36	<41	<40	<38	<41	<35	<36	<33
Aroclor-1254	9800	1100	<36	<41	<40	<38	<41	<35	<36	<33
Aroclor-1260	680	220	<36	<41	<40	<38	<41	<35	<36	<33

PCB	Sample Location, Depth, and Date Collected									
	Reference		Pajarito Canyon			Ancho Canyon				
	EPA MSSL Industrial	EPA MSSL Residential	PC-3 0-21 cm (12/16/99)	PC-4 0-5 cm (12/16/99)	PC-5[a] 0-24 cm (12/16/99)	AC-1 0-5 cm (12/16/99)	AC-2 0-17 cm (12/16/99)	AC-3 5-16 cm (12/16/99)	AC-4 0-7 cm (12/16/99)	AC-5 10-24 cm (12/16/99)
Aroclor-1016	34000	3900	<38	<34	<32	<34	<34	<34	<33	<31
Aroclor-1221	680	220	<38	<34	<32	<34	<34	<34	<33	<31
Aroclor-1232	680	220	<38	<34	<32	<34	<34	<34	<33	<31
Aroclor-1242	680	220	<38	<34	<32	<34	<34	<34	<33	<31
Aroclor-1248	680	220	<38	<34	<32	<34	<34	<34	<33	<31
Aroclor-1254	9800	1100	<38	<34	<32	<34	<34	<34	<33	<31
Aroclor-1260	680	220	<38	<34	<32	<34	<34	<34	<33	<31

TABLE 12
(continued)

PCB	Sample Location, Depth, and Date Collected				
	Reference		QA/QC Samples		
	EPA MSSL Industrial	EPA MSSL Residential	CC-EB (12/15/99)	AC-EB (12/16/99)	ACS-EB (12/06/99)
Aroclor-1016	34000	3900	<1.0	<1.0	<1.0
Aroclor-1221	680	220	<1.0	<1.0	<1.0
Aroclor-1232	680	220	<1.0	<1.0	<1.0
Aroclor-1242	680	220	<1.0	<1.0	<1.0
Aroclor-1248	680	220	<1.0	<1.0	<1.0
Aroclor-1254	9800	1100	<1.0	<1.0	<1.0
Aroclor-1260	680	220	<1.0	<1.0	<1.0

* All results reported in micrograms per liter (µg/l)
a EPA Region 6 Human Health Medium-Specific Screening Levels
b ACS-18-3 is a duplicate sample of ACS-18-1.
c BC-5 is a duplicate sample of BC-2
d CC-9 is a duplicated sample of CC-2.
e PC-5 is a duplicate sample of PC-2.

TABLE 13: Summary of Preliminary Analytical Results for Sediment Samples - Radionuclides
Los Alamos National Laboratory, New Mexico

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Acid Canyon								
	EPA PRG*	EPA PRG	LANL	ACS-18-1 0-26 cm (12/6/99)			ACS-18-3 Duplicate of ACS-18-1 (12/6/99)			ACS-18-2 26-46 cm (12/6/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.066	0.27 J	0.21	0.21	0.21 J	0.18	0.18	0.65 J	0.27	0.14
Plutonium-239/240	10	2.5	0.068	77	19	0.2	82	20	0.2	112	22	0.1
Uranium-234	69	18	2.59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235	0.57	0.16	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238	73	18	2.29	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	57	14	1.04	0.36	0.51	0.65	0.55	0.55	0.90	1.21 J	0.60	0.87
Gross Alpha				NA	NA	NA	NA	NA	NA	NA	NA	NA
Gross Beta				NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137	0.072	0.020	0.9	0.51	0.18	0.12	0.74	0.16	0.12	0.65	0.22	0.13
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.04	4.01	0.49	0.15	3.30	0.43	0.14	3.35	0.41	0.15
Lead-210	3.2	0.78		--	--	--	--	--	--	2.2	1.5	1.3
Lead-212				1.26	0.32	0.13	1.07	0.33	0.13	1.19	0.30	0.14
Lead-214				1.22	0.36	0.17	1.27	0.37	0.18	0.95	0.33	0.22
Potassium-40	0.25	0.068	38.6	30.5	4.3	1.1	30.0	4.1	0.9	29.0	4.4	0.9
Thallium-208				--	--	--	--	--	-	--	--	--
Thorium-234				--	--	--	2.40	0.75	0.79	1.28	0.61	0.90

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Acid Canyon								
	EPA PRG	EPA PRG	LANL	ACS-35-0 2-10 cm (12/6/99)			ACS-12-1 0-30 cm (12/6/99)			ACS-12-2 30-62 cm (12/6/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.12	0.11	0.13	-0.036	0.075	0.20	0.433	0.25	0.17
Plutonium-239/240	10	2.5	0.068	27.5	6.0	0.1	0.12	0.13	0.18	0.018	0.062	0.14
Uranium-234	69	18	2.59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235	0.57	0.16	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238	73	18	2.29	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	57	14	1.01	-0.91	0.56	1.0	3.51	0.95	0.88	20.7	4.3	1.4
Gross Alpha				NA	NA	NA	NA	NA	NA	NA	NA	NA
Gross Beta				NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137	0.072	0.020	0.9	0.079	0.060	0.13	3.19	0.41	0.13	5.53	0.70	0.11
Actinium-228				--	--	--	1.22	0.30	0.47	--	--	--
Americium-241	7.5	1.9	0.01	0.19	0.13	0.1	12.8	1.4	0.3	23.8	2.7	0.3
Lead-210	3.2	0.78		1.55	0.90	0.87	--	--	--	--	--	--
Lead-212				0.67	0.14	0.09	1.01	0.20	0.14	1.34	0.22	0.18
Lead-214				0.53	0.14	0.14	0.94	0.20	0.19	1.21	0.20	0.24
Potassium-40	0.25	0.068	38.6	28.3	4.1	1	29.3	4.1	0.9	27.8	4.2	1.5
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Acid Canyon								
	EPA PRG	EPA PRG	LANL	ACS-48 0 0-12 cm (12/6/99)			ACS-3-1 0-28 cm (12/6/99)			ACS-3-2 37-62 cm (12/6/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium 238	11	2 7	0 006	1 02	0 43	0 15	0 48 J	0 30	0 22	0 062	0 079	0 11
Plutonium 239/240	10	2.5	0 068	184	45	0 1	137	34	0 2	2.73	0 70	0 10
Uranium 234	69	18	2 59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235	0 57	0 16	0 20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238	73	18	2.29	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	57	14	1 04	2 12 J	0 76	0 95	0 89 J	0 56	0 85	0 74	0 51	0 80
Gross Alpha				NA	NA	NA	NA	NA	NA	NA	NA	NA
Gross Beta				NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137	0 072	0 020	0 9	0.93	0 18	0 15	0 25	0 11	0 13	-0 063	0 078	0 14
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0 04	3.70	0 47	0 17	1.71	0 32	0 14	--	--	--
Lead-210	3.2	0 78		2.4	1 3	1 5	3 8	1 3	1.4	--	--	--
Lead-212				1 09	0 21	0 23	1 30	0 34	0 14	1 29	0 37	0 14
Lead-214				0 95	0 18	0 18	1 31	0 37	0 19	1.15	0 39	0 20
Potassium-40	0 25	0 068	35 6	26 0	4 2	1.1	30.0	4 5	1 1	32.7	4 8	1 4
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	2 34	0 75	0 89	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Acid Canyon						Sandia Canyon		
	EPA PRG	EPA PRG	LANL	ACS-3-3 62-89 cm (12/6/99)			ACS-3-4 89-104 cm (12/6/99)			SC-4 0-17 cm (12/13/99)		
	Commercial	Residential	Background	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	1.06	0.44	0.15	0.843	0.37	0.15	NA	NA	NA
Plutonium-239/240	10	2.5	0.068	117	28	0.1	140	33	0.1	NA	NA	NA
Uranium-234	69	18	2.59	NA	NA	NA	NA	NA	NA	1.08	0.34	0.07
Uranium-235	0.57	0.16	0.20	NA	NA	NA	NA	NA	NA	0.0923	0.024	0.050
Uranium-238	73	18	2.29	NA	NA	NA	NA	NA	NA	0.9043	0.030	0.049
Strontium-90	57	14	1.04	5.6	1.3	0.9	10.8	2.3	0.8	NA	NA	NA
Gross Alpha				NA	NA	NA	NA	NA	NA	23.5	6.3	6.0
Gross Beta				NA	NA	NA	NA	NA	NA	32.3	6.8	8.3
Cesium-137	0.072	0.020	0.9	2.84	0.39	0.13	7.10	0.89	0.15	NA	NA	NA
Actinium-228				1.49	0.28	0.42	--	--	--	NA	NA	NA
Americium-241	7.5	1.9	0.04	29.3	3.3	0.3	10.6	1.2	0.3	NA	NA	NA
Lead-210	3.2	0.78		--	--	--	--	--	--	NA	NA	NA
Lead-212				1.69	0.23	0.26	1.49	0.26	0.20	NA	NA	NA
Lead-214				1.25	0.25	0.22	1.09	0.24	0.29	NA	NA	NA
Potassium-40	0.25	0.068	38.6	29.0	4.4	1.5	27.9	4.3	1.2	NA	NA	NA
Thallium-208				--	--	--	0.59	0.17	0.14	NA	NA	NA
Thorium-234				1.47	0.78	0.89	--	--	--	NA	NA	NA

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Sandia Canyon								
	EPA PRG	EPA PRG	LANL	SC-2 0-3 cm (12/13/99)			SC-3 8-19 cm (12/13/99)			SC-4 2-12 cm (12/13/99)		
	Commercial	Residential	Background	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	10	2.5	0.068	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	69	18	2.59	1.46	0.45	0.11	1.05	0.37	0.13	1.13	0.36	0.08
Uranium-235	0.57	0.16	0.20	0.102 J	0.093	0.10	0.173 J	0.14	0.12	0.077 J	0.079	0.052
Uranium-238	73	18	2.29	1.45	0.38	0.08	1.06	0.37	0.13	1.34	0.41	0.04
Strontium-90	57	14	1.04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gross Alpha				36.7	7.5	5.6	30.0	6.8	4.8	26.3	5.8	3.7
Gross Beta				45.5	6.7	5.7	43.3	7.1	6.9	49.4	7.6	6.8
Cesium-137	0.072	0.020	0.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Actinium-228				NA	NA	NA	NA	NA	NA	NA	NA	NA
Americium-241	7.5	1.9	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-210	3.2	0.78		NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-212				NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-214				NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium-40	0.25	0.068	38.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium-208				NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-234				NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Sandia Canyon						Bayo Canyon		
	EPA PRG	EPA PRG	LANL	SC-5 0-18 cm (12/13/99)			SC-6 0-12 cm (12/13/99)			BC-1 0-14 cm (12/13/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	NA	NA	NA	NA	NA	NA	0.023	0.052	0.095
Plutonium-239/240	10	2.5	0.068	NA	NA	NA	NA	NA	NA	0.083 J	0.073	0.060
Uranium-234	69	18	2.59	1.37	0.41	0.07	1.48	0.49	0.17	1.46	0.44	0.04
Uranium-235	0.57	0.16	0.20	0.076 J	0.078	0.052	0.09	0.11	0.19	0.12	0.10	0.05
Uranium-238	73	18	2.29	1.18	0.37	0.07	1.36	0.47	0.17	1.64	0.48	0.08
Strontium-90	57	14	1.04	NA	NA	NA	NA	NA	NA	0.85	0.53	0.81
Gross Alpha				26.4	6.2	5.4	27.3	6.1	4.4	34.0	7.3	4.4
Gross Beta				39.1	6.1	5.6	43.3	6.9	6.6	43.4	7.1	6.9
Cesium-137	0.072	0.020	0.9	NA	NA	NA	NA	NA	NA	0.83	0.20	0.15
Actinium-228				NA	NA	NA	NA	NA	NA	--	--	--
Americium-241	7.5	1.9	0.01	NA	NA	NA	NA	NA	NA	--	--	--
Lead-210	3.2	0.78		NA	NA	NA	NA	NA	NA	1.9	1.7	1.5
Lead-212				NA	NA	NA	NA	NA	NA	1.62	0.41	0.16
Lead-214				NA	NA	NA	NA	NA	NA	1.68	0.48	0.25
Potassium-40	0.25	0.068	35.6	NA	NA	NA	NA	NA	NA	30.6	4.7	1.3
Thallium-208				NA	NA	NA	NA	NA	NA	--	--	--
Thorium-234				NA	NA	NA	NA	NA	NA	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Bayo Canyon								
	EPA PRG Commercial	EPA PRG Residential	LANL Background	BC-2 14-27 cm (12/13/99)			BC-3 10-22 cm (12/13/99)			BC-4 4-11 cm (12/13/99)		
				Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.13	0.13	0.17	0.003	0.062	0.13	0.068	0.098	0.15
Plutonium-239/240	10	2.5	0.068	0.037	0.059	0.085	0.051	0.066	0.094	-0.011	0.013	0.10
Uranium-234	69	18	2.59	1.74	0.60	0.13	1.35	0.40	0.13	1.21	0.38	0.08
Uranium-235	0.57	0.16	0.20	0.133	0.13	0.09	0.153	0.11	0.08	0.035	0.057	0.094
Uranium-238	73	18	2.29	1.34	0.49	0.13	1.40	0.41	0.07	0.903	0.31	0.04
Strontium-90	57	14	1.04	0.34	.060	1.0	0.23	0.61	1.0	0.40	0.52	0.86
Gross Alpha				33.8	7.4	5.0	30.7	6.8	5.2	25.5	6.3	4.9
Gross Beta				49.9	7.8	7.2	45.3	7.2	6.7	47.8	7.4	6.6
Cesium-137	0.072	0.020	0.9	0.38	0.15	0.15	0.06	0.12	0.24	0.32	0.12	0.14
Actinium-228				1.71	0.35	0.59	--	--	--	--	--	--
Americium-241	7.5	1.9	0.04	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		--	--	--	2.5	1.8	1.5	2.5	1.5	1.2
Lead-212				1.43	0.26	0.27	1.83	0.28	0.15	1.21	0.34	0.21
Lead-214				1.35	0.26	0.24	1.59	0.29	0.27	1.25	0.41	0.19
Potassium-40	0.25	0.068	38.6	29.1	4.6	1.9	31.3	5.4	2.1	32.6	4.7	1.4
Thallium-208				--	--	--	--	--	--	0.33	0.12	0.12
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Bayo Canyon			Mortandad Canyon					
	EPA PRG	EPA PRG	LANL	BC-5 Duplicate of BC-2 (12/13/99)			MC-1 0-5 cm (12/14/99)			MC-2 0-8 cm (12/14/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.066	0.079	0.11	0.053	0.078	0.12	0.17 J	0.11	0.11
Plutonium-239/240	10	2.5	0.065	0.057	0.066	0.085	0.030	0.018	0.070	0.14 J	0.10	0.11
Uranium-234	69	18	2.59	1.65	0.47	0.10	0.78 J	0.26	0.1	0.75 J	0.25	0.08
Uranium-235	0.57	0.16	0.20	0.13 J	0.11	0.12	0.026	0.047	0.091	0.026	0.047	0.091
Uranium-238	73	18	2.29	1.48	0.43	0.09	0.87 J	0.28	0.09	0.76 J	0.26	0.08
Strontium 90	57	14	1.01	0.16	0.52	0.89	0.20	0.52	0.88	0.08	0.43	0.75
Gross Alpha				30.3	6.9	5.9	21.0	5.2	4.3	16.4	4.8	4.7
Gross Beta				41.4	7.0	6.6	37.4	6.4	6.6	37.2	6.4	6.6
Cesium-137	0.072	0.020	0.9	0.36	0.17	0.17	0.04	0.11	0.23	0.26	0.11	0.11
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.04	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		4.0	1.6	1.7	3.7	1.4	1.4	2.4	1.3	1.2
Lead-212				1.16	0.26	0.19	1.27	0.22	0.17	1.12	0.28	0.13
Lead-214				1.34	0.24	0.24	1.07	0.22	0.22	0.91	0.29	0.20
Potassium 40	0.25	0.068	38.6	26.8	4.2	2.0	32.8	5.3	1.5	31.0	5.0	1.6
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Mortandad Canyon								
	EPA PRG Commercial	EPA PRG Residential	LANL Background	MC-3 15-24 cm (12/14/99)			MC-4 0.5 cm (12/14/99)			MC-5A 0-13 cm (12/14/99)		
				Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.028	0.065	0.12	0.003	0.044	0.10	0.82	0.26	0.09
Plutonium-239/240	10	2.5	0.068	0.015	0.046	0.092	0.017	0.032	0.081	106	21	0.07
Uranium-234	69	18	2.59	0.62 J	0.24	0.16	0.51 J	0.20	0.07	0.73	0.26	0.07
Uranium-235	0.57	0.16	0.20	0.055 J	0.065	0.050	0.087	0.082	0.10	0.121	0.098	0.085
Uranium-238	73	18	2.29	0.56 J	0.22	0.04	0.56 J	0.21	0.07	0.74	0.26	0.08
Strontium-90	57	14	1.04	0.2	1.1	2.0	0.41	0.49	0.80	-0.01	0.52	0.91
Gross Alpha				19.5	5.2	4.7	16.2	4.6	3.8	20.0	5.1	4.1
Gross Beta				47.0	7.5	7.3	39.4	6.8	7.2	42.9	6.7	6.3
Cesium-137	0.072	0.020	0.9	0.005	0.068	0.12	0.44	0.15	0.16	0.124	0.095	0.14
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.01	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		--	--	--	1.9	1.5	1.3	--	--	--
Lead-212				0.91	0.28	0.13	1.22	0.28	0.14	1.01	0.30	0.15
Lead-214				0.81	0.29	0.22	0.89	0.27	0.21	0.99	0.32	0.21
Potassium-40	0.25	0.068	38.6	27.2	4.5	1.8	26.9	4.4	1.3	28.2	4.7	1.7
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Mortandad Canyon			Canada del Buey					
	EPA PRG	EPA PRG	LANL	MC-5B 22-30 cm (12/14/99)			CC-1 10-17 cm (12/15/99)			CC-2 5-20 cm (12/15/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.46 J	0.19	0.12	0.23	0.15	0.17	0.030	0.058	0.12
Plutonium-239/240	10	2.5	0.068	67	13	0.07	0.017	0.050	0.12	-0.002	0.005	0.006
Uranium-234	69	18	2.59	0.53 J	0.19	0.11	0.99	0.48	0.19	0.68 J	0.28	0.14
Uranium-235	0.57	0.16	0.20	0.102 J	0.084	0.098	0.01	0.10	0.24	0.029	0.072	0.17
Uranium-238	73	18	2.29	0.72 J	0.23	0.06	1.0	0.48	0.11	0.72 J	0.29	0.12
Strontium-90	57	14	1.01	-0.05	0.54	0.95	-0.02	0.37	0.65	-0.17	0.36	0.65
Gross Alpha				13.9	4.5	4.3	17.1	4.4	3.5	20.4	5.4	4.8
Gross Beta				37.7	6.8	7.6	37.0	5.8	5.4	27.3	5.6	6.7
Cesium-137	0.072	0.020	0.9	0.005	0.035	0.14	-0.06	0.12	0.22	0.13	0.10	0.17
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.01	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		1.50	0.90	1.5	3.7	1.6	1.4	2.7	1.3	1.4
Lead-212				0.94	0.19	0.14	1.02	0.22	0.25	1.26	0.34	0.22
Lead-214				0.75	0.17	0.18	1.16	0.24	0.24	1.02	0.37	0.24
Potassium-40	0.25	0.068	38.6	30.4	4.6	1.3	24.7	4.5	2.4	21.8	4.0	1.0
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Canada del Buey								
	EPA PRG	EPA PRG	LANL	CC-3 0-13 cm (12/15/99)			CC-4 0-2 cm (12/15/99)			CC-5A 18-26 cm (12/15/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.012	0.057	0.15	0.11	0.11	0.16	-0.006	0.056	0.16
Plutonium-239/240	10	2.5	0.068	0.031	0.055	0.11	0.007	0.036	0.11	0.006	0.031	0.092
Uranium-234	69	18	2.59	0.823	0.40	0.15	1.11	0.50	0.18	1.07	0.41	0.10
Uranium-235	0.57	0.16	0.20	0.0	0.0	0.1	0.143	0.16	0.12	0.123	0.13	0.08
Uranium-238	73	18	2.29	1.04	0.46	0.1	1.08	0.45	0.10	0.873	0.36	0.10
Strontium-90	57	14	1.04	0.03	0.55	0.97	-0.06	0.33	0.59	0.01	0.41	0.72
Gross Alpha				18.8	5.3	4.2	21.5	5.3	4.2	29.9	6.6	4.5
Gross Beta				35.3	6.2	6.5	37.4	6.0	6.0	36.4	5.8	5.6
Cesium-137	0.072	0.020	0.9	0.012	0.095	0.17	0.10	0.10	0.21	-0.05	0.12	0.22
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.03	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		--	--	--	3.8	1.5	1.8	2.7	1.3	1.5
Lead-212				1.17	0.33	0.23	1.23	0.23	0.25	1.45	0.26	0.17
Lead-214				1.0	0.36	0.20	1.03	0.23	0.25	1.35	0.24	0.23
Potassium-40	0.25	0.068	38.6	26.6	4.6	1.7	28.8	4.7	1.4	25.2	4.8	1.8
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Canada del Buey								
	EPA PRG Commercial	EPA PRG Residential	LANL Background	CC-5B 30-39 cm (12/15/99)			CC-6 0-7.5 cm (12/15/99)			CC-7 0-7 cm (12/15/99)		
				Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.060	0.097	0.20	0.16 J	0.12	0.14	0.18 J	0.12	0.15
Plutonium-239/240	10	2.5	0.068	0.034	0.054	0.090	0.013	0.034	0.079	0.031	0.056	0.11
Uranium-234	69	18	2.59	0.84	0.28	0.68	0.99 J	0.38	0.19	0.99 J	0.45	0.1
Uranium-235	0.57	0.16	0.20	0.100	0.096	0.14	0.13 J	0.11	0.07	0.045	0.091	0.12
Uranium-238	73	18	2.29	0.85	0.29	0.12	1.16	0.42	0.14	0.76 J	0.39	0.18
Strontium-90	57	14	1.04	0.31	0.85	1.5	-0.19	0.44	0.78	-0.33	0.47	0.84
Gross Alpha				14.4	4.5	4.5	17.2	4.7	4.0	18.6	5.1	4.3
Gross Beta				33.0	6.1	6.7	35.9	6.0	6.0	32.9	6.4	7.5
Cesium-137	0.072	0.020	0.9	0.017	0.088	0.18	0.21	0.13	0.15	0.092	0.072	0.15
Actinium-228				1.52	0.38	0.57	--	--	--	--	--	--
Americium-241	7.5	1.9	0.04	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		3.4	1.4	1.2	--	--	--	3.3	1.2	1.1
Lead-212				1.25	0.23	0.15	1.22	0.34	0.16	1.16	0.30	0.20
Lead-214				1.26	0.24	0.20	1.21	0.39	0.19	0.83	0.31	0.18
Potassium 40	0.25	0.068	38.6	24.6	4.3	1.6	22.7	3.9	1.7	35.7	4.2	1.3
Thallium-208				0.51	0.13	0.14	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Canada del Buey						Pajarito Canyon		
	EPA PRG	EPA PRG	LANL	CC-8 20-33 cm (12/15/99)			CC-9 Duplicate of CC-2 (12/15/99)			PC-1 0-17 cm (12/16/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.20 J	0.14	0.19	0.12	0.11	0.17	0.1	0.11	0.20
Plutonium-239/240	10	2.5	0.068	-0.010	0.040	0.15	0.13 J	0.10	0.11	0.034	0.055	0.091
Uranium-234	69	18	2.59	1.13	0.40	0.10	0.82 J	0.31	0.18	0.91 J	0.39	0.14
Uranium-235	0.57	0.16	0.20	0.026	0.053	0.072	0.042	0.068	0.11	0.035	0.071	0.096
Uranium-238	73	18	2.29	0.74 J	0.30	0.10	0.81 J	0.31	0.09	0.82 J	0.36	0.14
Strontium-90	57	14	1.04	0.7	1.7	3.0	0.05	0.53	0.91	0.55	0.47	0.75
Gross Alpha				22.3	5.5	4.5	15.6	4.3	3.5	19.3	5.0	4.1
Gross Beta				40.1	6.7	6.6	33.8	5.7	5.8	30.6	5.0	4.8
Cesium-137	0.072	0.020	0.9	0.016	0.095	0.17	-0.003	0.10	0.20	0.41	0.14	0.15
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.04	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		2.5	1.1	1.5	2.7	1.4	1.2	2.6	1.4	1.3
Lead-212				1.11	0.20	0.22	1.20	0.21	0.16	1.18	0.34	0.16
Lead-214				1.01	0.19	0.20	1.00	0.18	0.22	1.01	0.33	0.24
Potassium-40	0.25	0.068	38.6	23.4	3.9	1.6	21.0	3.9	1.8	20.1	4.2	1.5
Thallium-208				--	--	--	--	--	--	0.52	0.16	0.12
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Pajarito Canyon								
	EPA PRG Commercial	EPA PRG Residential	LANL Bkground	PC-2 0-24 cm (12/16/99)			PC-3 0-21 cm (12/16/99)			PC-4 0-5 cm (12/16/99)		
				Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.065	0.072	0.12	0.035	0.077	0.17	0.15	0.12	0.17
Plutonium-239/240	10	2.5	0.068	0.040	0.050	0.068	0.006	0.045	0.13	0.007	0.035	0.10
Uranium-234	69	18	2.59	0.85 J	0.35	0.07	0.73 J	0.31	0.16	0.72 J	0.32	0.16
Uranium-235	0.57	0.16	0.20	0.060	0.086	0.081	0.016	0.057	0.16	0.025	0.064	0.15
Uranium-238	73	18	2.29	0.77 J	0.33	0.12	0.85 J	0.34	0.13	1.18	0.44	0.12
Strontium-90	57	14	1.04	0.20	0.45	0.77	0.26	0.40	0.68	0.39	0.41	0.68
Gross Alpha				21.0	5.7	5.6	21.2	5.2	4.0	19.7	4.9	4.0
Gross Beta				32.5	5.7	6.0	30.6	5.3	5.5	30.6	5.4	5.8
Cesium-137	0.072	0.020	0.9	0.054	0.096	0.18	0.34	0.18	0.19	0.37	0.14	0.13
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.01	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		--	--	--	3.4	1.5	1.5	--	--	--
Lead-212				1.27	0.25	0.20	1.19	0.24	0.19	1.11	0.31	0.21
Lead-214				0.94	0.24	0.24	1.17	0.23	0.29	0.95	0.35	0.18
Potassium-40	0.25	0.068	38.6	25.3	4.3	1.6	23.0	4.7	1.7	24.0	4.2	2.3
Thallium-208				0.46	0.14	0.15	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Pajarito Canyon			Ancho Canyon					
	EPA PRG Commercial	EPA PRG Residential	LANL Bkgrnnd	PC-5 Duplicate of PC-2 (12/16/99)			AC-1 0-5 cm (12/16/99)			AC-2 0-17 cm (12/16/99)		
				Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	0.062	0.072	0.12	0.040	0.059	0.11	0.14	0.11	0.15
Plutonium-239/240	10	2.5	0.068	0.000	0.028	0.095	0.050	0.058	0.092	-0.021	0.033	0.14
Uranium-234	69	18	2.59	0.83 J	0.33	0.14	1.62	0.51	0.16	1.30	0.54	0.28
Uranium-235	0.57	0.16	0.20	0.076	0.097	0.13	0.054	0.059	0.17	-0.03	0.10	0.38
Uranium-238	73	18	2.29	0.89 J	0.35	0.14	2.66	0.75	0.14	1.28	0.54	0.32
Strontium-90	57	14	1.04	0.14	0.40	0.69	-0.47	0.44	0.78	0.23	0.36	0.61
Gross Alpha				19.4	4.8	4.0	24.6	5.1	3.1	19.9	4.9	3.8
Gross Beta				34.7	5.5	5.3	39.6	5.5	4.4	40.8	6.0	5.1
Cesium-137	0.072	0.020	0.9	0.052	0.097	0.18	0.39	0.16	0.15	0.16	0.16	0.17
Actinium-228				--	--	--	1.14	0.34	0.46	--	--	--
Americium-241	7.5	1.9	0.01	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		--	--	--	2.9	1.6	2.0	3.5	1.3	1.4
Lead-212				1.20	0.36	0.21	1.30	0.25	0.20	1.43	0.23	0.21
Lead-214				1.26	0.42	0.23	1.09	0.22	0.27	1.02	0.26	0.28
Potassium-40	0.25	0.068	38.6	22.2	3.9	1.7	27.7	4.8	1.8	29.9	5.1	2.3
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				--	--	--	--	--	--	--	--	--

TABLE 13
(continued)

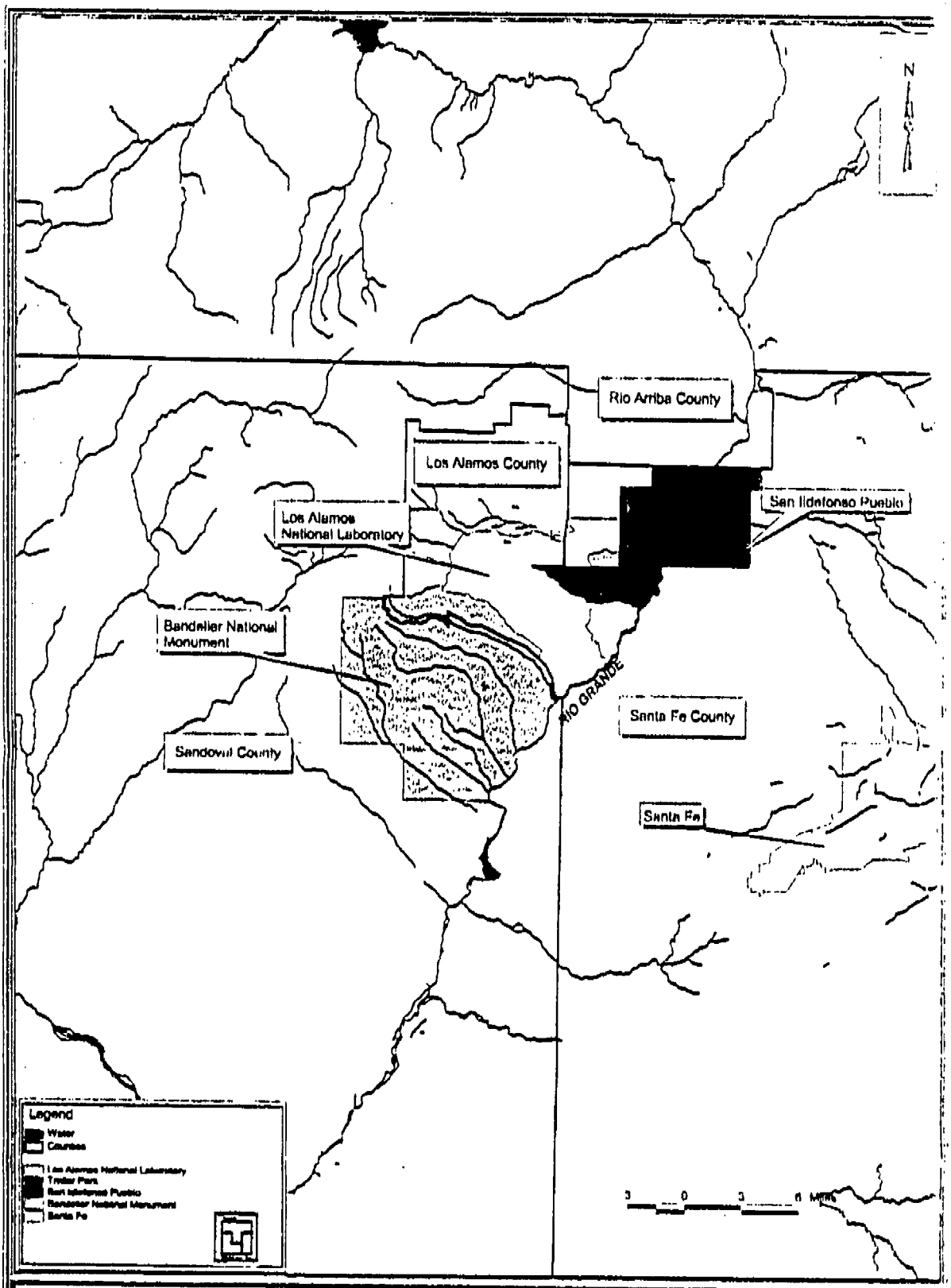
Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			Ancho Canyon								
	EPA PRG	EPA PRG	LANL	AC-3 5-16 cm (12/16/99)			AC-4 0-7 cm (12/16/99)			AC-5 10-24 cm (12/16/99)		
	Commercial	Residential	Bkground	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	81	2.7	0.006	0.129 J	0.097	0.097	0.018	0.037	0.050	0.027	0.051	0.11
Plutonium-239/240	10	2.5	0.068	0.025	0.044	0.087	0.013	0.025	0.034	-0.009	0.009	0.083
Uranium-234	69	18	2.59	0.93	0.36	0.12	1.25	0.43	0.1	0.81	0.33	0.22
Uranium-235	0.57	0.16	0.20	0.15	0.14	0.17	0.046	0.073	0.12	0.033	0.082	0.19
Uranium-238	73	18	2.29	1.34	0.46	0.12	1.55	0.50	0.12	1.05	0.39	0.11
Strontium-90	57	14	1.04	0.31	0.38	0.63	0.22	0.40	0.67	0.24	0.43	0.72
Gross Alpha				28.4	5.9	3.7	22.6	5.4	4.4	19.5	4.7	3.3
Gross Beta				41.0	4.1	5.5	43.1	6.8	6.3	39.7	5.9	5.1
Cesium-137	0.072	0.020	0.9	0.36	0.14	0.14	0.37	0.14	0.14	0.12	0.11	0.21
Actinium-228				--	--	--	--	--	--	--	--	--
Americium-241	7.5	1.9	0.04	--	--	--	--	--	--	--	--	--
Lead-210	3.2	0.78		4.2	1.4	1.3	--	--	--	3.2	1.6	1.6
Lead-212				1.38	0.36	0.16	1.04	0.29	0.20	1.07	0.22	0.22
Lead-214				1.16	0.41	0.20	0.91	0.33	0.19	1.06	0.21	0.25
Potassium-40	0.25	0.068	38.6	28.2	4.4	1.6	28.4	4.3	0.8	28.6	4.6	1.2
Thallium-208				--	--	--	--	--	--	--	--	--
Thorium-234				1.96	0.79	0.98	--	--	--	--	--	--

TABLE 13
(continued)

Radionuclide	Sample Location, Depth, and Date Collected											
	Reference			QA/QC Samples								
	EPA PRG[a]	EPA PRG	LANL	ACS EB (12/6/99)			CC-EB (12/15/99)			AC-EB (12/16/99)		
	Commercial	Residential	Background	Result	Sigma Error	MDC	Result	Sigma Error	MDC	Result	Sigma Error	MDC
Plutonium-238	11	2.7	0.006	-0.5	0.11	0.37	-0.10	0.51	1.5	0.37	0.61	1.2
Plutonium-239/240	10	2.5	0.068	0.013	0.099	0.28	0.08	0.39	1.1	-0.023	0.047	0.56
Uranium-234	69	18	2.59	NA	NA	NA	0.1	0.11	0.13	0.05	0.10	0.14
Uranium-235	0.57	0.16	0.20	NA	NA	NA	0.032	0.065	0.087	0.0	0.0	0.1
Uranium-238	73	18	2.29	NA	NA	NA	0.021	0.053	0.12	0.57	0.081	0.077
Strontium-90	57	14	1.04	0.13	0.87	1.5	-0.25	0.50	0.88	0.38	0.85	1.4
Gross Alpha				NA	NA	NA	-0.11	0.63	1.2	-0.36	0.45	1.0
Gross Beta				NA	NA	NA	0.11	0.96	1.7	-0.9	1.0	1.8
Cesium-137	0.072	0.020	0.9	-0.5	6.4	13	-13.0	7.8	14	0.5	8.2	16

- * All results reported in pico Curies per gram (pCi/g)
- a Preliminary Remediation Goals
- NA Not Analyzed
- – Radionuclide was not detected
- J Result is greater than sample detection limit but less than stated reported limit

105 • 00004 • 000



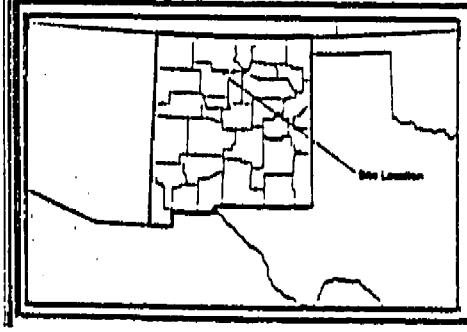
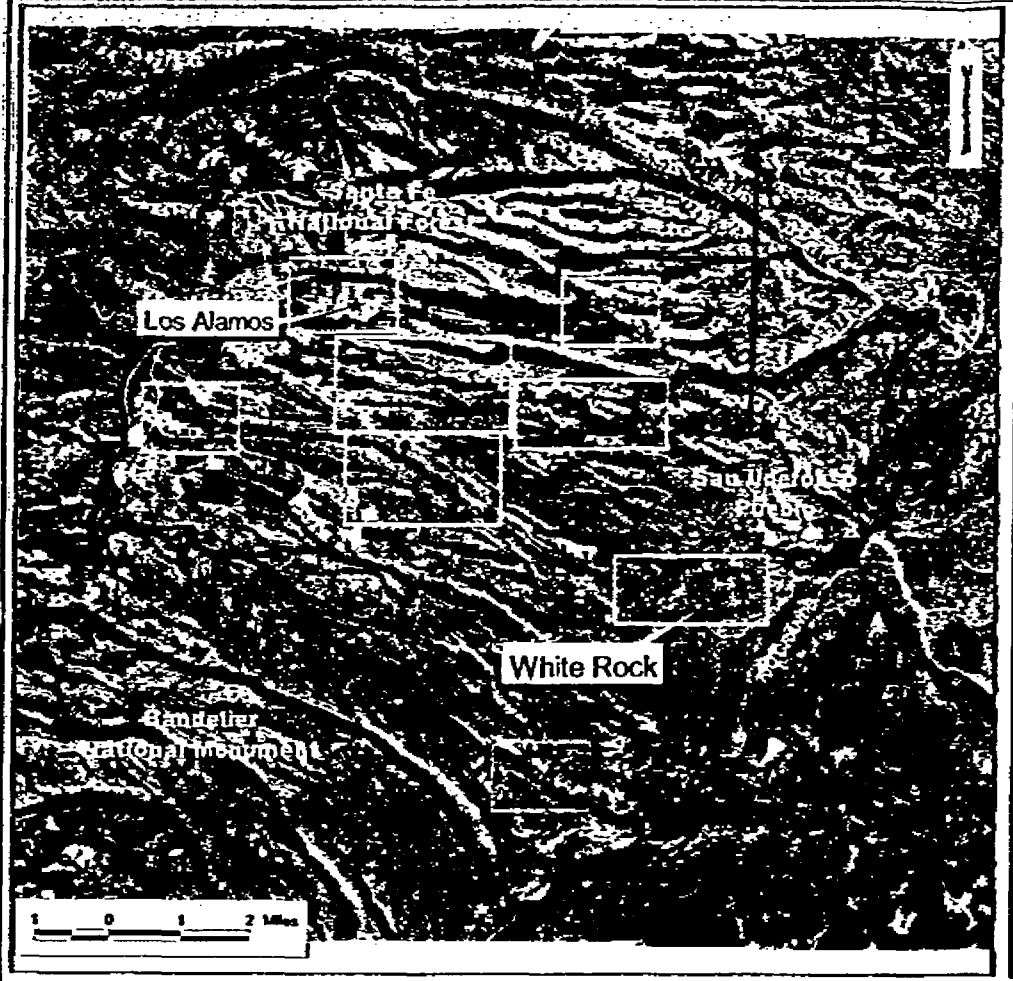
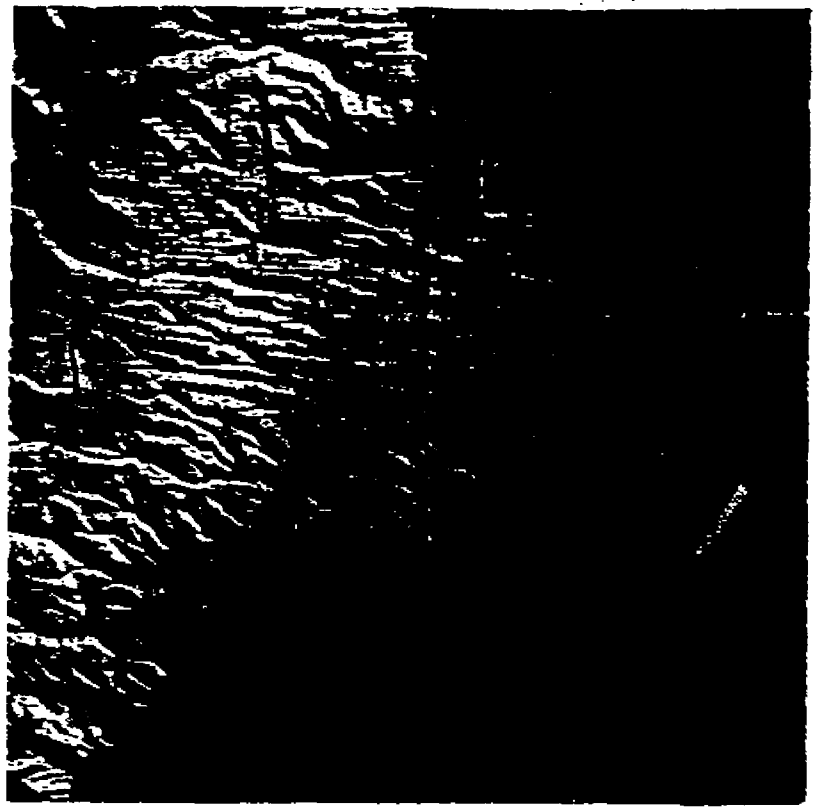


Figure 1
Site Location Map
Los Alamos National Laboratory

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

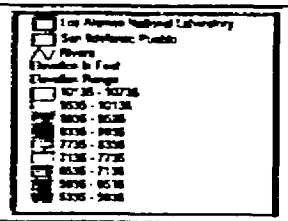


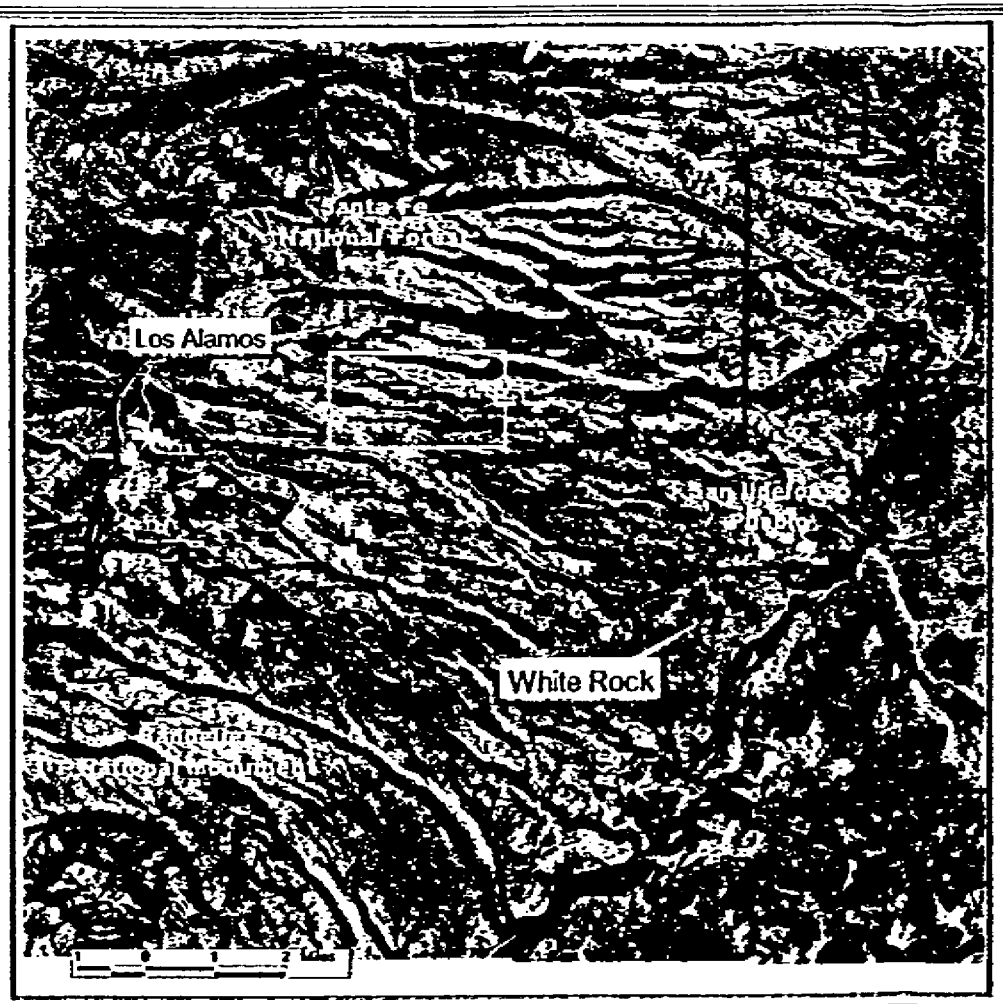


Legend
- Effluent
- Groundwater
- Sediment
- Spring/Surface Water
- San Ildefonso Pueblo
- Los Alamos National Laboratory
- Sample Areas (Areas of Interest)

Figure 2

Aerial View and Digital Elevation Model
Los Alamos National Laboratory





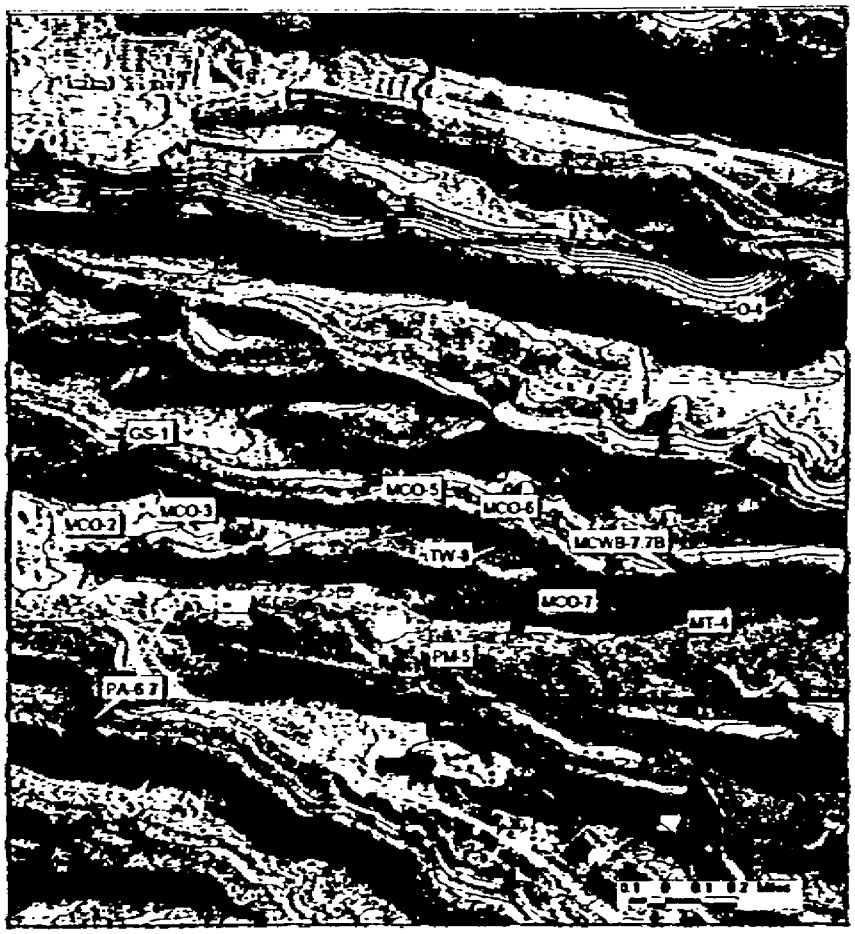
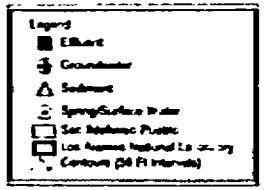
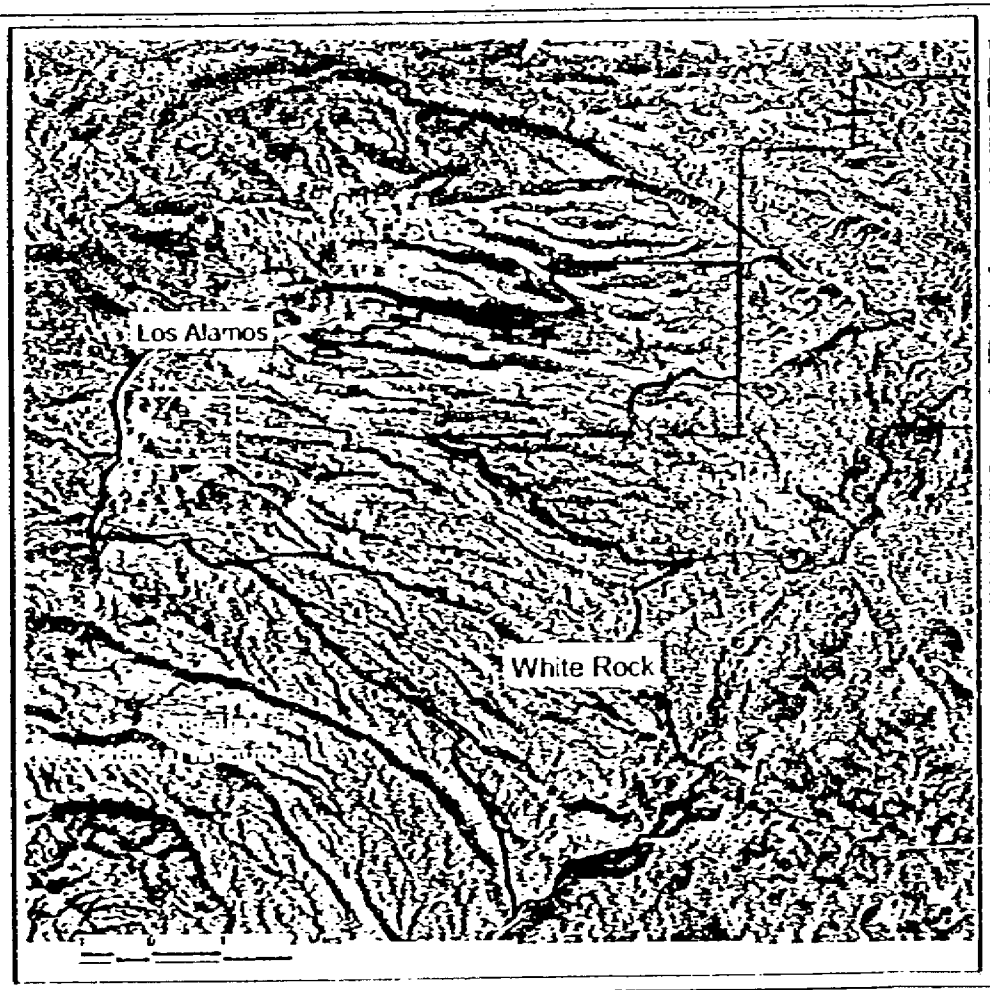


Figure 3

Aerial View/Sample Locations
Mortandad Canyon
Los Alamos National Laboratory





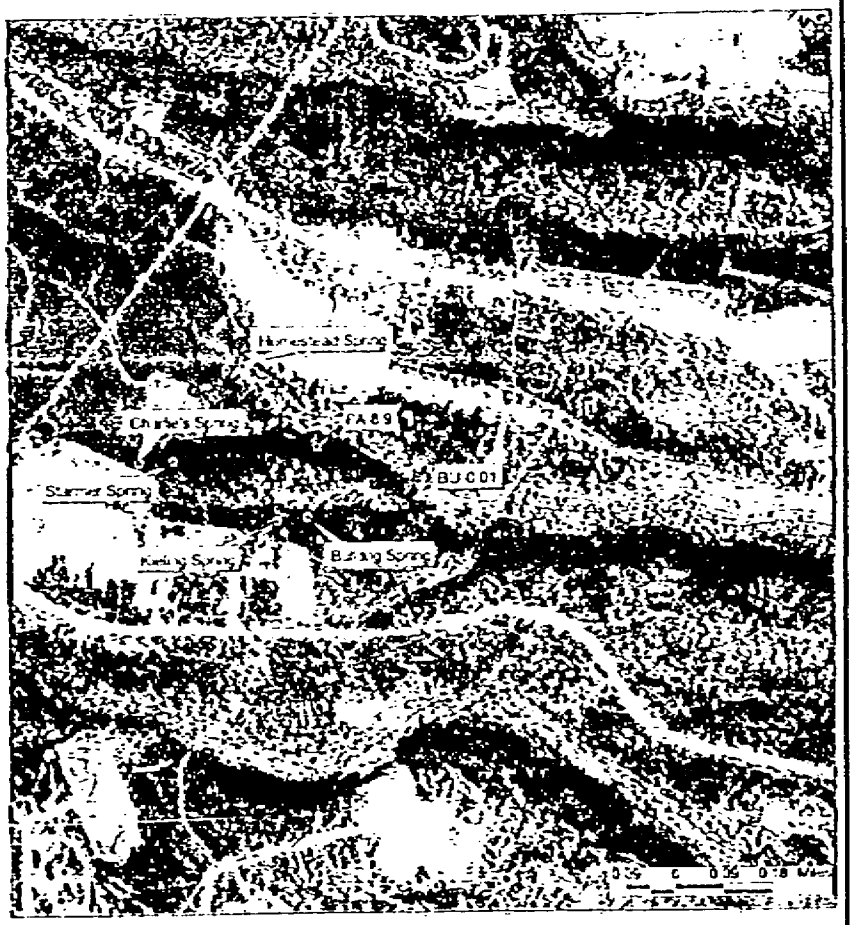


Figure 4

Aerial View/Sample Locations
Upper Pajarito Canyon
Los Alamos National Laboratory

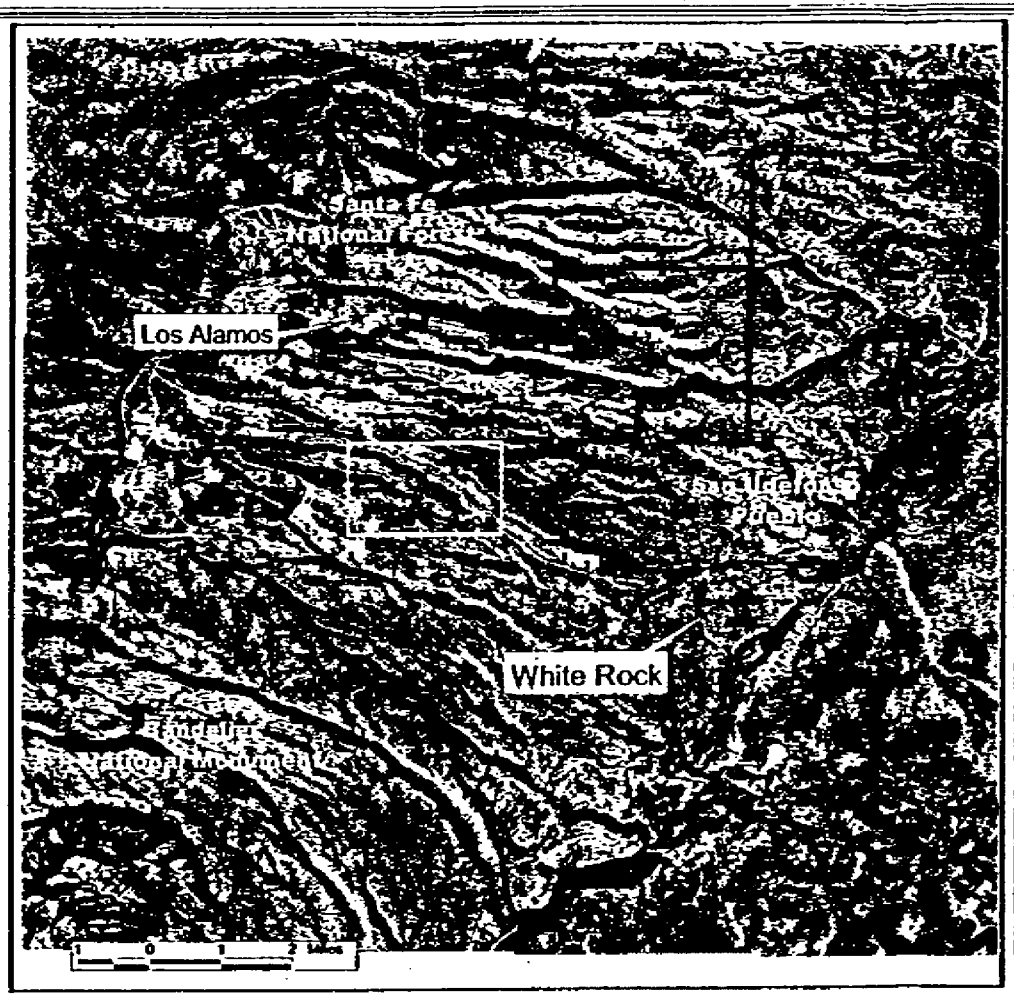
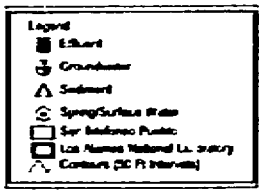


Figure 5

Aerial View/Sample locations
Middle Pajarito Canyon
Los Alamos National Laboratory



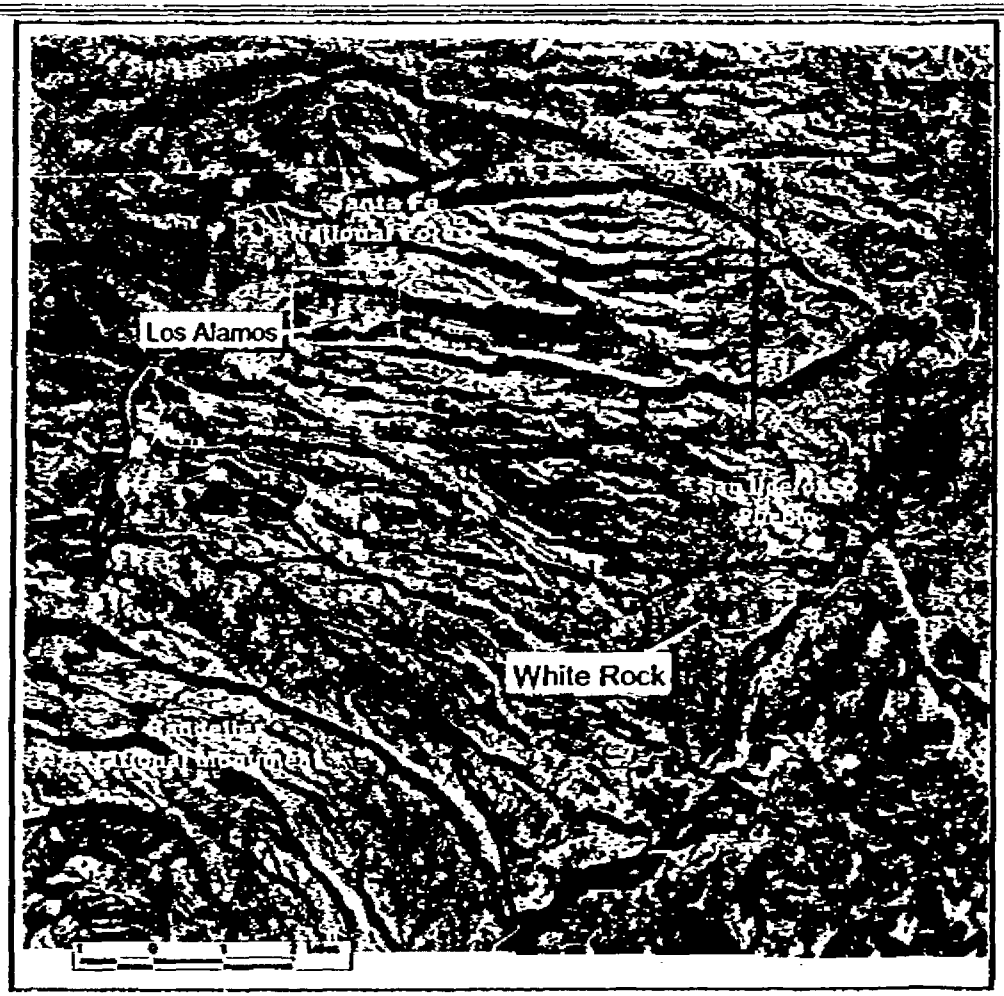
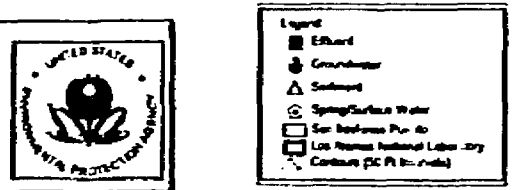


Figure 6

Aerial View/Sample Locations
Acid Canyon
Los Alamos National Laboratory



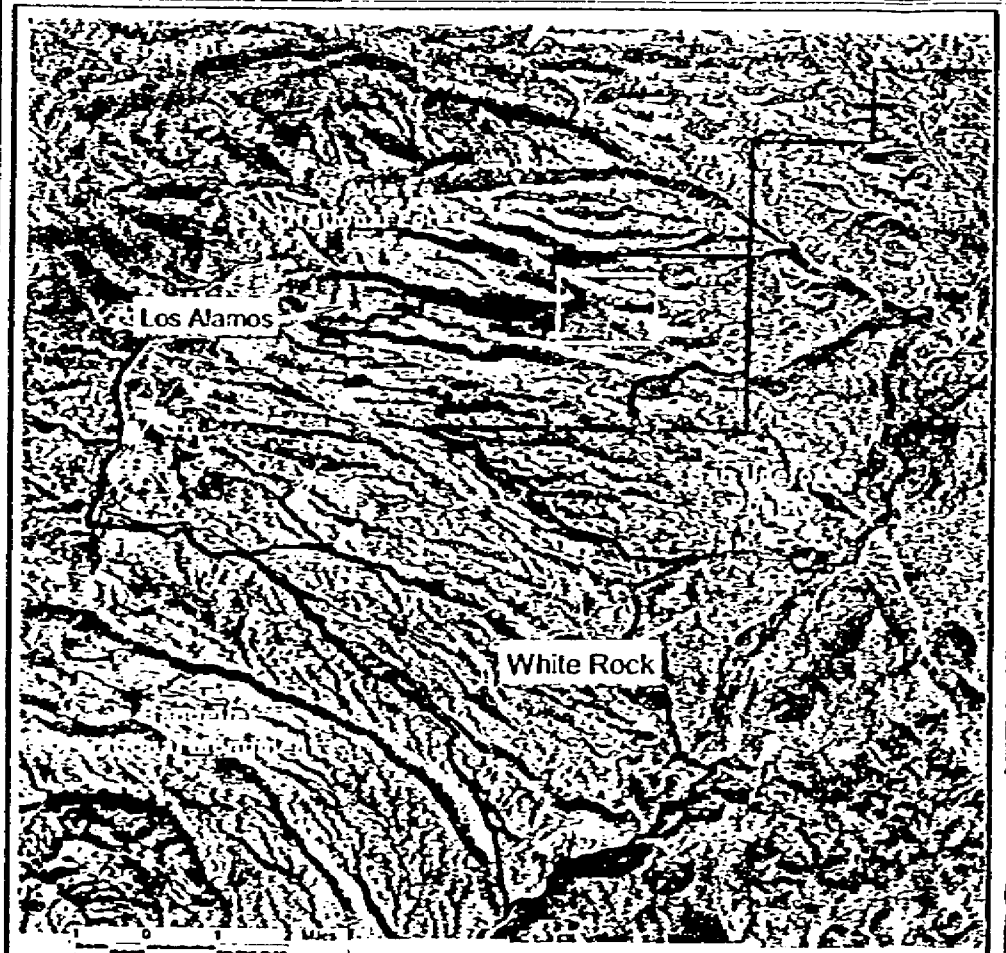


Figure 7

Aerial View/Sample Locations
Bayo Canyon
Los Alamos National Laboratory

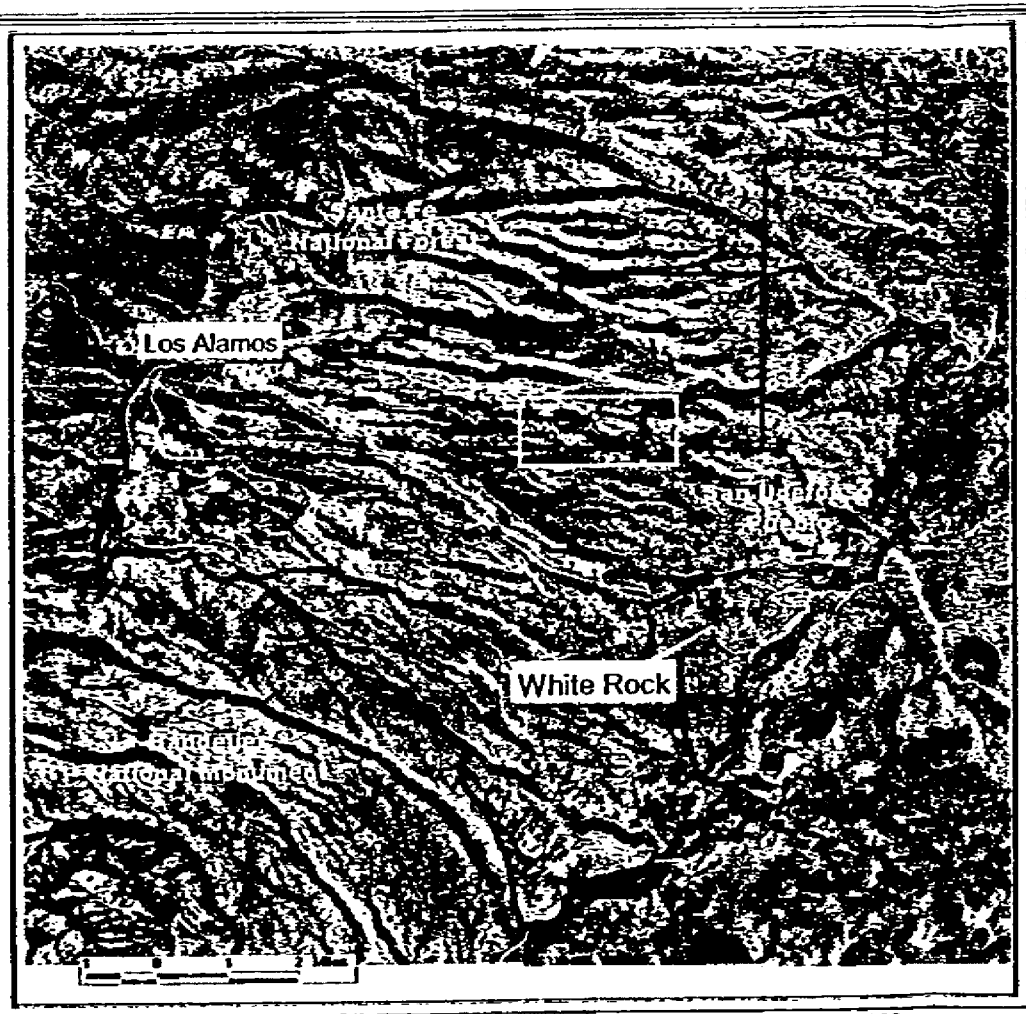
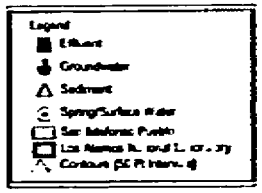
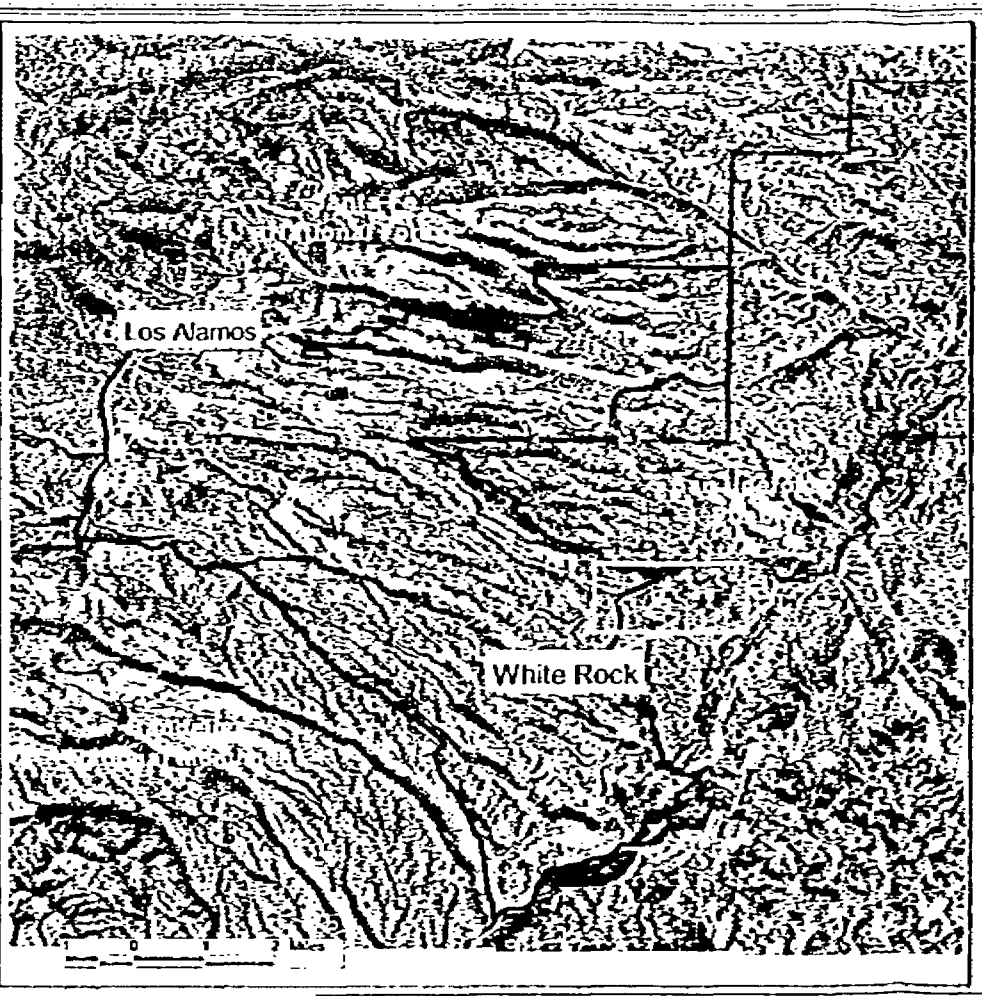


Figure 8

Aerial View/Sample Locations
Mortandad/Sandia Canyons
Los Alamos National Laboratory





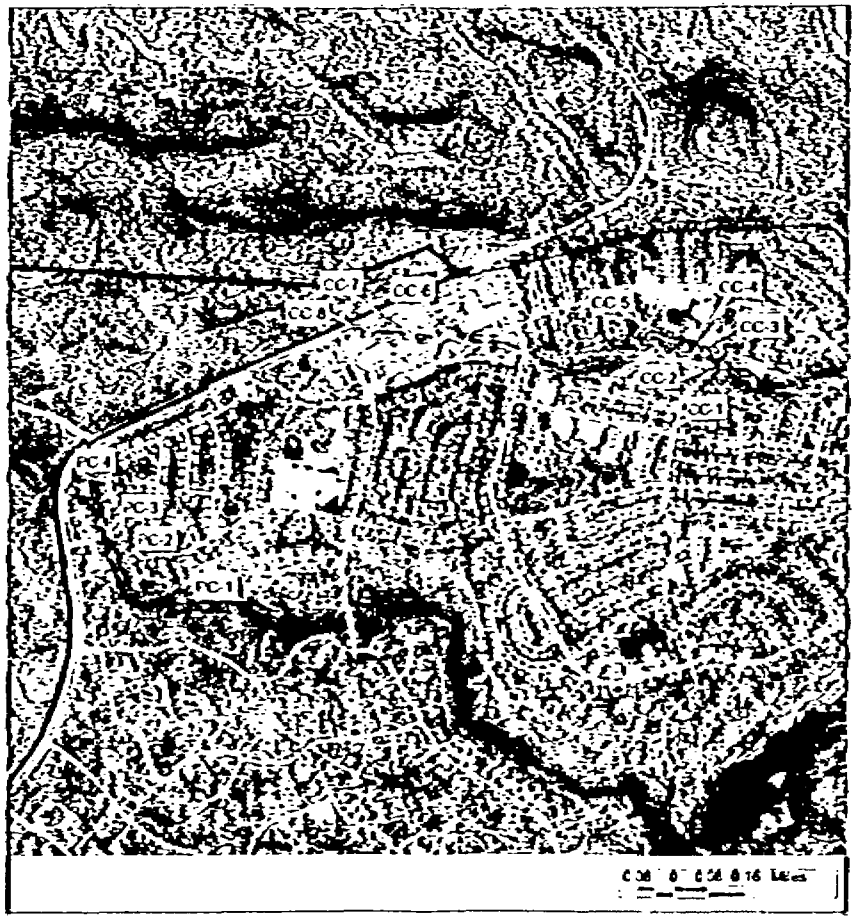


Figure 9

Aerial View/Sample Locations
Lower Pajarito/Canada del Buey
Los Alamos National Laboratory

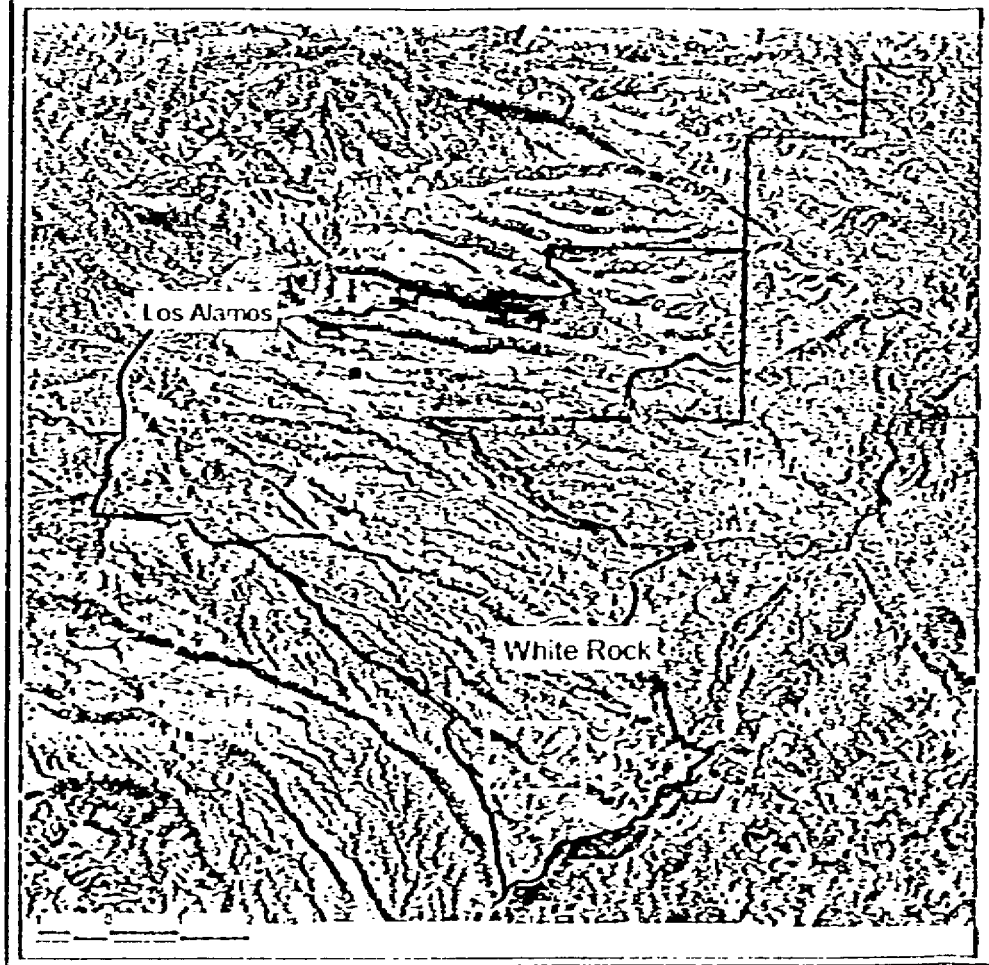


Figure 10

Aerial View/Sample Locations
Ancho Canyon
Los Alamos National Laboratory

APPENDIX A

Field Logbooks

Logbook 1

09.66.70.66

Field Log Book

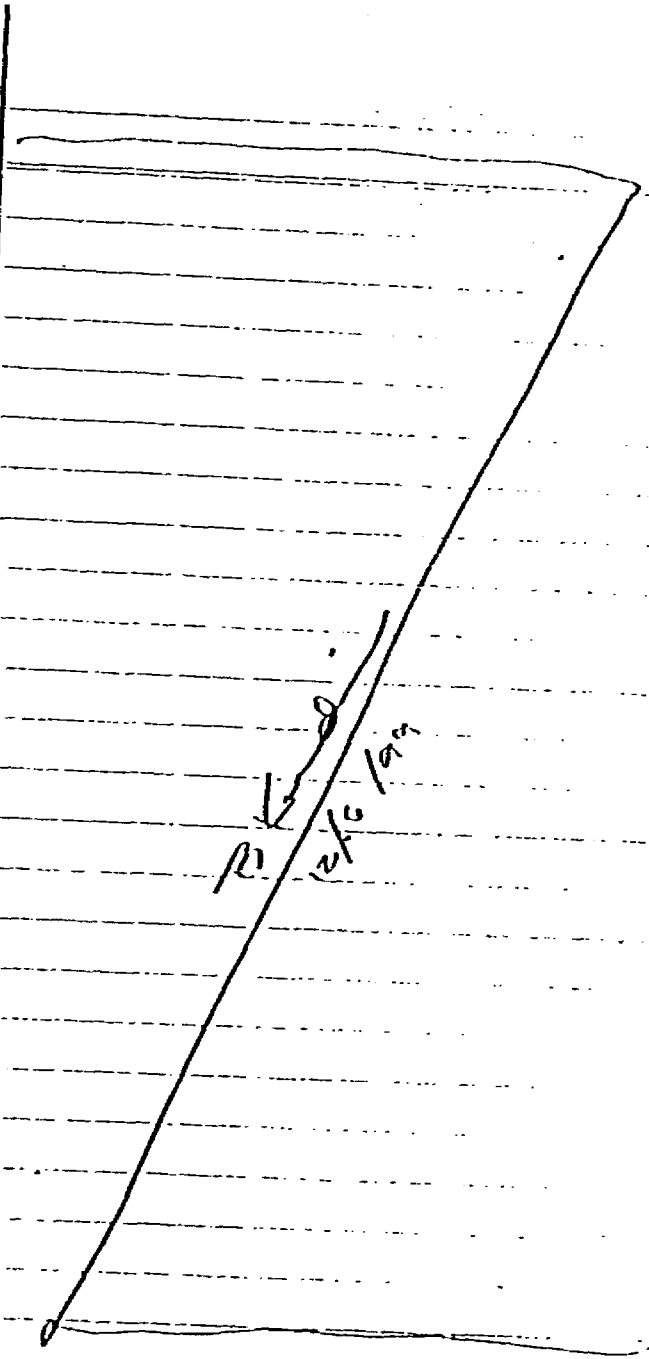
for

Los Alamos National Lab. - Phase 2

By: Tetra Tech, Inc.
750 N. St. Paul
Suite 600
Dallas, TX 75201

For: U.S. EPA
1445 Ross Ave
Dallas, TX 75202

02



LANL - Aquatic — Los Alamos, NM
Dec. 6, 1999 — 01300.00.015

1021 Arrive at Los Alamos Aquatic Center. Met w/ Steve Rennie, LANL. Waited for Ping Simms.

1032 Hiked into Acid Canyon. Decided Mr. Simms will fin or when he arrived.

1033 Arrived at first sample location where hiking trail crosses the stream channel.

1047 Bear bear scat removed. Began collecting sample ACS-35-0.

1049 Pull 1, Pool 1 of sample material on sieve. Being done by B. Kendall witnessed by J. Hurley.

1104 Completed sample collection at ACS-35-0. Sample was collected by Chris Hooks, Phil Hopkins and Jim Hurley. Cleaned the sampling equipment using Contrex and DI Water. Final depth at the location was 2.0 m.

1122 Arrived at second sample location - ACS-18. Will collect 0-26 cm (ACS-18-1) at 20-40 cm.

LANL - Phase 2 Los Alamos, NM

Dec. 6, 1989 01300, FL 015

(ACS-18-2) ACS-18-1 material was homogeneous fine sand, brown in color

1140 completed sampling ACS-18-1 and ACS-18-3 (dupe). Removed the bent rod from

1200 completed sampling ACS-18-2 from 24 to 46 cm. Demand equipment.

1210 Drill 1, this 2 of ACS-18 been lubing cont by Rosalesch subcontract by Hockley

1220 Arrive at ACS-12 location where three samples will be collected ACS-12-1, ACS-12-2, ACS-12-3, Chris decided to collect only 2 samples at this local

1235 Collected sample ACS-12-1 from 0-30 cm depth. Material was fine sand, light grey-brown in color.

1245 Collected sample ACS-12-2 from 30-46 cm depth. Material was fine sand silt, brown in color

B. Kowalski

B. Kowalski 12/6/89

LANL-Pumice — Los Alamos, NM

Dec. 6, 1994 — 01300.0.015

1152 Roll 1, Photo 3 of ALS-12 looking E by B Kerkeslak witnessed by J Hartley

1159 Roll 1, Photo 4 of ALS-12 and ALS-48 in background looking E by B Kerkeslak, witnessed by J Hartley

1300 Collected sample ALS-48 from 0-12 cm depth. Material were gray-brown fine sand. Collected MU/MSP for metals and PCB

1307 Roll 1, Photo 5 of looking ALS-48 looking down by B Kerkeslak witnessed by J Hartley

1319 Arrived at ALS-3 where 4 samples are scheduled.

1330 - Collected ALS-3-1 from 0-33 cm. Material were light brown fine sand.

1340 Collected ALS-3-2 from 51-62 cm. Material were light brown fine sand.

BKerkeslak

LANL: Phoenix Los Alamos, NM

Dec. 6, 1999 01300.00.015

1350 Collected ACS-3-3 from 62 to 88 cm in depth. Material was light brown fine sand.

1400 Collected ACS-3-4 from 88-104 cm in depth. Material was dark brown fine sand.

1410 Collected equipment blank ACS-EB.

1425 Roll 1, Photo 6 of ACS-3 location facing SE by P. Kaufmann and J. Hinkley

1430 Depart ACS-3. M. Daly, S. Kennedy and R. Meyer arrived at the site

1450 Arrive back at the Los Alamos Physics Center

1500 Depart Physics Center

1520 Arrive at NMED Dwight Burrow White Rock Office

Labeled and sealed 6 sample bottles containing samples collected at ACS location

BKaufman

LANL-Phase 2 Los Alamos, NM

Dec 6, 1989 0300.RC.015

Samples collected from the north fork of Acid Canyon were listed below:

Sample No.	Date	Time
NS-35-0	12/6	1102
ACS-18-1	12/6	1140
ACS-18-2	12/6	1200
ACS-18-3	12/6	1210
ACS-12-1	12/6	1235
ACS-12-2	12/6	1245
ACS-48 Comp-0	12/6	1300
ACS-3-1	12/6	1330
ACS-3-2	12/6	1340
ACS-3-3	12/6	1350
ACS-3-4	12/6	1400
ACS-EB	12/6	1410

End of Day

LANL - Area 2 Los Alamos, NM

Dec. 7, 1999 01300.06.015

0813 Weather is partly cloudy and approximately 70°F. Depart NMED White Rock office to meet w/ LANL personnel. Today's schedule is to start sampling wells in Mortandad Canyon. The wells scheduled for the day include TW-8, MCO-2, MCO-3, and MCP-4B.

0825 Arrive at ESH-18. Met w/ David Rogers, Max ~~Maines~~ Maes of Contractor Montoya. Had a safety meeting. Also attending the meeting were Rich Mayer, EPA and Bob Wright, NMED.

0847 Naomi Abeyta, Nash Cordova of San Ildefonso arrived at the meeting. The generator for TW-8 failed; therefore, we will not sample that well today. We will start with MT-4 and work our way back up.

B Kendall

LANL- Phase 2 Los Alamos, NM

Dec. 7, 1999 01300.01.015

0900 Dressed ESH-18 in field PPE and drove around to Mortandad Canyon.

0905 Arrive at MT-4. Water level was measured at 59.69 ft below TOC. Total depth is approximately 74 feet. The amount of water within the well was calculated to be 7.34 gallons. Began purging at 0952 hours. Purging is at approx. 500 ml/min. Procedures for the visit at Mortandad Canyon will be to purge at least one well volume and then monitor water quality parameters.

1000 Water level was 59.65 ft below TOC. Conductivity 560, Temp 19.4°C, TDS 307 ppm, pH 5.40 (pH 7)

1014 Cond 560

Temp 19.3°C

TDS 307 ppm

pH 5.45

Turb. 4.85

BKG-0

B 12/7/88

LANL - Pajarito Los Alamos, NM

Dec. 7, 1988 01300.02.015

1029 Pump rate is approx. 540 ml/min

1033 pH 6.54

Temp 10.4

TDS 307

Cond 560

Turb 1.57

1039 Pump rate is approx. 540 ml/min

1046 Water level was 59.69 feet below TOC

1105 Collected sample MT-4 and will leave MT-4

Cond 512

TDS 308

Temp 9.6

pH 6.46

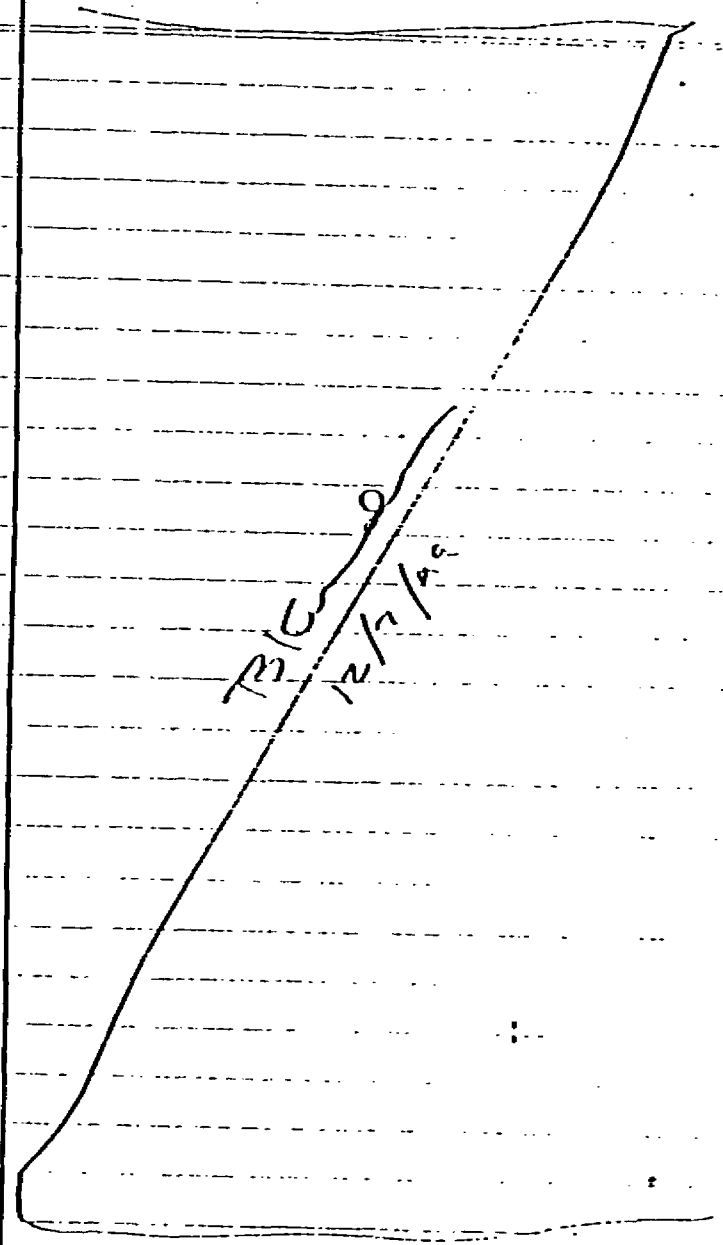
1115 Water level was approx. 59.69 feet below TOC

1120 Roll, Bob J. of MT-4 fairing by BKerbrick witnessed by J. Hosley

1120 Depart MT-4

1135 Arrive at MCO-4B. Top of pump was measured to be 23.54 feet below TOC

Blank



the test was taken the hand the pump. Well values were calculated based on the lip of the pump. Well waters were estimated to be 1.75 gallons.

1110 Pagan pressured MCO-10

1154 Unable to obtain water level at MCO-4B. Therefore, either the water level was below the pump intake or the bladder pump was not functioning properly. Called David Pagan to substitute MCO-4B for MCO-5

1200 Depart MCO-4B. Proceed to RTC office for screening.

1213 Arrive at RTC office

1223 RTC personnel screened sample and team.

1225 Depart RTC office. See Wilkins personnel report.

Wed.

BKG 12/7/99

LANL - Phase 2 Los Alamos, NM

Dec 7, 1999 0300-0-015

1215 Arrive at MCO-3 Potential
security wire detected

1252 Water level unknown
5.95 w/ 1.5 feet air shield up
Total depth of well is 16 feet
Estimated volume of water
is approx 1 gallon

1319 Begin purging activities
Pump rate is approx 1 liter
every [illegible] sec

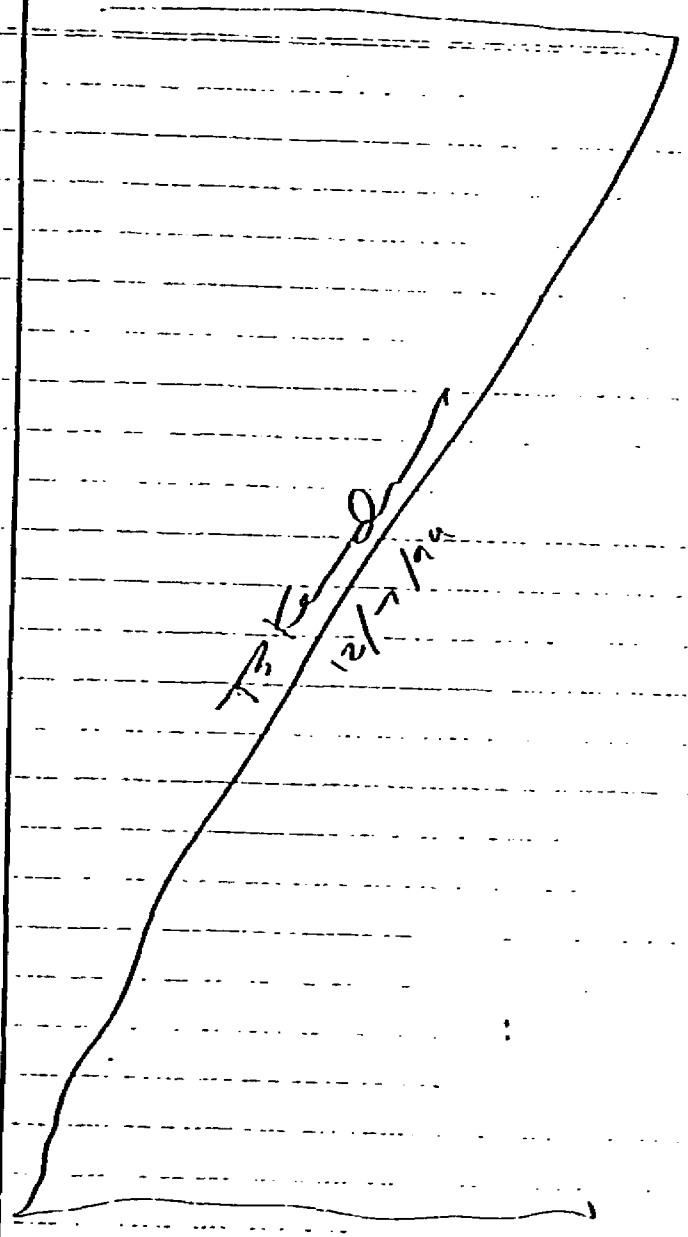
1312 Cond 553
Temp 4.2°C
pH –
TDS 323

1329 Water level is 5.93 feet

1345 Cond 563
Temp 4.2
pH 5.9 ?
TDS 321

1354 Water level is 5.95 feet
Cond 563
Temp 4.2
pH 6.17 ?
TDS 321

BKG-09



LANL - Phase I — Los Alamos, NM

Dec 7, 1989 — 01300.06.015

1400 Collected sample MCO-3 from well MCO-2

1412 Bail 1, Clean & fill MCO-3 casing E. by B. Sandoval witnessed by J. Hurley

1417 Depart MCO-3

1430 Arrive at MCO-2

1443 Water level in MCO-2 was 9.35 PVC. One well volume is approx. 2.45 gallons

1455 Start pumping activities. Purge rate is approx. 500 ml/min

1458 Cond —

pH 7.90

Temp 8.5 °C

Turb 86

DO 0.35

Water Level 8.41

1500 Stand pump rate

Water level 8.66

1502 pH 7.49 DO 0.40

Temp 8.5

Cond .321

Turb 45

Blank —

B Kelly 12/7/99

LANL - Phase 2 Los Alamos, NM

Dec. 7, 1999 01300.00.015

1504 Pump site is now 360 ml/min

1507 Water level now 8.02 feet

1508 pH 7.66

cond 0.253

temp 8.2

turb 4

DO 0.32

1513 Water level is now 7.99 feet

pH 7.66

DO 0.20

cond .242

turb 15

temp 8.2

1530 Collected sample MCO-2

at MCO-2

1536 pH 8.0

cond 0.243

turb 8.0

temp 7.8

DO 0.42

Water level 7.51 feet

Water TDL

Blood

LANL-Area 2 Los Alamos, NM

Dec 7, 1999 01300.06.015

1542 Drill 1, Pump 1 at MLO-2
Facing N by B Kostelnik
witnessed by J Hoyland

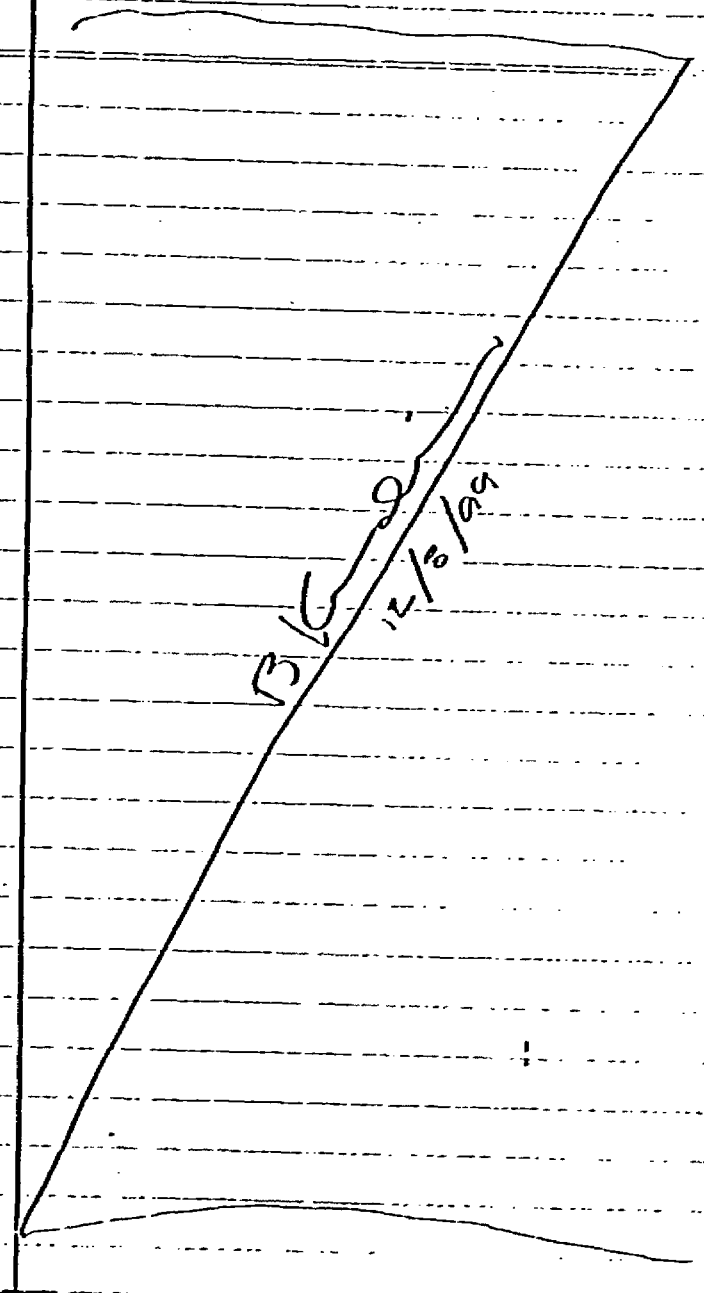
1545 Report MLO-2 and
Mortandad Canyon.

1555 Arrive at White Rock office
Summary of pump sampling:

Well/Sump's No	Date	Time
MT-4	12/7	1105
MLO-4B	12/7	Dry
MLO-3	12/7	1400
MLO-1 (Pump)	12/7	1310
MLO-2	12/7	1510

End of Day

Resumed



LANL - Phase 2 Los Alamos, NM

Dec. 8, 1999 01200.20.015

0705 Arrive at White Rock office to pick up samples for transport to Southwest Laboratory. Dispose of two rubber containing samples from Acid Canyon and Mortandad Canyon.

0840 Arrive at ESH-18 and met with Max Maez. The plan is to begin the day's sampling at MCO-5 in Mortandad Canyon.

0848 Depart ESH-18 enroute to MCO-5

0908 Arrive at MCO-5

0912 Max Maez arrived at the MCO-5 location.

0915 Water level in MCO-5 was 26.20 feet below TOC. Total depth of MCO-5 is 46 feet below TOC. Purge of 3 well volumes is estimated to be 21.5 gallons.

0930 Purge rate is approx 150 ml/min

Cond 0.513 Temp 18.0

pH 6.49 DO 5.47

Turb 73

TKemal

LANL - Phase 2 Los Alamos, NM

Dec. 8, 1989 013-00-01-015

0934 Water level is 26.60 feet below TOC

0941 pH 6.53

Turb 3

DO 7.53

Temp 8.9

Cond .5610

Water Level = 26.60

Pump Rate 990 ml/min

0949 Pump Rate 470 ml/min

pH 6.93

Cond 0.610

Turb 1.0

DO 4.14

Temp 7.4

Water Level 26.18 feet

1010 pH 6.96

Cond 0.606

Turb 1

Temp 7.3

Water level = 26.27 feet

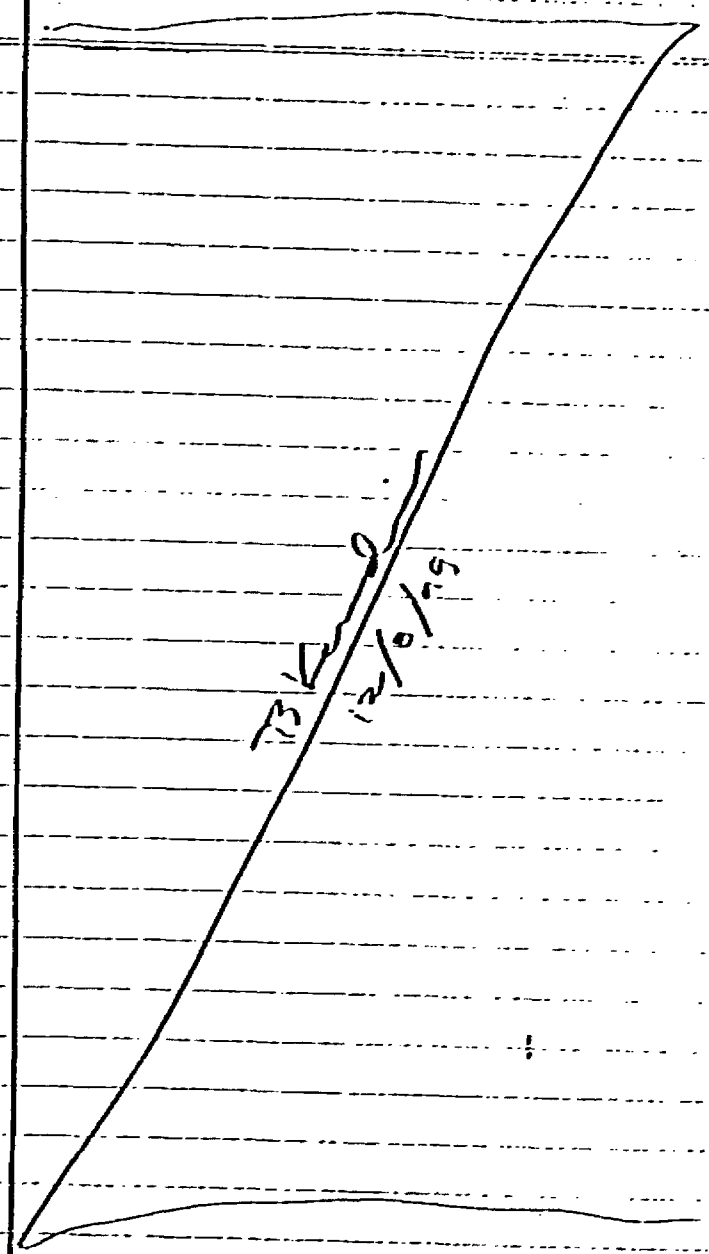
1013 Roll 1, Photo 10 of Mars

facing E by B Kendall

witnessed by J Hurley

BKendall

12/8/89



LANL - Area 2 Los Alamos, NM
Dec. 8, 1999 01300.02.015

1015 pH 6.47
Cond 0.409
Turb 1
Temp 7.2
Water level 26.25
pump rate 490 ml/min
1045 Collected MCO-5 and
well MCO-5 (including MS/MSD)
1050 pump rate now 510 ml/min
pH 7.00
cond 0.403
turb 1
temp 7.2
Water level was 26.29 feet
1102 Depart MCO-5. Started
the sample for TU-B at about
1050 hours
1107 Arrive at MCO-6
1111 Water level in MCO-6 was
39.90 feet below TOC.
1120 Pump rate 740 ml/min
pH 7.23 temp 7.7
Cond 0.413
turb 2

TBKrabacher

LANL - Phase 2 Los Alamos, NM

Dec. 8, 1989 01306.06.015

1125 Water level is 39.01 feet

1135 pH 7.27

cond 0.413

turb 1

temp 7.8

water level 39.04 feet

purge rate 830 ml/min

1140 pH 7.26

cond 0.413

turb 1

temp 7.3

water level 39.05 feet

1145 pH 7.26

cond 0.413

turb 1

temp 7.3

water level - 39.05 feet

1146 Roll, Plate II, at MCP-6

with Jim Hawley, Collection

WPS information

1200 Collected MCP-6 at BK

with MCP-6

TBG - 0

LANL-Pump 2 Los Alamos, NM

Dec 8, 1999 01300.06.015

1210 Final parameters

pH 7.25

cond 0.410

turb 2

temp 7.6

Water level 39.01

pump rate 34 ml

1220 Depart MCO-6

1225 Arrive at MCO-7

1233 Water level in MCO-7

was 41.73 feet below TOC

So well volume is 12.36 gallons

1240 Pump rate is 100 ml/min

1242 pH 6.81

cond 0.513

turb 5

temp 8.4

pump rate 200 ml/min

1250 pH 6.91

cond 0.513

turb 1

temp 8.5

BK 12/9/99

LANL - Phase 3 Los Alamos, NM

Dec. 8, 1989 01300.06.015

1300 cond 0.526

pH 6.93

turb 13

temp 8.5

1304 Water level - 41.75 feet

1306 Pump rate 760 ml/min

Turb : 5.55 NTU (Alex)

1310 pH 6.92

cond 0.510

turb 8

temp 8.5

water level - 41.74 feet

Turb : 3.46 NTU (Alex)

1320 pH 6.92

cond 0.509

turb 13

temp 8.5

Water level - 41.73

turb 5.54 NTU (Alex)

1330 pH 6.91

cond 0.509

turb 12 (9.45 - Alex)

temp 8.5

water level 41.80

TBKaul

12/8/89

TBKaul

LANL - Phase 2 Los Alamos, NM

Dec. 8, 1994 01700.06.015

1334 Resp rate 720 ml/min

1335 pH 6.92

cond 0.551

turb 13 (5.10 - Mon)

temp 3.5

Water level - 41.35 feet

1350 Collected sample MCO-7

at well MCO-7

1400 Roll 1, Arch 12 of MCO-7

facing SE by B Kendall

witnessed by J Hurley

1402 Water level - 41.87 feet

pH 6.87

cond 0.508

turb 8

temp 8.4

pump rate -

1410 Depart MCO-7

1416 Arrive at MCOB-7,7B

1420 Water level is 60.58 feet

below TOC. Total Depth is

70.0 feet. One well volume

is approx. 3.76 gallons

B Kendall

12/2/99

LANL - Area 2 Los Alamos, NM

Dec. 8, 1999 01300.06.015

1435 Pump rate 340 ml/min

Water level 60.13 feet

1437 pH 6.95

cond 0.511

turb 1.55 (2)

temp 8.4

Water level 60.16 feet

1442 Pump rate 340 ml/min

pH 6.98

cond 0.511

turb 1

temp 8.8

Water level 60.18 feet

1447 pH 6.97

cond 0.511

turb 0

temp 8.8

1452 pH 6.94

cond 0.521

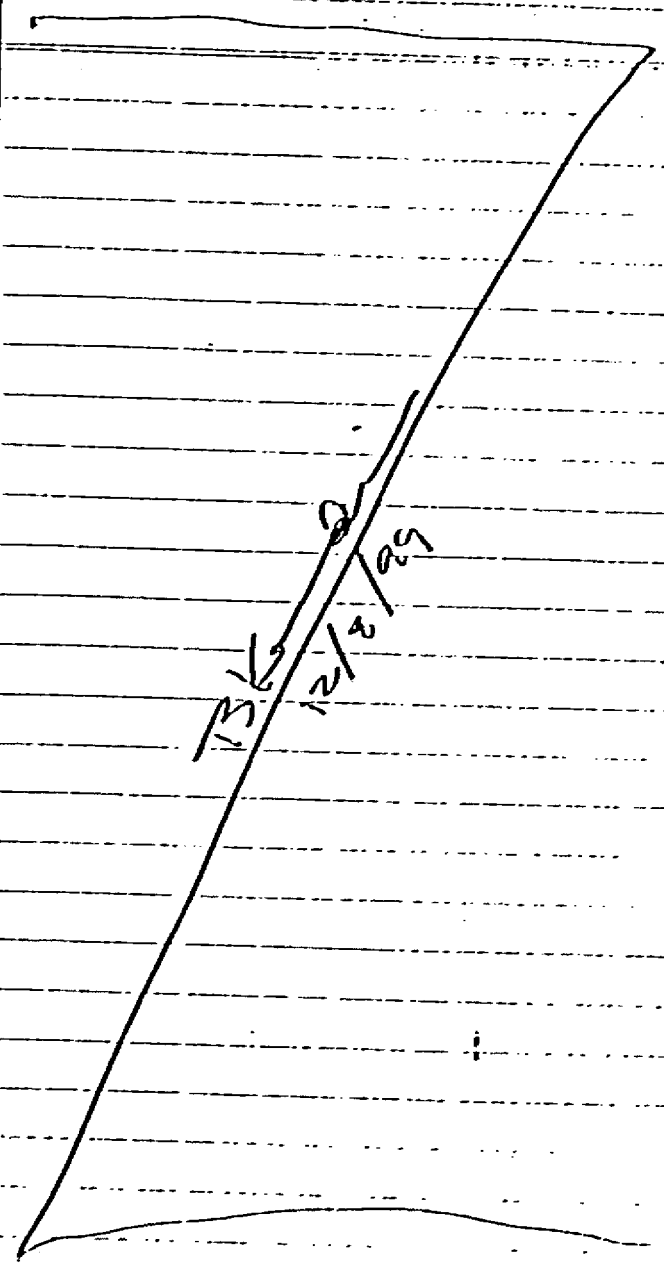
turb 0

temp 8.9

Water level 60.18 feet

Pump Rate 340 ml/min

BK 8



LANL-Area 2 Los Alamos, NM
Dec. 8, 1999 01300.06.015

1457 pH 6.95
cond 0.507
turb 0
temp 9.0
1502 pH 6.91
cond 0.509
turb 0
temp 9.0
water level 60.77 feet
pump rate 410 ml/min
1510 Collected MCWB-7.7B and
well MCWB-7.7B.
1514 Roll 1, Photo 13 of MCWB-7.7B
facing W by BKeedwell
witnessed by J Hosley
1520 Depart MCWB-7.7B
1526 Arrive at TW-8
1530 Roll 1, Photo 14 of TW-8
wellhead with water flowing at
facing SE by BKeedwell
witnessed by J Hosley
1530 Roll 1, Photo 15 of overall
view of TW-8 facing E
by BKeedwell witnessed by J Hosley
BKeedwell

LANL - Phase 2 Los Alamos, NM
Dec. 8, 1999 01300.06.015

1537: pH 7.70
cond 2.112
turb 1
temp 17.0

1545 Collected TW-8 at well
TW-8

1558 Depart TW-8 [illegible]

Below is a summary of samples collected during the day's activities

Sample No.	Date	Time
MCO-5 (MW)	11/1/99	1095
MCO-6	11/3/99	1200
MCO-7	11/1/99	1350
MCOB-7.7B	11/3/99	1510
TW-8	11/1/99	1595

End of Day

12/9/99

LANL - Phase 2 Los Alamos, NM

Dec 9, 1999 01300.06.015

1355 Arrive at ESH-18 to pick up David Rosen. Started down to Gaging Station 1 in Mortandad Canyon.

1415 Arrive at Gaging Station 1 in Mortandad Canyon

1427 Called Deborah Hall at TA-50 and she said they would start running.

1440 Collected MCO-FB at GS-1 locale. MCO-FB is a field blank collected by transferring DI water to appropriate sample containers.

1455 Water discharge arrived at GS-1 locale.

1500 Water quality parameters:

pH 7.48

cond 0.4885

turb 51.7

DO 8.17

temp 21.7°C

1510 Collected GS-1 from Gaging Station 1.

LANL - Phase 2 — Los Alamos, NM

Dec. 9, 1989 — 0800, 0.015

1517 Roll 1, Photo 16 of Gaging Station 1 view facing W by B Kendrick witnessed by J Hosley

1519 Roll 1, Photo 17 of Gaging Station 1 facing S by B Kendrick witnessed by J Hosley

1525 Deport GS-1 leave

Below is a summary of samples collected during the day's activities

Sample No	Date	Time
MW-FB	12/9	1410
GS-1	12/9	1510

Prior to conducting the sampling activities this day, the Tetra Tech sampling team arrived at the PRE-NAMED Duty Officer White Rock office at 0800 hours. Because FOLEX failed to pick up the sample coolers prepared during the previous day, the Tetra Tech sampling team

The two sample coolers were then resealed and new custody seals were applied. In addition, four additional sample coolers were prepared for shipment. At approx. 1000 hours, FedEx picked up the six sample coolers. Three coolers were sent to Southwest Laboratories of Oklahoma, two sample coolers were sent to Quantera Laboratories, and one sample cooler was sent to Coastal Scientific Laboratory. At approximately 1010 hours, called David Moss of TA-50 Radioactive Wastewater Treatment to determine what time the plant would discharge into Mortandad Canyon. Mr. Moss stated that the plant would be ready to discharge into the canyon at approximately 1400 hours. He also stated that he would call when he knows a more definite time for the discharge. Meanwhile, the Technical sampling team prepared

sample containers for GS-1 and MW-FB. The team then prepared sample containers for tomorrow's sampling activities. At approx. 1310 hours, called David Moss to get informed on the scheduled discharge event from the TA-50 plant. Mr. Moss stated he he would call when the plant was ready to discharge and that the plant would not discharge until the sampling team was in place in Mortandad Canyon and ready to collect the samples. At approximately 1335, Deborah Hall at TA-50 plant called and informed the Fishbone team that the plant was not ready to discharge into the canyon. She said the plant would not discharge until the sampling team was in place within the canyon. Called David Rogers and informed him that the sampling team was on its way to pick him

LANL-Phase 2 Los Alamos, NM

Dec 9, 1999 01DOP.06.015

at the ESH-18 office at the
Pajarito Mortandad Canyon
and Gaging Station 1. Mr. Rogers
stated that he would meet
the sampling team outside
the ESH-18 office at TA-59.
The team met Mr. Rogers at
1355 hours.

End of Diary

LANL-Phase 2 Los Alamos, NM
Dec 10, 1996 0730-0815

0715 Arrive at gated stack at entrance to the area where the sampling is scheduled to take place. Met David Rogers outside the gate.

0733 M. Dale and Rich Mayer arrived at the gate location. Mr. Dale entered the gated area to get badges for the sampling team.

0738 M. Dale and D. Rogers went into the gated area to get badges.

0754 M. Dale came out of gated area with security badges.

0758 Entered the gated area.

0802 Arrived at TA-8 security area.

0813 Depart TA-8 security area.

0821 Arrive at DX-2 Group Office Building to sign in.

0830 Arrive at Hundred Spring Flow. Since the spring was reportedly dry at the flow for the past spring.

12/10/96

LANL-Plan 2 Los Alamos, NM

Dec 10, 1990 01300.06.015

0920 Collected Homestead Spring sample in Pajarito Canyon

Cond of spring water 54,

temp 37°C, and TDS 96

0935 Photo 1 & 2 of Homestead Spring

0937 Depart Homestead Spring area

1004 Arrive at Starmer's Spring located in Starmer Gulch

1030 Collected Starmer's Spring at Starmer Gulch

1034 Cond. 111

temp 7.8°C

TDS 61 ppm

1034 Photo 3,4,5 of Starmer Spring by MED

1033 Depart Starmer Spring area

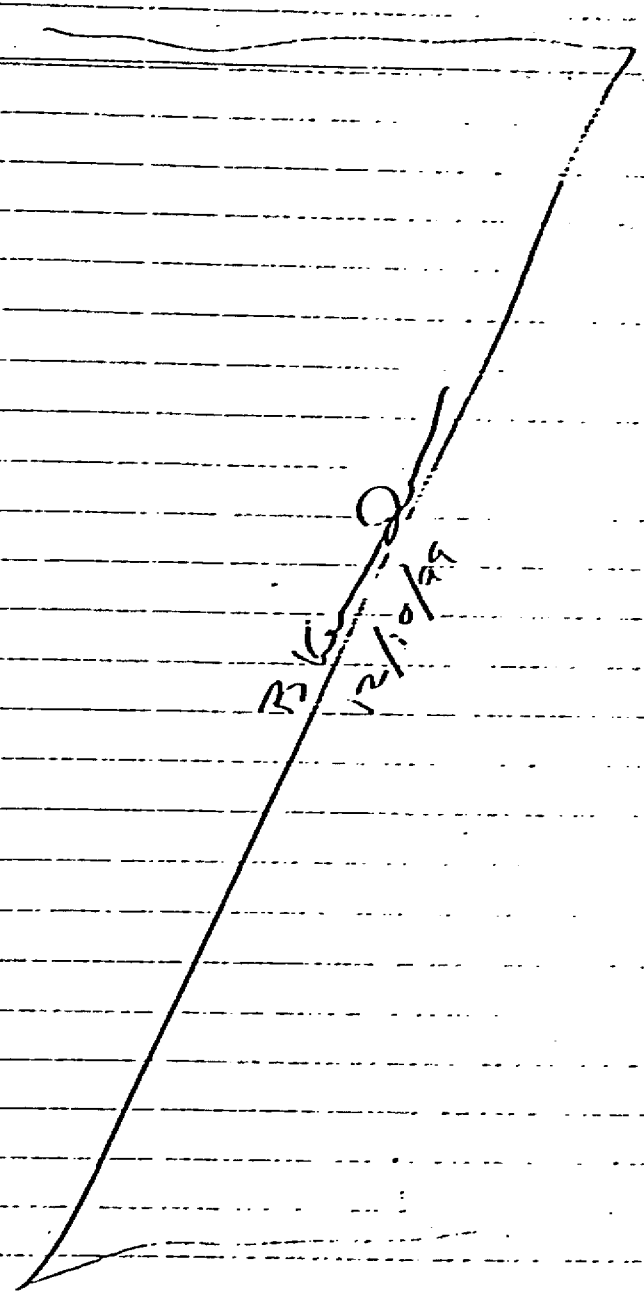
1035 Arrive at Chaetin Spring located upstream of Starmer Spring in Starmer Gulch.

1055 Rain & hail started to end sample at Chaetin Spring.

RD 12/12/96

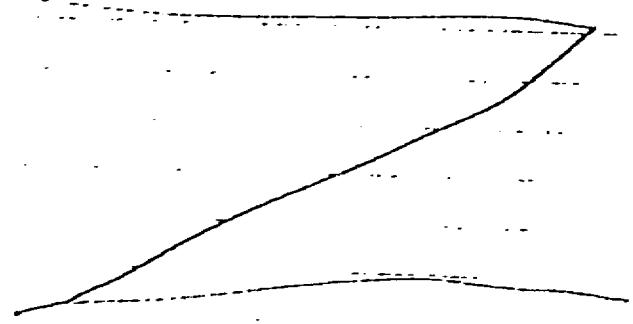
LANL-Phase 2 Los Alamos, NM
Dec. 10, 1996 01300.06.015

1056 Cond 180
Temp 15
TDS 76
1115 Arrive back at truck and eat lunch
1129 Depart trucks for Kieling Spring
1200 Arrive at Kieling Spring
1220 Collected sample at Kieling Spring
1236 Cond 238 µS/cm
TDS 130 mg/L
Temp 8.1 °C
1240 Depart Kieling Spring
1247 Arrive at Bulldog Spring
1300 Collect Bulldog Spring sample in Arroyo Delahalle
1301 Cond 240 µS/cm
TDS ~~Temp~~ 132 mg/L
Temp ~~TDS~~ 23 °C
1310 Depart Bulldog Spring location
1325 Arrive at PU-001 surface water location.



LANL - Pajarito Los Alamos, NM
Dec 10, 1999 01300-01-015

1345 Collected sample Bu-8.01 from surface water
1348 Cond 227 µS/cm
Temp 0.1 °C
TDS 125 mg/L
1353 Depart Bu-8.01 Inst
1410 Arrive at PA-8.9
1415 Collected PA-8.9 in Pajarito Canyon
1427 Cond 102 µS/cm
Temp 2.4 °C
TDS 59 mg/L
1430 Depart PA-8.8
1445 Arrive at trucks and depart field
1450 Depart security area enroute to White Rock office



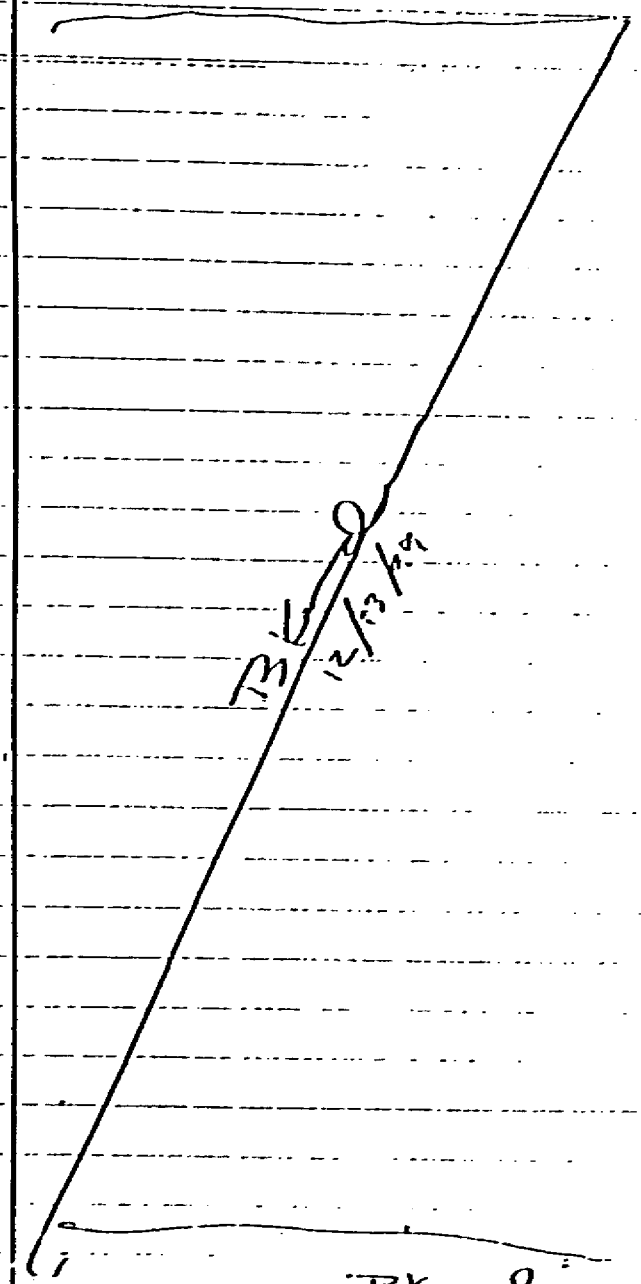
BLC
12/10/95

LANL - Area 2 — Los Alamos, NM
Dec 10, 1995 — 0900 - 1015

Below is a summary of samples collected during the day's activities

Sample Location	Date	Time
Unnamed Spring	12/10	0920
Cerrito Spring	12/10	Dry
Sherman Spring	12/10	1030
Bulldog Spring	12/10	1300
Kutting Spring	12/10	1220
BN-0.01	12/10	1345
TA-8.9	12/10	1415

Jim Hartley led a separate sampling team into a separate area associated with TA-18. This group was scheduled to collect samples from TA-18 Spring, Threemile (B) Spring, TA-6.7 surface water, and TA-0.9 surface water. Information concerning these activities is recorded in Log Book No. 2 from this sampling event.



LANL-Phase 2 Los Alamos, NM

Dec 13, 1999 [illegible]

0800: Field team consisting of Sandra Malaga, LANL, Bill Turney, LANL, and Roy Gaulbise, NPS meet at NMED White Rock office. Chris Hanks-Moya, NMED will arrive at approximately 0830 hours. Dave Wolfenbarger and Sandra Jacquez also arrived.

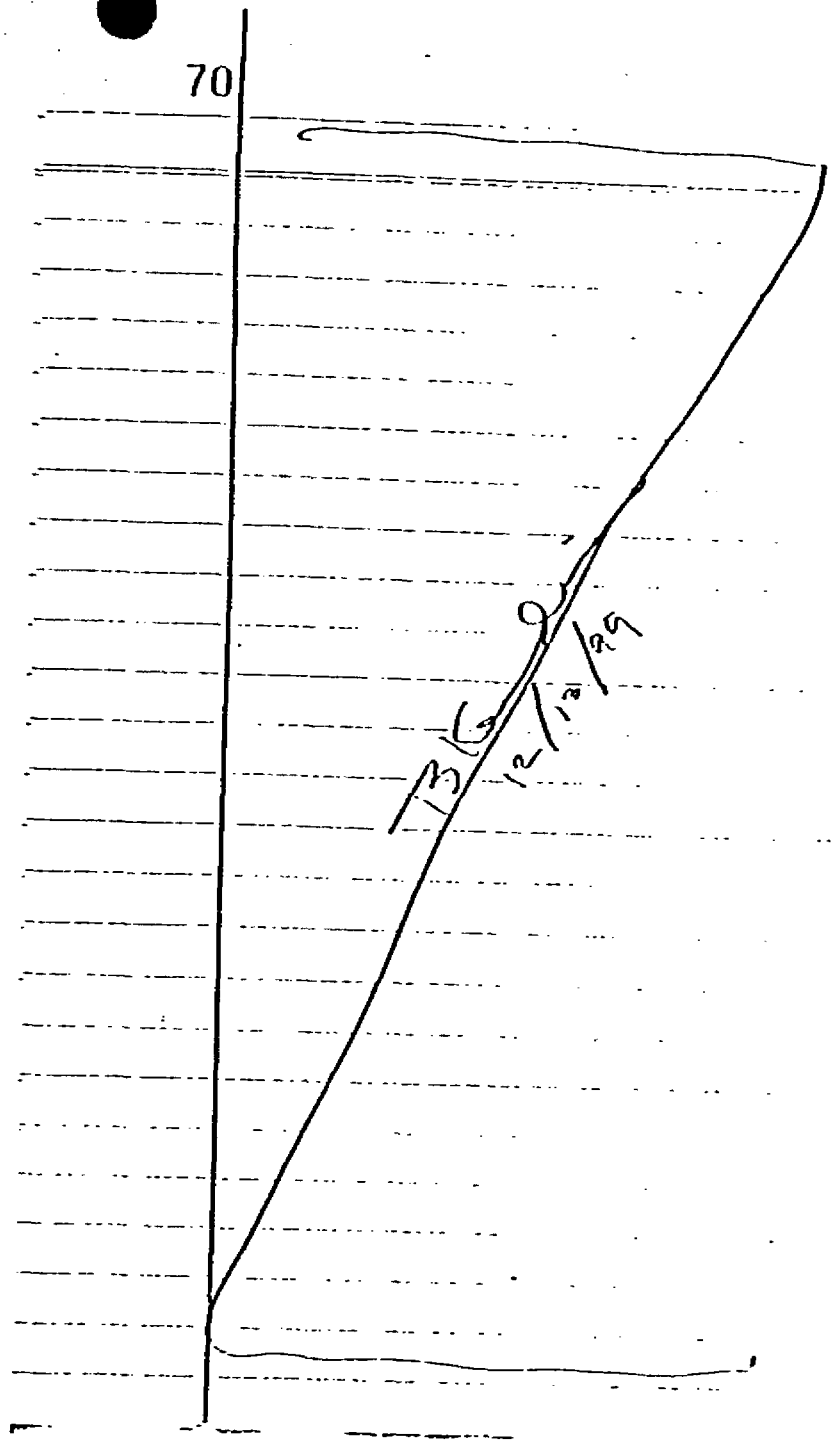
0847: Depart White Rock office. Bill Turney decided not to go with the sampling team.

0851: Parked along State Road 4.

0905: Arrive at first sampling location on east side of State Road 4 in Sandia Canyon. This location will be designated as SC-1. Sample SC-1 will be collected from 0 to 12 cm in depth.

0910: Roll 1, Photo #1 looking at sampling location SC-1 facing S by Bill Kendrick witnessed by J Hanks-Moya

0910: Roll 1, Photo #2 looking view of SC-1 facing S by Bill Kendrick witnessed by J Hanks-Moya



witnessed by J Hartley.

0923 Sample material - sample is a light brown sand to fine sand with some silt and pebbles.

0927 Collected sample SC-1

0932 Depart SC-1

0936 Arrive at SC-2 location

0945 Roll 1, Photo 20 view of SC-2 location. Sample will be collected from the top 5cm of material - Material consists of sand to fine sand with some silt. Facing S by BKenfield witnessed by J Hartley

0946 Roll 1 Photo 21 closeup view SC-2 sample material. Facing S by BKenfield witnessed by J Hartley

0955 Collected sample SC-2

Depart SC-2 location

1000 Arrive at SC-3 location. Sample will be collected from 8 to 11 cm in depth. Material was sand to fine sand.

BK 12/13/89

LANL-Area 2 Los Alamos, NM

Dec 13, 1989 0:30 [illegible] 015

1010 Roll 1, Photo 22 View of SC-3 location facing S by B Kedrovich witnessed by J Hoxley

1011 Roll 1, Photo 23 Aerial view of SC-3 facing S by BKedrovich witnessed by J Hoxley

1025 Collected sample SC-3

1032 Departed SC-3 location

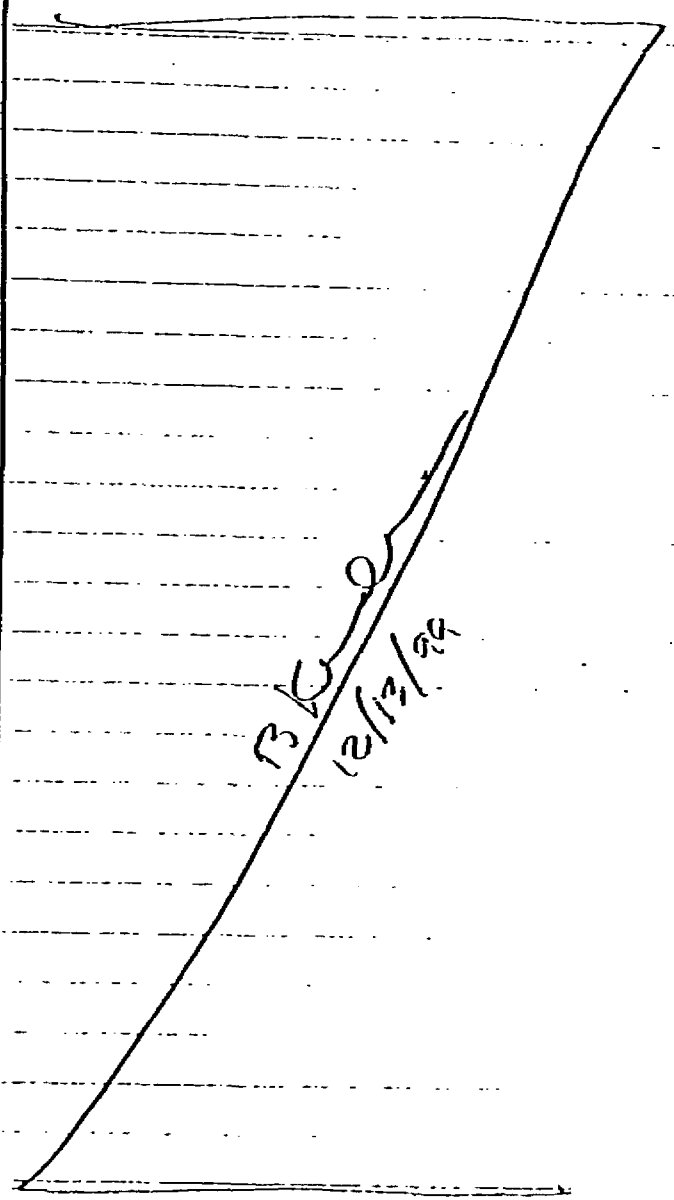
1035 Arrive at SC-4 location SC-4 consists of a sediment layer from 20-12 cm in depth.

1037 Roll 1, Photo 24 View of SC-4 location facing SE by BKedrovich witnessed by J Hoxley

1038 Roll 1, Photo 25 closeup of SC-4 facing SE by BKedrovich witnessed by J Hoxley

1050 Collected Sample SC-4

1110 Arrived at SC-5 location on the west side of State Rd 4 within Sandia Canyon.



LANL - Phase 2 Los Alamos, NM

Dec. 13, 1994 01300.11.015

1117 Roll 2, Photo 1 View of SC-6 facing SW by B Kendrick witnessed by J Hardley

1118 Roll 2, Photo 2 Closeup view of SC-6 facing SW by B Kendrick witnessed by J Hardley

Sample will be collected from 0-12 cm

1125 Collected sample SC-6

1130 Depart SC-6

1133 Arrive at SC-5 beach

1140 Roll 2, Photo 3 of sample location SC-5 facing SE by B Kendrick witnessed by J Hardley

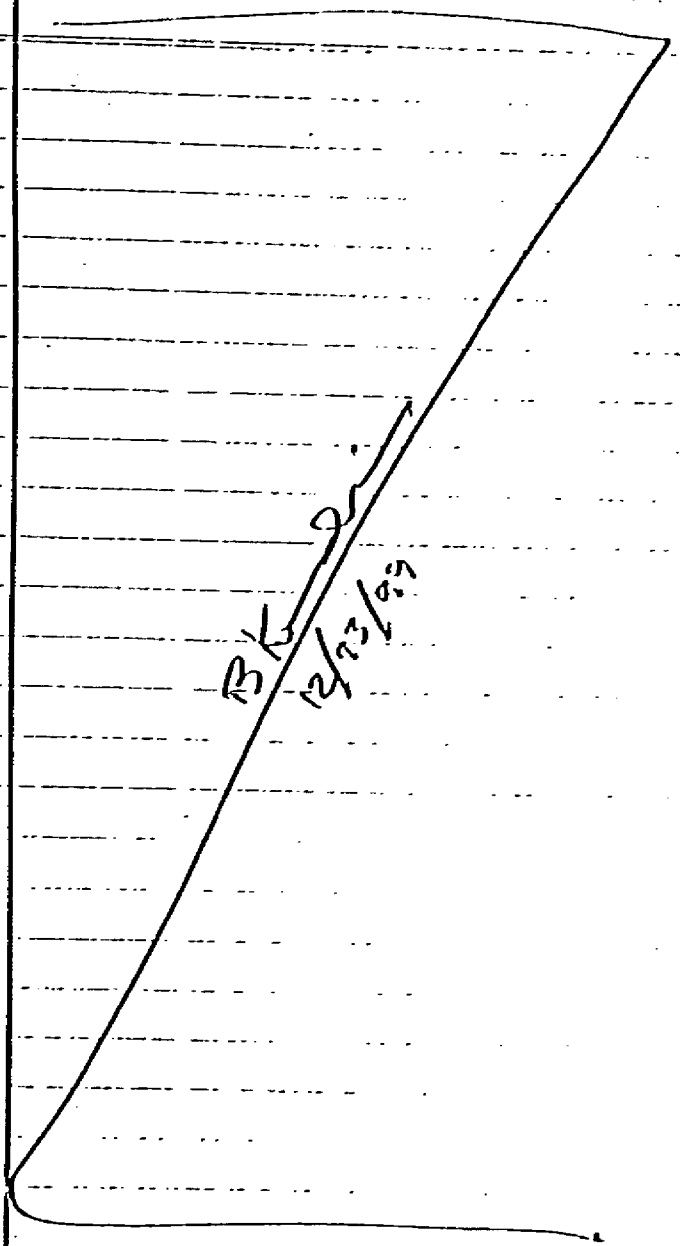
1142 Roll 2, Photo 4 closeup of SC-5 location facing SE by B Kendrick witnessed by J Hardley

1150 Collected sample SC-5

1200 Depart SC-5 beach

210 Depart Sandia Canyon Area

A total of six samples was collected from Sandia Canyon



LANL-Phase 2 Los Alamos, NM
Dec 13, 1999 01300.06.015

1273 Arrive at parking lot in lobe of Bayo Canyon

1315 Arrive at location BC-1 located in Bayo Canyon. Contact with sediment sample location.

1340 Roll 2, Photo 5 View of location BC-1 facing S by Blandford witnessed by J Hawley

1341 Roll 2, Photo 6 closeup of sample location BC-1 facing S by Blandford witnessed by J Hawley

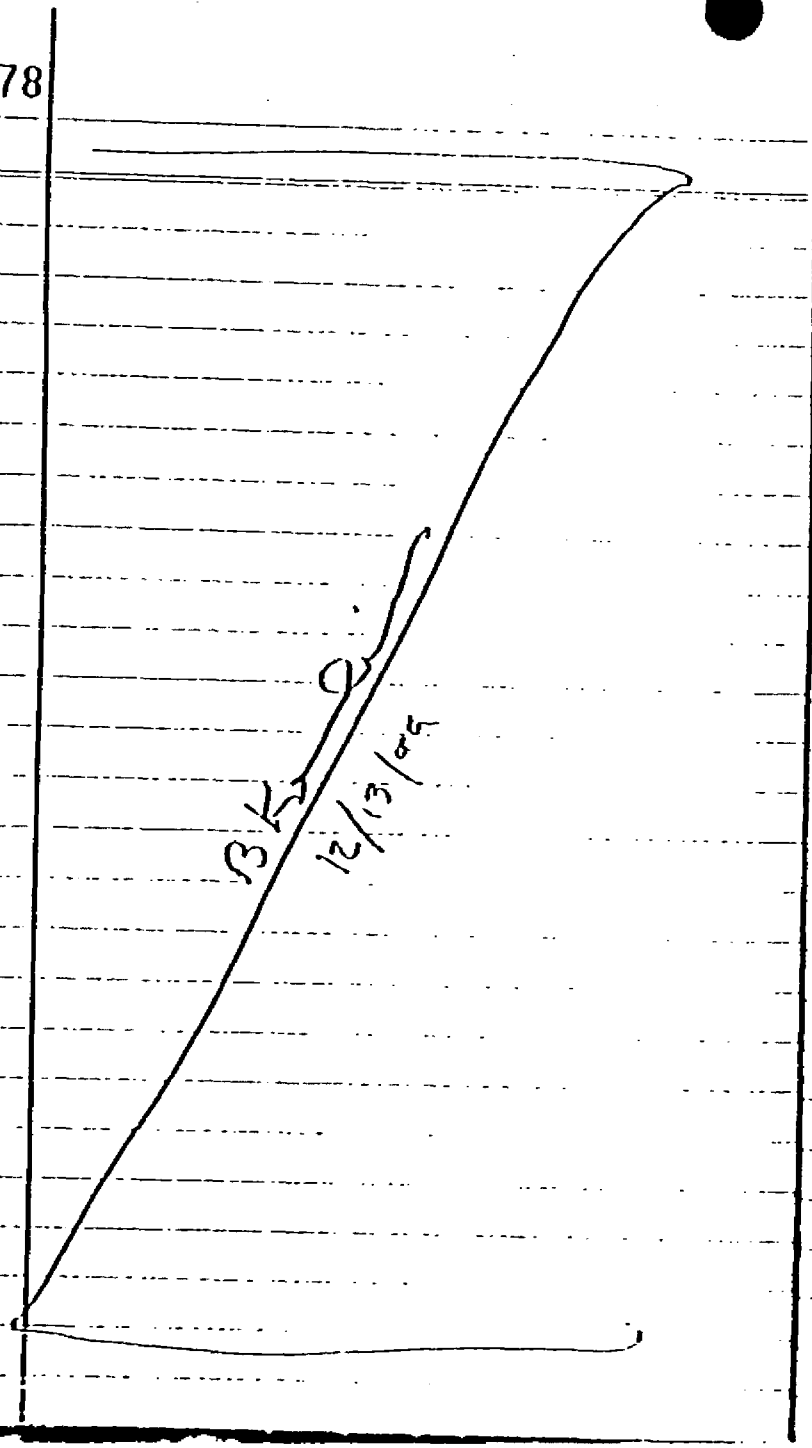
1348 Collected sample BC-1

1373 Depart location BC-1

1351 Arrive at BC-2 location

1355 Roll 2, Photo 7 of BC-2 location. Sample will be collected from 14 to 27cm depth. Facing E by Blandford witnessed by J Hawley.

1356 Roll 2, Photo 8 of closeup of BC-2. Facing E by Blandford witnessed by J Hawley



LANL-Phase 2 Los Alamos, NM

Dec 13, 1988 01300-01.015

1410 Collected sample BC-2 and 2 dupe

1414 Depart BC-2

1418 Arrive at BC-3

1427 Roll 2, Photo 1 View of BC-3 facing E by B Kendrick witnessed by Jim Hourley

1424 Roll 2, Photo 10 Closeup of BC-3 Bounce by B Kendrick witnessed by J. Hourley

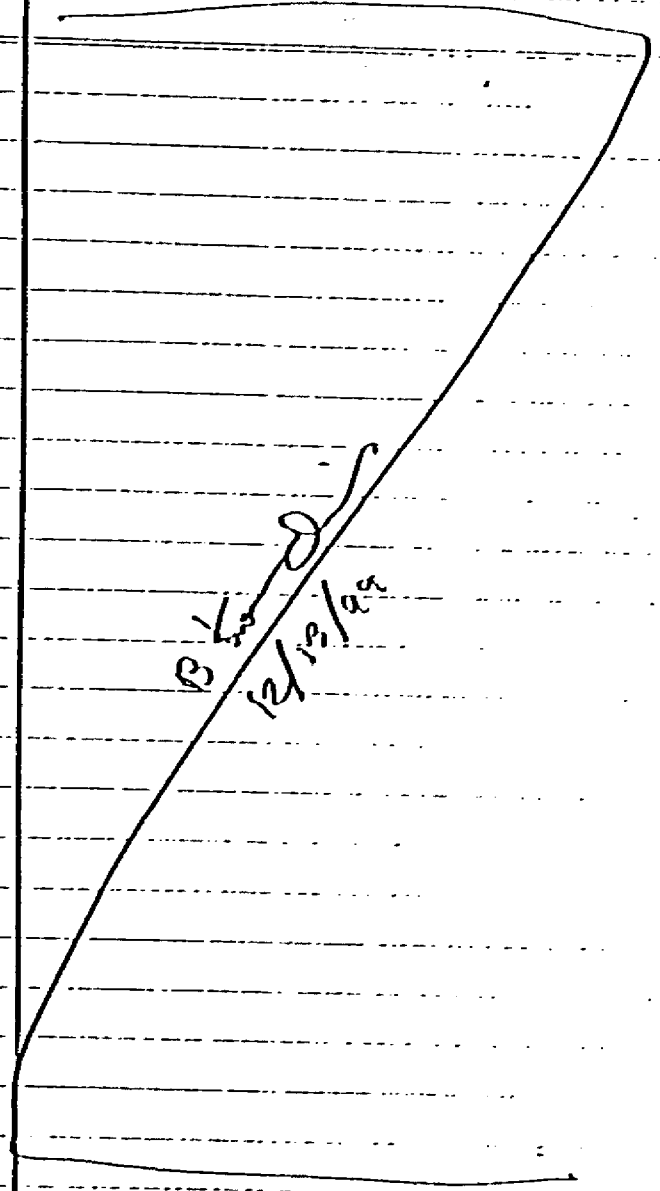
1432 Collected BC-3

1435 Depart BC-3 area

1436 Arrive at BC-4 location

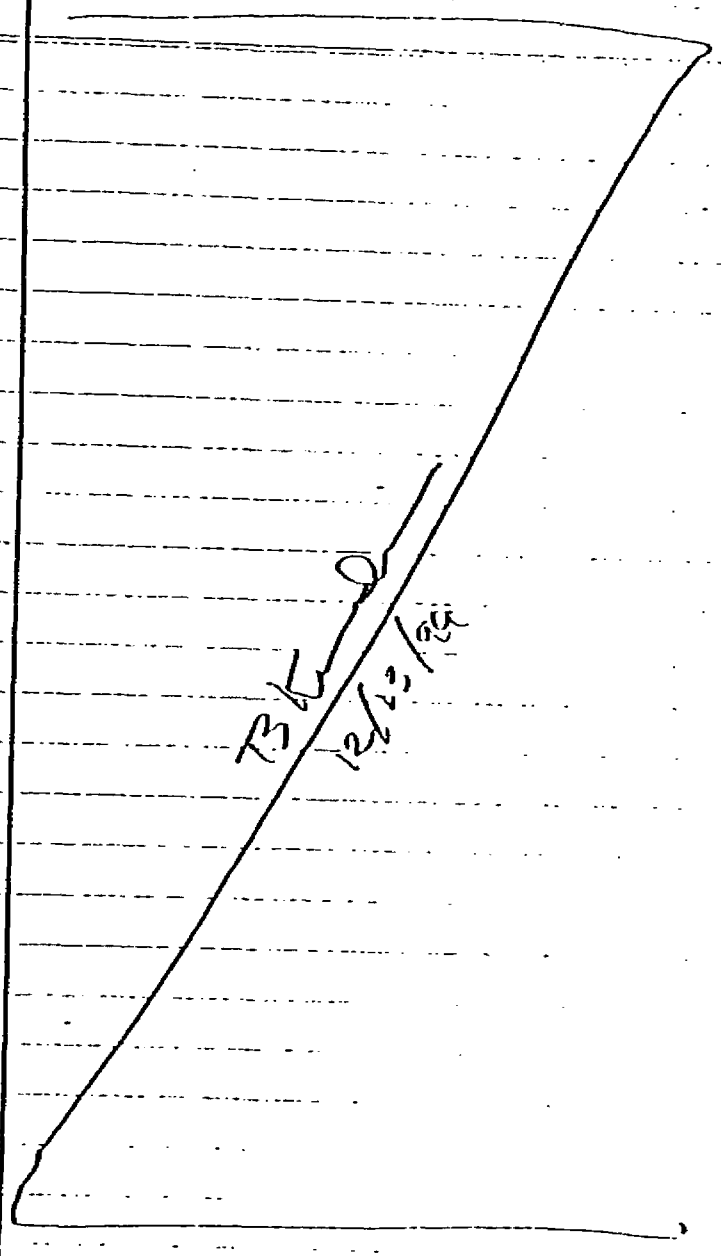
1450 Roll 2, Photo 4 View of BC-4 facing SE by B Kendrick witnessed by J Hourley. GPS was used approx. 1 meter W of actual location of sample BC-4

1452 Roll 2, Photo 12 Closeup of BC-4 bounce facing SE by B Kendrick witnessed by J Hourley. Depth of sample is 4 to 11 cm.



LANL - Phase 2 Los Alamos, NM
Dec. 13, 1989 01300.06.015

1505 Collected Sample BC-4
1515 Depart BC-4 and Bayo Canyon. Enroute to White Rock Office.
1535 Arrive back at White Rock office. Prepare sample bottles for sampling production wells PM-1, PM-2, PM-5, 01.
1700 Arrive at Los Alamos County Annex located on Trinity Dr. to meet with Bob Beers and NMED water personnel. County personnel directed the Technical team to the LANL power plant where the water well pump is stationed. The county person was not at the plant. A LANL employee called the county person and left a message.
1740 Bob Beers arrived at the plant.
1755 Depart power plant
1800 Arrive at PM-5. Wait
1810 Water opened the pump house



LANL - PM-2 Los Alamos, NM
Dec 17, 1999 01300.00.015

1807 Water quality parameters
Cond 0.179
temp 24.4
turb 0
pH 7.07
DO 4.03

1810 Collected sample PM-5 from well head at production well
Pajarito Mesa 5

1813 Roll 2, Photo 13 of the pump and sampling point at PM-5 location by BK witnessed by JH

1832 Depart PM-5 location

1839 Arrive at PM-2 location for Production well PM-2

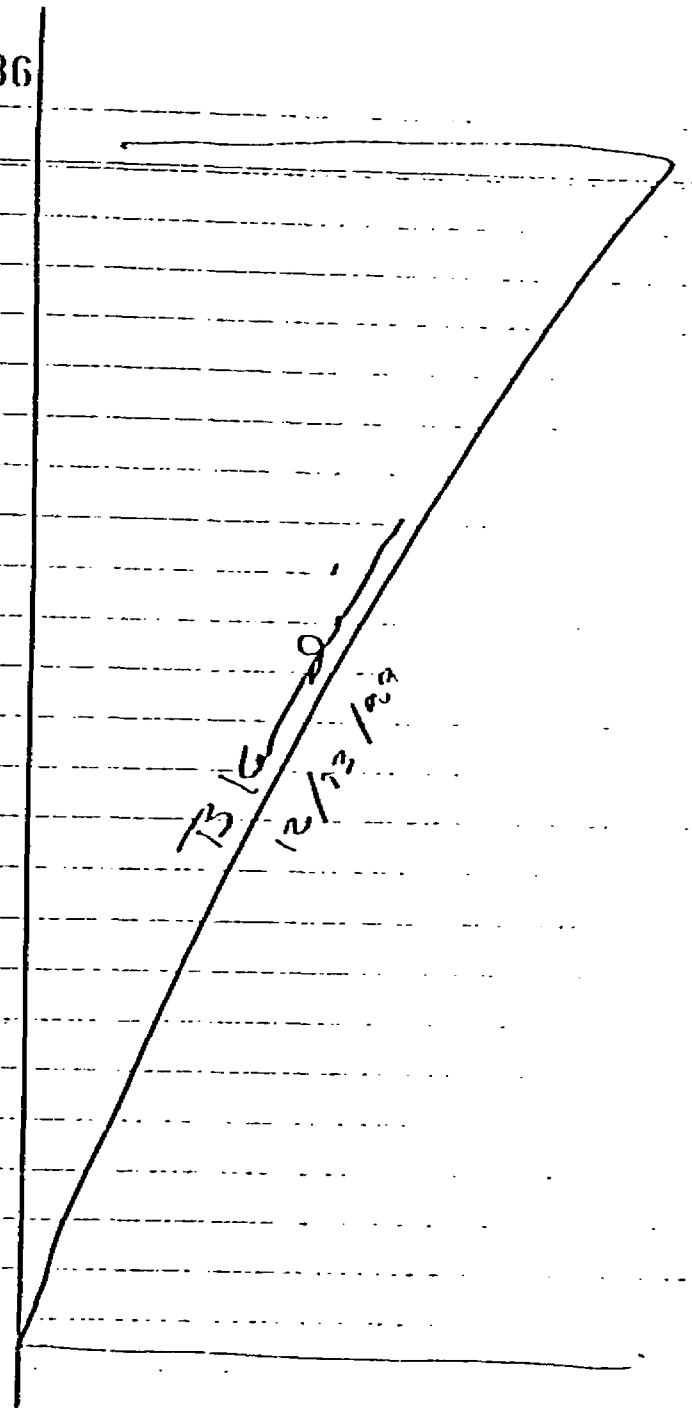
1844 Water quality parameters
pH 7.11
Cond 0.092
turb 0
temp 23.1
DO 4.51

1848 Roll 2, Photo 14 View of pump and sampling point at PM-2 location by BK witnessed by JH.

BK
12/13/99

LANL-Area 2 Los Alamos, NM
Dec. 13, 1999 01300-06.015

1850 Collected sample PM-2
1911 Depart PM-2 location
1925 Arrive at PM-1 location
1943 Water quality measurements
pH 7.33
Cond 0.215
Turb 0 NTU
Temp 26.1
DO 4.14 → 3.52 → 4.02
1952 Roll 2, Photo 15 View of PM-1 pump and sampling point. PM-1 located by BK and witnessed by JH.
1955 Collected sample PM-1 from PM-1 production well
2011 Depart PM-1 location
2025 Arrive at O-4 sampling location
2030 Roll 2, Photo 16 View of O-4 pump and sampling point at O-4 location by BK witnessed by JH.



LANL - Pump 2 — Los Alamos, NM

Dec 13, 1999 — 0300.01.015

2032 Water quality parameters

pH 6.75

cond 0.721

turb 0

DO 3.85

temp 27.3

2040 Collected sample 0-4 from 0-4 production well.

2055 Depart 0-4 team enroute to White Rock Office.

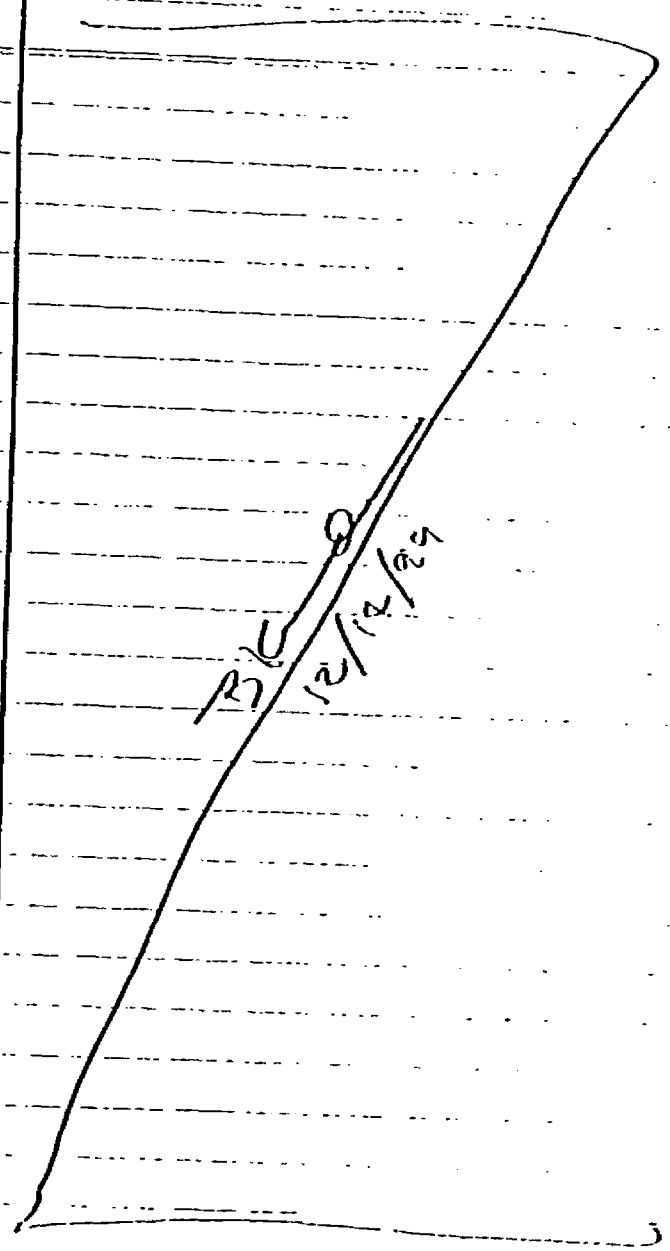
Sample ID/Location	Date	Time
SC-1	12/13/99	0925
SC-2	12/13/99	0955
SC-3	12/13/99	1025
SC-4	12/13/99	1050
SC-5	12/13/99	1150
SC-6 (PA/PISO)	12/13/99	1115
BC-1	12/13/99	1340
BC-2	12/13/99	1410
BC-3	12/13/99	1430
BC-4	12/13/99	1505
BC-5 (Dupl of BC-1)	12/13/99	1420

LANL - Plant 2 Los Alamos, NM

Dec 13, 1999 01300.09.015

Sample Number	Date	Time
B PM-1	11/13/99	2011
PM-2	11/13/99	1850
PM-5	12/13/99	1810
D-4	12/13/99	2040

END OF DAY



LANL - Phase I — Los Alamos, NM

Dec 14, 1989 — 0100 - 0215

0830 Sampling team met at White Rock office. Team consisted of Chris Hansen-Hagen, NMED, Emilio Hinojos, LANL, and Sandra Jacquez, NMED. Traveled to Mortandad Canyon.

0915 Arrived in Mortandad Canyon

0930 - Cf. Hinojos sampled MC-1 on east side of passageway at westernmost end. Inc. Sampled surface 0-5cm. Air = 25cm 25cm

1005 - Roll 2 Photo 13 - Photo of MC-1 facing West. Photo taken by Cf. Hinojos.

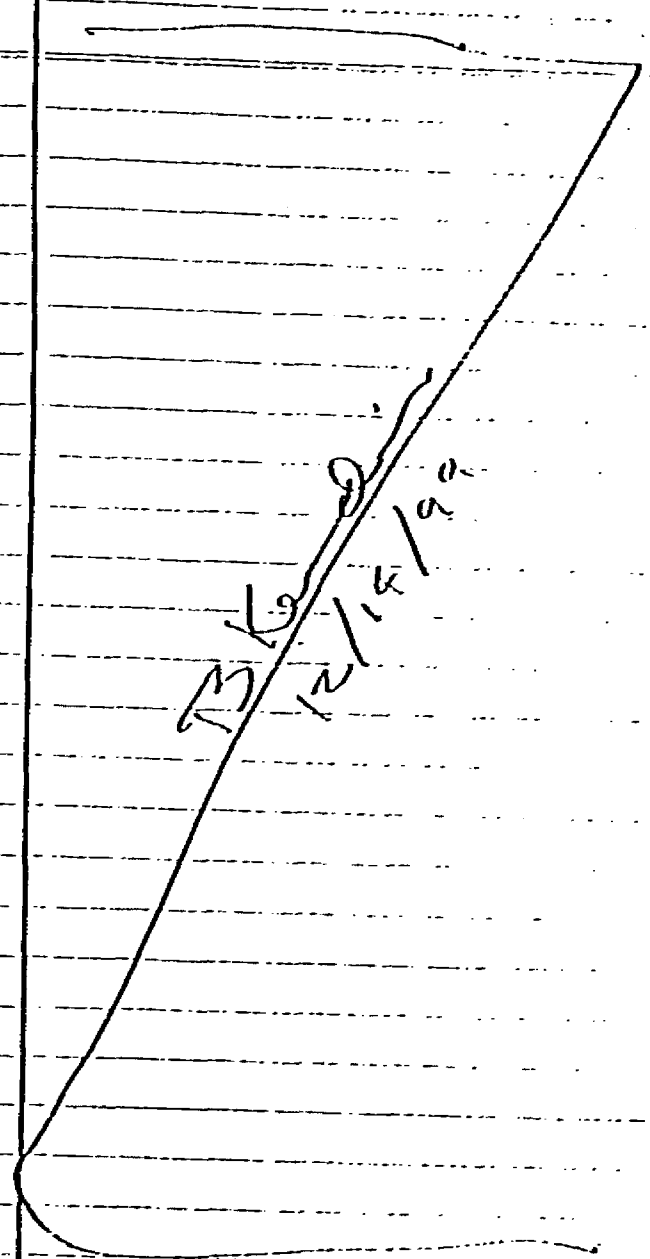
1010 - Area equipment.

1015 - Depart MC-1 location

1040 : Arrive at MC-3 and MC-9 locations

1055 Roll 2, Photo 14 of MC-3 and MC-9 locations facing S by Blackbirds returned by J Hinojos

1057 Roll 2, Photo 15 close up view of MC-3 facing S by Blackbirds returned by J Hinojos



LANL - Phase 2 Los Alamos, NM

Dec 19, 1979 013-2-06-015

1058 Roll 2, Photo 21 Closeup view of MC-4 hole facing N by B Kerlinski witnessed by J Hawley

1106 Sample depth for MC-3 was between 15 and 24 cm below the surface.

1115 Collected Sample MC-3

1121 Sample MC-4 was collected from 0 to 5 cm in depth directly in the stream channel

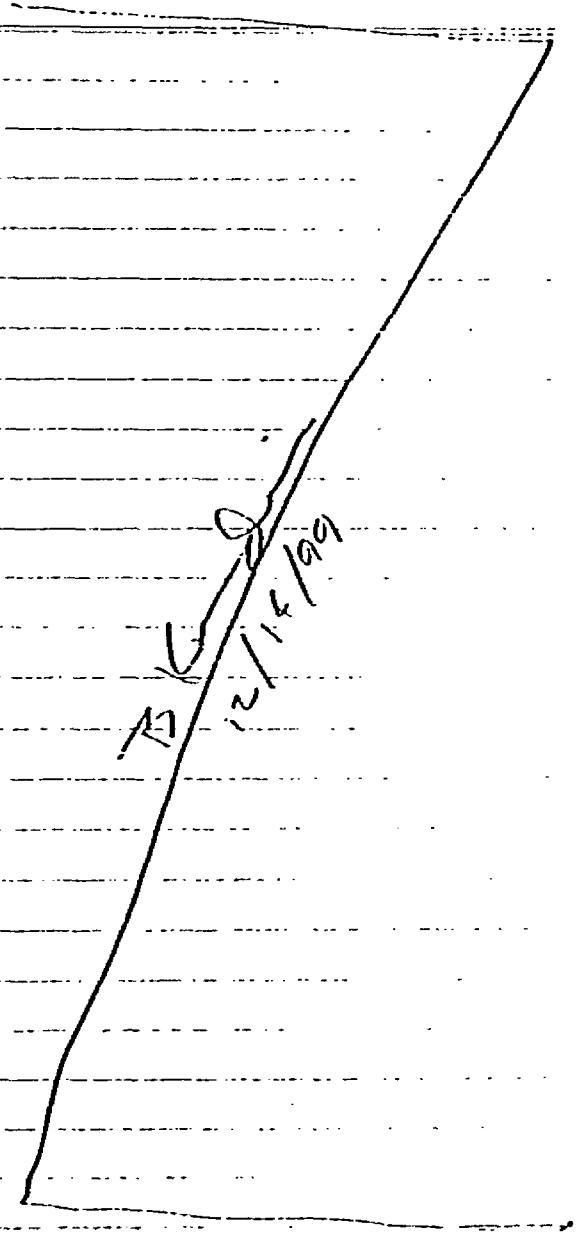
1130 Collected sample MC-4

1175 Depart MC-3 & MC-2 location

1142 Arrive at MC-2 location

1147 Roll 2, Photo 22 View of location MC-2 facing S by B Kerlinski witnessed by J Hawley

1149 Roll 2, Photo 23 Closeup of location MC-2 facing S by B Kerlinski witnessed by J Hawley.



LANL-Area 2 Los Alamos, NM

Dec 14, 1999 01300.06.015

1200 Collected Sample MC-2 (0-2 cm)

1207 Depart MC-2 area

1220 Arrive at Locale MC-5 where two samples will be collected. The first sample will be collected from 0-13 cm and then from 22 to 32 cm for the second sample. The first sample will be designated as MC-5a (0-13 cm) and the second sample will be designated as MC-5b (22-32 cm).

1226 Roll 2, Photo 24 View of MC-5 location facing S by Blankenship witnessed by J. Hoxley

1225 Roll 2, Photo 25 Closeup view of MC-5 sample location showing sediment layer to be sampled. Facing S by B Blankenship witnessed by J Hoxley.

1235 Collected MC-5a (0-13 cm)

1250 Collected MC-5b (22-30 cm)

1255 Depart MC-5 sample location enroute to White Rock office

LANL-Phase 2 Los Alamos, NM

Dec 14, 1999 0130.01.015

1345 Depart White Rock office to locate sample points within Canada del Buey within the White Rock community. Personnel present include Chris Hawkes-Ulyen and Bill Turney, LANL.

1430 Return to White Rock office after selecting 5 locations for 6 samples in the lower part of Canada del Buey near the elementary school. Prepared samples for shipment on 12/15.

End of Day

BKO

BLD
12/15/99

LANL - Phase 2 Los Alamos, NM
Dec 15, 1999 01101-00-015

See Field Log Book No. 2
for information regarding the
remainder of the sampling
event.

Bill 12/15/99

Logbook 2

Field Log Book #2
for
Los Alamos Nat'l Laboratory - Phase 2

By: Techlaw, Inc.
750 N. St. Paul
Suite 600
Dallas, Tx 75201

For: U.S. EPA
1445 Ross Ave
Dallas, Tx 75202

GASL Project — LOS ALAMOS, NM

12-10-99 — 01300.06.015

Field Team:

James Hockey - Technical

Chris Hinton - Project - LANL

Bruce Ledgerwood - DOE

Harvey Decker - ESH-18

WX: overcast, windy

Arrived at TA-18 at 0755. Harvey Decker arrived at 0845.

Arrived at Sandia Spring at 0830 to find it dry. Drive down to TA-18 Q.4 at 0852. It was cloudy with @ ½" of snow in it. Arrived at TA-18 at 0856. Spring was flowing while sampling equipment was prepared. Chris and Bruce hiked up downstream to access flow A plate but was not needed because it was all the exp. measurements are below.

Sample	Time	Volume (L)
1011 -	11.73	3.42
	13.08	3.952
	12.43	3.92
	12.54	3.8
	12.55	4.3
	12.35	3.7
1011 -	13.34	4.1

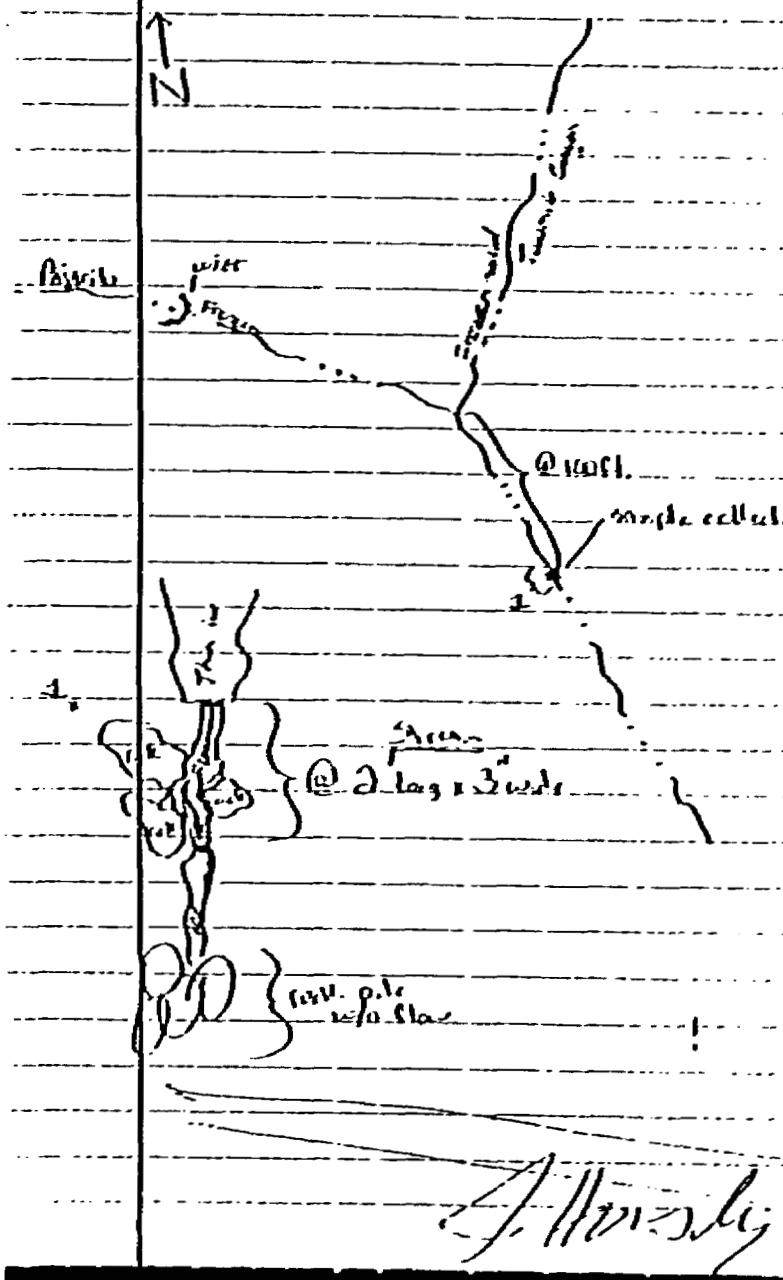
LANL - Phase 2 — Los Alamos, NM

12-10-99 — 01300.016.015

Began pumping at 1025. Field parameter sample
collected at 1028. Field parameters are listed
below: pH = 6.1
Cond. = 0.201
Turb. = 29.9
DO = 1.24
Temp. = 8.2 °C
Collected Arsenic, Anions, Perchlorate, Explosives
and dissolved actinides. An MS/MSD was
also collected at 1105. Sample was collected
by placing tube in stream immediately
adjacent to spring percolates. Sample
was collected using a peristaltic pump
by S. Hardy. Left site at 1130. Arrived
at PA 6-7 at 1200. The creek was flowing
and the measurement showed 0.821 cfs. Creek
was solid above and below sample area.
Decision made to head back at 1210. Before
leaving, we took duplicate of the barcode (two) &
Particle collection. One attached a small Pyrex to
flow of sample water so a sample was
collected. S. Hardy collected field parameters
in Pelican at 1235: pH = 6.85
Cond. = 0.145
Turb. = 91.1
D.O. = 6.55
Temp. = 9.7

Los Alamos, NM

12-10-93 013006.015



Collected samples at 1252. Field blank (FB-6.7) was collected at 1300. Sample location was paced back to coordinate and determined to be 100'. Back at lock at 1330. At SWEPS office at 1350 to unload and label samples.

Station	Time	Parameters
TA-18	1105	Anions
		Perchlorate
		Explosives
		Ammonia
		Dissolved Cations
TA-18 ms/msb	1105	Anions
		Perchlorate
		Explosives
		Ammonia
		Dissolved Cations
FB 6.7	1252	Anions
		Perchlorate
		Explosives
		Ammonia
		Dissolved Cations
FB 6.7	1300	Soil Moisture

Samples were labeled and custody seals applied at 1510.

Continuation of
Log Book No. 1

00:00001:000

LANL-Area 2 Los Alamos, NM

Dec 15, 1999 01300.01.015

0815 Arrival at [illegible] Bldg [illegible] the [illegible] [illegible]

0858 Roll 3, Photo 1 View of [illegible] CC-2 facing S by B Kendrick witnessed by J Hurley

0900 Roll 3, Photo 2 Close-up View of [illegible] CC-2 facing S. Sample will be collected from 20 to 33 cm. By B. Kendrick witnessed by J Hurley

0915 Sample was changed out for [illegible] which is dated and known [illegible] the [illegible]. The [illegible] placed in sample container inside the [illegible] for [illegible] [illegible]. The [illegible] [illegible] in the next sample [illegible].

0925 Arrival at [illegible] CC-7

0933 Roll 3, Photo 3 View of CC-7 facing N by B Kendrick witnessed by J Hurley

0939 Roll 3, Photo 4 Close-up of CC-7 facing N by B Kendrick witnessed by J Hurley. Sample will be collected from 0-27 cm.

1000 Collected Sample CC-7

1012 Departed [illegible] CC-7

BKendrick

LANL - Phase 2 Los Alamos, NM

Dec. 15, 1989 01300.00.005

1017 Arrive at location CC-6

1019 Roll 3, Frame 5 View of location CC-6 before sediment sampling. Photo taken by B Kendrick, witnessed by J Hartley

1030 Roll 3 Frame 6 Close-up view of CC-6. Sample will be collected from depth of D=7.5 m. Photo taken by B Kendrick, witnessed by J Hartley

1039 Sediment was frozen. The core sample is standing that level in tube in hole. Repeat CC-6 tube

1145 Sample removed from CC-7 and CC-6 tube thawed enough to place into sample container.

1155 Collected sample CC-8

1159 Collected equipment blank CC-EB

1200 Collected sample CC-6

1215 Arrive at White Rock office for lunch.

1300 Arrive back at Cowden del Bay to continue sample collection

1300 Arrive at sample location CC-5

LANL - Phase 2 Los Alamos, NM

Dec. 15, 1999 01300.01.015

1311 Roll 3, Photo 7 View of CC-5 location. Two samples will be collected at this location (CC-5A and CC-5B).
Photo E by B Kendall witnessed by J Hartley

1313 Roll 3, Photo 9 Close-up view of CC-5 location. CC-5A will be collected from 18 to 24 in depth. CC-5B will be collected from 30 to 36 in depth. Photo E by B Kendall witnessed by J Hartley

1330 Collected sample CC-5A

1345 Sample material for CC-5B was frozen. They placed the sample in plastic bags for transport back to White Rock Office

1350 Depart CC-5 location

1400 Arrive at location CC-4. Sample material will be collected from the fine-grained sediment located on the surface to a depth of approx 6 in

1405 Roll 3, Photo 7 at location CC-4 taken by B Kendall witnessed by J Hartley.

B Kendall

LANL - Phase 2 Los Alamos, NM

Dec 15, 1999 01700.00.015

1415 Collected Sample CC-4

1424 Arrival at location CC-3
Sample material will be collected
from 0 to 13 cm

1430 Roll 3, Photo 10 View of
location CC-3 facing N by D Kaplick
witnessed by J Hurley

1431 Roll 3, Photo 11 Close view
location CC-3 facing N by
D Kaplick witnessed by J Hurley

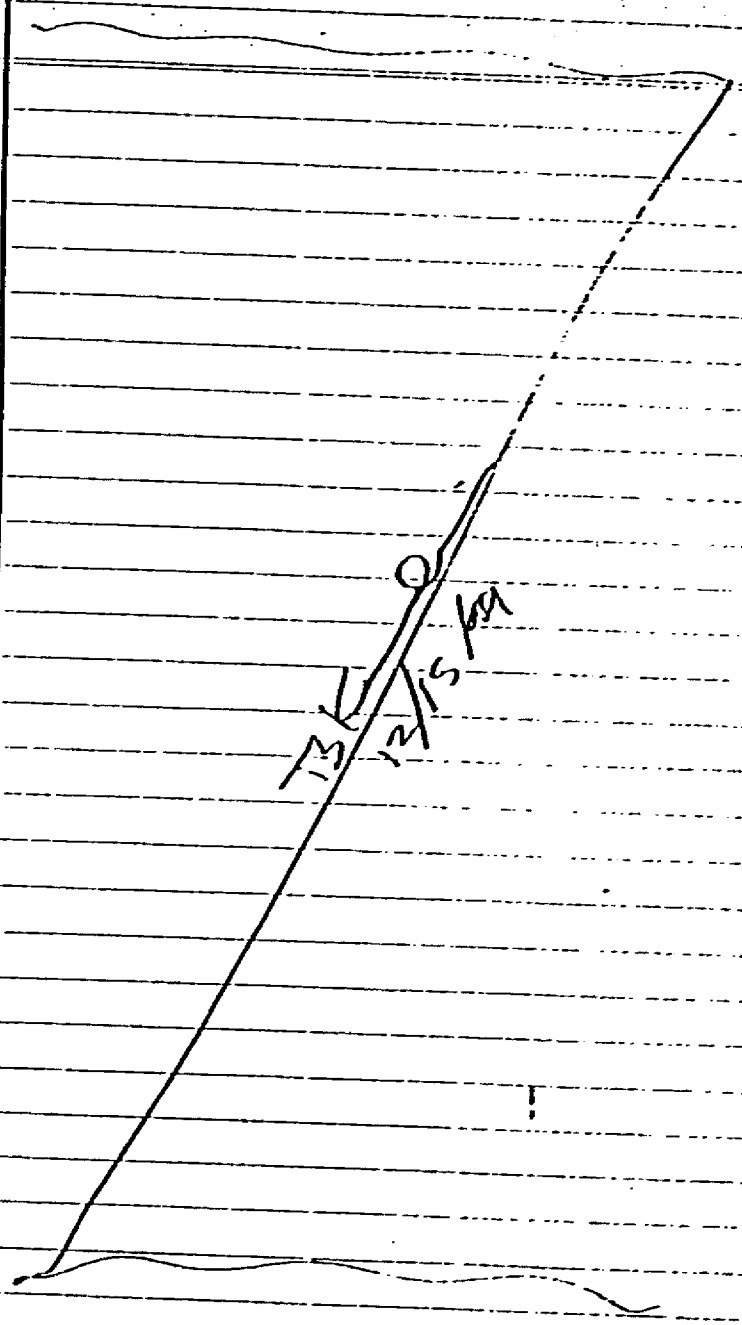
1445 Sample material for CC-3
was frozen solid. Placed material
in plastic bags to transport back
to Work Back Office

1456 Arrive at location CC-2 located
inside of culvert before described
Sample will be collected at a
depth of 5 to 0 cm

1515 Roll 3 Photo 12 View of CC-2
location facing N by D Kaplick
witnessed by J Hurley

1515 Collected Sample CC-2

1525 Arrival at sample location CC-1
Sample will be collected from 12
to 17 cm in depth



LANL - Phase 2 Los Alamos, NM

Dec 15, 1999 0130P.DC.015

1532 Drill Point B View of sample location CC-1 facing N by BK-field
witnessed by J Hartley

1512 Drill Point A of Group 1 location CC-1 facing N by BK-field
witnessed by J. Hartley

1545 Collected sample CC-1

1553 Depart Canada del Buey
arrive at White Rock office

Below is a summary of samples collected during this day.

Sample ID/Location	Date	Time
CC-1	12/15/99	1545
CC-2	12/15/99	1515
CC-3	12/15/99	1495
CC-4 MW100	12/15/99	1415
CC-5A	12/15/99	1370
CC-5B	12/15/99	1345
CC-6	12/15/99	1014
CC-7	12/15/99	1000
CC-8	12/15/99	0915
CC-9 (dup of CC-2)	12/15/99	0830
~~12/15/99~~		—
CC-EB	12/15/99	1150

END OF DAY

TPH: .9

LANL - Phase 2 Los Alamos, NM

Dec 16, 1999 01700.00.015

0755 Arrive at PC-1 location located in Pajarito Canyon

0815 Roll 3, Photo 15 View of PC-1 facing E by B Kendrick witnessed by J Hartley

0815 Roll 3, Photo 16 Close up view of PC-1 trench will be sampled from 0-17 cm in depth facing E by B Kendrick witnessed by J Hartley

0820 Collected sample PC-1

0845 Arrive at PC-2 location in Pajarito Canyon

0853 Roll 3, Photo 17 View of PC-2 by B Kendrick witnessed by J Hartley

0855 Roll 3, Photo 18 Close up view of PC-2 Sample will be collected from 0-24 cm in depth facing S by B Kendrick witnessed by J Hartley

0925 Collected PC-2 from Pajarito Canyon also in duplicate

1113 Arrive at PC-3 location

1117 Roll 3, Photo 19 View of PC-3 location facing S by B Kendrick witnessed by J Hartley (signature illegible).

B. 12/16/99

LANL - Phase 2, Los Alamos, NM

Dec 11, 1994 01300.04.015

Roll 3, Photo 20 (1111) Close up view of PC-3 location facing S by BKendrick witnessed by J Hoxley. Sample will be collected for 0-21 cm

1130 Collected sample PC-3

1146 Arrived at PC-4 location approximately 150 feet east of Jemez Road 4. Sample will be collected for 0-5 cm in depth.

1152 Roll 3, Photo 21 View of PC-4 facing N by BKendrick witnessed by J Hoxley

1154 Roll 3, Photo 22 Close-up view of PC-4 facing N by BKendrick witnessed by J Hoxley

1210 Collected sample PC-4

1217 Depart Pajarito Canyon

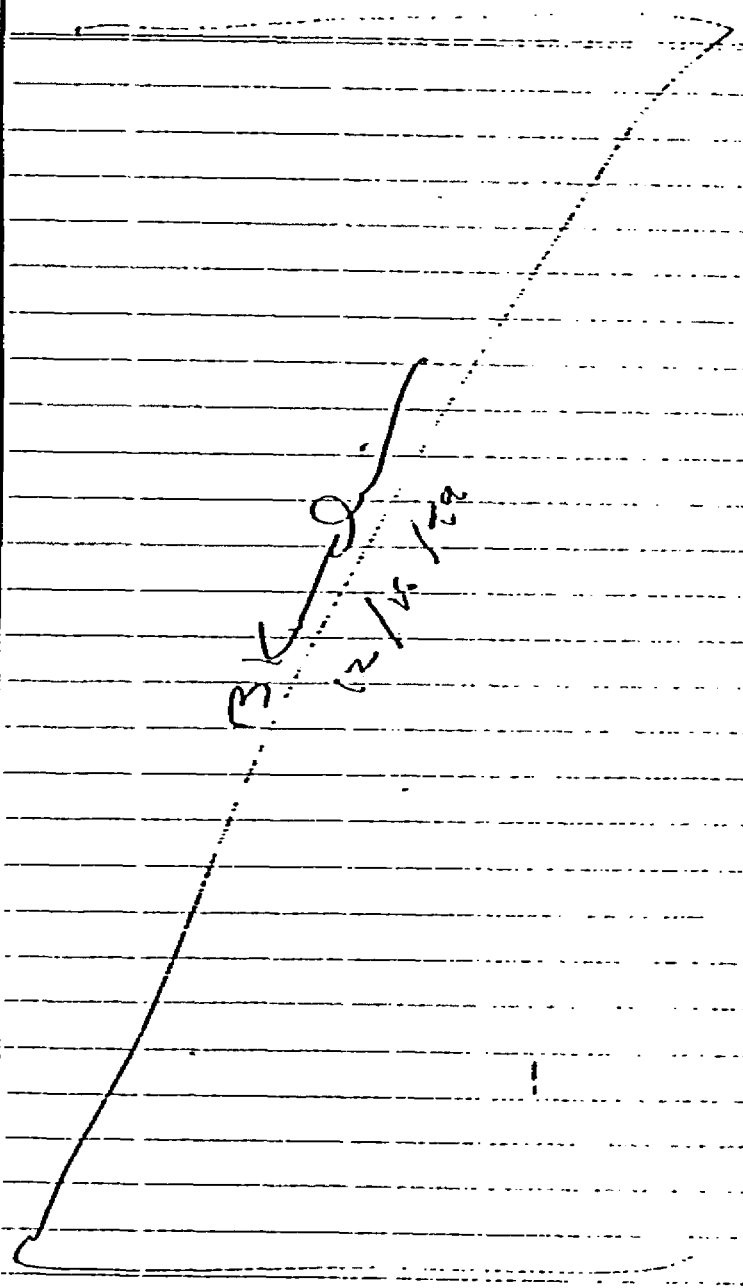
1349 Arrive at AC-5 in Ancho Canyon. Sample will be collected from 12-24 cm in depth.

1347 Roll 4, Photo 1 View of AC-5 facing S by BKendrick witnessed by J Hoxley

1349 Roll 4 Photo 2 Close up view of AC-5 facing S by BKendrick witnessed by J Hoxley

1400 Collected sample AC-5

BKendrick



LANL - Phase 2 Los Alamos, NM

Dec 11, 1989 01300.00.015

1408 Arrival at AC-4. Sample will be collected from 0 - 7 cm

1410 Roll 4, Photo 3 View of AC-4 facing S by B Kedlecik witnessed by J Hawley

1412 Roll 4, Photo 4 Closeup view of AC-4 facing S by B Kedlecik witnessed by J Hawley

1425 Collected AC-4

1435 Arrival at AC-3

1440 Roll 4, Photo 5 View of AC-3 facing N by B Kedlecik witnessed by J Hawley

1447 Roll 4, Photo 6 Closeup view of AC-3 facing N by B Kedlecik witnessed by J Hawley

1450 Collected Sample AC-3. AC-2 is located approximately 50 feet S of AC-3.

1454 Roll 4, Photo 7 View of AC-2 facing N by B Kedlecik witnessed by J Hawley

1500 Roll 4, Photo 8 Closeup of AC-2 facing N by B Kedlecik witnessed by J Hawley. Sample was collected from 0 to 17 cm in depth.

1515 Collected Sample AC-2

LANL - Phase 2 Los Alamos, NM

Dec 15, 1994 01300.06.015

1513 Arrive at basin AC-1. Sample material will be collected from 0 to 5 cm in depth.

1527 Roll 4, Photo 9 View of AC-1 looking approx 30° East West at Anchor Canyon Coring Site. Film IN by B. Kendrick witnessed by J. Hurley.

1529 Roll 4, Photo 10 Close up of AC-1 Coring IN by B. Kendrick witnessed by J. Hurley.

1540 Collected AC-1

1551 Arrive back at vehicle. Prepared to collect an equipment blank.

1610 Collected equipment blank AC-EB

1615 Depart Anchor Canyon Area enroute to White Rock office.

B. Kendrick

LANL - Phase 2 Los Alamos, NM

Dec 16, 1993 0300.06.015

Below is a summary of the samples collected during this day's activities

Sample ID/Location	Date	Time
PC-1	12/11/93	1020
PC-2	12/11/93	1105
PC-3	12/11/93	1130
PC-4	12/11/93	1210
PC-5 (overall time)	12/11/93	1230
AC-1	12/11/93	1540
AC-2	12/11/93	1515
AC-3	12/11/93	1450
AC-4	12/11/93	1425
AC-5 (overall time)	12/11/93	1400
AC-EB	12/11/93	1610

END OF DAY

MB 12/16/93

LANL- Phase 2 Los Alamos, NM

Dec 17, 1999 01300.06.015

1000 Arrive at well SM-30. Weather was approximately 35°F and clear. Present at the start were Steve Calhoun, Jimmy Harris, Deborah Steen, EPIC Jimmy works for ATS. Danny Kolesar and Henry Dalton were present. Michael Dale and Robert Vinyard were present. Well SM-30 was developed on Monday (12/11). Approximately 10 gallons were removed during well development operations.

1021 Opened wellhead and screened using an OVA. Reading from OVA was 1.3-70 ppm 1 hours, reading was questionable. Breathing zone measurement was 0 ppm. Photo #.

1025 Water level in SM-30 was measured to be 22.27 feet below TOC.

1037 Begin purging SM-30

1045 Measured flow rate to be approximately 425 ml/min

pH 6.05

cond 0.159

temp 13.1

turb 6 (1.00)

DO 3.77

BK

BK 12/12/96

LANL-Phase 2 Los Alamos, NM

Dec 17, 1999 0130.02.015

1050 Water quality parameters
pH 6.08
cond 0.199
turb 5
temp 13.3
DO 2.43

1100 Water quality parameters
pH 5.97
cond 0.190
turb 5
temp 13.7
DO 1.98

1102 Water level was 22.30 feet below TOC

1105 Water quality parameters
pH 5.93
cond 0.146
turb 5
DO 2.25
temp 13.6

1110 Water quality parameters
pH 5.94
cond 0.146
turb 4
DO 2.36
Temp 13.6

1112 Roll 9, Photo 12 Video # 99-30
white purging facility WD by Blackland

Witnessed by J Hartley

1135 Water quality parameters
pH 5.89
cond 0.149
turb 13.4
DO 2.21
temp 13.1

1145 completed sampling using peristaltic pump. Pulled tubing for well

1210 Collected SM-30 sample

1220 Depart SM-30 location.

The following is a summary of samples collected during the days activities

Sample ID/Location	Date	Time
SM-30 (in flow)	11/17/95	1210
SD-30 (Dup of SM-30)	11/17/95	1130

END OF DAY

BK

296.70669.97

APPENDIX B

Chronological Summary of Field Activities

Chronological Summary
1999 Groundwater Sampling Mission
Los Alamos National Laboratory

This section provides a brief summary of all sampling activities that were conducted by TechLaw (TL) staff from December 6, 1999 through December 17, 1999 at Los Alamos National Laboratory (LANL). This summary is based on TechLaw's daily logbooks and does not include all recorded details. Copies of the logbooks are included in Appendix A.

December 6, 1999 (Monday)

Weather: Temperature low 30's, clear.
Proposed work: Begin sediment sampling in proximity of the TA-45 tributary to Acid and Pueblo Canyon confluence.
In Attendance (sampling): B. Kendrick, TL-WAM; J. Housley, TL Team Member; B. Wingo, NMED; C. Hanlon-Meyer, NMED; S. Reneau, LANL;

Bret Kendrick, TL-WAM and Jim Housley, TL team member arrived at the Los Alamos Aquatic Center at 1021 and discuss safety issues and sampling logistics prior to the sampling event. It was decided that Ray Sisneros was to join the sample team in the canyon when he arrived, so at 1030 the team entered the Acid Canyon tributary. Sampling activities began at 1033 at an area where a hiking trail crossed the stream channel.

A three centimeter frozen crust was removed to collect sample ACS-35-0. The sample was collected by Chris Hanlon-Meyer and Jim Housley to a depth of ten centimeters. An area of soil large enough to fill all sample containers was extracted and placed into a stainless steel bowl and mixed into an homogeneous sample using a stainless steel trowel. A 2 cm sieve was used to filter roots and gravel from the sediment. All sampling equipment was decontaminated using Fantastic and DI water before moving to the next location.

Two samples were collected at the next location using the same methodology as previously described. Because these samples were collected from an embankment of alluvial deposition, the trowel was used to score vertical lines in the sediment as an outline of the area to be removed for a representative sample. At 1140, ACS-18-1 was collected from 0 to 26 cm from a brown, homogenous, fine sand. A duplicate of ACS-18-1 was collected from the same depth and labeled as ACS-18-3. A second sample, ACS-18-2, was obtained from 26 to 46 cm at 1200. Sampling equipment was decontaminated between the two stations and after the final sample was collected.

Samples ACS-12-1 and ACS-12-2 were collected from an embankment at the next location using the trowel as stated earlier to provide an outline of the sample collection area. ACS-12-1 was collected at 1235 from 0 to 30 cm in depth and was composed of a fine sand which was grayish-brown in color. At 1245, after decontaminating the sampling equipment, ACS-12-2 was collected from 30 to 62 cm. Sediment was a brown, fine, sandy silt. Sampling equipment was decontaminated before leaving to the next sample location.

Sample ACS-48 was collected at 1300 from 0 to 12 cm in depth using the stainless steel trowel

and bowl as mentioned previously. The sediment was a grayish-brown fine sand. An MS/MSD was also collected for metals and PCBs at this location. Sampling equipment was decontaminated before leaving for the next location.

The final station was ACS-3 where four samples were to be collected from an alluvial embankment. The first sample, ACS-3-1, was collected from 0 to 28 cm at 1330. The second sample was ACS-3-2 located from 32 to 62 cm and ACS-3-3 from 62 to 89 cm. All three of these samples consisted of a light brown, fine sand. ACS-3-4 was collected at 1400 from 89 to 104 cm in depth and was a dark brown, fine sand. After the final sample was collected, the sampling equipment was again decontaminated using Fantastic and DI water.

An equipment blank, ACS-EB, was prepared at 1410 by pouring DI water over the equipment used into a stainless steel bowl. The DI water was the poured from the bowl into sample jars to be analyzed for residual contaminants persistent after decontamination.

At 1430, M. Dale and S. Yanicak from the New Mexico Environment Department arrived with Rich Mayer, the EPA-WAM. The team arrived back to the Aquatic Center at1450 and departed to the NMED Oversight Bureau, White Rock Office at 1500. Upon arrival, B. Kendrick and J. Housley prepared the samples for shipment.

<u>December 7, 1999 (Tuesday)</u>

Weather: Partly Cloudy, approximately 20 degrees.
Proposed Work: Start sampling wells TW-8, MCO-2, MCO-3, and MCO-4B in Mortandad Canyon
In Attendance: R. Mayer, EPA-WAM; B. Kendrick, TL-WAM; J. Housley, TL team member; B. Wingo, NMED; M. Dale, NMED; N. Archuleta, San Ildefonso Indian Reservation; and N. Kaniatobe, San Ildefonso Indian Reservation.

Activities: TL team members met with David Rogers, Max Maes, Consuelo Montoya at ESH-18 for a safety meeting at 0825 hours. Naomi Archuleta and Noah Kaniatobe arrived at the meeting at 0847. The sampling team proceeded to well MT-4 and arrived at 0925. This well was installed in 1988 and is constructed of two-inch diameter PVC pipe. The well had a locked steel outer protective casing which was secured by concrete. The water level was measured at 59.64 feet below the top of casing (TOC), and the total well depth is approximately 74 feet. Low-flow purging began at 0950 at a rate of 580 ml/min. Purged water was not containerized and was discharged directly onto the ground surface. This disposal method had been agreed to by NMED prior to this sampling event. The water level was measured at 1008 at a depth of 59.65 feet below TOC and water quality parameters were collected at 1008, 1014, and 1023. There was no draw-down of the water level while purging, and water quality parameters were stable. Sample MT-4 was collected at 1105 using a bladder pump. After sample collection, water quality parameters and water level were again measured to ensure well stabilization. Sample team departed MT-4 at 1130.

The team then proceeded to well MCO-4B in lower Mortandad Canyon. This well was installed in 1990 and was constructed of two-inch diameter polyvinyl chloride (PVC) pipe. The well had

a one-foot square concrete well pad and a locked, steel outer protective casing. The second well to be sampled was MCO-4B. The top of the pump was measured at 23.54 feet below TOC. The water level was below the top of the pump. At 1146, an attempt was made to purge the well but no water could be removed. Therefore, either the pump intake was above the water level or the pump was not functioning properly. A call was placed to David Rogers to verify the substitution of MCO-5 for MCO-4B. MCO-4B was departed at 1200. After stopping at the RTC office to scan the samples and trash, the San Ildefonso Pueblo personnel departed.

The sample team arrived at MCO-3, located at the base of a steep ravine and along a creek bed, at 1245 to find that the well's steel outer protective casing was not locked. MCO-3 is a three inch diameter, black plastic well with a total depth of twelve feet. The water level was measured at 5.95 feet below TOC. TOC was 2.5 feet above ground surface. The well was purged and sampled using a battery powered peristaltic pump. MCO-1 was collected as a duplicate of MCO-3. The team departed MCO-3 at 1417.

The sample team arrived at MCO-2 which is a two inch, black plastic well with a locking cap. The total depth of the well is nine feet, and the water level was measured at 6.35 feet below TOC. Purging was initiated using a battery powered peristaltic pump, and water quality parameters were measured every four minutes. After parameters stabilized, samples were collected. The team departed MCO-2 and Mortindad Canyon at 1545 to return to the NMEDOB White Rock office. Samples were prepared for shipment, by B. Kendrick and J. Housley.

<u>December 8, 1999 (Wednesday)</u>
Weather: Temperature in the mid 20s, overcast.
Proposed work: Sample MCO-5, MCO-6, MCO-7, MCWB-7.7B, and MCO-8.
In Attendance: R. Mayer, EPA-WAM; B. Kendrick, TL-WAM; J. Housley, TL team member; B. Wingo, NMED; M. Maes, LANL;

Activities: The TL team and Bob Wingo of NMED arrived at ESH-18 and met with Max Maes. The team then proceeded to well MCO-5 in lower Mortandad Canyon along a dry creek bed that crosses the dirt road. This well was installed in 1960 and is constructed of three-inch black plastic pipe. A locked, steel protective outer casing was secured in place by concrete. The water level was detected at 26.20 feet below TOC with a total well depth of 46 feet. Three well volumes were purged using a dedicated bladder pump. Purged water was not containerized and was discharged directly onto the ground surface. MCO-5 samples were collected after water quality parameters had stabilized. Samples were also collected at this location for a matrix spike/matrix spike duplicate. The team departed MCO-5 at 1102.

The team arrived at MCO-6 at 1107, which was installed in March 1974. The well is constructed of four-inch diameter plastic pipe. It has a locked, steel outer protective casing with no well pad present. An initial water level was measured at 39.00 feet, and according to published boring logs, the well reaches a total depth of 47 feet. The well was purged and sampled with a dedicated bladder pump. The sample team departed the site at 1220.
The sampling team then proceeded to well MCO-7. Well MCO-7 was installed in 1960 and is constructed of three-inch black plastic pipe. The well had a locked, steel protective outer casing which was secured by concrete. Due to low water flow and limited recharge, samples were collected after one borehole volume was purged and measured parameters had stabilized prior to

sampling.

The team members arrived at well MCWB-7.7B at 1416. This well was installed in 1994 and is constructed of three-inch diameter PVC pipe. The well had a locked, steel protective outer casing and a three-foot square concrete well pad. The water level was detected at 60.08 feet below TOC with a total depth of 70 feet. One well volume was purged, and after the water quality parameters had stabilized, the well was sampled. All purged water was containerized. The team departed MCWB-7.7B at 1520.

The team arrived at well TW-8 at 1526. The well is an eight inch diameter steel well with a locked steel casing and a concrete pad. The well extends to a total depth of 1,065 feet and is pumped by an electric generator. The generator was started at approximately 1050 to purge the well. Water quality parameters and samples were collected from a faucet on the wellhead. The team departed for the day to the NMED White Rock office to prepare samples for shipment.

<u>December 9, 1999 (Thursday)</u>
Weather: Clear, low 40's
Proposed Work: Sample Gauging Station 1 (GS-1) and ship coolers.
In Attendance: B. Kendrick, TL-WAM; J. Housley, TL team member; B. Wingo, NMED; D. Rogers, LANL.

Activities: The TL team received a call from Mr. David Moss at the TA-50 Radioactive Wastewater Treatment Plant who said the plant was to start discharging water at approximately 1400, making it possible to collect a sample at Gauging Station-1. Samples that were previously collected were packed in coolers and prepared for shipment. Three coolers were sent to Southwest Laboratories of Oklahoma, two were sent to Quanterra Laboratories, and one was sent to Coastal Scientific Laboratory via FedEx.

The TL team arrived at ESH-18 to pick up David Rogers and proceeded to Mortindad Canyon, to sample TA-50 effluent, at Gauging Station-1. The sample was to be collected using a battery powered peristaltic pump to remove water from the streambed as it was released from TA-50. At 1427, B. Kendrick called Deborah Hall at TA-50, and she said they would start releasing. A field blank was collected while waiting for the release water to arrive by transferring DI water to appropriate sample containers and labeled as MCO-FB. Release water arrived at sample station at 1445. After water quality parameters were obtained, sample GS-1 was collected from the gauging station. The team departed the gauging station at 1525.

<u>December 10, 1999 (Friday)</u>

Weather: overcast, 40's
Team A, Proposed Work: Sample Upper Pajarito Springs
In Attendance: B. Kendrick, TL-WAM; R. Mayer, EPA-WAM; B. Wingo, NMED; S. Yanicak,

NMED; M. Dale, NMED; and D. Rogers, LANL..

Activities: Team members met outside the TA-8 security area. Michael Dale and David Rogers brought badges to enter the gated area. The team arrived at 0900 Homestead Spring. The flow rate was reportedly half as much as the rate during the previous sampling event. Homestead Spring was sampled using a peristaltic pump after water quality parameters had been obtained.

Team A proceeded to Starmer's Spring, located in Starmer's Gulch, at 1004. The team collected samples from the spring using a peristaltic pump after water quality parameters had been assessed. The team departed Starmer's Spring at 1033.

After arriving at Charlie's Spring, which is located upstream of Starmer's Gulch, Rich Mayer, EPA WAM, decided not to sample because the area had little water. The team moved on to collect water from Kieling Spring at 1220, Bulldog Spring at 1300, BU-0.01 at 1345, and PA-8.9 at 1425. After sampling PA-8.9, Team A departed the field and returned to the NMED White Rock office where TL prepared sample containers for shipment.

Team B. Proposed Work: Sample Middle and Lower Pajarito surface waters
In Attendance: J. Housley, TL Team Member, C. Hanlon-Meyer, NMED; B. Wedgeworth, NMED; and H. Decker, LANL.

Activities: Jim Housley, Bruce Wedgeworth, and Chris Hanlon-Meyer arrived at TA-18 at 0835. Harvey Decker arrived at 0845, and the team entered the guard gates. After entering, the sample team hiked to Threemile Spring in Pajarito Canyon and found it dry. The team departed and went to sample surface water at station TM-0.4. It was also dry so the team moved on to TA-18 Spring. The spring was flowing, so NMED personnel measured the flow rate and J. Housley prepared sampling equipment. After completing flow rate measurements, field parameters and samples were collected using a battery powered peristaltic pump. Samples which required filtering were collected from an in-line 0.45μ filter. A surface water sample and matrix spike/matrix spike duplicate was also collected at TA-18 Spring.

Team B left Technical Area-18 and proceeded to PA-6.7 to collect surface water from the Pajarito and Twomile Canyon confluence. The sampling location was in the lower end of Pajarito Canyon and was frozen. The Twomile Canyon stream was smaller than Pajarito stream and was frozen solid. The team inspected the stream downstream of the confluence and located a small area of flowing water approximately 100 feet from the confluence. It was deduced that the stream must have been from Pajarito so the sample was collected. A peristaltic pump was used to collect the samples, and any samples which required filtering were collected with a 0.45μ in-line filter. A field blank, labeled FB-6.7, was also collected at this site by transferring DI water into sample containers. Team B returned to the NMED White Rock office at 1350, and J. Housley labeled and sealed sample containers. Rich Mayer returned to Dallas.

<u>December 13, 1999 (Monday)</u>

Weather: 40's, partly cloudy

Proposed Work: Sample Sandia and Bayo Canyon, and production wells PM-1, PM-2, PM-5, O-4.
In Attendance: B. Kendrick, TL-WAM; J. Housley, TL Team Member; C. Montoya, LANL; B. Turney, LANL; C. Hanlon-Meyer, NMED; B. Wedgeworth, NMED, Sandra Jacquez, NMED; and Rory Gauthier, NPS.

Activities: Sediment samples were collected along embankments of alluvial deposits in Sandia and Bayo Canyon. The method for collecting the sediment was as stated earlier of Acid Canyon where a stainless steel trowel was used to score an outline of the area of soil to be removed. The sediment is removed and placed into a large stainless steel bowl to be homogenized. If debris such as roots or gravel was present in the mixture, it was sieved before filling sample jars. All sample locations were logged with a Trimble GPS Pro XR/XRS system and downloaded to Pathfinder Office 2.0 software for later incorporation into the report.

The sample team arrived at the first sampling location on the east side of State Road 4 in Sandia Canyon. The location was designated as SC-1 and consisted of sediment 0 to 17 cm in depth. The sample material was a light brown, medium to fine grain sand with some silt and rootlets and was collected by TL at 0925. The second sample was a medium to fine sand with some silt that was located from 0 to 3 cm. The sample was labeled as SC-2 and was collected at 0955. The team arrived at the next location labeled SC-3 to collect a sample from 8 to 19 cm in depth. The sediment was medium to fine sand and was collected at 1025. SC-4 was collected at the next location at 1050 from 2 to 12 cm in depth. The sample team crossed to the west side of State Road 4 to collect the final two samples. After locating SC-5, the sample team continued on to SC-6 and worked back toward the vehicles. SC-6 was collected from 0 to 12 cm in depth at 1125. A matrix spike/matrix spike duplicate was also collected at this location. The sample team arrived at the final sample location and collected SC-5 at 1150. At 1210 the sample team departed Sandia Canyon and continued to Bayo Canyon to complete the day's sediment sampling.

A total of five samples were collected in Bayo Canyon. BC-1 was collected at 1340, BC-2 at 1410, BC-3 at 1430, and BC-4 at 1505. The fifth sample was BC-5 and was collected as a duplicate of BC-2. TL departed Bayo Canyon at 1515 to the NMED White Rock office to prepare samples for shipment.

TL prepared bottles afterward for collection of water from local production wells. The TL team met with Mr. Bob Beers of LANL, and Walter of the County Water Department, at the LANL power plant. All wells were purged when we arrived at their individual sites. The first production well sampled was PM-5 at 1810. The sample was collected from the well head after water quality parameters were established. The second well was PM-2 which was sampled in the same manner at 1850. Production wells PM-1 and O-4 were collected at 1955 and 2040 respectively. TL departed O-4 and proceeded to the NMED White Rock office at 2055 to prepare samples for shipment.

<u>December 14, 1999 (Tuesday)</u>

Weather: Mid to high 40's, slight breeze
Proposed Work: Sediment sampling in Mortindad Canyon
In Attendance: B. Kendrick, TL-WAM; J. Housley, TL Team Member; C. Montoya, LANL; C. Hanlon-Meyer, NMED; Sandra Jacquez, NMED.

Activities: Sample team arrived at MC-1 and sampled sediment 0 to 5 cm at 1000. The sample area was scored with a stainless steel trowel, and sediment was placed into a stainless steel bowl. The sediment was sieved to remove larger gravel from the sample and then placed into sample jars. The sampling locations were logged with a Trimble GPS Pro XR/XRS system and downloaded to Pathfinder 2.0 software for later processing.

The sample team moved to MC-3 and collected sediment located from 15 to 24 cm in depth in the same manner as mentioned above. The sample was collected at 1115. The next location, MC-4, was located approximately four feet from MC-3 and was located directly in the dry stream channel. MC-4 was collected from 0 to 5 cm in depth at 1130. The team back-tracked to MC-2 where a sample was collected from 0 to 8 cm at 1200. The final location, MC-5, included two areas to be sampled. The first was designated as MC-5a and was collected from 0 to 13 cm at 1235. The second sample was designated as MC-5b and was collected from 22 to 30 cm in depth at 1250. The sample team departed the canyon and returned to the NMED White Rock office.

B. Kendrick, Chris Hanlon-Meyer, and Bill Turney departed to locate sample locations for Canada del Buey Canyon within the White Rock community while J. Housley labeled and sealed collected samples. Five locations for six samples were located to be sampled the next day.

<u>December 15, 1999 (Wednesday)</u>

Weather: Not recorded
Proposed Work: Sample Canada del Buey.
In Attendance: B. Kendrick, TL-WAM; J. Housley, TL team member; C. Montoya, LANL; B. Turney, LANL.

Activities: The sample team arrived at Canada del Buey behind McDonalds Restaurant in White Rock at 0815. The first sample to be collected was CC-8 at a depth from 20 to 33 cm. The sample was collected at 0915 in the same manner as previous sediment samples. A hammer and stainless steel chisel were used to chip out the outlined area of soil because the soil was frozen solid. In order to fill sample jars, the bowl of sample material was placed on the dash of the truck in the sun so it could defrost. CC-7 was the second location and was collected from 0 to 7 cm. The sample was collected at 1000 and the team moved west through the canyon to station CC-6. This sample was collected in the same manner as above from 0 to 7.5 cm in depth. The sample was collected at 1034 and the stainless steel bowl was placed in the truck to thaw. At 1125 the CC-8 and CC-6 had defrosted enough to transfer into sample containers. The sampling equipment was decontaminated, and an equipment blank was collected at 1150. The blank was labeled as CC-EB.

The team drove to a location farther west to continue sampling the canyon and arrived at location

HOT • 6969 • 1000

101

CC-5 at 1309. Two samples were collected at the location. The first was designated as CC-5a and was located from 18 to 26 cm in depth. The sample was collected at 1330. The second sample was designated as CC-5b and was collected from 30 to 39 cm in depth at 1345. The samples were placed in plastic bags for transport back to the NMEDOB White Rock office to be transferred to sample containers when thawed. The next sampling location was CC-4 where a surface sample was collected to a depth of approximately 2 cm. CC-4 and a matrix spike/matrix spike duplicate were collected at 1415. The next sample location was CC-3 and was collected from 0 to 13 cm in depth. The sample was collected at 1445 and was also frozen solid. It too was placed in plastic bags and taken to the NMEDOB office to be thawed. The next location, CC-2, was located inside a culvert under the dead end on LaJano Road. The sample was collected from 5 to 20 cm in depth at 1515. Sample CC-9 was also collected here as a duplicate sample of CC-2. The final sample of the day was CC-1 which was sampled from 10 to 17 cm. The sample was collected at 1545 and TL returned to the NMEDOB office to prepare samples for shipment.

December 16, 1999 (Thursday)

Weather: Not Recorded
Team 1 (LANL-ESH) Proposed Work: Sample Pajarito and Ancho Canyon
In Attendance: B. Kendrick, TL-WAM; J. Housley, TL team member; S. Yanicak, LANL; C. Hanlon-Meyer; C. Montoya, LANL; B. Turney, LANL.

Activities: The team sampled locations in Pajarito and Ancho Canyon in the same manner as previous sediment sampling. The sample team arrived at PC-1 and sampled a depth of 0 to 17 cm at 1020. PC-2 was sampled from 0 to 24 cm at 1105. A duplicate sample was also collected from this location and labeled PC-5. The team collected PC-3 from 0 to 21 cm in depth at 1130 and PC-4 was collected from 0 to 5 cm in depth at 1210. The final Pajarito Canyon sampling location, PC-4, was located approximately 150 feet east of State Road 4.

The team drove to a public access area of Ancho Canyon and collected the final five sediment samples. Sample AC-5 and a matrix spike/matrix spike duplicate was collected from 10 to 24 cm in depth at 1400. The second location was AC-4 where a sample was collected from 0 to 7 cm in depth at 1425. Sample AC-3 was collected at 1450 and the team moved approximately 50 feet south to sample AC-2. AC-2 was collected from 0 to 17 cm in depth at 1515. The final location, AC-1, was sampled from 0 to 5 cm in depth. The location was approximately 300 feet west of the Ancho Canyon Gauging Station and was sampled at 1540. The equipment was decontaminated and an equipment blank, AC-EB, was collected. The team departed the canyon and returned to the NMED office to prepare samples for shipment.

December 17, 1998 (Friday)

Weather: 35, clear
Proposed Work: Sample SM-30 groundwater well.
In Attendance: B. Kendrick, TL-WAM; J. Housley, TL Team Member; B. Wingo, NMED; M. Dale, NMED; S. Calhoun, PMC; J. Harris, ATS; D. Steven, PMC; D. Katzman, ER-LANL; H.

Decker, LANL:

Activities: The well was developed on Monday (12/13) when approximately 63 gallons were removed. The well was enclosed in a flush mounted road box and was screened with an OVA when opened. Readings fluctuated around 163 to 170 in the well but were very questionable. Readings obtained in the breathing zone were consistently zero. The water level was measured at 22.27 feet below TOC, and low-flow purging was initiated. The well was purged using a battery powered peristaltic pump at a flow rate of 425 ml/minute. Water quality parameters including pH, conductivity, turbidity, dissolved oxygen, and temperature were monitored for fifty minutes to ensure stabilization. When confident that the parameters had stabilized, samples were collected using the peristaltic pump. Samples which required filtering were collected from a 0.45μ in-line filter. SM-30 samples were collected along with an MS/MSD sample and a duplicate labeled as SD-30. The TL team departed the site to the NMED White Rock office at 1220 to prepare samples for shipment.

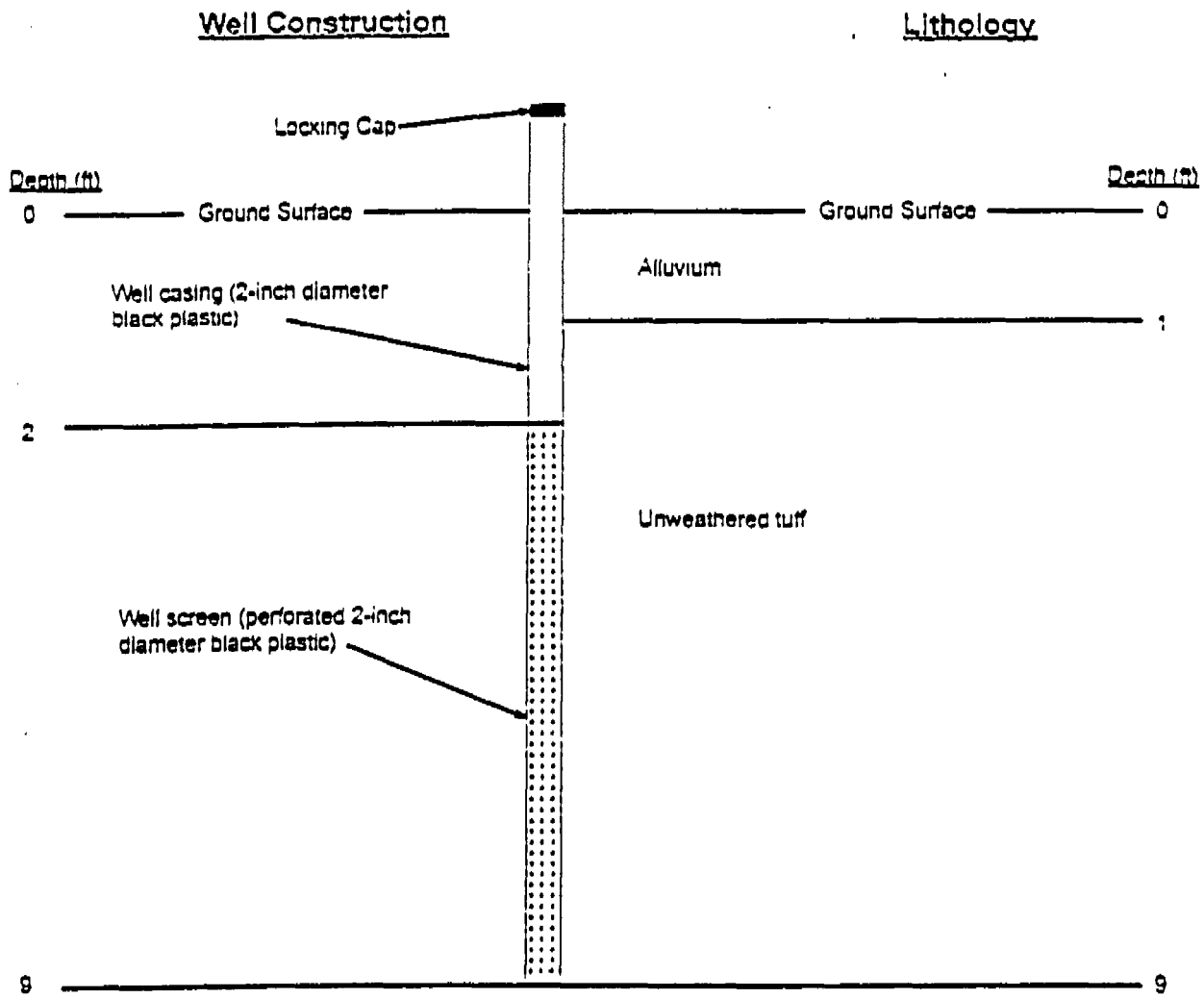
APPENDIX C

Generalized Well Construction and Lithologic Descriptions

Generalized Well Construction and Lithologic Description

Well Designation: MCO-2
Date Completed: November 1960
Location: Mortandad Canyon

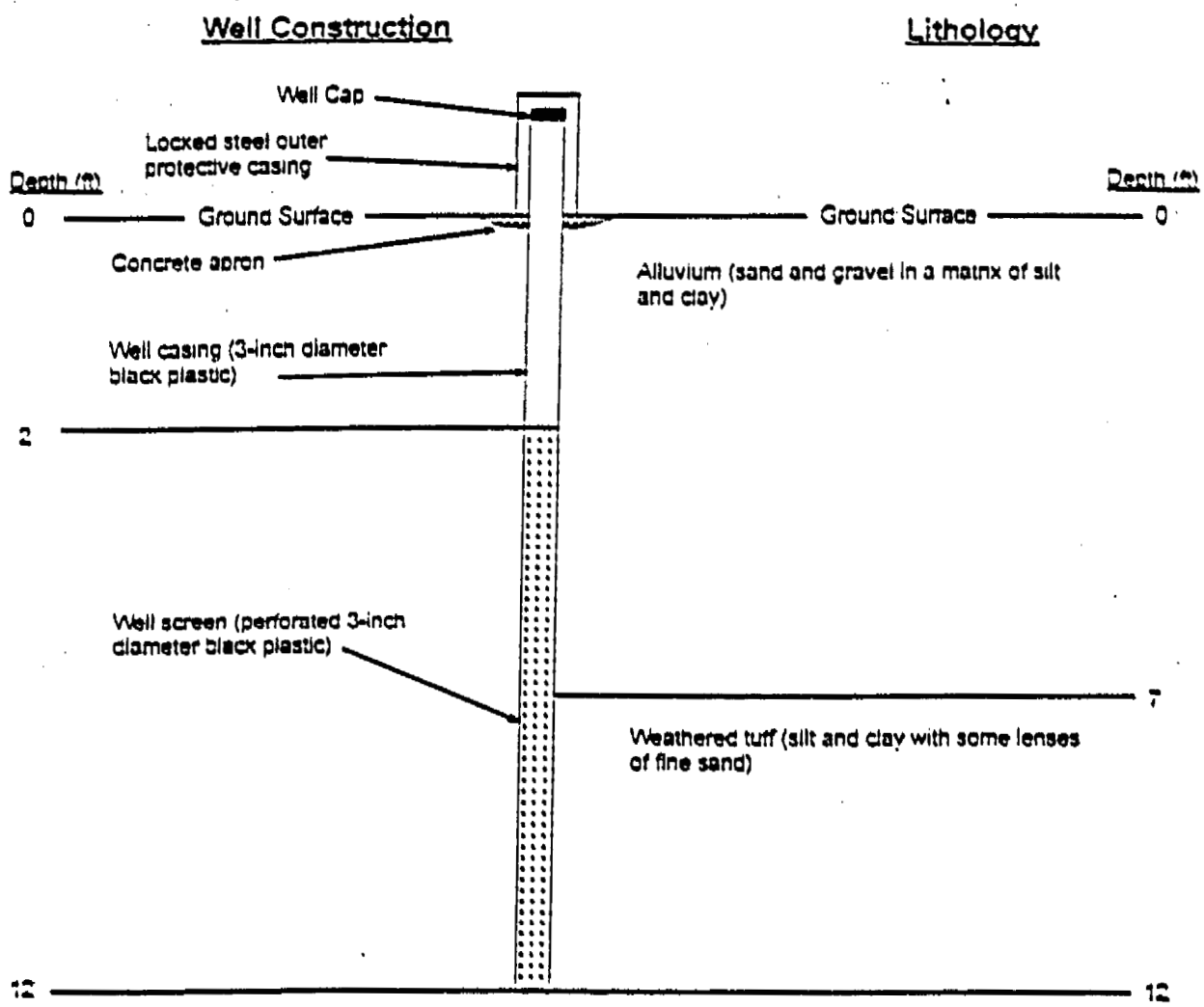
Well Diameter: 2 inches
Length of Well Screen: 7 feet
Total Depth of Well: 9 feet



Generalized Well Construction and Lithologic Description

Well Designation: MCO-3
Date Completed: March 1967
Location: Mortandad Canyon

Well Diameter: 3 inches
Length of Well Screen: 10 feet
Total Depth of Well: 12 feet



Generalized Well Construction and Lithologic Description

Well Designation: MCO-5

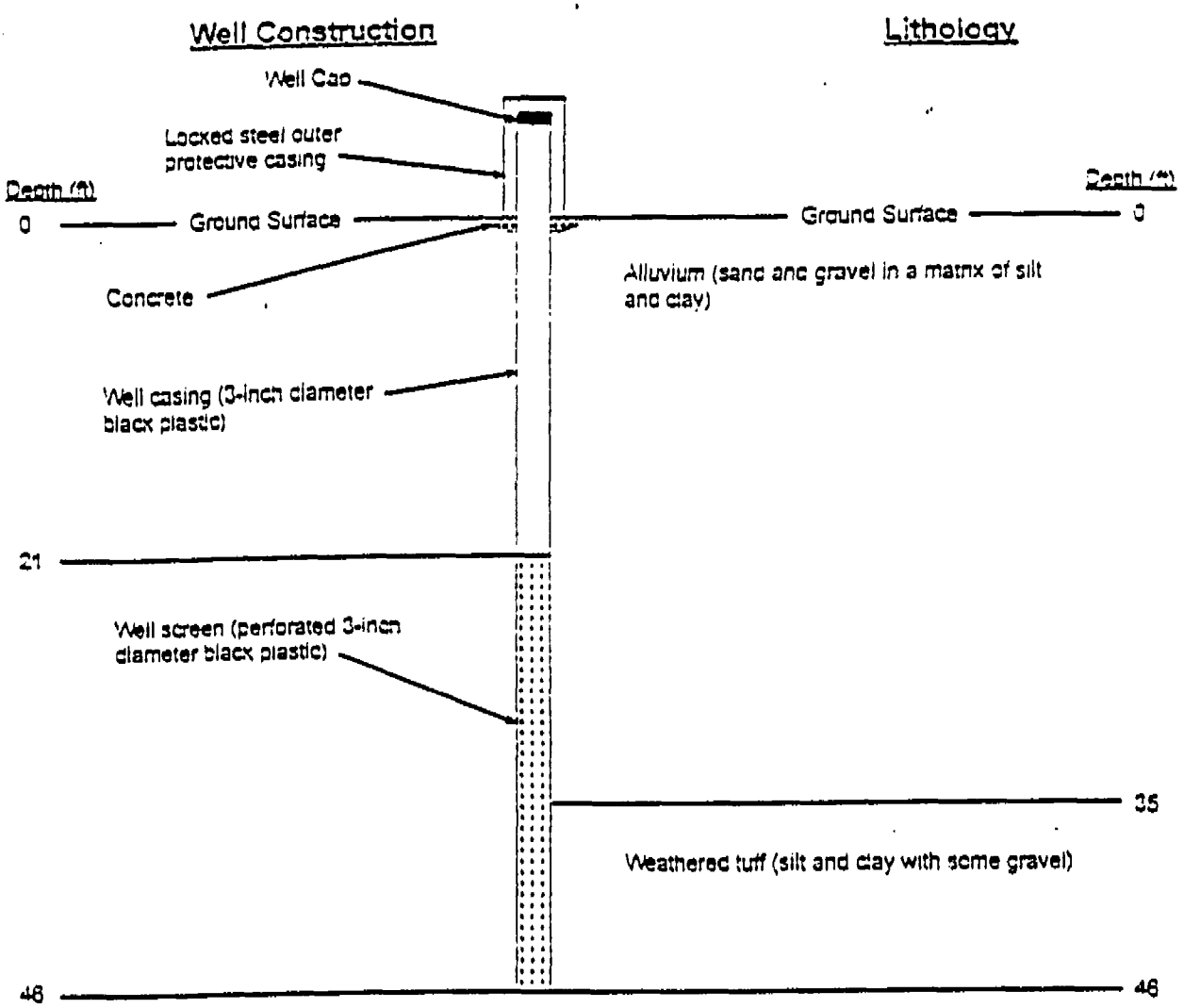
Date Completed: October 1960

Location: Mortandad Canyon

Well Diameter: 3 inches

Length of Well Screen: 25 feet

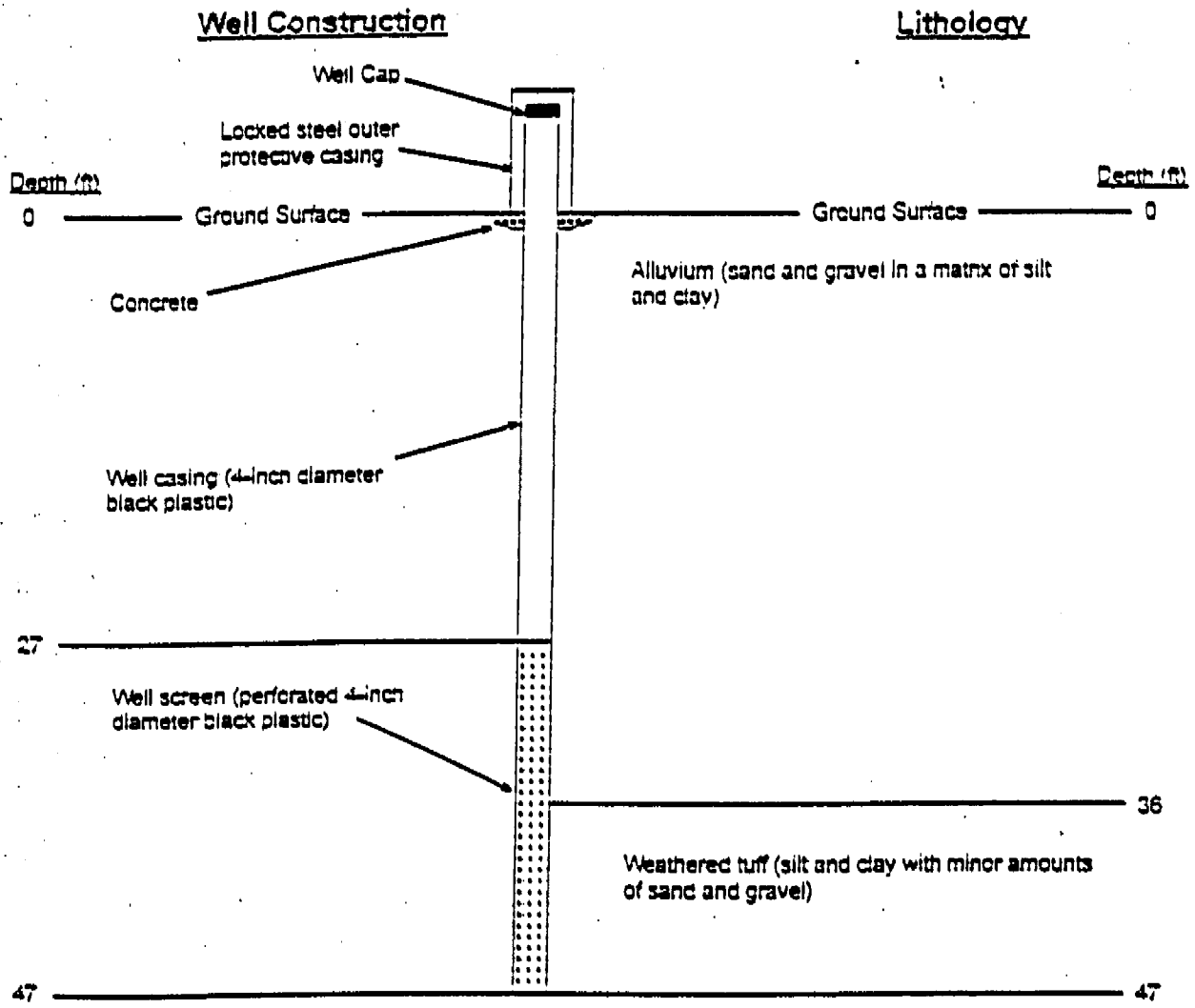
Total Depth of Well: 46 feet



Generalized Well Construction and Lithologic Description

Well Designation: MCO-6
Date Completed: March 1974
Location: Mortandad Canyon

Well Diameter: 4 inches
Length of Well Screen: 20 feet
Total Depth of Well: 47 feet



Generalized Well Construction and Lithologic Description

Well Designation: MCO-7

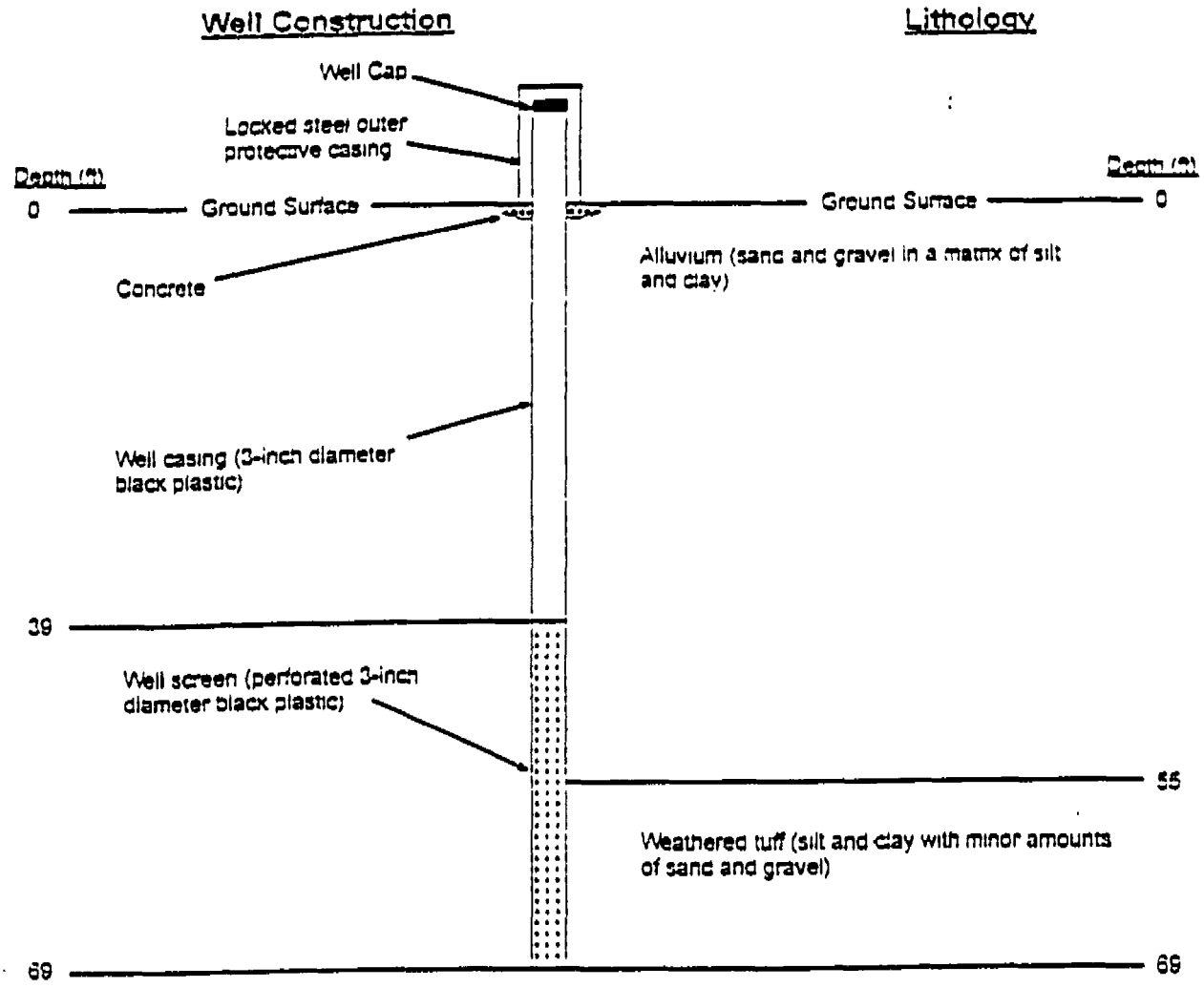
Date Completed: October 1960

Location: Morandad Canyon

Well Diameter: 3 inches

Length of Well Screen: 30 feet

Total Depth of Well: 69 feet



Generalized Well Construction and Lithologic Description

Well Designation: MCW6-7 7B

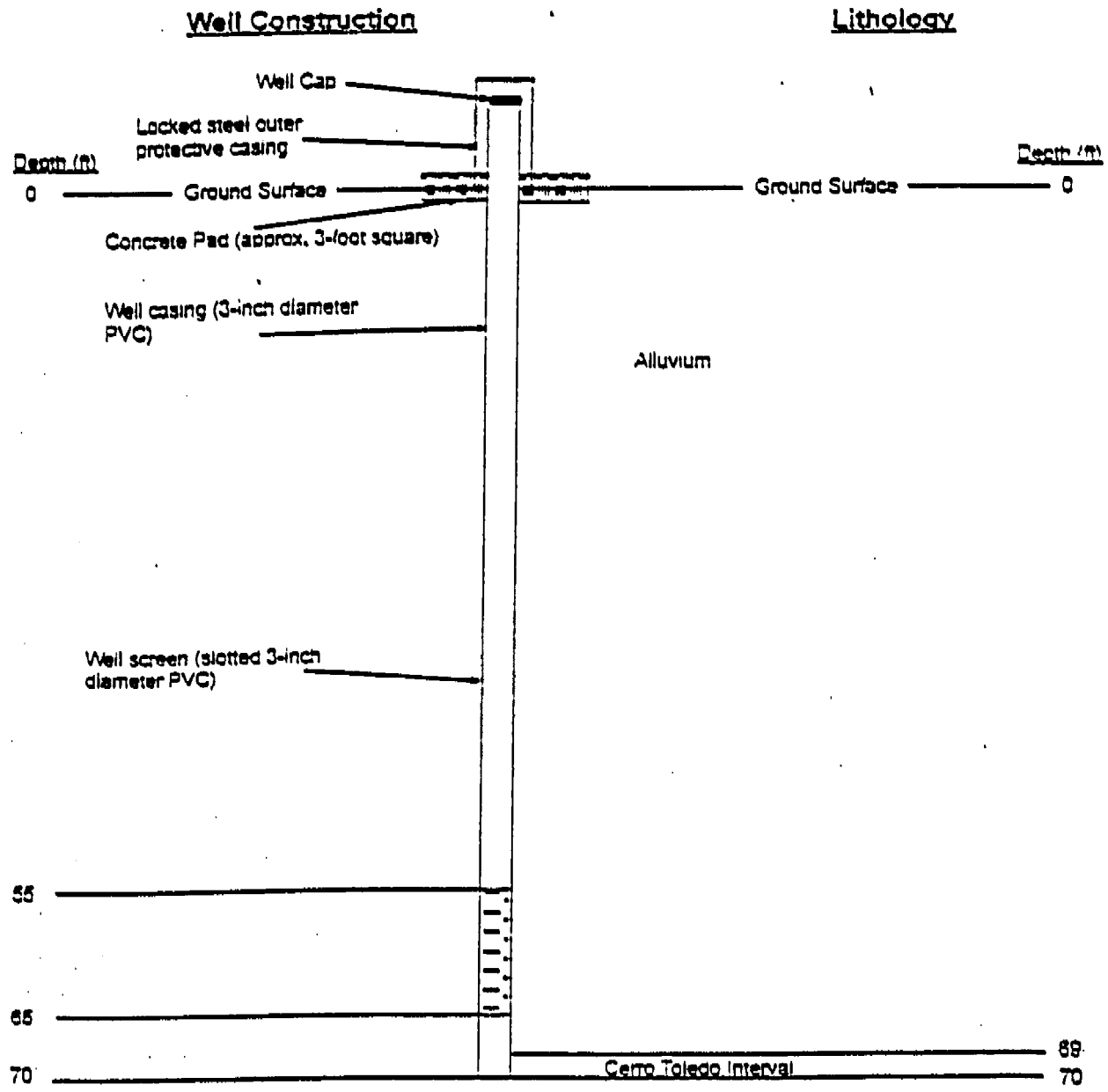
Date Completed: December 1994

Location: Montandad Canyon

Well Diameter: 3 inches

Length of Well Screen: 10 feet

Total Depth of Well: 70 feet



TECHLAW, INC.

Regional Oversight Contract
No. 68-W6-0063

Generalized Well Construction and Lithologic Description

Well Designation: MT-4

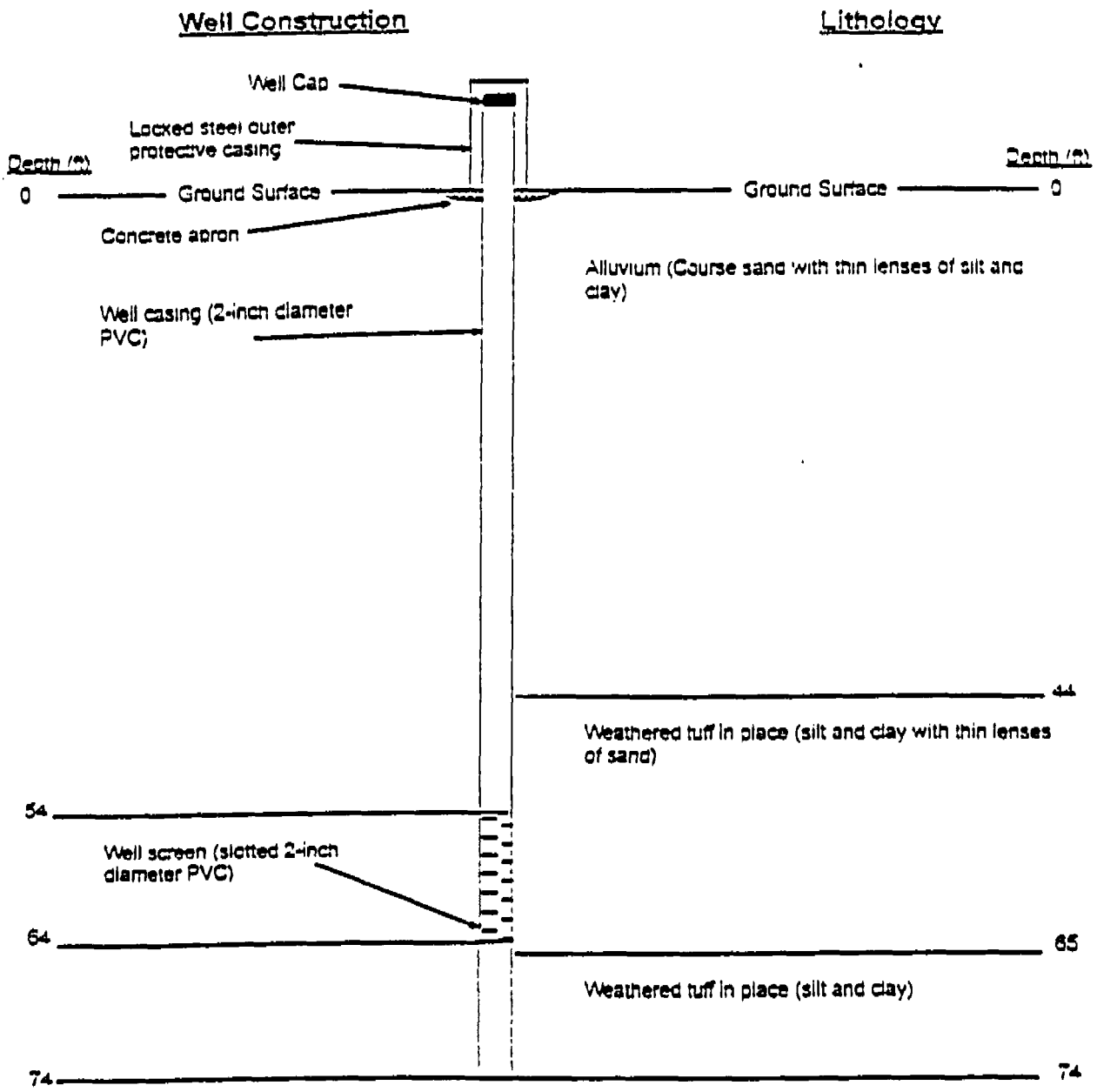
Date Completed: November 1988

Location: Montandad Canyon

Well Diameter: 2 inches

Length of Well Screen: 10 feet

Total Depth of Well: 74 feet



Generalized Well Construction and Lithologic Description

Well Designation: TW-8

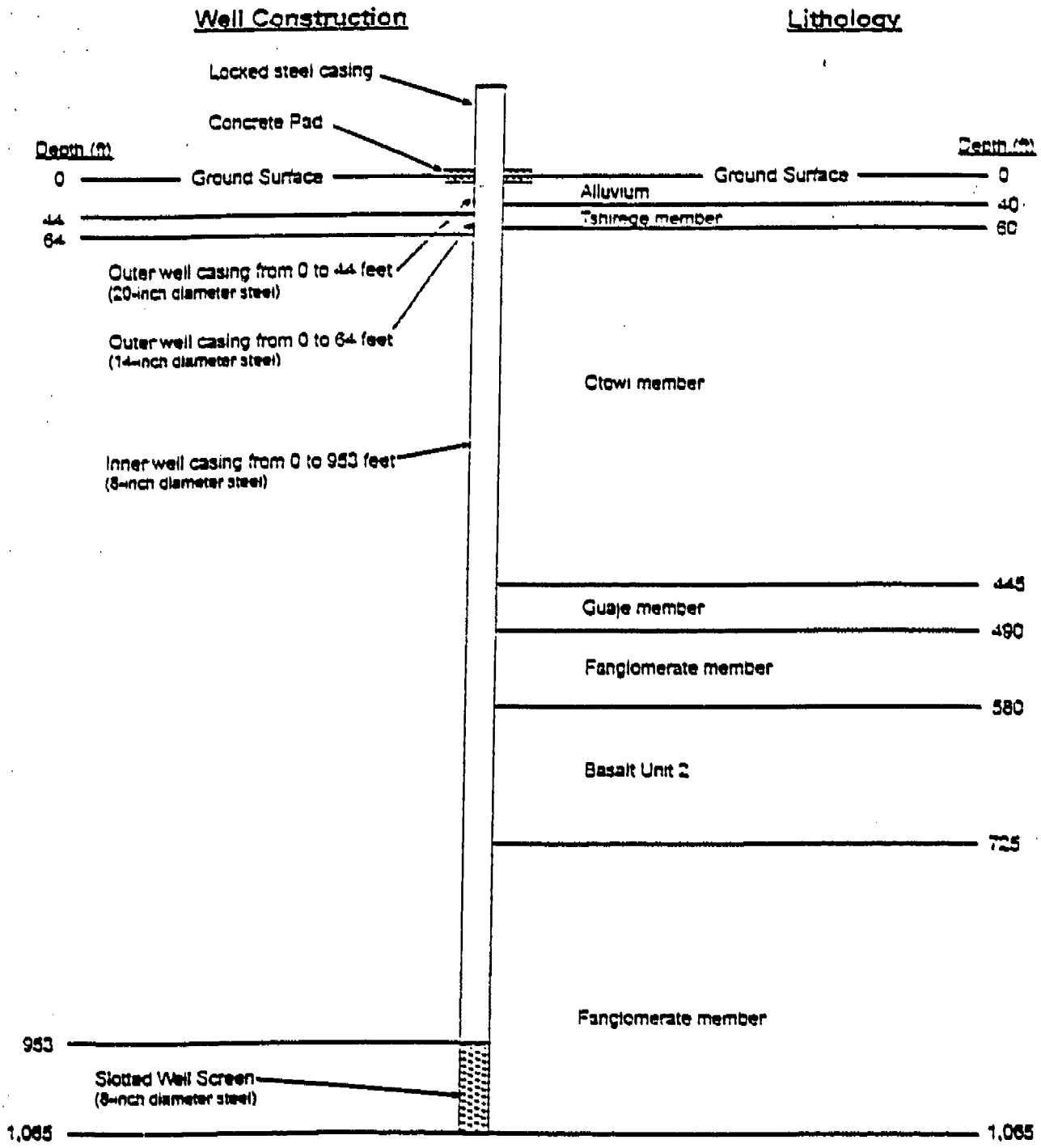
Date Completed: December 1960

Location: Mortandad Canyon

Well Diameter: 8 inches

Length of Well Screen: Not Available

Total Depth of Well: 1,065 feet



APPENDIX D

Comparative Standards Description

COMPARATIVE STANDARDS DESCRIPTION

The following is a description of the U.S. Environmental Protection Agency (EPA), New Mexico Environment Department (NMED), and U.S. Department of Energy (DOE) water quality standards, guidelines, and limits used for comparison in Tables 5, 6, 7, 8, and Appendix E of this report. These standards, guidelines, and limits do not necessarily apply to the analytical results for samples collected during the sampling event, but have been included as a point of reference for the reader.

EPA Maximum Contaminant Levels (EPA MCL)

EPA MCLs are defined as the maximum permissible level of a contaminant in water which is delivered to any user of a public water system. A public water system means a system which has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year.

EPA MCLs also include secondary maximum contaminant levels which apply to public water systems. These secondary MCLs are defined as the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of public water system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition. The secondary MCLs are not enforceable by the EPA.

Finally, there are action levels for lead and copper contained in the EPA MCLs. The action levels are defined as the concentration of lead or copper in water in a public water system which requires treatment specified in Subpart I of 40 CFR 141 prior to distribution to users.

EPA Region 6 Human Health Medium-Specific Screening Levels (EPA MSSL)

The USEPA Region 6 Human Health Medium-Specific Screening Levels address common human health exposure pathways. They do not consider all potential human health exposure pathways nor address ecological concerns. The comparison of preliminary investigation data against risk-based media concentrations provides for an initial evaluation for the relative environmental concern for a site or set of environmental data. EPA MSSL values are chemical concentrations that correspond to fixed levels of risk (i.e., either a one-in-one million [10^{-6}] cancer risk or a noncarcinogenic hazard quotient of one, whichever occurs at a lower concentration). The EPA MSSL values used for comparison to the analytical results are based on use of the water as residential tap water.

National Pollutant Discharge Elimination System (NPDES) Permit Limits

NPDES permits are a means to regulate and limit elements and compounds regularly discharged from outfalls associated with facility processes. These permits are issued by State and/or Federal regulatory agencies. The NPDES permit establishes limits and monitoring and reporting requirements for facilities with regulated outfalls.

New Mexico Maximum Contaminant Levels (NM MCL)

Except for arsenic, fluoride, gross alpha particle radioactivity, strontium-90, and tritium, the NM MCLs apply to community water systems and non-transient, non-community water systems. NM MCLs only apply to community water systems for arsenic, fluoride, gross alpha particle radioactivity, strontium-90, and tritium. A community water system is defined as any water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. A non-transient, non-community water system is defined as a public water supply system that is not a "community water system" and that regularly serves at least 25 of the same persons for more than six months per year, including but limited to schools and factories.

New Mexico Water Quality Control Commission (NM WQCC) Standards

The NM WQCC standards referred to in this report apply to groundwater of 10,000 milligrams per liter (mg/L) total dissolved solids (TDS) concentration or less. The standards apply to the dissolved (filtered) sample of the contaminants except for mercury, organic compounds, and non-aqueous phase liquids.

New Mexico Standards for Interstate and Intrastate Streams for Wildlife Habitat Limits (NM WHL)

Wildlife habitat water is defined as water of the State used by plants and animals. This water is not considered pathogenic to humans or domesticated livestock and plants. The NM WHLs apply to all discharges to the surface waters of New Mexico.

DOE Derived Concentration Guides (DOE DCG)

DOE DCG values are divided into two categories: 1) water ingestion in uncontrolled areas and 2) water ingestion from drinking water systems. The DCG values for water ingestion in uncontrolled areas are based on a committed effective dose equivalent of 100 mrem per year for each individual radionuclide. The DOE DCG values do not take into account the additive effects of radionuclides. Water ingestion in uncontrolled areas refers to drinking water sources other than public drinking water systems.

The DOE DCG values for water ingestion from drinking water systems applies to public water systems which have at least fifteen service connections or regularly serve an average of at least twenty-five individuals daily at least 60 days out of the year. The DOE DCG values for water ingestion from drinking water systems is calculated by taking 4 percent of the DCG values for water ingestion in uncontrolled areas. The DCG values for water ingestion from drinking water systems are based on a committed effective dose equivalent of 4 mrem per year for each individual radionuclide.

APPENDIX E

Comparison Tables

Acid Canyon Sediment Sample Comparison Summary of Preliminary Analytical Results for - Radionuclides *
Los Alamos National Laboratory, New Mexico

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-3								
	EPA PRG*	EPA PRG	LANL	0-28 cm			37-62 cm			62-89 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	1.02	NS	NS	0.062	NS	NS	1.06	NS	NS
Plutonium-239/240	10	2.5	0.068	1.81	NS	NS	2.73	NS	NS	1.17	NS	NS
Uranium-234	69	18	2.59	NA	NS	NS	NA	NS	NS	NA	NS	NS
Uranium-235	0.57	0.16	0.20	NA	NS	NS	NA	NS	NS	NA	NS	NS
Uranium-238	73	18	2.29	NA	NS	NS	NA	NS	NS	NA	NS	NS
Strontium-90	57	14	1.04	2.12	NS	NS	0.74	NS	NS	5.6	NS	NS
Cesium-137	0.072	0.020	0.9	0.93	NS	NS	-0.063	NS	NS	2.84	NS	NS
Actinium-228				--	NS	NS	--	NS	NS	1.49	NS	NS
Americium-241	7.5	1.9	0.04	3.70	NS	NS	--	NS	NS	29.3	NS	NS
Lead-210	3.2	0.78		2.4	NS	NS	--	NS	NS	--	NS	NS
Lead-212				1.09	NS	NS	1.29	NS	NS	1.69	NS	NS
Lead-214				0.95	NS	NS	1.15	NS	NS	1.25	NS	NS
Potassium-40	0.25	0.068	36.8	26.0	NS	NS	32.7	NS	NS	29.0	NS	NS
Thallium-208				--	NS	NS	--	NS	NS	--	NS	NS
Thorium-234				--	NS	NS	--	NS	NS	1.17	NS	NS

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-3			Fixed Point Site ACS-4					
	EPA PRG	EPA PRG	LANL	89-104 cm			0-18 cm			24-53 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	0.84	NS	NS	NS	1.14	NS	NS	0.005	NS
Plutonium-239/240	10	2.5	0.068	140	NS	NS	NS	451	NS	NS	4.09	NS
Uranium-234	69	18	2.59	NA	NS	NS	NS	3.1	NS	NS	0.86	NS
Uranium-235	0.57	0.16	0.20	NA	NS	NS	NS	0.27	NS	NS	0.08	NS
Uranium-238	73	18	2.29	NA	NS	NS	NS	3.6	NS	NS	0.76	NS
Strontium-90	57	14	1.04	10.8	NS	NS	NS	4.37	NS	NS	0.53	NS
Cesium-137	0.072	0.020	0.9	7.10	NS	NS	NS	0.23	NS	NS	<0.20	NS
Actinium-228				--	NS	NS	NS	<1.1	NS	NS	1.5	NS
Americium-241	7.5	1.9	0.04	10.6	NS	NS	NS	10.3	NS	NS	<0.66	NS
Lead-210	3.2	0.78		--	NS	NS	NS	--	NS	NS	--	NS
Lead-212				1.49	NS	NS	NS	1.28	NS	NS	1.56	NS
Lead-214				1.09	NS	NS	NS	<0.36	NS	NS	1.44	NS
Potassium-40	0.25	0.068	36.8	27.9	NS	NS	NS	--	NS	NS	--	NS
Thallium-208				0.59	NS	NS	NS	<0.30	NS	NS	<0.19	NS
Thorium-234				--	NS	NS	NS	--	NS	NS	--	NS

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-4						Fixed Point Site ACS-10		
	EPA PRG	EPA PRG	LANL	59-69 cm			74-84 cm			0-15 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	0.019	NS	NS	0.137	NS	NS	4.53	NS
Plutonium-239/240	10	2.5	0.068	NS	2.25	NS	NS	30.2	NS	NS	373	NS
Uranium-234	69	18	2.59	NS	1.93	NS	NS	3.29	NS	NS	10.2	NS
Uranium-235	0.57	0.16	0.20	NS	0.13	NS	NS	0.199	NS	NS	0.52	NS
Uranium-238	73	18	2.29	NS	1.05	NS	NS	1.71	NS	NS	4.02	NS
Strontium-90	57	14	1.04	NS	2.13	NS	NS	2.07	NS	NS	56	NS
Cesium-137	0.072	0.020	0.9	NS	<0.16	NS	NS	<0.21	NS	NS	17.4	NS
Actinium-228				NS	1.55	NS	NS	1.68	NS	NS	1.55	NS
Americium-241	7.5	1.9	0.04	NS	<0.53	NS	NS	1.17	NS	NS	68	NS
Lead-210	3.2	0.78		NS	--	NS	NS	--	NS	NS	--	NS
Lead-212				NS	1.59	NS	NS	1.28	NS	NS	1.87	NS
Lead-214				NS	1.21	NS	NS	1.45	NS	NS	1.69	NS
Potassium-40	0.25	0.068	36.8	NS	--	NS	NS	--	NS	NS	--	NS
Thallium-208				NS	0.52	NS	NS	0.54	NS	NS	0.52	NS
Thorium-234				NS	--	NS	NS	--	NS	NS	--	NS

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-10			Fixed Point Site ACS-11					
	EPA PRG	EPA PRG	LANL	15-36 cm			0-30 cm			30-53 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	9.6	NS	NS	NS	13	NS	NS	3.8
Plutonium-239/240	10	2.5	0.068	NS	1880	NS	NS	NS	2780	NS	NS	1620
Uranium-234	69	18	2.59	NS	5.37	NS	NS	NS	NA	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	0.285	NS	NS	NS	NA	NS	NS	NA
Uranium-238	73	18	2.29	NS	2.53	NS	NS	NS	NA	NS	NS	NA
Strontium-90	57	14	1.04	NS	32.7	NS	NS	NS	NA	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	15.2	NS	NS	NS	NA	NS	NS	NA
Actinium-228				NS	1.61	NS	NS	NS	NA	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	228	NS	NS	NS	NA	NS	NS	NA
Lead-210	3.2	0.78		NS	--	NS	NS	NS	NA	NS	NS	NA
Lead-212				NS	1.79	NS	NS	NS	NA	NS	NS	NA
Lead-214				NS	1.45	NS	NS	NS	NA	NS	NS	NA
Potassium-40	0.25	0.068	36.8	NS	--	NS	NS	NS	NA	NS	NS	NA
Thallium-208				NS	<0.25	NS	NS	NS	NA	NS	NS	NA
Thorium-234				NS	--	NS	NS	NS	NA	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-11			Fixed Point Site ACS-12					
	EPA PRG	EPA PRG	LANL	61-84 cm			0-30 cm			24-53 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.8	-0.036	NS	NS	0.13	NS	NS
Plutonium-239/240	10	2.5	0.068	NS	NS	1344	0.12	NS	NS	0.018	NS	NS
Uranium-234	69	18	2.59	NS	NS	NA	NA	NS	NS	NA	NS	NS
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NA	NS	NS	NA	NS	NS
Uranium-238	73	18	2.29	NS	NS	NA	NA	NS	NS	NA	NS	NS
Strontium-90	57	14	1.01	NS	NS	NA	3.54	NS	NS	20.7	NS	NS
Cesium-137	0.072	0.020	0.9	NS	NS	NA	3.19	NS	NS	5.53	NS	NS
Actinium-228				NS	NS	NA	1.22	NS	NS	--	NS	NS
Americium-241	7.5	1.9	0.01	NS	NS	NA	12.8	NS	NS	23.8	NS	NS
Lead-210	3.2	0.78		NS	NS	NA	--	NS	NS	--	NS	NS
Lead-212				NS	NS	NA	1.01	NS	NS	1.34	NS	NS
Lead-214				NS	NS	NA	0.94	NS	NS	1.21	NS	NS
Potassium-40	0.25	0.068	36.8	NS	NS	NA	29.3	NS	NS	27.8	NS	NS
Thallium-208				NS	NS	NA	--	NS	NS	--	NS	NS
Thorium-234				NS	NS	NA	--	NS	NS	--	NS	NS

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-15								
	EPA PRG	EPA PRG	LANL	0-10 cm			25-41 cm			41-65 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.46	NS	NS	0.074	NS	NS	0.27
Plutonium-239/240	10	2.5	0.068	NS	NS	94.2	NS	NS	9.57	NS	NS	37.4
Uranium-234	69	18	2.59	NS	NS	4.63	NS	NS	NA	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	NS	0.336	NS	NS	NA	NS	NS	NA
Uranium-238	73	18	2.29	NS	NS	2.56	NS	NS	NA	NS	NS	NA
Strontium-90	57	14	1.04	NS	NS	1.19	NS	NS	NA	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	NS	0.57	NS	NS	NA	NS	NS	NA
Actinium-228				NS	NS	--	NS	NS	NA	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	NS	4.4	NS	NS	NA	NS	NS	NA
Lead-210	3.2	0.78		NS	NS	--	NS	NS	NA	NS	NS	NA
Lead-212				NS	NS	--	NS	NS	NA	NS	NS	NA
Lead-214				NS	NS	--	NS	NS	NA	NS	NS	NA
Potassium-40	0.25	0.068	36.8	NS	NS	--	NS	NS	NA	NS	NS	NA
Thallium-208				NS	NS	--	NS	NS	NA	NS	NS	NA
Thorium-234				NS	NS	--	NS	NS	NA	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-16								
	EPA PRG	EPA PRG	LANL	0-15 cm			19-35 cm			35-56 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.51	NS	NS	16.8	NS	NS	0.85
Plutonium-239/240	10	2.5	0.068	NS	NS	114.5	NS	NS	4900	NS	NS	267
Uranium-234	69	18	2.59	NS	NS	NA	NS	NS	5	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NS	NS	1.3	NS	NS	NA
Uranium-238	73	18	2.29	NS	NS	NA	NS	NS	5.1	NS	NS	NA
Strontium-90	57	14	1.04	NS	NS	NA	NS	NS	70	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	NS	NA	NS	NS	0.11	NS	NS	NA
Actinium-228				NS	NS	NA	NS	NS	--	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	NS	NA	NS	NS	93	NS	NS	NA
Lead-210	3.2	0.78		NS	NS	NA	NS	NS	--	NS	NS	NA
Lead-212				NS	NS	NA	NS	NS	--	NS	NS	NA
Lead-214				NS	NS	NA	NS	NS	--	NS	NS	NA
Potassium-40	0.25	0.068	36.8	NS	NS	NA	NS	NS	--	NS	NS	NA
Thallium-208				NS	NS	NA	NS	NS	--	NS	NS	NA
Thorium-234				NS	NS	NA	NS	NS	--	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary – Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-16			Fixed Point Site ACS-18					
	EPA PRG	EPA PRG	LANL	56-68 cm			0-26 cm			26-46 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.25	0.27	NS	NS	0.65	NS	NS
Plutonium-239/240	10	2.5	0.068	NS	NS	112.1	77	NS	NS	112	NS	NS
Uranium-234	69	18	2.59	NS	NS	NA	NA	NS	NS	NA	NS	NS
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NA	NS	NS	NA	NS	NS
Uranium-238	73	18	2.29	NS	NS	NA	NA	NS	NS	NA	NS	NS
Strontium-90	57	14	1.04	NS	NS	NA	0.36	NS	NS	1.21	NS	NS
Cesium-137	0.072	0.020	0.9	NS	NS	NA	0.51	NS	NS	0.65	NS	NS
Actinium-228				NS	NS	NA	--	NS	NS	--	NS	NS
Americium-241	7.5	1.9	0.04	NS	NS	NA	4.01	NS	NS	3.35	NS	NS
Lead-210	3.2	0.78		NS	NS	NA	--	NS	NS	2.2	NS	NS
Lead-212				NS	NS	NA	1.26	NS	NS	1.19	NS	NS
Lead-214				NS	NS	NA	1.22	NS	NS	0.95	NS	NS
Potassium-40	0.25	0.068	36.8	NS	NS	NA	30.5	NS	NS	29.0	NS	NS
Thallium-208				NS	NS	NA	--	NS	NS	--	NS	NS
Thorium-234				NS	NS	NA	--	NS	NS	1.28	NS	NS

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-23								
	EPA PRG	EPA PRG	LANL	5-14 cm			27-45 cm			45-58 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	2.3	NS	NS	0.81	NS	NS	3.19
Plutonium-239/240	10	2.5	0.068	NS	NS	218	NS	NS	82.9	NS	NS	393
Uranium-234	69	18	2.59	NS	NS	NA	NS	NS	NA	NS	NS	4.64
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NS	NS	NA	NS	NS	0.22
Uranium-238	73	18	2.29	NS	NS	NA	NS	NS	NA	NS	NS	2.66
Strontium-90	57	14	1.01	NS	NS	NA	NS	NS	NA	NS	NS	46.9
Cesium-137	0.072	0.020	0.9	NS	NS	NA	NS	NS	NA	NS	NS	148
Actinium-228				NS	NS	NA	NS	NS	NA	NS	NS	--
Americium-241	7.5	1.9	0.01	NS	NS	NA	NS	NS	NA	NS	NS	67
Lead-210	3.2	0.78		NS	NS	NA	NS	NS	NA	NS	NS	--
Lead-212				NS	NS	NA	NS	NS	NA	NS	NS	--
Lead-214				NS	NS	NA	NS	NS	NA	NS	NS	--
Potassium-40	0.25	0.068	36.8	NS	NS	NA	NS	NS	NA	NS	NS	--
Thallium-208				NS	NS	NA	NS	NS	NA	NS	NS	--
Thorium-234				NS	NS	NA	NS	NS	NA	NS	NS	--

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-23						Fixed Point Site ACS-24		
				56-68 cm			68-77 cm			26-46 cm		
	EPA PRG Commercial	EPA PRG Residential	LANL Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	4.5	NS	NS	1.58	NS	0.1	NS
Plutonium-239/240	10	2.5	0.068	NS	NS	548	NS	NS	277	NS	92	NS
Uranium-234	69	18	2.59	NS	NS	NA	NS	NS	NA	NS	3.3	NS
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NS	NS	NA	NS	0.26	NS
Uranium-238	73	18	2.29	NS	NS	NA	NS	NS	NA	NS	1.83	NS
Strontium-90	57	14	1.04	NS	NS	NA	NS	NS	NA	NS	0.48	NS
Cesium-137	0.072	0.020	0.9	NS	NS	NA	NS	NS	NA	NS	<0.31	NS
Actinium-228				NS	NS	NA	NS	NS	NA	NS	<1.1	NS
Americium-241	7.5	1.9	0.04	NS	NS	NA	NS	NS	NA	NS	1.3	NS
Lead-210	3.2	0.78		NS	NS	NA	NS	NS	NA	NS	--	NS
Lead-212				NS	NS	NA	NS	NS	NA	NS	1.05	NS
Lead-214				NS	NS	NA	NS	NS	NA	NS	1.28	NS
Potassium-40	0.25	0.068	36.8	NS	NS	NA	NS	NS	NA	NS	--	NS
Thallium-208				NS	NS	NA	NS	NS	NA	NS	<0.28	NS
Thorium-234				NS	NS	NA	NS	NS	NA	NS	--	NS

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-24			Fixed Point Site ACS-30			Fixed Point Site ACS-33		
	EPA PRG	EPA PRG	LANL	12-24 cm			0-14 cm			5-23 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	1.46	NS	NS	0.193	NS	NS	NS	0.445
Plutonium-239/240	10	2.5	0.068	NS	205	NS	NS	68.4	NS	NS	NS	129.7
Uranium-234	69	18	2.59	NS	4.8	NS	NS	2.53	NS	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	0.85	NS	NS	0.127	NS	NS	NS	NA
Uranium-238	73	18	2.29	NS	2.35	NS	NS	1.5	NS	NS	NS	NA
Strontium-90	57	14	1.01	NS	1.04	NS	NS	0.36	NS	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	6.9	NS	NS	0.25	NS	NS	NS	NA
Actinium-228				NS	1.63	NS	NS	<0.67	NS	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	35.8	NS	NS	<0.55	NS	NS	NS	NA
Lead-210	3.2	0.78		NS	--	NS	NS	--	NS	NS	NS	NA
Lead-212				NS	1.71	NS	NS	0.52	NS	NS	NS	NA
Lead-214				NS	1.45	NS	NS	1	NS	NS	NS	NA
Potassium-40	0.25	0.068	36.8	NS	--	NS	NS	--	NS	NS	NS	NA
Thallium-208				NS	0.56	NS	NS	<0.16	NS	NS	NS	NA
Thorium-234				NS	--	NS	NS	--	NS	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-33			Fixed Point Site ACS-35			Fixed Point Site ACS-36		
	EPA PRG	EPA PRG	LANL	40-55 cm			2-10 cm			0-10 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.008	0.12	NS	NS	NS	NS	0.12
Plutonium-239/240	10	2.5	0.068	NS	NS	20.6	27.5	NS	NS	NS	NS	26
Uranium-234	69	18	2.59	NS	NS	NA	NA	NS	NS	NS	NS	1.27
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NA	NS	NS	NS	NS	0.076
Uranium-238	73	18	2.29	NS	NS	NA	NA	NS	NS	NS	NS	1
Strontium-90	57	14	1.04	NS	NS	NA	-0.91	NS	NS	NS	NS	0.38
Cesium-137	0.072	0.020	0.9	NS	NS	NA	0.079	NS	NS	NS	NS	0.12
Actinium-228				NS	NS	NA	--	NS	NS	NS	NS	--
Americium-241	7.5	1.9	0.04	NS	NS	NA	0.19	NS	NS	NS	NS	0.67
Lead-210	3.2	0.78		NS	NS	NA	1.55	NS	NS	NS	NS	--
Lead-212				NS	NS	NA	0.67	NS	NS	NS	NS	--
Lead-214				NS	NS	NA	0.53	NS	NS	NS	NS	--
Potassium-40	0.25	0.068	36.8	NS	NS	NA	28.3	NS	NS	NS	NS	--
Thallium-208				NS	NS	NA	--	NS	NS	NS	NS	--
Thorium-234				NS	NS	NA	--	NS	NS	NS	NS	--

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-37						Fixed Point Site ACS-46		
	EPA PRG	EPA PRG	LANL	5-35 cm			42-61 cm			0-20 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.114	NS	NS	0.009	NS	NS	0.124
Plutonium-239/240	10	2.5	0.068	NS	NS	23.9	NS	NS	9.51	NS	NS	17.4
Uranium-234	69	18	2.59	NS	NS	NA	NS	NS	NA	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NS	NS	NA	NS	NS	NA
Uranium-238	73	18	2.29	NS	NS	NA	NS	NS	NA	NS	NS	NA
Strontium-90	57	14	1.04	NS	NS	NA	NS	NS	NA	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	NS	NA	NS	NS	NA	NS	NS	NA
Actinium-228				NS	NS	NA	NS	NS	NA	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	NS	NA	NS	NS	NA	NS	NS	NA
Lead-210	3.2	0.78		NS	NS	NA	NS	NS	NA	NS	NS	NA
Lead-212				NS	NS	NA	NS	NS	NA	NS	NS	NA
Lead-214				NS	NS	NA	NS	NS	NA	NS	NS	NA
Potassium-40	0.25	0.068	36.8	NS	NS	NA	NS	NS	NA	NS	NS	NA
Thallium-208				NS	NS	NA	NS	NS	NA	NS	NS	NA
Thorium-234				NS	NS	NA	NS	NS	NA	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-46			Fixed Point Site ACS-47					
	EPA PRG	EPA PRG	LANL	20-33 cm			0-10 cm			14-29 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	0.183	NS	NS	2	NS	NS	37.3
Plutonium-239/240	10	2.5	0.068	NS	NS	46.1	NS	NS	1002	NS	NS	7780
Uranium-234	69	18	2.59	NS	NS	NA	NS	NS	NA	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NS	NS	NA	NS	NS	NA
Uranium-238	73	18	2.29	NS	NS	NA	NS	NS	NA	NS	NS	NA
Strontium-90	57	14	1.04	NS	NS	NA	NS	NS	NA	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	NS	NA	NS	NS	NA	NS	NS	NA
Actinium-228				NS	NS	NA	NS	NS	NA	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	NS	NA	NS	NS	NA	NS	NS	NA
Lead-210	3.2	0.78		NS	NS	NA	NS	NS	NA	NS	NS	NA
Lead-212				NS	NS	NA	NS	NS	NA	NS	NS	NA
Lead-214				NS	NS	NA	NS	NS	NA	NS	NS	NA
Potassium-40	0.25	0.068	36.8	NS	NS	NA	NS	NS	NA	NS	NS	NA
Thallium-208				NS	NS	NA	NS	NS	NA	NS	NS	NA
Thorium-234				NS	NS	NA	NS	NS	NA	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-47								
	EPA PRG	EPA PRG	LANL	29-39 cm			39-49 cm			58-86 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	NS	NS	4.5	NS	NS	17.8	NS	NS	0.91
Plutonium-239/240	10	2.5	0.068	NS	NS	1660	NS	NS	6780	NS	NS	231
Uranium-234	69	18	2.59	NS	NS	NA	NS	NS	21.5	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NS	NS	NA	NS	NS	2	NS	NS	NA
Uranium-238	73	18	2.29	NS	NS	NA	NS	NS	16.6	NS	NS	NA
Strontium-90	57	14	1.04	NS	NS	NA	NS	NS	80	NS	NS	NA
Cesium-137	0.072	0.020	0.9	NS	NS	NA	NS	NS	-0.007	NS	NS	NA
Actinium-228				NS	NS	NA	NS	NS	--	NS	NS	NA
Americium-241	7.5	1.9	0.04	NS	NS	NA	NS	NS	64	NS	NS	NA
Lead-210	3.2	0.78		NS	NS	NA	NS	NS	--	NS	NS	NA
Lead-212				NS	NS	NA	NS	NS	--	NS	NS	NA
Lead-214				NS	NS	NA	NS	NS	--	NS	NS	NA
Potassium-40	0.25	0.063	36.8	NS	NS	NA	NS	NS	--	NS	NS	NA
Thallium-208				NS	NS	NA	NS	NS	--	NS	NS	NA
Thorium-234				NS	NS	NA	NS	NS	--	NS	NS	NA

Acid Canyon Sediment Samples Comparison Summary - Radionuclides (continued)

Radionuclide	Sample Location and Depth											
	Reference			Acid Canyon								
				Fixed Point Site ACS-48			Trail - East of ACS-12			Trail - West of ACS-11		
	EPA PRG	EPA PRG	LANL	0-12 cm			0-0.5 cm			0-0.5 cm		
	Commercial	Residential	Background	EPA	NMED	LANL	EPA	NMED	LANL	EPA	NMED	LANL
Plutonium-238	11	2.7	0.006	1.02	NS	NS	NS	NS	-0.007	NS	NS	0.013
Plutonium-239/240	10	2.5	0.068	184	NS	NS	NS	NS	0.123	NS	NS	0.096
Uranium-234	69	18	2.59	NA	NS	NS	NS	NS	NA	NS	NS	NA
Uranium-235	0.57	0.16	0.20	NA	NS	NS	NS	NS	NA	NS	NS	NA
Uranium-238	73	18	2.29	NA	NS	NS	NS	NS	NA	NS	NS	NA
Strontium-90	57	14	1.04	2.12	NS	NS	NS	NS	NA	NS	NS	NA
Cesium-137	0.072	0.020	0.9	0.93	NS	NS	NS	NS	NA	NS	NS	NA
Actinium-228				--	NS	NS	NS	NS	NA	NS	NS	NA
Americium-241	7.5	1.9	0.04	3.70	NS	NS	NS	NS	NA	NS	NS	NA
Lead-210	3.2	0.78		2.4	NS	NS	NS	NS	NA	NS	NS	NA
Lead-212				1.09	NS	NS	NS	NS	NA	NS	NS	NA
Lead-214				0.95	NS	NS	NS	NS	NA	NS	NS	NA
Potassium-40	0.25	0.068	36.8	26.0	NS	NS	NS	NS	NA	NS	NS	NA
Thallium-208				--	NS	NS	NS	NS	NA	NS	NS	NA
Thorium-234				--	NS	NS	NS	NS	NA	NS	NS	NA

* All results reported in pico Curies per gram (pCi/g)
a Preliminary Remediation Goals
NA Not Analyzed
NS Not Sampled
-- Radionuclide not detected

APPENDIX F

Analytical Data

VOC Data

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A / Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

January 24, 2000

CLIENT: TECHLAW

SDG NO.: 41536

VOLATILE FRACTION

Five water samples plus MS/MSD were submitted for Volatile Organic Analysis. The samples were analyzed by GC/MS following Method SW846-8260B.

No major problems occurred during the analyses of these samples. Sample SM-30 DISS was run diluted based on a screen analysis which is submitted in the screen data section. The sample required still further dilution to achieve linearity. Both sets of data are submitted. The 4-methyl-2-pentanone in the 250UL run was carryover from a previous run as confirmed by the screen analysis and the MS/MSD. .

Blanks: VBLK1 contained low level 4-methyl-2-pentanone less than five times the PQL.

Surrogates: Sample SD-30 contained surrogates outside QC recovery limits. The diluted reanalysis contained surrogates within limits. Both sets of data are submitted.

Laboratory Control Spikes: LCS1, LCS2, LCSD2 and LCS3 each contained one compound outside QC recovery limits (high). LCSD2 contained three compounds outside QC recovery limits (two high / one low).

Internal Standards: No problems.

Matrix Spikes: Sample SM-30 DISSMS contained four compounds and SW-30 DISSMSD contained three compounds outside QC recovery limits (analytical batch K991222A). Four compounds exceeded their RPD limits for that sample. Analytical batch L991230A contained an MS/MSD from SWLO episode 41531. Analytical batch N991229A contained an MS/MSD from SWLO episode 41524.

Harry M. Berg
Organic Program Manager

January 24, 2000

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PM-2

Lab Name: SWL-TULSA Contract: LA PHASE 2

Lab Code: SWOK Case No.: TECHLAW SAS No.: SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.07

Sample wt/vol: 5 (g/mL) ML Lab File ID: K30658.D

Level: (low/med) LOW Date Received: 12/18/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	6	
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	4	J
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	26	B
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U

FORM I VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PM-5

Lab Name: SWL-TULSA Contract: LA PHASE 2

Lab Code: SWOK Case No.: TECHLAW SAS No.: SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.08

Sample wt/vol: 5 (g/mL) ML Lab File ID: K30659.D

Level: (low/med) LOW Date Received: 12/18/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	3	J
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	24	B
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	3	J
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U

FORM I VOA

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SD-30

Lab Name: SWL-TULSA Contract: LA PHASE 2

Lab Code: SWOK Case No.: TECHLAW SAS No.: SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.06

Sample wt/vol: 5 (g/mL) ML Lab File ID: K30657.D

Level: (low/med) LOW Date Received: 12/16/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 20.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	100	U
75-01-4	Vinyl Chloride	100	U
74-83-9	Bromomethane	100	U
75-00-3	Chloroethane	100	U
75-35-4	1,1-Dichloroethene	510	
67-64-1	Acetone	100	U
75-15-0	Carbon Disulfide	100	U
75-09-2	Methylene Chloride	100	U
75-34-3	1,1-Dichloroethane	340	
540-59-0	1,2-Dichloroethene (total)	120	
78-93-3	2-Butanone	100	U
67-66-3	Chloroform	47	J
71-55-6	1,1,1-Trichloroethane	22000	E
56-23-5	Carbon Tetrachloride	100	U
71-43-2	Benzene	100	U
107-06-2	1,2-Dichloroethane	200	
79-01-6	Trichloroethene	310	
78-87-5	1,2-Dichloropropane	100	U
75-27-4	Bromodichloromethane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
108-10-1	4-Methyl-2-Pentanone	100	U
108-88-3	Toluene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
79-00-5	1,1,2-Trichloroethane	100	U
127-18-4	Tetrachloroethene	50	J
591-78-6	2-Hexanone	100	U
124-48-1	Dibromochloromethane	100	U
108-90-7	Chlorobenzene	100	U
100-41-4	Ethylbenzene	100	U
1330-20-7	Xylene (total)	100	U
100-42-5	Styrene	100	U
75-25-2	Bromoform	100	U
79-34-5	1,1,2,2-Tetrachloroethane	100	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SD-30DL

Lab Name: SWL-TULSA Contract: LA PHASE 2

Lab Code: SWOK Case No.: TECHLAW SAS No.: SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.06DL

Sample wt/vol: 5 (g/mL) ML Lab File ID: L41871.D

Level: (low/med) LOW Date Received: 12/18/99

% Moisture: not dec. _____ Date Analyzed: 12/30/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 200.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1000	U
75-01-4	Vinyl Chloride	1000	U
74-83-9	Bromomethane	1000	U
75-00-3	Chloroethane	1000	U
75-35-4	1,1-Dichloroethene	1000	U
67-64-1	Acetone	1000	U
75-15-0	Carbon Disulfide	1000	U
75-09-2	Methylene Chloride	1000	U
75-34-3	1,1-Dichloroethane	1000	U
540-59-0	1,2-Dichloroethene (total)	1000	U
78-93-3	2-Butanone	1000	U
67-66-3	Chloroform	1000	U
71-55-6	1,1,1-Trichloroethane	7400	D
56-23-5	Carbon Tetrachloride	1000	U
71-43-2	Benzene	1000	U
107-06-2	1,2-Dichloroethane	1000	U
79-01-6	Trichloroethene	1000	U
78-87-5	1,2-Dichloropropane	1000	U
75-27-4	Bromodichloromethane	1000	U
10061-01-5	cis-1,3-Dichloropropene	1000	U
108-10-1	4-Methyl-2-Pentanone	1000	U
108-88-3	Toluene	1000	U
10061-02-6	trans-1,3-Dichloropropene	1000	U
79-00-5	1,1,2-Trichloroethane	1000	U
127-18-4	Tetrachloroethene	1000	U
591-78-6	2-Hexanone	1000	U
124-48-1	Dibromochloromethane	1000	U
108-90-7	Chlorobenzene	1000	U
100-41-4	Ethylbenzene	1000	U
1330-20-7	Xylene (total)	1000	U
100-42-5	Styrene	1000	U
75-25-2	Bromoform	1000	U
79-34-5	1,1,2,2-Tetrachloroethane	1000	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SM-30 DISS

Lab Name: SWL-TULSA Contract: LA PHASE 2

Lab Code: SWOK Case No.: TECHLAW SAS No.: SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.03

Sample wt/vol: 5 (g/mL) ML Lab File ID: K30645.D

Level: (low/med) LOW Date Received: 12/18/99

% Moisture: not dec. _____ Date Analyzed: 12/22/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 20.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	100	U
75-01-4	Vinyl Chloride	100	U
74-83-9	Bromomethane	100	U
75-00-3	Chloroethane	100	U
75-35-4	1,1-Dichloroethene	100	U
67-64-1	Acetone	100	U
75-15-0	Carbon Disulfide	100	U
75-09-2	Methylene Chloride	100	U
75-34-3	1,1-Dichloroethane	100	U
540-59-0	1,2-Dichloroethene (total)	110	
78-93-3	2-Butanone	100	U
67-66-3	Chloroform	100	U
71-55-6	1,1,1-Trichloroethane	1200	
56-23-5	Carbon Tetrachloride	100	U
71-43-2	Benzene	100	U
107-06-2	1,2-Dichloroethane	100	U
79-01-6	Trichloroethene	82	J
78-87-5	1,2-Dichloropropane	100	U
75-27-4	Bromodichloromethane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
108-10-1	4-Methyl-2-Pentanone	93000	BE
108-88-3	Toluene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
79-00-5	1,1,2-Trichloroethane	100	U
127-18-4	Tetrachloroethene	100	U
591-78-6	2-Hexanone	100	U
124-48-1	Dibromochloromethane	100	U
108-90-7	Chlorobenzene	100	U
100-41-4	Ethylbenzene	100	U
1330-20-7	Xylene (total)	100	U
100-42-5	Styrene	480	
75-25-2	Bromoform	100	U
79-34-5	1,1,2,2-Tetrachloroethane	100	U

LA

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIP BLANK

Lab Name: SWL-TULSA Contract: LA PHASE 2

Lab Code: SWOK Case No.: TECHLAW SAS No.: SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.09

Sample wt/vol: 5 (g/mL) ML Lab File ID: N37810.D

Level: (low/med) LOW Date Received: 12/18/99

% Moisture: not dec. _____ Date Analyzed: 12/29/99

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-Pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U

FORM I VOA

Inorganic Data

UNH • 966070 • 6SN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2590

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41411
SDG: 41411A

DATE: January 14, 2000
SOW NO.: SW846
EPISODE NO.: 41411

INORGANIC METAL FRACTION:

Eleven soil samples plus one MS/MSD were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, & 6010B
SWL-IN-207	SW846 7470A & 7471A

Uranium was left out of the spiking solution in the initial ICP prep. Therefore the samples were re-prepped and re-analyzed for Uranium. The run analysis QC failed for selenium in the initial ICP analysis. Therefore selenium was re-analyzed. The re-analysis data for each is the data reported on the Forms.

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Se, As, Cd, Co, Pb, Ag, Tl, & Sb. No action required.

Linearity near the CRDL (CRA & CRI): The CRI standard was outside of our in-house warning limits of 70 - 130%R for the following elements: Co & Se. No action required.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Cd, Ag, Tl, & Zn. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): The following element was outside the control limits of 75-125% recovery: Sb. All associated samples were flagged with a "N" on Form I's. No action required.

Duplicates (LCSD and MSD): No problems.

Serial Dilution (ICP): The serial dilution was outside the control limits of 10% for the following elements: Ag. All associated samples were flagged with an "E" on Form I's. No action required.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman
Inorganic Program Manager

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___

Lab Code: SWOK__ Case No.: 41411 SAS No.: _____ SDG No.: 41411A

SOW No.: SW846__

Client Sample ID	Lab Sample ID
_ASC-11-1_____	_41411.05_____
_ASC-11-2_____	_41411.06_____
_ASC-18-1_____	_41411.02_____
_ASC-18-2_____	_41411.03_____
_ASC-18-3_____	_41411.04_____
_ASC-3-1_____	_41411.08_____
_ASC-3-2_____	_41411.09_____
_ASC-3-3_____	_41411.10_____
_ASC-3-4_____	_41411.11_____
_ASC-35-0_____	_41411.01_____
_ASC-48-0_____	_41411.07_____
_ASC-48-0S_____	_41411.12S_____
_ASC-48-0M_____	_41411.14SD_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:
____BATCH_ID#S=_ICP=99121114__ICP=99121115__AV=991215HG5_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Deborah J. Inman Susan S. Turner for...

Date: January 12, 2000 Title: Inorganic Program Manager

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-12-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411A
Matrix (soil/water): SOIL Lab Sample ID: 41411.05
Level (low/med): LOW Date Received: 12/10/99
% Solids: 95.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.27	U	N	P
7440-38-2	Arsenic	2.0			P
7440-39-3	Barium	40.2			P
7440-41-7	Beryllium	0.65			P
7440-43-9	Cadmium	0.3			P
7440-48-4	Cobalt	2.7	B		P
7440-50-8	Copper	11.6			P
7439-92-1	Lead	37.7			P
7439-97-6	Mercury	0.67			CV
7440-02-0	Nickel	7.4			P
7782-49-2	Selenium	0.36	B		P
7440-22-4	Silver	0.80	B	E	P
7440-28-0	Thallium	0.34	U		P
7440-62-2	Vanadium	6.7			P
7440-66-6	Zinc	31.6			P
7440-61-1	Uranium	2.2	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

CLIENT SAMPLE ID

ASC-12-2

INORGANIC ANALYSES DATA SHEET

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411A
Matrix (soil/water): SOIL Lab Sample ID: 41411.06
Level (low/med): LOW Date Received: 12/10/99
% Solids: 86.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.31	U	N	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	21.4			P
7440-41-7	Beryllium	0.73			P
7440-43-9	Cadmium	1.2			P
7440-48-4	Cobalt	1.2	B		P
7440-50-8	Copper	18.1			P
7439-92-1	Lead	56.0			P
7439-97-6	Mercury	1.2			CV
7440-02-0	Nickel	13.8			P
7782-49-2	Selenium	0.70			P
7440-22-4	Silver	3.9		E	P
7440-28-0	Thallium	0.62	B		P
7440-62-2	Vanadium	10.9			P
7440-66-6	Zinc	55.6			P
7440-61-1	Uranium	6.4			P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-18-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411A
Matrix (soil/water): SOIL Lab Sample ID: 41411.02
Level (low/med): LOW Date Received: 12/10/99
% Solids: 82.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.22	U	N	P
7440-38-2	Arsenic	2.2			P
7440-39-3	Barium	36.2			P
7440-41-7	Beryllium	0.60			P
7440-43-9	Cadmium	1.1			P
7440-48-4	Cobalt	1.4	B		P
7440-50-8	Copper	8.0			P
7439-92-1	Lead	17.1			P
7439-97-6	Mercury	0.48			CV
7440-02-0	Nickel	8.3			P
7782-49-2	Selenium	0.48	B		P
7440-22-4	Silver	0.13	UB	S	P
7440-28-0	Thallium	0.40	U		P
7440-62-2	Vanadium	6.9			P
7440-66-6	Zinc	49.5			P
7440-61-1	Uranium	3.0	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

1 2

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-18-2

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41411 SAS No.: _____ SDG No.: 41411A
Matrix (soil/water): SOIL_ Lab Sample ID: 41411.03
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: _74.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.35	U	N	P
7440-38-2	Arsenic__	3.1	_		P
7440-39-3	Barium___	43.3	_		P
7440-41-7	Beryllium	0.67	_		P
7440-43-9	Cadmium__	0.2	_		P
7440-48-4	Cobalt___	1.9	B		P
7440-50-8	Copper___	10.4	_		P
7439-92-1	Lead____	46.1	_		P
7439-97-6	Mercury__	0.32	_		CV
7440-02-0	Nickel___	8.0	_		P
7782-49-2	Selenium_	0.55	B		P
7440-22-4	Silver___	1.3	_	E	P
7440-28-0	Thallium_	0.44	U		P
7440-62-2	Vanadium_	9.4	_		P
7440-66-6	Zinc____	46.7	_		P
7440-61-1	Uranium__	1.3	U		P
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		
			_		

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-18-3

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411A
Matrix (soil/water): SOIL Lab Sample ID: 41411.04
Level (low/med): LOW Date Received: 12/10/99
% Solids: 83.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.31	U	N	P
7440-38-2	Arsenic	2.3			P
7440-39-3	Barium	31.9			P
7440-41-7	Beryllium	0.63			P
7440-43-9	Cadmium	1.2			P
7440-48-4	Cobalt	1.7	B		P
7440-50-8	Copper	9.7			P
7439-92-1	Lead	20.0			P
7439-97-6	Mercury	0.57			CV
7440-02-0	Nickel	8.0			P
7782-49-2	Selenium	0.45	B		P
7440-22-4	Silver	0.61	B	E	P
7440-28-0	Thallium	0.39	U		P
7440-62-2	Vanadium	8.0			P
7440-66-6	Zinc	32.7			P
7440-61-1	Uranium	3.8	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-3-1

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41411 SAS No.: _____ SDG No.: 41411A
Matrix (soil/water): SOIL_ Lab Sample ID: 41411.08
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: _93.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.19	U	N	P
7440-38-2	Arsenic	[illegible]	-		P
7440-39-3	Barium	[illegible]	-		P
7440-41-7	Beryllium	0.[illegible]	-		P
7440-43-9	Cadmium	0.[illegible]	-		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	[illegible]	B		P
7439-92-1	Lead	[illegible]	-		P
7439-97-6	Mercury	0.[illegible]	-		CV
7440-02-0	Nickel	[illegible]	-		P
7782-49-2	Selenium	0.[illegible]	B		P
7440-22-4	Silver	0.[illegible]	U	S	P
7440-28-0	Thallium	0.37	U		P
7440-62-2	Vanadium	6.0	-		P
7440-66-6	Zinc	[illegible]	-		P
7440-61-1	Uranium	[illegible]	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

CLIENT SAMPLE ID 10

INORGANIC ANALYSES DATA SHEET

ASC-3-2

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41411 SAS No.: _____ SDG No.: 41411X
Matrix (soil/water): SOIL_ Lab Sample ID: 41411.09
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: _94.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.18	U	N	P
7440-38-2	Arsenic___	2.0	-		P
7440-39-3	Barium___	49.5	-		P
7440-41-7	Beryllium	0.56	-		P
7440-43-9	Cadmium___	0.42	-		P
7440-48-4	Cobalt___	1.5	B		P
7440-50-8	Copper___	1.6	B		P
7439-92-1	Lead_____	9.0			P
7439-97-6	Mercury___	0.03	U		CV
7440-02-0	Nickel___	3.7			P
7782-49-2	Selenium_	0.46	U		P
7440-22-4	Silver___	0.23	U	E	P
7440-28-0	Thallium_	0.35	U		P
7440-62-2	Vanadium_	5.3	-		P
7440-66-6	Zinc_____	34.2	-		P
7440-61-1	Uranium__	1.0	U		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

1 2

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID 11

ASC-3-3

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41411 SAS No.: _____ SDG No.: 41411A
Matrix (soil/water): SOIL_ Lab Sample ID: 41411.10
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: _94.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.29	U	N	P
7440-38-2	Arsenic	2.5			P
7440-39-3	Barium	38.9			P
7440-41-7	Beryllium	0.84			P
7440-43-9	Cadmium	2.5			P
7440-48-4	Cobalt	1.2			P
7440-50-8	Copper	11.6			P
7439-92-1	Lead	98.2			P
7439-97-6	Mercury	0.82			CV
7440-02-0	Nickel	11.5			P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	2.5		E	P
7440-28-0	Thallium	0.87	U		P
7440-62-2	Vanadium	8.8			P
7440-66-6	Zinc	30.0			P
7440-61-1	Uranium	1.0	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-3-4

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411A
Matrix (soil/water): SOIL Lab Sample ID: 41411.11
Level (low/med): LOW Date Received: 12/10/99
% Solids: 88.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.31	U	N	P
7440-38-2	Arsenic	3.0			P
7440-39-3	Barium	36.4			P
7440-41-7	Beryllium	0.3			P
7440-43-9	Cadmium	10.5			P
7440-48-4	Cobalt	5.3			P
7440-50-8	Copper	61.0			P
7439-92-1	Lead	42.3			P
7439-97-6	Mercury	0.2			CV
7440-02-0	Nickel	14.4			P
7782-49-2	Selenium	0.43	B		P
7440-22-4	Silver	8.3		E	P
7440-28-0	Thallium	0.83	B		P
7440-62-2	Vanadium	9.9			P
7440-66-6	Zinc	30.5			P
7440-61-1	Uranium	3.4	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID: ASC-35-0

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411A
Matrix (soil/water): SOIL Lab Sample ID: 41411.01
Level (low/med): LOW Date Received: 12/10/99
% Solids: 80.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.31	B	N	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	17.4			P
7440-41-7	Beryllium	0.45	B		P
7440-43-9	Cadmium	0.39			P
7440-48-4	Cobalt	0.98	B		P
7440-50-8	Copper	29.6			P
7439-92-1	Lead	38.4			P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	3.8			P
7782-49-2	Selenium	0.57	B		P
7440-22-4	Silver	0.14	U	S	P
7440-28-0	Thallium	0.40	U		P
7440-62-2	Vanadium	5.2			P
7440-66-6	Zinc	54.8			P
7440-61-1	Uranium	1.2	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID: ASC-48-0

Lab Name: SOUTHWEST_LAB_OF_OK Contract: TBCLAW
Lab Code: SWOK Case No.: 41411 SAS No.: SDG No.: 41411X
Matrix (soil/water): SOIL Lab Sample ID: 41411.07
Level (low/med): LOW Date Received: 12/10/99
% Solids: 87.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.31	U	N	P
7440-38-2	Arsenic	1.9			P
7440-39-3	Barium	36.5			P
7440-41-7	Beryllium	0.48	B		P
7440-43-9	Cadmium	0.55			P
7440-48-4	Cobalt	1.4	B		P
7440-50-8	Copper	4.9	B		P
7439-92-1	Lead	5.1			P
7439-97-6	Mercury	0.11			CV
7440-02-0	Nickel	3.1			P
7782-49-2	Selenium	0.41	B		P
7440-22-4	Silver	0.22	B	E	P
7440-28-0	Thallium	0.39	U		P
7440-62-2	Vanadium	6.1			P
7440-66-6	Zinc	38.1			P
7440-61-1	Uranium	1.6	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2500

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41536
SDG: 41536

DATE: January 26, 2000
SOW NO.: SW846
EPISODE NO.: 41536

INORGANIC METAL FRACTION:

Two dissolved and two total water samples were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. Please see the DC-1 (Sample Log-in Sheet) for sample conditions and cooler temperatures at receipt. The sample's analysis was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, & 6010B
SWL-IN-207	SW846 7470A & 7471A

The samples were filtered before analysis. Since digestion was not required for these samples, a prep blank and lab controls do not apply. The run QC appears on the forms. A Form XIII is in the package in order to enable our software generating program to record the results on the forms.

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Cd, Ni, Se, U, Cu, Mg.

No action required.

Linearity near the CRDL (CRA & CRI): No problems.

Preparation Blanks: The following element showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Cu. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): (Dissolved metals) The following elements were outside the control limits of 75-125% recovery: Fe & Al. All associated samples were flagged with a "N" on Form I's. No action required.

Duplicates (LCSD and MSD): No problems.

Serial Dilution (ICP): The serial dilution was outside the control limits of 10% for the following elements: Mg. All associated samples were flagged with an "E" on Form I's. No action required.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman
Inorganic Program Manager

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

AC-ES

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAN___
Lab Code: SWOK__ Case No.: 41536 SAS No.: _____ SDG No.: 41536_
Matrix (soil/water): WATER Lab Sample ID: 41536.02
Level (low/med): LOW__ Date Received: 12/18/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_	3.0	B		P
7440-38-2	Arsenic__	3.3	B		P
7440-39-3	Barium___	0.93	B		P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium__	0.33	B		P
7440-70-2	Calcium__				NR
7440-48-4	Cobalt___				P
7440-50-8	Copper___	26.1	B		P
7439-89-6	Iron_____				NR
7439-92-1	Lead_____	2.1	U		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury__	0.10	B		CV
7440-02-0	Nickel___	3.0	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium_	2.9	U		P
7440-22-4	Silver___	2.0	U		P
7440-23-5	Sodium___				NR
7440-28-0	Thallium_	2.3	U		P
7440-62-2	Vanadium_	0.90	U		P
7440-66-6	Zinc_____	38.5			P
7732-18-5	Silicon__				NR
7440-61-1	Uranium__	20.5	U		P
7440-24-6_	Strontium				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-EB

Lab Name: SOUTHWEST LAB OF OK Contract: TECLAW
Lab Code: SWOK Case No.: 41536 SAS No.: SDG No.: 41536
Matrix (soil/water): WATER Lab Sample ID: 41536.01
Level (low/med): LOW Date Received: 12/18/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	3.0	UCD		P
7440-38-2	Arsenic	3.1	UCD		P
7440-39-3	Barium	0.46	B		P
7440-41-7	Beryllium	0.20	UCD		P
7440-43-9	Cadmium	0.20	UCD		P
7440-70-2	Calcium				NR
7440-48-4	Cobalt	2.1	UCD		P
7440-50-8	Copper	10	B		P
7439-89-6	Iron				NR
7439-92-1	Lead	2.1	CD		P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10	UCD		CV
7440-02-0	Nickel	1.6	B		P
7440-09-7	Potassium				NR
7782-49-2	Selenium	2.5	UCD		P
7440-22-4	Silver	2.0	UCD		P
7440-23-5	Sodium				NR
7440-28-0	Thallium	2.1	UCD		P
7440-62-2	Vanadium	0.90			P
7440-66-6	Zinc	18.0	B		P
7782-49-5	Silicon				NR
7440-61-1	Uranium	10.5	CD		P
7440-24-6	Strontium				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE 006

SD-30

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41536 SAS No.: SDG No.: 41536
Matrix (soil/water): WATER Lab Sample ID: 41536.06
Level (low/med): LOW Date Received: 12/18/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	926		N	P
7440-36-0	Antimony				N
7440-38-2	Arsenic				N
7440-39-3	Barium				N
7440-41-7	Beryllium				N
7440-43-9	Cadmium				N
7440-70-2	Calcium	9350			P
7440-48-4	Cobalt				N
7440-50-8	Copper				N
7439-89-6	Iron	437		N	P
7439-92-1	Lead				N
7439-95-4	Magnesium	1400		B	P
7439-96-5	Manganese	5.2	B		P
7439-97-6	Mercury				N
7440-02-0	Nickel				N
7440-09-7	Potassium	1560	B		P
7782-49-2	Selenium				N
7440-22-4	Silver				N
7440-23-5	Sodium	16700			P
7440-28-0	Thallium				N
7440-62-2	Vanadium				N
7440-66-6	Zinc				N
7732-18-5	Silicon	7680			P
7440-61-1	Uranium				N
7440-24-6	Strontium	34.9			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SM-30 DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41536 SAS No.: SDG No.: 41536
Matrix (soil/water): WATER Lab Sample ID: 41536.03
Level (low/med): LOW Date Received: 12/28/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	494		N	P
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium	9260			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	177		N	P
7439-92-1	Lead				NR
7439-95-4	Magnesium	1130		E	P
7439-96-5	Manganese	4.6	B		P
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium	1500	B		P
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium	16900			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
7732-18-5	Silicon	6800			P
7440-61-1	Uranium				NR
7440-24-6	Strontium	54.7			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2358 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41411
SDG: 41411B

DATE: January 21, 2000
SOW NO.: SW846
EPISODE NO.: 41411

INORGANIC METAL FRACTION:

One water sample was submitted for ICP and Hg analysis. No major problems occurred during the digestion or analysis of this sample. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, 6010B
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Sb, As, Cr, Tl, U // No action required.

Linearity near the CRDL (CRA & CRI): The CRI standard was outside of our in-house warning limits of 70 - 130%R for the following elements: Hg, Sb, Be, Ag, Ba // No action required.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blanks: Cr, Cu, Zn // No action required. The Preparation Blank read above the CRDL for Pb: there was no further action required for the sample since the Pb level was nondetected. The results from the original digestion are reported on the Form 1 for this sample.

Lab Control Spikes: No problems.

Matrix Spike(s) (and MSD): No problems.

Duplicate(s) (LCSD and MSD): No problems.

Serial Dilution (ICP): No problems.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

- SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___

Lab Code: SWOK__ Case No.: 41411 SAS No.: _____ SDG No.:414113

SOW No.: SW846__

Client Sample ID	Lab Sample ID
_ASC-EB_____	_41411.11_____
_ASC-EBS_____	_41411.11S_____
_ASC-EBSD_____	_41411.11SD_____

Were ICP interelement corrections applied ? Yes/No NO_

Were ICP background corrections applied ? Yes/No NO_
If yes - were raw data generated before application of background corrections ? Yes/No

Comments:
____BATCH_ID_#'S:__P=00011324,_00011924_____
_____AV=991213HG2_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Deborah J. Inman Susan S. Turner for...

Date: _____ Title: Inorganic Program Manager__

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

ASC-EB

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41411 SAS No.: _____ SDG No.: 414115
Matrix (soil/water): WATER Lab Sample ID: 41411.12
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	5.0	U		P
7440-38-2	Arsenic__	3.2	U		P
7440-39-3	Barium___	0.40	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium__	0.20	U		P
7440-47-3	Chromium_	0.50	U		P
7440-48-4	Cobalt___	1.0	U		P
7440-50-8	Copper___	1.0	U		P
7439-92-1	Lead____	2.1	U		P
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	0.80	U		P
7782-49-2	Selenium_	2.9	U		P
7440-22-4	Silver___	2.0	U		P
7440-28-0	Thallium_	2.3	U		P
7440-62-2	Vanadium_	0.90	U		P
7440-66-6	Zinc____	4.2	U		P
7440-62-2	Uranium__	10.5	U		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41450
SDG: 41450

DATE: January 14, 2000
SOW NO.: SW846
EPISODE NO.: 41450

INORGANIC METAL FRACTION:

Four total and five dissolved samples plus two MS/MSD's were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, & 6010B
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Sb, Hg, Mg, Ni, & Cu. No action required.

Linearity near the CRDL (CRA & CRI): No problems.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Cu. No action required.

Lab Control Spikes: No problems.

Matrix Spikes (and MSD): No problems.

Duplicates (LCSD and MSD): No problems.

Serial Dilution (ICP): The serial dilution was outside the control limits of 10% for the following elements: Dissolved metals- Mn, total metals- Zn. All associated samples were flagged with an "E" on Form I's. No action required.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman
Inorganic Program Manager

CLIENT SAMPLE ID 3

INORGANIC ANALYSES DATA SHEET

GS-1

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___ SDG No.: 41450_
Lab Code: SWOK__ Case No.: 41450 SAS No.: _____
Matrix (soil/water): WATER Lab Sample ID: 41450.07
Level (low/med): LOW__ Date Received: 12/24/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				P
7440-36-0	Antimony_	5.0	U		P
7440-38-2	Arsenic__	5.0	U		P
7440-39-3	Barium___	28.0			P
7440-41-7	Beryllium	0.30			P
7440-43-9	Cadmium__	0.90	B		P
7440-70-2	Calcium__				P
7440-48-4	Cobalt___	1.0	U		P
7440-50-8	Copper___	19.0	B		P
7439-89-6	Iron_____				P
7439-92-1	Lead_____	1.0	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese				P
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	34.0			P
7440-09-7	Potassium				P
7782-49-2	Selenium_	2.0	U		P
7440-22-4	Silver___	1.0	U		P
7440-23-5	Sodium___				P
7440-28-0	Thallium_	2.0	U		P
7440-62-2	Vanadium_	2.5	B		P
7440-66-6	Zinc_____	273		E	P
7782-18-5	Silicon__				P
7440-24-6	Strontium				P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
CLIENT_ID#-GS-1_____

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

GS-1 DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41450 SAS No.: SDG No.: 41450
Matrix (soil/water): WATER Lab Sample ID: 41450.08
Level (low/med): LOW Date Received: 12/14/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14.1	U		P
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium	22100			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	14.1	U		P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3440			P
7439-96-5	Manganese	12.1		E	P
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium	5110			P
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium	45700			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
7782-18-5	Silicon	22400			P
7440-24-6	Strontium	85.9			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CLIENT ID#=GS-1 DISS

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-F3

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41450 SAS No.: SDG No.: 41450
Matrix (soil/water): WATER Lab Sample ID: 41450.05
Level (low/med): LOW Date Received: 12/14/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony	[illegible]	U		P
7440-38-2	Arsenic	[illegible]	U		P
7440-39-3	Barium	0.40			P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium				P
7440-48-4	Cobalt	[illegible]	U		P
7440-50-8	Copper	[illegible]	U		P
7439-89-6	Iron				P
7439-92-1	Lead	[illegible]	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese				P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	0.60	U		P
7440-09-7	Potassium				P
7782-49-2	Selenium	[illegible]	U		P
7440-22-4	Silver	[illegible]	U		P
7440-23-5	Sodium				P
7440-28-0	Thallium	[illegible]	U		P
7440-62-2	Vanadium	0.90	U		P
7440-66-6	Zinc	8.1	B	E	P
7732-18-5	Silicon				P
7440-24-6	Strontium				P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
CLIENT ID#=MCO-F3

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-FB DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41450 SAS No.: _____ SDG No.: 41450_
Matrix (soil/water): WATER Lab Sample ID: 41450.06
Level (low/med): LOW_ Date Received: 12/14/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	14.1	U		P
7440-36-0	Antimony_				NR
7440-38-2	Arsenic___				NR
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium___				NR
7440-70-2	Calcium___	337	B		P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____	14.1	U		P
7439-92-1	Lead_____				NR
7439-95-4	Magnesium	72.5	B		P
7439-96-5	Manganese	1.2	U	B	P
7439-97-6	Mercury___				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium	353	U		P
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___	2300			P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
7732-18-5	Silicon___	69.0	U		P
7440-24-6	Strontium	1.6			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID#=MCO-FB_DISS

FORM I - IN

0.Ft • 1.0.0.0.0 • 1.0.0.0.0

CLIENT SAMPLE ID: 7

INORGANIC ANALYSES DATA SHEET

MCWB-7 7B

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41450 SAS No.: SDG No.: 41450
Matrix (soil/water): WATER Lab Sample ID: 41450.01
Level (low/med): LOW Date Received: 12/14/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	1.1	U		P
7440-39-3	Barium	149			P
7440-41-7	Beryllium	0.50	U		P
7440-43-9	Cadmium	0.50	U		P
7440-70-2	Calcium				P
7440-48-4	Cobalt	[illegible]	U		P
7440-50-8	Copper	1.0	U		P
7439-89-6	Iron				P
7439-92-1	Lead	1.1	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese				P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	5.2			P
7440-09-7	Potassium				P
7782-49-2	Selenium	1.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium				P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	1.3	B		P
7440-66-6	Zinc	5.3	B	E	P
7732-18-5	Silicon				P
7440-24-6	Strontium				P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
CLIENT ID#=MCWB-7.7B

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCWB-7 7B D

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41450 SAS No.: SDG No.: 41450
Matrix (soil/water): WATER Lab Sample ID: 41450.02
Level (low/med): LOW Date Received: 12/14/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.1	U		P
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium	11700			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	14.2	U		P
7439-92-1	Lead				NR
7439-95-4	Magnesium	3750			P
7439-96-5	Manganese	1.2	U	B	P
7439-97-6	Mercury				NR
7440-02-0	Nickel				NR
7440-09-7	Potassium	7640			P
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium	87900			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
7732-18-5	Silicon	17100			P
7440-24-6	Strontium	156			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:
CLIENT_ID#=MCWB-7.7B_DISS

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

TA-18 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41450 SAS No.: _____ SDG No.: 41450_
Matrix (soil/water): WATER Lab Sample ID: 41450.22
Level (low/med): LOW__ Date Received: 12/14/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	232			P
7440-36-0	Antimony_				P
7440-38-2	Arsenic__				P
7440-39-3	Barium___				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium__				P
7440-70-2	Calcium__	11800			P
7440-48-4	Cobalt___				P
7440-50-8	Copper___				P
7439-89-6	Iron_____	461			P
7439-92-1	Lead_____				P
7439-95-4	Magnesium	3720			P
7439-96-5	Manganese	128		B	P
7439-97-6	Mercury__				P
7440-02-0	Nickel___				P
7440-09-7	Potassium	3080			P
7782-49-2	Selenium_				P
7440-22-4	Silver___				P
7440-23-5	Sodium___	16800			P
7440-28-0	Thallium_				P
7440-62-2	Vanadium_				P
7440-66-6	Zinc_____				P
7732-18-5	Silicon__	14800			P
7440-24-6	Strontium	80.0			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID#=TA-18_DISS

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

TW-8

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41450 SAS No.: _____ SDG No.: 41450_
Matrix (soil/water): WATER Lab Sample ID: 41450.03
Level (low/med): LOW___ Date Received: 12/14/99
% Solids: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic___	3.0			P
7440-39-3	Barium___	0.3			P
7440-41-7	Beryllium	0.50			P
7440-43-9	Cadmium___	0.50			P
7440-70-2	Calcium___				NR
7440-48-4	Cobalt___				NR
7440-50-8	Copper___	1.0			P
7439-89-6	Iron___				NR
7439-92-1	Lead___	4.4			P
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury___	0.20			CV
7440-02-0	Nickel___	0.80			P
7440-09-7	Potassium				NR
7782-49-2	Selenium_				P
7440-22-4	Silver___	1.0			P
7440-23-5	Sodium___				NR
7440-28-0	Thallium_				P
7440-62-2	Vanadium_	5.5			P
7440-66-6	Zinc___	468		E	P
7732-18-5	Silicon___				NR
7440-24-6	Strontium				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
CLIENT_ID#=TW-8

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

TW-8 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41450 SAS No.: _____ SDG No.: 41450_
Matrix (soil/water): WATER Lab Sample ID: 41450.04
Level (low/med): LOW__ Date Received: 12/14/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	31.1	U		P
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__				NR
7440-39-3	Barium___				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__				NR
7440-70-2	Calcium__	11700			P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____	14.1	U		P
7439-92-1	Lead_____				NR
7439-95-4	Magnesium	4180			P
7439-96-5	Manganese	1.7	B	S	P
7439-97-6	Mercury__				NR
7440-02-0	Nickel___				NR
7440-09-7	Potassium	1740	B		P
7782-49-2	Selenium_				NR
7440-22-4	Silver___				NR
7440-23-5	Sodium___	11600			P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
7732-18-5	Silicon__	31600			P
7440-24-6	Strontium	53.3			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID#=TW-8_DISS_____

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41407
SDG: 41407

DATE: January 14, 2000
SOW NO.: SW846
EPISODE NO.: 41407

INORGANIC METAL FRACTION:

Seven water samples plus one MS/MSD were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analysis was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, & 6010B
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Ba, Cd, Cu, Ni, Se, Tl, & U. No action required.

Linearity near the CRDL (CRA & CRI): No problems.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Cd, Cu, Se, & U. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): No problems.

Duplicates (LCSD and MSD): No problems.

Serial Dilution (ICP): No problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman
Inorganic Program Manager

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-1

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.02
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	5.0	B		P
7440-38-2	Arsenic	3.3	B		P
7440-39-3	Barium	48.6			P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	0.54	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	10.2	B		P
7439-92-1	Lead	[illegible]	B		P
7439-97-6	Mercury	0.10	B		CV
7440-02-0	Nickel	10	B		P
7782-49-2	Selenium	4.9	B		P
7440-22-4	Silver	2.0	B		P
7440-28-0	Thallium	3.0	B		P
7440-62-2	Vanadium	0.90	B		P
7440-66-6	Zinc	15.5	B		P
7440-61-1	Uranium	19.2	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-2

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.03
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	13.4			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	0.68	B		P
7440-43-9	Cadmium	0.30	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	5.0	B		P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	8.0	B		P
7782-49-2	Selenium	2.9	U		P
7440-22-4	Silver	2.0	U		P
7440-28-0	Thallium	2.6	B		P
7440-62-2	Vanadium	2.8	B		P
7440-66-6	Zinc	14.5	B		P
7440-61-1	Uranium	21.2	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-3

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.04
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	[illegible]	[illegible]		[illegible]
7440-38-2	Arsenic	[illegible]	[illegible]		[illegible]
7440-39-3	Barium	49.5			P
7440-41-7	Beryllium	0.30	[illegible]		P
7440-43-9	Cadmium	0.85	B		P
7440-48-4	Cobalt	[illegible]	[illegible]		P
7440-50-8	Copper	10.0	B		P
7439-92-1	Lead	[illegible]	[illegible]		P
7439-97-6	Mercury	0.10	[illegible]		CV
7440-02-0	Nickel	10.3	B		P
7782-49-2	Selenium	2.9	[illegible]		P
7440-22-4	Silver	[illegible]	[illegible]		P
7440-28-0	Thallium	[illegible]	B		P
7440-62-2	Vanadium	0.90	[illegible]		P
7440-66-6	Zinc	16.9	B		P
7440-61-1	Uranium	16.7	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

1 2

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-5

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.05
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.0			P
7440-38-2	Arsenic	3.3			P
7440-39-3	Barium	32.4			P
7440-41-7	Beryllium	0.30			P
7440-43-9	Cadmium	0.46			P
7440-48-4	Cobalt	1.1			P
7440-50-8	Copper	2.4	B		P
7439-92-1	Lead	2.2			P
7439-97-6	Mercury	0.10			CV
7440-02-0	Nickel	8.2	B		P
7782-49-2	Selenium	2.9			P
7440-22-4	Silver	1.0			P
7440-28-0	Thallium	2.3			P
7440-62-2	Vanadium	0.90			P
7440-66-6	Zinc	4.7			P
7440-61-1	Uranium	10.5			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

0006076 • 1145

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-6

Lab Name: SOUTHWEST LABORATORIES Contract: TECELAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.08
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	[illegible]	[illegible]		[illegible]
7440-38-2	Arsenic	[illegible]	[illegible]		[illegible]
7440-39-3	Barium	87.0			[illegible]
7440-41-7	Beryllium	0.30	[illegible]		[illegible]
7440-43-9	Cadmium	0.9[illegible]	[illegible]		[illegible]
7440-48-4	Cobalt	[illegible]	[illegible]		[illegible]
7440-50-8	Copper	[illegible]	[illegible]		[illegible]
7439-92-1	Lead	[illegible]	[illegible]		[illegible]
7439-97-6	Mercury	0.[illegible]	[illegible]		[illegible]
7440-02-0	Nickel	9.3	[illegible]		[illegible]
7782-49-2	Selenium	[illegible]	[illegible]		[illegible]
7440-22-4	Silver	[illegible]	[illegible]		[illegible]
7440-28-0	Thallium	[illegible]	[illegible]		[illegible]
7440-62-2	Vanadium	0.90	[illegible]		[illegible]
7440-66-6	Zinc	[illegible]	[illegible]		[illegible]
7440-61-1	Uranium	[illegible]	[illegible]		[illegible]

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-7

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.09
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.0	U		P
7440-38-2	Arsenic	3.3	U		P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	7.6			P
7440-48-4	Cobalt	[illegible]	U		P
7440-50-8	Copper	[illegible]	B		P
7439-92-1	Lead	[illegible]	B		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	7.8	B		P
7782-49-2	Selenium	3.9	U		P
7440-22-4	Silver	3.0	U		P
7440-28-0	Thallium	3.7	B		P
7440-62-2	Vanadium	2.4	B		P
7440-66-6	Zinc	7.8	B		P
7440-61-1	Uranium	20.0	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MT-4

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41407 SAS No.: SDG No.: 41407
Matrix (soil/water): WATER Lab Sample ID: 41407.01
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.0	U		P
7440-38-2	Arsenic	3.1	U		P
7440-39-3	Barium	129			P
7440-41-7	Beryllium	0.30	U		P
7440-43-9	Cadmium	0.92	B		P
7440-48-4	Cobalt	1.7	U		P
7440-50-8	Copper	2.8	B		P
7439-92-1	Lead	2.1	U		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	6.1	B		P
7782-49-2	Selenium	2.9	U		P
7440-22-4	Silver	2.0	U		P
7440-28-0	Thallium	3.1	B		P
7440-62-2	Vanadium	1.2	B		P
7440-66-6	Zinc	6.9	B		P
7440-61-1	Uranium	27.4	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41405
SDG: 41405

DATE: 1/12/00
SOW NO.: SW846
EPISODE NO.: 41405

INORGANIC METAL FRACTION:

Seven water samples, plus one matrix spike and one matrix spike duplicate were submitted for ICP analysis. No major problems occurred during the digestion or analysis of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, 6010B

The samples were filtered prior to analysis. The Form 13 indicates the volume of sample filtered prior to analysis.

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: No problems.

Linearity near the CRDL (CRA & CRI): No problems.

Lab Control Spikes: No problems.

Matrix Spikes (and MSD): No problems.

Duplicates (and MSD): No problems.

Serial Dilution (ICP): The water serial dilution was outside the control limits of 10% for the following elements: K, Na All associated samples were flagged with an "E" on Form I's. No action required.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-1 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41405 SAS No.: _____ SDG No.: 41405_
Matrix (soil/water): WATER Lab Sample ID: 41405.02
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	21.1	U		P
7440-70-2	Calcium__	77800			P
7439-89-6	Iron_____	24.1	U		P
7439-95-4	Magnesium	4560			P
7439-96-5	Manganese	1.2	U		P
7440-09-7	Potassium	5400		B	P
7440-23-5	Sodium___	44600		B	P
7631-86-9	Silicon__	21300			P
7440-24-6	Strontium	143			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-2 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41405 SAS No.: _____ SDG No.: 41405_
Matrix (soil/water): WATER Lab Sample ID: 41405.03
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	100	B		P
7440-70-2	Calcium	11700			P
7439-89-6	Iron	12400			P
7439-95-4	Magnesium	5490			P
7439-96-5	Manganese	710			P
7440-09-7	Potassium	1530		B	P
7440-23-5	Sodium	21500		B	P
7722-18-5	Silicon	38500			P
7440-24-6	Strontium	121			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-3 DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41405 SAS No.: SDG No.: 41405
Matrix (soil/water): WATER Lab Sample ID: 41405.04
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	32.1	U		P
7440-70-2	Calcium	79400			P
7439-89-6	Iron	24.1	U		P
7439-95-4	Magnesium	4740			P
7439-96-5	Manganese	1.2	U		P
7440-09-7	Potassium	3900		B	P
7440-23-5	Sodium	43600		B	P
7782-49-2	Silicon	22300			P
7440-24-6	Strontium	147			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-5 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41405 SAS No.: _____ SDG No.: 41405_
Matrix (soil/water): WATER Lab Sample ID: 41405.05
Level (low/med): LOW__ Date Received: 12/10/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	11.1	U		P
7440-70-2	Calcium__	22100			P
7439-89-6	Iron_____	24.1	U		P
7439-95-4	Magnesium	3230			P
7439-96-5	Manganese	1.1	U		P
7440-09-7	Potassium	18300		B	P
7440-23-5	Sodium___	33400		B	P
7631-86-9	Silicon__	17700			P
7440-24-6	Strontium	136			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCO-6 DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41405 SAS No.: SDG No.: 41405
Matrix (soil/water): WATER Lab Sample ID: 41405.08
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	32.1	U		P
7440-70-2	Calcium	31900			P
7439-89-6	Iron	24.2	U		P
7439-95-4	Magnesium	3130			P
7439-96-5	Manganese	1.2	U		P
7440-09-7	Potassium	16300		B	P
7440-23-5	Sodium	65800		B	P
7732-18-5	Silicon	17600			P
7440-24-6	Strontium	135			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MCC-7 DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41405 SAS No.: SDG No.: 41405
Matrix (soil/water): WATER Lab Sample ID: 41405.09
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	78.0	B		P
7440-70-2	Calcium	38000			P
7439-89-6	Iron	24.2	B		P
7439-95-4	Magnesium	9720			P
7439-96-5	Manganese	1.2	B		P
7440-09-7	Potassium	12700		E	P
7440-23-5	Sodium	30800		E	P
7782-49-2	Silicon	18600			P
7440-24-6	Strontium	185			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

296.7069.1150

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MT-4 DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41405 SAS No.: SDG No.: 41405
Matrix (soil/water): WATER Lab Sample ID: 41405.01
Level (low/med): LOW Date Received: 12/10/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.2	B		P
7440-70-2	Calcium	14000			P
7439-89-6	Iron	24.2	B		P
7439-95-4	Magnesium	5830			P
7439-96-5	Manganese	1.2	B		P
7440-09-7	Potassium	6950		B	P
7440-23-5	Sodium	34900		B	P
7782-49-2	Silicon	28500			P
7440-24-6	Strontium	154			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

001
~~096~~

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41535
SDG: 41535

DATE: 1/19/00
SOW NO.: SW846
EPISODE NO.: 41535

INORGANIC METAL FRACTION:

Three water samples were submitted for ICP analysis. No major problems occurred during the digestion or analysis of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, 6010B

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: U // No action required.

Linearity near the CRDL (CRA & CRI): No problems.
Preparation Blanks: No problems.
Lab Control Spikes: No problems.
Duplicates (LCSD): No problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

151

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

FM-1

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41535 SAS No.: SDG No.: 41535
Matrix (soil/water): WATER Lab Sample ID: 41535.01
Level (low/med): LOW Date Received: 12/18/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.3	U		P
7440-39-3	Barium				NR
7440-61-1	Uranium	10.3	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

004

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PM-2

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41535 SAS No.: SDG No.: 41535
Matrix (soil/water): WATER Lab Sample ID: 41535.03
Level (low/med): LOW Date Received: 12/23/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.0	B		P
7440-61-1	Uranium				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

NUM • 960095 • 1

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

C-4

Lab Name: SOUTHWEST LABORATORIES Contract: TECHLAW
Lab Code: SWOK Case No.: 41335 SAS No.: SDG No.: 41335
Matrix (soil/water): WATER Lab Sample ID: 41335.02
Level (low/med): LOW Date Received: 12/18/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.3	U		P
7440-39-3	Barium				NR
7440-61-1	Uranium	10.3	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:
Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41451
SDG: 41451

DATE: 1/12/00
SOW NO.: SW846
EPISODE NO.: 41451

INORGANIC METAL FRACTION:

Four water samples were submitted for ICP analysis. No major problems occurred during the digestion or analysis of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, 6010B

The samples were filtered prior to analysis. The Form 13 indicates the volume of sample filtered prior to analysis.

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Mg // No action required.

Linearity near the CRDL (CRA & CRI): No problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

U.S. EPA - CLP

1 -

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

FB-6 7 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41451 SAS No.: _____ SDG No.: 41451_
Matrix (soil/water): WATER Lab Sample ID: 41451.04
Level (low/med): LOW__ Date Received: 12/14/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	34.1	U		P
7440-70-2	Calcium__	522	B		P
7439-89-6	Iron_____	4.2	U		P
7439-95-4	Magnesium	100	B		P
7439-96-5	Manganese	1.2	U		P
7440-09-7	Potassium	353	U		P
7440-23-5	Sodium___	2340			P
7782-18-5	Silicon__	89.0	U		P
7440-24-6	Strontium	1.5			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID=FB-6.7_DISS

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

HOMESTEAD

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41451 SAS No.: _____ SDG No.: 41451_
Matrix (soil/water): WATER Lab Sample ID: 41451.06
Level (low/med): LOW__ Date Received: 12/14/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	196	B		P
7440-70-2	Calcium__	7910			P
7439-89-6	Iron_____	123			P
7439-95-4	Magnesium	1820			P
7439-96-5	Manganese	4.0	B		P
7440-09-7	Potassium	2190	B		P
7440-23-5	Sodium___	8160			P
7782-18-5	Silicon__	16900			P
7440-24-6	Strontium	62.1			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID=HOMESTEAD_DISS

FORM I - IN

FUTL.00605.1

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PA-6 7 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41451 SAS No.: _____ SDG No.: 41451_
Matrix (soil/water): WATER Lab Sample ID: 41451.02
Level (low/med): LOW__ Date Received: 12/14/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	111	B		P
7440-70-2	Calcium__	12900			P
7439-89-6	Iron____	79.8	B		P
7439-95-4	Magnesium	4140			P
7439-96-5	Manganese	2.0	B		P
7440-09-7	Potassium	2470	B		P
7440-23-5	Sodium___	15800			P
7631-18-5	Silicon__	13800			P
7440-24-6	Strontium	90.2			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID=PA-6.7_DISS

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

STARMER

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41451 SAS No.: _____ SDG No.: 41451_
Matrix (soil/water): WATER Lab Sample ID: 41451.08
Level (low/med): LOW__ Date Received: 12/24/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	111	B		P
7440-70-2	Calcium__	10300			P
7439-89-6	Iron_____	63.7	B		P
7439-95-4	Magnesium	3570			P
7439-96-5	Manganese	1.5	B		P
7440-09-7	Potassium	2380	B		P
7440-23-5	Sodium___	10600			P
7782-18-5	Silicon__	26900			P
7440-24-6	Strontium	78.6			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID=STARMER_DISS

FORM I - IN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41488
SDG: 41488

DATE: 1/17/00
SOW NO.: SW846
EPISODE NO.: 41488

INORGANIC METAL FRACTION:

Three dissolved and one total water samples were submitted for ICP analysis. No major problems occurred during the digestion or analysis of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, 6010B

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Mg // No action required.

Linearity near the CRDL (CRA & CRI): No problems.
Preparation Blanks: No problems.
Lab Control Spikes: No problems.
Duplicates (LCSD): No problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

BU-0 01 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41488 SAS No.: _____ SDG No.: 41488_
Matrix (soil/water): WATER Lab Sample ID: 41488.06
Level (low/med): LOW__ Date Received: 12/16/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	47.1	B		P
7440-39-3	Barium___				NR
7440-70-2	Calcium___	41300			P
7439-89-6	Iron____	24.1	B		P
7439-95-4	Magnesium	6010			P
7439-96-5	Manganese	1.7	B		P
7440-09-7	Potassium	3460			P
7440-23-5	Sodium___	16800			P
7782-49-2	Silicon___	20700			P
7440-24-6	Strontium	131			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID=BU-0.01_DISS

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

BULLDOG DISS

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41488 SAS No.: SDG No.: 41488
Matrix (soil/water): WATER Lab Sample ID: 41488.02
Level (low/med): LOW Date Received: 12/16/99
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	70.9	B		P
7440-39-3	Barium				NR
7440-70-2	Calcium	11700			P
7439-89-6	Iron	29.9	B		P
7439-95-4	Magnesium	3950			P
7439-96-5	Manganese	1.5	B		P
7440-09-7	Potassium	1620			P
7440-23-5	Sodium	18300			P
7782-18-5	Silicon	23600			P
7440-24-6	Strontium	133			P

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PA-8 9 DISS

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41488 SAS No.: _____ SDG No.: 41488_
Matrix (soil/water): WATER Lab Sample ID: 41488.04
Level (low/med): LOW Date Received: 12/16/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	139	B		P
7440-39-3	Barium___		-		NR
7440-70-2	Calcium__	10800			P
7439-89-6	Iron_____	75.1	B		P
7439-95-4	Magnesium	3560			P
7439-96-5	Manganese	6.2	B		P
7440-09-7	Potassium	2490	B		P
7440-23-5	Sodium___	21900			P
7782-18-5	Silicon__	13000			P
7440-24-6	Strontium	77.4			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
CLIENT_ID=PA-8.9_DISS

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PM-5

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41488 SAS No.: _____ SDG No.: 41488_
Matrix (soil/water): WATER Lab Sample ID: 41488.07
Level (low/med): LOW__ Date Received: 12/16/99
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				M
7440-39-3	Barium___	19.0			P
7440-70-2	Calcium__				M
7439-89-6	Iron_____				M
7439-95-4	Magnesium				M
7439-96-5	Manganese				M
7440-09-7	Potassium				M
7440-23-5	Sodium___				M
7782-49-2	Silicon__				M
7440-24-6	Strontium				M

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

0051.9669.7092

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41534
SDG: 41534

DATE: 1/14/2000
SOW NO.: SW846
EPISODE NO.: 41534

INORGANIC METAL FRACTION:
Ten soil samples plus one MS/MSD were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analysis were completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, & 6010B
SWL-IN-207	SW846 7470A & 7471A

This is an addendum package for 41534 to include the results of the arsenic and nickel analysis on these samples. The results for arsenic and nickel were omitted from the original package. Therefore an addendum forms package was created to fix this oversight.

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Sb, Tl, Ag, & Hg. No action required.

Linearity near the CRDL (CRA & CRI): The CRI standard was outside of our in-house warning limits of 70 - 130%R for the following elements: Se & U. No action required.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Ba, Ni, Cd, Ag, & Zn. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): The following element was outside the control limits of 75-125% recovery: Sb. All associated samples were flagged with a "N" on Form I's. No action required.

Duplicates (LCSD and MSD): No problems.

Serial Dilution (ICP): No problems.

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Inman
Inorganic Program Manager

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

AC-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41534 SAS No.: SDG No.: 41534
Matrix (soil/water): SOIL Lab Sample ID: 41534.06
Level (low/med): LOW Date Received: 12/18/99
% Solids: 93.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.28	U	N	P
7440-38-2	Arsenic	[illegible]			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	[illegible]			P
7440-43-9	Cadmium	0.06	B		P
7440-48-4	Cobalt	[illegible]			P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]	B		P
7439-97-6	Mercury	[illegible]			CV
7440-02-0	Nickel	[illegible]			P
7782-49-2	Selenium	0.34	B		P
7440-22-4	Silver	[illegible]	U		P
7440-28-0	Thallium	0.35	U	N	P
7440-62-2	Vanadium	[illegible]			P
7440-66-6	Zinc	[illegible]			P
7440-61-1	Uranium	[illegible]			P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

2996.70699.100

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

AC-2

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.07
Level (low/med): LOW__ Date Received: 12/18/99
% Solids: _95.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.28	U	N	P
7440-38-2	Arsenic__	2.5			P
7440-39-3	Barium__	70.1			P
7440-41-7	Beryllium	0.68			P
7440-43-9	Cadmium__	0.03	B		P
7440-48-4	Cobalt___	4.5	B		P
7440-50-8	Copper___	9.5			P
7439-92-1	Lead____	11.4	B		P
7439-97-6	Mercury__	0.06			CV
7440-02-0	Nickel___	4.5			P
7782-49-2	Selenium_	0.43	B		P
7440-22-4	Silver___	0.12	U		P
7440-28-0	Thallium_	0.35	U	N	P
7440-62-2	Vanadium_	9.4			P
7440-66-6	Zinc____	31.8			P
7440-61-1	Uranium__	1.8	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

AC-3

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.08
Level (low/med): LOW__ Date Received: 12/18/99
% Solids: _91.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.48	U	N	P
7440-38-2	Arsenic__	2.3	-		P
7440-39-3	Barium___	60.0	-		P
7440-41-7	Beryllium	0.74	-		P
7440-43-9	Cadmium__	0.04	B		P
7440-48-4	Cobalt___	3.0	-		P
7440-50-8	Copper___	8.2	-		P
7439-92-1	Lead____	12.2	B		P
7439-97-6	Mercury__	0.05	-		CV
7440-02-0	Nickel___	5.4	-		P
7782-49-2	Selenium_	0.58	B		P
7440-22-4	Silver___	0.22	BCD		P
7440-28-0	Thallium_	0.50	B	N	P
7440-62-2	Vanadium_	10.9	-		P
7440-66-6	Zinc____	40.4	-		P
7440-61-1	Uranium__	1.5	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW____ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

1691.0000.0692

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

AC-4

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.09
Level (low/med): LOW___ Date Received: 12/18/99
% Solids: _96.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.28	B	N	P
7440-38-2	Arsenic___	1.8			P
7440-39-3	Barium___	3.6			P
7440-41-7	Beryllium	0.48	B		P
7440-43-9	Cadmium__	0.03	B		P
7440-48-4	Cobalt___	2.0	B		P
7440-50-8	Copper___	5.2			P
7439-92-1	Lead____	3.1	B		P
7439-97-6	Mercury__	0.05			CV
7440-02-0	Nickel___	3.8	B		P
7782-49-2	Selenium_	0.45	B		P
7440-22-4	Silver___	0.22	B		P
7440-28-0	Thallium_	0.35	B	N	P
7440-62-2	Vanadium_	8.5			P
7440-66-6	Zinc____	48.1			P
7440-61-1	Uranium__	1.1	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

AC-5

Lab Name: SOUTHWEST_LAB_OF_OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41534 SAS No.: SDG No.: 41534
Matrix (soil/water): SOIL Lab Sample ID: 41534.10
Level (low/med): LOW Date Received: 12/18/99
% Solids: 93.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	[illegible]	B	N	P
7440-38-2	Arsenic	[illegible]			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	0.4[illegible]	B		P
7440-43-9	Cadmium	0.04	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	4.[illegible]	B		P
7439-92-1	Lead	9.[illegible]	B		P
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel	[illegible]	B		P
7782-49-2	Selenium	0.[illegible]	B		P
7440-22-4	Silver	0.4[illegible]	B		P
7440-28-0	Thallium	0.36	B	N	P
7440-62-2	Vanadium	8.4			P
7440-66-6	Zinc	7.5	B		P
7440-61-1	Uranium	[illegible]	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

N69-70699.1191

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PC-1

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.01
Level (low/med): LOW__ Date Received: 12/18/99
% Solids: _89.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.29	B	N	P
7440-38-2	Arsenic__	4.0			P
7440-39-3	Barium___	162			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.08	B		P
7440-48-4	Cobalt___	5.1			P
7440-50-8	Copper___	13.4			P
7439-92-1	Lead____	18.6	B		P
7439-97-6	Mercury__	0.02	B		CV
7440-02-0	Nickel___	11.1			P
7782-49-2	Selenium_	0.36	B		P
7440-22-4	Silver___	0.13	B		P
7440-28-0	Thallium_	0.83	B	N	P
7440-62-2	Vanadium_	20.4			P
7440-66-6	Zinc____	56.0			P
7440-61-1	Uranium__	2.5	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PC-2

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.02
Level (low/med): LOW__ Date Received: 12/18/99
% Solids: _94.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.26	B	N	P
7440-38-2	Arsenic___	[illegible]	_		P
7440-39-3	Barium___	[illegible]	_		P
7440-41-7	Beryllium	0.75	_		P
7440-43-9	Cadmium___	0.03	B		P
7440-48-4	Cobalt___	[illegible]	_		P
7440-50-8	Copper___	[illegible]	_		P
7439-92-1	Lead____	[illegible]	B		P
7439-97-6	Mercury___	[illegible]	[illegible]		CV
7440-02-0	Nickel___	[illegible]	_		P
7782-49-2	Selenium_	[illegible]	B		P
7440-22-4	Silver___	[illegible]	[illegible]		P
7440-28-0	Thallium_	0.[illegible]	B	N	P
7440-62-2	Vanadium_	[illegible]	_		P
7440-66-6	Zinc____	36.[illegible]	_		P
7440-61-1	Uranium___	[illegible].0	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PC-3

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.03
Level (low/med): LOW__ Date Received: 12/28/99
% Solids: _85.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.31	U	N	P
7440-38-2	Arsenic__	4.0	-		P
7440-39-3	Barium___	166	-		P
7440-41-7	Beryllium	1.2	-		P
7440-43-9	Cadmium__	0.20	B		P
7440-48-4	Cobalt___	5.8	-		P
7440-50-8	Copper___	33.1	-		P
7439-92-1	Lead____	22.8	B		P
7439-97-6	Mercury__	0.03	B		CV
7440-02-0	Nickel___	22.3	-		P
7782-49-2	Selenium_	0.38	BUCD		P
7440-22-4	Silver___	0.14	BUCD		P
7440-28-0	Thallium_	0.55	B	N	P
7440-62-2	Vanadium_	22.6	-		P
7440-66-6	Zinc____	58.4	-		P
7440-61-1	Uranium__	2.3	B		P

Color Before: BROWN___ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PC-4

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.04
Level (low/med): LOW__ Date Received: 10/18/99
% Solids: _92.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.28	U	N	P
7440-38-2	Arsenic__	3.3	_		P
7440-39-3	Barium___	148	_		P
7440-41-7	Beryllium	0.99	_		P
7440-43-9	Cadmium__	0.05	B		P
7440-48-4	Cobalt___	5.3	_		P
7440-50-8	Copper___	11.1	_		P
7439-92-1	Lead____	30.9	_		P
7439-97-6	Mercury__	0.02	B		CV
7440-02-0	Nickel___	10.0	_		P
7782-49-2	Selenium_	0.40	B		P
7440-22-4	Silver___	0.14	B		P
7440-28-0	Thallium_	0.59	B	N	P
7440-62-2	Vanadium_	20.5	_		P
7440-66-6	Zinc____	41.1	_		P
7440-61-1	Uranium__	2.0	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

PC-5

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41534 SAS No.: _____ SDG No.: 41534_
Matrix (soil/water): SOIL_ Lab Sample ID: 41534.05
Level (low/med): LOW__ Date Received: 12/18/99
% Solids: _94.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.28	U	N	P
7440-38-2	Arsenic__	3.2			P
7440-39-3	Barium___	116			P
7440-41-7	Beryllium	0.79			P
7440-43-9	Cadmium__	0.03	U		P
7440-48-4	Cobalt___	4.9			P
7440-50-8	Copper___	6.9			P
7439-92-1	Lead____	11.1			P
7439-97-6	Mercury__	0.02	B		CV
7440-02-0	Nickel___	7.5			P
7782-49-2	Selenium_	0.34	U		P
7440-22-4	Silver___	0.22	U		P
7440-28-0	Thallium_	0.35	U	N	P
7440-62-2	Vanadium_	16.8			P
7440-66-6	Zinc____	36.5			P
7440-61-1	Uranium__	1.2	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41509
SDG: 41509A

DATE: 1/24/00
SOW NO.: SW846
EPISODE NO.: 41509

INORGANIC METAL FRACTION:

Twenty soil samples, plus one matrix spike and one matrix spike duplicate were submitted for ICP and Hg analysis. No major problems occurred during the digestion or analysis of these samples. Please see the DC-1 (Sample Log-In Sheet) for sample conditions and cooler temperatures at receipt. The sample's analyses was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, 6010B
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.
Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Sb, Co, As, Tl, V, U No action required.

Linearity near the CRDL (CRA & CRI): The CRI standard was outside of our in-house warning limits of 70 - 130%R for the following elements: Sb, Ba, Be, Ag No action required.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Cd, Co, Cu, Sb, As, V, Zn
No action required.
Lab Control Spikes: No problems.

Matrix Spikes (and MSD): The following elements were outside the control limits of 75-125% recovery: Sb, U All associated samples were flagged with a "N" on Form I's.
No action required.
Duplicates (LCSD and MSD): No problems.
Serial Dilution (ICP): No problems.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.01
Level (low/med): LOW Date Received: 12/17/99
% Solids: 91.[illegible]

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.[illegible]	U	N	P
7440-38-2	Arsenic	[illegible]			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	0.[illegible]			P
7440-43-9	Cadmium	0.08	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	[illegible]			P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0.[illegible]	U		P
7440-28-0	Thallium	0.37	U		P
7440-62-2	Vanadium	[illegible]			P
7440-66-6	Zinc	[illegible]			P
7440-61-1	Uranium	[illegible]	B	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

BC-2

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.02
Level (low/med): LOW Date Received: 12/17/99
% Solids: 95.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.72	B	N	P
7440-38-2	Arsenic	[illegible]			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	0.47	B		P
7440-43-9	Cadmium	0.23	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	[illegible]	B		P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	[illegible]			P
7782-49-2	Selenium	0.35	B		P
7440-22-4	Silver	[illegible]	U		P
7440-28-0	Thallium	0.26	U		P
7440-62-2	Vanadium	[illegible]			P
7440-66-6	Zinc	[illegible]			P
7440-61-1	Uranium	[illegible]	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

BC-3

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.03
Level (low/med): LOW Date Received: 12/17/99
% Solids: 95.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.13	U	N	P
7440-38-2	Arsenic	1.4			P
7440-39-3	Barium	19.9			P
7440-41-7	Beryllium	0.41	B		P
7440-43-9	Cadmium	0.13	B		P
7440-48-4	Cobalt	1.1	B		P
7440-50-8	Copper	1.1	B		P
7439-92-1	Lead	7.1			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	1.3			P
7782-49-2	Selenium	0.35	B		P
7440-22-4	Silver	0.13	B		P
7440-28-0	Thallium	0.36	B		P
7440-62-2	Vanadium	3.6			P
7440-66-6	Zinc	16.1			P
7440-61-1	Uranium	1.3	B	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LC1219SB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: LC1219SB

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) __ Date Received:

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	340	
11104-28-2	Aroclor-1221	33	
11141-16-5	Aroclor-1232	33	
53469-21-9	Aroclor-1242	33	
12672-29-6	Aroclor-1248	33	
11097-69-1	Aroclor-1254	33	
11096-82-5	Aroclor-1260	300	
Surrogate amount spiked		6.67	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LD1219SB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: LD1219SB

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) __ Date Received:

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	320	
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	290	
Surrogate amount spiked		6.67	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-4

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.23

Sample wt/vol: 31.8 (g/mL) G Lab File ID:_____

% Moisture: 16 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	37	U
11104-28-2	Aroclor-1221	37	U
11141-16-5	Aroclor-1232	37	U
53469-21-9	Aroclor-1242	37	U
12672-29-6	Aroclor-1248	37	U
11097-69-1	Aroclor-1254	37	U
11096-82-5	Aroclor-1260	37	U
Surrogate amount spiked		7.49	

FORM I PEST

0001 • 1009 • 0909

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-4MS

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.24MS

Sample wt/vol: 30.3 (g/mL) G Lab File ID:_____

% Moisture: 14 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	380	
11104-28-2	Aroclor-1221	38	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	38	U
12672-29-6	Aroclor-1248	38	U
11097-69-1	Aroclor-1254	38	U
11096-82-5	Aroclor-1260	340	
Surrogate amount spiked		7.68	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-4MSD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.25MSD

Sample wt/vol: 33.5 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 9.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	370	
11104-28-2	Aroclor-1221	34	
11141-16-5	Aroclor-1232	34	
53469-21-9	Aroclor-1242	34	
12672-29-6	Aroclor-1248	34	
11097-69-1	Aroclor-1254	34	
11096-82-5	Aroclor-1260	330	
Surrogate amount spiked		6.94	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-5A

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.26

Sample wt/vol: 30.2 (g/mL) G Lab File ID:_____

% Moisture: 10 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.3 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	36	U
11104-28-2	Aroclor-1221	36	U
11141-16-5	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12672-29-6	Aroclor-1248	36	U
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U
Surrogate amount spiked		7.36	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-SB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.27

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/29/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	41	U
11104-28-2	Aroclor-1221	41	U
11141-16-5	Aroclor-1232	41	U
53469-21-9	Aroclor-1242	41	U
12672-29-6	Aroclor-1248	41	U
11097-69-1	Aroclor-1254	41	U
11096-82-5	Aroclor-1260	41	U
Surrogate amount spiked		8.33	

FORM I PEST

0411*96969*70

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-6

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.28

Sample wt/vol: 30.9 (g/mL) G Lab File ID:_____

% Moisture: 21 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	40	U
11104-28-2	Aroclor-1221	40	U
11141-16-5	Aroclor-1232	40	U
53469-21-9	Aroclor-1242	40	U
12672-29-6	Aroclor-1248	40	U
11097-69-1	Aroclor-1254	40	U
11096-82-5	Aroclor-1260	40	U
Surrogate amount spiked		8.19	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-7

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.29

Sample wt/vol: 30.8 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	38	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	38	U
12672-29-6	Aroclor-1248	38	U
11097-69-1	Aroclor-1254	38	U
11096-82-5	Aroclor-1260	38	U
Surrogate amount spiked		7.54	

FORM I PEST

1H1.9990709

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-8

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.30

Sample wt/vol: 31.1 (g/mL) G Lab File ID:_____

% Moisture: 23 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	41	
11104-28-2	Aroclor-1221	41	
11141-16-5	Aroclor-1232	41	
53469-21-9	Aroclor-1242	41	
12672-29-6	Aroclor-1248	41	
11097-69-1	Aroclor-1254	41	
11096-82-5	Aroclor-1260	41	
Surrogate amount spiked		8.35	

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-9

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.31

Sample wt/vol: 31.0 (g/mL) G Lab File ID: _____

% Moisture: 9 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.6 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	35	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U
Surrogate amount spiked		7.09	

FORM I PEST

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG: 41536

FRACTION: PCBs

2 water samples were extracted by SW846 method 3510B and analyzed for PCBs as aroclors by SW846 method 8082. No major problems occurred during the analysis of the samples.

Blanks: No corrective action required.

Surrogates: No corrective action required.

Laboratory Control Spike: No corrective action required.

Matrix Spikes: No corrective action required.

Example Calculation:

sample #	41536.02ms		
analyte	1260 peak #1 on rtx-pest2		
As=area of analyte in sample		=	775312
V(f)=final volume of extract (ml)		=	10
D=dilution factor		=	1
CF=calibration factor (1/ng/ml)		=	1048.055
W(V)=volume of sample extracted (ml)		=	750

$$\text{conc (ug/L)} = \frac{\frac{As}{CF} \quad \frac{V(f)}{W(V)} \quad D}{} \quad \frac{\frac{ml}{ml} \quad \frac{ng}{ml}}{}$$

$$= \frac{\frac{775312}{1048.055} \quad \frac{10}{750} \quad 1}{}$$

$$= 9.864$$

Drew Cowan
GC Supervisor
Dc

December 30, 1999

01

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-EB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.01

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

% Moisture: _____ decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 12/20/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/29/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.3 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
Surrogate amount spiked		0.20	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

AC-EB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41536

Matrix: (soil/water) WATER Lab Sample ID: 41536.02

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

% Moisture: _____ decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 12/20/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.2 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	
11104-28-2	Aroclor-1221	1.0	
11141-16-5	Aroclor-1232	1.0	
53469-21-9	Aroclor-1242	1.0	
12672-29-6	Aroclor-1248	1.0	
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	1.0	
Surrogate amount spiked		0.20	

FORM I PEST

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG: 41411

FRACTION: PCBs

1 water and 13 soil samples were extracted by SW846 methods 3510B and 3550. Then analyzed for PCBs as aroclors by SW846 method 8082. No major problems occurred during the analysis of the samples. 1 of the samples contained an aroclor below the reporting limit.

It should be noted that SWLO is in the process of updating our form generation software to "work" with the most recent update of method 8082. As a result, no form 10's can be generated at this time for aroclors other than 1016 and 1260. This is because under the newest 8082 results for the other aroclors are calculated using a single point calibration.

Blanks: No corrective action required.

Surrogates: No corrective action required.

Laboratory Control Spike: No corrective action required.

Matrix Spikes: No corrective action required.

Example Calculation:

sample #	41411.01		
analyte	1260 peak #1 on rtx-pest		
As=area of analyte in sample		=	20453
V(f)=final volume of extract (ml)		=	10
D=dilution factor		=	1
CF=calibration factor (1/ng/ml)		=	1300.02
W(V)=weight of sample extracted (g)		=	30
%m=% moisture		=	19

$$\text{conc (ug/kg)} = \frac{As \quad V(f) \quad D \quad ml \quad ng}{CF \quad W(V) \quad (100-\%m)/100) \quad ml \quad g}$$

$$= \frac{20453 \quad 10 \quad 1}{1300.02 \quad 30 \quad 0.81}$$

$$= 6.474$$

Drew Cowan
GC Supervisor
Dc

December 22, 1999

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-3S-0

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.01

Sample wt/vol: 30.0 (g/mL) G Lab File ID:_____

% Moisture: 19 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	41	U
11104-28-2	Aroclor-1221	41	U
11141-16-5	Aroclor-1232	41	U
53469-21-9	Aroclor-1242	41	U
12672-29-6	Aroclor-1248	41	U
11097-69-1	Aroclor-1254	41	U
11096-82-5	Aroclor-1260	41	U
Surrogate amount spiked		8.23	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-18-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECH SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	40	U
11104-28-2	Aroclor-1221	40	U
11141-16-5	Aroclor-1232	40	U
53469-21-9	Aroclor-1242	40	U
12672-29-6	Aroclor-1248	40	U
11097-69-1	Aroclor-1254	117	
11096-82-5	Aroclor-1260	40	U
Surrogate amount spiked		8.13	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-18-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.03

Sample wt/vol: 30.0 (g/mL) G Lab File ID:_____

% Moisture: 26 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/17/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	44	U
11104-28-2	Aroclor-1221	44	U
11141-16-5	Aroclor-1232	44	U
53469-21-9	Aroclor-1242	44	U
12672-29-6	Aroclor-1248	44	U
11097-69-1	Aroclor-1254	322	
11096-82-5	Aroclor-1260	44	U
Surrogate amount spiked		9.01	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-18-3

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.3 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	39	
11141-16-5	Aroclor-1232	39	
53469-21-9	Aroclor-1242	39	
12672-29-6	Aroclor-1248	39	
11097-69-1	Aroclor-1254	124	
11096-82-5	Aroclor-1260	39	
Surrogate amount spiked		7.94	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-12-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.05

Sample wt/vol: 30.0 (g/mL) G Lab File ID:_____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.9 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	367	
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.94	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-12-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.3 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	38	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	38	U
12672-29-6	Aroclor-1248	38	U
11097-69-1	Aroclor-1254	580	
11096-82-5	Aroclor-1260	38	U
Surrogate amount spiked		7.75	

FORM I PEST

2960.170699.178

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-12-2DL

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.06DL

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.3 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	77	U
11104-28-2	Aroclor-1221	77	U
11141-16-5	Aroclor-1232	77	U
53469-21-9	Aroclor-1242	77	U
12672-29-6	Aroclor-1248	77	U
11097-69-1	Aroclor-1254	635	
11096-82-5	Aroclor-1260	77	U
Surrogate amount spiked		7.75	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-48-0

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.07

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/17/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	38	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	38	U
12672-29-6	Aroclor-1248	38	U
11097-69-1	Aroclor-1254	107	
11096-82-5	Aroclor-1260	38	U
Surrogate amount spiked		7.58	

FORM I PEST

9911.0009.0002

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-3-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.08

Sample wt/vol: 30.0 (g/mL) G Lab File ID:_____

% Moisture: 7 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.1 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	35	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	37	U
11096-82-5	Aroclor-1260	35	U
Surrogate amount spiked		7.17	

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-3-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.09

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/17/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	[illegible]	[illegible]
11104-28-2	Aroclor-1221	[illegible]	[illegible]
11141-16-5	Aroclor-1232	[illegible]	[illegible]
53469-21-9	Aroclor-1242	[illegible]	[illegible]
12672-29-6	Aroclor-1248	[illegible]	[illegible]
11097-69-1	Aroclor-1254	[illegible]	[illegible]
11096-82-5	Aroclor-1260	[illegible]	[illegible]
Surrogate amount spiked		7.09	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-3-3

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.10

Sample wt/vol: 30.0 (g/mL) G Lab File ID:_____

% Moisture: 5 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	56	
11096-82-5	Aroclor-1260	35	U
Surrogate amount spiked		7.02	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-3-3DL

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.10DL

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 5 decanted: (Y/N) __ Date Received: 12/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/14/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/17/99

Injection Volume: 0.5 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 6.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	66	U
11104-28-2	Aroclor-1221	66	U
11141-16-5	Aroclor-1232	66	U
53469-21-9	Aroclor-1242	66	U
12672-29-6	Aroclor-1248	66	U
11097-69-1	Aroclor-1254	626	D
11096-82-5	Aroclor-1260	66	U
Surrogate amount spiked		7.02	

FORM I PEST

1001 • 99660 • 992

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-3-4

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) SOIL Lab Sample ID: 41411.11

Sample wt/vol: 30.0 (g/mL) G Lab File ID:_____

% Moisture: 11 decanted: (Y/N) __ Date Received: 11/10/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 11/14/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 11/17/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.6 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	37	U
11104-28-2	Aroclor-1221	37	U
11141-16-5	Aroclor-1232	37	U
53469-21-9	Aroclor-1242	37	U
12672-29-6	Aroclor-1248	37	U
11097-69-1	Aroclor-1254	344	
11096-82-5	Aroclor-1260	37	U
Surrogate amount spiked		7.49	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASC-EB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41411

Matrix: (soil/water) WATER Lab Sample ID: 41411.11

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

Surrogate amount spiked	7.02	

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
Surrogate amount spiked		0.20	

FORM I PEST

2699.1009.1001

Surrogate amount spiked	[illegible]	

2966706691 3

Explosives Data

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG NO: 41450

FRACTION: EXPLOSIVES

3 water samples were analyzed for explosives by SW-846, method 8330.

No major problems occurred during the analysis of the samples.

Blanks: No corrective action required.

Surrogates: No corrective action required.

Laboratory Control Spikes: 4 out of 28 recoveries were slightly outside control limits, no corrective action was taken.

Matrix Spikes: 2 out of 28 recoveries and 1 out of 14 RPDs were slightly outside control limits, no corrective action was taken.

Example Calculation:

sample #	41450.10ms		
analyte	hmx		
As=area of analyte in sample		=	6322754
D=dilution factor		=	2
CF=calibration factor (1/ug/l)		=	70411.256

$$\text{conc (ug/l)} = \frac{As \quad D}{CF} \qquad \frac{ug}{l}$$

$$= \frac{6322754 \quad 2}{70411.256}$$

$$= 179.6$$

Jennifer Freeman

Jennifer Freeman
Drew Cowan
GC Supervisor
jf

December 21, 1999

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TA-18

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41450

Matrix: (soil/water) WATER Lab Sample ID: 41450.09

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/14/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
122-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

FORM I

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG NO: 41535

FRACTION: EXPLOSIVES

1 water sample was analyzed for explosives by SW-846, method 8330.

No major problems occurred during the analysis of the sample.

Blanks: No corrective action required.

Surrogates: No corrective action required.

Laboratory Control Spikes: 1 out of 28 recoveries was slightly outside control limits, no corrective action was taken.

Matrix Spikes: 2 out of 28 recoveries and 2 out of 14 RPDs were slightly outside control limits, no corrective action was taken.

Example Calculation:

sample #	41535.03ms		
analyte	hmx		
As=area of analyte in sample		=	14341493
D=dilution factor		=	2
CF=calibration factor (1/ug/l)		=	160360.6

$$\text{conc (ug/l)} = \frac{As \quad D}{CF} \qquad \frac{ug}{l}$$

$$= \frac{14341493 \quad 2}{160360.604}$$

$$= 178.9$$

Drew Cowan
GC Supervisor
dc

December 30, 1999

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PM-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41535

Matrix: (soil/water) WATER Lab Sample ID: 41535.03

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/18/99

Extraction Volume: 5 ML Date Extracted: 12/27/99

Extraction Method: SEPF Date Analyzed: 12/27/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG NO: 41451

FRACTION: EXPLOSIVES

5 water samples were analyzed for explosives by SW-846, method 8330.

No major problems occurred during the analysis of the samples.

Blanks: No corrective action required.

Surrogates: No corrective action required.

Laboratory Control Spikes: 4 out of 28 recoveries were slightly outside control limits, no corrective action was taken.

Matrix Spikes: No corrective action required (SWLO episode 41450).

Example Calculation:

sample #	41450.10ms		
analyte	hmx		
As=area of analyte in sample		=	6322754
D=dilution factor		=	2
CF=calibration factor (1/ug/l)		=	70411.256

$$\text{conc (ug/l)} = \frac{As \quad D}{CF} \qquad \frac{ug}{l}$$

$$= \frac{6322754 \quad 2}{70411.256}$$

$$= 179.8$$

Jon Barrows
Drew Cowan
GC Supervisor
Jb

December 21, 1999

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PA-6.7

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41451

Matrix: (soil/water) WATER Lab Sample ID: 41451.01

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/14/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

FB-6.7

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41451

Matrix: (soil/water) WATER Lab Sample ID: 41451.03

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/14/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	12.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

HOMESTEAD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41451

Matrix: (soil/water) WATER Lab Sample ID: 41451.05

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/14/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

FORM I

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

STARMER

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41451

Matrix: (soil/water) WATER Lab Sample ID: 41451.07

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/14/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

KIELING

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41451

Matrix: (soil/water) WATER Lab Sample ID: 41451.09

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/14/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.20	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	20.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG NO: 41488

FRACTION: EXPLOSIVES

4 water samples were analyzed for explosives by SW-846, method 8330.

No major problems occurred during the analysis of the samples.

Blanks: No corrective action required.

Surrogates: No corrective action required.

Laboratory Control Spikes: 4 out of 28 recoveries were slightly outside control limits, no corrective action was taken.

Matrix Spikes: No corrective action required (SWLO episode 41450).

Example Calculation:

sample #	41450.10ms		
analyte	hmx		
As=area of analyte in sample		=	6322754
D=dilution factor		=	2
CF=calibration factor (1/ug/l)		=	70411.256

$$\text{conc (ug/l)} = \frac{As \quad D}{CF} \qquad \frac{ug}{l}$$

$$= \frac{6322754 \quad 2}{70411.256}$$

$$= 179.6$$

Jon Barrows for
Drew Cowan
GC Supervisor
jb

December 21, 1999

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BULLDOG

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41488

Matrix: (soil/water) WATER Lab Sample ID: 41488.01

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/16/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	12.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PA-8.9

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41488

Matrix: (soil/water) WATER Lab Sample ID: 41488.03

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/16/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BU0.01

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41488

Matrix: (soil/water) WATER Lab Sample ID: 41488.05

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/16/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.20	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	10.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

FORM I

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PM-5

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHLAW SDG No.: 41488

Matrix: (soil/water) WATER Lab Sample ID: 41488.07

Sample Amt: 5 ML % Moisture: _____ Date Received: 12/16/99

Extraction Volume: 5 ML Date Extracted: 12/16/99

Extraction Method: SEPF Date Analyzed: 12/17/99

GPC Cleanup: (Y/N) N Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: UG/L	Q
2691-41-0	HMX	13.0	U
121-82-4	RDX	14.0	U
99-35-4	TNB	7.30	U
99-65-0	DNB	4.00	U
479-45-8	TETRYL	20.0	U
98-95-3	NB	7.00	U
118-96-7	TNT	6.40	U
1946-51-0	4ADNT	7.00	U
35572-78-2	2ADNT	12.0	U
606-20-2	26DNT	9.40	U
121-14-2	24DNT	5.70	U
88-72-2	2NT	12.0	U
99-99-0	4NT	7.90	U
99-08-1	3NT	8.00	U
Surrogate amount spiked		400.00	

Radionuclide Data

Quanterra - St. Louis

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Quanterra
Environmental Services

ANALYTICAL REPORT

PROJECT NO. TECHLAW

Phase I

Lot #: F9L140165

Julie Shanahan

Techlaw, Inc.
750 N St Paul
Suite 600
Dallas, TX 75201

QUANTERRA INCORPORATED

Ron Martino
Project Manager

February 9, 2000

Data is incomplete without Case Narrative

CASE NARRATIVE

Lot # F9L140165

I. Introduction

On December 10, 1999, samples were received at the Quanterra St. Louis laboratory from Techlaw. A copy of the chain of custody and the condition upon receipt report is included with the analytical data.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

IV. Comments/Nonconformances

Enriched Tritium

Quanterra was directed to use the University of Miami Tritium Laboratory for the enriched tritium and this laboratory was not audited and approved by Quanterra, therefore, Quanterra does not warrant and is not responsible for their work pursuant to our Standard Terms and Conditions. The analysis was performed and reported directly to Techlaw. Quanterra was only responsible for the delivery of the samples to the University of Miami.

Strontium 90

There were no anomalies associated with this analysis.

Gamma

There were no anomalies associated with this analysis.

Isoplutonium

Samples ACS-18-1, ACS-18-1, ACS-48-0, ACS-3-1, ACS-3-4, ACS3-3, contain high Pu-239 activity which tails into and through the Pu-242 tracer region of interest. These samples have tracer recoveries > 100 % recovery. The activity results for these samples are biased low by at least as much as the tracer bias is greater than 100%. This bias is caused by the calculation algorithem not truncating the yield at 100%. Three samples were rerun for yields > 125% upper control limit.

The LCS for this batch has only Pu 239 reported. Pu 238 is in the spike sample as a second radionuclide but the spike list was not complete. If The data is released I can attempt to delete the LCS and re-create it which should bring in the new list.

Quanterra - St. Louis

METHODS SUMMARY

F9L140165

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Cs-137 & Hits by Gamma GAMMA SPEC MULTI ISO CAL	HASL Gamma (Cs	
Isotopic Pu by Alpha Spe Alpha Spectroscopy	NAS Iso Pu (SHO	
STRONTIUM 90 Sr90-Y90 cal	DOE SR-90 BY GP	
STRONTIUM 90 Sr90-Y90 cal	SMWW SR-90 BY G	

References:

DOE "DOE METHODS FOR EVALUATING ENVIRONMENTAL AND WASTE MANAGEMENT SAMPLES" OCTOBER 1994 US DEPARTMENT OF ENERGY

HASL Health and Safety Laboratory

NAS National Academy of Science

SMWW "STANDARD METHODS FOR WASTE WATER"

Data is incomplete without Case Narrative

F9L140165.0399

SAMPLE SUMMARY

F9L140163

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
D69PL	010	ACS-EB	12/06/99	14:20
D69PM	011	MCD-1	12/07/99	13:20
D69PR	012	MCD-2	12/07/99	15:30
D69C6	014	MCD-5	12/08/99	10:45
D69CA	015	MCD-6	12/08/99	12:00
D69CC	016	MCD-7	12/08/99	13:50
D69CE	017	MCWB-7.73	12/08/99	15:20
D69CM	018	MT-4	12/07/99	11:05
D69CQ	019	TW-8	12/07/99	15:45
D69R1	020	ACS-35-0	12/06/99	11:02
D69R8	021	ACS-18-1	12/06/99	11:40
D69RA	022	ACS-18-2	12/06/99	12:30
D69RD	023	ACS-18-3	12/06/99	12:20
D69RF	024	ACS-12-1	12/06/99	12:35
D69T2	025	ACS-12-2	12/06/99	12:45
D69TQ	026	ACS-48-0	12/06/99	13:00
D69TV	027	ACS-3-1	12/06/99	13:20
D69TX	028	ACS-3-2	12/06/99	13:40
D69V1	029	ACS-3-4	12/06/99	14:00
D69V9	030	ACS-3-3	12/06/99	13:50

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot test, solids, solubility, temperature, viscosity, and weight.

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: ACS-EB

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9114016S-010
Work Order: D69PL
Matrix: WATER

Date Collected: 12/06/99 1410
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Nats by NASL AM-02 MOD				pCi/L	Gamma (Cs & Nats)			
Cesium 137	-0.1	U	6.4	10	01/19/00	01/20/00	3019140	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/L	Iso Pu (SHORT CT)			
Plutonium 238	-0.05	U	0.11	0.37	12/13/99	12/22/99	9356203	40
Plutonium 239/40	0.012	U	0.099	0.25	12/13/99	12/22/99	9356203	40
SR-90 BY GFPC SMWW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	0.13	U	0.37	1.5	01/25/00	12/22/99	3035192	99

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Yld results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

UNOFFICIAL DOCUMENT

TECHLAW, INC.

Client Sample ID: MCO-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-011
Work Order: D69PM
Matrix: WATER

Date Collected: 12/07/99 1310
Date Received: 12/10/99 0912

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC SW846 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	84		17	3	01/05/00	02/03/00	0005192	20

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: MCO-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-012
Work Order: D69FR
Matrix: WATER

Date Collected: 12/07/99 1530
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	File #
SR-90 BY GFPC SMWW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	0.33	U	0.33	0.90	01/05/00	02/01/00	0001192	18

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

TECHLAW, INC.

Client Sample ID: MCO-5

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-014
Work Order: D69Q6
Matrix: WATER

Date Collected: 12/08/99 1045
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Unsert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY DFPC SMWW 7500-SR MOD				pCi/L	SR-90 BY DFPC			
Strontium 90	45.6		9.0	0.8	01/05/00	02/03/00	0005192	70

NOTE(S):

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: MCO-6

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9214C165-015
Work Order: D69QA
Matrix: WATER

Date Collected: 12/08/99 1200
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC SHAW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	44.6		8.9	0.7	01/03/00	02/03/00	0002192	73

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Qual results are greater than the MDC

Data is incomplete without Case Narrative

290.70695.197

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: MCO-7

Quanterra, Inc. - Radiochemistry

Lab Sample ID: T9L140168-016
Work Order: D69CC
Matrix: WATER

Date Collected: 12/08/99 1350
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
SR-90 BY GFPC SNOW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	1.86	J	0.77	1.0	01/05/00	02/03/00	0003192	54

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: MCWB-7.73

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-017
Work Order: D69CE
Matrix: WATER

Date Collected: 12/08/99 1510
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 sr/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC SMWW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	0.09	U	0.45	0.78	01/05/00	02/02/00	0005192	72

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

0009 • 1000 • 1000

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: MT-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-018
Work Order: D69CM
Matrix: WATER

Date Collected: 12/07/99 1105
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC Meth 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	-0.01	U	0.27	0.64	01/01/00	02/02/00	3001132	--

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: TW-8

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9214016S-019
Work Order: D69QQ
Matrix: WATER

Date Collected: 12/07/99 1545
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC SMWW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	0.19	U	0.40	0.67	01/[illegible]/00	02/02/00	[illegible]	[illegible]

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

9911.9660.7.6992

TECHLAW, INC.

Client Sample ID: ACS-35-0

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9914C165-020
Work Order: D69R1
Matrix: SOLID

Date Collected: 12/06/99 1100
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.12	U	0.11	0.12	12/16/99	12/29/99	9351210	78
Plutonium 239/40	27.3		6.0	0.1	12/16/99	12/29/99	9351210	78
Gamma Cs-137 & Rlts by HASL AM-02 MOD				pCi/g	Gamma (Cs & Rlts)			
Cesium 137	0.079	U	0.080	0.13	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241DP	0.19		0.22	0.1	12/20/99	01/24/00	0019340	
Lead 210	1.55		0.30	0.87	12/20/99	01/24/00	0019340	
Lead 212	0.67		0.14	0.09	12/20/99	01/24/00	0019340	
Lead 214	0.53		0.14	0.14	12/20/99	01/24/00	0019340	
Potassium 40	28.3		4.1	1	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	-0.91	U	0.16	1.0	12/16/99	01/12/00	9351222	40

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC

U Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: ACS-35-0 DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-020X
Work Order: D69R1
Matrix: SOLID

Date Collected: 12/06/99 1102
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Rlts by HASL AM-02 MOD			pCi/g		Gamma (Cs & hlts)			
Cesium 137	0.025	U	0.019	0.11	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241NP	0.174		0.088	0.099	12/20/99	01/24/00	0019340	
Lead 212	0.67		0.19	0.13	12/20/99	01/24/00	0019340	
Lead 214	0.57		0.20	0.14	12/20/99	01/24/00	0019340	
Potassium 40	27.0		3.9	0.8	12/20/99	01/24/00	0019340	

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

0002.960607.6

TECHLAW, INC.

Client Sample ID: ACS-18-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140163-001
Work Order: D69R9
Matrix: SOLID

Date Collected: 12/06/99 1140
Date Received: 12/10/99 0912

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SMORT GT) NAS ONLY MOD			pCi/g		Iso Pu (SMORT GT)			
Plutonium 238	0.27	J	0.21	0.22	12/16/99	12/29/99	9351210	111
Plutonium 239/40	77	-	19	0.2	12/16/99	12/29/99	9351210	111
Gamma Cs-137 6 Hits by HASL AM-02 MOD			pCi/g		Gamma (Cs 6 hits)			
Cesium 137	0.31		0.18	0.22	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241MP	4.01		0.49	0.22	12/20/99	01/24/00	0019340	
Lead 212	1.26		0.32	0.13	12/20/99	01/24/00	0019340	
Lead 214	1.22		0.36	0.17	12/20/99	01/24/00	0019340	
Potassium 40	30.5		4.3	1.1	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.36	U	0.31	0.35	12/16/99	01/12/00	9351220	62

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

- \- For informational purposes only. The detection limit does not follow significant figures SOP.
- J Result is greater than sample detection limit but less than stated reporting limit.
- U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

TECHLAW, INC.

Client Sample ID: ACS-18-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9214016S-022
Work Order: D69RA
Matrix: SOLID

Date Collected: 12/06/99 1200
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Unsert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	0.65		0.22	0.12	12/20/99	01/24/00	3019340	
*** Other Detected Radionuclides ***								
Americium 241RP	3.35		0.43	0.15	12/20/99	01/24/00	3019340	
Lead 210	2.2		1.5	1.3	12/20/99	01/24/00	3019340	
Lead 212	1.19		0.30	0.14	12/20/99	01/24/00	3019340	
Lead 214	0.95		0.33	0.22	12/20/99	01/24/00	3019340	
Potassium 40	29.0		4.4	0.9	12/20/99	01/24/00	3019340	
Thorium 234	1.28		0.63	0.30	12/20/99	01/24/00	3019340	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	1.21	J	0.60	0.87	12/16/99	01/12/00	9951222	61
Iso PLUTONIUM (SHORT CT) NAS CNLT MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.65	J	0.27	0.14	01/03/00	01/11/00	3003308	107
Plutonium 239/40	112	*	22	0.1	01/03/00	01/11/00	3003308	107

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

* For informational purposes only. The detection limit does not follow significant figures SOP.

J Result is greater than sample detection limit but less than stated reporting limit.

Data is incomplete without Case Narrative

TECHLAW, INC.

Client Sample ID: ACS-18-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 99L140165-023
Work Order: D69RD
Matrix: SOIL

Date Collected: 12/06/99 1210
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Rld #
Iso PLUTONIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.22	J	0.18	0.18	12/16/99	12/29/99	9351220	116
Plutonium 239/40	82	=	20	0.2	12/16/99	12/29/99	9351220	116
Gamma Cs-137 & Nats by HASL AM-02 MCD			pCi/g		Gamma (Cs & Nats)			
Cesium 137	0.74		0.16	0.12	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241HP	3.20		0.43	0.14	12/20/99	01/24/00	0019340	
Lead 212	1.07		0.33	0.12	12/20/99	01/24/00	0019340	
Lead 214	1.27		0.27	0.28	12/20/99	01/24/00	0019340	
Potassium 40	30.3		4.1	0.9	12/20/99	01/24/00	0019340	
Thorium 234	2.40		0.75	0.79	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MCD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.55	U	0.55	0.80	12/14/99	01/12/00	9351222	57

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

= For informational purposes only. The detection limit does not follow significant figures SOP.

J Result is greater than sample detection limit but less than stated reporting limit.

U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: ACS-12-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 791140165-024 Date Collected: 12/06/99 1215
Work Order: D69RF Date Received: 12/10/99 0910
Matrix: SOIL

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tld %
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	3.19		0.44	0.12	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Actinium 228	1.22		0.30	0.47	12/20/99	01/24/00	0019340	
Americium 241RP	12.8		1.4	0.3	12/20/99	01/24/00	0019340	
Lead 212	1.04		0.22	0.14	12/20/99	01/24/00	0019340	
Lead 214	0.94		0.20	0.13	12/20/99	01/24/00	0019340	
Potassium 40	29.3		4.1	0.9	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	3.54		0.92	0.88	12/16/99	01/12/00	9351222	59
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	-0.034	U	0.075	0.20	01/03/00	01/11/00	0031309	31
Plutonium 239/40	0.12	U	0.12	0.19	01/03/00	01/11/00	0031308	33

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Tld results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

NOV-09-2000

TECHLAW, INC.

Client Sample ID: ACS-12-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: T9114016E-02E
Work Order: D69T7
Matrix: SOLID

Date Collected: 12/06/99 1041
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Nats by NASL AM-02 MOD			pCi/g		Gamma (Cs & nats)			
Cesium 137	3.53		0.70	0.11	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241KP	23.8		2.7	0.3	12/20/99	01/24/00	0019340	
Lead 212	1.34		0.22	0.18	12/20/99	01/24/00	0019340	
Lead 214	1.22		0.20	0.24	12/20/99	01/24/00	0019340	
Potassium 40	27.8		4.2	1.3	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	20.7		4.3	1.4	12/16/99	01/12/00	9351222	37
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.43	J	0.25	0.17	01/03/00	01/11/00	0003308	76
Plutonium 239/40	0.018	U	0.062	0.14	01/03/00	01/11/00	0003308	76

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
J Result is greater than sample detection limit but less than stated reporting limit.
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: ACS-48-0

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-026
Work Order: D69T0
Matrix: SOLID

Date Collected: 12/06/99 1300
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MDD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	1.02		0.43	0.12	12/16/99	12/29/99	9351210	102
Plutonium 239/40	184	*	45	0.1	12/16/99	12/29/99	9351210	102
Gamma Cs-137 & Hits by HASL AM-02 MDD			pCi/g		Gamma (Cs & hits)			
Cesium 137	0.93		0.28	0.15	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241MP	3.70		0.47	0.17	12/20/99	01/24/00	0019340	
Lead 210	2.4		1.3	1.5	12/20/99	01/24/00	0019340	
Lead 212	1.09		0.21	0.22	12/20/99	01/24/00	0019340	
Lead 214	0.95		0.18	0.18	12/20/99	01/24/00	0019340	
Potassium 40	26.0		4.2	1.1	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MDD			* pCi/g		SR-90 BY GFPC			
Strontium 90	2.12	J	0.76	0.95	12/16/99	01/12/00	9351222	54

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
* For informational purposes only. The detection limit does not follow significant figures SOP.
J Result is greater than sample detection limit but less than stated reporting limit.

Data is incomplete without Case Narrative

NOV-09-2000

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: ACS-3-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-007
Work Order: 66977
Matrix: SOILS

Date Collected: 12/06/99 1220
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 sr/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.48	J	0.30	0.22	12/16/99	12/29/99	9351220	109
Plutonium 239/40	137	*	34	0.2	12/16/99	12/29/99	9351220	109
Gamma Cs-137 & Nlts by HASL AM-02 MOD			pCi/g		Gamma (Cs & Nlts)			
Cesium 137	0.23		0.11	0.13	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241MP	1.72		0.32	0.14	12/20/99	01/24/00	0019340	
Lead 210	1.3		1.3	1.4	12/20/99	01/24/00	0019340	
Lead 212	1.30		0.34	0.14	12/20/99	01/24/00	0019340	
Lead 214	1.31		0.37	0.19	12/20/99	01/24/00	0019340	
Potassium 40	30.0		4.5	1.1	12/20/99	01/24/00	0019340	
Thorium 234	2.34		0.75	0.89	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.89	J	0.56	0.85	12/16/99	01/22/00	9351222	56

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
* For informational purposes only. The detection limit does not follow significant figures SOP.
J Result is greater than sample detection limit but less than stated reporting limit.

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: ACS-3-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 991140169-028
Work Order: D697X
Matrix: SOLID

Date Collected: 12/06/99 1340
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.062	U	0.079	0.11	12/16/99	12/29/99	9991220	74
Plutonium 239/40	2.73		0.70	0.10	12/16/99	12/29/99	9991220	74
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	-0.060	U	0.071	0.14	12/20/99	01/24/00	3019340	
--- Other Detected Radionuclides ---								
Lead 212	1.29		0.37	0.14	12/20/99	01/24/00	3019340	
Lead 214	1.15		0.39	0.20	12/20/99	01/24/00	3019340	
Potassium 40	22.7		4.8	1.4	12/20/99	01/24/00	3019340	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.74	U	0.11	0.20	12/16/99	01/12/00	9991220	66

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

FOR • 990607 • 6902

TECHLAW, INC.

Client Sample ID: ACS-3-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 9912140165-020
Work Order: D69V9
Matrix: SOLID

Date Collected: 12/06/99 1330
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Dil %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	1.06		0.44	0.15	12/16/99	12/29/99	9351220	137
Plutonium 239/40	127	-	28	0.1	12/16/99	12/29/99	9351220	137
Gamma Cs-137 & Hits by NASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	2.84		0.39	0.13	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Actinium 228	1.49		0.28	0.42	12/20/99	01/24/00	0019340	
Americium 241N9	29.3		3.2	0.3	12/20/99	01/24/00	0019340	
Lead 212	1.69		0.22	0.26	12/20/99	01/24/00	0019340	
Lead 214	1.25		0.25	0.22	12/20/99	01/24/00	0019340	
Potassium 40	29.0		4.4	2.5	12/20/99	01/24/00	0019340	
Thorium 234	1.47		0.70	0.39	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DGR 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	3.6		1.3	0.9	12/16/99	01/12/00	9351222	54

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

* For informational purposes only. The detection limit does not follow significant figures SOP.

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: ACS-3-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L140165-029
Work Order: D69V2
Matrix: SOLID

Date Collected: 12/06/99 1400
Date Received: 12/10/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.84	J	0.37	0.15	12/16/99	12/29/99	9951210	122
Plutonium 239/40	140	-	33	0.1	12/16/99	12/29/99	9951210	122
Gamma Cs-137 & Nats by NASL AM-02 MOD			pCi/g		Gamma (Cs & Nats)			
Cesium 137	7.10		0.89	0.15	12/20/99	01/24/00	0019340	
--- Other Detected Radionuclides ---								
Americium 241MP	10.6		1.2	0.2	12/20/99	01/24/00	0019340	
Lead 212	1.49		0.26	0.20	12/20/99	01/24/00	0019340	
Lead 214	1.39		0.24	0.29	12/20/99	01/24/00	0019340	
Potassium 40	27.9		4.3	1.2	12/20/99	01/24/00	0019340	
Thallium 208	0.59		0.17	0.14	12/20/99	01/24/00	0019340	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	10.8		2.3	0.9	12/16/99	01/12/00	9951222	44

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
\- For informational purposes only. The detection limit does not follow significant figures SOP.
J Result is greater than sample detection limit but less than stated reporting limit.

Data is incomplete without Case Narrative

2969 • 7069 • 2001

TECHLAW, INC.

Client Sample ID: BC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160223-001
Work Order: D6F05
Matrix: SOLID

Date Collected: 12/13/99 1340
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.022	J	0.032	0.095	01/03/00	01/11/00	0002308	91
Plutonium 239/40	0.083	J	0.072	0.060	01/03/00	01/11/00	0002308	94

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: BC-1 DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-001K
Work Order: D6F05
Matrix: SOLID

Date Collected: 12/13/99 1340
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) WAS ONLY MED			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.108	J	0.0998	0.12	01/03/00	01/11/00	0000308	41
Plutonium 239/40	0.063	J	0.073	0.099	01/03/00	01/11/00	0000308	32

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Yld results are greater than the MDC

Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

0002-990607

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-EB

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210118-006
Work Order: D6MKE
Matrix: WATER

Date Collected: 12/16/99 1610
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Nuts by NASL AM-02 MOD				pCi/L	Gamma (Cs & Nuts)			
Cesium 137	0.5	U	8.2	14	01/18/00	01/19/00	2018145	

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analysed for but was not detected

Data is incomplete without Case Narrative

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-EB DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210113-006K
Work Order: D6MKC
Matrix: WATER

Date Collected: 12/16/99 1610
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Vld #
Gamma Cs-137 & Nuts by HASL AM-02 MOD				pCi/L	Gamma (Cs & nuts)			
Cesium 137	-0.1	U	9.6	18	01/10/00	01/19/00	2011141	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Vld results are greater than the MDC

U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

JOB • 99609 • 207

METHOD BLANK REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L140165
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Lab Sample ID Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso Pu (SHORT CT)			F9L170000-2208	
Plutonium 238	0.047	U	0.078	0.12	12/16/99	12/29/99	9911212	91
Plutonium 239/40	0.083	U	0.077	0.084	12/16/99	12/29/99	9911212	99
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g	SR-90 BY GFPC			F9L170000-2223	
Strontium 90	0.37	U	0.42	0.72	12/14/99	01/12/00	9911222	77
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso Pu (SHORT CT)			F0A030000-3082	
Plutonium 238	0.036	U	0.053	0.080	01/03/00	01/11/00	0001003	43
Plutonium 239/40	0.020	U	0.046	0.034	01/03/00	01/11/00	0001003	47
Gamma Cs-137 & Nits by HASL AM-02 MOD			pCi/g	Gamma (Cs & nats)			F0A190000-3403	
Cesium 137	-0.0008	U ?	0.039	0.074	12/20/99	01/24/00	0013240	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only

Bold results are greater than the MDC

? For informational purposes only. The result does not follow significant figures SOP

U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

METHOD BLANK REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L140163
Matrix: WATER

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Lab Sample ID Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/L	Iso Pu (SHORT CT)			F9L220000-205B	
Plutonium 238	0.04	U	0.14	0.15	12/15/99	12/22/99	4314281	64
Plutonium 239/40	-0.035	U	0.035	0.22	12/15/99	12/22/99	3356201	60
SR-90 BY GFPC SW846 7500-SR MOD			pCi/L	SR-90 BY GFPC			F0A250000-192B	
Strontium 90	-0.08	U	0.41	0.73	01/05/00	01/21/00	0005132	44
Gamma Cs-137 & Hits by KAGL AM-02 MOD			pCi/L	Gamma (Cs & hits)			F0A180000-142B	
Americium 241	-4.4	U	8.3	15	01/18/00	01/20/00	0018145	
Cesium 137	-4.6	U	7.5	16	01/18/00	01/20/00	0018145	
Cobalt 60	11	U	10	24	01/18/00	01/20/00	0018145	
Invalid	0.0		0.0	0.0	01/18/00	01/20/00	0018145	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only

Yield results are greater than the MDC

* For informational purposes only. The result does not follow significant figures SOP

U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

296.70699.NOB

Quanterra - St. Louis

DUPLICATE EVALUATION REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L140165
Work Order #: D69R
Matrix: SOLID

Date Sampled: 12/06/99
Date Received: 12/10/99

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result		Total Uncert. (2 σ+/-)	% Yld	QC Sample ID Precision	
Gamma Cs-137 & Nats by HASL	pCi/g				Gamma (Cs & Nats)				F9L140165-020	
Cesium 137	0.079	U	0.060		0.022	U	0.059		104	.RPD
---Other Detected Radionuclides---										
Americium 241M?	0.19		0.13		0.174		0.088		11	RPD
Lead 212	0.67		0.24		0.67		0.19		0.4	RPD
Lead 214	0.53		0.24		0.57		0.20		7	RPD
Potassium 40	28.3		4.1		27.0		3.9		4	RPD
	Batch #:		3019340 (Sample)		3019340 (Duplicate)					

NOTE(S)

Data are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

U Analyte analyzed for but was not detected

Data is incomplete without Case Narrative

Quanterra - St. Louis

Laboratory Control Sample Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9114C165
Matrix: SOLID

Parameter	Spike Amount	Result		Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec		Lab Sample ID / QC Control Limits
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD pCi/g					Iso Pu (SHORT CT)				FCA030000-308C
Plutonium 238	10.6	9.6	-	2.0	0.38	72	91	-	63 - 129
Plutonium 239/40	12.4	11.8	-	2.3	0.34	72	95	-	68 - 124
Batch #: 3003308					Analysis Date 01/11/00				
Gamma Cs-137 & Mats by HASL AM-02 MOD pCi/g					Gamma (Cs & Mats)				FCA190000-340C
Cesium 137	18900	18100	-	3000	70		96	-	58 - 117
Batch #: 0319340					Analysis Date 01/24/00				
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD pCi/g					Iso Pu (SHORT CT)				F9L170000-210C
Plutonium 239/40	6.21	6.5	-	1.5	0.34	[illegible]	105	-	64 - 132
Batch #: 9951210					Analysis Date 12/20/99				
SR-90 BY GFPC DOE 7500-SR MOD pCi/g					SR-90 BY GFPC				F9L170000-220C
Strontium 90	5.45	5.3		1.2	0.7	76	98		49 - 126
Batch #: 9951222					Analysis Date 12/20/99				

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.

Data is incomplete without Case Narrative

296.70669.209

Quanterra - St. Louis

Laboratory Control Sample Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9214C161
Matrix: WATER

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Rec	% Rec	Lab Sample ID QC Control Limits
SR-90 BY GFPC SMWW 7500-SR MOD		pCi/L		SR-90 BY GFPC			F0A050000-192C
Strontium 90	9.72	10.4	2.2	3.7	44	107	24 - 126
	Batch #:	0000192		Analysis Date=	12/03/00		
Gamma Cs-137 & Kits by HASL AM-02 MOD		pCi/L		Gamma (Cs & kits)			F0A180000-143C
Cesium 137	25300	26300	2300	100		104	88 - 117
	Batch #:	0019143		Analysis Date=	11/20/00		

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.

Data is incomplete without Case Narrative

Quanterra - St. Louis

Laboratory Control Sample/LCS Duplicate Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L140165
Matrix: WATER

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	% Rld	% Rec	QC Control Limits	Lab Sample ID Precision	
Iso PLUTONIUM (SHORT CT) NAS ONLY MED		pCi/L	Iso Pu (SHORT CT)				F9L220000-203C	
Plutonium 238	10.4	9.9	2.5	79	93	(67 - 120)		
Spk 2	10.4	8.6	2.1	82	81	(67 - 120)	13	*RPD
Plutonium 239/40	12.4	11.4	2.9	78	92	(67 - 120)		
Spk 2	12.4	10.3	2.6	82	83	(67 - 120)	9	*RPD
	Batch #: 9306201			Analysis Date		12-22-96		

NOTE(S)

Calculations are performed before rounding to avoid round-off error in calculated results

* For informational purposes only. The detection limit does not follow significant figures SOP.

Data is incomplete without Case Narrative

2966.70699.210

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Quanterra
Environmental Services

ANALYTICAL REPORT

PROJECT NO. TECHLAW

Phase 2

Lot #: P9L220152

Julie Shanahan

Techlaw
750 N. St. Paul
Dallas, TX 75201

QUANTERRA INCORPORATED

Rob Martino
Project Manager

January 27, 2000

CASE NARRATIVE

Lot # F9L220151

I. Introduction

On December 18, 1999, samples were received at the Quanterra St. Louis laboratory from Techlaw. A copy of the chain of custody and the condition upon receipt report is included with the analytical data.

III. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

IV. Comments/Nonconformances

<u>Strontium 90</u>

There were no anomalies associated with this analysis.

<u>Isouranium</u>

There were no anomalies associated with this analysis.

<u>Gamma</u>

There were no anomalies associated with this analysis.

<u>Isoplutonium</u>

There were no anomalies associated with this analysis.

<u>ABT</u>

The percent RPD for the sample and sample duplicate in the beta analysis is at 55% which is outside the QC limits.

Lanterra - St. Louis

METHODS SUMMARY

F9L220151

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Cs-137 & Kids by Gamma GAMMA SPEC MULTI ISO CAL	HASL Gamma (Cs	
Gross Alpha/Beta by GFPC TH230/Sr90-Y90 cal	DOE GROSS A/B	
Isotopic Pu by Alpha Spe Alpha Spectroscopy	NAS Iso Pu (SHO	
Isotopic U by Alpha Spec Alpha Spectroscopy	NAS Iso U (SHOR	
STRONTIUM 90 Sr90-Y90 cal	DOE SR-90 BY GF	

References:

DOE "DOE METHODS FOR EVALUATING ENVIRONMENTAL AND WASTE MANAGEMENT SAMPLES" OCTOBER 1994 US DEPARTMENT OF ENERGY

HASL Health and Safety Laboratory

NAS National Academy of Science

2969.7069.212

Quanterra - St. Louis

SAMPLE SUMMARY

F9L220151

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
D6PQP	001	PC-1		
D6PQR	002	PC-2	12/16/99	20:20
D6PQV	003	PC-3	12/16/99	21:05
D6PQW	004	PC-4	12/16/99	22:30
D6PR0	005	PC-5	12/16/99	22:20
D6PR2	006	AC-1	12/16/99	22:30
D6PR6	007	AC-2	12/16/99	15:40
D6PR7	008	AC-3	12/16/99	15:25
D6PR8	009	AC-4	12/16/99	14:50
D6PR9	010	AC-5	12/16/99	14:25
D6PRA	011	CC-1	12/16/99	14:00
D6PRC	012	CC-2	12/15/99	15:45
D6PRE	013	CC-3	12/15/99	15:25
D6PRG	014	CC-4	12/15/99	14:45
D6PRH	015	CC-5A	12/15/99	14:25
			12/15/99	22:30

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

TECHLAW, INC.

Client Sample ID: PC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L120151-001
Work Order: D62CP
Matrix: SOLID

Date Collected: 12/16/99 1020
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.1	U	0.11	0.20	01/03/00	01/14/00	0003211	78
Plutonium 239/40	0.034	U -	0.035	0.091	01/03/00	01/14/00	0003211	79
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.91	J	0.39	0.14	01/03/00	01/13/00	0003268	83
Uranium 235	0.035	U -	0.071	0.096	01/03/00	01/13/00	0003268	83
Uranium 238	0.82	J	0.36	0.14	01/03/00	01/13/00	0003268	83
Gamma Cs-137 & Rats by HASL AM-02 MOD				pCi/g	Gamma (Cs & Rats)			
Cesium 137	0.41		0.14	0.15	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 210	2.6		1.4	1.2	12/23/99	01/04/00	0003180	
Lead 212	1.18		0.34	0.16	12/23/99	01/04/00	0003180	
Lead 214	1.01		0.33	0.24	12/23/99	01/04/00	0003180	
Potassium 40	20.1		4.2	1.5	12/23/99	01/04/00	0003180	
Thallium 208	0.32		0.16	0.22	12/23/99	01/04/00	0003180	
GROSS A/B BY DCE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	19.3		5.0	4.1	01/10/00	01/11/00	0010176	
Gross Beta	20.6		5.0	4.8	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.55	U	0.47	0.75	01/12/00	01/25/00	0011254	

DEF(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Yld results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: PC-1 DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 991220151-001X
Work Order: D6PQ7
Matrix: SOLID

Date Collected: 12/16/99 1020
Date Received: 12/18/99 0820

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Dil #
Gamma Cs-137 & Nits by HASL AM-02 MOD				pCi/g	Gamma (Cs & Nits)			
Cesium 137	0.43		0.19	0.17	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 210	4.0		2.1	1.6	12/23/99	01/04/00	0003180	
Lead 212	1.10		0.24	0.20	12/23/99	01/04/00	0003180	
Lead 214	0.95		0.23	0.25	12/23/99	01/04/00	0003180	
Potassium 40	22.0		3.3	1.2	12/23/99	01/04/00	0003180	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.098	U *	0.096	0.12	01/03/00	01/14/00	0003312	96
Plutonium 239/40	-0.014	U *	0.014	0.086	01/03/00	01/14/00	0003312	96
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.96	J	0.38	0.22	01/03/00	01/13/00	0003368	56
Uranium 235	0.38	U	0.10	0.14	01/03/00	01/13/00	0003368	56
Uranium 238	1.05		0.40	0.11	01/03/00	01/13/00	0003368	56
GROSS A/B BY DCX RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	12.2		3.7	3.2	01/10/00	01/11/00	0010176	
Gross Beta	17.4		2.3	4.6	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCX 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.10	U	0.47	0.80	01/12/00	01/25/00	0011294	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

*. For informational purposes only. The detection limit does not follow significant figures SOP.

' Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: PC-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L220151-002 Date Collected: 12/16/99 1105
Work Order: D6PGR Date Received: 12/18/99 0830
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.063	U -	0.070	0.12	01/03/00	01/14/00	0000210	95
Plutonium 239/40	0.040	U -	0.050	0.043	01/03/00	01/14/00	0000210	95
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.85	J	0.35	0.07	01/03/00	01/12/00	0000368	55
Uranium 235	0.060	U -	0.086	0.081	01/03/00	01/12/00	0000368	55
Uranium 238	0.77	J	0.33	0.12	01/03/00	01/12/00	0000368	55
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	0.054	U -	0.096	0.19	12/23/99	01/04/00	0000180	
--- Other Detected Radionuclides ---								
Lead 212	1.27		0.25	0.20	12/23/99	01/04/00	0000180	
Lead 214	0.94		0.24	0.24	12/23/99	01/04/00	0000180	
Potassium 40	23.3		4.3	1.6	12/23/99	01/04/00	0000180	
Thallium 208	0.46		0.14	0.15	12/23/99	01/04/00	0000180	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	22.0		5.7	5.5	01/10/00	01/11/00	0010176	
Gross Beta	32.5		5.7	6.0	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.20	U	0.45	0.77	01/12/00	01/25/00	0011224	

CTE(S)

ata are incomplete without the case narrative.

DC is determined by instrument performance only.

old results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

uanterra - St. Louis

TECHLAW, INC.

Client Sample ID: PC-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L220181-003
Work Order: D6PQV
Matrix: SOLID

Date Collected: 12/16/99 1100
Date Received: 12/18/99 0811

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Mid %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.035	U -	0.077	0.17	01/03/00	01/14/00	0002212	99
Plutonium 239/40	0.006	U -	0.045	0.13	01/03/00	01/14/00	0002212	38
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.73	J	0.21	0.16	01/03/00	01/13/00	0002268	58
Uranium 235	0.014	U -	0.037	0.16	01/03/00	01/13/00	0002268	12
Uranium 238	0.85	J	0.24	0.13	01/03/00	01/13/00	0002268	55
Gamma Cs-137 & Nits by NASL AM-02 MOD				pCi/g	Gamma (Cs & Nits)			
Cesium 137	0.24		0.18	0.19	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 210	3.4		1.5	1.5	12/23/99	01/04/00	0003180	
Lead 212	1.12		0.24	0.19	12/23/99	01/04/00	0003180	
Lead 214	1.17		0.23	0.29	12/23/99	01/04/00	0003180	
Potassium 40	23.3		4.7	1.7	12/23/99	01/04/00	0003180	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	21.2		5.2	4.0	01/10/00	01/11/00	0010176	
Gross Beta	30.4		5.3	3.5	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.26	U	0.40	0.68	01/12/00	01/23/00	0011334	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: PC-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 79L220131-004
Work Order: D6PGW
Matrix: SOLID

Date Collected: 12/16/99 [illegible]
Date Received: 12/18/99 [illegible]

Parameter	Result	Qual	Total Uncert. (2 sigma/-)	MDC	Prep Date	Analysis Date	Batch #	Vial #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.12	U	0.12	0.17	01/03/00	01/14/00	0003211	12
Plutonium 239/40	0.007	U -	0.021	0.02	01/03/00	01/14/00	0003211	12
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.72		0.32	0.16	01/03/00	01/12/00	0003368	34
Uranium 235	0.025	U -	0.064	0.15	01/03/00	01/12/00	0003368	34
Uranium 238	1.28		0.44	0.12	01/03/00	01/12/00	0003368	34
Gamma Cs-137 & Hits by NASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	0.37		0.24	0.13	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 212	1.22		0.21	0.21	12/23/99	01/04/00	0003180	
Lead 214	0.95		0.35	0.18	12/23/99	01/04/00	0003180	
Potassium 40	24.0		4.2	2.3	12/23/99	01/04/00	0003180	
GROSS A/B BY DCE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	19.7		4.9	4.0	01/10/00	01/11/00	0010176	
Gross Beta	30.6		5.4	5.0	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.29	U	0.41	0.68	01/12/00	01/21/00	0011214	

NOTE(S)

ata are incomplete without the case narrative.
DC is determined by instrument performance only.
old results are greater than the MDC
.For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: PC-5

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L220181-005
Work Order: D6PR0
Matrix: SOLID

Date Collected: 12/16/99 1220
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.042	U -	0.072	0.12	01/03/00	01/14/00	0000212	92
Plutonium 239/40	-0.0000009	U ? -	0.028	0.095	01/03/00	01/14/00	0000212	92
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium-234	0.83	U	0.33	0.24	01/03/00	01/13/00	0000268	61
Uranium 235	0.076	U -	0.097	0.12	01/03/00	01/13/00	0000268	61
Uranium-238	0.89	U	0.32	0.24	01/03/00	01/13/00	0000268	61
Gamma Cs-137 & Nlts by NASL AM-02 MOD				pCi/g	Gamma (Cs & Nlts)			
Cesium 137	0.232	U -	0.087	0.18	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 212	1.20		0.36	0.21	12/23/99	01/04/00	0003180	
Lead 214	1.26		0.42	0.23	12/23/99	01/04/00	0003180	
Potassium 40	22.2		3.9	1.7	12/23/99	01/04/00	0003180	
GROSS A/B BY DCE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	19.4		4.8	4.0	01/10/00	01/11/00	0010176	
Gross Beta	34.7		5.5	5.3	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.14	U	0.40	0.69	01/12/00	01/23/00	0011284	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

? For informational purposes only. The detection limit does not follow significant figures SOP.

, For informational purposes only. The result does not follow significant figures SOP

U - Analyte analyzed for but was not detected

anterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 791220151-006 Date Collected: 12/16/99 1540
Work Order: D6PR2 Date Received: 12/18/99 0800
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tld #
Lab PLUTONIUM (SHORT CT) NAS ONLY MDC				pCi/g		Lab Pu (SHORT CT)		
Plutonium 238	0.040	U -	0.039	0.11	01/03/00	01/14/00	0000310	96
Plutonium 239/240	0.050	U -	0.038	0.092	01/03/00	01/14/00	0000310	96
Lab URANIUM (SHORT CT) NAS ONLY MDC				pCi/g		Lab U (SHORT CT)		
Uranium 234	1.62		0.51	0.16	01/03/00	01/13/00	0000368	93
Uranium 235	0.054	U -	0.089	0.17	01/03/00	01/13/00	0000368	93
Uranium 238	2.66		0.75	0.24	01/03/00	01/13/00	0000368	93
Gamma Cs-137 6 Hits by HASL AM-02 MDC				pCi/g		Gamma (Cs 6 hits)		
Cesium 137	0.39		0.16	0.15	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Actinium 228	1.14		0.34	0.46	12/23/99	01/04/00	0003180	
Lead 210	2.9		1.6	2.3	12/23/99	01/04/00	0003180	
Lead 212	1.30		0.25	0.20	12/23/99	01/04/00	0003180	
Lead 214	1.09		0.22	0.27	12/23/99	01/04/00	0003180	
Potassium 40	27.7		4.8	1.8	12/23/99	01/04/00	0003180	
GROSS A/B BY DOE RP-710 MDC				pCi/g		GROSS A/B		
Gross Alpha	24.6		5.1	3.1	01/10/00	01/11/00	0010176	
Gross Beta	39.6		5.5	4.4	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DOE 7500-SR MDC				pCi/g		SR-90 BY GFPC		
Strontium 90	-0.47	U	0.44	0.78	01/12/00	01/21/00	0011014	

NOTES:

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

\- For informational purposes only. The detection limit does not follow significant figures SOP.

U Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: AC-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9122[illegible]-007
Work Order: D6PR6
Matrix: SOLID

Date Collected: 12/18/99 1[illegible]
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Std #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.14	U	0.11	0.15	01/12/00	01/14/00	0002[illegible]	40
Plutonium 239/40	-0.021	U *	0.033	0.24	01/12/00	01/14/00	0002[illegible]	40
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.30		0.54	0.28	01/03/00	01/13/00	0002368	35
Uranium 235	-0.30	U	0.15	0.28	01/03/00	01/13/00	0002368	35
Uranium 238	1.28		0.54	0.22	01/03/00	01/13/00	0002368	35
Gamma Cs-137 & Hits by NASL AM-02 MOD			pCi/g		Gamma (Cs & hits)			
Cesium 137	0.14	U	0.16	0.17	12/23/99	01/04/00	0002180	
--- Other Detected Radionuclides ---								
Lead 210	3.5		1.3	1.4	12/23/99	01/04/00	0002180	
Lead 212	1.43		0.23	0.23	12/23/99	01/04/00	0002180	
Lead 214	1.02		0.26	0.28	12/23/99	01/04/00	0002180	
Potassium 40	29.9		5.3	2.3	12/23/99	01/04/00	0002180	
GROSS A/B BY DCE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	19.9		4.9	3.8	01/10/00	01/11/00	0010176	
Gross Beta	40.8		6.0	5.1	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.23	U	0.36	0.41	01/12/00	01/25/00	0011254	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Dual results are greater than the MDC

* For informational purposes only. The detection limit does not follow significant figures SOP.

U Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 991220151-008
Work Order: D6FR7
Matrix: SOLID

Date Collected: 12/16/99 1450
Date Received: 12/18/99 1330

Parameter	Result	Qual	Total Unsert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
Iso PLUTONIUM (SHORT CT) NAS ONLY MDD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.129	J -	0.097	0.097	01/03/00	01/14/00	0003310	74
Plutonium 239/40	0.025	U -	0.044	0.057	01/03/00	01/14/00	0003310	74
Iso URANIUM (SHORT CT) NAS ONLY MDD			pCi/g		Iso U (SHORT CT)			
Uranium 234	0.93	J	0.36	0.12	01/03/00	01/12/00	0003368	50
Uranium 235	0.15	U	0.14	0.17	01/03/00	01/12/00	0003368	50
Uranium 238	1.34		0.46	0.22	01/03/00	01/12/00	0003368	50
Gamma Cs-137 & Nlts by HASL AM-02 MDD			pCi/g		Gamma (Cs & Nlts)			
Cesium 137	0.36		0.14	0.14	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 210	4.2		1.4	1.3	12/23/99	01/04/00	0003180	
Lead 212	1.38		0.36	0.16	12/23/99	01/04/00	0003180	
Lead 214	1.16		0.41	0.20	12/23/99	01/04/00	0003180	
Potassium 40	28.2		4.4	1.5	12/23/99	01/04/00	0003180	
Thorium 234	1.96		0.79	0.38	12/23/99	01/04/00	0003180	
GROSS A/B BY DOE RP-710 MDD			pCi/g		GROSS A/B			
Gross Alpha	28.4		5.9	3.7	01/10/00	01/11/00	0010176	
Gross Beta	42.0		4.1	5.5	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DOE 7500-SR MDD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.31	U	0.38	0.60	01/12/00	01/25/00	0011234	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: AC-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L120151-009 Date Collected: 12/16/99 1425
Work Order: D6FR8 Date Received: 12/18/99 0830
Matrix: SOLID

Parameter	Result	Qual	Total Unceert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Xlt #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.010	U -	0.007	0.080	01/03/00	01/14/00	0003210	86
Plutonium 239/40	0.010	U -	0.005	0.004	01/03/00	01/14/00	0003210	86
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.22		0.43	0.1	01/03/00	01/13/00	0003368	91
Uranium-235	0.046	U -	0.073	0.12	01/03/00	01/13/00	0003368	91
Uranium 238	1.55		0.50	0.12	01/03/00	01/13/00	0003368	91
Gamma Cs-137 & Nlts by HASL AM-02 MOD			pCi/g		Gamma (Cs & Nlts)			
Cesium 137	0.37		0.14	0.14	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 212	1.04		0.29	0.20	12/23/99	01/04/00	0003180	
Lead 214	0.91		0.33	0.19	12/23/99	01/04/00	0003180	
Potassium 40	28.4		4.3	0.8	12/23/99	01/04/00	0003180	
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	22.6		5.4	4.4	01/10/00	01/11/00	0010175	
Gross Beta	43.1		6.8	6.3	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.22	U	0.40	0.67	01/12/00	01/25/00	0011354	

OTE(S)

ata are incomplete without the case narrative.
DC is determined by instrument performance only.
ald results are greater than the MDC
For informational purposes only. The detection limit does not follow significant figures SOP.
Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-5

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9122015I-010 Date Collected: 12/15/99 1400
Work Order: D6PR9 Date Received: 12/15/99 0930
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Tic #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.027	U -	0.051	0.11	01/03/00	01/14/00	0003310	1*
Plutonium 239/240	-0.0097	U -	0.0099	0.083	01/03/00	01/14/00	0003310	1*
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.81	J	0.33	0.22	01/03/00	01/13/00	0003368	50
Uranium 235	0.032	U -	0.082	0.16	01/03/00	01/13/00	0003368	50
Uranium 238	1.35		0.39	0.21	01/03/00	01/13/00	0003368	50
Gamma Cs-137 & Nats by NASL AM-02 MOD				pCi/g	Gamma (Cs & Nats)			
Cesium 137	0.12	U	0.11	0.21	12/21/99	01/04/00	0002180	
--- Other Detected Radionuclides ---								
Lead 210	3.2		1.6	1.6	12/23/99	01/04/00	0002180	
Lead 212	1.07		0.22	0.22	12/23/99	01/04/00	0002180	
Lead 214	1.06		0.23	0.25	12/23/99	01/04/00	0002180	
Potassium 40	28.5		4.5	1.2	12/23/99	01/04/00	0002180	
GROSS A/B BY DCE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	13.8		4.7	3.2	01/10/00	01/11/00	0010176	
Gross Beta	39.7		5.9	5.1	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.04	U	0.43	0.72	01/12/00	01/21/00	0011254	

DEF(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Detected results are greater than the MDC
* For informational purposes only. The detection limit does not follow significant figures SOP.

[illegible]

TECHLAW, INC.

Client Sample ID: CC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 991220181-011
Work Order: D6PRA
Matrix: SOLID

Date Collected: 12/15/99 1343
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.23	J	0.13	0.17	01/03/00	01/14/00	0002212	71
Plutonium 239/40	0.217	U	0.[illegible]	0.12	01/03/00	01/14/00	0002212	71
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	0.89	J	0.48	0.19	01/03/00	01/12/00	0002368	30
Uranium 235	0.34	U	0.12	0.24	01/03/00	01/12/00	0002368	30
Uranium 238	1.3	J	0.48	0.22	01/03/00	01/12/00	0002368	30
Gamma Cs-137 & Nits by NASL AM-02 MOD			pCi/g		Gamma (Cs & Nits)			
Cesium 137	-0.04	U	0.12	0.22	12/23/99	01/04/00	0002180	
--- Other Detected Radionuclides ---								
Lead 210	3.7		1.6	1.4	12/23/99	01/04/00	0002180	
Lead 212	1.02		0.22	0.25	12/23/99	01/04/00	0002180	
Lead 214	1.16		0.24	0.24	12/23/99	01/04/00	0002180	
Potassium 40	24.7		4.5	2.4	12/23/99	01/04/00	0002180	
GROSS A/B BY DCE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	17.1		4.4	3.5	01/10/00	01/11/00	0010176	
Gross Beta	37.0		5.8	5.4	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	-0.02	U	0.37	0.62	01/12/00	01/28/00	0011254	

NOTE(S)

Ts are incomplete without the case narrative.

C is determined by instrument performance only.

Id results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: CC-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L220151-012
Work Order: D6PRC
Matrix: SOLID

Date Collected: 12/15/99 1511
Date Received: 12/17/99 0910

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Std %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.039	U -	0.039	0.12	01/03/00	01/14/00	0000310	94
Plutonium 239/40	-0.002*	U -	0.0033	0.066	01/03/00	01/14/00	0000310	96
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.68	U	0.28	0.14	01/03/00	01/13/00	0000368	66
Uranium 235	0.029	U -	0.070	0.17	01/03/00	01/13/00	0000368	66
Uranium 238	0.72	U	0.29	0.22	01/03/00	01/13/00	0000368	66
Gamma Cs-137 & Rlts by HASL AM-02 MOD				pCi/g	Gamma (Cs & Rlts)			
Cesium 137	0.13	U	0.10	0.17	12/23/99	01/04/00	0002180	
--- Other Detected Radionuclides ---								
Lead 210	2.7		1.3	1.4	12/23/99	01/04/00	0002180	
Lead 212	1.26		0.34	0.22	12/23/99	01/04/00	0002180	
Lead 214	1.02		0.37	0.24	12/23/99	01/04/00	0002180	
Potassium 40	22.8		4.0	1.0	12/23/99	01/04/00	0002180	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	20.4		5.4	4.8	01/10/00	01/11/00	0010176	
Gross Beta	27.3		5.6	6.7	01/10/00	01/11/00	0010176	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	-0.17*	U	0.26	0.65	01/12/00	01/21/00	0011214	

Qualifiers(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Reported results are greater than the MDC

Value for informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: CC-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 791220181-013
Work Order: D6FRE
Matrix: SOLID

Date Collected: 12/18/99 1445
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso Pu (SHORT CT)		
Plutonium 238	0.012	U -	0.097	0.13	01/03/00	01/14/00	0003310	88
Plutonium 239/40	0.034	U -	0.033	0.11	01/03/00	01/14/00	0003310	88
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso U (SHORT CT)		
Uranium 234	0.82	J	0.40	0.13	01/03/00	01/13/00	0003368	38
Uranium 235	0.0	U	0.0	0.1	01/03/00	01/13/00	0003368	38
Uranium 238	1.04		0.46	0.1	01/03/00	01/13/00	0003368	38
Gamma Cs-137 & Nuts by HASL AM-02 MOD				pCi/g		Gamma (Cs & Nuts)		
Cesium 137	0.012	U -	0.095	0.17	12/22/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 212	1.17		0.33	0.23	12/23/99	01/04/00	0003180	
Lead 214	1.0		0.36	0.20	12/23/99	01/04/00	0003180	
Potassium 40	26.6		4.6	1.7	12/23/99	01/04/00	0003180	
GROSS A/B BY DCE AP-710 MOD				pCi/g		GROSS A/B		
Gross Alpha	18.8		5.3	4.2	01/10/00	01/12/00	0010176	
Gross Beta	35.3		6.2	6.3	01/10/00	01/12/00	0010176	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g		SR-90 BY GFPC		
Strontium 90	0.33	U	0.55	0.37	01/12/00	01/25/00	0011354	

CTT(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Yield results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: CC-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 79L220151-014
Work Order: D62RG
Matrix: SOLID

Date Collected: 12/16/99 1415
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso Pu (SHORT CT)		
Plutonium 238	0.11	U	0.11	0.16	01/03/00	01/14/00	0003210	32
Plutonium 239/40	0.007	J	0.036	0.11	01/03/00	01/14/00	0003210	32
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso U (SHORT CT)		
Uranium 234	1.22		0.50	0.18	01/03/00	01/12/00	0003368	37
Uranium 235	0.14	J	0.16	0.12	01/03/00	01/12/00	0003368	37
Uranium 238	1.38		0.48	0.20	01/03/00	01/12/00	0003368	37
Gamma Cs-137 & Nats by HASL AM-02 MOD				pCi/g		Gamma (Cs & Nats)		
Cesium 137	0.10	U	0.10	0.21	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 210	3.8		1.5	1.8	12/23/99	01/04/00	0003180	
Lead 212	1.23		0.23	0.25	12/23/99	01/04/00	0003180	
Lead 214	1.03		0.22	0.25	12/23/99	01/04/00	0003180	
Potassium 40	28.8		4.7	1.4	12/23/99	01/04/00	0003180	
GROSS A/B BY DCE RP-710 MOD				pCi/g		GROSS A/B		
Gross Alpha	22.5		5.3	4.2	01/10/00	01/12/00	0010174	
Gross Beta	27.4		6.0	6.3	01/10/00	01/12/00	0010174	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g		SR-90 BY GFPC		
Strontium 90	-0.06	U	0.33	0.39	01/12/00	01/21/00	0011234	

ID(S)

s are incomplete without the case narrative.

I is determined by instrument performance only.

d results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: CC-SA

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9122015[illegible]-01[illegible]
Work Order: D6PRM
Matrix: SOLID

Date Collected: 12/15/99 1030
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Vld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso Pu (SHORT CT)		
Plutonium 238	-0.006	U -	0.016	0.16	01/03/00	01/14/00	0003210	81
Plutonium 239/40	0.008	U -	0.031	0.082	01/03/00	01/14/00	0003210	81
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso U (SHORT CT)		
Uranium 234	1.07		0.41	0.10	01/03/00	01/13/00	0003368	54
Uranium 235	0.12	J	0.13	0.08	01/03/00	01/13/00	0003368	54
Uranium 238	0.87	J	0.36	0.10	01/03/00	01/13/00	0003368	54
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g		Gamma (Cs & hits)		
Cesium 137	-0.05	U	0.12	0.22	12/23/99	01/04/00	0003180	
--- Other Detected Radionuclides ---								
Lead 210	2.7		1.3	1.5	12/23/99	01/04/00	0003180	
Lead 212	1.45		0.26	0.17	12/23/99	01/04/00	0003180	
Lead 214	1.35		0.24	0.22	12/23/99	01/04/00	0003180	
Potassium 40	25.2		4.8	1.9	12/23/99	01/04/00	0003180	
GROSS A/B BY DOE RP-710 MOD				pCi/g		GROSS A/B		
Gross Alpha	29.9		6.6	4.5	01/10/00	01/12/00	0010276	
Gross Beta	36.4		5.8	3.6	01/10/00	01/12/00	0010276	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g		SR-90 BY GFPC		
Strontium 90	0.01	U	0.41	0.72	01/12/00	01/25/00	0011214	

NOTE(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Vld results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analyzed for but was not detected

Quanterra - St. Louis

METHOD BLANK REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L220161
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Lab Sample ID Batch #	Yld %
Gamma Cs-137 & Nits By HASL AM-02 MOD			pCi/g	Gamma (Cs & nits)			FGA030000-180B	
Cesium 137	0.033	U	0.044	0.10	12/22/99	01/04/00	0002130	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso Pu (SHORT CT)			FGA030000-310B	
Plutonium 238	0.024	U *	0.050	0.11	01/03/00	01/14/00	0002212	41
Plutonium 239/40	0.019	U *	0.035	0.047	01/03/00	01/14/00	0002212	41
GROSS A/B BY DOE RP-710 MOD			pCi/g	GROSS A/B			FGA100000-176B	
Gross Alpha	-0.2	U	2.2	4.4	01/10/00	01/12/00	0010176	
Gross Beta	2.7	U	2.3	4.5	01/10/00	01/12/00	0010176	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g	SR-90 BY GFPC			FGA120000-254B	
Strontium 90	0.21	U	0.42	0.71	01/12/00	01/25/00	0011254	49
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso U (SHORT CT)			FGA030000-363B	
Uranium 234	0.009	U *	0.046	0.14	01/03/00	01/13/00	0002348	42
Uranium 235	0.0	U *	0.0	0.07	01/03/00	01/13/00	0002348	42
Uranium 238	-0.013	U *	0.035	0.14	01/03/00	01/13/00	0002348	42

DES (S)

Data are incomplete without the case narrative.

U is determined using instrument performance only

Yld results are greater than the MDC

* For informational purposes only. The detection limit does not follow significant figures SOP.

Analyte analysed for but was not detected

:anterra - St. Louis

DUPLICATE EVALUATION REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L220131
Work Order #: 3620
Matrix: SOIL

Date Sampled: 12/16/99
Date Received: 12/18/99

Parameter	SAMPLE Result	Total Unsert. (2σ+/-)	% Rld	DUPLICATE Result	Total Unsert. (2 σ+/-)	% Rld	QC Sample ID Precision	
Gamma Cs-137 & Nats by HASL	pCi/g			Gamma (Cs & nats)			F9L220131-001	
Cesium 137	0.41	0.14		0.43	0.13		4	RPD
---Other Detected Radionuclides---								
Lead 210	2.4	1.4		4.3	2.1		44	*RPD
Lead 212	1.18	0.34		1.10	0.34		*	*RPD
Lead 214	1.01	0.33		0.95	0.33		6	*RPD
Potassium-40	20.1	4.2		22.0	3.9		9	*RPD
	Batch #:	0003180	(Sample)		0003180	(Duplicate)		
Iso PLUTONIUM (SHORT CT)	pCi/g			Iso Pu (SHORT CT)			F9L220131-001	
Plutonium 238	0.1	U	0.11	79	0.098	U	0.094	96	3.3	*RPD
Plutonium 239/240	0.024	U	0.035	79	-0.016	U	0.024	94	545	*RPD
	Batch #:	0003310	(Sample)		0003310	(Duplicate)				
Iso URANIUM (SHORT CT)	pCi/g			Iso U (SHORT CT)			F9L220131-001	
Uranium 234	0.91	U	0.39	93	0.96	U	0.38	54	6	*RPD
Uranium 235	0.032	U	0.071	93	0.04	U	0.10	54	79	*RPD
Uranium 238	0.82	U	0.36	93	1.05		0.40	54	24	*RPD
	Batch #:	0003368	(Sample)		0003368	(Duplicate)				
GROSS A/B BY DOE RP-710 MOD	pCi/g			GROSS A/B			F9L220131-001	
Gross Alpha	19.3	5.0		13.2	3.7		38	*RPD
Gross Beta	22.6	5.0		17.4	3.8		55	*RPD
	Batch #:	0010174	(Sample)		0010174	(Duplicate)		
SR-90 BY GFPC DOE 7500-SR	pCi/g			SR-90 BY GFPC			F9L220131-001	
Strontium 90	0.25	U	0.47	0.10	U	0.47	138	*RPD
	Batch #:	0011354	(Sample)		0011354	(Duplicate)		

:TE(S)

ts are incomplete without the case narrative.
lculations are performed before rounding to avoid round-off error in calculated results

For informational purposes only. The detection limit does not follow significant figures SOP.

. Analyte analyzed for but was not detected

Quanterra - St. Louis

Laboratory Control Sample Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L220111
Matrix: SOLID

Parameter	Spike Amount	Result		Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec		Lab Sample ID / QC Control Limits
Gamma Cs-137 & Hits by HASL AM-02 MOD pCi/g					Gamma (Cs & hits)				F0A030000-180C
Cesium 137	18900	18400	-	2100	40		97	-	98 - 117
	Batch #:	0C03180			Analysis Date	01/04/00			
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD pCi/g					Iso Pu (SHORT CT)				F0A030000-213C
Plutonium 238	5.29	5.1	-	1.0	0.1	95	97	-	48 - 126
Plutonium 239/40	5.21	5.9	-	1.0	0.06	95	111	-	48 - 126
	Batch #:	0C02210			Analysis Date	01/14/00			
Iso URANIUM (SHORT CT) NAS ONLY MOD pCi/g					Iso U (SHORT CT)				F0A030000-268C
Uranium 234	5.21	5.1		1.0	0.1	98	117		41 - 123
Uranium 238	5.21	5.6	-	1.0	0.07	98	127	-	41 - 123
	Batch #:	0C03268			Analysis Date	01/12/00			
GROSS A/B BY DOE RP-720 MOD pCi/g					GROSS A/B				F0A100000-176C
Gross Alpha	27.1	26.5		4.6	1.9		98		68 - 147
Gross Beta	26.8	24.7		4.7	1.2		92		64 - 143
	Batch #:	0C10176			Analysis Date	01/12/00			
SR-90 BY GFPC DOE 7500-SR MOD pCi/g					SR-90 BY GFPC				F0A110000-154C
Strontium 90	9.70	10.0		2.1	0.5	91	103		45 - 126
	Batch #:	0C11254			Analysis Date	01/25/00			

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Quanterra
Environmental Services

ANALYTICAL REPORT

PROJECT NO. TECHLAW

Phase 2

Lot #: F9L160225

Julie Shanahan

Techlaw, Inc.
750 N St Paul
Suite 600
Dallas, TX 75201

QUANTERRA INCORPORATED

Ron Martino
Project Manager

February 4, 2000

CASE NARRATIVE

Lot # F9L160225

I. Introduction

On December 16, 1999, samples were received at the Quanterra St. Louis laboratory from Techlaw. A copy of the chain of custody and the condition upon receipt report is included with the analytical data.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

IV. Comments/Nonconformances

Strontium 90

The LCS has a low recovery 8% for the Yttrium carrier. The LCS Strontium preparation was counted with acceptable results.

Sample MC-3 has a low carrier recovery for Yttrium at 37% but within acceptance criteria.

Isouranium

The Blank has a U-234 activity result (0.3564 pCi/g) which is greater than the MDA (0.07961 pCi/g) but is less than the CRDL (1 pCi/g). This activity in the blank is caused by Pu-242 tracer tailing into the U-234 region of interest.

Gamma

There were no anomalies associated with this analysis.

Isoplutonium

There were no anomalies associated with this analysis.

ABT

There were no anomalies associated with this analysis.

METHODS SUMMARY

F9L160225

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Cs-137 & Hits by Gamma GAMMA SPEC MULTI ISO CAL	HASL Gamma (Cs	
Gross Alpha/Beta by GFPC Th230/Sr90-Y90 cal	DOE GROSS A/B	
Isotopic Pu by Alpha Spe Alpha Spectroscopy	NAS Iso Pu (SHO	
Isotopic U by Alpha Spec Alpha Spectroscopy	NAS Iso U (SHOR	
STRONTIUM 90 Sr90-Y90 cal	DOE SR-90 BY GF	

References:

DOE "DOE METHODS FOR EVALUATING ENVIRONMENTAL AND WASTE MANAGEMENT SAMPLES" OCTOBER 1994 US DEPARTMENT OF ENERGY

HASL Health and Safety Laboratory

NAS National Academy of Science

FINAL 960607 0512

Lancaster - St. Louis

SAMPLE SUMMARY

F9L160225

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
D6F05	001	BC-1	12/23/99	13:40
D6F0P	002	BC-2	12/23/99	14:10
D6F0T	003	BC-3	12/23/99	14:30
D6F11	004	BC-4	12/23/99	15:05
D6F15	005	BC-5	12/23/99	14:20
D6F17	006	SC-1	12/23/99	09:25
D6F1D	007	SC-2	12/23/99	09:55
D6F37	008	SC-3	12/23/99	10:25
D6F3A	009	SC-4	12/23/99	10:50
D6F3H	010	SC-5	12/23/99	11:50
D6F45	011	SC-6	12/23/99	11:25
D6F4Q	012	MC-1	12/24/99	10:00
D6F52	013	MC-2	12/24/99	12:00
D6F56	014	MC-3	12/24/99	11:25
D6F5D	015	MC-4	12/24/99	11:30
D6F5C	016	MC-5A	12/24/99	12:55
D6F5R	017	MC-5B	12/24/99	12:50

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot test, stress, solubility, temperature, viscosity, and weight.

TECHLAW, INC.

Client Sample ID: BC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9116022S-001
Work Order: D6F05
Matrix: SOLID

Date Collected: 12/13/99 1240
Date Received: 12/16/99 0911

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.022	U	0.022	0.091	01/03/00	01/11/00	0002308	94
Plutonium 239/40	0.083	J	0.073	0.060	01/03/00	01/11/00	0002308	94
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	1.46		0.44	0.04	01/03/00	01/12/00	0003360	82
Uranium 235	0.12	J	0.10	0.05	01/03/00	01/12/00	0003360	82
Uranium 238	1.64		0.48	0.08	01/03/00	01/12/00	0003360	82
Gamma Cs-137 & Nats by HASL AM-02 MOD			-	pCi/g	Gamma (Cs & Nats)			
Cesium 137	0.82		0.20	0.15	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	1.9		1.7	1.5	12/28/99	01/05/00	9363247	
Lead 212	1.62		0.41	0.16	12/28/99	01/05/00	9363247	
Lead 214	1.68		0.48	0.25	12/28/99	01/05/00	9363247	
Potassium 40	20.6		4.7	1.3	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	34.3		7.3	4.4	01/10/00	01/10/00	0010205	
Gross Beta	43.4		7.1	6.9	01/10/00	01/10/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.85	J	0.33	0.81	01/12/00	01/29/00	0012121	70

NOTE(S)

[illegible]s are incomplete without the case narrative.

[illegible] is determined by instrument performance only.

[illegible] results are greater than the MDC

[illegible] Result is greater than sample detection limit but less than stated reporting limit.

[illegible] Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: BC-1 DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-001X
Work Order: D6705
Matrix: SOLID

Date Collected: 12/13/99 1340
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 +/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.103	U	0.0998	0.13	01/03/00	01/11/00	0000328	92
Plutonium 239/40	0.063	U	0.072	0.098	01/03/00	01/11/00	0000328	92
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.49		0.43	0.11	01/03/00	01/13/00	0000360	90
Uranium 235	0.101	U	0.091	0.10	01/03/00	01/13/00	0000360	90
Uranium 238	1.89		0.52	0.08	01/03/00	01/13/00	0000360	90
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	26.5		6.0	4.5	01/10/00	01/13/00	0010205	
Gross Beta	45.2		7.1	6.9	01/10/00	01/13/00	0010205	

[illegible] (2):

[illegible]s are incomplete without the case narrative.

[illegible] is determined by instrument performance only.

[illegible]d results are greater than the MDC

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: BC-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: T9116022S-002
Work Order: D6T02
Matrix: SOLID

Date Collected: 12/13/99 1410
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso Pu (SHORT CT)		
Plutonium 238	0.12	U	0.12	0.17	01/02/00	01/11/00	0002309	72
Plutonium 239/40	0.027	U	0.059	0.085	01/02/00	01/11/00	0002309	72
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g		Iso U (SHORT CT)		
Uranium 234	1.74		0.60	0.12	01/03/00	01/12/00	0002360	56
Uranium 235	0.12	J	0.42	0.39	01/03/00	01/12/00	0002360	56
Uranium 238	1.24		0.49	0.13	01/03/00	01/12/00	0002360	56
Gamma Cs-137 & Nats by KASL AM-02 MOD				pCi/g		Gamma (Cs & Nats)		
Cesium 137	0.38		0.22	0.15	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Actinium 228	1.71		0.35	0.39	12/28/99	01/05/00	9363247	
Lead 212	1.43		0.26	0.27	12/28/99	01/05/00	9363247	
Lead 214	1.35		0.26	0.24	12/28/99	01/05/00	9363247	
Potassium 40	29.1		4.6	1.9	12/28/99	01/05/00	9363247	
GROSS A/B BY DCE RP-710 MOD				pCi/g		GROSS A/B		
Gross Alpha	33.8		7.4	5.0	01/10/00	01/13/00	0010202	
Gross Beta	49.9		7.8	7.2	01/10/00	01/13/00	0010202	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g		SR-90 BY GFPC		
Strontium 90	0.24	U	0.60	1.0	01/12/00	01/29/00	0012121	57

NOTE(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Qual results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

U Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: BC-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-002
Work Order: D6F0T
Matrix: SOLID

Date Collected: 12/13/99 1430
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.002	U	0.062	0.13	01/03/00	01/11/00	0003308	93
Plutonium 239/40	0.051	U	0.066	0.094	01/03/00	01/11/00	0003308	93
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	1.35		0.40	0.13	01/03/00	01/12/00	0003360	94
Uranium 235	0.15	J	0.11	0.08	01/03/00	01/12/00	0003360	94
Uranium 238	1.40		0.41	0.07	01/03/00	01/12/00	0003360	94
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	0.06	U	0.12	0.24	12/23/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	2.5		1.9	1.5	12/28/99	01/05/00	9363247	
Lead 212	1.83		0.28	0.15	12/28/99	01/05/00	9363247	
Lead 214	1.59		0.29	0.27	12/28/99	01/05/00	9363247	
Potassium 40	31.3		5.4	2.1	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	30.7		4.8	5.2	01/10/00	01/13/00	0010205	
Gross Beta	44.3		7.2	6.7	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.23	U	0.61	1.0	01/10/00	01/29/00	0012121	57

CTE(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: BC-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-004 Date Collected: 12/12/99 1505
Work Order: 06711 Date Received: 12/13/99 0911
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.048	U	0.098	0.15	01/03/00	01/11/00	0001228	72
Plutonium 239/40	-0.011	U	0.015	0.10	01/03/00	01/11/00	0001228	72
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	1.21		0.28	0.38	01/03/00	01/13/00	0002260	76
Uranium 235	0.035	U	0.037	0.194	01/03/00	01/13/00	0002260	76
Uranium 238	0.90	J	0.32	0.34	01/03/00	01/13/00	0002260	76
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	0.32		0.22	0.24	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	2.5		1.5	1.2	12/28/99	01/05/00	9363247	
Lead 212	1.21		0.34	0.21	12/28/99	01/05/00	9363247	
Lead 214	1.25		0.41	0.19	12/28/99	01/05/00	9363247	
Potassium 40	32.6		4.7	1.4	12/28/99	01/05/00	9363247	
Thallium 208	0.33		0.22	0.12	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	25.3		6.3	4.0	01/10/00	01/13/00	0010205	
Gross Beta	47.9		7.4	6.6	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.40	U	0.32	0.46	01/12/00	01/29/00	0012121	70

NOTE(S)

DQ are incomplete without the case narrative.
C is determined by instrument performance only.
Results are greater than the MDC
Result is greater than sample detection limit but less than stated reporting limit.
Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: BC-5

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-005
Work Order: 36715
Matrix: SOLID

Date Collected: 12/13/99 1400
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tld #
Iso PLUTONIUM (SHORT CT) WAS ONLY MCD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.064	U	0.079	0.11	01/22/00	01/11/00	0000300	83
Plutonium 239/40	0.057	U	0.064	0.082	01/22/00	01/11/00	0000300	83
Iso URANIUM (SHORT CT) WAS ONLY MCD				pCi/g	Iso U (SHORT CT)			
Uranium 234	1.65		0.47	0.10	01/03/00	01/13/00	0000360	91
Uranium 235	0.13	J	0.11	0.12	01/03/00	01/13/00	0000360	91
Uranium 238	1.48		0.43	0.09	01/03/00	01/13/00	0000360	91
Gamma Cs-137 & Nats BY HASL AM-02 MCD				pCi/g	Gamma (Cs & Nats)			
Cesium 137	0.36		0.17	0.17	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	4.0		1.6	1.7	12/28/99	01/05/00	9363247	
Lead 212	1.16		0.26	0.19	12/28/99	01/05/00	9363247	
Lead 214	1.34		0.24	0.24	12/28/99	01/05/00	9363247	
Potassium 40	26.8		4.2	2.0	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MCD				pCi/g	GROSS A/B			
Gross Alpha	30.3		6.9	5.9	01/10/00	01/12/00	0010205	
Gross Beta	44.4		7.0	6.6	01/10/00	01/12/00	0010205	
SR-90 BY GFPC DOE 7500-SR MCD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.16	U	0.32	0.89	01/12/00	01/29/00	0010121	66

DEF(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Tld results are greater than the MDC
J Result is greater than sample detection limit but less than stated reporting limit.
U Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: SC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9116032S-006
Work Order: D6F17
Matrix: SOLID

Date Collected: 12/13/99 0915
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.08		0.34	0.07	01/03/00	01/13/00	0003360	92
Uranium 235	0.092	J	0.084	0.030	01/03/00	01/13/00	0003360	92
Uranium 238	0.904	J	0.030	0.040	01/03/00	01/13/00	0003360	92
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	23.5		6.3	6.0	01/10/00	01/13/00	0010205	
Gross Beta	32.0		6.8	8.0	01/10/00	01/13/00	0010205	

ES(S)

ts are incomplete without the case narrative.
T is determined by instrument performance only.
ld results are greater than the MDC
Result is greater than sample detection limit but less than stated reporting limit.

0092 • 7060 • 2NB

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: SC-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-007
Work Order: D6F1D
Matrix: SOLID

Date Collected: 12/13/99 0955
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso URANIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.46		0.45	0.12	01/03/00	01/13/00	0003360	80
Uranium 235	0.102	J	0.098	0.10	01/03/00	01/13/00	0003360	80
Uranium 238	1.15		0.38	0.08	01/03/00	01/13/00	0003360	80
GROSS A/B BY DOE RP-710 MCD			pCi/g		GROSS A/B			
Gross Alpha	36.7		7.5	5.6	01/10/00	01/12/00	0010203	
Gross Beta	45.5		6.7	5.7	01/10/00	01/12/00	0010203	

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Yld results are greater than the MDC
J Result is greater than sample detection limit but less than stated reporting limit.

TECHLAW, INC.

Client Sample ID: SC-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-002
Work Order: D6737
Matrix: SOLID

Date Collected: 12/13/99 1325
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tld %
Iso URANIUM (SHORT CT) NAS ONLY MED			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.05		0.37	0.13	01/03/00	01/13/00	0003360	67
Uranium 235	0.17	J	0.14	0.12	01/03/00	01/13/00	0003360	67
Uranium 238	1.06		0.37	0.13	01/03/00	01/13/00	0003360	67
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	30.3		6.8	4.8	01/10/00	01/12/00	0010205	
Gross Beta	43.3		7.1	6.3	01/10/00	01/12/00	0010205	

CTE(S)

ata are incomplete without the case narrative.

DC is determined by instrument performance only.

ld results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

TECHLAW, INC.

Client Sample ID: SC-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9116C225-009
Work Order: D673A
Matrix: SOLID

Date Collected: 12/13/99 1050
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso URANIUM (SHORT CT), NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.13		0.26	0.08	01/03/00	01/13/00	0003360	88
Uranium 235	0.077	J	0.079	0.052	01/03/00	01/13/00	0003360	88
Uranium 238	1.34		0.41	0.04	01/03/00	01/13/00	0003360	88
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	26.3		5.8	3.7	01/10/00	01/13/00	0010203	
Gross Beta	49.4		7.4	6.8	01/10/00	01/13/00	0010203	

NOTE(S)

Data are incomplete without the case narrative.

J is determined by instrument performance only.

Bold results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

TECHLAW, INC.

Client Sample ID: SC-5

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-010
Work Order: D6F3H
Matrix: SOLID

Date Collected: 12/13/99 1150
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	1.37		0.41	0.07	01/03/00	01/13/00	0003360	88
Uranium 235	0.076	J	0.078	0.052	01/03/00	01/13/00	0003360	88
Uranium 238	1.18		0.37	0.07	01/03/00	01/13/00	0003360	88
GROSS A/B BY DGE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	26.4		6.2	5.4	01/10/00	01/12/00	0010205	
Gross Beta	39.1		4.1	5.4	01/10/00	01/12/00	0010205	

OTE(S)

ata are incomplete without the case narrative.

DC is determined by instrument performance only.

ld results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

0WR.9697069 2

TECHLAW, INC.

Client Sample ID: SC-6

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L160225-011
Work Order: D6F45
Matrix: SOLID

Date Collected: 12/13/99 1125
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Wtd #
Iso URANIUM (SHORT CT) NAS ONLY MDD				pCi/g	Iso U (SHORT CT)			
Radium 234	1.48		0.49	0.17	01/03/00	01/13/00	0003360	34
Radium 235	0.09	J	0.11	0.19	01/03/00	01/13/00	0003360	34
Radium 238	1.36		0.47	0.17	01/03/00	01/13/00	0003360	34
GROSS A/B BY DOE RP-710 MDD				pCi/g	GROSS A/B			
Gross Alpha	27.3		6.1	4.4	01/10/00	01/13/00	0010203	
Gross Beta	43.3		6.9	6.6	01/10/00	01/13/00	0010203	

ES(S)

s are incomplete without the case narrative.
: is determined by instrument performance only.
d results are greater than the MDC
Analyte analysed for but was not detected

TECHLAW, INC.

Client Sample ID: MC-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 9911[illegible]-012
Work Order: D6T4C
Matrix: SOLID

Date Collected: 12/14/99 1300
Date Received: 12/16/99 0911

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.050	U	0.078	0.12	01/03/00	01/11/00	0000308	79
Plutonium 239/40	0.030	U	0.046	0.070	01/03/00	01/11/00	0000308	79
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.79	J	0.26	0.1	01/03/00	01/13/00	0000360	83
Uranium 235	0.026	U	0.047	0.091	01/03/00	01/13/00	0000360	83
Uranium 238	0.87	J	0.28	0.09	01/03/00	01/13/00	0000360	83
Gamma Cs-137 & Nats by HASL AM-02 MOD				pCi/g	Gamma (Cs & Nats)			
Cesium 137	0.04	U	0.11	0.22	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	3.7		1.4	1.4	12/28/99	01/05/00	9363247	
Lead 212	1.27		0.22	0.17	12/28/99	01/05/00	9363247	
Lead 214	1.07		0.22	0.22	12/28/99	01/05/00	9363247	
Potassium 40	22.8		5.3	1.5	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	21.3		5.2	4.3	01/10/00	01/13/00	0010205	
Gross Beta	37.4		6.4	6.4	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.20	U	0.32	0.88	01/12/00	01/20/00	0012121	66

DOE (S)

[illegible]ts are incomplete without the case narrative.
[illegible]C is determined by instrument performance only.
[illegible]d results are greater than the MDC
[illegible] Result is greater than sample detection limit but less than stated reporting limit.
[illegible] Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: MC-2

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 7911500225-013
Work Order: D6F32
Matrix: SOLID

Date Collected: 12/14/99 1200
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.17	J	0.11	0.11	01/03/00	01/12/00	0003309	84
Plutonium 239/40	0.14	J	0.10	0.11	01/03/00	01/12/00	0003308	84
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	0.75	J	0.22	0.08	01/03/00	01/13/00	0003360	80
Uranium 235	0.026	U	0.047	0.091	01/03/00	01/13/00	0003360	80
Uranium 238	0.76	J	0.26	0.08	01/03/00	01/13/00	0003360	80
Gamma Cs-137 & Nats by NASL AM-02 MOD			pCi/g		Gamma (Cs & nats)			
Cesium 137	0.26		0.11	0.11	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	2.4		1.3	1.3	12/28/99	01/05/00	9363247	
Lead 212	1.12		0.28	0.13	12/28/99	01/05/00	9363247	
Lead 214	0.91		0.29	0.20	12/28/99	01/05/00	9363247	
Potassium 40	22.0		5.0	1.6	12/28/99	01/05/00	9363247	
GROSS A/B BY DCP RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	16.4		4.8	4.7	01/10/00	01/13/00	0010205	
Gross Beta	37.2		6.4	6.6	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.38	U	0.42	0.75	01/12/00	01/29/00	0012121	69

NOTE(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Gross results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: MC-3

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9116022S-014
Work Order: D6F56
Matrix: SOLID

Date Collected: 12/14/99 1115
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.025	U	0.045	0.12	01/03/00	01/11/00	0003308	--
Plutonium 239/240	0.015	U	0.044	0.092	01/03/00	01/11/00	0003308	--
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.62	J	0.24	0.16	01/03/00	01/12/00	0003360	*3
Uranium 235	0.022	J	0.065	0.050	01/03/00	01/12/00	0003360	*3
Uranium 238	0.56	J	0.22	0.34	01/03/00	01/12/00	0003360	*3
Gamma Cs-137 & Nlts by HASL AM-02 MOD				pCi/g	Gamma (Cs & nlts)			
Cesium 137	0.003	U	0.048	0.12	12/29/99	01/05/00	9362247	
--- Other Detected Radionuclides ---								
Lead 212	0.91		0.28	0.12	12/29/99	01/05/00	9362247	
Lead 214	0.81		0.29	0.22	12/29/99	01/05/00	9362247	
Potassium 40	27.2		4.5	1.9	12/29/99	01/05/00	9362247	
GROSS A/B BY DCE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	29.5		5.2	4.7	01/10/00	01/13/00	0010205	
Gross Beta	47.0		7.5	7.3	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DCE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.2	U	1.1	2.0	01/12/00	01/20/00	0012121	3*

QTS(S)

Qts are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: MC-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 9912160225-015
Work Order: D6F5D
Matrix: SOLID

Date Collected: 12/14/99 1120
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.003	U	0.044	0.10	01/03/00	01/11/00	0000238	95
Plutonium 239/240	0.017	U	0.042	0.081	01/03/00	01/11/00	0000238	95
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.51	J	0.20	0.07	01/03/00	01/12/00	0000240	82
Uranium 235	0.087	U	0.082	0.10	01/03/00	01/12/00	0000240	82
Uranium 238	0.56	J	0.22	0.07	01/03/00	01/12/00	0000240	83
Gamma Cs-137 & Nuclides by HASL AM-02 MOD				pCi/g	Gamma (Cs & nuclides)			
Cesium 137	0.44		0.13	0.16	12/28/99	01/07/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	1.9		1.5	1.3	12/28/99	01/07/00	9363247	
Lead 212	1.22		0.28	0.14	12/28/99	01/07/00	9363247	
Lead 214	0.89		0.27	0.21	12/28/99	01/07/00	9363247	
Potassium 40	26.9		4.4	1.3	12/28/99	01/07/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	16.2		4.4	3.8	01/10/00	01/13/00	0010203	
Gross Beta	39.4		6.8	7.2	01/10/00	01/13/00	0010203	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.44	U	0.49	0.80	01/12/00	01/29/00	0010121	70

Qual(S)

Qs are incomplete without the case narrative.

U is determined by instrument performance only.

Bold results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: MC-5A

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 79L160225-016
Work Order: D6T5J
Matrix: SOIL

Date Collected: 12/14/99 1235
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.82	J	0.26	0.09	01/03/00	01/11/00	0002308	112
Plutonium 239/40	126	-	21	0.07	01/03/00	01/11/00	0002308	112
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.73	J	0.26	0.07	01/03/00	01/13/00	0002360	73
Uranium 235	0.121	J	0.098	0.085	01/03/00	01/13/00	0002360	73
Uranium 238	0.74	J	0.26	0.08	01/03/00	01/13/00	0002360	73
Gamma Cs-137 & Rlts by HASL AM-02 MOD				pCi/g	Gamma (Cs & Rlts)			
Cesium 137	0.124	U	0.093	0.14	12/29/99	01/07/00	9362247	
--- Other Detected Radionuclides ---								
Lead 212	1.04		0.30	0.15	12/28/99	01/07/00	9362247	
Lead 214	0.99		0.22	0.21	12/28/99	01/07/00	9362247	
Potassium 40	28.2		4.7	1.7	12/28/99	01/07/00	9362247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	23.0		5.1	4.1	01/10/00	01/13/00	0010205	
Gross Beta	42.9		6.7	6.3	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	-0.21	U	0.32	0.91	01/12/00	01/29/00	0010121	44

QTE(S)

QCs are incomplete without the case narrative.
QC is determined by instrument performance only.
If results are greater than the MDC
For informational purposes only. The detection limit does not follow significant figures SOP.
Result is greater than sample detection limit but less than stated reporting limit.
Analyte analyzed for but was not detected

GBN • 966067 • 6GN

TECHLAW, INC.

Client Sample ID: MC-SB

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9121602E3-017
Work Order: D6F5K
Matrix: SOLID

Date Collected: 12/14/99 1250
Date Received: 12/16/99 0915

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.46	J	0.19	0.12	01/03/00	01/11/00	0003308	100
Plutonium 239/40	67	=	13	0.07	01/03/00	01/11/00	0003308	100
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g		Iso U (SHORT CT)			
Uranium 234	0.53	J	0.19	0.11	01/03/00	01/13/00	0003360	98
Uranium 235	0.102	J	0.084	0.398	01/03/00	01/13/00	0003360	98
Uranium 238	0.72	J	0.23	0.06	01/03/00	01/13/00	0003360	98
Gamma Cs-137 & Nuts by HASL AM-02 MOD			pCi/g		Gamma (Cs & Nuts)			
Cesium 137	0.035	U	0.075	0.14	12/28/99	01/07/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	1.50		0.90	1.5	12/28/99	01/07/00	9363247	
Lead 212	0.94		0.19	0.14	12/28/99	01/07/00	9363247	
Lead 214	0.75		0.17	0.18	12/28/99	01/07/00	9363247	
Potassium 40	30.4		4.6	1.3	12/28/99	01/07/00	9363247	
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	13.9		4.5	4.3	01/10/00	01/13/00	0010205	
Gross Beta	37.7		6.8	7.6	01/10/00	01/13/00	0010205	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	-0.05	U	0.34	0.95	01/12/00	01/19/00	0010181	62

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Lab results are greater than the MDC

For informational purposes only. The detection limit does not follow significant figures SOP.

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: CC-5B

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-001
Work Order: D6MCA
Matrix: SOLID

Date Collected: 12/15/99 1345
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
Gamma Cs-137 & Hits by HASL AM-02 MOD			pCi/g		Gamma (Cs & hits)			
Cesium 137	0.017	U	0.088	0.18	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Actinium 228	1.52		0.38	0.37	12/28/99	01/05/00	9363247	
Lead 210	3.1		1.4	1.2	12/28/99	01/05/00	9363247	
Lead 212	1.25		0.23	0.18	12/28/99	01/05/00	9363247	
Lead 214	1.26		0.24	0.20	12/28/99	01/05/00	9363247	
Potassium 40	24.5		4.2	1.6	12/28/99	01/05/00	9363247	
Thallium 208	0.32		0.13	0.14	12/28/99	01/05/00	9363247	

CE(S)

s are incomplete without the case narrative.

: is determined by instrument performance only.

d results are greater than the MDC

Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: CC-5B DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: T9L210115-001K
Work Order: D6MJA
Matrix: SOLID

Date Collected: 12/13/99 1345
Date Received: 12/18/99 0820

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Nits by HASL AM-02 MOD			pCi/g		Gamma (Cs & Nits)			
Cesium 137	0.138	U	0.095	0.19	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	2.9		1.3	1.1	12/28/99	01/05/00	9363247	
Lead 212	1.32		0.33	0.15	12/28/99	01/05/00	9363247	
Lead 214	1.05		0.37	0.20	12/28/99	01/05/00	9363247	
Potassium 40	26.0		4.3	1.5	12/28/99	01/05/00	9363247	
Thallium 208	0.42		0.14	0.11	12/28/99	01/05/00	9363247	

DTE(S)

Nits are incomplete without the case narrative.
MDC is determined by instrument performance only.
Yld results are greater than the MDC
Analyte analyzed for but was not detected

METHOD BLANK REPORT

Quantarra, Inc. - Radiochemistry

Client Lot ID: F9L160220
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Lab Sample ID Batch #	Aliq #
Gamma Cs-137 & Nits by HASL AM-02 MOD			pCi/g	Gamma (Cs & nits)			F9L290000-247B	
Cesium 137	-0.016	U	0.039	0.068	12/28/99	01/05/00	3062247	
Radium (226)	-0.14	U	0.75	1.9	12/28/99	01/05/00	3062247	
Radium 228	-0.29	U	0.27	0.25	12/28/99	01/05/00	3062247	
Thorium 228	-0.45	U	0.17	0.26	12/28/99	01/05/00	3062247	
Thorium 228	-0.41	U	0.42	0.85	12/28/99	01/05/00	3062247	
--- Other Detected Radionuclides ---								
Protactinium 231	0.8	U	1.5	2.4	12/28/99	01/05/00	3062247	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso Pu (SHORT CT)			F0A030000-308B	
Plutonium 238	0.036	U	0.050	0.080	01/03/00	01/12/00	3002309	82
Plutonium 239/240	0.020	U	0.0-6	0.084	01/03/00	01/12/00	3002308	82
GROSS A/B BY DCE RP-710 MOD			pCi/g	GROSS A/B			F0A100000-205B	
Gross Alpha	0.2	U	2.0	3.9	01/10/00	01/13/00	3010202	
Gross Beta	6.2	J	3.0	4.6	01/10/00	01/13/00	3010202	
SR-90 BY GFPC DCE 7500-SR MOD			pCi/g	SR-90 BY GFPC			F0A120000-121B	
Strontium 90	-0.03	U	0.40	0.71	01/12/00	01/29/00	3012121	94
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso U (SHORT CT)			F0A030000-360B	
Uranium 234	0.36	J	0.15	0.08	01/03/00	01/13/00	3003360	100
Uranium 235	0.014	U	0.030	0.092	01/03/00	01/13/00	3003360	100
Uranium 238	0.017	U	0.021	0.061	01/03/00	01/13/00	3003360	100

TE(S)

A are incomplete without the case narrative.

is determined using instrument performance only

d results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

N69 • 70699 • NPLU

Quanterra - St. Louis

DUPLICATE EVALUATION REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L160225
Work Order #: D6F0
Matrix: SOLID

Date Sampled: 12/13/99
Date Received: 12/16/99

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Yld	DUPLICATE Result		Total Uncert. (2σ+/-)	% Yld	QC Sample ID Precision	
Iso PLUTONIUM (SHORT CT)		pCi/g			Iso Pu (SHORT CT)				F9L160225-001	
Plutonium 238	0.022	U	0.032	94	0.108	U	0.0990	92	130	*RPD
Plutonium 239/40	0.083	J	0.073	94	0.063	U	0.073	92	29	*RPD
Batch #:	0003309 (Sample)				0003308 (Duplicate)					
Iso URANIUM (SHORT CT)		pCi/g			Iso U (SHORT CT)				F9L160225-001	
Uranium 234	1.46		0.44	92	1.49		0.43	90	2	*RPD
Uranium 235	0.12	U	0.10	92	0.101	U	0.091	90	19	*RPD
Uranium 238	1.44		0.48	92	1.89		0.52	90	14	*RPD
Batch #:	0003360 (Sample)				0003340 (Duplicate)					
GROSS A/B BY DCK RP-710 MOD		pCi/g			GROSS A/B				F9L160225-001	
Gross Alpha	34.3		7.3		25.5		6.3		29	*RPD
Gross Beta	43.4		7.1		45.5		7.1		5	*RPD
Batch #:	0010205 (Sample)				0010205 (Duplicate)					

NOTE(S)

ata are incomplete without the case narrative.
Calculations are performed before rounding to avoid round-off error in calculated results

Result is greater than sample detection limit but less than stated reporting limit.
Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: BKGSD-09

Quanterra, Inc. - Radiochemistry

Lab Sample ID:A9L150222-001
Work Order: D6D5T
Matrix: SOLID

Date Collected: 12/14/99 1120
Date Received: 12/15/99 0945

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tid #
Iso URANIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso T (SHORT CT)			
Uranium 234	3.31		0.90	0.12	01/03/00	01/27/00	0003356	86
Uranium 235	0.22	J	0.13	0.1	01/03/00	01/27/00	0003356	86
Uranium 238	2.98		0.73	0.36	01/03/00	01/27/00	0003356	86

NOTE(S)

ts are incomplete without the case narrative.

C is determined by instrument performance only.

d results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

096.170669.0050

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: BKGSD-09 DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: A9L150222-001X
Work Order: D6D5T
Matrix: SOLID

Date Collected: 12/14/99 1120
Date Received: 12/15/99 0945

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	3.46		0.87	0.11	01/03/00	01/27/00	0003356	68
Uranium 235	0.17	J	0.12	0.09	01/03/00	01/27/00	0003356	68
Uranium 238	3.03		0.78	0.04	01/03/00	01/27/00	0003356	68

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

ANALYTICAL REPORT

PROJECT NO. TECHLAW

Phase 2

Lot #: F9L210115

Julie Shanahan

Techlaw, Inc.
750 N St Paul
Suite 600
Dallas, TX 75201

QUANTERRA INCORPORATED

Ron Martino
Project Manager

February 4, 2000

CASE NARRATIVE

Lot # F9L210115

I. Introduction

On December 21, 1999, samples were received at the Quanterra St. Louis laboratory from Techlaw. A copy of the chain of custody and the condition upon receipt report is included with the analytical data.

III. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

IV. Comments/Nonconformances

Strontium 90

There were no anomalies associated with this analysis.

Isouranium

There were no anomalies associated with this analysis.

Gamma

There were no anomalies associated with this analysis.

Isoplutonium

For the water samples, MDA achieved for Pu-238 is > CRDL 1 pCi/L. This was the effect of reduced tracer recoveries ranging 20-30% and a higher detector background in the Pu-238 region of interest as compared to the Pu-239/240 region of interest. All MDA's achieved are less than 1.54 pCi/L. Data is accepted to report.

ABT

There were no anomalies associated with this analysis.

METHODS SUMMARY

F9L210115

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Cs-137 & Hits by Gamma GAMMA SPEC MULTI ISO CAL	HASL Gamma (Cs	
Gross Alpha/Beta by GFPC Th230/Sr90-Y90 cal	DOE GROSS A/B	
Gross Alpha/Beta by GFPC Th230/Sr90-Y90 cal	SW846 GROSS A/B	
Isotopic Pu by Alpha Spe Alpha Spectroscopy	NAS Iso Pu (SHO	
Isotopic U by Alpha Spec Alpha Spectroscopy	NAS Iso U (SHOR	
STRONTIUM 90 Sr90-Y90 cal	DOE SR-90 BY GF	
STRONTIUM 90 Sr90-Y90 cal	SMWW SR-90 BY G	

References:

DOE "DOE METHODS FOR EVALUATING ENVIRONMENTAL AND WASTE MANAGEMENT SAMPLES" OCTOBER 1994 US DEPARTMENT OF ENERGY

HASL Health and Safety Laboratory

NAS National Academy of Science

SMWW "STANDARD METHODS FOR WASTE WATER"

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

0092 • 0999 • 0709 • 2

Lancaster - St. Louis

SAMPLE SUMMARY

F9L210115

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
D6MCA	001	CC-5B		
D6MCE	002	CC-6	12/15/99	13:45
D6MC9	003	CC-7	12/15/99	12:34
D6MCA	004	CC-8	12/15/99	10:00
D6MCC	005	CC-9	12/15/99	09:25
D6MCE	006	AC-EB	12/15/99	08:30
D6MCG	007	CC-EB	12/16/99	16:20
D6MCJ	008	GS-1	12/15/99	11:50
D6MCL	009	D-4	12/09/99	15:20
D6MCM	010	PM-1	12/13/99	20:40
D6MCP	011	MCD-FB	12/13/99	20:21
			12/09/99	14:40

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results listed as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Laboratory - St. Louis

THIS IS NOT AN INVOICE

BILL TO:
Julie Shanahan
Techlaw, Inc.
750 N St Paul
Suite 600,TX 75201

REPORT SENT TO:
Julie Shanahan
Techlaw, Inc.
750 N St Paul
Suite 600,TX 75201

PHONE: 214 953-0045 FAX: 214 754-0819

PHONE:214 953-0045 FAX: 214 754-0819

LOT ID. : P9L210115 QUOTE: 034221
P.O. NUMBER :
SAMPLE RECEIVING DATE : 12/21/99
PROJECT NUMBER : TECHLAW
SAMPLING SITE : Phase 2
REPORT RECIPIENT : Julie Shanahan
REPORT DATE : 0/00/00

QUANT	PARAMETER	UNIT COST	AMOUNT
5	SOLID, GROSS A/B	55.00	275.00
2	WATER, GROSS A/B	55.00	110.00
6	WATER, SR-90 BY GFPC	110.00	660.00
5	SOLID, SR-90 BY GFPC	110.00	550.00
5	SOLID, Gamma (Cs & Hits)	89.00	445.00
2	WATER, Gamma (Cs & Hits)	89.00	178.00
5	SOLID, Iso Plutonium	120.00	600.00
2	WATER, Iso Plutonium	120.00	240.00
5	SOLID, Iso Uranium	120.00	600.00
2	WATER, Iso Uranium	120.00	240.00
			3,898.00

9912 • 0606 • 2192

TECHLAW, INC.

Client Sample ID: CC-5B

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210125-001
Work Order: D6MJR
Matrix: SOLID

Date Collected: 12/15/99 1245
Date Received: 12/18/99 0820

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tbd %
Iso PLUTONIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.060	U	0.097	0.20	01/05/00	01/27/00	2005167	79
Plutonium 239/40	0.034	U	0.034	0.090	01/05/00	01/27/00	2005167	79
Iso URANIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso U (SHORT CT)			
Uranium 234	0.84	J	0.28	0.08	01/03/00	01/28/00	0002336	75
Uranium 235	0.100	U	0.096	0.14	01/01/00	01/28/00	2002216	75
Uranium 238	0.85	J	0.29	0.12	01/03/00	01/28/00	0002336	75
Gamma Cs-137 & Hits by NASL AM-02 MCD			pCi/g		Gamma (Cs & hits)			
Cesium 137	0.017	U	0.098	0.13	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Actinium 228	1.32		0.38	0.37	12/28/99	01/05/00	9363247	
Lead 210	3.1		1.4	1.2	12/28/99	01/05/00	9363247	
Lead 212	1.25		0.23	0.15	12/28/99	01/05/00	9363247	
Lead 214	1.26		0.24	0.20	12/28/99	01/05/00	9363247	
Potassium 40	24.6		4.3	1.6	12/28/99	01/05/00	9363247	
Thallium 208	0.31		0.10	0.14	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	14.4		4.5	4.5	12/28/99	01/20/00	0029122	
Gross Beta	33.0		6.1	6.7	12/28/99	01/20/00	0029122	
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g		SR-90 BY GFPC			
Strontium 90	0.31	U	0.35	1.5	01/12/00	01/29/00	0012121	40

NOTE(S)

Results are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

J Result is greater than sample detection limit but less than stated reporting limit.

U Analyte analyzed for but was not detected

:anterra - St. Louis

TECHLAW, INC.

Client Sample ID: CC-5B DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-001K
Work Order: D6MJR
Matrix: SOLID

Date Collected: 12/16/99 1345
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Tld #
Gamma Cs-137 & Nats by HASL AM-02 MOD			pCi/g		Gamma (Cs & Nats)			
Cesium 137	0.138	U	0.095	0.19	12/23/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	2.9		1.0	1.1	12/28/99	01/05/00	9363247	
Lead 212	1.32		0.33	0.15	12/28/99	01/05/00	9363247	
Lead 214	1.05		0.37	0.20	12/28/99	01/05/00	9363247	
Potassium 40	26.0		4.0	1.2	12/28/99	01/05/00	9363247	
Thallium 208	0.42		0.14	0.11	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD			pCi/g		GROSS A/B			
Gross Alpha	18.6		4.8	3.7	12/28/99	01/20/00	0019152	
Gross Beta	33.3		6.1	6.7	12/28/99	01/20/00	0019152	

:TE(S)

ta are incomplete without the case narrative.

T is determined by instrument performance only.

ld results are greater than the MDC

Analyte analyzed for but was not detected

0492.706699

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: CC-6

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-002
Work Order: D6M3E
Matrix: SOLID

Date Collected: 12/13/99 1224
Date Received: 12/13/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso Pu (SHORT CT)			
Plutonium 238	0.16	J	0.12	0.14	01/03/00	01/27/00	0003167	81
Plutonium 239/40	0.012	U	0.034	0.079	01/03/00	01/27/00	0003167	81
Iso URANIUM (SHORT CT) NAS ONLY MCD			pCi/g		Iso U (SHORT CT)			
Uranium 234	0.99	J	0.38	0.19	01/03/00	01/27/00	0003356	47
Uranium 235	0.11	J	0.11	0.07	01/03/00	01/27/00	0003356	47
Uranium 238	1.16		0.42	0.14	01/03/00	01/27/00	0003356	47
Gamma Cs-137 & Nlts by NASL AM-02 MCD			pCi/g		Gamma (Cs & Nlts)			
Cesium 137	0.21		0.13	0.13	12/28/99	01/03/00	9363247	
--- Other Detected Radionuclides ---								
Lead 212	1.22		0.34	0.16	12/28/99	01/03/00	9363247	
Lead 214	1.21		0.39	0.19	12/28/99	01/03/00	9363247	
Potassium 40	22.7		3.9	1.7	12/28/99	01/03/00	9363247	
GROSS A/B BY DOE RP-710 MCD			pCi/g		GROSS A/B			
Gross Alpha	17.2		4.7	4.0	12/28/99	01/20/00	0019132	
Gross Beta	25.9		6.0	6.0	12/28/99	01/20/00	0019132	
SR-90 BY GFPC DOE 7500-SR MCD			pCi/g		SR-90 BY GFPC			
Strontium 90	-0.19	U	0.44	0.79	01/12/00	01/29/00	0012121	70

(Qual (s)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
Result is greater than sample detection limit but less than stated reporting limit.
Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: CC-7

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-003 Date Collected: 12/15/99 1000
Work Order: D6MK9 Date Received: 12/18/99 0830
Matrix: SOLID

Parameter	Result	Qual	Total Unceert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.18	J	0.12	0.15	01/05/00	01/27/00	0005167	78
Plutonium 239/40	0.031	U	0.056	0.11	01/05/00	01/27/00	0005167	78
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.99	J	0.45	0.1	01/03/00	01/28/00	0003356	36
Uranium 235	0.045	U	0.091	0.10	01/03/00	01/28/00	0003356	36
Uranium 238	0.76	J	0.39	0.18	01/03/00	01/28/00	0003356	36
Gamma Cs-137 & Kids by HASL AM-02 MOD				pCi/g	Gamma (Cs & kids)			
Cesium 137	0.092	U	0.072	0.15	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	3.3		1.2	1.1	12/28/99	01/05/00	9363247	
Lead 212	1.16		0.30	0.20	12/28/99	01/05/00	9363247	
Lead 214	0.83		0.31	0.18	12/28/99	01/05/00	9363247	
Potassium 40	35.7		4.2	1.3	12/28/99	01/05/00	9363247	
GROSS A/B BY DCE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	18.6		5.1	4.3	12/28/99	01/20/00	0012132	
Gross Beta	32.9		6.4	7.5	12/28/99	01/20/00	0012132	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	-0.33	U	0.47	0.84	01/12/00	01/29/00	0012121	72

DEF(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Yld results are greater than the MDC
Result is greater than sample detection limit but less than stated reporting limit.
Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: CC-8

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 991210115-004 Date Collected: 12/15/99 0915
Work Order: D6MKA Date Received: 12/15/99 0830
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.20	J	0.14	0.29	01/03/00	01/27/00	0005167	75
Plutonium 239/40	-0.010	U	0.042	0.15	01/03/00	01/27/00	0005167	75
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	1.13		0.40	0.20	01/03/00	01/28/00	0003256	70
Uranium 235	0.024	U	0.033	0.072	01/03/00	01/28/00	0003256	70
Uranium 238	0.74	J	0.30	0.20	01/03/00	01/28/00	0003256	70
Gamma Cs-137 & Nuts by NASL AM-02 MOD				pCi/g	Gamma (Cs & nuts)			
Cesium 137	0.016	U	0.095	0.17	12/28/99	01/05/00	9363247	
--- Other Detected Radionuclides ---								
Lead 210	2.5		1.1	1.5	12/28/99	01/05/00	9363247	
Lead 212	1.12		0.20	0.22	12/28/99	01/05/00	9363247	
Lead 214	1.04		0.19	0.20	12/28/99	01/05/00	9363247	
Potassium 40	23.4		3.9	1.6	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	22.3		5.3	4.5	12/28/99	01/20/00	0019152	
Gross Beta	40.1		6.7	6.6	12/28/99	01/20/00	0019152	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.7	U	1.7	3.0	01/12/00	01/29/00	0012121	18

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
J Result is greater than sample detection limit but less than stated reporting limit.
U Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: CC-9

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-005
Work Order: D6MKD
Matrix: SOLID

Date Collected: 12/13/99 0820
Date Received: 12/13/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso Pu (SHORT CT)			
Plutonium 238	0.12	U	0.11	0.17	01/05/00	01/27/00	0002167	78
Plutonium 239/40	0.23	J	0.10	0.11	01/05/00	01/27/00	0002167	78
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/g	Iso U (SHORT CT)			
Uranium 234	0.82	J	0.31	0.18	01/03/00	01/28/00	0002236	70
Uranium 235	0.042	U	0.068	0.11	01/03/00	01/28/00	0002236	70
Uranium 238	0.81	J	0.31	0.09	01/03/00	01/28/00	0002236	70
Gamma Cs-137 & Hits by HASL AM-02 MOD				pCi/g	Gamma (Cs & hits)			
Cesium 137	-0.003	U J	0.10	0.20	12/29/99	01/05/00	9363247	
*** Other Detected Radionuclides ***								
Lead 210	2.7		1.4	1.2	12/28/99	01/05/00	9363247	
Lead 212	1.20		0.21	0.16	12/28/99	01/05/00	9363247	
Lead 214	1.00		0.18	0.22	12/28/99	01/05/00	9363247	
Potassium 40	21.0		3.9	1.8	12/28/99	01/05/00	9363247	
GROSS A/B BY DOE RP-710 MOD				pCi/g	GROSS A/B			
Gross Alpha	15.6		4.2	3.1	12/28/99	01/20/00	0019152	
Gross Beta	33.8		5.7	2.8	12/28/99	01/20/00	0019152	
SR-90 BY GFPC DOE 7500-SR MOD				pCi/g	SR-90 BY GFPC			
Strontium 90	0.05	U	0.55	0.91	01/12/00	01/29/00	0012121	72

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

* For informational purposes only. The result does not follow significant figures SOP

J Result is greater than sample detection limit but less than stated reporting limit.

U Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-EB

Quanterra, Inc. - Radiochemistry

Lab Sample ID: 791210115-006
Work Order: D6MKE
Matrix: WATER

Date Collected: 12/16/99 1610
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Unsert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
Gamma Cs-137 & Nuts by HASL AM-02 MOD				**pCi/L**	**Gamma (Cs & nuts)**			
Cesium 137	0.2	U	9.2	16	01/19/00	01/19/00	0018143	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				**pCi/L**	**Iso Pu (SHORT CT)**			
Plutonium 238	0.27	U	0.61	1.2	01/28/00	01/28/00	0028149	26
Plutonium 239/40	-0.022	U	0.047	0.56	01/28/00	01/28/00	0028149	26
Iso URANIUM (SHORT CT) NAS ONLY MOD				**pCi/L**	**Iso U (SHORT CT)**			
Uranium 234	0.38	U	0.10	0.14	01/28/00	01/29/00	0028155	97
Uranium 235	0.0	U -	0.0	0.1	01/28/00	01/29/00	0028155	97
Uranium 238	0.057	U	0.081	0.077	01/28/00	01/29/00	0028155	97
GROSS A/B BY GFPC SW846 9310 MOD				**pCi/L**	**GROSS A/B**			
Gross Alpha	-0.36	U	0.48	1.0	01/04/00	01/10/00	0004164	
Gross Beta	-0.9	U	1.0	1.9	01/04/00	01/10/00	0004164	
SR-90 BY GFPC SNOW 7500-SR MOD				**pCi/L**	**SR-90 BY GFPC**			
Strontium 90	0.38	U	0.55	1.4	01/27/00	02/01/00	0007293	71

NOTE(S)

Data are incomplete without the case narrative.
MDC as determined by instrument performance only.
Bold results are greater than the MDC
\- For informational purposes only. The detection limit does not follow significant figures SOP.
U Analyte analyzed for but was not detected

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: AC-EB DUP

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-006X
Work Order: D6MKE
Matrix: WATER

Date Collected: 12/16/99 1610
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
GROSS A/B BY GFPC SW846 9310 MOD			pCi/L		GROSS A/B			
Gross Alpha	-0.24	U	0.61	1.2	01/04/00	01/11/00	0004164	
Gross Beta	0.3	U	1.0	1.7	01/04/00	01/11/00	0004164	
Gamma Cs-137 & Kids by HASL 300-02 MOD			pCi/L		Gamma (Cs & kids)			
Cesium 137	-4.5	U	9.9	19	01/18/00	01/19/00	0018141	

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

WEN • 000709 • 0002

TECHLAW, INC.

Client Sample ID: CC-EB

Quantera, Inc. - Radiochemistry

Lab Sample ID: F9L210115-007
Work Order: D6MXG
Matrix: WATER

Date Collected: 12/15/99 1150
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Tlq #
Gamma Cs-137 & Nits by NASL AM-02 MOD				pCi/L	Gamma (Cs & Nats)			
Cesium 137	-11.0	U	7.4	14	01/18/00	01/19/00	3018142	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD				pCi/L	Iso Pu (SHORT CT)			
Plutonium 238	-0.10	U	0.51	1.5	01/25/00	01/28/00	3028149	23
Plutonium 239/40	0.38	U	0.39	1.1	01/25/00	01/28/00	3028149	23
Iso URANIUM (SHORT CT) NAS ONLY MOD				pCi/L	Iso U (SHORT CT)			
Uranium 234	0.1	U	0.11	0.13	01/25/00	01/28/00	3028155	104
Uranium 235	0.032	U	0.065	0.287	01/25/00	01/28/00	3028155	104
Uranium 238	0.021	U	0.053	0.12	01/25/00	01/28/00	3028155	104
GROSS A/B BY GFPC SW846 9310 MOD				pCi/L	GROSS A/B			
Gross Alpha	-0.11	U	0.63	1.2	01/04/00	01/11/00	3004164	
Gross Beta	-0.14	U	0.94	1.7	01/04/00	01/11/00	3004164	
SR-90 BY GFPC SNOW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	-0.25	U	0.50	0.88	01/07/00	01/24/00	3007202	70

CTE(S)

ata are incomplete without the case narrative.
TC is determined by instrument performance only.
Bold results are greater than the MDC
U Analyte analyzed for but was not detected

TECHLAW, INC.

Client Sample ID: GS-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-008
Work Order: D6MKJ
Matrix: WATER

Date Collected: 12/09/99 1510
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 sigma)	MDC	Prep Date	Analysis Date	Batch #	Kid %
SR-90 BY GFPC SMEW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	11.0		2.3	0.8	01/07/00	01/24/00	0007293	[illegible]

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Kid results are greater than the MDC

Quanterra - St. Louis

TECHLAW, INC.

Client Sample ID: 0-4

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-009
Work Order: D6MXL
Matrix: WATER

Date Collected: 12/13/99 2040
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC SHAW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	0.44	C	0.43	0.70	01/07/00	02/24/00	C0C7293	74

DEF(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Yield results are greater than the MDC
Analyte analysed for but was not detected

TECHLAW, INC.

Client Sample ID: PM-1

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-010
Work Order: D6MKM
Matrix: WATER

Date Collected: 12/13/99 0011
Date Received: 12/13/99 0830

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
SR-90 BY GFPC SMWW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	0.33	U	0.29	0.65	01/07/00	01/24/00	0000293	[illegible]

NOTE(S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Reported results are greater than the MDC
U Analyte analyzed for but was not detected

UFR-960607-0092

anterra - St. Louis

TECHLAW, INC.

Client Sample ID: MCO-FB

Quanterra, Inc. - Radiochemistry

Lab Sample ID: F9L210115-011
Work Order: D6MKP
Matrix: WATER

Date Collected: 12/09/99 1440
Date Received: 12/18/99 0830

Parameter	Result	Qual	Total Uncert. (2 +/-)	MDC	Prep Date	Analysis Date	Batch #	Uld %
SR-90 BY GFPC SDWW 7500-SR MOD				pCi/L	SR-90 BY GFPC			
Strontium 90	-0.62	U	0.48	0.86	01/07/00	01/24/00	DC07E93	--

ME(S)

s are incomplete without the case narrative.
is determined by instrument performance only.
d results are greater than the MDC
Analyte analyzed for but was not detected

Quanterra - St. Louis

METHOD BLANK REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F91210115
Matrix: SOLID

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Lab Sample ID Batch #	Yld %
Gamma Cs-137 & Nats by HASL AM-02 MOD			pCi/g	Gamma (Cs & Nats)			F91190000-247B	
Cesium 137	-0.018	U	0.039	0.066	12/28/99	01/05/00	3362247	
Radium (226)	-0.16	U	0.75	1.4	12/28/99	01/05/00	3362247	
Radium 228	-0.29	U	0.17	0.25	12/28/99	01/05/00	3362247	
Uranium 235	-0.45	U	0.17	0.26	12/28/99	01/05/00	3362247	
Uranium 238	-0.61	U	0.42	0.85	12/28/99	01/05/00	3362247	
--- Other Detected Radionuclides ---								
Protactinium 231	0.7	U	1.1	2.4	12/28/99	01/05/00	3362247	
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso U (SHORT CT)			F0A030000-356B	
Uranium 234	0.100	J	0.073	0.066	01/03/00	01/27/00	0003356	95
Uranium 235	0.012	U	0.029	0.069	01/03/00	01/27/00	0003356	95
Uranium 238	0.044	U	0.048	0.056	01/03/00	01/27/00	0003356	95
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/g	Iso Pu (SHORT CT)			F0A050000-167B	
Plutonium 238	0.079	U	0.097	0.17	01/05/00	01/27/00	0005167	75
Plutonium 239/240	-0.0038	U	0.0076	0.090	01/05/00	01/27/00	0005167	75
SR-90 BY GFPC DOE 7500-SR MOD			pCi/g	SR-90 BY GFPC			F0A120000-121B	
Strontium 90	-0.05	U	0.43	0.75	01/12/00	01/29/00	0012121	74
GROSS A/B BY DOE RP-710 MOD			pCi/g	GROSS A/B			F0A190000-152B	
Gross Alpha	0.6	U	2.2	3.7	12/23/99	01/20/00	0019152	
Gross Beta	0.4	U	3.4	4.2	12/28/99	01/20/00	0019152	

NOTE(S)

DQIs are incomplete without the case narrative.

MDC is determined using instrument performance only

Yld results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analysed for but was not detected

METHOD BLANK REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L210113
Matrix: WATER

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	MDC	Prep Date	Analysis Date	Lab Sample ID Batch #	Yld %
GROSS A/B BY GFPC SW846 9310 MOD			pCi/L	GROSS A/B			FQA040000-164B	
Gross Alpha	0.45	U	0.43	0.66	01/04/00	01/11/00	0004164	
Gross Beta	2.8	U	1.2	1.3	01/04/00	01/11/00	0004164	
Invalid	0.0		0.0	0.0	01/04/00	01/11/00	0004164	
SR-90 BY GFPC EPA 7500-SR MOD			pCi/L	SR-90 BY GFPC			FQA070000-293B	
Strontium 90	0.13	U	0.14	0.62	01/07/00	01/24/00	0007292	40
Gamma Cs-137 & Nlts by MASL AM-02 MOD			pCi/L	Gamma (Cs & Nlts)			FQA180000-145B	
Americium 241	-4.4	U	9.8	22	01/18/00	01/20/00	0018145	
Cesium 137	-4.6	U	7.5	16	01/18/00	01/20/00	0018145	
Cobalt 60	11	U	10	24	01/18/00	01/20/00	0018145	
Invalid	0.0		0.0	0.0	01/18/00	01/20/00	0018145	
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD			pCi/L	Iso Pu (SHORT CT)			FQA250000-149B	
Plutonium 238	0.12	U	0.37	0.87	01/25/00	01/29/00	0025149	34
Plutonium 239/40	0.13	U	0.32	0.66	01/25/00	01/29/00	0025149	34
Iso URANIUM (SHORT CT) NAS ONLY MOD			pCi/L	Iso U (SHORT CT)			FQA250000-155B	
Uranium 234	0.015	U	0.032	0.14	01/25/00	01/28/00	0025155	87
Uranium 235	0.043	U	0.090	0.20	01/25/00	01/28/00	0025155	87
Uranium 238	-0.01	U	0.014	0.14	01/25/00	01/28/00	0025155	87

DEF(S)

ta are incomplete without the case narrative.

C is determined using instrument performance only

ld results are greater than the MDC

Result is greater than sample detection limit but less than stated reporting limit.

Analyte analyzed for but was not detected

Quanterra - St. Louis

Laboratory Control Sample Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: [illegible]
Matrix: SOLID

Parameter	Spike Amount	Result		Total Uncert. (2 σ+/-)	MDC	% Rec			QC Control Limits
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD		pCi/g			Iso Pu (SHORT CT)				FOA030000-308C
Plutonium 238	10.6	9.4	-	2.0	0.08	73	90	-	46 - 126
Plutonium 239/40	10.4	11.9	-	2.3	0.04	73	93	-	46 - 126
Batch #:	0002308				Analysis Date	01/11/00			
Iso URANIUM (SHORT CT) NAS ONLY MOD		pCi/g			Iso U (SHORT CT)				FOA030000-360C
Uranium 234	6.01	5.8	-	1.2	0.1	97	96	-	42 - 123
Uranium 238	6.01	5.9	-	1.2	0.07	97	98	-	42 - 123
Batch #:	0002340				Analysis Date	01/12/00			
GROSS A/B BY DGE RP-710 MOD		pCi/g			GROSS A/B				FOA100000-205C
Gross Alpha	27.1	13.4		4.1	2.4		50		48 - 147
Gross Beta	26.8	24.0		5.0	6.0		90		48 - 145
Batch #:	0010203				Analysis Date	01/12/00			
SR-90 BY GFPC DGE 7500-SR MOD		pCi/g			SR-90 BY GFPC				FOA120000-121C
Strontium 90	9.70	9.2		1.8	0.3	91	95		43 - 126
Batch #:	0010121				Analysis Date	01/21/00			
Gamma Cs-137 & Hits by HASL AM-02 MOD		pCi/g			Gamma (Cs & hits)				F9L290000-247C
Cesium 137	18900	18300	-	1900	70		97	-	55 - 117
Batch #:	9363247				Analysis Date	01/06/00			

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow [illegible]

Quanterra - St. Louis

DUPLICATE EVALUATION REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L210115
Work Order #: D6MC
Matrix: SOLID

Date Sampled: 12/15/99
Date Received: 12/18/99

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Rld	DUPLICATE Result		Total Uncert. (2σ+/-)	% Rld	QC Sample ID Precision	
Gamma Cs-137 & Nats by HASL	pCi/g				Gamma (Cs & Nats)				F9L210115-001	
Cesium 137	0.017	U	0.080		0.138	U	0.095		156	\RPD
---Other Detected Radionuclides---										
Lead 210	3.1		1.4		2.9		1.0		9	\RPD
Lead 212	1.25		0.23		1.32		0.33		4	\RPD
Lead 214	1.26		0.24		1.05		0.37		19	\RPD
Potassium 40	24.6		4.2		26.0		4.3		6	\RPD
Thallium 208	0.31		0.13		0.42		0.14		15	\RPD
	Batch #:		9363247	(Sample)			9363247	(Duplicate)		
GROSS A/B BY DOE RP-710 MOD	pCi/g				GROSS A/B				F9L210115-001	
Gross Alpha	14.4		4.5		18.6		4.8		22	\RPD
Gross Beta	32.0		4.1		33.3		4.1		3.9	\RPD
	Batch #:		3019155	(Sample)			3019155	(Duplicate)		

NOTE(S)

ata are incomplete without the case narrative.
alculations are performed before rounding to avoid round-off error in calculated results

U Analyte analyzed for but was not detected

DUPLICATE EVALUATION REPORT

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L210115
Work Order #: D6MK
Matrix: WATER

Date Sampled: 12/16/99
Date Received: 12/18/99

Parameter	SAMPLE Result		Total Uncert. (2σ+/-)	% Rld	DUPLICATE Result		Total Uncert. (2σ+/-)	% Rld	QC Sample ID Precision	
GROSS A/B BY GFPC SW846		pCi/L			GROSS A/B				F9L210115-006	
Gross Alpha	-0.36	U	0.48		-0.24	U	0.61		-42	%RPD
Gross Beta	-0.9	U	1.0		0.3	U	1.0		-425	%RPD
	Batch #:	0004144	(Sample)		0004164	(Duplicate)				
Gamma Cs-137 & Nuc by HASL		pCi/L			Gamma (Cs & nuc)				F9L210115-006	
Cesium 137	0.5	U	8.2		-8.5	U	9.9		-223	%RPD
	Batch #:	0018143	(Sample)		0018144	(Duplicate)				

NOTE(S)

ata are incomplete without the case narrative.
alculations are performed before rounding to avoid round-off error in calculated results

U Analyte analyzed for but was not detected

Quanterra - St. Louis

Laboratory Control Sample Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L210115
Matrix: SOLID

Parameter	Spike Amount	Result		Total Uncert. (2 σ+/-)	MDC	% Rcd	% Rec		Lab Sample ID / QC Control Limits
Iso URANIUM (SHORT CT) NAS ONLY MCD		pCi/g			Iso U (SHORT CT)				F0A030000-256C
Uranium 234	6.01	5.5	-	1.2	0.07	92	92	-	40 - 120
Uranium 238	6.01	5.5	-	1.4	0.04	92	92	-	40 - 120
Batch #: 0003256					Analysis Date	01/27/00			
Iso PLUTONIUM (SHORT CT) NAS ONLY MCD		pCi/g			Iso Pu (SHORT CT)				F0A050000-167C
Plutonium 238	5.29	5.4		1.2	0.1	91	102		40 - 120
Plutonium 239/40	6.21	6.4		1.5	0.1	91	103		40 - 120
Batch #: 0005167					Analysis Date	01/27/00			
SR-90 BY GFPC DOE 7500-SR MOD		pCi/g			SR-90 BY GFPC				F0A120000-122C
Strontium 90	9.70	9.2		1.8	0.3	91	95		49 - 126
Batch #: 0012121					Analysis Date	01/31/00			
GROSS A/B BY DOE AP-710 MOD		pCi/g			GROSS A/B				F0A190000-152C
Gross Alpha	27.1	19.5		3.2	4.3	72			48 - 147
Gross Beta	26.3	24.2		3.4	5.8	90			48 - 145
Batch #: 0019152					Analysis Date	01/20/00			
Gamma Cs-137 & Kids by NASL AM-02 MOD		pCi/g			Gamma (Cs & BIS)				F9L290000-247C
Cesium 137	18900	18300	-	1300	70	97		-	80 - 127
Batch #: 9361247					Analysis Date	01/06/00			

NOTE(S)

MDC as determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

\- For informational purposes only. The detection limit does not follow significant figures SOP.
\- For informational purposes only. [illegible]

Quanterra - St. Louis

Laboratory Control Sample Report

Quanterra, Inc. - Radiochemistry

Client Lot ID: F9L210115
Matrix: WATER

Parameter	Spike Amount	Result	Total Uncert. (2 σ+/-)	MDC	% Yld	% Rec	Lab Sample ID / QC Control Limits
GROSS A/B BY GFPC SW846 9310 MOD		pCi/L		GROSS A/B			F0A040000-164C
Gross Alpha	45.0	50.9	5.8	1.0		113	47 - 121
Batch #: 0004164				Analysis Date	01/11/00		
GROSS A/B BY GFPC SW846 9310 MOD		pCi/L		GROSS A/B			F0A040000-164C
Gross Beta	97.0	98	10	2		101	54 - 121
Batch #: 0004164				Analysis Date	01/11/00		
SR-90 BY GFPC SMWW 7500-SR MOD		pCi/L		SR-90 BY GFPC			F0A070000-293C
Strontium 90	9.71	11.9	2.4	0.8	92	122	34 - 126
Batch #: 0007293				Analysis Date	01/24/00		
Gamma Cs-137 & Nuclides by NASL AM-02 MOD		pCi/L		Gamma (Cs & nuclides)			F0A180000-145C
Cesium 137	25300	26300	2500	100		104	81 - 117
Batch #: 0018145				Analysis Date	01/20/00		
Iso PLUTONIUM (SHORT CT) NAS ONLY MOD		pCi/L		Iso Pu (SHORT CT)			F0A250000-149C
Plutonium 238	10.6	11.4	3.1	0.5	92	110	47 - 120
Plutonium 239/240	12.4	11.6	3.1	0.5	92	94	47 - 120
Batch #: 0025149				Analysis Date	01/28/00		
Iso URANIUM (SHORT CT) NAS ONLY MOD		pCi/L		Iso U (SHORT CT)			F0A250000-153C
Uranium 234	12.0	9.4	2.2	0.1	77	92	58 - 129
Uranium 238	12.0	10.7	2.5	0.2	89	89	58 - 129
Batch #: 0025155				Analysis Date	01/29/00		

NOTE(S)

MDC is determined by instrument performance only
Calculations are performed before rounding to avoid round-off error in calculated results

- For informational purposes only. The detection limit does not follow significant figures SOP.
- For informational purposes only. The detection limit does not follow significant figures SOP.

9FN-960807-0292

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

BC-4

Lab Name: SOUTHWEST LAB OF OK Contract: TRCLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.04
Level (low/med): LOW Date Received: 12/17/99
% Solids: 99.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.28	U	N	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	31.3			P
7440-41-7	Beryllium	0.40	B		P
7440-43-9	Cadmium	0.14	B		P
7440-48-4	Cobalt	1.4	B		P
7440-50-8	Copper	3.4	B		P
7439-92-1	Lead	3.4			P
7439-97-6	Mercury	0.00	U		CV
7440-02-0	Nickel	4.2			P
7782-49-2	Selenium	0.22	U		P
7440-22-4	Silver	0.22	U		P
7440-28-0	Thallium	0.33	U		P
7440-62-2	Vanadium	4.7			P
7440-66-6	Zinc	16.3			P
7440-47-3	Chromium	1.2	B	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

BC-5

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.05
Level (low/med): LOW Date Received: 12/17/99
% Solids: 94.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.29	U	N	P
7440-38-2	Arsenic	1.7			P
7440-39-3	Barium	47.6			P
7440-41-7	Beryllium	0.53			P
7440-43-9	Cadmium	0.04	B		P
7440-48-4	Cobalt	1.5	B		P
7440-50-8	Copper	4.5	B		P
7439-92-1	Lead	8.7			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	3.3			P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	0.11	U		P
7440-28-0	Thallium	0.36	U		P
7440-62-2	Vanadium	5.6			P
7440-66-6	Zinc	32.0			P
7440-61-1	Uranium	1.0	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.20
Level (low/med): LOW Date Received: 12/17/99
% Solids: 81.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.41	U	N	P
7440-38-2	Arsenic	1.3			P
7440-39-3	Barium	30.6			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	1.1			P
7440-48-4	Cobalt	3.2			P
7440-50-8	Copper	9.3			P
7439-92-1	Lead	11.5			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	6.0			P
7782-49-2	Selenium	0.39	U		P
7440-22-4	Silver	0.14	U		P
7440-28-0	Thallium	0.40	U		P
7440-62-2	Vanadium	8.9			P
7440-66-6	Zinc	49.0			P
7440-62-2	Uranium	1.2	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-2

Lab Name: SOUTHWEST_LAB_OF_OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.22
Level (low/med): LOW Date Received: 12/17/99
% Solids: 91.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.29	U	N	P
7440-38-2	Arsenic	3.0			P
7440-39-3	Barium	128			P
7440-41-7	Beryllium	0.64			P
7440-43-9	Cadmium	0.25	B		P
7440-48-4	Cobalt	5.0			P
7440-50-8	Copper	8.3			P
7439-92-1	Lead	4.2			P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	9.0			P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0.23	U		P
7440-28-0	Thallium	0.57	B		P
7440-62-2	Vanadium	15.9			P
7440-66-6	Zinc	152			P
7440-61-1	Uranium	1.3	B	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-3

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509X
Matrix (soil/water): SOIL Lab Sample ID: 41509.22
Level (low/med): LOW Date Received: 12/17/99
% Solids: 81.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	[illegible]	B	N	P
7440-38-2	Arsenic	[illegible]			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	[illegible]	B		P
7440-43-9	Cadmium	[illegible]	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	[illegible]	B		P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	[illegible]	B		CV
7440-02-0	Nickel	[illegible]	B		P
7782-49-2	Selenium	[illegible]	B		P
7440-22-4	Silver	[illegible]	U		P
7440-28-0	Thallium	[illegible]	U		P
7440-62-2	Vanadium	[illegible]			P
7440-66-6	Zinc	[illegible]			P
7440-61-1	Uranium	[illegible]	B	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: NA

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MC-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.06
Level (low/med): LOW Date Received: 12/17/99
% Solids: 93.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.19	U	N	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	78.9			P
7440-41-7	Beryllium	0.73			P
7440-43-9	Cadmium	0.05	B		P
7440-48-4	Cobalt	[illegible]			P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	6.6			P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	0.33	U		P
7440-28-0	Thallium	0.36	U		P
7440-62-2	Vanadium	[illegible]			P
7440-66-6	Zinc	37.6			P
7440-61-1	Uranium	1.0	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MC-2

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.07
Level (low/med): LOW Date Received: 12/17/99
% Solids: 96.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.27	U	N	P
7440-38-2	Arsenic	2.0			P
7440-39-3	Barium	47.4			P
7440-41-7	Beryllium	0.50	B		P
7440-43-9	Cadmium	0.17	B		P
7440-48-4	Cobalt	1.8	B		P
7440-50-8	Copper	3.6	B		P
7439-92-1	Lead	8.0			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	1.1			P
7782-49-2	Selenium	0.33	U		P
7440-22-4	Silver	0.11	U		P
7440-28-0	Thallium	0.34	U		P
7440-62-2	Vanadium	4.9			P
7440-66-6	Zinc	9.6			P
7440-61-1	Uranium	0.98	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MC-3

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41509 SAS No.: _____ SDG No.: 41509A
Matrix (soil/water): SOIL_ Lab Sample ID: 41509.08
Level (low/med): LOW___ Date Received: 12/17/99
% Solids: _96.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	0.17	U	N	P
7440-38-2	Arsenic__	1.5			P
7440-39-3	Barium___	39.2			P
7440-41-7	Beryllium	0.29	U		P
7440-43-9	Cadmium__	0.61			P
7440-48-4	Cobalt___	1.5	U		P
7440-50-8	Copper___	2.3	U		P
7439-92-1	Lead____	6.7			P
7439-97-6	Mercury__	0.00			CV
7440-02-0	Nickel___	2.5			P
7782-49-2	Selenium_	0.33	U		P
7440-22-4	Silver___	0.22	U		P
7440-28-0	Thallium_	0.34	U		P
7440-62-2	Vanadium_	4.7			P
7440-66-6	Zinc____	16.8			P
7440-61-1	Uranium__	0.99	U	N	P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MC-4

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41509 SAS No.: _____ SDG No.: 41509A
Matrix (soil/water): SOIL_ Lab Sample ID: 41509.09
Level (low/med): LOW__ Date Received: 12/17/99
% Solids: _96.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.28	B	N	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	30.			P
7440-41-7	Beryllium	0.33	B		P
7440-43-9	Cadmium	0.03	B		P
7440-48-4	Cobalt	1.8	B		P
7440-50-8	Copper	2.5	B		P
7439-92-1	Lead	.8	B		P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	2.5			P
7782-49-2	Selenium	0.34	B		P
7440-22-4	Silver	0.[illegible]	B		P
7440-28-0	Thallium	0.39	B		P
7440-62-2	Vanadium	9.[illegible]			P
7440-66-6	Zinc	9.0			P
7440-61-1	Uranium	1.1	B	N	P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MC-5A

Lab Name: SOUTHWEST LAB OF OK Contract: TSCELAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.10
Level (low/med): LOW Date Received: 12/17/99
% Solids: 94.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.13	U	N	P
7440-38-2	Arsenic	[illegible]			P
7440-39-3	Barium	[illegible]			P
7440-41-7	Beryllium	0.48	B		P
7440-43-9	Cadmium	[illegible]	B		P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	[illegible]	B		P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00	U		CV
7440-02-0	Nickel	[illegible]			P
7782-49-2	Selenium	0.35	U		P
7440-22-4	Silver	[illegible]	U		P
7440-28-0	Thallium	0.36	U		P
7440-62-2	Vanadium	6.6			P
7440-66-6	Zinc	18.0			P
7440-61-1	Uranium	1.8	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

017

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

MC-SB

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK___ Case No.: 41509 SAS No.: _____ SDG No.: 41509A
Matrix (soil/water): SOIL_ Lab Sample ID: 41509.11
Level (low/med): LOW__ Date Received: 12/17/99
% Solids: _36.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.28	U	N	P
7440-38-2	Arsenic	1.5			P
7440-39-3	Barium	13.3			P
7440-41-7	Beryllium	0.39	B		P
7440-43-9	Cadmium	0.25	B		P
7440-48-4	Cobalt	1.1	B		P
7440-50-8	Copper	2.3	B		P
7439-92-1	Lead	3.1			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	2.1			P
7782-49-2	Selenium	0.34	U		P
7440-22-4	Silver	0.11	U		P
7440-28-0	Thallium	0.35	U		P
7440-62-2	Vanadium	4.1			P
7440-66-6	Zinc	16.5			P
7440-61-1	Uranium	0.99	U	N	P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.12
Level (low/med): LOW Date Received: 12/17/99
% Solids: 96.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.13	U	N	P
7440-38-2	Arsenic	2.4			P
7440-39-3	Barium	33.0			P
7440-41-7	Beryllium	0.72			P
7440-43-9	Cadmium	0.03	U		P
7440-48-4	Cobalt	[illegible]			P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00	B		CV
7440-02-0	Nickel	4.7			P
7782-49-2	Selenium	0.34	U		P
7440-22-4	Silver	0.[illegible]	U		P
7440-28-0	Thallium	0.35	U		P
7440-62-2	Vanadium	10.1			P
7440-66-6	Zinc	29.8			P
7440-61-1	Uranium	1.7	B	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-2

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.13
Level (low/med): LOW Date Received: 12/17/99
% Solids: 92.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.12	U	N	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	37.8			P
7440-41-7	Beryllium	0.68			P
7440-43-9	Cadmium	0.42			P
7440-48-4	Cobalt	3.3			P
7440-50-8	Copper	4.7			P
7439-92-1	Lead	10.8			P
7439-97-6	Mercury	0.00	U		CV
7440-02-0	Nickel	4.6			P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0.13	U		P
7440-28-0	Thallium	0.37	U		P
7440-62-2	Vanadium	8.5			P
7440-66-6	Zinc	11.2			P
7440-61-1	Uranium	1.0	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-3

Lab Name: SOUTHWEST_LAB_OF_OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.14
Level (low/med): LOW Date Received: 12/17/99
% Solids: 96.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.27	U	N	P
7440-38-2	Arsenic	1.8	-		P
7440-39-3	Barium	47.3	-		P
7440-41-7	Beryllium	0.48	B		P
7440-43-9	Cadmium	0.07	B		P
7440-48-4	Cobalt	1.5	B		P
7440-50-8	Copper	5.4	-		P
7439-92-1	Lead	16.0	-		P
7439-97-6	Mercury	0.00	-		CV
7440-02-0	Nickel	3.0	-		P
7782-49-2	Selenium	0.33	UD		P
7440-22-4	Silver	0.21	UB		P
7440-28-0	Thallium	0.34	UD		P
7440-62-2	Vanadium	5.2	-		P
7440-66-6	Zinc	18.8	-		P
7440-61-1	Uranium	0.99	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-4

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.15
Level (low/med): LOW Date Received: 12/17/99
% Solids: 94.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.28	U	N	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	54.2			P
7440-41-7	Beryllium	0.88			P
7440-43-9	Cadmium	0.08	B		P
7440-48-4	Cobalt	[illegible]			P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00			CV
7440-02-0	Nickel	3.8			P
7782-49-2	Selenium	0.34	U		P
7440-22-4	Silver	0.43	B		P
7440-28-0	Thallium	0.35	U		P
7440-62-2	Vanadium	6.2			P
7440-66-6	Zinc	34.8			P
7440-61-1	Uranium	0.99	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-5

Lab Name: SOUTHWEST_LAB_OF_OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.26
Level (low/med): LOW Date Received: 12/17/99
% Solids: 96.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.26	U	N	P
7440-38-2	Arsenic	2.4			P
7440-39-3	Barium	65.6			P
7440-41-7	Beryllium	0.[illegible]			P
7440-43-9	Cadmium	0.[illegible]			P
7440-48-4	Cobalt	[illegible]	B		P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]			P
7439-97-6	Mercury	0.00			CV
7440-02-0	Nickel	5.[illegible]			P
7782-49-2	Selenium	0.[illegible]	U		P
7440-22-4	Silver	0.[illegible]	U		P
7440-28-0	Thallium	0.[illegible]	U		P
7440-62-2	Vanadium	9.[illegible]			P
7440-66-6	Zinc	45.6			P
7440-61-1	Uranium	1.00	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: TRACE

Comments:

FORM I - IN

U.S. EPA - CLP

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

SC-6

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509A
Matrix (soil/water): SOIL Lab Sample ID: 41509.17
Level (low/med): LOW Date Received: 12/17/99
% Solids: 36.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.28	U	N	P
7440-38-2	Arsenic	2.5			P
7440-39-3	Barium	38.2			P
7440-41-7	Beryllium	0.67			P
7440-43-9	Cadmium	0.06	B		P
7440-48-4	Cobalt	2.4	B		P
7440-50-8	Copper	1.6			P
7439-92-1	Lead	11.3			P
7439-97-6	Mercury	0.00			CV
7440-02-0	Nickel	4.8			P
7782-49-2	Selenium	0.34	BU		P
7440-22-4	Silver	0.33	B		P
7440-28-0	Thallium	0.35	BU		P
7440-62-2	Vanadium	10.6			P
7440-66-6	Zinc	55.0			P
7440-61-1	Uranium	1.00	U	N	P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
700 West Albany / Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

SDG NARRATIVE

CONTRACT: TECHLAW
CASE: 41509B
SDG: 41509

DATE: January 17, 2000
SOW NO.: SW846
EPISODE NO.: 41509

INORGANIC METAL FRACTION:

Nine soil samples plus one MS/MSD was submitted for ICP and Hg analysis. No major problems occurred during the digestion or analyses of these samples. Please see the DC-1 (Sample Log-in Sheet) for sample conditions and cooler temperatures at receipt. The sample's analysis was completed according to the following:

SWL SOP #	Method SOP is based
SWL-IN-205	SW846 3010A, 3050A, & 6010B
SWL-IN-207	SW846 7470A & 7471A

Initial and Continuing Calibration Checks: No problems.

Initial and Continuing Calibration Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Calibration Blanks: Co, Sb, & Ti. No action required.

Linearity near the CRDL (CRA & CRI): The CRI standard was outside of our in-house warning limits of 70 - 130%R for the following elements: Sb, Ba, Be, & Ag. No action required.

Preparation Blanks: The following elements showed low level concentrations below the Contract Required Detection Limit in the Preparation Blank: Cd, Cu, & Co. No action required.

Lab Control Spikes: No problems.

Matrix Spike (and MSD): The following elements were outside the control limits of 75-125% recovery: Sb. All associated samples were flagged with a "N" on Form I's. No action required.

Duplicates (LCSD and MSD): The following element was outside the control limits of 0-20% RPD: LCSSD- no problem; MSD- Sb. All associated samples were flagged with a "*" on Form I's. No action required.

Serial Dilution (ICP): The serial dilution was outside the control limits of 10% for the following elements: Zn. All associated samples were flagged with an "E" on Form I's. No action required.

SW846 MDLs: The IDL column on the Form 10s contain our MDLs rather than IDLs and the CRDL column on the Form 10s contain our PQLS rather than CRDLs. MDLs are done on an annual basis (SWOK SOP states between November and February) instead of requiring the quarterly change needed for IDLs.

Sincerely,

Deborah J. Hinman
Inorganic Program Manager

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-2

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41309 SAS No.: SDG No.: 413098
Matrix (soil/water): SOIL Lab Sample ID: 41309.22
Level (low/med): LOW Date Received: 12/17/99
% Solids: 91.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.26	U	N*	P
7440-38-2	Arsenic	3.0			P
7440-39-3	Barium	128			P
7440-41-7	Beryllium	0.84			P
7440-43-9	Cadmium	0.15	B		P
7440-48-4	Cobalt	3.0			P
7440-50-8	Copper	3.3			P
7439-92-1	Lead	14.1			P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	8.0			P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0.13	U		P
7440-28-0	Thallium	0.57	B		P
7440-62-2	Vanadium	15.9			P
7440-66-6	Zinc	152		E	P
7440-61-1	Uranium	1.3	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

2960706692600

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-1

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 41509E
Matrix (soil/water): SOIL Lab Sample ID: 41509.22
Level (low/med): LOW Date Received: 12/17/99
% Solids: 81.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.33	U	N*	P
7440-38-2	Arsenic	1.7			P
7440-39-3	Barium	28.0			P
7440-41-7	Beryllium	0.19	B		P
7440-43-9	Cadmium	0.04	B		P
7440-48-4	Cobalt	4.3	B		P
7440-50-8	Copper	1.4	B		P
7439-92-1	Lead	7.9	B		P
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel	4.0	B		P
7782-49-2	Selenium	0.41	U		P
7440-22-4	Silver	0.33	U		P
7440-28-0	Thallium	0.42	U		P
7440-62-2	Vanadium	8.7			P
7440-66-6	Zinc	19.1		E	P
7440-61-1	Uranium	1.2	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-4

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 415095
Matrix (soil/water): SOIL Lab Sample ID: 41509.23
Level (low/med): LOW Date Received: 12/17/99
% Solids: 84.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	[illegible]	[illegible]	N*	[illegible]
7440-38-2	Arsenic	[illegible]	[illegible]		[illegible]
7440-39-3	Barium	[illegible]	[illegible]		[illegible]
7440-41-7	Beryllium	0.67	[illegible]		[illegible]
7440-43-9	Cadmium	0.04	[illegible]		[illegible]
7440-48-4	Cobalt	[illegible]	[illegible]		[illegible]
7440-50-8	Copper	[illegible]	[illegible]		[illegible]
7439-92-1	Lead	[illegible]	[illegible]		[illegible]
7439-97-6	Mercury	0.03	[illegible]		[illegible]
7440-02-0	Nickel	[illegible]	[illegible]		[illegible]
7782-49-2	Selenium	0.39	[illegible]		[illegible]
7440-22-4	Silver	0.14	[illegible]		[illegible]
7440-28-0	Thallium	0.39	[illegible]		[illegible]
7440-62-2	Vanadium	[illegible]	[illegible]		[illegible]
7440-66-6	Zinc	28.9	[illegible]	E	[illegible]
7440-61-1	Uranium	[illegible]	[illegible]		[illegible]

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-SA

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 415095
Matrix (soil/water): SOIL Lab Sample ID: 415095.26
Level (low/med): LOW Date Received: 12/17/99
% Solids: 90.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.30	U	NF	P
7440-38-2	Arsenic	2.1			P
7440-39-3	Barium	1.68			P
7440-41-7	Beryllium	0.58			P
7440-43-9	Cadmium	0.05	B		P
7440-48-4	Cobalt	4.3			P
7440-50-8	Copper	5.1			P
7439-92-1	Lead	18.2	B		P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	9.3			P
7782-49-2	Selenium	0.36	UB		P
7440-22-4	Silver	0.13	UB		P
7440-28-0	Thallium	0.62	B		P
7440-62-2	Vanadium	12.2			P
7440-66-6	Zinc	35.8		E	P
7440-61-1	Uranium	2.3	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-5B

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41509 SAS No.: _____ SDG No.: 41509B
Matrix (soil/water): SOIL_ Lab Sample ID: 41509.27
Level (low/med): LOW__ Date Received: 12/17/99
% Solids: _80.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.33	U	NT	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	120			P
7440-41-7	Beryllium	0.81			P
7440-43-9	Cadmium	0.05	B		P
7440-48-4	Cobalt	4.9			P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]	B		P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	[illegible]			P
7782-49-2	Selenium	0.41	U		P
7440-22-4	Silver	0.25	U		P
7440-28-0	Thallium	0.68	B		P
7440-62-2	Vanadium	20.0			P
7440-66-6	Zinc	46.0		E	P
7440-61-1	Uranium	1.7	B		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-6

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 415095
Matrix (soil/water): SOIL Lab Sample ID: 41509.26
Level (low/med): LOW Date Received: 12/17/99
% Solids: 78.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.34	U	N*	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	122			P
7440-41-7	Beryllium	0.70			P
7440-43-9	Cadmium	0.12	B		P
7440-48-4	Cobalt	4.4			P
7440-50-8	Copper	6.1	B		P
7439-92-1	Lead	11.0	B		P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	6.8			P
7782-49-2	Selenium	0.42	U		P
7440-22-4	Silver	0.23	B		P
7440-28-0	Thallium	0.43	U		P
7440-62-2	Vanadium	10.7			P
7440-66-6	Zinc	25.1		E	P
7440-61-1	Uranium	1.2	B		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-7

Lab Name: SOUTHWEST_LAB_OF_OK_____ Contract: TECHLAW___
Lab Code: SWOK__ Case No.: 41509 SAS No.: _____ SDG No.: 415095
Matrix (soil/water): SOIL_ Lab Sample ID: 41509.29
Level (low/med): LOW__ Date Received: 12/17/99
% Solids: _84.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.31	U	N*	P
7440-38-2	Arsenic	2.6			P
7440-39-3	Barium	102			P
7440-41-7	Beryllium	0.70			P
7440-43-9	Cadmium	0.04	U		P
7440-48-4	Cobalt	4.0			P
7440-50-8	Copper	[illegible]			P
7439-92-1	Lead	[illegible]	SN		P
7439-97-6	Mercury	0.03	U		CV
7440-02-0	Nickel	7.8			P
7782-49-2	Selenium	0.39	U		P
7440-22-4	Silver	0.14	U		P
7440-28-0	Thallium	0.40	U		P
7440-62-2	Vanadium	[illegible]			P
7440-66-6	Zinc	[illegible]		E	P
7440-61-1	Uranium	2.2	U		P

Color Before: BROWN____ Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-8

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 415095
Matrix (soil/water): SOIL Lab Sample ID: 41509.30
Level (low/med): LOW Date Received: 12/17/99
% Solids: 76.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.38	U	N*	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	103			P
7440-41-7	Beryllium	0.67			P
7440-43-9	Cadmium	0.63			P
7440-48-4	Cobalt	4.1			P
7440-50-8	Copper	8.5	B		P
7439-92-1	Lead	10.4	B		P
7439-97-6	Mercury	0.03	B		CV
7440-02-0	Nickel	6.5			P
7782-49-2	Selenium	0.43	U		P
7440-22-4	Silver	0.16	U		P
7440-28-0	Thallium	0.44	U		P
7440-62-2	Vanadium	10.2			P
7440-66-6	Zinc	21.7		E	P
7440-61-1	Uranium	1.2	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

CLIENT SAMPLE ID

CC-9

Lab Name: SOUTHWEST LAB OF OK Contract: TECHLAW
Lab Code: SWOK Case No.: 41509 SAS No.: SDG No.: 415095
Matrix (soil/water): SOIL Lab Sample ID: 41509.31
Level (low/med): LOW Date Received: 12/17/99
% Solids: 91.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.30	U	N*	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	106			P
7440-41-7	Beryllium	0.76			P
7440-43-9	Cadmium	0.98			P
7440-48-4	Cobalt	4.5			P
7440-50-8	Copper	7.3			P
7439-92-1	Lead	14.4			P
7439-97-6	Mercury	0.03	UN		CV
7440-02-0	Nickel	7.1			P
7782-49-2	Selenium	0.36	U		P
7440-22-4	Silver	0.12	U		P
7440-28-0	Thallium	0.37	U		P
7440-62-2	Vanadium	12.1			P
7440-66-6	Zinc	144		E	P
7440-61-1	Uranium	1.1	U		P

Color Before: BROWN Clarity Before: Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts:

Comments:

General Chemistry Data

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2500

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: January 14, 2000
EPISODE NO.: 41536

INORGANIC FRACTION:

Two water samples, plus one matrix spike and one matrix spike duplicate, were submitted for the following classical inorganic analysis: IC(F,Cl,SO4), Total Alkalinity. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-301	EPA 300.0	IC(F,Cl,SO4)
SWL-IN-500	EPA 310.1	Total Alkalinity

Refer to Sample Receipt Notification for details of sample conditions at receipt. Explanations of the forms are the following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

QC SUMMARY

Initial and Continuing Calibration Check: No problems.
Blanks: All blanks were below the reporting limit.
Lab Control Spikes: No problems.
Matrix Spikes & MSD: No problems.
Duplicates (LCS & MSD): No problems.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41336.03

REPORTED : 11.12.99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41336.03
SAMPLE #: SM-30 2288
LOCATION:
MATRIX : Water

SAMPLED : 11/17 99
SUBMITTED: 11.18 99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/L	40.0	12/29/99 08:45	JCL	SM 2320B
CARBONATE	20.0	mg/L	ND	12/29/99 08:45	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/L	22.4	12/26/99 16:41	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/L	ND	12/26/99 16:41	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/L	5.6	12/26/99 16:41	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
N/A = NOT APPLICABLE

TECHLAW, INC.
[illegible] E 42ND STREET SUITE [illegible]
NEW YORK, NY 10168

REPORT : 41536.04

REPORTED : [illegible]

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41536.04 MSL
SAMPLE #: SM-3C DISS
LOCATION:
MATRIX : Water

SAMPLED : [illegible]
SUBMITTED: [illegible]

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	[illegible]	mg/l	[illegible]	[illegible]	[illegible]	SM [illegible]
CARBONATE	[illegible]	mg/l	ND	[illegible]	[illegible]	SM [illegible]
INORGANIC CHLORIDE	[illegible]	mg/l	[illegible]	[illegible]	SS	EPA [illegible] SW [illegible]
FLUORIDE	[illegible]	mg/l	[illegible]	[illegible]	SS	EPA [illegible] SW [illegible]
SULFATE	[illegible]	mg/l	[illegible]	[illegible]	SS	EPA [illegible] SW [illegible]

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41836.05

REPORTED : 01/13/00

Attn: Julie Shamanan

PROJECT : LA PHASE 2
LAB# : 41836.05 SD1
SAMPLE #: SM-3C DISS
LOCATION:
MATRIX : Water

SAMPLED : 12.17.99
SUBMITTED: 12.18.99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	140	12/29/99 08:45	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/29/99 08:45	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	33.8	12/26/99 17:14	SS	EPA 300.1 SW 9056
FLUORIDE	0.10	mg/l	10.4	12/26/99 17:14	SS	EPA 300.1 SW 9056
SULFATE	0.20	mg/l	16.3	12/26/99 17:14	SS	EPA 300.1 SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41836.06

REPORTED : 01/13/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41836.06
SAMPLE #: SD-30
LOCATION:
MATRIX : Water

SAMPLED : 12/17/99
SUBMITTED: 12/18/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/L	54.0	12/29/99 08:45	JCL	SM 2320B
CARBONATE	20.0	mg/L	ND	12/29/99 08:45	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/L	22.2	12/26/99 17:31	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/L	ND	12/26/99 17:31	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/L	5.6	12/26/99 17:31	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2358 / Fax (918) 251-2599

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: January 14, 2000
EPISODE NO.: 41450

INORGANIC FRACTION:

Five water samples, plus one matrix spike and one matrix spike duplicate, were submitted for the following classical inorganic analysis: IC(F,Cl,SO4), Nitrate-Nitrite, Total Phosphorous, Ammonia Nitrogen (NH3-N), Total Alkalinity, TKN. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-301	EPA 300.0	IC(F,Cl,SO4)
SWL-IN-304	EPA 353.2	Nitrate-Nitrite
SWL-IN-305	EPA 365.1	Total Phosphorous
SWL-IN-400	EPA 350.3	Ammonia Nitrogen (NH3-N)
SWL-IN-500	EPA 310.1	Total Alkalinity
SWL-IN-503	EPA 351.3	TKN

Refer to Sample Receipt Notification for details of sample conditions at receipt. Explanations of the forms are the following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

QC SUMMARY

Initial and Continuing Calibration Check: No problems.
Blanks: All blanks were below the reporting limit.
Lab Control Spikes: No problems.
Matrix Spikes & MSD: The following were outside the control limits: Nitrate-Nitrite // No further action was taken since sample concentration was greater than four times the spike added.
Duplicates (LCS & MSD): No problems.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY.10168

REPORT : 41450.05

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41450.05
SAMPLE #: MCC-F2
LOCATION:
MATRIX : Water

SAMPLED : 12/09/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.2
NITRATE-NITRITE	0.10	mg/l	ND	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	ND	12/15/99 00:20	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	ND	12/15/99 00:20	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	ND	12/15/99 00:20	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41450.07

REPORTED : 01/04/00

Attn: Julia Shanahan

PROJECT : LA PHASE 2
LAB# : 41450.07
SAMPLE #: 33-1
LOCATION:
MATRIX : Water

SAMPLED : 12/29/99
SUBMITTED: 12/24/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	1.1	12/27/99 14:00	KAL	EPA 350.3
ALKALINITY	20.0	mg/l	100	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	3.1	12/15/99	ZGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	1.1	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	0.32	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	33.1	12/15/99 00:37	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.61	12/15/99 00:37	SS	EPA 300.0/SW 9056
SULFATE	2.0	mg/l	161	12/15/99 02:22	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41450.09

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41450.09
SAMPLE #: TA-18
LOCATION:
MATRIX : Water

SAMPLED : 12/10/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	XAL	EPA 350.3
BICARBONATE	20.0	mg/l	46.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	ND	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	16.0	12/15/99 00:53	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.10	12/15/99 00:53	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	7.1	12/15/99 00:53	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41450.10

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41450.10 MS1
SAMPLE #: TA-13
LOCATION:
MATRIX : Water

SAMPLED : 12/13/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	4.0	12/27/99 14:00	KAL	EPA 350.1
BICARBONATE	20.0	mg/l	138	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	20.4	12/15/99	TGG	EPA 351.3
TOTAL PHOSPHORUS	0.10	mg/l	0.34	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	26.3	12/13/99 01:44	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	10.1	12/13/99 01:44	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	17.4	12/13/99 01:44	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
*, = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41450.11

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41450.11 SD1
SAMPLE #: TA-18
LOCATION:
MATRIX : Water

SAMPLED : 12/10/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	4.2	12/27/99 14:00	SRL	EPA 350.1
BICARBONATE	20.0	mg/l	136	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	19.9	12/15/99	TGG	EPA 351.2
TOTAL PHOSPHORUS	0.10	mg/l	0.94	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	27.2	12/15/99 02:01	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	10.2	12/15/99 02:01	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	17.6	12/15/99 02:01	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

2969 • 0809 • 2171

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: 01/08/2000
EPISODE NO.: 41488

INORGANIC FRACTION:

Three water samples were submitted for the following classical inorganic analysis: IC(F,Cl,SO4), Nitrate-Nitrate, Total Phosphorous, Ammonia Nitrogen (NH3-N), Total Alkalinity, Bicarbonate, Carbonate , and TKN. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-301	EPA 300.0	IC(F,Cl,SO4)
SWL-IN-304	EPA 353.2	Nitrate-Nitrate
SWL-IN-305	EPA 365.1	Total Phosphorous
SWL-IN-400	EPA 350.3	Ammonia Nitrogen (NH3-N)
SWL-IN-500	EPA 310.1	Total Alkalinity, Bicarbonate, Carbonate
SWL-IN-503	EPA 351.3	TKN

Refer to Sample Receipt Notification for details of sample conditions at receipt. Explanations of the forms are the following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

Initial and Continuing Calibration Check: No problems.

Blanks: All blanks were below the reporting limit.

Lab Control Spikes: No problems.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41489.01

REPORTED : 01/06/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41489.01
SAMPLE #: 3UTL3CG
LOCATION:
MATRIX : Water

SAMPLED : 12/10/99
SUBMITTED: 12/16/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	01/04/00 09:40	KAL	EPA 350.1
BICARBONATE	20.0	mg/l	82.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	2.5	12/30/99 17:00	JCL	EPA 351.2
NITRATE-NITRITE	0.10	mg/l	0.20	12/17/99 15:00	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 13:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	19.5	12/17/99 01:16	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.29	12/17/99 01:16	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	13.5	12/17/99 01:16	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
N/A = NOT APPLICABLE

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41489.03

REPORTED : 01/06/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41489.03
SAMPLE #: 2A-3.9
LOCATION:
MATRIX : Water

SAMPLED : 12.10.99
SUBMITTED: 12.16/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	01/04/00 09:40	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	46.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	4.8	12/30/99 17:10	JCL	EPA 351.2
NITRATE-NITRITE	0.10	mg/l	ND	12/17/99 15:00	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	0.10	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	7.2	12/17/99 01:32	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	ND	12/17/99 01:32	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	4.9	12/17/99 01:32	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41488.05

REPORTED : 01/06/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41488.05
SAMPLE #: BU-0.01
LOCATION:
MATRIX : Water

SAMPLED : 12/13/99
SUBMITTED: 12/16/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	01/04/00 09:40	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	74.0	12/27/99 10:30	JGL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JGL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	1.7	12/30/99 17:00	JGL	EPA 351.2
NITRATE-NITRITE	0.10	mg/l	0.13	12/17/99 18:00	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	20.3	12/17/99 02:23	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.22	12/17/99 02:23	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	13.0	12/17/99 02:23	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: 1/04/2000
EPISODE NO.: 41451

INORGANIC FRACTION:

Five water samples were submitted for the following classical inorganic analysis: IC(F,Cl,SO4), Nitrate-Nitrate, Total Phosphorous, Ammonia Nitrogen (NH3-N), Total Alkalinity, TKN, Ammonia. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-301	EPA 300.0	IC(F,Cl,SO4)
SWL-IN-304	EPA 353.2	Nitrate-Nitrate
SWL-IN-305	EPA 365.1	Total Phosphorous
SWL-IN-400	EPA 350.3	Ammonia Nitrogen (NH3-N)
SWL-IN-500	EPA 310.1	Total Alkalinity
SWL-IN-503	EPA 351.3	TKN
SWL-IN-504	EPA 350.2	Ammonia

Refer to Sample Receipt Notification for details of sample conditions at receipt. Explanations of the forms are he following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

Initial and Continuing Calibration Check: No problems.

Blanks: All blanks were below the reporting limit.

Lab Control Spikes: No problems.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41451.01

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41451.01
SAMPLE #: RA-6.7
LOCATION:
MATRIX : Water

SAMPLED : 12/13/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	52.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	ND	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	13.2	12/13/99 02:18	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.13	12/13/99 02:18	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	7.9	12/13/99 02:18	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
N/A = NOT APPLICABLE

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41451.03

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41451.03
SAMPLE #: FB-6.7
LOCATION:
MATRIX : Water

SAMPLED : 12.10.99
SUBMITTED: 12.14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	ND	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	ND	12/15/99 02:34	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	ND	12/15/99 02:34	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	ND	12/15/99 02:34	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41451.05

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41451.05
SAMPLE #: HOMESTEAD
LOCATION:
MATRIX : Water

SAMPLED : 12/13/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	KRL	EPA 350.3
BICARBONATE	20.0	mg/l	36.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	ND	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	3.6	12/15/99 02:51	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	ND	12/15/99 02:51	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	2.7	12/15/99 02:51	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41451.07

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41451.07
SAMPLE #: STARMER
LOCATION:
MATRIX : Water

SAMPLED : 12/10/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	42.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	1.1	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	7.4	12/13/99 03:08	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	ND	12/13/99 03:09	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	5.1	12/13/99 03:08	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAN, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41451.09

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41451.09
SAMPLE #: KEEBING
LOCATION:
MATRIX : Water

SAMPLED : 12/10/99
SUBMITTED: 12/14/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/27/99 14:00	KAL	EPA 350.3
BICARBONATE	20.0	mg/l	32.0	12/27/99 10:30	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/27/99 10:30	JCL	SM 2320B
NITROGEN (TKN)	1.0	mg/l	ND	12/18/99	TGG	EPA 351.2
NITRATE-NITRITE	0.10	mg/l	0.59	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2
INORGANIC CHLORIDE	0.20	mg/l	22.7	12/15/99 03:25	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.16	12/15/99 03:25	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	12.3	12/15/99 03:25	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: 01/13/2000
EPISODE NO.:41535

INORGANIC FRACTION:

Two water samples were submitted for the following classical inorganic analysis: Nitrate-Nitrate, Total Phosphorous, Ammonia Nitrogen (NH3-N) and TKN. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-304	EPA 353.2	Nitrate-Nitrate
SWL-IN-305	EPA 365.1	Total Phosphorous
SWL-IN-400	EPA 350.3	Ammonia Nitrogen (NH3-N)
SWL-IN-503	EPA 351.3	TKN

Refer to Sample Receipt Notification for details of sample conditions at receipt. Explanations of the forms are the following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

Initial and Continuing Calibration Check: No problems.

Blanks: All blanks were below the reporting limit.

Lab Control Spikes: No problems.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41535.01

REPORTED : 01/20/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41535.01
SAMPLE #: PM-1
LOCATION:
MATRIX : Water

SAMPLED : 12/13/99
SUBMITTED: 12/13/99

MISCELLANEOUS

PARAMETER	RESULTS**		UNITS	DATE PREPARED	DATE ANALYZED	REFERENCE METHOD
AMMONIA (N)	0.10	U	mg/L		01/07/00	EPA 350.3
NITROGEN (TKN)	6.4		mg/L		12/30/99	EPA 351.3
NITRATE-NITRITE	0.45		mg/L		01/09/00	EPA 353.2
TOTAL PHOSPHORUS	0.10	U	mg/L	12/21/99	12/29/99	EPA 365.2

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41535.02

REPORTED : 01/20/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41535.02
SAMPLE #: 0-4
LOCATION:
MATRIX : Water

SAMPLED : 12/13/99
SUBMITTED: 12/13/99

MISCELLANEOUS

PARAMETER	RESULTS**		UNITS	DATE PREPARED	DATE ANALYZED	REFERENCE METHOD
AMMONIA (N)	0.10	U	mg/L		01/07/00	EPA 350.1
NITROGEN (TKN)	7.0		mg/L		12/30/99	EPA 351.2
NITRATE-NITRITE	0.35		mg/L		01/09/00	EPA 353.2
TOTAL PHOSPHORUS	0.10	U	mg/L	12/21/99	12/29/99	EPA 365.2

2966-70669-277

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: 12/29/99
EPISODE NO.: 41405

INORGANIC FRACTION:

Seven water samples, plus one matrix spike and one matrix spike duplicate were submitted for IC (F, Cl, SO4), Total Alkalinity, Bicarbonate, and Carbonate analysis. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-301	EPA 300.0	IC (F, Cl, SO4)
SWL-IN-500	EPA 310.1/SM2320/B	Total Alkalinity, Bicarbonate, Carbonate

Refer to Sample Receipt Notification for details of sample conditions at receipt. An explanation of the forms are the following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

Initial and Continuing Calibration Check: No problems.

Initial and Continuing Calibration Blanks: All blanks were below the reporting limit.

CRI (Low Standard): No problems.

Blanks: All blanks were below the reporting limit.

Lab Control Spikes: No problems.
Matrix Spikes: No problems.

Sincerely,

Susan S. Turner for...
Deborah J. Inman
Inorganic Program Manager

0-2-9 • 7 0 9 9 9 • 2 8

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.01

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.01
SAMPLE #: MT-4 DISS
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	130	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	21.9	12/14/99 00:41	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	1.1	12/14/99 00:41	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	33.3	12/14/99 00:41	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
N/A = NOT APPLICABLE

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.02

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.02
SAMPLE #: MCC-1 2138
LOCATION:
MATRIX : Water

SAMPLED : 12/17/99
SUBMITTED: 12/18/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	99.0	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	12.3	12/14/99 20:56	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.33	12/14/99 20:56	SS	EPA 300.0/SW 9056
SULFATE	2.0	mg/l	167	12/15/99 03:42	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.03

REPORTED : 12/23/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.03
SAMPLE #: MCC-2 DISS
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	160	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	6.0	12/14/99 01:15	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	0.82	12/14/99 01:15	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	1.5	12/14/99 01:15	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2000
NEW YORK, NY 10168

REPORT : 41405.04

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.04
SAMPLE #: MCO-3 DEEP
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/L	98.0	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/L	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/L	12.9	12/14/99 21:32	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/L	0.55	12/14/99 21:32	SS	EPA 300.0/SW 9056
SULFATE	2.0	mg/L	173	12/15/99 03:59	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

2960706992080

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY.10168

REPORT : 41405.05

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.05
SAMPLE #: MCC-5 DISS
LOCATION:
MATRIX : Water

SAMPLED : 12/08.99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	170	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	12.5	12/14/99 02:22	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	1.2	12/14/99 02:22	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	34.0	12/14/99 02:22	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.06

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.06 MS1
SAMPLE #: MCO-8 DISS
LOCATION:
MATRIX : Water

SAMPLED : 12/08/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	172	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	22.9	12/14/99 22:39	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	11.3	12/14/99 22:39	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	44.3	12/14/99 22:39	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.07

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.07 SD1
SAMPLE #: MCC-5 DIGS
LOCATION:
MATRIX : Water

SAMPLED : 12/08/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	272	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	23.2	12/14/99 02:56	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	11.3	12/14/99 02:56	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	44.3	12/14/99 02:56	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.06

REPORTED : 12/23/99

ATTN: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.06
SAMPLE #: MCC-6 DISS
LOCATION:
MATRIX : Water

SAMPLED : 12/13 99
SUBMITTED: 12/13 99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
BICARBONATE	20.0	mg/l	160	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	13.1	12/14/99 03:13	SS	EPA 300.0/SW 9056
FLUORIDE	0.10	mg/l	1.3	12/14/99 03:13	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	31.0	12/14/99 03:13	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

NBR • 966706 • 2

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41405.09

REPORTED : 12/29/99

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41405.09
SAMPLE #: MCC-7 DISS
LOCATION:
MATRIX : Water

SAMPLED : 12/09/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
TOTAL CARBONATE	20.0	mg/l	194	12/17/99 13:00	JCL	SM 2320B
CARBONATE	20.0	mg/l	ND	12/17/99 13:00	JCL	SM 2320B
INORGANIC CHLORIDE	0.20	mg/l	21.0	12/14/99 03:29	SS	EPA 300.0/SW 9056
FLUORIDE	0.20	mg/l	1.3	12/14/99 03:29	SS	EPA 300.0/SW 9056
SULFATE	0.20	mg/l	28.3	12/14/99 03:29	SS	EPA 300.0/SW 9056

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany / Broken Arrow, Oklahoma 74012 / Office (918) 251-2858 / Fax (918) 251-2599

SDG NARRATIVE

CLIENT: TECHLAW
PROJECT: LA PHASE 2

DATE: January 14, 2000
EPISODE NO.: 41407

INORGANIC FRACTION:

Seven water samples, plus one matrix spike and one matrix spike duplicate, were submitted for the following classical inorganic analysis: Nitrate-Nitrite, Total Phosphorous, Ammonia Nitrogen (NH3-N), and TKN. The sample's analyses were completed according to the following:

SWL SOP #	Method SOP is based	Parameter
SWL-IN-304	EPA 353.2	Nitrate-Nitrite
SWL-IN-305	EPA 365.1	Total Phosphorous
SWL-IN-400	EPA 350.3	Ammonia Nitrogen (NH3-N)
SWL-IN-503	EPA 351.3	TKN

Refer to Sample Receipt Notification for details of sample conditions at receipt. Explanations of the forms are the following:

Form 1 (Sample results) - will be provided by our Reporting Department.
Form 3 (Blanks) - This information is included on the QC spreadsheet.
Form 7 (Laboratory Control Sample) - Provided by the LCS/LCSD Quality Control Data Sheets.

QC SUMMARY

Initial and Continuing Calibration Check: No problems.
Blanks: All blanks were below the reporting limit.
Lab Control Spikes: No problems.
Matrix Spikes & MSD: The following were outside the control limits: Nitrate-Nitrite // No action required.
Duplicates (LCS & MSD): No problems.

Sincerely,

Susan S. Turner for ...
Deborah J. Inman
Inorganic Program Manager

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.01

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.01
SAMPLE #: MT-4
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/20/99 09:30	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.2
NITRATE-NITRITE	1.0	mg/l	12.6	12/17/99 15:00	DSF	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DSF	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
N/A = NOT APPLICABLE

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.02

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.02
SAMPLE #: MCS-1
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/20/99 09:30	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	1.5	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	0.11	12/23/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.03

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.03
SAMPLE #: MCC-2
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/20/99 09:30	KRL	EPA 350.1
NITROGEN (TKN)	1.0	mg/l	ND	12/16/99	TGG	EPA 351.1
NITRATE-NITRITE	0.10	mg/l	ND	12/16/99 14:56	DST	EPA 353.1
TOTAL PHOSPHORUS	0.10	mg/l	0.48	12/29/99 10:44	DST	EPA 365.1

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.04

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.04
SAMPLE #: MCC-3
LOCATION:
MATRIX : Water

SAMPLED : 12/07/99
SUBMITTED: 12/11/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/20/99 09:30	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	0.72	12/14/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	0.11	12/29/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

2965 • 70665 • 2805

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.05

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.05
SAMPLE #: MCS-5
LOCATION:
MATRIX : Water

SAMPLED : 12/08/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/20/99 09:30	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
TOTAL PHOSPHORUS	0.10	mg/l	ND	12/29/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.06

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.06 MS1
SAMPLE #: MCC-5
LOCATION:
MATRIX : Water

SAMPLED : 12/08/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/L	3.9	12/20/99 09:30	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/L	19.6	12/13/99	TGG	EPA 351.3
TOTAL PHOSPHORUS	0.10	mg/L	0.92	12/29/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

0002 • 000036 • 1000 9

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.07

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.07 SO1
SAMPLE #: MCB-5
LOCATION:
MATRIX : Water

SAMPLED : 12/08/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	4.1	12/20/99 09:30	KRL	EPA 350.3
NITROGEN (TKN)	1.0	mg/l	19.0	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	1.0	mg/l	14.5	12/17/99 15:00	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	0.89	12/29/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.08

REPORTED : 01/04/00

Attn: Julie Shanahan

PROJECT : LA PHASE 2
LAB# : 41407.08
SAMPLE #: MCS-6
LOCATION:
MATRIX : Water

SAMPLED : 12/08/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/L	ND	12/20/99 09:00	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/L	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	1.0	mg/L	11.4	12/17/99 15:00	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/L	0.25	12/29/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

TECHLAW, INC.
122 E 42ND STREET SUITE 2200
NEW YORK, NY 10168

REPORT : 41407.09

REPORTED : 01/04/00

Attn: Julie Shananan

PROJECT : LA PHASE 2
LAB# : 41407.09
SAMPLE #: MCC-7
LOCATION:
MATRIX : Water

SAMPLED : 12/09/99
SUBMITTED: 12/10/99

MISCELLANEOUS

PARAMETER	REPORTING LIMIT	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	0.10	mg/l	ND	12/20/99 09:20	KAL	EPA 350.3
NITROGEN (TKN)	1.0	mg/l	ND	12/15/99	TGG	EPA 351.3
NITRATE-NITRITE	0.10	mg/l	1.3	12/16/99 14:56	DST	EPA 353.2
TOTAL PHOSPHORUS	0.10	mg/l	0.24	12/29/99 10:44	DST	EPA 365.2

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
17950 Industriplex Blvd. • Baton Rouge, LA 70809 • Office (225) 753-8650 • Fax (225) 751-1405

January 09, 2000

Ms Julie Shanahan
TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

AATSLA: 39360

Dear Ms Shanahan:

Enclosed are the analytical data for the samples received in our laboratory on December 20, 1999 for the above episode.

Client Identification	Laboratory Identification	Matrix	Date Collected
SM-30	39360.01	WATER	12/13/99
SD-30	39360.02	WATER	12/13/99
PM-1	39360.03	WATER	12/13/99
PM-2	39360.04	WATER	12/13/99
PM-3	39360.05	WATER	12/13/99
O-4	39360.06	WATER	12/13/99
SM-30MS	39360.07	WATER	12/13/99
SM-30MSD	39360.08	WATER	12/13/99

All samples were analyzed within appropriate holding times for parameters listed on the enclosed Chain of Custody. Quality control criteria were within acceptable limits.

AATS is pleased to have had the opportunity to provide this analytical characterization and is eager to assist you with any future requirements.

Sincerely,

Dean Saia
Project Officer

DS/yk

Enclosure

2 9 6 9 • 7 0 6 6 9 • 2 0 0 0

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	SM-30	Project ID:	
AATS ID:	39360.01	Report:	39360.01

Collected: 12/13/1999	Report Date: 01/09/2000	Page:	1
Received: 12/20/1999	Last Modified:	Matrix:	Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		— INORGANICS —				
PERCHLORATE		0.5	mg/L	ND	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-6650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: SD-30 Project ID:

AATS ID: 39360.02 Report: 39360.02

Collected: 12/13/1999 Report Date: 01/09/2000 Page: 1
Received: 12/20/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.5	mg/L	ND	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
= UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
= NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1986

2005 • 0669 • 9

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: PM-1 Project ID:

AATS ID: 39360.03 Report: 39360.03

Collected: 12/13/1999 Report Date: 01/09/2000 Page: 1
Received: 12/20/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
				--- INORGANICS ---		
PERCHLORATE		0.5	mg/L	ND	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: PM-2 Project ID:

AATS ID: 39360.04 Report: 39360.04

Collected: 12/13/1999 Report Date: 01/09/2000 Page: 1
Received: 12/20/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		0.5	mg/L	ND	12/21/99	EPA 300

D = NOT DETECTED ABOVE QUANTITATION LIMIT
= ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
= UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NOT APPLICABLE
ology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

0992 • 9660 • 1070 • 992

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: PM-5 Project ID:

AATS ID: 39360.05 Report: 39360.05

Collected: 12/13/1999 Report Date: 01/09/2000 Page: 1
Received: 12/20/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
				— INORGANICS —		
PERCHLORATE		0.5	mg/L	ND	12/27/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11930 Industriplex Blvd. Baton Rouge, LA 70809 504 753-6650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: 0-4 Project ID:

AATS ID: 39360.06 Report: 39360.06

Collected: 12/12/1999 Report Date: 01/09/2000 Page: 1
Received: 12/20/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		— INORGANICS —				
PERCHLORATE		0.5	mg/L	ND	12/21/99	EPA 300

J = NOT DETECTED ABOVE QUANTITATION LIMIT
= ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
= UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-6650

Client Name: TECHLAW INC. ER & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: SM-30MS

Project ID:

AATS ID: 39360.07

Report: 39360.07

Collected: 12/13/1999

Report Date: 01/09/2000

Page: 1

Received: 12/20/1999

Last Modified:

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULT	DATE ANALYZED	METHOD REFERENCE
			*** INORGANICS ***			
PERCHLORATE		0.5	mg/L	1.5	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: SM-30MSD Project ID:

AATS ID: 39360.08 Report: 39360.08

Collected: 12/13/1999 Report Date: 01/09/2000 Page: 1
Received: 12/20/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		0.5	mg/L	1.4	12/21/99	EPA 300

* NOT DETECTED ABOVE QUANTITATION LIMIT
* ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
* UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
* NOT APPLICABLE
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983
SW = EPA METHODOLOGY, "SW-846", THIRD EDITION, SEPTEMBER 1994

2969 • 000-07 • 6992

AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
11950 Industriplex Blvd. • Baton Rouge, LA 70809 • Office (225) 753-8650 • Fax (225) 751-1405

January 09, 2000

Ms Julie Shanahan
TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

AATSLA: 39246

Dear Ms Shanahan:

Enclosed are the analytical data for the samples received in our Laboratory on December 14, 1999 for the above episode.

Client Identification	Laboratory Identification	Matrix	Date Collected
MLO-1	39246.01	WATER	12/07/99
MLO-2	39246.02	WATER	12/07/99
MLO-3	39246.03	WATER	12/07/99
MLO-5	39246.04	WATER	12/08/99
MLO-5MS	39246.05	WATER	12/08/99
MLO-5MSD	39246.06	WATER	12/08/99
MLO-6	39246.07	WATER	12/08/99
MLO-7	39246.08	WATER	N/A
MLO-7.7B	39246.09	WATER	12/07/99
MT-4	39246.10	WATER	12/08/99
TW-8	39246.11	WATER	12/09/99
MLO-FB	39246.12	WATER	12/09/99
GS-1	39246.13	WATER	12/10/99
HOMESTEAD	39246.14	WATER	12/10/99
STARMER	39246.15	WATER	12/10/99
BULLDOG	39246.16	WATER	12/10/99
KEALING	39246.17	WATER	12/10/99
BU-0.01	39246.18	WATER	12/10/99
PA-8.9	39246.19	WATER	12/10/99
PA-6.7	39246.20	WATER	12/10/99
TA-18	39246.21	WATER	12/10/99
TA-18MS	39246.22	WATER	12/10/99
TA-18MSD	39246.23	WATER	12/10/99
FB-6.7	39246.24	WATER	12/10/99

All samples were analyzed within appropriate holding times for parameters listed on the enclosed Chain of Custody. Quality control criteria were within acceptable limits.

AMERICAN ANALYTICAL & TECHNICAL SERVICES, INC.
11950 Industriplex Blvd. • Baton Rouge, LA 70809 • Office (225) 753-8650 • Fax (225) 751-1405

Ms Julie Shanahan
TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

AATSLA: 39246

AATS is pleased to have had the opportunity to provide this analytical characterization and is eager to assist you with any future requirements.

Sincerely,

Dean Saia
Project Officer

DS/yk

Enclosure

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLO -1 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.01 Report: 39246.01

Collected: Report Date: 01/09/2000 Page: 1

Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		2.5	mg/L	3.3	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT

B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE

I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE

= NOT APPLICABLE

Methodology: SM = STANDARD METHODS, 18th EDITION, 1992

EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

D = SURROGATES DILUTED OUT

J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

2969.7069.2967

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8050

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	MLO -2	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.02	Report:	39246.02
Collected:		Report Date: 01/09/2000	Page: 1
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			*** INORGANICS ***			
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLO -3 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.03 Report: 39246.03

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULT	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		2.0	mg/L	ND	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
N = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

0099 • 0000 • 1025

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504-753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLO -5 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.04 Report: 39246.04

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.1	mg/L	1.1	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = MEPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION
SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLO -5MS

Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.05

Report: 39246.05

Collected:

Report Date: 01/09/2000

Page: 1

Received: 12/14/1999

Last Modified:

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		1.0	mg/L	ND	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT

B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE

I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE

NA = NOT APPLICABLE

Methodology: SM = STANDARD METHODS, 18th EDITION, 1995

EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

D = SURROGATES DILUTED OUT

J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

6992-70699-296

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	MLO -5MSD	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.06	Report:	39246.06
Collected:		Report Date: 01/09/2000	Page: 1
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		1.0	mg/L	<1.0	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	MLO -6	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.07	Report:	39246.07
Collected:		Report Date: 01/09/2000	Page: 1.
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			*** INORGANICS ***			
PERCHLORATE		1.0	mg/L	1.1	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
= NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

2996706699297

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLO -7 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.08 Report: 39246.08

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		1.0	mg/L	1.3	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLWB-7.7B

Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.09

Report: 39246.09

Collected:

Report Date: 01/09/2000

Page: 1

Received: 12/14/1999

Last Modified:

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			*** INORGANICS ***			
PERCHLORATE		0.5	mg/L	1.7	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
N = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MT-4 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.10 Report: 39246.10

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		0.5	mg/L	1.4	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = MEPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION
SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	TW-8	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.11	Report:	39246.11

Collected:
Received: 12/14/1999

Report Date: 01/09/2000 Page: 1
Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: MLO-FB

Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.12

Report: 39246.12

Collected:

Report Date: 01/09/2000

Page: 1

Received: 12/14/1999

Last Modified:

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		— INORGANICS —				
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: GS-1

Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.13

Report: 39246.13

Collected:
Received: 12/14/1999

Report Date: 01/09/2000

Last Modified:

Page: 1

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		0.5	mg/L	1.5	12/17/99	EPA 300

NO = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
[illegible] = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
[illegible] = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

00W-960607-0009

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	HOMESTEAD	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.14	Report:	39246.14
Collected:		Report Date: 01/09/2000	Page: 1
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		0.5	mg/L	0.6	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 752-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: STARMER

Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.15

Report: 39246.15

Collected:

Report Date: 01/09/2000

Page: 1

Received: 12/14/1999

Last Modified:

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			— INORGANICS —			
PERCHLORATE		0.1	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
= NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	BULLDOG	Project ID:	LOS ALAMOS NAT. LAB
AATS ID:	39246.16	Report:	39246.16
Collected:		Report Date: 01/09/2000	Page: 1
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
				— INORGANICS —		
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT

B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE

I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE

NA = NOT APPLICABLE

Methodology: SM = STANDARD METHODS, 18th EDITION, 1995

EPA = MEPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

D = SURROGATES DILUTED OUT

J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: KEALING

Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.17

Report: 39246.17

Collected:

Report Date: 01/09/2000

Page: 1

Received: 12/14/1999

Last Modified:

Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULT	DATE ANALYZED	METHOD REFERENCE
			*** INORGANICS ***			
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

NOV.-09-99 TUE 07:09 PM

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	BU-0.01	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.18	Report:	39246.18
Collected:		Report Date: 01/09/2000	Page: 1
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULT	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
= UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name:	TECHLAW INC. EH & S 750 N. SAINT PAUL ST. SUITE 600 DALLAS, TX 75201		
Client ID:	PA-8.9	Project ID:	LOS ALAMO'S NAT. LAB
AATS ID:	39246.29	Report:	39246.29
Collected:		Report Date: 01/09/2000	Page: 1
Received:	12/14/1999	Last Modified:	Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		— INORGANICS —				
PERCHLORATE		0.2	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1992
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-6650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: PA-6.7 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.20 Report: 39246.20

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			*** INORGANICS ***			
PERCHLORATE		0.5	mg/L	0.6	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: TA-18 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.21 Report: 39246.21

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
			--- INORGANICS ---			
PERCHLORATE		0.5	mg/L	ND	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
= UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION
SW = EPA METHODOLOGY, "#SW846#", THIRD EDITION, SEPTEMBER 1994

FOM • 99999 • 70292

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: TA-18MS
Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.22
Report: 39246.22

Collected:
Received: 12/14/1999
Report Date: 01/09/2000
Last Modified:
Page: 1
Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.5	mg/L	1.9	12/21/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION
SW = EPA METHODOLOGY, #SW846#, THIRD EDITION, SEPTEMBER 1994

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11950 Industriplex Blvd. Baton Rouge, LA 70809 504 753-8650

Client Name: TECHLAW INC. EH & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: TA-18MSD | Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.23 | Report: 39246.23

Collected: | Report Date: 01/09/2000 | Page: 1

Received: 12/14/1999 | Last Modified: | Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.5	mg/L	1.9	12/21/99	EPA 300

D = NOT DETECTED ABOVE QUANTITATION LIMIT
= ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
= UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NOT APPLICABLE
ology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = #EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
O = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, SEPTEMBER 1994

UIOM • 9999071 • 999

AMERICAN ANALYTICAL & TECHNICAL SERVICES

11930 Industriplex Blvd. Baton Rouge, LA 70809 504 753-6650

Client Name: TECHLAW INC. ER & S
750 N. SAINT PAUL ST.
SUITE 600
DALLAS, TX 75201

Client ID: FB-6.7 Project ID: LOS ALAMO'S NAT. LAB

AATS ID: 39246.24 Report: 39246.24

Collected: Report Date: 01/09/2000 Page: 1
Received: 12/14/1999 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PERCHLORATE		0.5	mg/L	ND	12/17/99	EPA 300

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 18th EDITION, 1995
EPA = "EPA600/4-79-020, MARCH 1983

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "SW846", THIRD EDITION, SEPTEMBER 1994

6309 • 9999 • 7009 • 9

PCB Data

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG: 41534

FRACTION: PCBs

10 soil samples were extracted by SW846 method 3550 and analyzed for PCBs as aroclors by SW846 method 8082. No major problems occurred during the analysis of the samples. All of the surrogate recoveries in this SDG exceeded control limits (most on 1 column only). No corrective action was taken because no arochlors were detected in the samples.

Blanks: No corrective action required.

Surrogates: Recoveries exceeded control limits (see above).

Laboratory Control Spike: No corrective action required.

Matrix Spikes: No corrective action required.

Example Calculation:

sample #	41534.11ms		
analyte	1260 peak #1 on rx-pest2		
As=area of analyte in sample		=	1748076
V(f)=final volume of extract (ml)		=	10
D=dilution factor		=	1
CF=calibration factor (1/ng/ml)		=	2243.68
W(V)=weight of sample extracted (g)		=	31.9
%m=% moisture		=	6

$$\text{conc (ug/kg)} = \frac{As \quad V(f) \quad D \quad ml \quad ng}{CF \quad W(V) \quad (100-\%m)/100) \quad ml \quad g}$$

$$= \frac{1748076 \quad 10 \quad 1}{2243.68 \quad 31.9 \quad 0.94}$$

$$= 259.825$$

Drew Cowan
GC Supervisor
Dc

December 29, 1999

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PC-1

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.01

Sample wt/vol: 30.7 (g/mL) G Lab File ID:_____

% Moisture: 11 decanted: (Y/N) __ . Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/22/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	36	U
11104-28-2	Aroclor-1221	36	U
11141-16-5	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12672-29-6	Aroclor-1248	36	U
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U
Surrogate amount spiked		7.32	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PC-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.02

Sample wt/vol: 31.3 (g/mL) G Lab File ID:_____

% Moisture: 5 decanted: (Y/N) __ Date Received: 10/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 10/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 10/22/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.73	

FORM I PEST

00034.0000692

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PC-3

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.03

Sample wt/vol: 30.2 (g/mL) G Lab File ID:_____

% Moisture: 14 decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/22/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	38	U
11104-28-2	Aroclor-1221	38	U
11141-16-5	Aroclor-1232	38	U
53469-21-9	Aroclor-1242	38	U
12672-29-6	Aroclor-1248	38	U
11097-69-1	Aroclor-1254	38	U
11096-82-5	Aroclor-1260	38	U
Surrogate amount spiked		7.70	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PC-4

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.04

Sample wt/vol: 31.6 (g/mL) G Lab File ID:_____

% Moisture: 7 decanted: (Y/N) __ Date Received: 12/13/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/22/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.3 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.81	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PC-5

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.05

Sample wt/vol: 33.3 (g/mL) G Lab File ID:_____

% Moisture: 6 decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/22/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.39	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

AC-1

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.06

Sample wt/vol: 30.5 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) __ Date Received: 12/13/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/22/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.98	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

AC-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.07

Sample wt/vol: 30.7 (g/mL) G Lab File ID:_____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/22/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.79	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

AC-3

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.08

Sample wt/vol: 31.7 (g/mL) G Lab File ID:_____

% Moisture: 8 decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/22/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.9 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.86	

FORM I PEST

MTH-000706

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

AC-4

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.09

Sample wt/vol: 30.8 (g/mL) G Lab File ID:_____

% Moisture: 3 decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/22/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.69	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

AC-5

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41534

Matrix: (soil/water) SOIL Lab Sample ID: 41534.10

Sample wt/vol: 34.0 (g/mL) G Lab File ID:_____

% Moisture: 6 decanted: (Y/N) __ Date Received: 12/18/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/22/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.9 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.26	

FORM I PEST

SOUTHWEST LABORATORY OF OKLAHOMA
1700 West Albany, Suite A/ Broken Arrow, OK 74012
918-251-2858

SDG NARRATIVE

CLIENT: TECHLAW

PROJECT: LA PHASE 2

SDG: 41509

FRACTION: PCBs

31 soil samples were extracted by SW846 method 3510B and analyzed for PCBs as aroclors by SW846 method 8082. No major problems occurred during the analysis of the samples.

Blanks: No corrective action required.

Surrogates: Several of the samples had the surrogates out high but those samples had no hits. No corrective action required.

Laboratory Control Spike: One set of Laboratory Control Spikes had Arochlor 1016 beyond recovery limits and since none of the samples had Arochlor 1016 no corrective action was required.

Matrix Spikes: Arochlor 1016 is out high in both sets of Matrix Spikes but none of the samples had Arochlor 1016 no corrective action required.

Example Calculation:

sample # 41509.02
analyte 1260 peak #1 on rtx-pest

As=area of analyte in sample	=	63125	
V(f)=final volume of extract (ml)	=	10	
D=dilution factor	=	1	
CF=calibration factor (1/ng/ml)	=	718.753	
W(V)=weight of sample extracted (g)	=	30.6	
%m=% moisture	=	4	

$$\text{conc (ug/kg)} = \frac{As \quad V(f) \quad D}{CF \quad W(V) \quad (100-\%m/100)} \quad \frac{ml}{mg} \quad \frac{ng}{g}$$

$$= \frac{63125 \quad 10 \quad 1}{718.753 \quad 30.6 \quad 0.96}$$

$$= 29.897$$

Jeff Cummins for
Drew Cowan
GC Supervisor
Dc

January 4, 2000

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BC-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.01

Sample wt/vol: 32.0 (g/mL) G Lab File ID:_____

% Moisture: 9 decanted: (Y/N) _ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.87	

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BC-2

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.02

Sample wt/vol: 30.6 (g/mL) G Lab File ID: _____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/29/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	39	
Surrogate amount spiked		6.81	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BC-3

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.03

Sample wt/vol: 31.5 (g/mL) G Lab File ID:_____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.61	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BC-4

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.04

Sample wt/vol: 30.8 (g/mL) G Lab File ID: _____

% Moisture: 1 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	32	U
11104-28-2	Aroclor-1221	32	U
11141-16-5	Aroclor-1232	32	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	32	U
11096-82-5	Aroclor-1260	32	U
Surrogate amount spiked		6.56	

FORM I PEST

UMW.MW.0996.0709

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BC-5

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.05

Sample wt/vol: 30.6 (g/mL) G Lab File ID:_____

% Moisture: 5 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.2 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.88	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MC-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.06

Sample wt/vol: 32.7 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.1 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.51	

FORM I PEST

2699.70869.MHB

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MC-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.07

Sample wt/vol: 30.8 (g/mL) G Lab File ID: _____

% Moisture: 3 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.69	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MC-3

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.08

Sample wt/vol: 30.3 (g/mL) G Lab File ID: _____

% Moisture: 3 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/26/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.5 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		5.80	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MC-4

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.09

Sample wt/vol: 30.8 (g/mL) G Lab File ID:_____

% Moisture: 3 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.69	

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MC-5A

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.10

Sample wt/vol: 30.8 (g/mL) G Lab File ID: _____

% Moisture: 5 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U
Surrogate amount spiked		6.84	

FORM I PEST

296-7066-5110

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MC-SB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.11

Sample wt/vol: 33.3 (g/mL) G Lab File ID: _____

% Moisture: 3 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/29/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.9 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.19	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.12

Sample wt/vol: 30.9 (g/mL) G Lab File ID: _____

% Moisture: 4 decanted: (Y/N) _ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/26/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.74	

FORM I PEST

2699 • 70699 • PM16

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-2

Lab Name: SWL-TULSA

Lab Code: SWCK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.13

Sample wt/vol: 30.7 (g/mL) G Lab File ID: _____

% Moisture: 8 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	35	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U
Surrogate amount spiked		7.08	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-3

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.14

Sample wt/vol: 30.2 (g/mL) G Lab File ID: _____

% Moisture: 3 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 01/04/00

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	34	
11104-28-2	Aroclor-1221	34	
11141-16-5	Aroclor-1232	34	
53469-21-9	Aroclor-1242	34	
12672-29-6	Aroclor-1248	34	
11097-69-1	Aroclor-1254	34	
11096-82-5	Aroclor-1260	48	
Surrogate amount spiked		6.83	

FORM I PEST

DRW.99.0699.7

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-4

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.15

Sample wt/vol: 31.4 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 01/04/00

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.9 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	34	U
11104-28-2	Aroclor-1221	34	U
11141-16-5	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12672-29-6	Aroclor-1248	34	U
11097-69-1	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	48	U
Surrogate amount spiked		6.78	

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-5

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.16

Sample wt/vol: 31.5 (g/mL) G Lab File ID: _____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 01/04/00

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.1 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	
11104-28-2	Aroclor-1221	33	
11141-16-5	Aroclor-1232	33	
53469-21-9	Aroclor-1242	33	
12672-29-6	Aroclor-1248	33	
11097-69-1	Aroclor-1254	33	
11096-82-5	Aroclor-1260	140	
Surrogate amount spiked		6.61	

FORM I PEST

HMM.056607.0099

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-6

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.17

Sample wt/vol: 31.0 (g/mL) G Lab File ID:_____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 01/04/00

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	58	
Surrogate amount spiked		6.72	

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-6MS

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.18MS

Sample wt/vol: 32.6 (g/mL) G Lab File ID: _____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	300	
11104-28-2	Aroclor-1221	32	U
11141-16-5	Aroclor-1232	32	U
53469-21-9	Aroclor-1242	32	U
12672-29-6	Aroclor-1248	32	U
11097-69-1	Aroclor-1254	32	U
11096-82-5	Aroclor-1260	310	
Surrogate amount spiked		6.39	

FORM I PEST

NRM • 99607 • 692

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SC-6MSD

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.19MSD

Sample wt/vol: 34.0 (g/mL) G Lab File ID: _____

% Moisture: 4 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/29/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.8 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	280	
11104-28-2	Aroclor-1221	30	
11141-16-5	Aroclor-1232	30	
53469-21-9	Aroclor-1242	30	
12672-29-6	Aroclor-1248	30	
11097-69-1	Aroclor-1254	30	
11096-82-5	Aroclor-1260	300	
Surrogate amount spiked		6.13	

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-1

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.20

Sample wt/vol: 30.7 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000(uL) Date Analyzed: 12/28/99

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.7 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	39	U
11141-16-5	Aroclor-1232	39	U
53469-21-9	Aroclor-1242	39	U
12672-29-6	Aroclor-1248	39	U
11097-69-1	Aroclor-1254	39	U
11096-82-5	Aroclor-1260	39	U
Surrogate amount spiked		7.94	

FORM I PEST

GNW.000607.0598

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-2

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.21

Sample wt/vol: 30.4 (g/mL) G Lab File ID:_____

% Moisture: 8 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.6 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
12674-11-2	Aroclor-1016	35	U
11104-28-2	Aroclor-1221	35	U
11141-16-5	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12672-29-6	Aroclor-1248	35	U
11097-69-1	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U
Surrogate amount spiked		7.15	

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CC-3

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: 41509.22

Sample wt/vol: 32.8 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) __ Date Received: 12/17/99

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 8.4 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	37	U
11104-28-2	Aroclor-1221	37	U
11141-16-5	Aroclor-1232	37	U
53469-21-9	Aroclor-1242	37	U
12672-29-6	Aroclor-1248	37	U
11097-69-1	Aroclor-1254	37	U
11096-82-5	Aroclor-1260	37	U
Surrogate amount spiked		7.53	

FORM I PEST

FNM-006907-0999

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BB1219SB

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TECHL SDG No.: 41509

Matrix: (soil/water) SOIL Lab Sample ID: BB1219SB

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: _____

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/19/99

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 12/28/99

Injection Volume: 0.5 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	33	U
11104-28-2	Aroclor-1221	33	U
11141-16-5	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12672-29-6	Aroclor-1248	33	U
11097-69-1	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U
Surrogate amount spiked		6.67	

APPENDIX G

Chain-of-Custody Forms

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. Albany • Broken Arrow, Oklahoma 74012 1421
Office: 918 251 2858 • Fax 918 251 2559

SAMPLING FIRM: Tech Law, Inc

CLIENT CONTACT: Julie Shumaker

PHONE NUMBER: 212-995-4004

P.O. or PROPOSAL NUMBER:

PROJECT NAME: Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): [illegible]

ANALYTICAL TESTS REQUESTED

SAMPLE ID	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Total Metals	Total Uranium	Nitrate/Nitrite	Total P	Ammonia	TKN	Dissolved Calcium	Anions	REMARKS
MT-4	12/1/99	1105		X	Mortandad Canyon	Water	1	X	X							
MT-4	12/1/99	1105		X		Water	1			X	X	X	X			
MT-4	12/1/99	1105		X		Water	1							X		
MT-4	12/1/99	1105		X		Water	1								X	
MCO-1	12/1/99	1310		X		Water	1	X	X							
MCO-1	12/1/99	1310		X		Water	1			X	X	X	X			
MCO-1	12/1/99	1310		X		Water	1							X		
MCO-1	12/1/99	1310		X		Water	1								X	
MCO-2	12/1/99	1530		X		Water	1	X	X							
MCO-2	12/1/99	1530		X		Water	1			X	X	X	X			
MCO-2	12/1/99	1530		X		Water	1							X		
MCO-2	12/1/99	1530		X		Water	1								X	
MCO-3	12/1/99	1400		X		Water	1	X	X							
MCO-3	12/1/99	1400		X		Water	1			X	X	X	X			
MCO-3	12/1/99	1400		X		Water	1							X		
MCO-3	12/1/99	1400		X		Water	1								X	

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
Bret Kendrick (B Gardner)	12/8/99	1500	[illegible]

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

REMARKS: Airbill B01L0B275190

[SR012-1192 03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918-251-2858 • Fax 918-251-2599

TM

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER
Tech Law, Inc	Julie Shanahan	212-949-4004

P.O. or PROPOSAL NUMBER	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): [illegible]

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Total Metals	Dissolved Metals	Anions	Ammonia	TKN	Nitrate/Nitrite	Total P		REMARKS
MW015	12/8/99	1045		X	Mortandad Canyon	Water	8	X	X	X	X	X	X	X		MS/MSD
MW-6	12/8/99	1200		X	Mortandad Canyon	Water	4	X	X	X	X	X	X	X		
MW-7	12/8/99	1350		X	Mortandad Canyon	Water	4	X	X	X	X	X	X	X		

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
Brit Lambrich (BE[illegible])	12/9/99	1500					

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	REMARKS
				Airbill: 8016082751 68

[SR012-1192-03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251-2858 • Fax 918 251-2599

SAMPLING FIRM: TechLaw, Inc.
CLIENT CONTACT: Julie Shanahan
PHONE NUMBER: 212-949-4004
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): [illegible]

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	PCBs	Total Metals	Total Uranium	Nitrate/Nitrite	Total P	Ammonia	TKN	Dissolved Solids	Anions	REMARKS
ACS-35-0	12/6/99	1102		X	Acid Canyon	Soil	1	X	X	X							
ACS-18-1	12/6/99	1140		X	Acid Canyon	Soil	1	X	X	X							
ACS-18-2	12/6/99	1200		X	Acid Canyon	Soil	1	X	X	X							
ACS-18-3	12/6/99	1210		X	Acid Canyon	Soil	1	X	X	X							
ACS-12-1	12/6/99	1235		X	Acid Canyon	Soil	1	X	X	X							
ACS-12-2	12/6/99	1245		X	Acid Canyon	Soil	1	X	X	X							
ACS-48-0	12/6/99	1300		X	Acid Canyon	Soil	1	X	X	X							
ACS-3-1	12/6/99	1330		X	Acid Canyon	Soil	1	X	X	X							
ACS-3-2	12/6/99	1340		X	Acid Canyon	Soil	1	X	X	X							
ACS-3-3	12/6/99	1350		X	Acid Canyon	Soil	1	X	X	X							
ACS-3-4	12/6/99	1400		X	Acid Canyon	Soil	1	X	X	X							
ACS-EB	12/6/99	1410		X	Acid Canyon	Water	1	X									
ACS-EB	12/6/99	1410		X	Acid Canyon	Water	1		X	X							

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
Brian Kornbrink (Brian [illegible])	12/8/99	1500	FedEx
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

REMARKS: Airbill B016082752 05

[SR012-1192 03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1431
Office: 918 251-2858 • Fax 918 251-2599

SAMPLING FIRM: Tetra Tech, Inc.
CLIENT CONTACT: Julie Shanahan
PHONE NUMBER: (212) 193-4004
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Phase 2
SAMPLER (Signature): B Kendrick (BK) / Tracy Hardy (Tracy Hardy)

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Total Metals	Dissolved Metals	Anions	Cations	TKN	Nitrate/Nitrite	Total P	Explosives	REMARKS
MCWB-278	12/8/93	1510		X	Mortandad Canyon	Water	4	X	X	X	X	X	X	X		
MW-8	12/8/93	1545		X	Mortandad Canyon	Water	4	X	X	X	X	X	X	X		
MCO-FB	12/8/93	1430		X	Mortandad Canyon	Water	4	X	X	X	X	X	X	X		
GS-1	12/9/93	1510		X	Mortandad Canyon	Water	4	X	X	X	X	X	X	X		
TA-18	12/10/93	1105		X	Threemile Canyon	Water	8		X	X	X	X	X	X	X	MS/MSD

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
BK Kendrick	12/13/93	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS
				Fed Ex # 8016 0375135

[SR012-1192 03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012 1421
Office: 918 251 2858 • Fax 918 251 2399

SAMPLING FIRM: Tetlow, Inc.
CLIENT CONTACT: Julie Shanahan
PHONE NUMBER: (212) 999-9009
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): B. Kendrick (B. Kendrick) / Jason Hardy (Jason Hardy)

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Dissolved Cations	Anions	Ammonia	TKN	Nitrate/Nitrite	Total P	Explosives		REMARKS
PA-6.7	12/10/99	1252		X	Pajarito Canyon	Water	4	X	X	X	X	X	X	X		
FB-6.7	12/10/99	1300		X	Pajarito Canyon	Water	4	X	X	X	X	X	X	X		
Hondo	12/10/99	0920		X	Pajarito Canyon	Water	4	X	X	X	X	X	X	X		
Sherman	12/10/99	1030		X	Sherman Gulch	Water	4	X	X	X	X	X	X	X		
Kiding	12/10/99	1220		X	Sherman Gulch	Water	4	X	X	X	X	X	X	X		

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
B. Kendrick (B. Kendrick)	12/13/99	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS:
				Airbill 801608275124

[SW012-1192-03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251-2050 • Fax 918 251-2399

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER
TechLaw, Inc	Julie Shanahan	212-949-4004

P.O. or PROPOSAL NUMBER	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): Brad Kendrick (BKendrick) / Grace Hosley (Grace Hosley)

ANALYTICAL TESTS REQUESTED: Perchlorate

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Perchlorate	REMARKS
MCO-1	12/7/99	1310		X	Mortandad Canyon	Water	1	X	
MCO-2	12/7/99	1530		X	Mortandad Canyon	Water	1	X	
MCO-3	12/8/99	1000		X	Mortandad Canyon	Water	1	X	
MCO-5	12/8/99	1045		X	Mortandad Canyon	Water	2	X	MS/MSD
MCO-6	12/8/99	1200		X	Mortandad Canyon	Water	1	X	
MCO-7	12/8/99	1350		X	Mortandad Canyon	Water	1	X	
MCWB-7.78	12/8/99	1510		X	Mortandad Canyon	Water	1	X	
MT-4	12/9/99	1105		X	Mortandad Canyon	Water	1	X	
TW-8	12/8/99	1545		X	Mortandad Canyon	Water	1	X	
MCO-FB	12/9/99	1440		X	Mortandad Canyon	Water	1	X	
GS-1	12/9/99	1510		X	Mortandad Canyon	Water	1	X	
Unknown	12/10/99	0920		X	Pajarito Canyon	Water	1	X	
Stormer	12/10/99	1030		X	Stormer Gulch	Water	1	X	
Bulldog	12/10/99	1300		X	Stormer Gulch	Water	1	X	
Kipling	12/10/99	1220		X	Stormer Gulch	Water	1	X	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
Brad Kendrick (BKendrick)	12/13/99	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS
				Airbill 8016082751 4C

[SR012-1192 03]

Page 2 of 2

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
3700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251-2858 • Fax 918 251-2599

SAMPLING FIRM: Tech Liaison, Inc.
CLIENT CONTACT: Julie Shanahan
PHONE NUMBER: (212) 949-9004
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Pueblo
SAMPLER (Signature): Brad Kendall, Ted Hardy

ANALYTICAL TESTS REQUESTED: Radiochem

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Radiochem									REMARKS
BU-0.01	12/10/99	1345		X	Stevens Gulch	Water	1	X									
PA-8.9	12/10/99	1925		X	Pajarito Canyon	Water	1	X									
PA-6.7	12/10/99	1252		X	Pajarito Canyon	Water	1	X									
TA-18	12/10/99	1105		X	Threemile Canyon	Water	2	X									MS/MSD
FB-6.7	12/10/99	1300		X	Pajarito Canyon	Water	1	X									

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
Brad Kendall	12/10/99	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS
				Airbill B016082751 4L

[SR012-1192 03]

ONW • GOGON • GON

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918-251-2858 • Fax 918 251-2599

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER
Techlaw, Inc.	Julie Shanahan	212-946-4004

P.O. or PROPOSAL NUMBER	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): James Hawley (James Hawley) / D. Kendrick (Dick D.)

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Silver (Ag)	Arsenic	Barium	TPH	Nitrate/Nitrite	Total P	Explosives	Barium (Total)	REMARKS
Building	12-10-99	1300		X	Strauss Gulch	water	1	X								
Building	↓	↓		X	↓	↓	1		X							
Building				X			1			X	X	X	X			
Building				X			1							X		
PA-89	12-10-99	1125		X	Pajarito Canyon	water	1	X								
PA-89	↓	↓		X	↓	↓	1		X							
PA-89				X			1			X	X	X	X			
PA-89				X			1							X		
BU-D.01	12-10-99	1315		X	Strauss Gulch	water	1	X								
BU-D.01	↓	↓		X	↓	↓	1		X							
BU-D.01				X			1			X	X	X	X			
BU-D.01				X			1							X		
PM-5	12-13-99	1810		X	Pajarito Mesa	water	1							X		
PM-5	↓	↓		X	↓	↓	1								X	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
James Hawley	12-13-99	1500	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature)

REMARKS: Airbill #: 801608275102

[SR012-1192 03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251 2050 • Fax 918 251 2599

SAMPLING FIRM: Tetra Tech, Inc.
CLIENT CONTACT: Julie Shumaker
PHONE NUMBER: 212-944-9006
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Phase 2
SAMPLER (Signature): B. Kuebler (BK-D) / Tom Hoda (Tom Hoda)

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	PCBs	Total Metals	Total Uranium						REMARKS
BC-1	11/13/99	1340		X	Bayo Canyon	Soil	1	X	X	X						
BC-2	11/13/99	1410		X	Bayo Canyon		1	X	X	X						
BC-3	11/13/99	1430		X	Bayo Canyon		1	X	X	X						
BC-4	11/13/99	1505		X	Bayo Canyon		1	X	X	X						
BC-5	11/13/99	1420		X	Bayo Canyon		1	X	X	X						
MC-1	11/14/99	1200		X	Mortandad Canyon		1	X	X	X						
MC-2	11/14/99	1200		X			1	X	X	X						
MC-3	11/14/99	1115		X			1	X	X	X						
MC-4	11/14/99	1170		X			1	X	X	X						
MC-5A	11/14/99	1215		X			1	X	X	X						
MC-5B	11/14/99	1250		X			1	X	X	X						
SC-1	11/13/99	0925		X	Sandia Canyon		1	X	X	X						
SC-2	11/13/99	0955		X			1	X	X	X						
SC-3	11/13/99	1025		X			1	X	X	X						
SC-4	11/13/99	1050		X			1	X	X	X						
SC-5	11/13/99	1150		X			1	X	X	X						

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
B. Kuebler (BK-D)	11/14/99	1500					

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	REMARKS
				Airbill 8016081275078

[SR012 1192 03]

DOW • 00001 • 00N

Page 1 of 1

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. Albany • Broken Arrow, Oklahoma 74012-8421
Office: 918 251 2858 • Fax 918 251 2599

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER
Technology, Inc.	Julie Shanahan	212-999-9x4

P.O. or PROPOSAL NUMBER	PROJECT NAME
	Los Alamos National Laboratory - Pinnacle

SAMPLER (Signature): B Kendall (BKendall) / Kendall, Chas. Arnold

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	PCBs	Total Metals	Total Volatiles							REMARKS
SC-6	12/13/99	1125		X	Sandia Canyon	Soil	2	X	X	X							MS/MSD
CC-1	12/15/99	1545		X	Cañada del Buey Canyon		1	X	X	X							
CC-2	12/15/99	1515		X			1	X	X	X							
CC-3	12/15/99	1445		X			1	X	X	X							
CC-4	12/15/99	1415		X			2	X	X	X							MS/MSD
CC-5A	12/15/99	1330		X			1	X	X	X							
CC-5B	12/15/99	1345		X			1	X	X	X							
CC-6	12/15/99	1034		X			1	X	X	X							
CC-7	12/15/99	1000		X			1	X	X	X							
CC-8	12/15/99	0915		X			1	X	X	X							
CC-9	12/15/99	0830		X			1	X	X	X							

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)
B Kendall (BKendall)	12/16/99	1500					

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	REMARKS
				Airbill 801608275098

(SR012-1192-03)

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251 2858 • Fax 918 251 2599

SAMPLING FIRM: Tetra Tech, Inc
CLIENT CONTACT: Julie Shanahan
PHONE NUMBER: 712-944-4009
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Phase 2
SAMPLER (Signature): B. Kindrick (B. Kindrick)

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	TCLP	Total Metals	Total Uranium	Dissolved Cations	Anions	VOC			REMARKS
CC-EB	12/15/99	1150		X	Cerro Grande	Water	2	X	X	X						
AC-EB	12/15/99	1110		X	Ancho Canyon	Water	2	X	X	X						
SM-30	12/13/99	1210		X	TA-3	Water	4				X	X				MS/MSD
SD-30	12/13/99	1130		X	TA-3	Water	2				X	X				
SM-30	12/13/99	1210		X	TA-3	Water	4						X			MS/MSD
SD-30	12/13/99	1130		X	TA-3	Water	2						X			
PM-2	12/13/99	1850		X	Pueblo Well	Water	2						X			
PM-5	12/13/99	1810		X	Pueblo Well	Water	2						X			
TB				X	Trip Blank	Water	2						X			

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY (Signature)
B. Kindrick (B. Kindrick)	12/17/99	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS
				Airbill 801608275054

(SR012-1192.01)

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

5700 W Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251 2858 • Fax 918 251 2599

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER
Techlaw, Inc.	Julie Shambaugh	212-999-4004

P.O. or PROPOSAL NUMBER	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLER (Signature): B. Kendrick (BKendrick) / T. Hook (T. Hook)

ANALYTICAL TESTS REQUESTED: Perchlorate

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Perchlorate								REMARKS
SM-30	12/17/11	1210		X	TA-3	Water	2	X								MS/MSD
SD-30	12/17/11	1130		X	TA-3	Water	1	X								
PM-1	12/17/11	2011		X	Pueblo Well	Water	1	X								
PM-2	12/17/11	1850		X	Pueblo Well	Water	1	X								
PM-5	12/17/11	1810		X	Pueblo Well	Water	1	X								
O-4	12/17/11	2040		X	Pueblo Well	Water	1	X								

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
B Kendrick (BKendrick)	12/17/11	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS

[SR012-1192.03]

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251 2858 • Fax 918 251 2399

SAMPLING FIRM: Tetra Tech, Inc
CLIENT CONTACT: Julie Strachan
PHONE NUMBER: 212-949-4004
P.O. or PROPOSAL NUMBER:
PROJECT NAME: Los Alamos National Laboratory - Phase 2
SAMPLER (Signature):

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	TCLP	Total Metals	Total Uranium						REMARKS
PC-1	12/11/99	1020		X	Pajarito Canyon	Soil	1	X	X	X						
PC-2	12/11/99	1105		X			1	X	X	X						
PC-3	12/11/99	1130		X			1	X	X	X						
PC-4	12/11/99	1210		X			1	X	X	X						
PC-5	12/11/99	1230		X			1	X	X	X						
AC-1	12/11/99	1540		X	Ancho Canyon		1	X	X	X						
AC-2	12/11/99	1515		X			1	X	X	X						
AC-3	12/11/99	1450		X			1	X	X	X						
AC-4	12/11/99	1425		X			1	X	X	X						
AC-5	12/11/99	1400		X			2	X	X	X						MS/MSD

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
Bret Kendrick (B Kendrick)	12/11/99	1500					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)

REMARKS: Airbill 8016082750 65

[SR012-1192.03]

NWW • 9000J • 6ON

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012-1421
Office: 918 251-2058 • Fax 918-251-2599

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER
Tech Law, Inc	Julie Shanahan	212-149-4014

P.O. or PROPOSAL NUMBER	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLER (Signature):

ANALYTICAL TESTS REQUESTED

SAMPLE NO	DATE	TIME	COMP.	GRAB	LOCATION	MATRIX	NUMBER OF CONTAINERS	Total As	Total Uranium	Ammonia	Nitrate/Nitrite	TKN	Total P	Total Res	Explosives	REMARKS
PM-1	12/0/99	2011		X	Perkins Well	Water	2	X	X	X	X	X	X			
O-4	12/11/99	2040		X	Perkins Well	Water	2	X	X	X	X	X	X			
PM-2	11/11/99	1850		X	Perkins Well	Water	2							X	X	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
Bret Kendrick (JSKendrick)	12/11/99	1520					

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED FOR LABORATORY BY (Signature)

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	REMARKS
				Airbill 8016082750 45

[SR012-1192-03]

Chain of Custody Record

Quanterra

QLA 4124

Client: Techlaw, Inc. - Julie Shemichek	Project Manager: Bret Kendrick	Date: 12/9/99	Chain Of Custody Number: 10999
Address: 750 N. St. Paul; Suite 600	Telephone Number (Area Code) Fax Number: (214) 953-0045	Lab Number:	Page 1 of 2
City: Dallas; State: TX; Zip Code: 75201	Site Contact: Bret Kendrick (214) 793-8722		
Project Name: Los Alamos National Laboratory - Phase 2	Carrier/Waybill Number: B01608275180		
Contract/Purchase Order/Quote No: 0130:0.0L.015.04.00.00.00.00.99			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No	Preservative	Condition on Receipt	Analysis: Organics	Metals	Conventional Chemistry
ACS-35-0	12/6/99	1102	Soil	1 liter	poly	1	Ice		X	X	X
ACS-18-1	12/6/99	1140	Soil	1 liter	poly	1	Ice		X	X	X
ACS-18-2	12/6/99	1200	Soil	1 liter	poly	1	Ice		X	X	X
ACS-11-3	12/6/99	1210	Soil	1 liter	poly	1	Ice		X	X	X
ACS-12-1	12/6/99	1135	Soil	1 liter	poly	1	Ice		X	X	X
ACS-12-2	12/6/99	1245	Soil	1 liter	poly	1	Ice		X	X	X
ACS-48-0	12/6/99	1300	Soil	1 liter	poly	1	Ice		X	X	X
ACS-3-1	12/6/99	1330	Soil	1 liter	poly	1	Ice		X	X	X
ACS-3-2	12/6/99	1340	Soil	1 liter	poly	1	Ice		X	X	X
ACS-3-4	12/6/99	1400	Soil	1 liter	poly	1	Ice		X	X	X
ACS-3-3	12/6/99	1350	Soil	1 liter	poly	1	Ice		X	X	X

Special Instructions:

Possible Hazard Identification: ☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I ☐ II ☐ III

Project Specific (Specify):

	Date	Time
1. Relinquished By: Bret Kendrick (BK Di)	12/9/99	1500
2. Relinquished By:		
3. Relinquished By:		

	Date	Time
1. Received By:		
2. Received By:		
3. Received By:		

Comments:

DISTRIBUTION: WHITE - Stays with Sample, CANARY - Returned to Client with Report, PINK - Field Copy

WHITE • GREEN • PINK

Custody Record

QLA 6.24

Client: TechLaw, Inc - Julie Stranahan	Project Manager: Bret Kendrick	Date: 12/9/99	Chain Of Custody Number: 47000
Address: 750 N. St. Paul, Suite 600	Telephone Number (Area Code) Fax Number: (214) 953-0045	Lab Number:	Page 2 of 2
City: Dallas; State: TX; Zip Code: 75201	Site Contact: Bret Kendrick (214) 793-8722		
Project Name: Los Alamos National Laboratory - Phase 2	Carrier/Waybill Number: 801608275180		
Contract/Purchase Order/Quote No: 01300.06.015.04.00.00.00.00.99			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Gamma Spec.									
MCO-1	12/7/99	1310	Water	250 ml	poly	1	Ice		X									
MCO-2	12/7/99	1530	Water	250 ml	poly	1	Ice		X									
MCO-3	12/7/99	1400	Water	250 ml	poly	1	Ice		X									
MCO-5	12/8/99	1045	Water	250 ml	poly	1	Ice		X									
MCO-6	12/8/99	1200	Water	250 ml	poly	1	Ice		X									
MCO-7	12/8/99	1350	Water	250 ml	poly	1	Ice		X									
MCWP-7-7B	12/8/99	1510	Water	250 ml	poly	1	Ice		X									
MT-1	12/7/99	1105	Water	250 ml	poly	1	Ice		X									
TW-1	12/8/99	1545	Water	250 ml	poly	1	Ice		X									

Special Instructions:

Possible Hazard Identification: ☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I ☐ II ☐ III

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: Bret Kendrick (BKendrick)	12/9/99	1500	1. Received By:		
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments:

DISTRIBUTION: WHITE - Stays with Sample, CANARY - Returned to Client with Report, PINK - Field Copy

Chain of Custody Record

Quanterra

Client: TechLaw, Inc. - Julie Shineldecker
Address: 750 N. St Paul, Suite 600
City: Dallas | State: TX | Zip Code: 75201
Project Name: Los Alamos National Laboratory - Area 2
Contract Purchase Order/Quote No: 01300.06.015.04.00.00.00.00.99

Project Manager: Bret Kendrick
Telephone Number (Area Code) Fax Number: (214) 953-0045
Site Contact: Bret Kendrick (214) 953-8722
Carrier/Waybill Number: BD160827517 9

Date: 12/9/99
Lab Number:
Chain Of Custody Number: 16
Page 1 of 1

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Sr-90	Specific Gamma Spectr.
ACS-EB	12/6/99	1910	Water	1 liter	poly	1	HNO3		X	
ACS-EB	12/6/99	1910	Water	1 liter	poly	1	HNO3			X
ACS-EB	12/6/99	1910	Water	1 liter	poly	1	HNO3			X
MCO-1	12/7/99	1310	Water	1 liter	poly	1	HNO3		X	
MCO-2	12/7/99	1530	Water	1 liter	poly	1	HNO3		X	
MCO-3	12/7/99	1400	Water	1 liter	poly	1	HNO3		X	
MCO-5	12/8/99	1045	Water	1 liter	poly	1	HNO3		X	
MCO-6	12/8/99	1500	Water	1 liter	poly	1	HNO3		X	
MCO-7	12/8/99	1350	Water	1 liter	poly	1	HNO3		X	
MCWB-7.7B	12/8/99	1510	Water	1 liter	poly	1	HNO3		X	
MT-4	12/7/99	1105	Water	1 liter	poly	1	HNO3		X	
TV1-8	12/7/99	1545	Water	1 liter	poly	1	HNO3		X	

Special Instructions:

Possible Hazard Identification: [ ] Non Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [X] Disposal By Lab [ ] Archive For ___ Months

Turn Around Time Required: [X] Normal [ ] Rush

QC Level: [ ] I [ ] II [ ] III

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: Bret Kendrick (BKendrick)	12/9/99	1500	1. Received By		
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments:

DISTRIBUTION: WHITE - Stays with Sample, CANARY - Returned to Client with Report, PINK - Field Copy

CMS Printed Products & Systems

EWN-000001-000

Chain of Custody Record

Quanterra

QLA 0126

Client: Techlaw, Inc. - Julie Shannahan
Address: 750 N. St. Paul - Suite 600
City: Dallas | State: TX | Zip Code: 75201
Project Name: Los Alamos National Laboratory - Phase 2
Contract Purchase Order/Quote No: 0130.06.015.04.00.00.00.99

Project Manager: Bret Kendrick
Telephone Number (Area Code) Fax Number: (214) 953-0045
Site Contact: Bret Kendrick (214) 793-8722
Carrier/Waybill Number: 8016082751 13 - Fed Ex

Date: 12-14-99
Lab Number:

Chain Of Custody Number: 34155
Page 1 of 2

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No	Preservative	Condition on Receipt	Analysis: VOC-8260	Metals-6010	Semivolatiles-8270	Gamma Spec	Gross Alpha/Beta
BC-1	12-13-99	1340	Soil	1 L	poly	1	ice		X	X	X	X	X
BC-2		1410				1			X	X	X	X	X
BC-3		1430				1			X	X	X	X	X
BC-4		1515				1			X	X	X	X	X
BC-5		1420				1			X	X	X	X	X
SC-1		0825				1					X		X
SC-2		0855				1					X		X
SC-3		1025				1					X		X
SC-4		1050				1					X		X
SC-5		1150				1					X		X
SC-6		1125				1					X		X
MC-1	12-14-99	1000				1			X	X	X	X	X
MC-2		1200				1			X	X	X	X	X
MC-3		1115				1			X	X	X	X	X
MC-4		1130				1			X	X	X	X	X
MC-5a		1255				1			X	X	X	X	X

Special Instructions:

Possible Hazard Identification: ☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ___ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I ☐ II ☐ III

Project Specific (Specify):

1. Relinquished By: [signature] Date: 12-15-99 Time: 1500
2. Relinquished By: Date: Time:
3. Relinquished By: Date: Time:

1. Received By: Date: Time:
2. Received By: Date: Time:
3. Received By: Date: Time:

Comments:

DISTRIBUTION: WHITE - Stays with Sample, CANARY - Returned to Client with Report, PINK - Field Copy

Chain of Custody Record

Quanterra

Client: Technos, Inc. - Julie Shanahan
Address: 750 N. St. Paul - Suite 600
City: Dallas | State: Tx | Zip Code: 75201
Project Name: Los Alamos National Laboratory - Phase 2
Contract/Purchase Order/Quote No: 01300.06.015.04.00.00.06.10.99

Project Manager: Brent Kendrick
Telephone Number (Area Code)/Fax Number: (214) 853-0015
Site Contact: Brent Kendrick (214) 793-8722
Carrier/Waybill Number: 8016082751 13 - Fed Ex

Date: 12-14-99
Lab Number:

Chain Of Custody Number: 34154
Page 2 of 2

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No	Preservative	Condition on Receipt	Hg-90	Isotopic U	Isotopic Pu	Gamma Spec	Gross alpha/beta
MC-5B	12-14-99	1250	soil	1 L	poly	1	ice		X	X	X	X	X

Special Instructions:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ___ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I ☐ II ☐ III

Project Specific (Specify):

1. Relinquished By: [signature] Date: 12-15-99 Time: 1500
2. Relinquished By: Date: Time:
3. Relinquished By: Date: Time:

1. Received By: Date: Time:
2. Received By: Date: Time:
3. Received By: Date: Time:

Comments:

DISTRIBUTION: WHITE - Stays with Sample, CANARY - Returned to Client with Report, PINK - Field Copy

UNW • 00001 • 0010

Chain of Custody Record

Quanterra

CLIA 6124

Client	Tetra Tech, Inc. - Julie Shanahan
Address	750 N. St Paul; Suite 600
City	Dallas
State	TX
Zip Code	75201
Project Name	La Akers Nation Laboratory - Phase 2
Contract/Purchase Order/Quote No	D1300.DL.015.04.00.00.00.00.A1
Project Manager	Bret Kendrick
Telephone Number (Area Code) Fax Number	(214) 953-5045
Site Contact	Bret Kendrick (214) 793-8722
Carrier/Waybill Number	BD1608275087
Date	12/17/99
Lab Number	
Chain Of Custody Number	46994
Page	1 of 1

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Sr-90	Plutonium 239	Plutonium 238	Cesium-137	Gross Alpha/Beta
PC-1	12/16/99	1020	Soil	1 Liter	1 Liter poly	1	Ice		X	X	X	X	X
PC-2	↓	1105	↓	↓	↓	1	↓		X	X	X	X	X
PC-3		1130				1			X	X	X	X	X
PC-4		1210				1			X	X	X	X	X
PC-5		1230				1			X	X	X	X	X
AC-1		1540				1			X	X	X	X	X
AC-2		1515				1			X	X	X	X	X
AC-3		1450				1			X	X	X	X	X
AC-4		1425				1			X	X	X	X	X
AC-5		1400				1			X	X	X	X	X
CC-1	12/15/99	1545				1			X	X	X	X	X
CC-2		1515				1			X	X	X	X	X
CC-3		1445				1			X	X	X	X	X
CC-4		1415				1			X	X	X	X	X
CC-5A	↓	1330	↓	↓	↓	1	↓		X	X	X	X	X

Special Instructions

Possible Hazard Identification: ☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I ☐ II ☐ III

Project Specific (Specify)

	Date	Time
1. Relinquished By: Bret Kendrick (TTK)	12/17/99	1500
2. Relinquished By		
3. Relinquished By		

	Date	Time
1. Received By		
2. Received By		
3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with Sample. CANARY - Returned to Client with Report. PINK - Field Copy

Chain of Custody Record

Quanterra

QUA 4124

Client: TechLaw, Inc. - Julie Shumaker

Address: 750 N St Paul; Suite 600

City: Dallas | State: TX | Zip Code: 75201

Project Name: Los Alamos National Laboratory - Phase 2

Contract Purchase Order/Quote No.:

Project Manager: Bret Kendrick

Telephone Number (Area Code) Fax Number: (214) 953-0045

Site Contact: Bret Kendrick (214) 793-3722

Carrier/Waybill Number: B01608275076

Date: 12/17/99

Lab Number:

Chain Of Custody Number: 46993

Page 1 of 1

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Sr-90	I-129	Tritium	Gamma Spec	Gross Alpha/Beta	Organic Sr-90						
CC-5B	12/15/99	1345	Soil	1 Liter	Poly	1	Ice		X	X	X	X	X							
CC-10	↓	1034	↓	↓	↓	1	↓		X	X	X	X	X							
CC-7		1000				1			X	X	X	X	X							
CC-8		0915				1			X	X	X	X	X							
CC-9		0830				1			X	X	X	X	X							
AC-EB	12/11/99	1110	Water	4 liter	Poly	4	HNO_3		X	X	X	X	X							
CC-EB	12/15/99	1150	Water	4 Liter	Poly	4	HNO_3		X	X	X	X	X							
GS-1	12/9/99	1510	Water	1 Liter	Poly	1	HNO_3							X						
O-4	12/12/99	2040	Water	1 Liter	Poly	1	HNO_3							X						
PM-1	12/13/99	2011	Water	1 Liter	Poly	1	HNO_3							X						
MCO-FB	12/9/99	1440	Water	1 Liter	Poly	1	HNO_3							X						

Special Instructions:

Possible Hazard Identification: ☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I ☐ II ☐ III

Project Specific (Specify):

	Date	Time
1 Relinquished By: Bret Kendrick (signature)	12/17/99	1500
2 Relinquished By:		
3 Relinquished By:		

	Date	Time
1 Received By:		
2 Received By:		
3 Received By:		

Comments:

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

0WW+00001+0N

OFFICIAL

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLERS: (Signature) B. Kendrick (BKendrick) / J. Hawley (JHawley)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Low Level Tritium							REMARKS
MCDIFB	12/1/99	1410		X	Mortandad Canyon	1	X							
GS-1	12/1/99	1510		X	Mortandad Canyon	1	X							
SM-30	12/1/99	1210		X	TA-3	1	X							
SD-30	12/1/99	1130		X	TA-3	1	X							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
B. Kendrick (BKendrick)	12/1/99 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Shipped by: FedEx		Airbill Number: 801608275032			

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files; Green to Report; Yellow Returns with Warrant

EPA 7500-53 (11/96)

6- 11619

OFFICIAL CHAIN OF CUSTODY RECORD

PROJ NO.	PROJECT NAME
	Los Alamos National Laboratory - Phase 2

SAMPLERS: (Signature) Bret Kendrick (BKendrick) / [illegible]

STA. NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Gross N Isotopes						REMARKS
MCO-3	11/8/96	1400		X		3	X						
MCO-5	11/8/96	1045		X		3	X						
MCO-1	11/8/96	1350		X		3	X						
MT-9	11/8/96	1105		X		3	X						
TW-6	11/8/96	1545		X		3	X						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Bret Kendrick (BKendrick)					
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Shipped by: Bret Kendrick		Airbill Number: 801608275157			

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files; Green to Report; Yellow Returns with Warrant

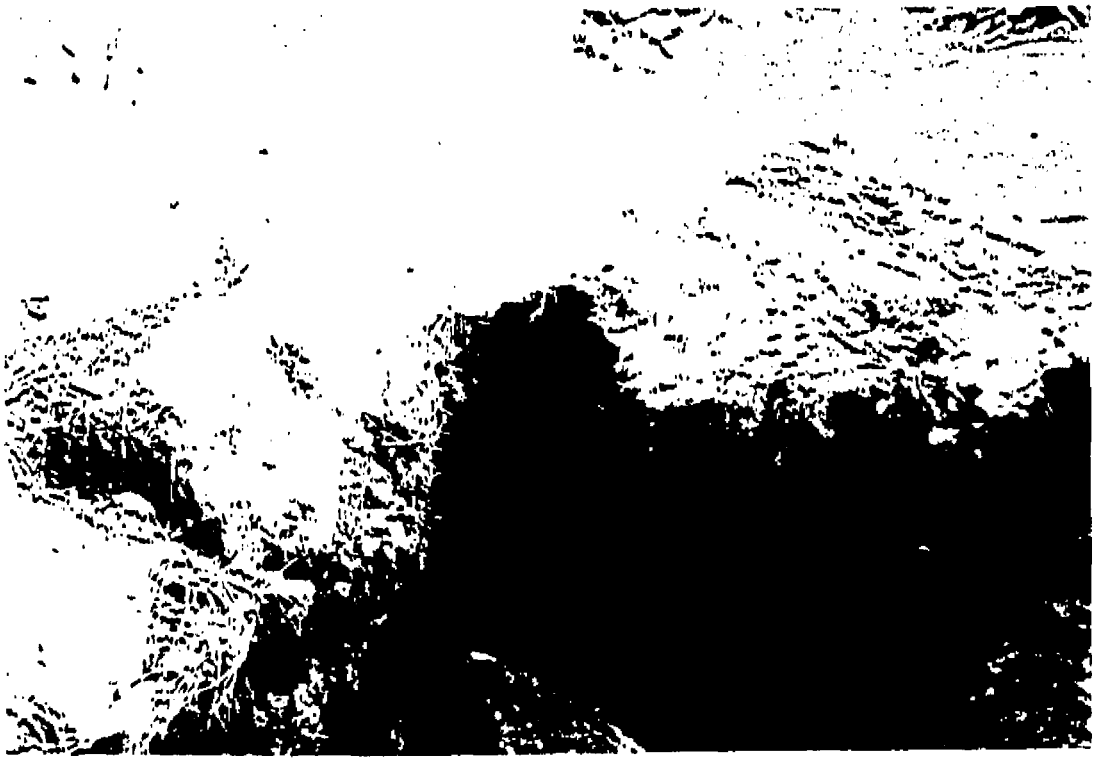
EPA 7500-53 (11/96)

6-11670
JAW-000001-0510

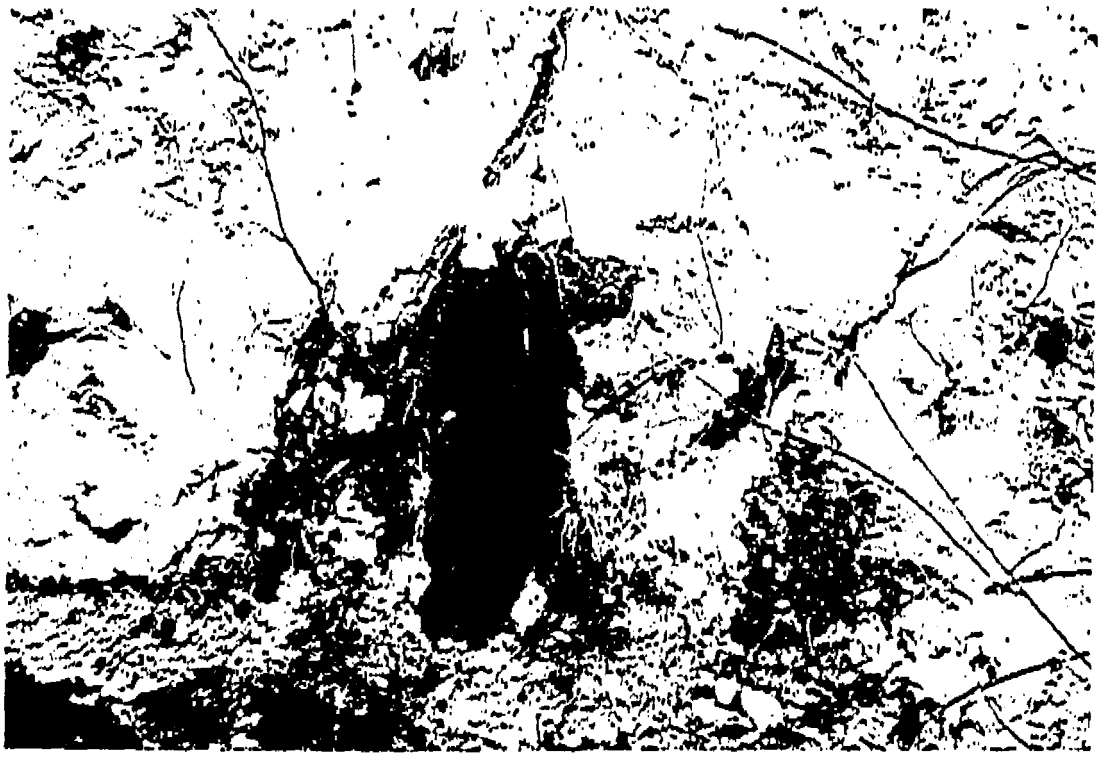
APPENDIX H

Photographs

Photograph No.:	1-1	**Facility:**	Los Alamos National Laboratory
Date:	December 6, 1999	**Time:**	1049
Photo By:	B. Kendrick	**Direction:**	Downward
Description:	View of sample material from ACS-35-0 being sieved for collection from Acid Canyon.		



Photograph No.:	1-2	**Facility:**	Los Alamos National Laboratory
Date:	December 6, 1999	**Time:**	1211
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of sample location ACS-18 in Acid Canyon.		



Photograph No.:	1-3	**Facility:**	Los Alamos National Laboratory
Date:	December 6, 1999	**Time:**	1252
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of sample location ACS-12 in Acid Canyon.		

Photograph No.:	1-4	**Facility:**	Los Alamos National Laboratory
Date:	December 6, 1999	**Time:**	1254
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of sample location ACS-12 in Acid Canyon with sample location ACS-48 in the background.		

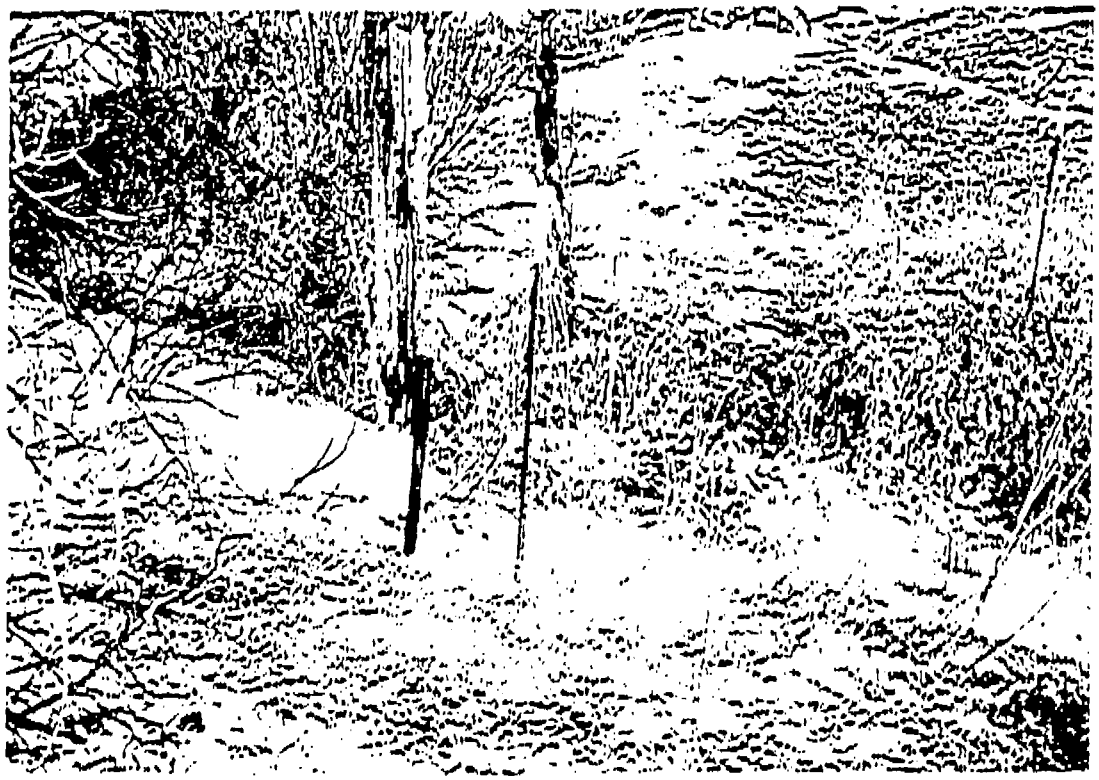
Photograph No.:	1-5	Facility:	Los Alamos National Laboratory
Date:	December 6, 1999	Time:	1307
Photo By:	B. Kendrick	Direction:	Downward
Description:	View of sample location ACS-48 in Acid Canyon.		

296.70669.342

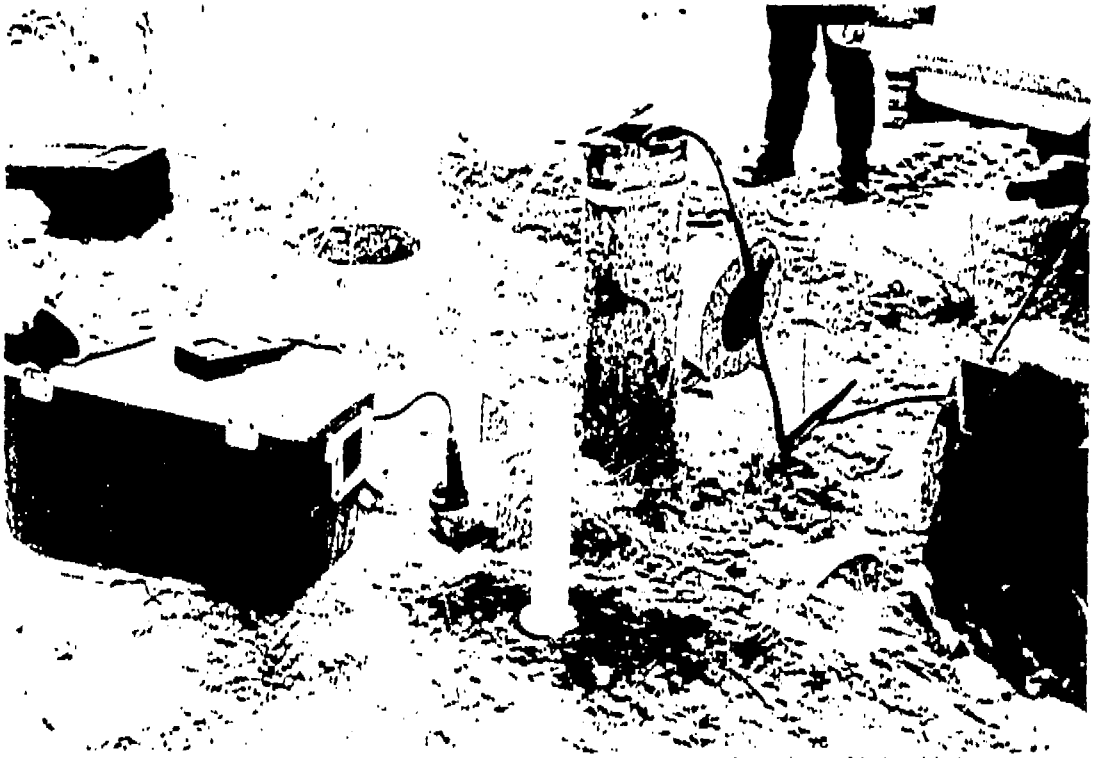
Photograph No.:	1-6	**Facility:**	Los Alamos National Laboratory
Date:	December 6, 1999	**Time:**	1425
Photo By:	B. Kendrick	**Direction:**	Southeast
Description:	View of sample location ACS-3 in Acid Canyon.		

Photograph No.:	1-7	**Facility:**	Los Alamos National Laboratory
Date:	December 7, 1999	**Time:**	1120
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of monitor well MT-4 in Mortandad Canyon.		

Photograph No.:	1-8	**Facility:**	Los Alamos National Laboratory
Date:	December 7, 1999	**Time:**	1413
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of monitor well MCO-3 located in Mortandad Canyon.		



Photograph No.:	1-9	Facility:	Los Alamos National Laboratory
Date:	December 7, 1999	Time:	1542
Photo By:	B. Kendrick	Direction:	North
Description:	View of monitor well MCO-2 in Mortandad Canyon.		

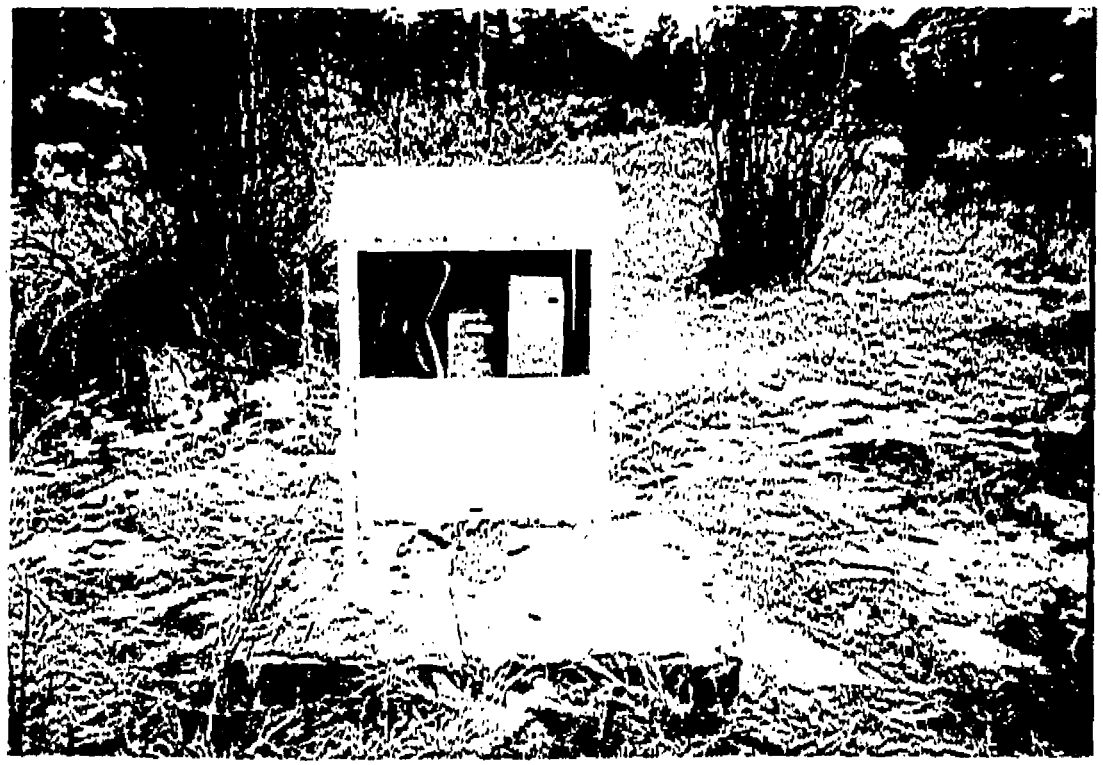


Photograph No.:	1-10	Facility:	Los Alamos National Laboratory
Date:	December 8, 1999	Time:	1013
Photo By:	B. Kendrick	Direction:	East
Description:	View of monitor well MCO-5 in Mortandad Canyon being purged using a dedicated bladder pump.		

Photograph No.:	1-11	**Facility:**	Los Alamos National Laboratory
Date:	December 8, 1999	**Time:**	1146
Photo By:	B. Kendrick	**Direction:**	Northwest
Description:	View of GPS data collection at monitor well MCO-6 in Mortandad Canyon.		

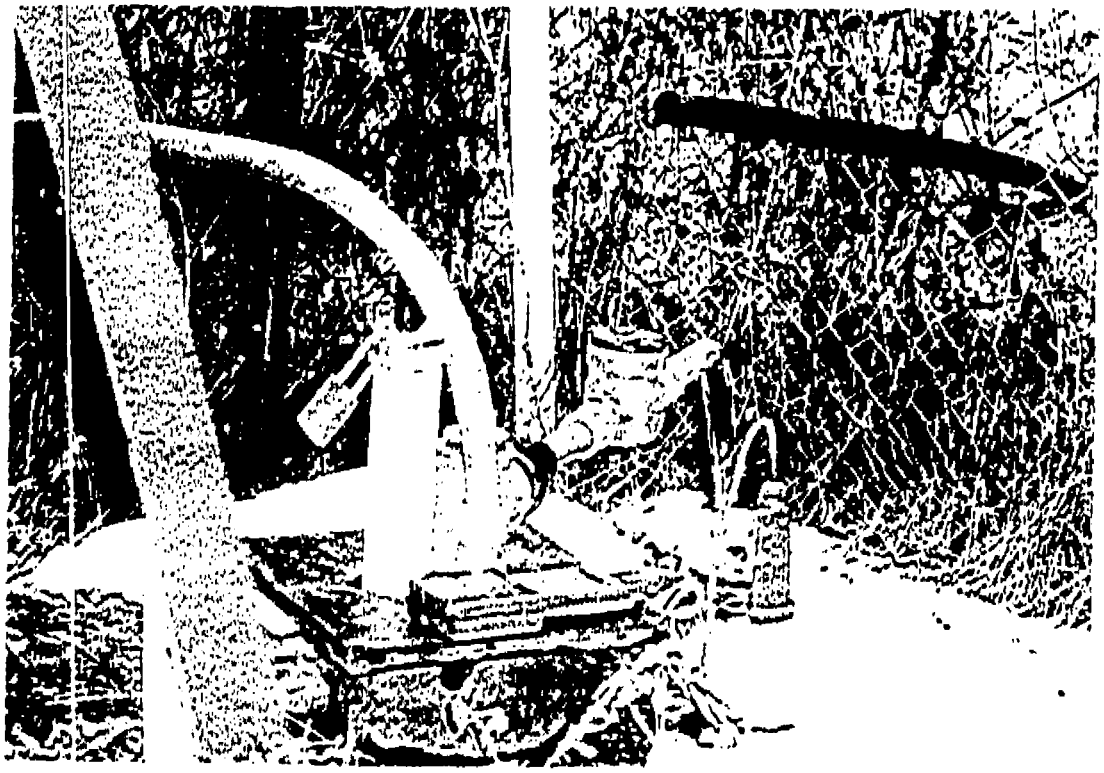
Photograph No.:	1-12	**Facility:**	Los Alamos National Laboratory
Date:	December 8, 1999	**Time:**	1400
Photo By:	B. Kendrick	**Direction:**	Southeast

Description: View of sample collection by TechLaw personnel at well MCO-7, located in lower Mortandad Canyon.



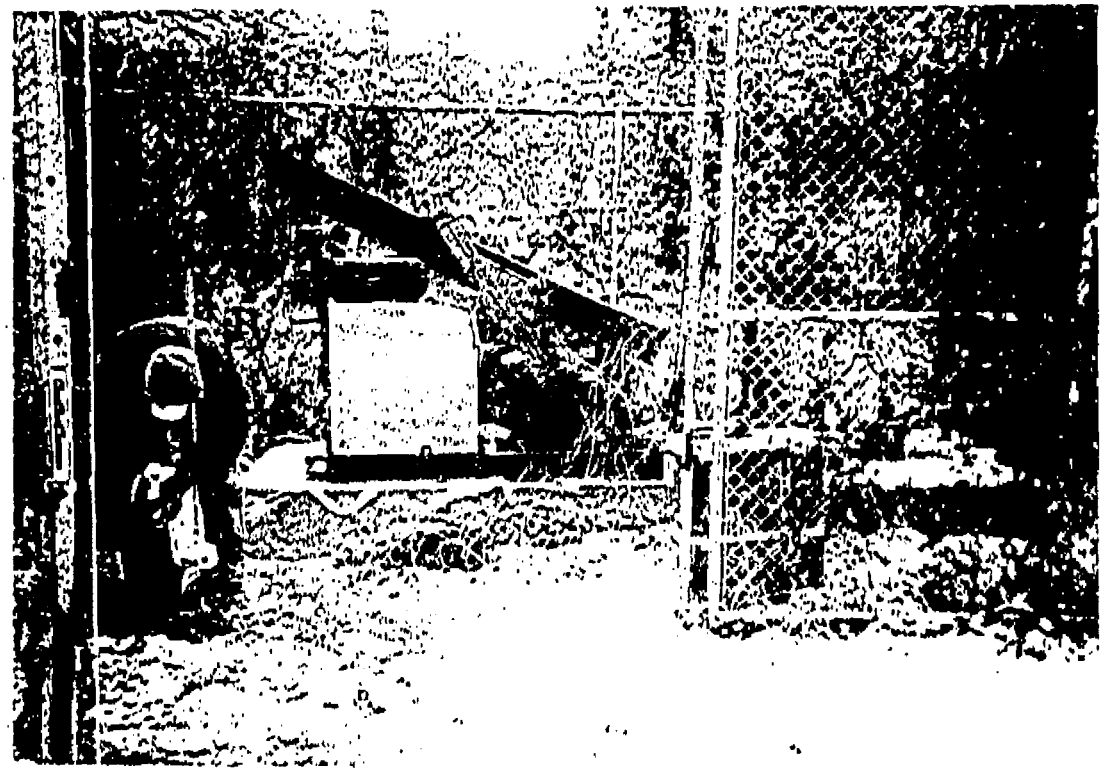
Photograph No.:	1-13	**Facility:**	Los Alamos National Laboratory
Date:	December 8, 1999	**Time:**	1514
Photo By:	B. Kendrick	**Direction:**	West

Description: A view of monitor well MCWB-7.7B in lower Mortandad Canyon.



Photograph No.:	1-14	**Facility:**	Los Alamos National Laboratory
Date:	December 8, 1999	**Time:**	1530
Photo By:	B. Kendrick	**Direction:**	Southeast

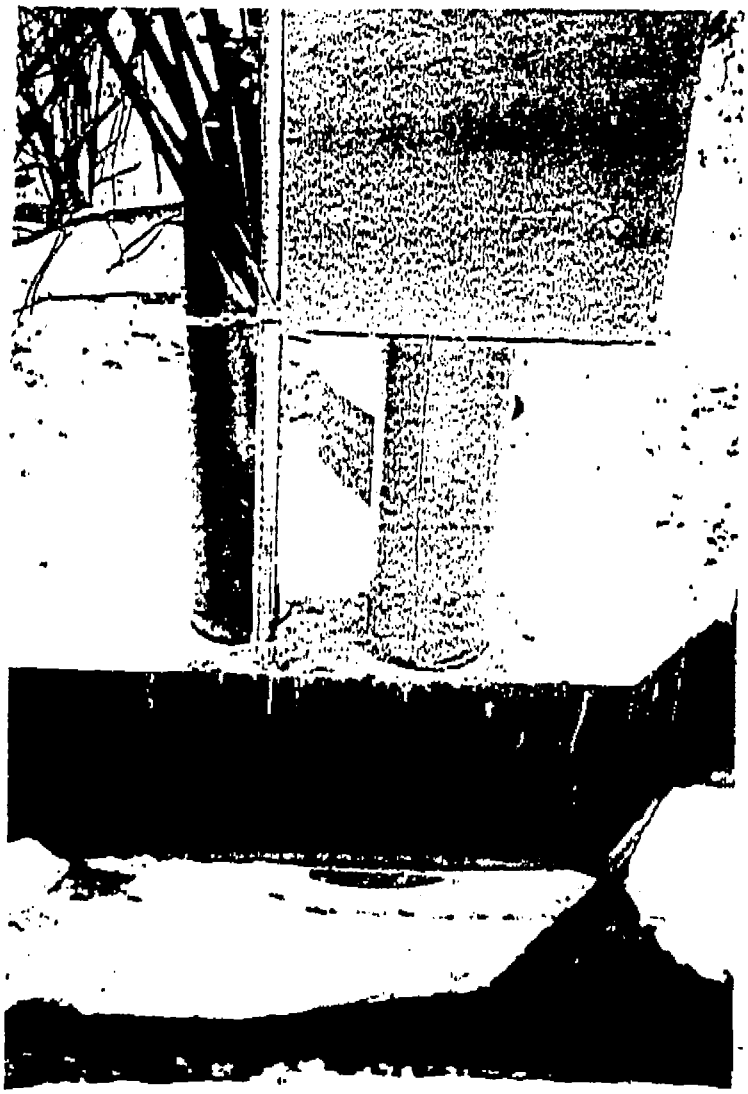
Description: View of water well TW-8 with water flowing from wellhead.



Photograph No.:	1-15	**Facility:**	Los Alamos National Laboratory
Date:	December 8, 1999	**Time:**	1028
Photo By:	B. Kendrick	**Direction:**	Southeast

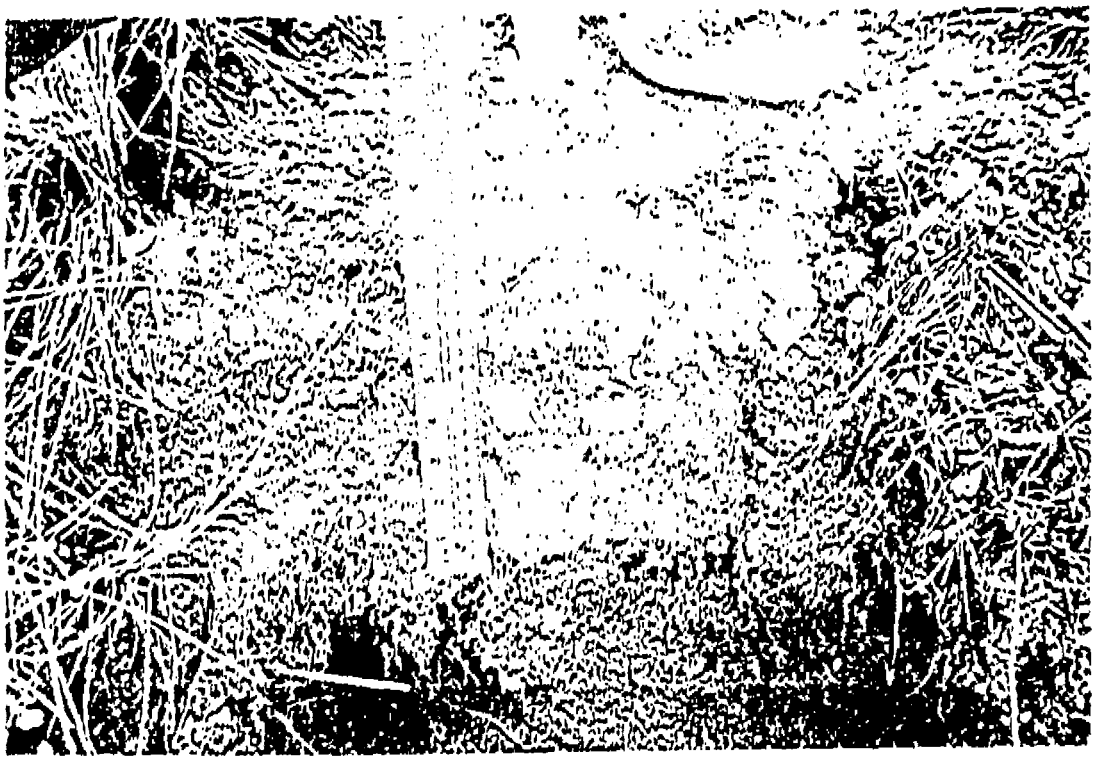
Description: Overall view of well TW-8, located in lower Mortandad Canyon.

Photograph No.:	1-16	**Facility:**	Los Alamos National Laboratory
Date:	December 9, 1999	**Time:**	1517
Photo By:	B. Kendrick	**Direction:**	West
Description:	View of weir at Gauging Station 1 (GS-1) where sample of effluent from TA-50 was collected.		

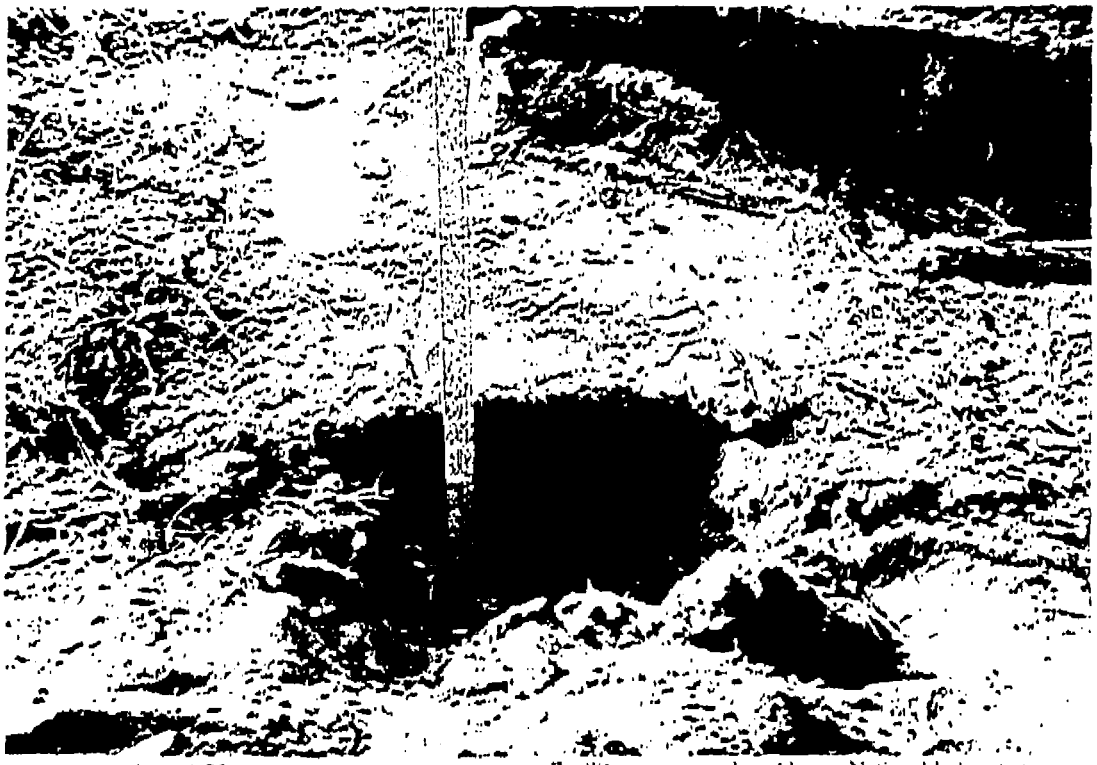


Photograph No.:	1-17	**Facility:**	Los Alamos National Laboratory
Date:	December 9, 1999	**Time:**	1519
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of Gauging Station 1 located in Mortandad Canyon where effluent sample GS-1 from Technical Area-50 was collected.		

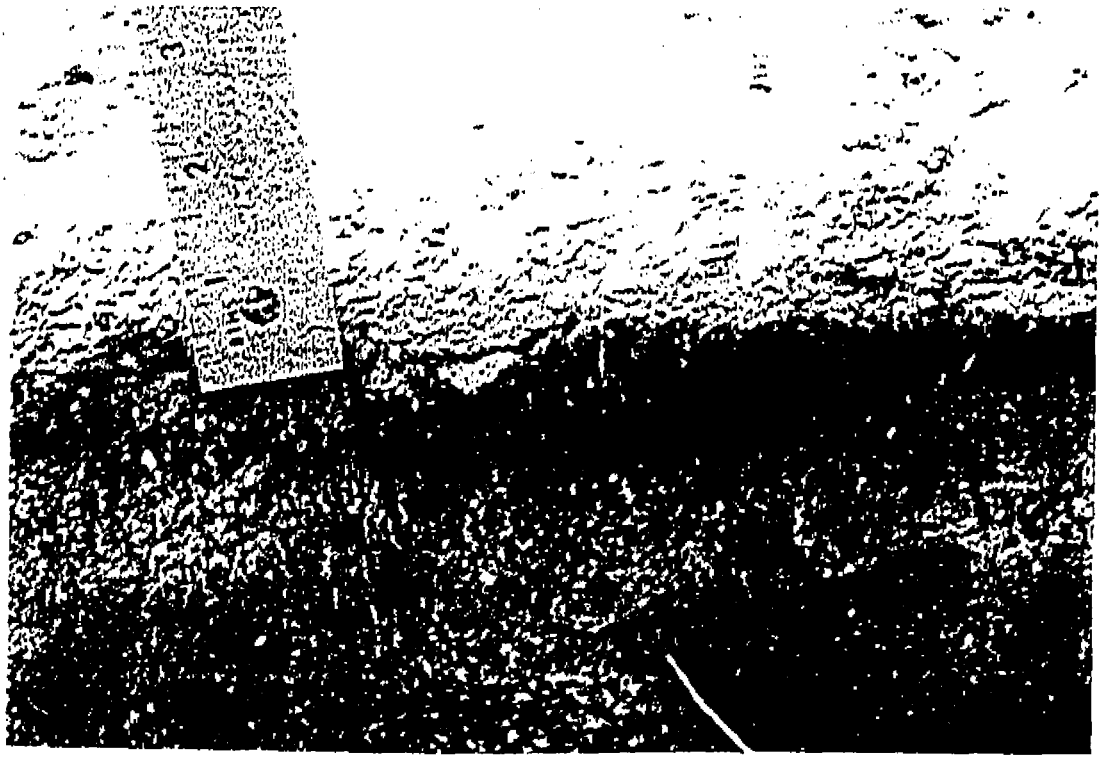
Photograph No.:	1-18	**Facility:**	Los Alamos National Laboratory
Date:	December 10, 1999	**Time:**	0915
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of soil sample location SC-1 in Sandia Canyon.		



Photograph No.:	1-19	Facility:	Los Alamos National Laboratory
Date:	December 13, 1999	Time:	0916
Photo By:	B. Kendrick	Direction:	South
Description:	Close-up view of sample SC-1. Sample was collected from 0 to 17 centimeters in depth.		



Photograph No.:	1-20	Facility:	Los Alamos National Laboratory
Date:	December 13, 1999	Time:	0945
Photo By:	B. Kendrick	Direction:	South
Description:	View of soil sample location SC-2 located in Sandia Canyon.		

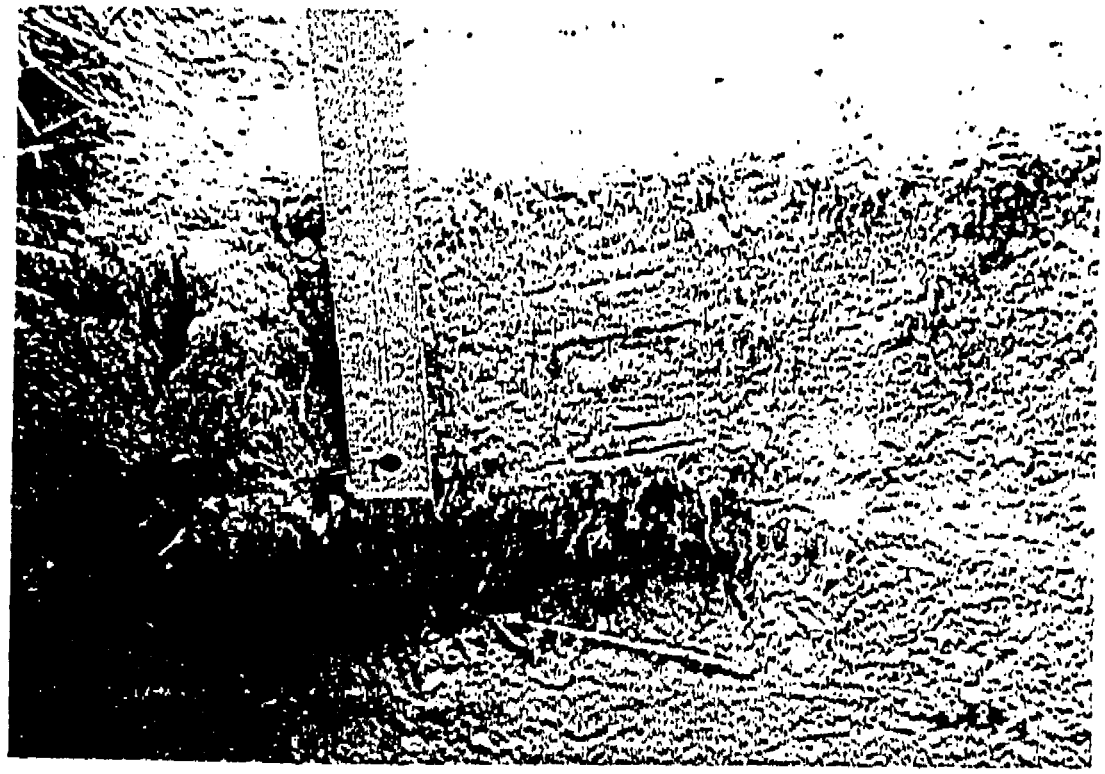


Photograph No.:	1-21	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	0946
Photo By:	B. Kendrick	**Direction:**	South

Description: Close-up view of soil sample location SC-2 located in Sandia Canyon. Sample was collected from the top three centimeters.

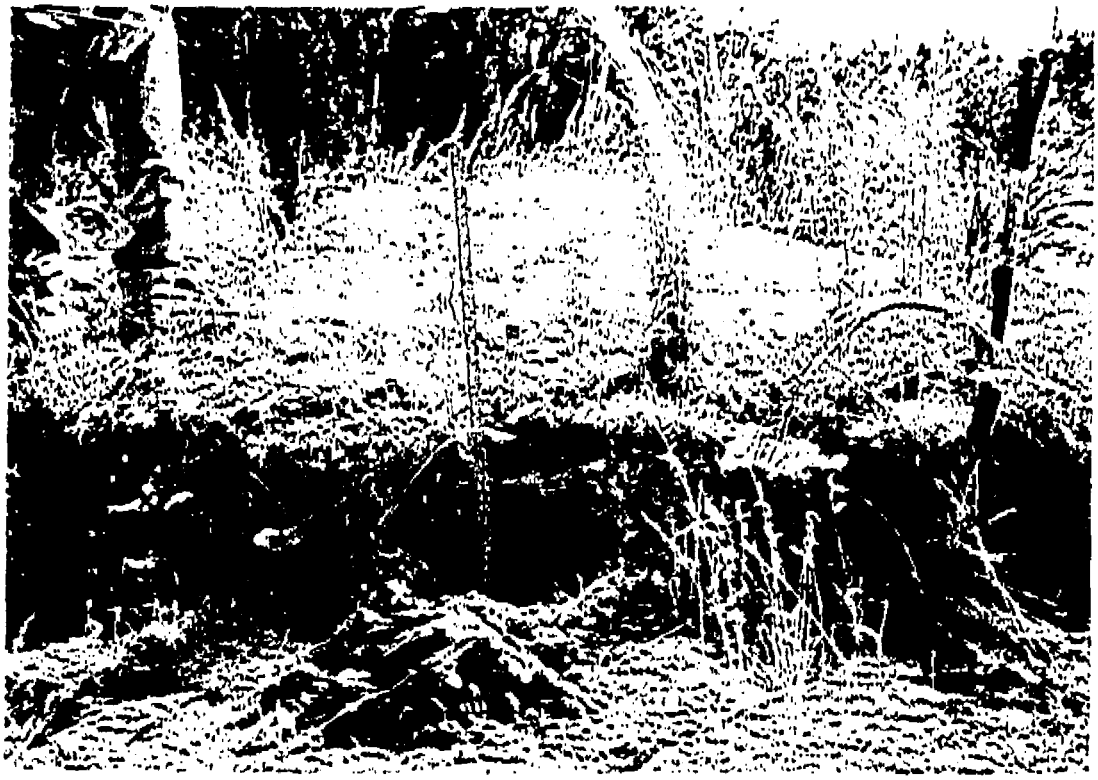
Photograph No.:	1-22	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1010
Photo By:	B. Kendrick	**Direction:**	South

Description: View of soil sample location SC-3 located in Sandia Canyon.



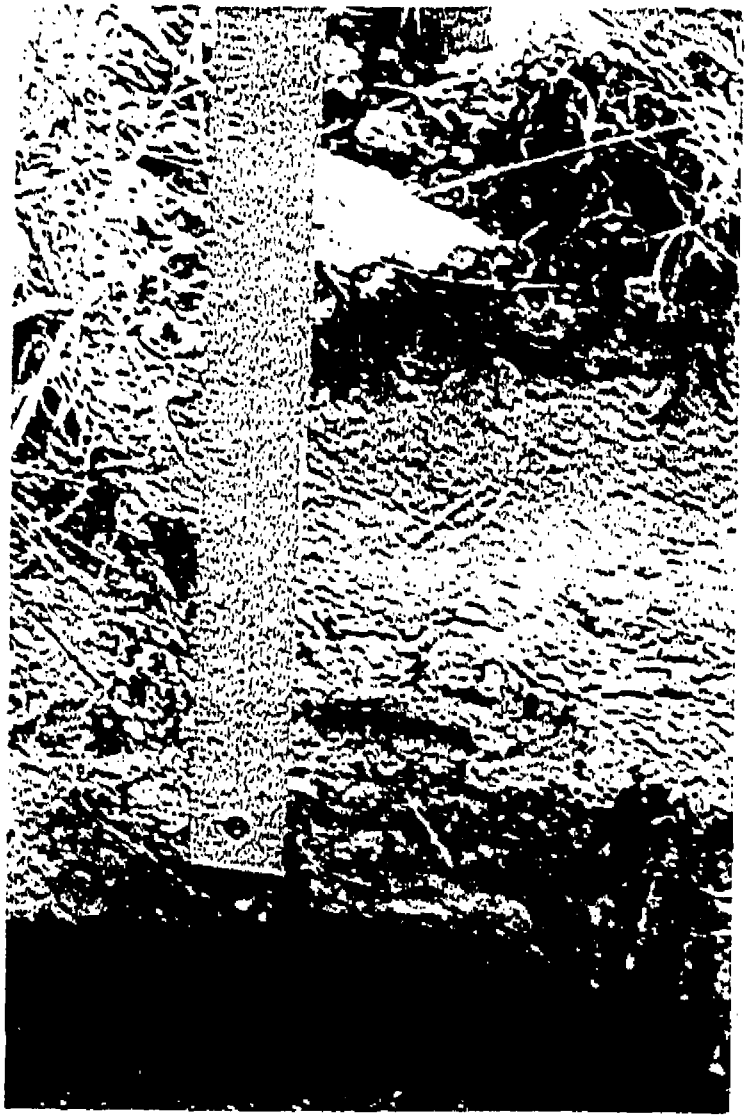
Photograph No.:	1-23	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1011
Photo By:	B. Kendrick	**Direction:**	South

Description: Close-up view of soil sample location SC-3 located in Sandia Canyon. Sample was collected from 8 to 19 centimeters.

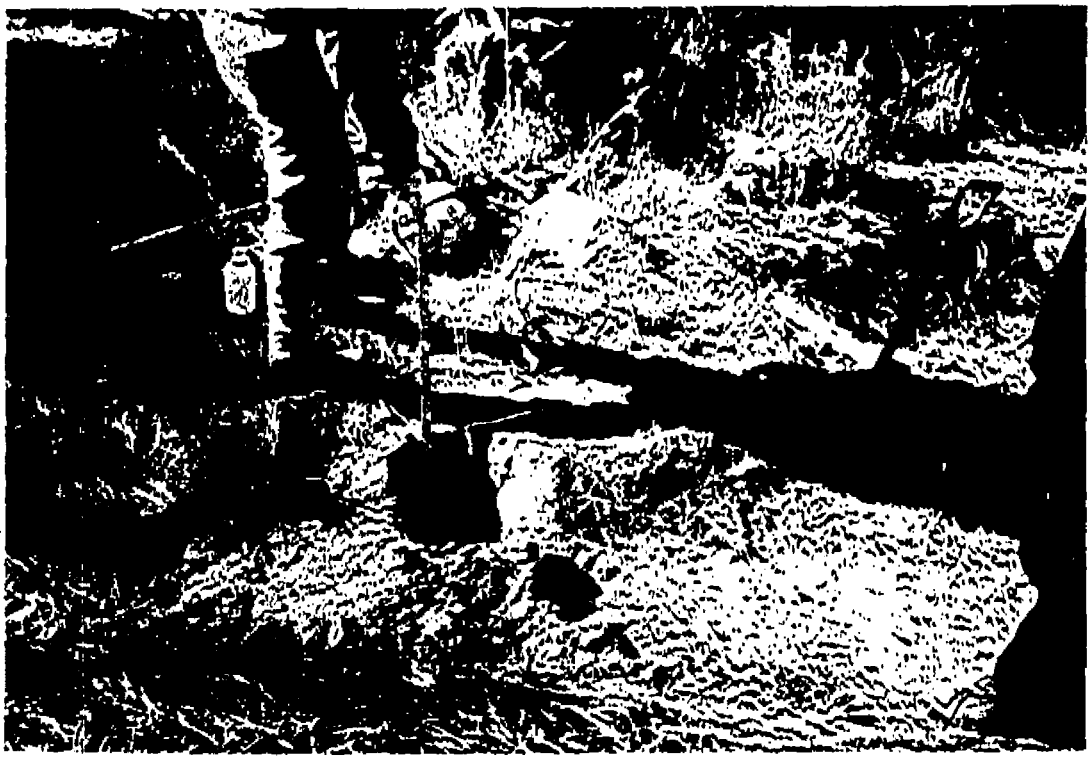


Photograph No.:	1-24	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1037
Photo By:	B. Kendrick	**Direction:**	Southeast

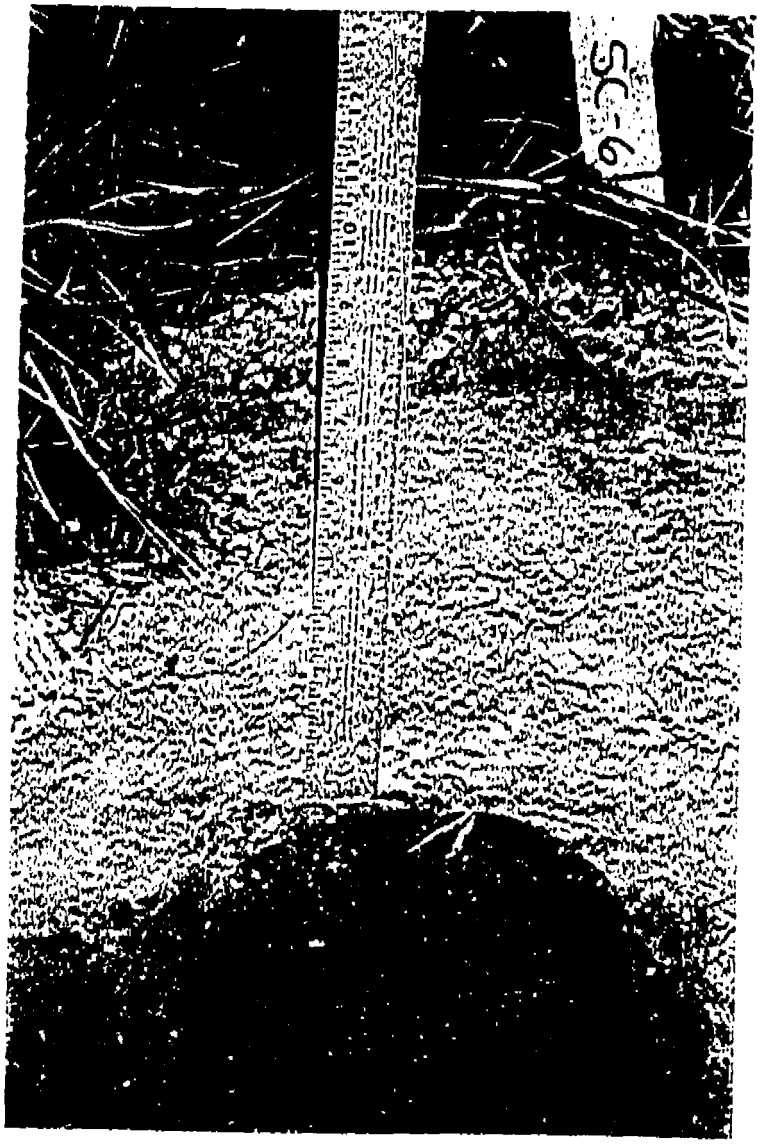
Description: View of soil sample location SC-4 located in Sandia Canyon.



Photograph No.:	1-25	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1038
Photo By:	B. Kendrick	**Direction:**	Southeast
Description:	Close-up view of soil sample location SC-2 located in Sandia Canyon. Sample was collected from 2 to 12 centimeters.		



Photograph No.:	2-1	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1117
Photo By:	B. Kendrick	**Direction:**	Southwest
Description:	View of soil sample location SC-6 in Sandia Canyon.		



Photograph No.:	2-2	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1118
Photo By:	B. Kendrick	**Direction:**	Southwest
Description:	Close-up view of sample location SC-6 in Sandia Canyon. Sample was collected from 0 to 12 centimeters in depth.		

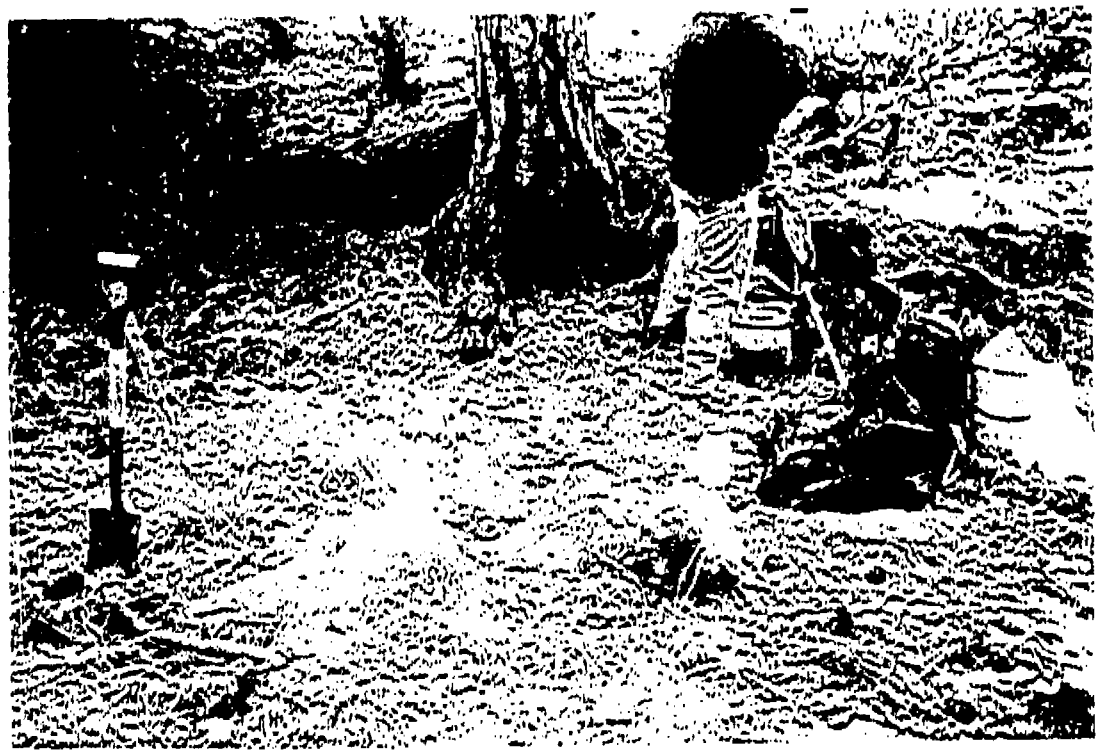
Photograph No.:	2-3	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1140
Photo By:	B. Kendrick	**Direction:**	Southeast
Description:	View of soil sample location SC-5 in Sandia Canyon.		

296.170665.5100

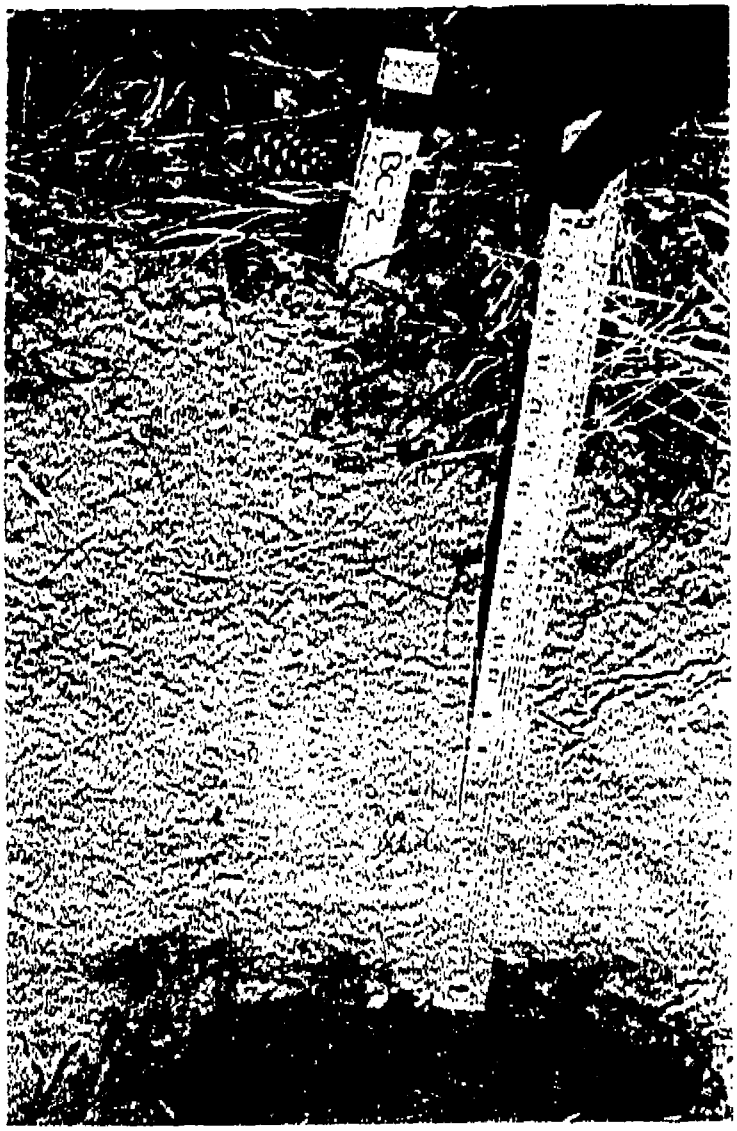
Photograph No.:	2-4	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1142
Photo By:	B. Kendrick	**Direction:**	Southeast
Description:	Close-up view of sample location SC-5.		

Photograph No.:	2-5	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1320
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of soil sample station BC-1 in Bayou Canyon.		

Photograph No.:	2-6	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1321
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of sample station BC-1 in Bayou Canyon.		



Photograph No.:	2-7	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1355
Photo By:	B. Kendrick	**Direction:**	East
Description:	View os soil sample location BC-2 in Bayo Canyon.		



Photograph No.:	2-8	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1356
Photo By:	B. Kendrick	**Direction:**	East
Description:	Close-up view of BC-1 in Bayo Canyon. A sample was collected from 14 to 27 centimeters in depth.		

Photograph No.:	2-9	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1422
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of soil sample station BC-3 in Bayo Canyon.		

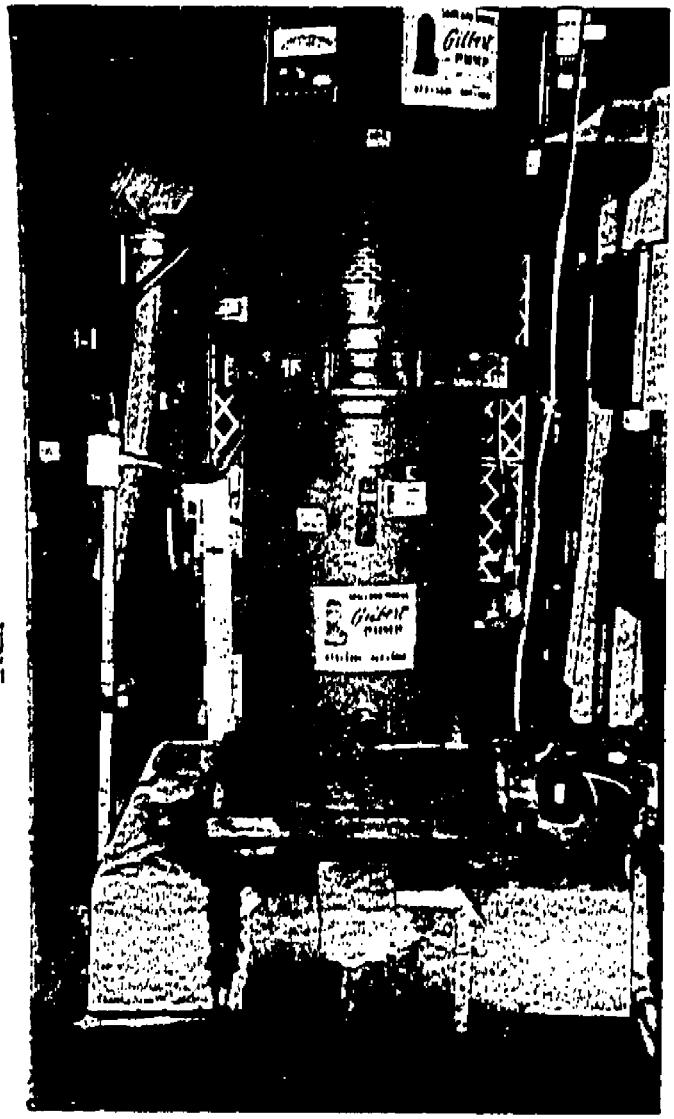
Photograph No.:	2-10	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1424
Photo By:	B. Kendrick	**Direction:**	East
Description:	Close-up view of sample location BC-3 in Bayo Canyon.		

5651.9660.7092

Photograph No.:	2-11	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1450
Photo By:	B. Kendrick	**Direction:**	Southeast
Description:	View of soil sample station BC-4 located in Bayo Canyon.		

9663.7069.2

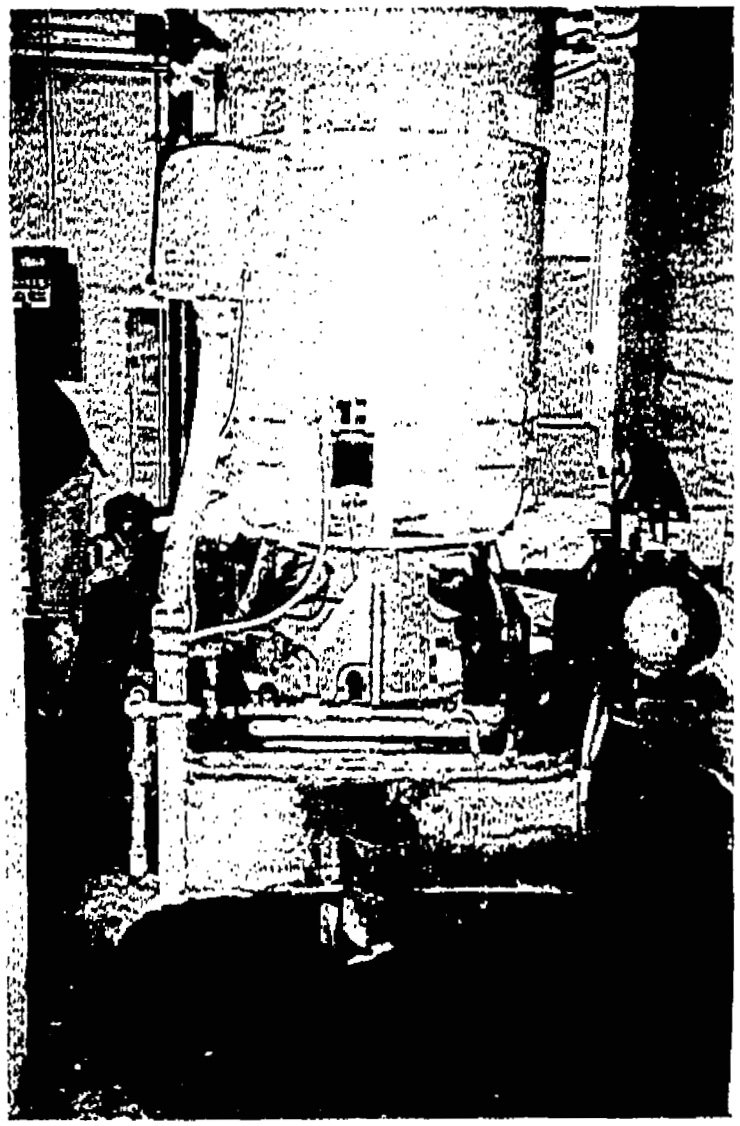
Photograph No.:	2-12	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1452
Photo By:	B. Kendrick	**Direction:**	Southeast
Description:	Close-up view of sample location BC-4 in Bayo Canyon. The sample was collected from a depth of 4 to 11 centimeters.		



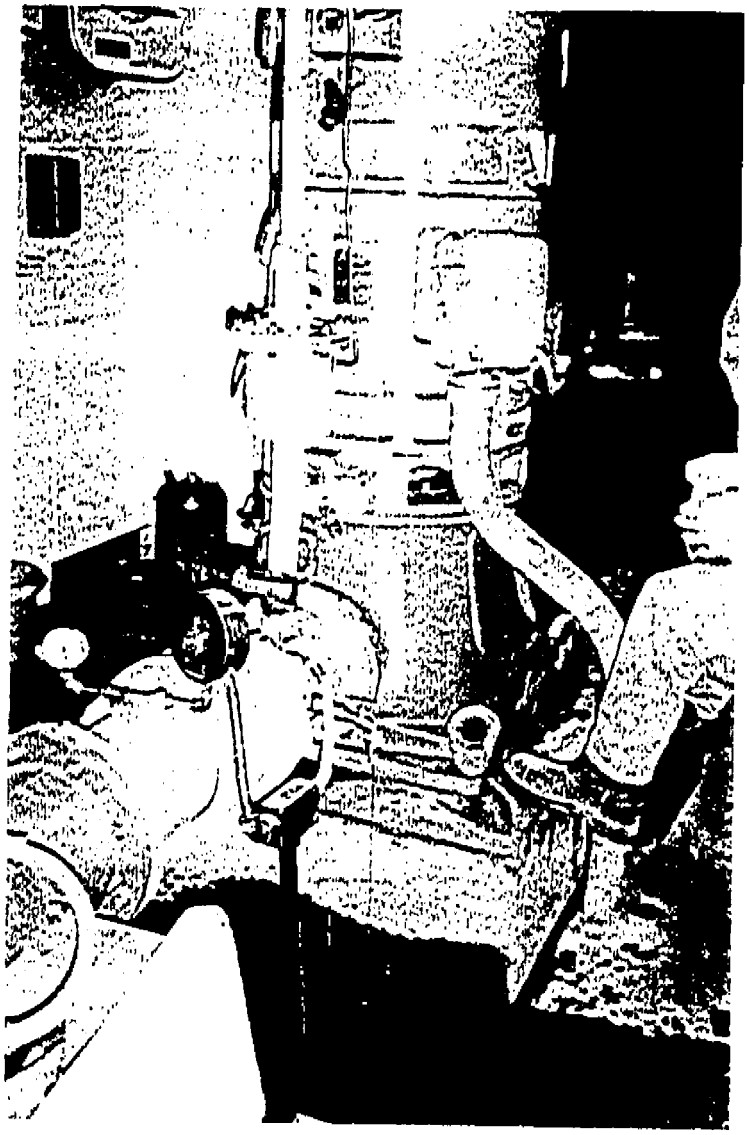
Photograph No.:	2-13	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1813
Photo By:	B. Kendrick	**Direction:**	Unknown
Description:	View of Pajarito Mesa production well, PM-5, wellhead and sample point.		

296 • 70695 • 3160

296.7069.3699

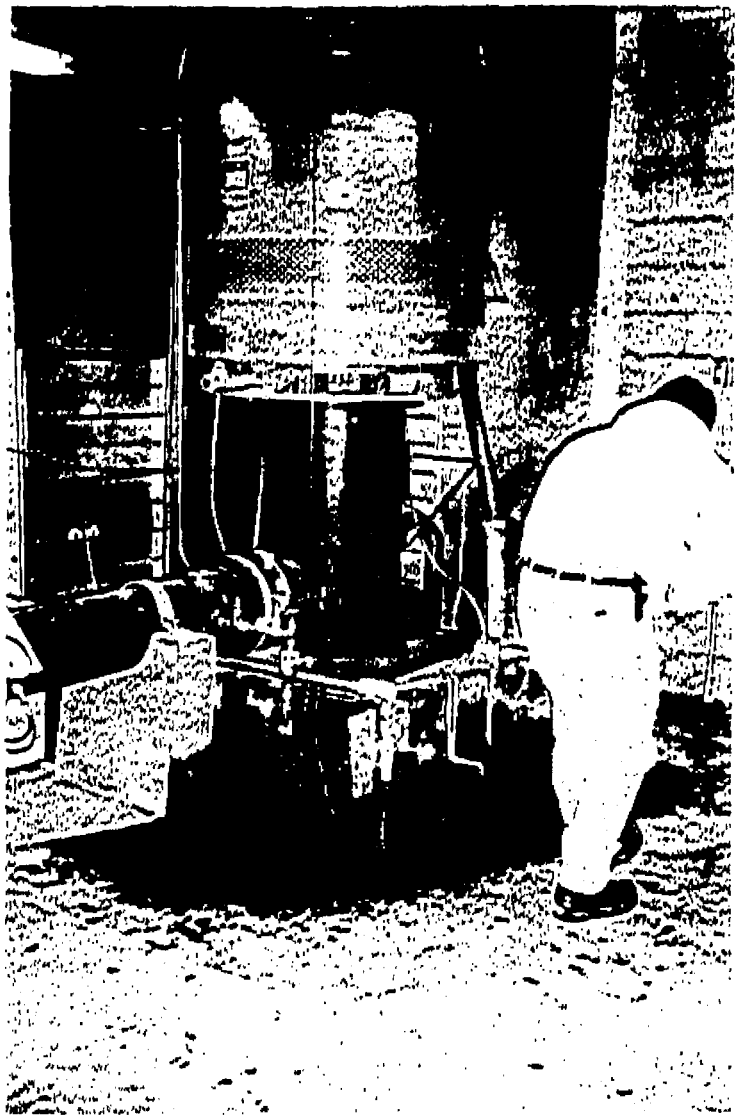


Photograph No.:	2-14	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1848
Photo By:	B. Kendrick	**Direction:**	Unknown
Description:	View of Pajarito Mesa production well, PM-2, pump and sampling point.		



Photograph No.:	2-15	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	1952
Photo By:	B. Kendrick	**Direction:**	Unknown
Description:	View of pump and sample point of Pajarito Mesa production well, PM-1.		

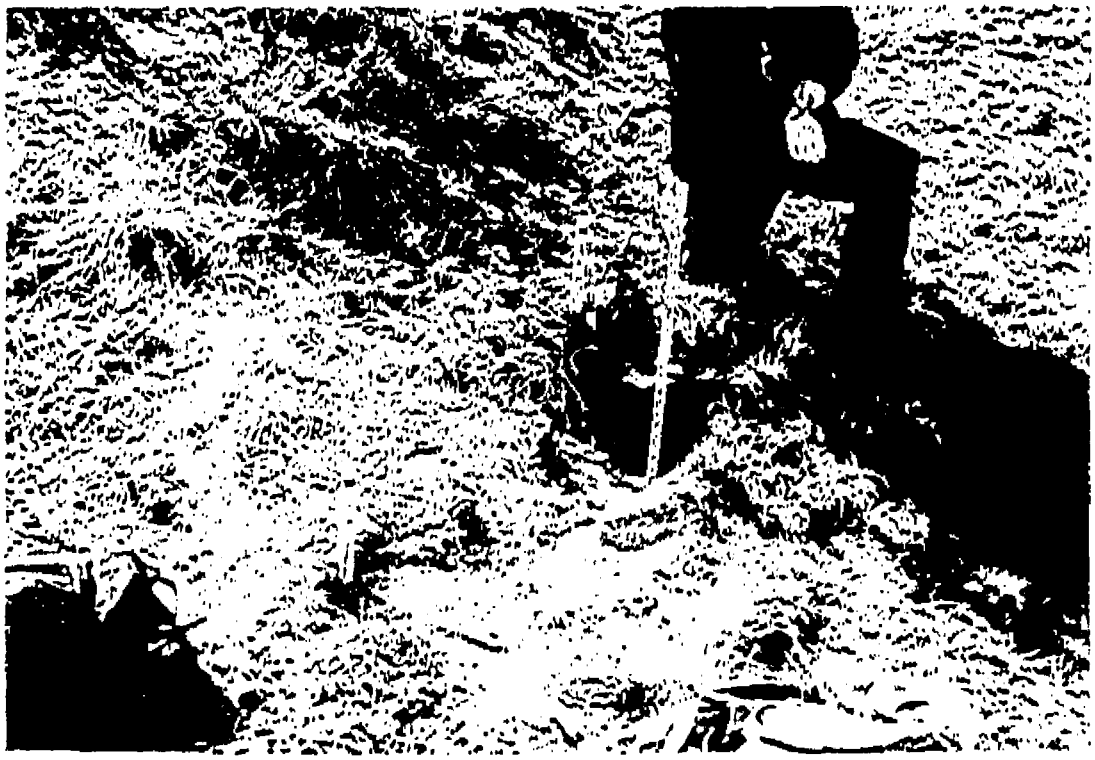
296.70669.370



Photograph No.:	2-16	**Facility:**	Los Alamos National Laboratory
Date:	December 13, 1999	**Time:**	2030
Photo By:	B. Kendrick	**Direction:**	Unknown
Description:	View of production well O-4 pump and sampling point.		

Photograph No.:	2-18	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1005
Photo By:	J. Housley	**Direction:**	North

Description: View of soil sample station MC-1 in Mortandad Canyon. A sample was collected from 0 to 5 centimeters.



Photograph No.:	2-19	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1055
Photo By:	B. Kendrick	**Direction:**	South

Description: View of soil sample locations MC-3 and MC-4 located in Mortandad Canyon.

296.70669.3733

Photograph No.:	2-20	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1057
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of soil sample station MC-3. A sample was collected between 15 and 24 centimeters in depth.		

Photograph No.:	2-21	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1058
Photo By:	B. Kendrick	**Direction:**	North

Description: Close-up view of soil sample station MC-4 in Mortandad Canyon. A sample was collected from 0 to 5 centimeters in depth.

Photograph No.:	2-22	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1147
Photo By:	B. Kendrick	**Direction:**	South

Description: View of soil sample location MC-2 in Mortandad Canyon.

2960706993375

Photograph No.:	2-23	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1149
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of soil sample station MC-2 in Mortandad Canyon. A sample was collected from 0 to 8 centimeters in depth.		

Photograph No.:	2-24	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1226
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of soil sample station MC-5 in Mortandad Canyon.		

296.70669.376

Photograph No.:	2-25	**Facility:**	Los Alamos National Laboratory
Date:	December 14, 1999	**Time:**	1228
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of soil sample station MC-5 in Mortandad Canyon. Two samples were collected from the location. The first was from 0 to 13 centimeters in depth, and the second sample was from 22 to 30 centimeters.		

Photograph No.:	3-1	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	0858
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of soil sample location CC-8 in Canada del Buey.		

296.70699.378

296.706669.379

Photograph No.:	3-2	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	0900
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of soil sample location CC-8 in Canada del Buey. A sample was collected at the location from 20 to 33 centimeters.		

Photograph No.:	3-3	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	0933
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location CC-7 located in Canada del Buey.		

296.7065.380

Photograph No.:	3-4	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	0934
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of CC-7 in Canada del Buey. A sample was collected from 0 to 7 centimeters in depth.		

296-70669-381

Photograph No.:	3-5	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1019
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location CC-6 in Canada del Buey. The area is located behind an apartment complex.		

Photograph No.:	3-6	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1020
Photo By:	B. Kendrick	**Direction:**	North
Description:	A close-up view of soil sample location CC-6 in Canada del Buey. A sample was collected from a depth of 0 to 7.5 centimeters.		

296-1706699-3833

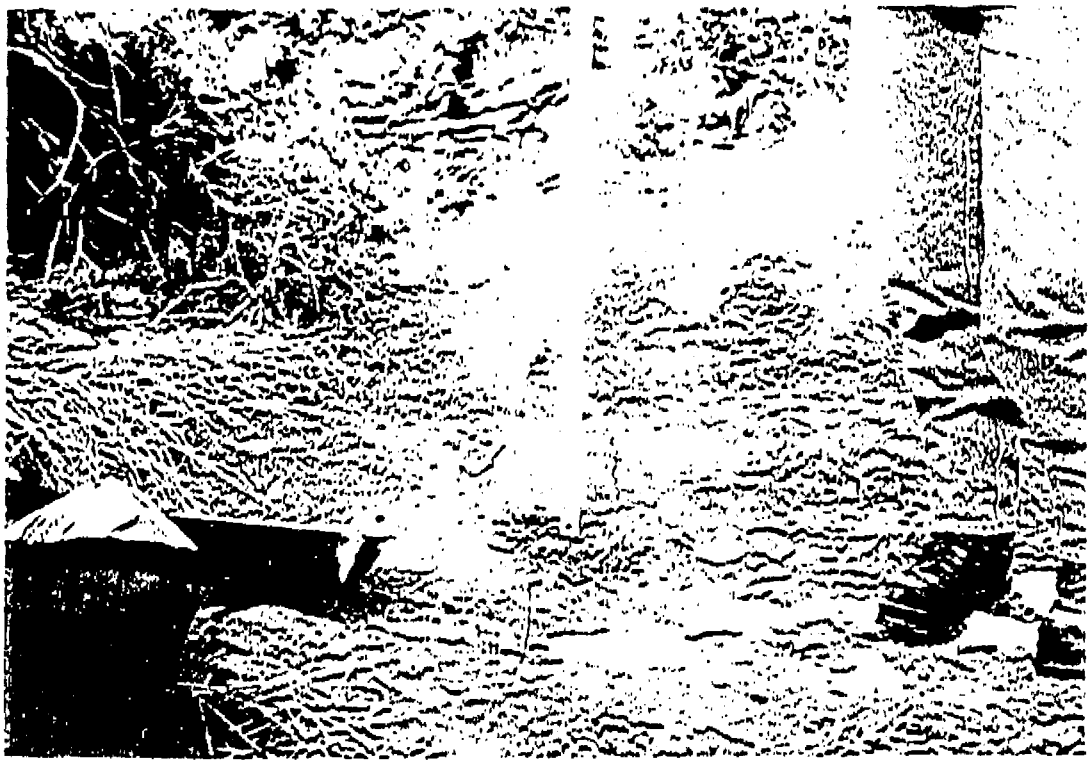
Photograph No.:	3-7	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1311
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of soil sample location CC-5 in Canada del Buey		

F013 • 960907 • 6960

Photograph No.:	3-8	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1313
Photo By:	B. Kendrick	**Direction:**	East

Description: Close-up view of soil sample location CC-5 in Canada del Buey. Two samples were taken from the location. The first, CC-5A was collected from 13 to 26 centimeters in depth, and the second, CC-5B, was collected from 30 to 39 centimeters.

5003 • 9660 • 7069 • 292

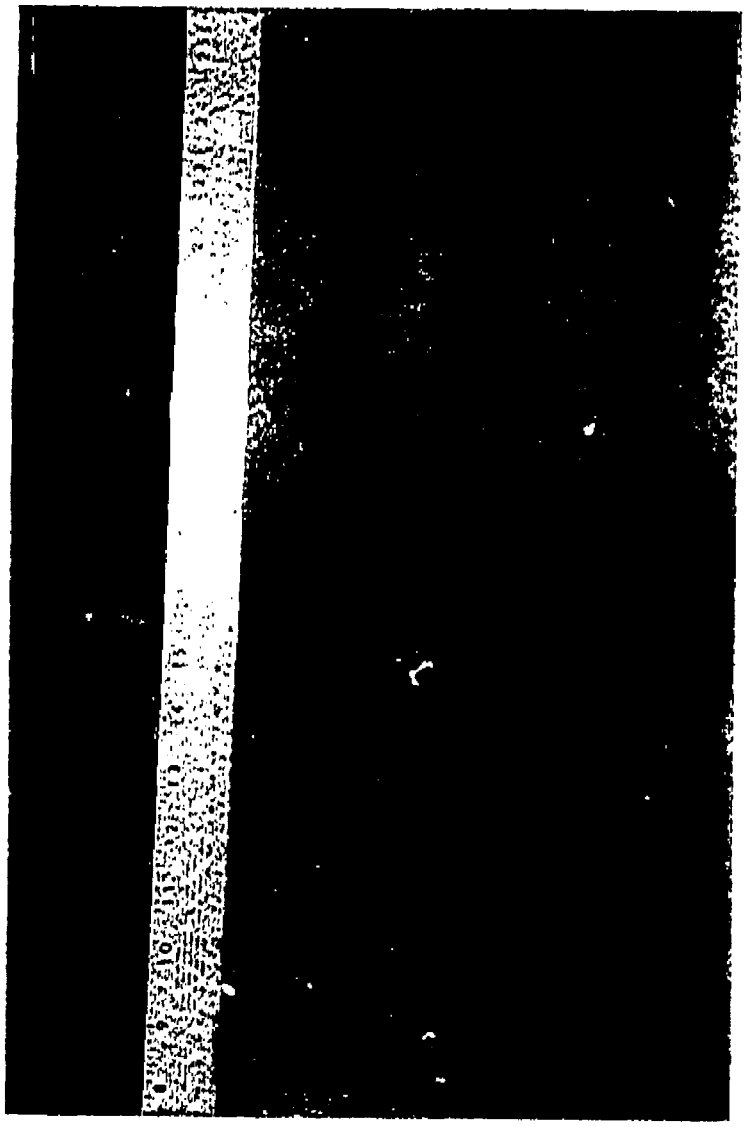


Photograph No.:	3-9	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1405
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location CC-4 in Canada del Buey.		

Photograph No.:	3-10	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1430
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location CC-3 in Canada del Buey.		

2596.70669.5000

Photograph No.:	3-11	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1432
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of soil sample CC-3 in Canada del Buey. A sample was collected from 0 to 13 centimeters in depth.		



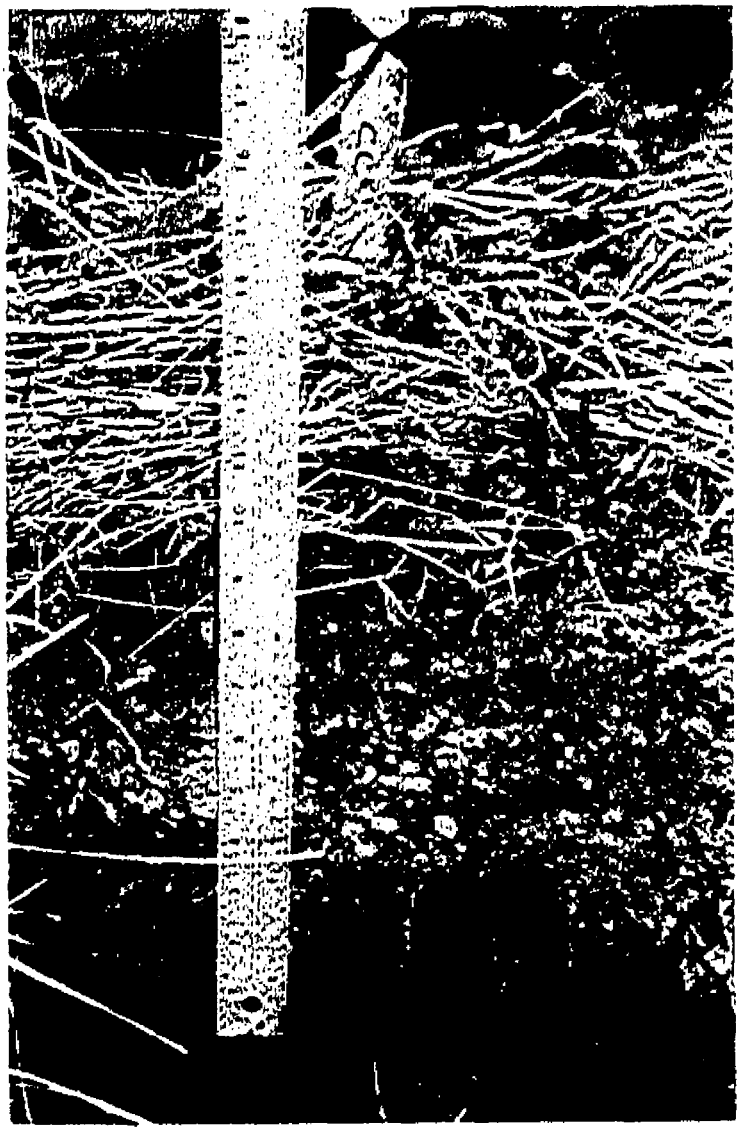
Photograph No.:	3-12	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1505
Photo By:	B. Kendrick	**Direction:**	North

Description: View of sample location CC-2 in Canada del Buey. The sample was collected at a depth of 5 to 20 centimeters and was located in a culvert under Lajuno Road.

5035 • 990907 • 692

Photograph No.:	3-13	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1530
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample station CC-1 located in Canada del Buey.		

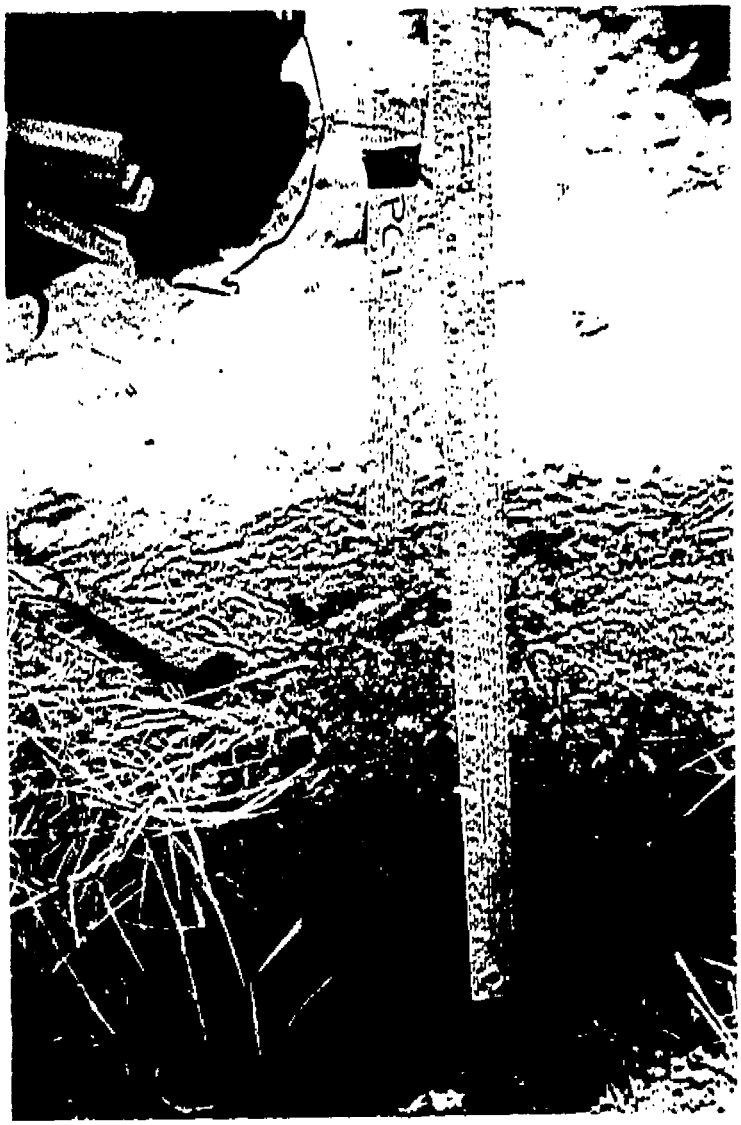
09/09/99 • 1600



Photograph No.:	3-14	**Facility:**	Los Alamos National Laboratory
Date:	December 15, 1999	**Time:**	1532
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of the sample location CC-1. The sample was collected from 10 to 17 centimeters in depth.		

Photograph No.:	3-15	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1003
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of soil sample location PC-1 in Pajarito Canyon.		

296.7069.392



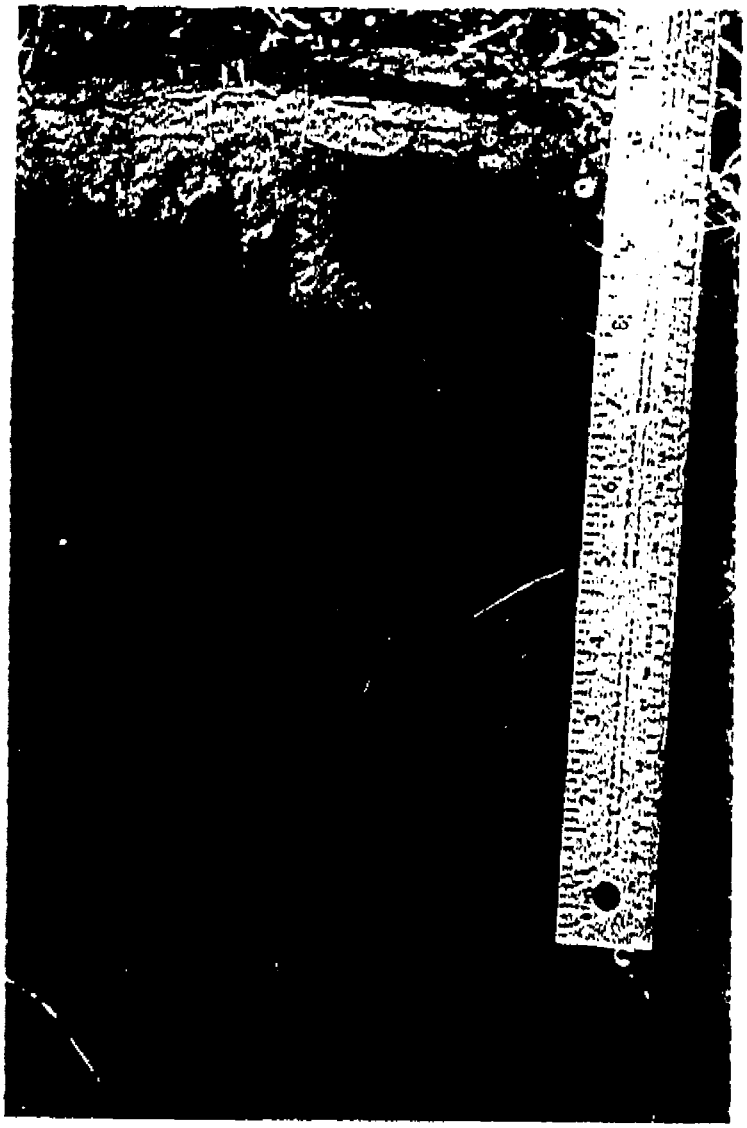
Photograph No.:	3-16	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1005
Photo By:	B. Kendrick	**Direction:**	East
Description:	Close-up view of sample location PC-1 in Pajarito Canyon. A sample was collected from 0 to 17 centimeters. Note the splintered stake caused by hammering it into frozen soil.		

3393.9990.702

Photograph No.:	3-17	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1043
Photo By:	B. Kendrick	**Direction:**	East
Description:	View of soil sampling location PC-2 in Pajarito Canyon.		

4933.960707.0002

296706935



Photograph No.:	3-18	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1045
Photo By:	B. Kendrick	**Direction:**	South

Description: Close-up view of soil sample location PC-2 in Pajarito Canyon. A sample was collected from 0 to 24 centimeters in depth.

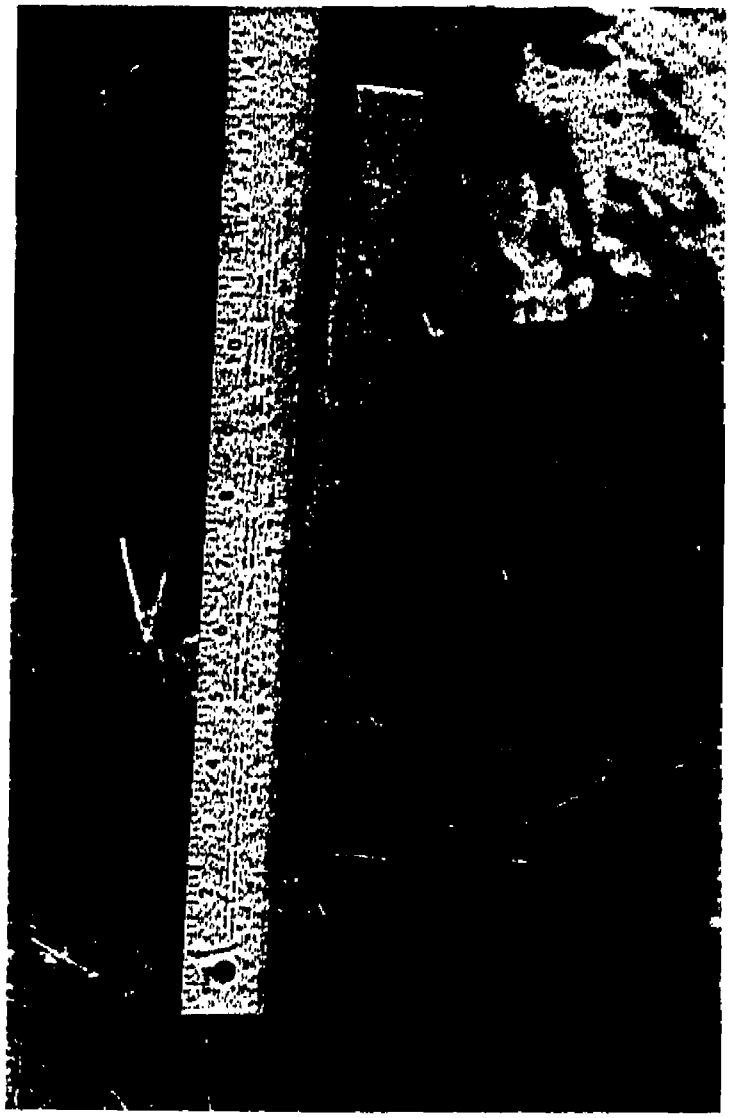
Photograph No.:	3-19	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1117
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of soil sample location PC-3 in Pajarito Canyon.		

6-9-3 • 5-5-0-0-7 • 6-9-9

Photograph No.:	3-20	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1114
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of soil sample location PC-3. A sample was collected from 0 to 21 centimeters in depth.		

Photograph No.:	3-21	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1152
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location PC-4 in Pajarito Canyon.		

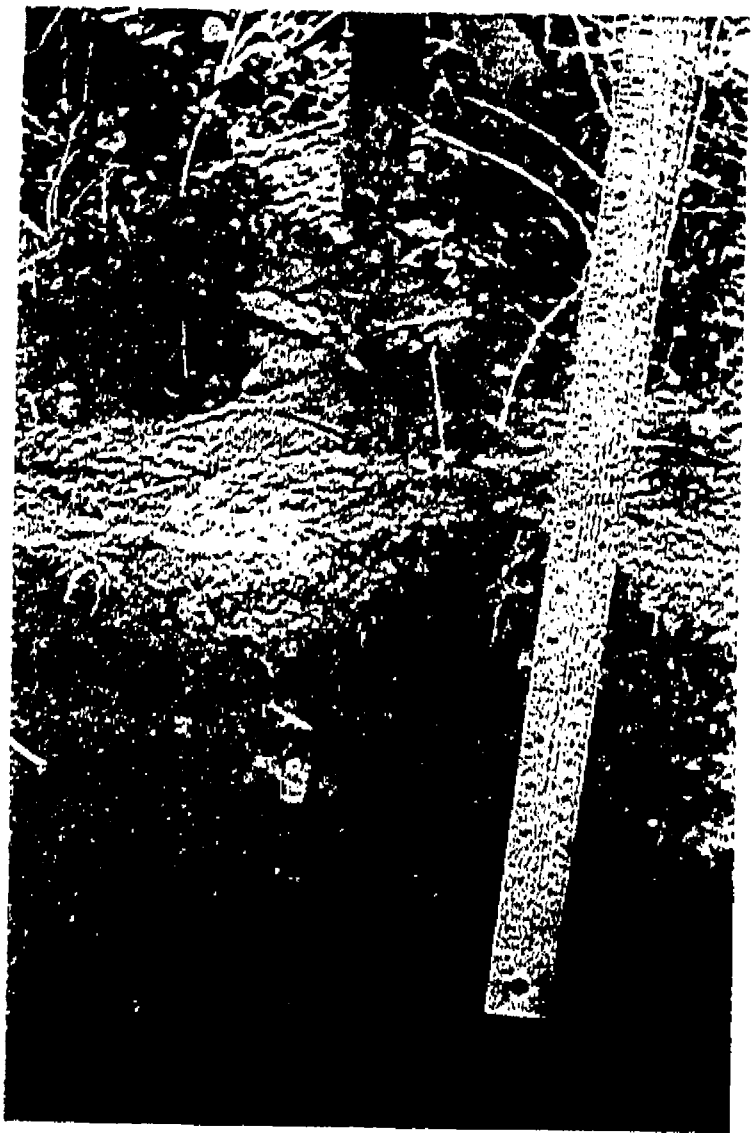
0993 • 5660 • 0702



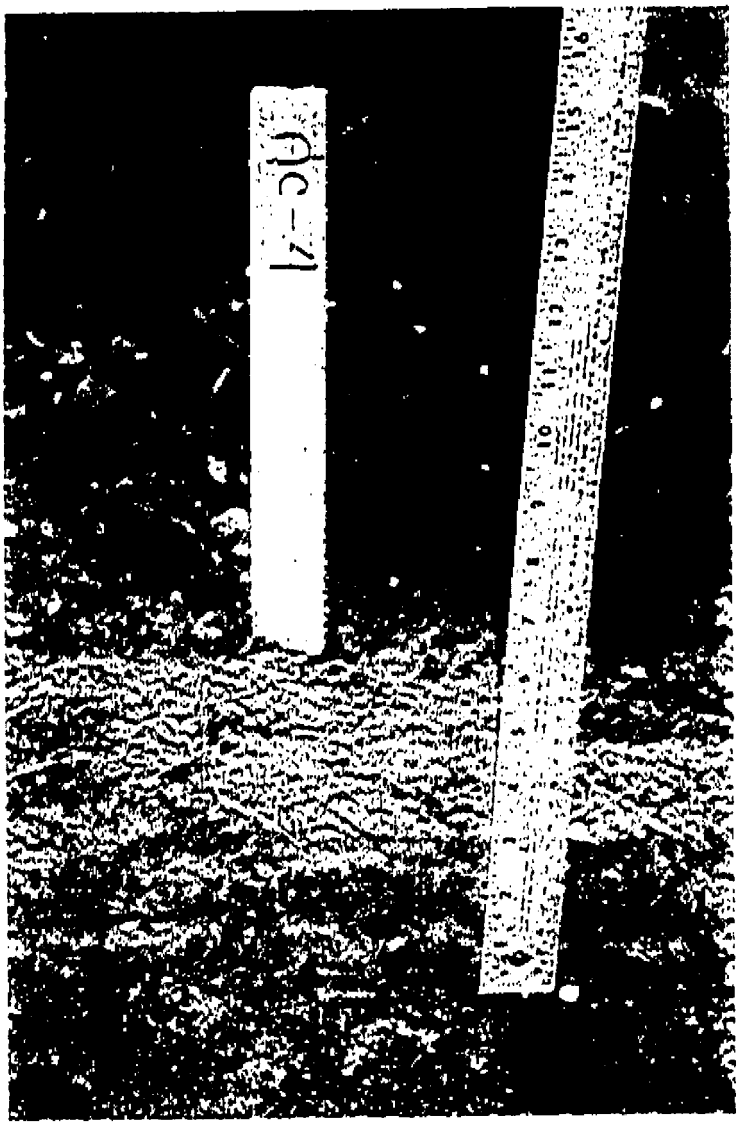
Photograph No.:	3-22	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1154
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of soil sample location PC-4.		

9993.9660.7022

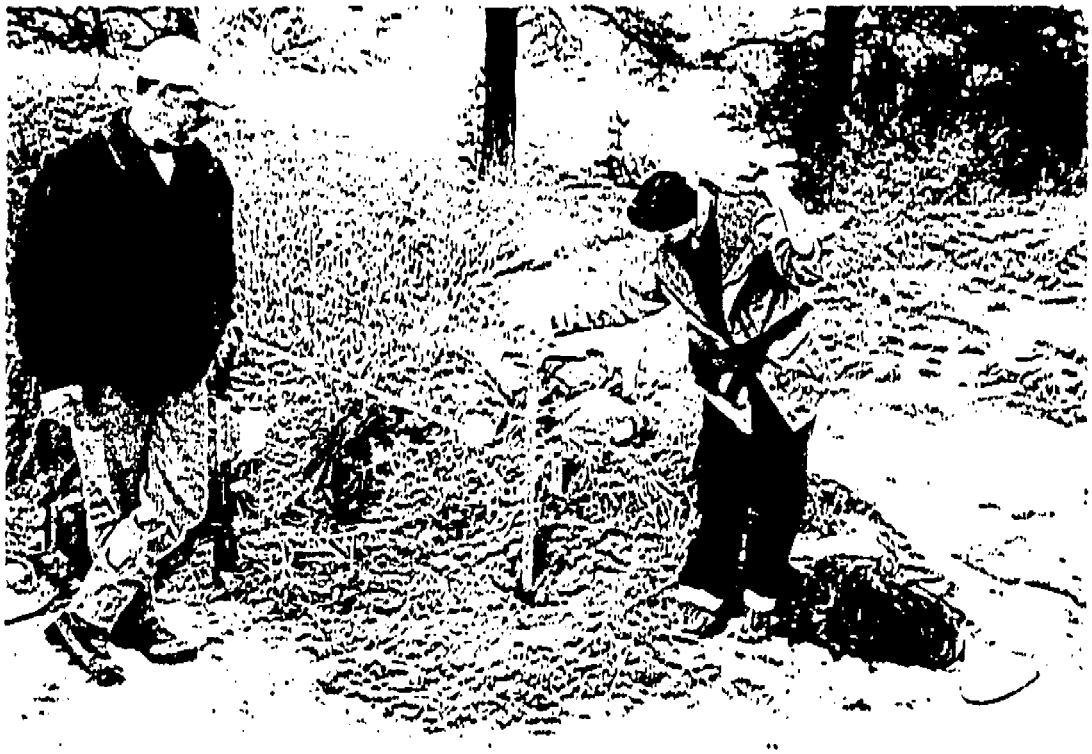
Photograph No.:	4-1	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1347
Photo By:	B. Kendrick	**Direction:**	South
Description:	View of soil sample location AC-1 located in Ancho Canyon.		



Photograph No.:	4-2	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1749
Photo By:	B. Kendrick	***Direction:***	South
Description:	Close-up view of soil sample location AC-5 in Ancho Canyon. A sample was collected from a depth of 10 to 24 centimeters.		



Photograph No.:	4-4	**Facility:**	Los Alamos National Laboratory
Date:	September 9, 1998	**Time:**	1412
Photo By:	B. Kendrick	**Direction:**	South
Description:	Close-up view of soil sample location AC-4 in Ancho Canyon. A sample was collected at a depth of 0 to 7 centimeters.		

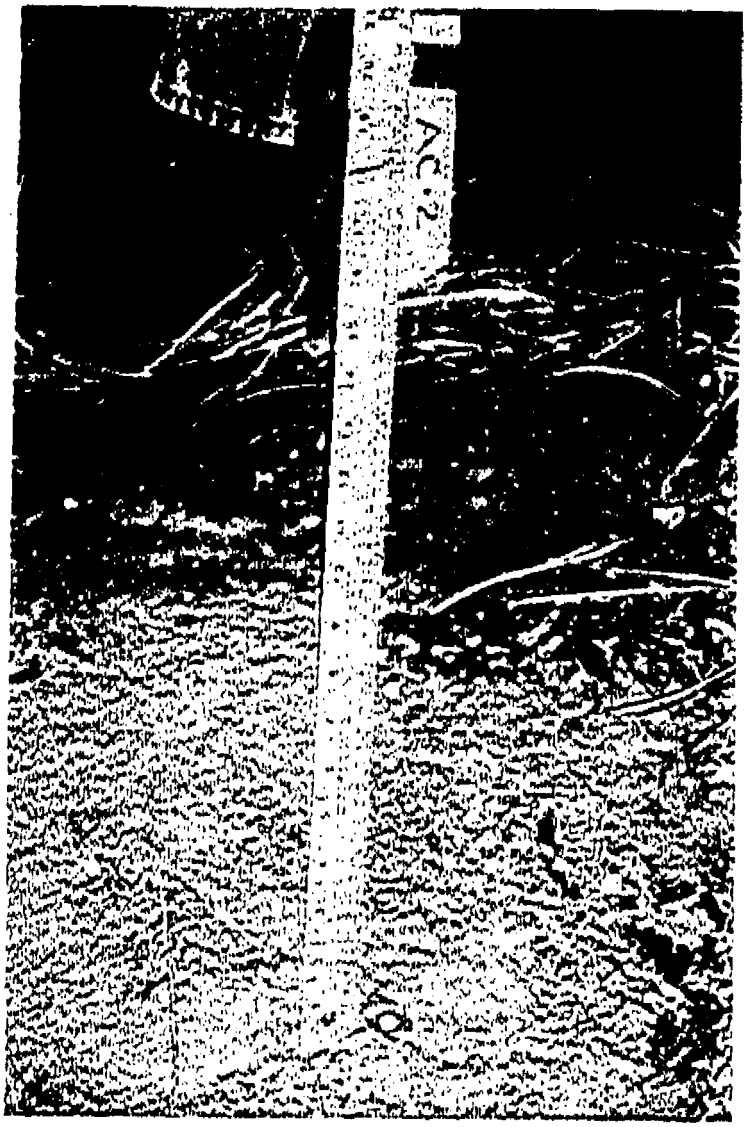


Photograph No.:	4-5	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1440
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location AC-3 located in Ancho Canyon.		

Photograph No.:	4-6	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1442
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of soil sample location AC-3 in Ancho Canyon.		

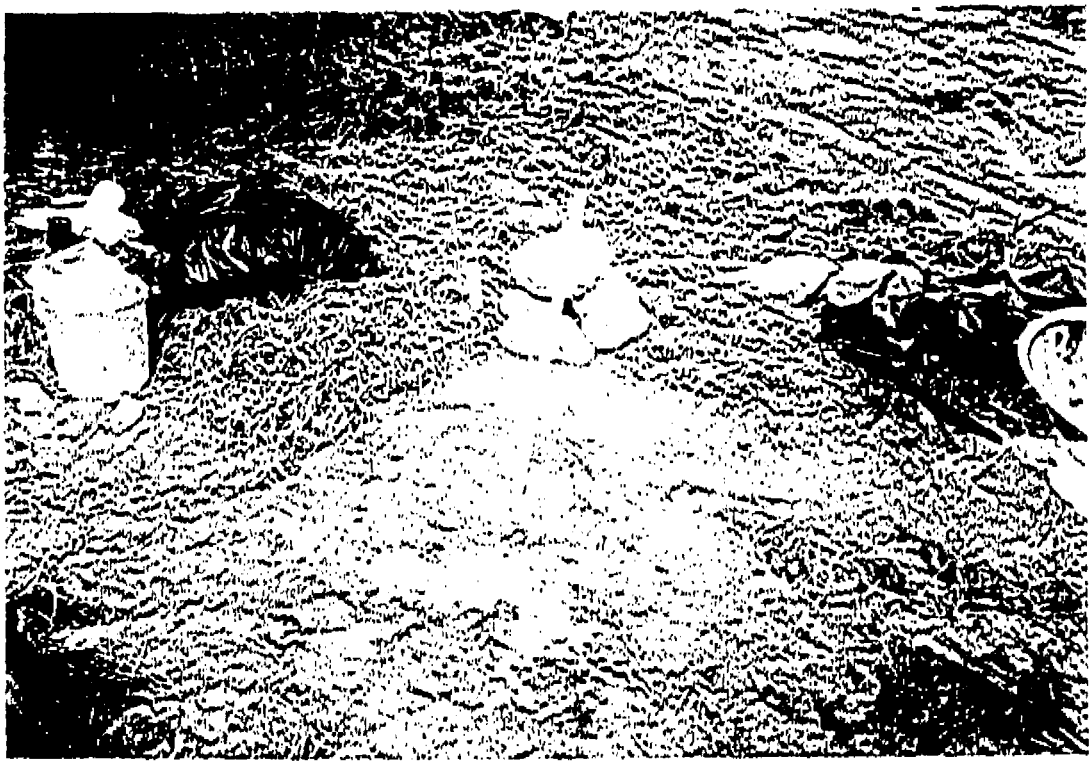
Photograph No.:	4-7	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1454
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location AC-2 in Ancho Canyon. The location is approximately 50 feet south of AC-3.		

05.1.09996.1002



Photograph No.:	4-8	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1500
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of soil sample location AC-2 in Ancho Canyon. A sample was collected from a depth of 0 to 17 centimeters.		

6 0 4 • 3 6 9 • 0 7 0 6 9 • 2



Photograph No.:	4-9	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1527
Photo By:	B. Kendrick	**Direction:**	North
Description:	View of soil sample location AC-1 in Ancho Canyon. AC-1 is located approximately 300 feet west of the Ancho Canyon Gaging Station.		

Photograph No.:	4-10	**Facility:**	Los Alamos National Laboratory
Date:	December 16, 1999	**Time:**	1529
Photo By:	B. Kendrick	**Direction:**	North
Description:	Close-up view of soil sample location AC-1 in Ancho Canyon. A sample was collected from a depth of 0 to 5 centimeters.		

Photograph No.:	4-11	**Facility:**	Los Alamos National Laboratory
Date:	December 17, 1999	**Time:**	1021
Photo By:	B. Kendrick	**Direction:**	West

Description: View of groundwater monitoring well SM-30 being screened with an OVA. Vapors were detected inside the well, but nothing was located in the breathing zone.

Photograph No.:	4-12	**Facility:**	Los Alamos National Laboratory
Date:	December 17, 1999	**Time:**	1112
Photo By:	B. Kendrick	**Direction:**	West

Description: View of groundwater monitoring well SM-30 being purged with a peristaltic pump.

APPENDIX I

Trend Analysis

TREND ANALYSIS

A trend analysis was completed for radiochemicals present within the shallow alluvial aquifers of Mortandad Canyon and Los Alamos Canyon. In addition, a trend analysis for strontium-90 (Sr-90) within TW series wells and PM series production wells was also completed. Historical data gathered from the following sources was used in the trend analysis.

- Los Alamos National Laboratory. Environmental Surveillance and Compliance at Los Alamos during 1994
- Los Alamos National Laboratory. Environmental Surveillance and Compliance at Los Alamos during 1995
- Los Alamos National Laboratory. Environmental Surveillance and Compliance at Los Alamos during 1996
- Los Alamos National Laboratory. Environmental Surveillance and Compliance at Los Alamos during 1997
- Los Alamos National Laboratory. Environmental Surveillance and Compliance at Los Alamos during 1998
- New Mexico Environment Department. July 1996. Hydrogeologic Evaluation of Los Alamos National Laboratory

In addition to the documents listed above, analytical data from the samples collected by EPA during the December 1999 sampling event were used where appropriate.

Included in the trend analysis are appropriate EPA and DOE water quality standards. A description of these water quality standards is provided below.

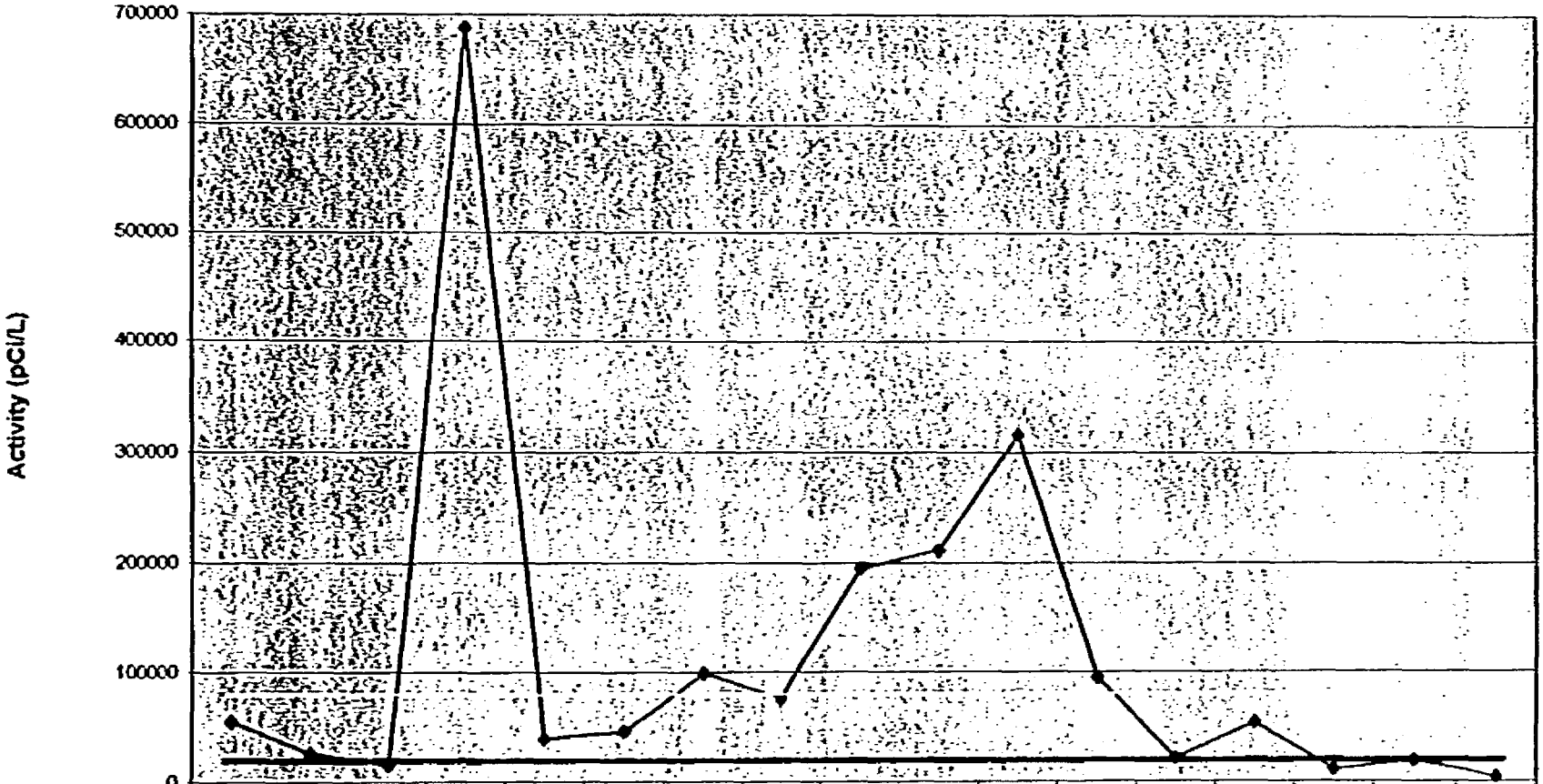
- *EPA Maximum Contaminant Levels (EPA MCLs).* EPA MCLs are defined as the maximum permissible level of a contaminant in water which is delivered to any user of a public water system. A public water system means a system which has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year.

  EPA MCLs also include secondary maximum contaminant levels which apply to public water systems. These secondary MCLs are defined as the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of public water system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition. The secondary MCLs are not enforceable by the EPA.

- *DOE Derived Concentration Guides (DOE DCG).* DOE DCG values are divided into two categories: 1) water ingestion from drinking water systems and 2) water ingestion in uncontrolled areas. The DOE DCG values for water ingestion from drinking water systems applies to public water systems which have at least fifteen service connections or regularly serve an average of at least twenty-five individuals daily at least 60 days out of the year. The DOE DCG values for water ingestion from drinking water systems is calculated by taking 4 percent of the DCG values for water ingestion in uncontrolled areas. The DCG values for water ingestion from drinking water systems are based on a committed effective dose equivalent of 4 mrem per year for each individual radionuclide.

  The DCG values for water ingestion in uncontrolled areas are based on a committed effective dose equivalent of 100 mrem per year for each individual radionuclide. The DOE DCG values do not take into account the additive effects of radionuclides. Water ingestion in uncontrolled areas refers to drinking water sources other than public drinking water systems.

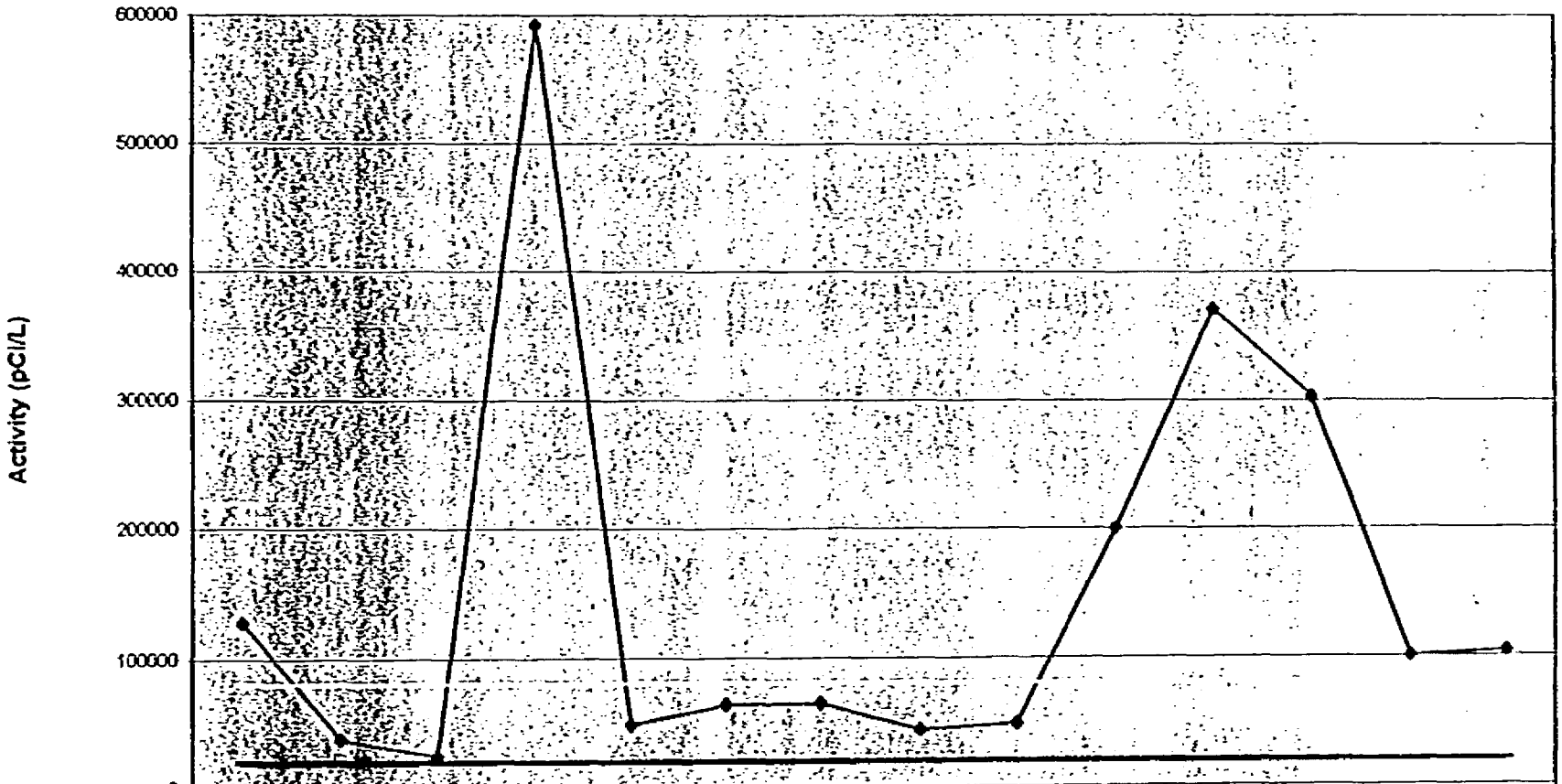
Tritium Activity in Well MCO-3



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1997	1998	1999
MCO-3	58000	27000	18000	688000	40000	47000	99000	75000	195000	211000	316000	95000	22000	54500	11428	19211	4293
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Year Sampled

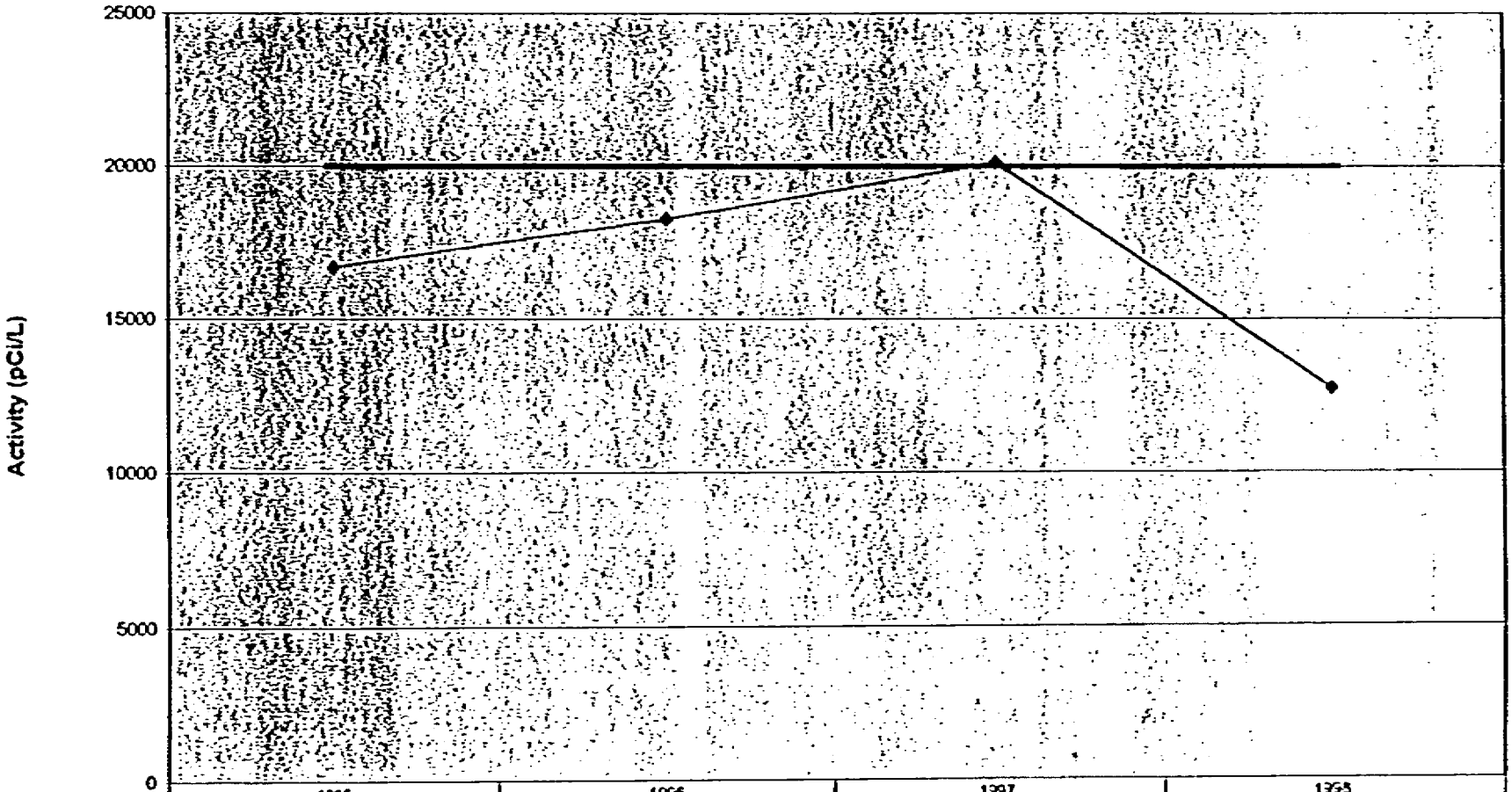
Tritium Activity in Well MCO-4



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994
MCO-4	128000	38000	25000	592000	49000	64000	65000	44000	49000	200000	371000	303000	100000	103700
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Year Sampled

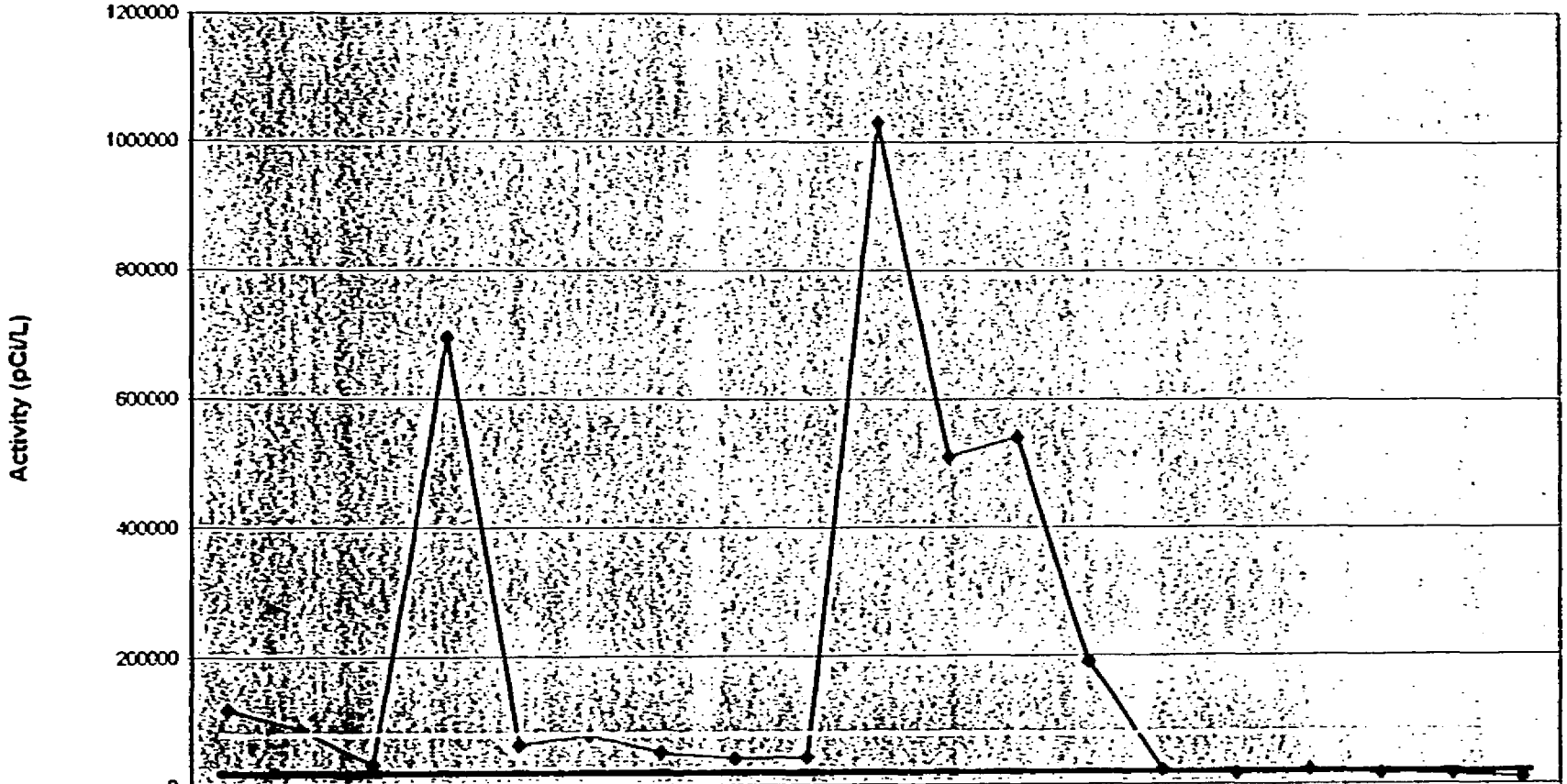
Tritium Activity In Well MCO-4B



	1995	1996	1997	1998
MCO-4B	15700	18279	20123	12711
EPA MCL	20000	20000	20000	20000

Year Sampled

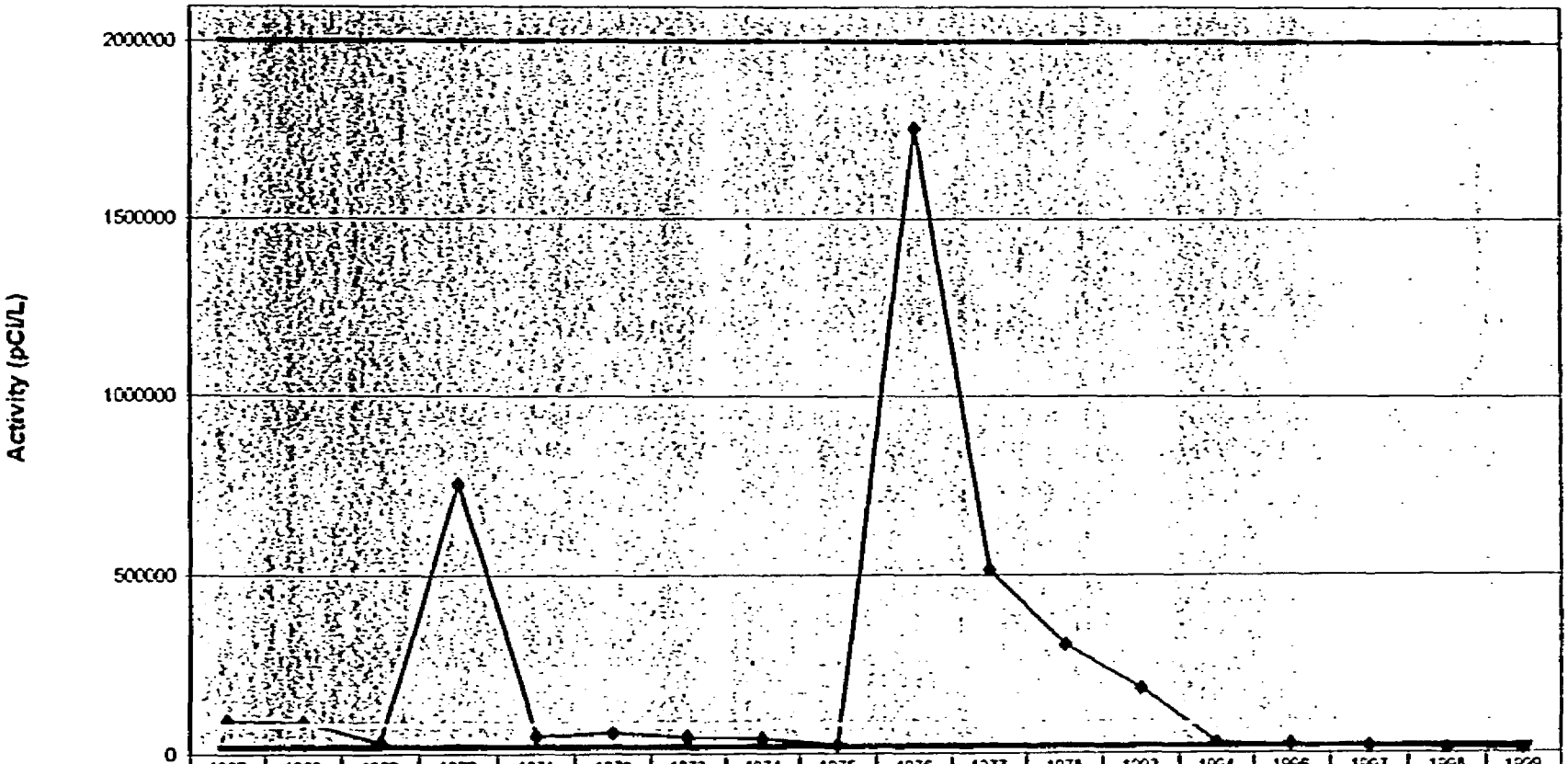
Tritium Activity in Well MCO-5



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1995	1996	1997	1998	1999
MCO-5	119000	88000	34000	695000	64000	78000	51000	42000	44000	1030000	510000	540000	190000	22500	17100	22722	17728	16111	9959
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Year Sampled

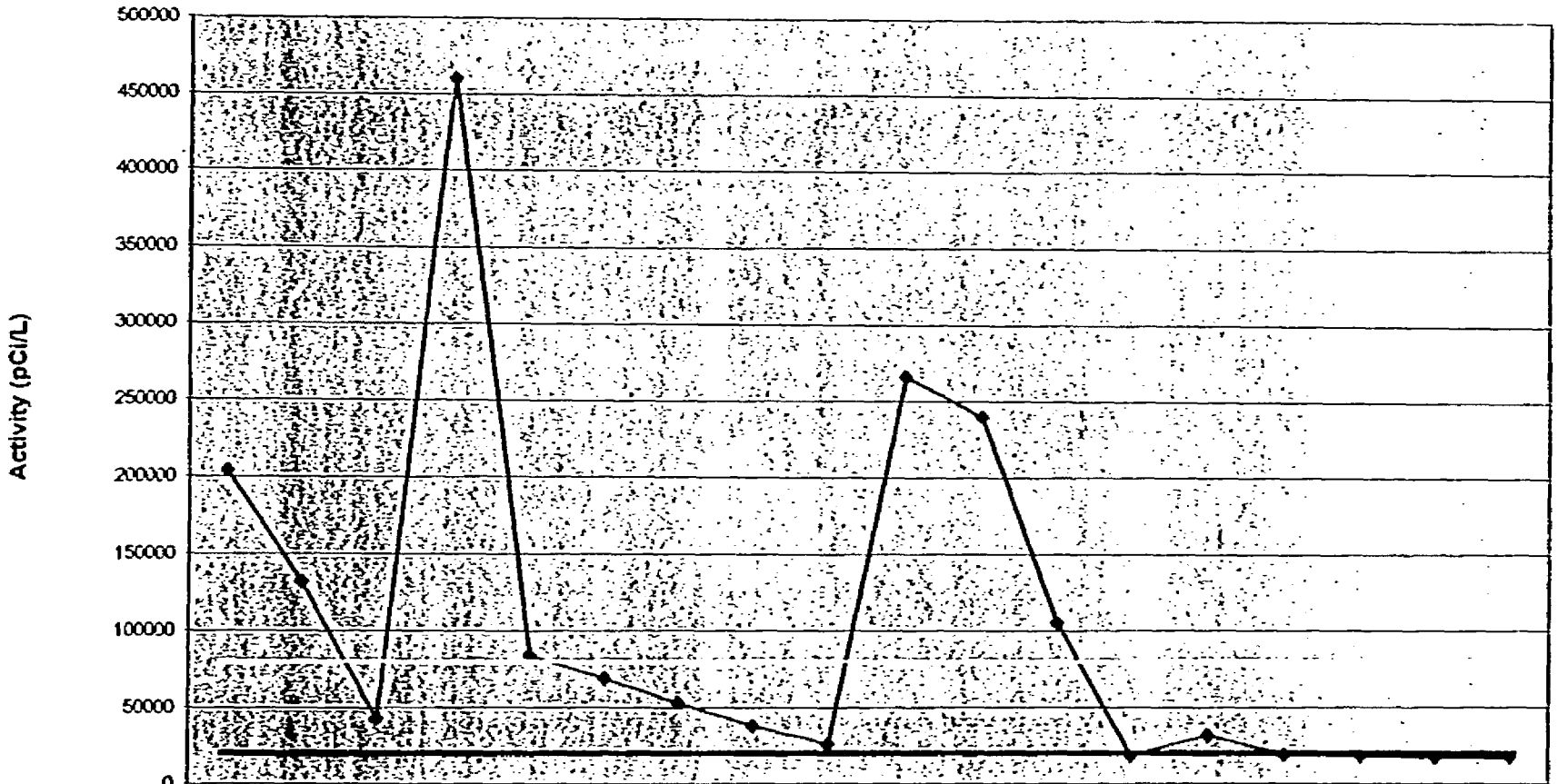
Tritium Activity in Well MCO-6



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1996	1997	1998	1999
MCO-6	94300	89000	34000	755000	51000	60000	49000	42000	24000	1760000	515000	305000	180000	28500	24395	18328	13300	10015
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000
DOE DCG2	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000

Year Sampled

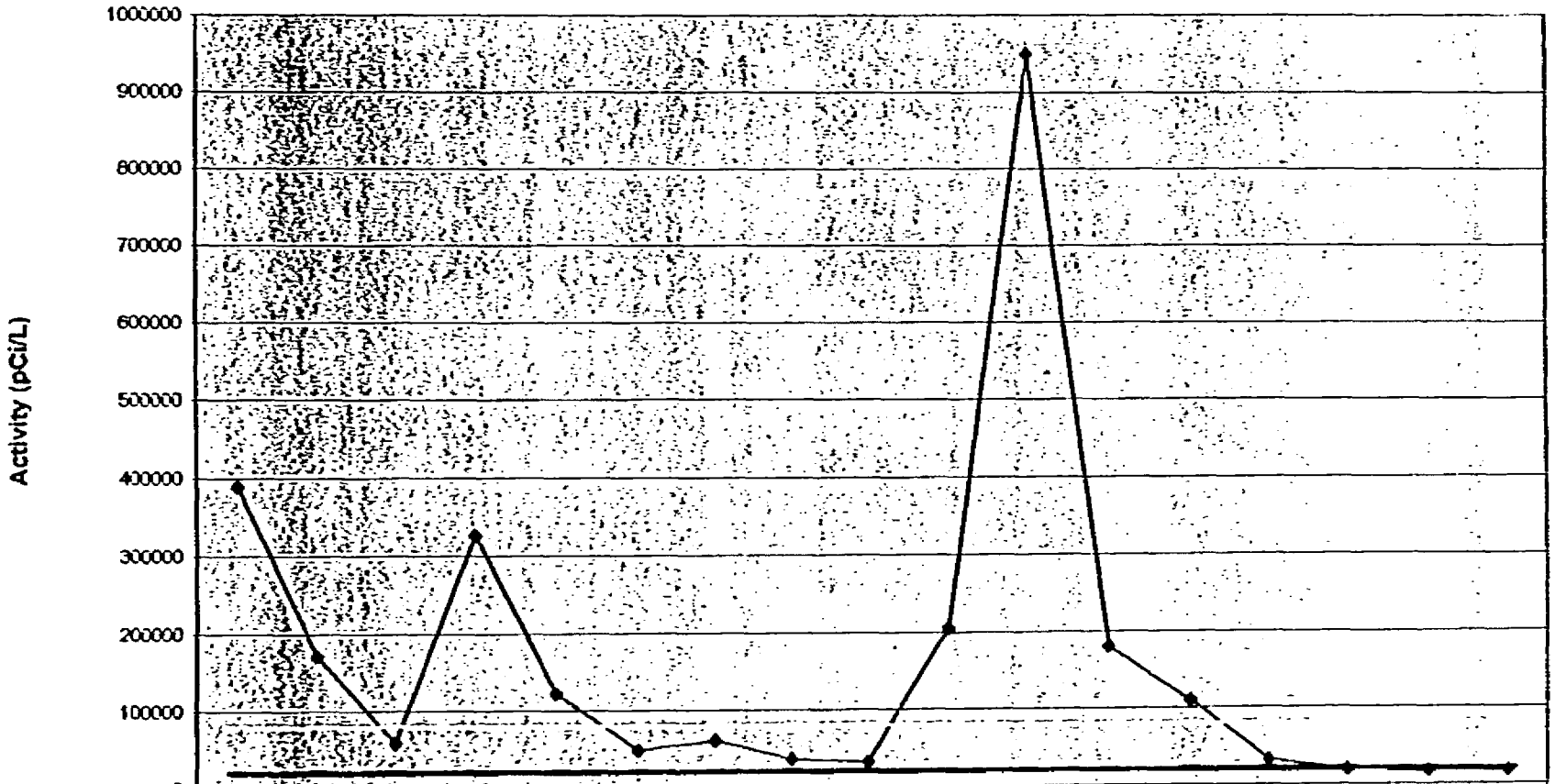
Tritium Activity in Well MCO-7



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1995	1996	1998	1999
MCO-7	204000	132000	43000	460000	84000	69000	53000	38000	26000	266000	240000	105000	18000	32100	19200	15027	17200	17325
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Year Sampled

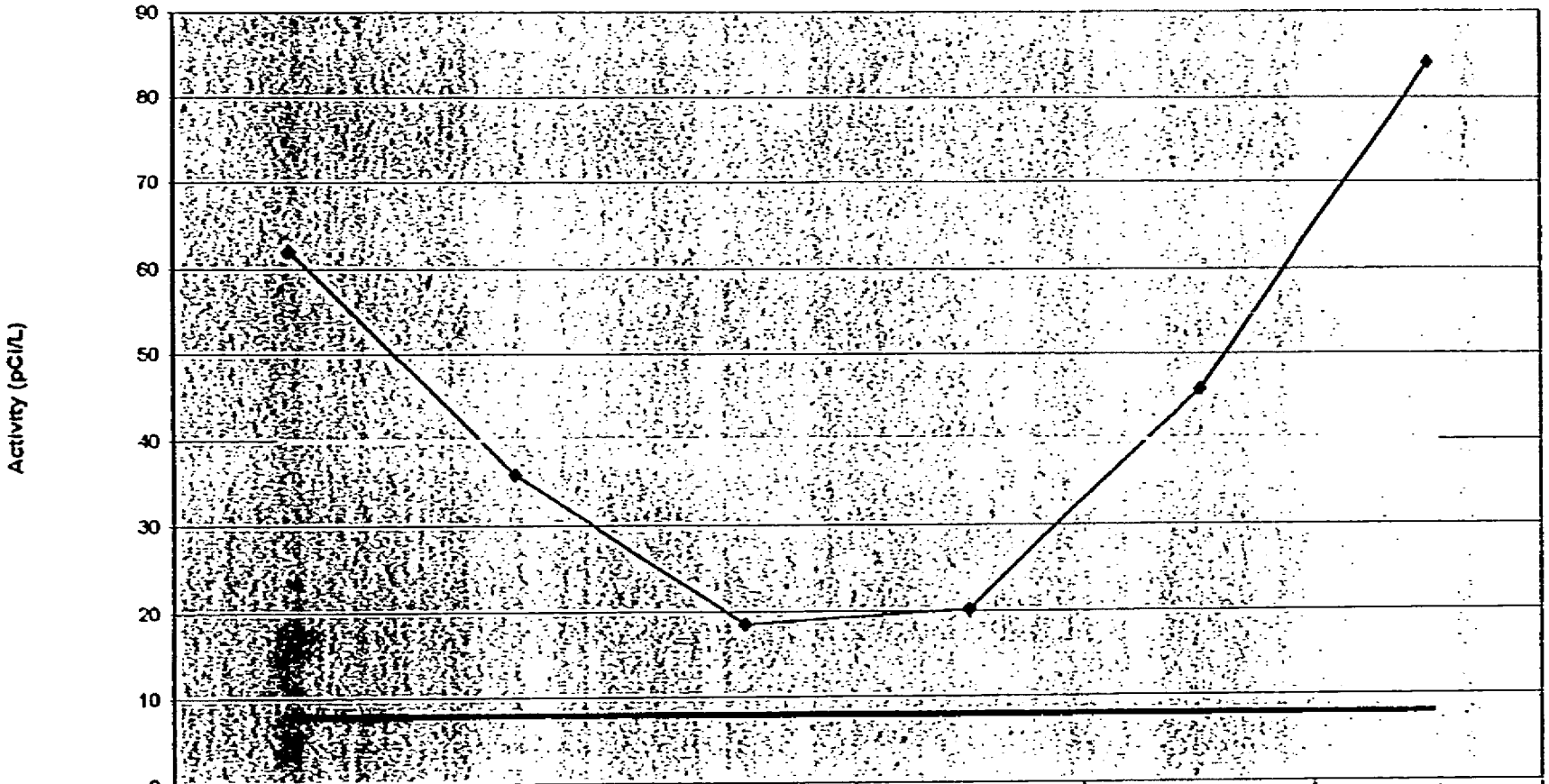
Tritium Activity for Well MCO-7.5



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1996	1997	1998
MCO-7.5	389000	171000	59000	328000	122000	49000	61300	36000	33000	205000	950000	180000	110000	32830	19800	18428	17800
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Year Sampled

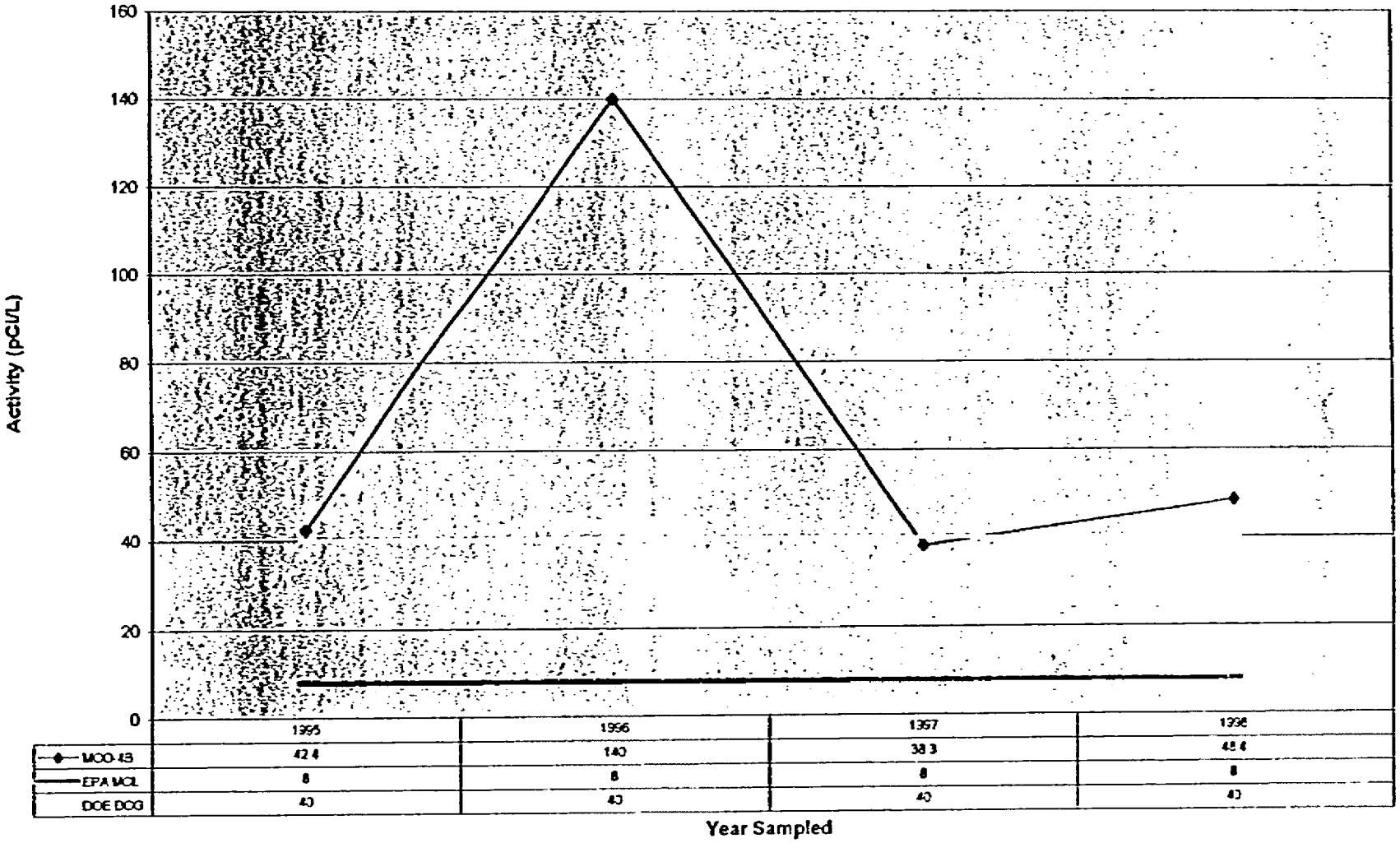
Strontium-90 Activity in Well MCO-3



	1976	1977	1994	1997	1998	1999
MCO-3	62	36	18.5	20.2	45.9	84
EPA MCL	8	8	8	8	8	8
DOE DCG	40	40	40	40	40	40

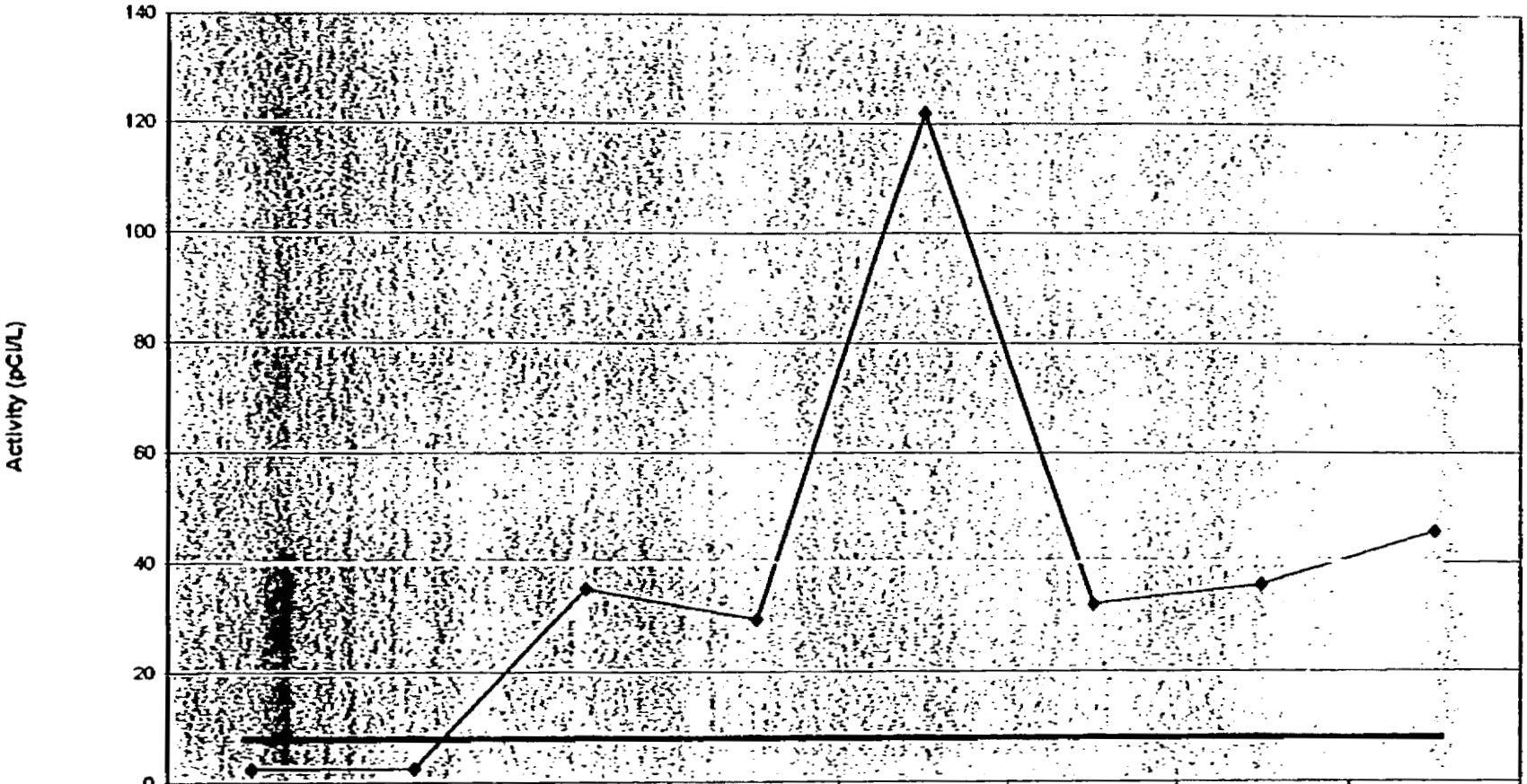
Year Sampled

Strontium-90 Activity In Well MCO-4B



	1995	1996	1997	1998
MCO-4B	42.4	140	38.3	48.4
EPA MCL	8	8	8	8
DOE DCG	40	40	40	40

Strontium-90 Activity in Well MCO-5



	1978	1978	1994	1995	1996	1997	1998	1999
MCO-5	2.5	2.6	35.2	29.6	121.9	32.3	36.9	45.6
EPA MCL	8	8	8	8	8	8	8	8
DOE DCG	40	40	40	40	40	40	40	40

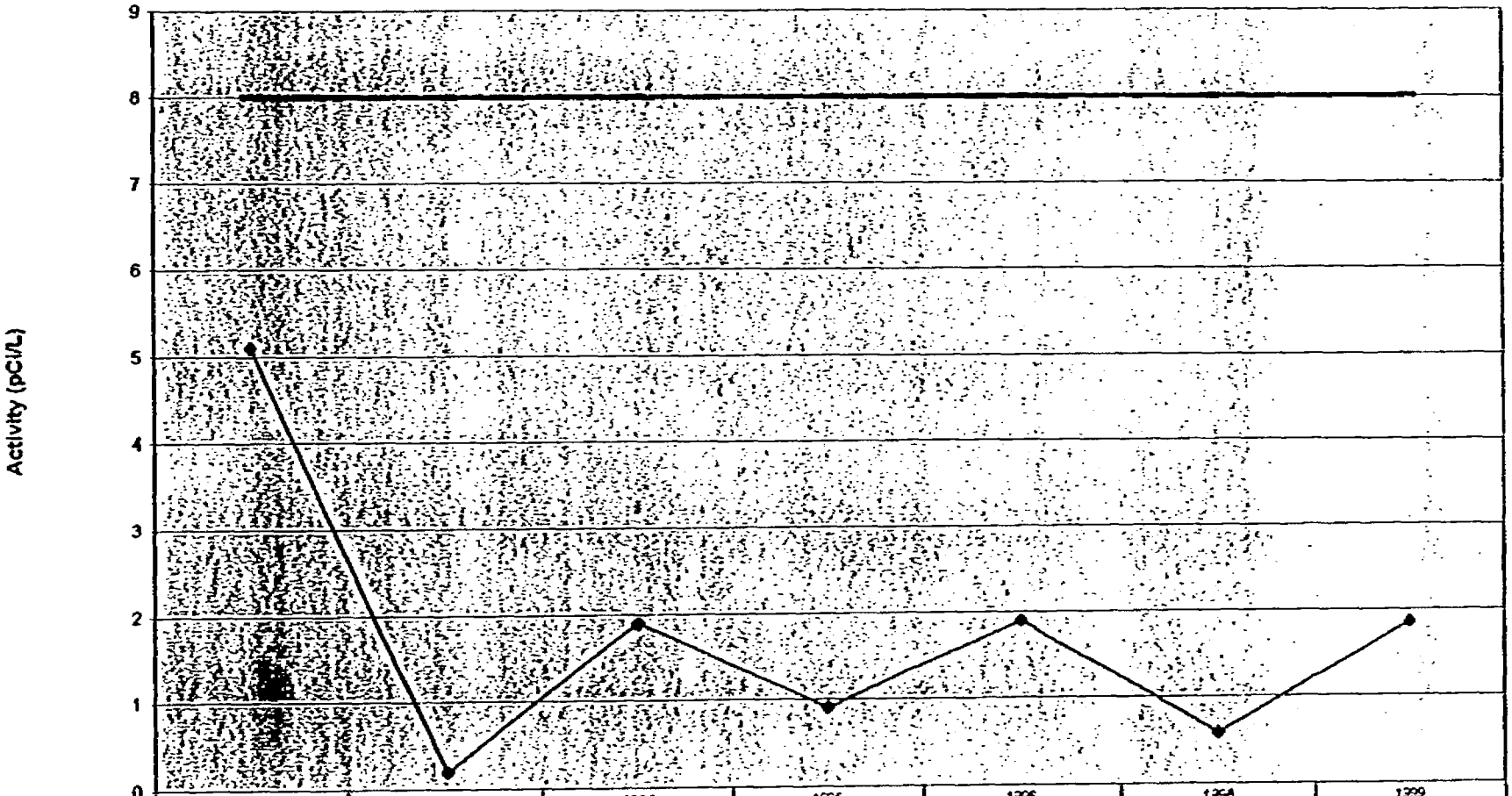
Year Sampled

Strontium-90 Activity in Well MCO-6

	1993	1994	1995	1996	1997	1998	1999
MCO-6	2.8	50.7	31.5	83.2	32.4	63.5	44.5
EPA MCL	8	8	8	8	8	8	8
DOE DOG	40	40	40	40	40	40	40

Year Sampled

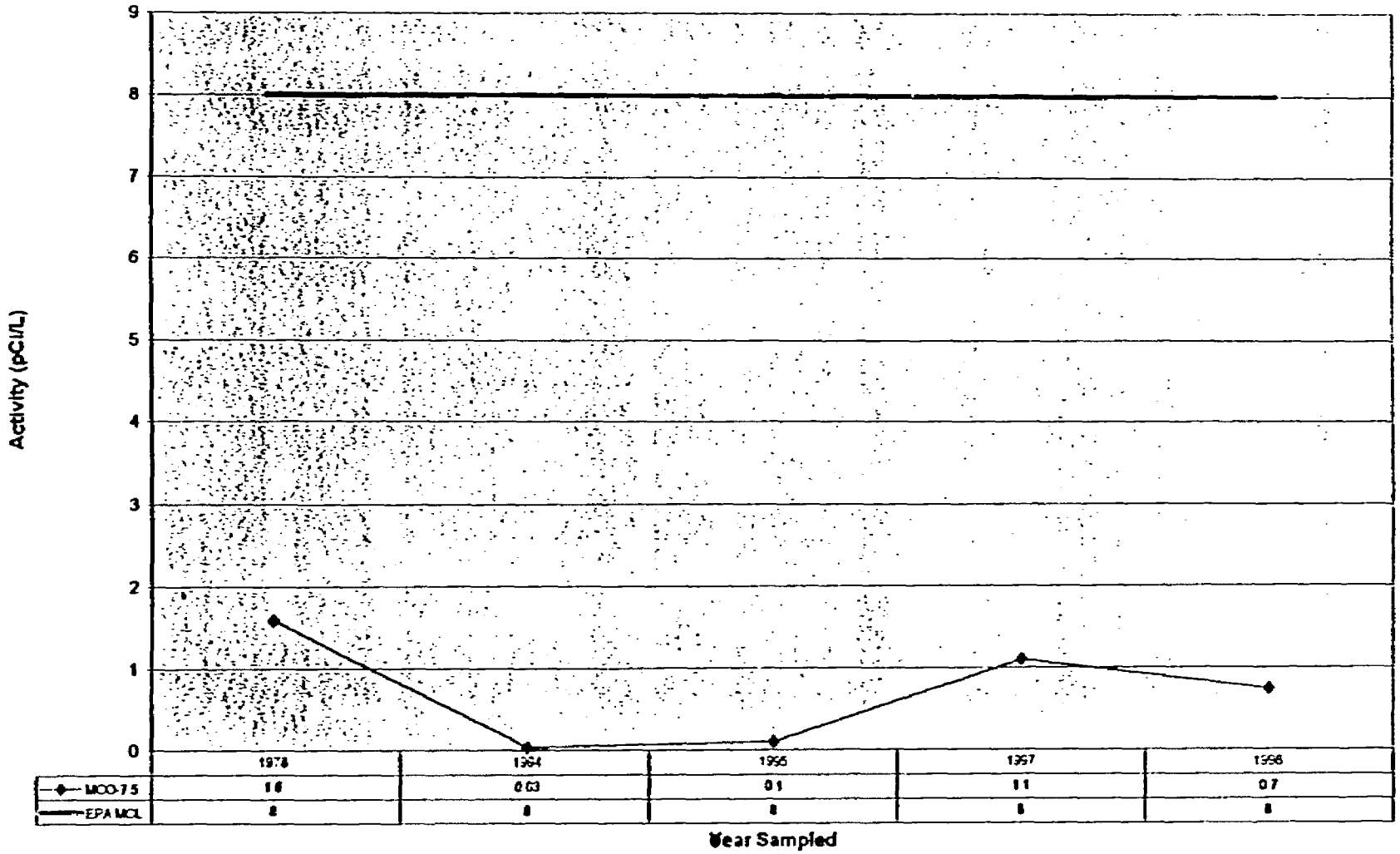
Strontium-90 Activity in Well MCO-7



	1976	1978	1984	1995	1996	1998	1999
MCO-7	5.1	0.2	1.9	0.9	1.9	0.5	1.9
EPA MCL	8	8	8	8	8	8	8

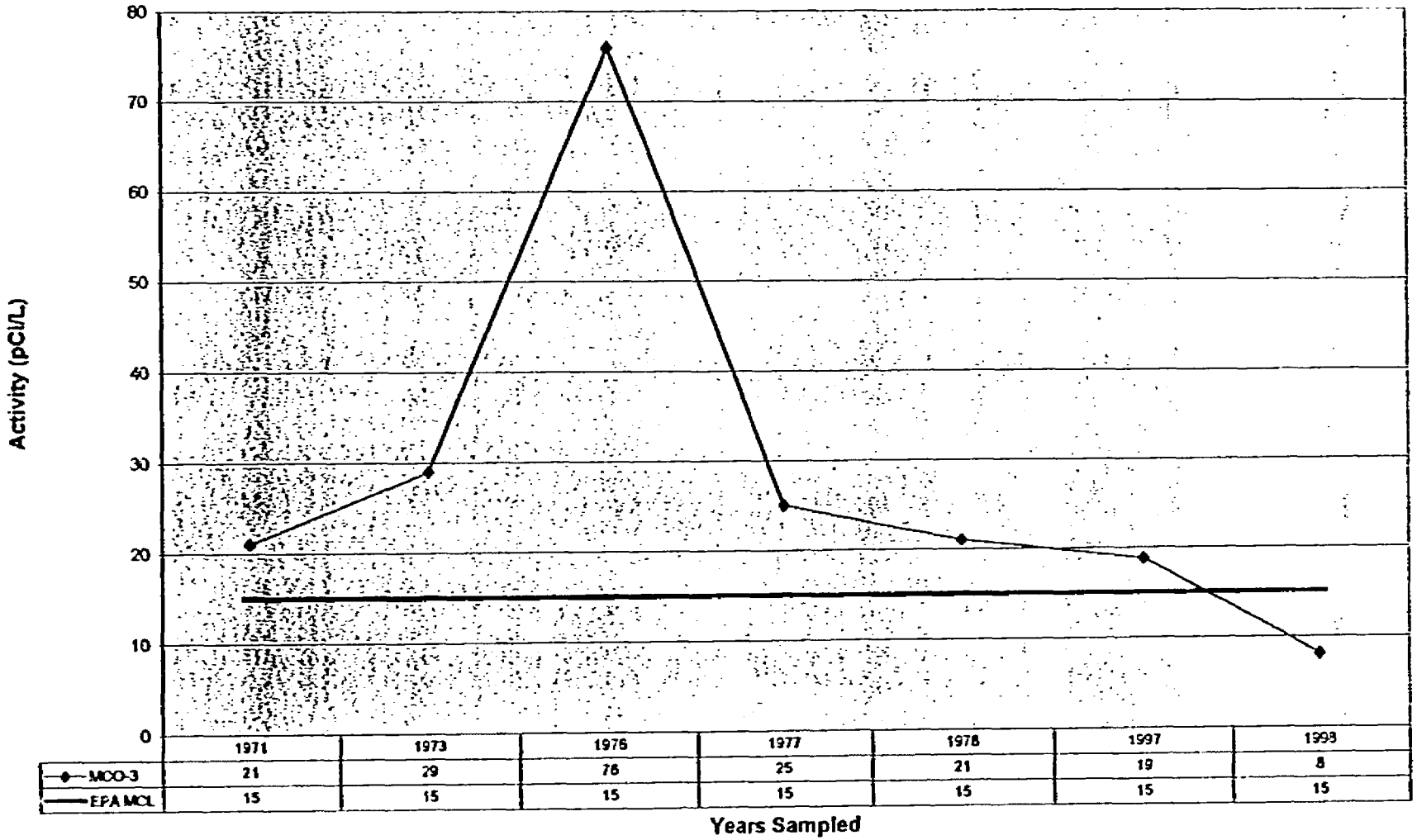
Year Sampled

Strontium-90 Activity in Well MCO-7.5



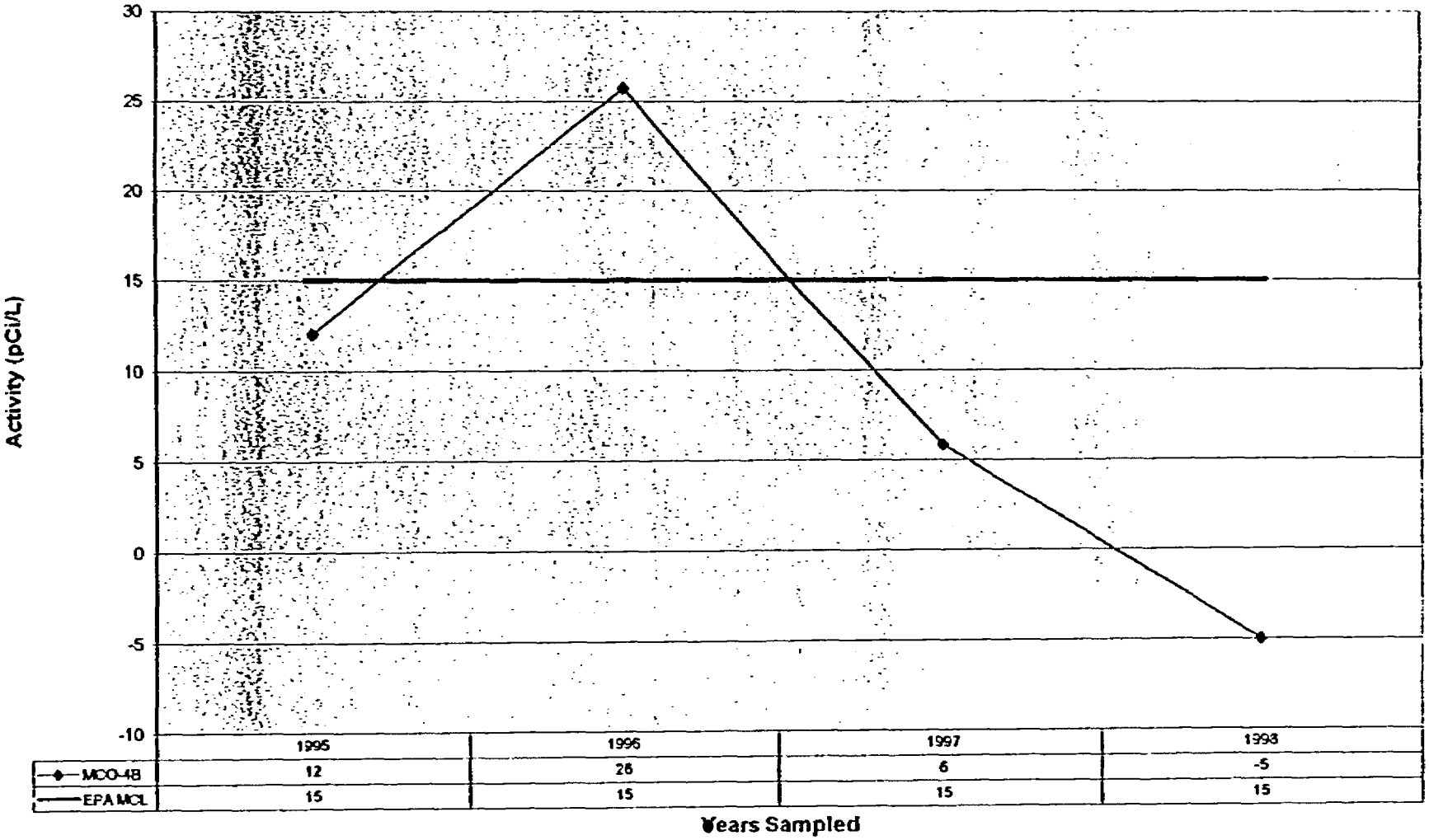
	1978	1994	1995	1997	1998
MCO-7.5	1.6	0.03	0.1	1.1	0.7
EPA MCL	8	8	8	8	8

Gross Alpha Avtivity for Well MCO-3



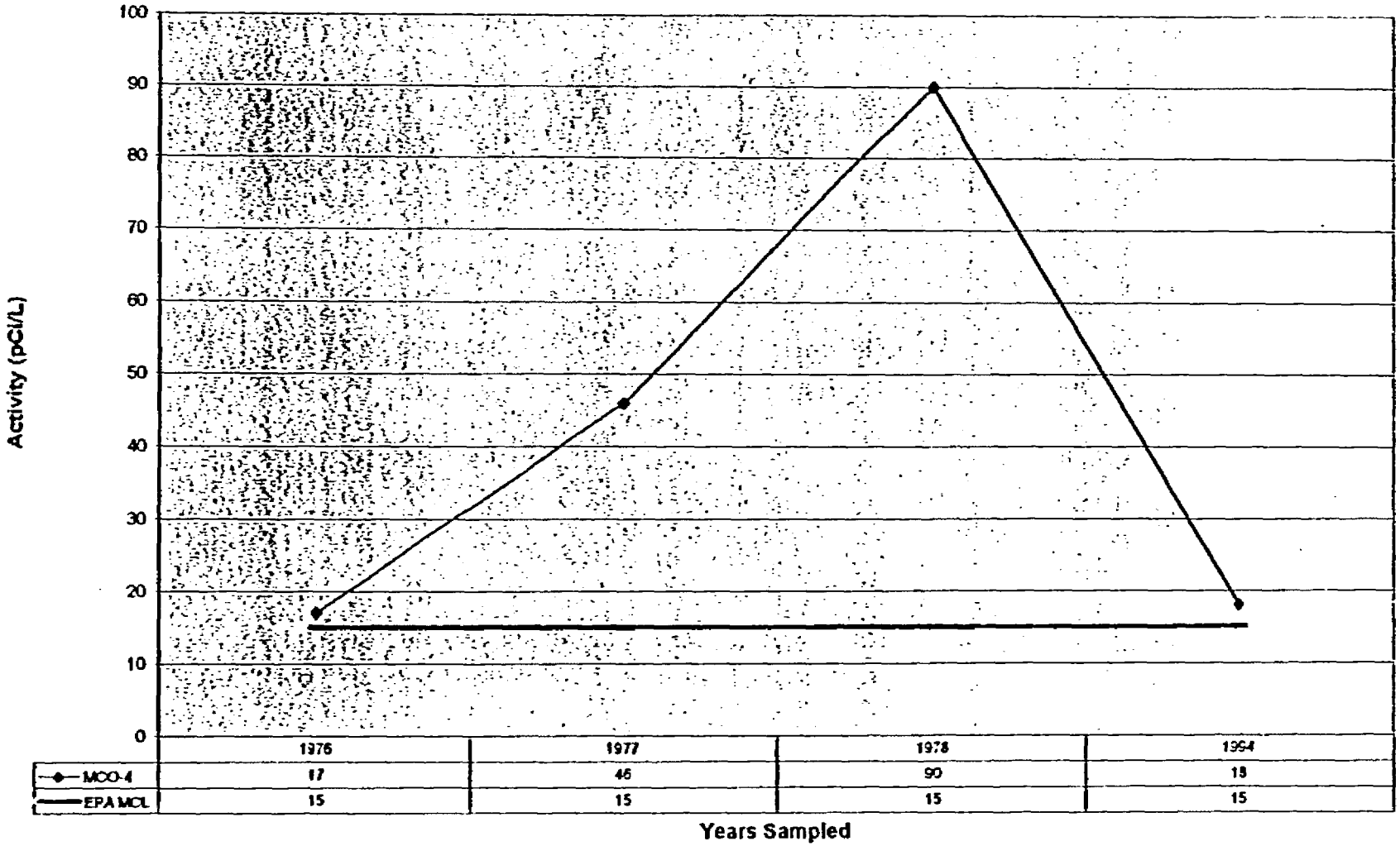
	1971	1973	1976	1977	1978	1997	1998
MCO-3	21	29	76	25	21	19	8
EPA MCL	15	15	15	15	15	15	15

Gross Alpha Activity for Well MCO-4B



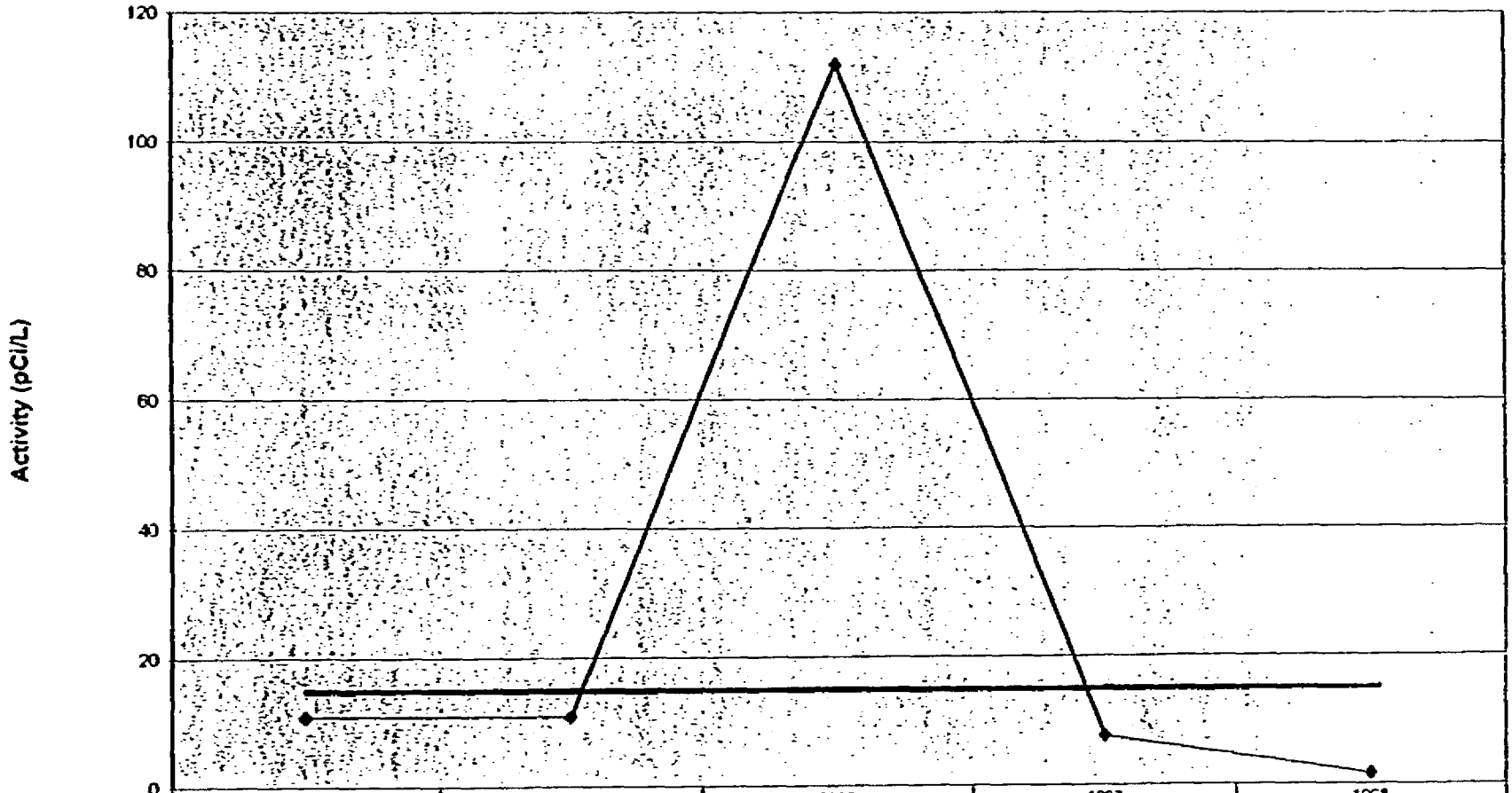
	1995	1996	1997	1998
MCO-4B	12	26	6	-5
EPA MCL	15	15	15	15

Gross Alpha Activity for Well MCO-4



	1976	1977	1978	1994
MCO-4	17	46	90	18
EPA MCL	15	15	15	15

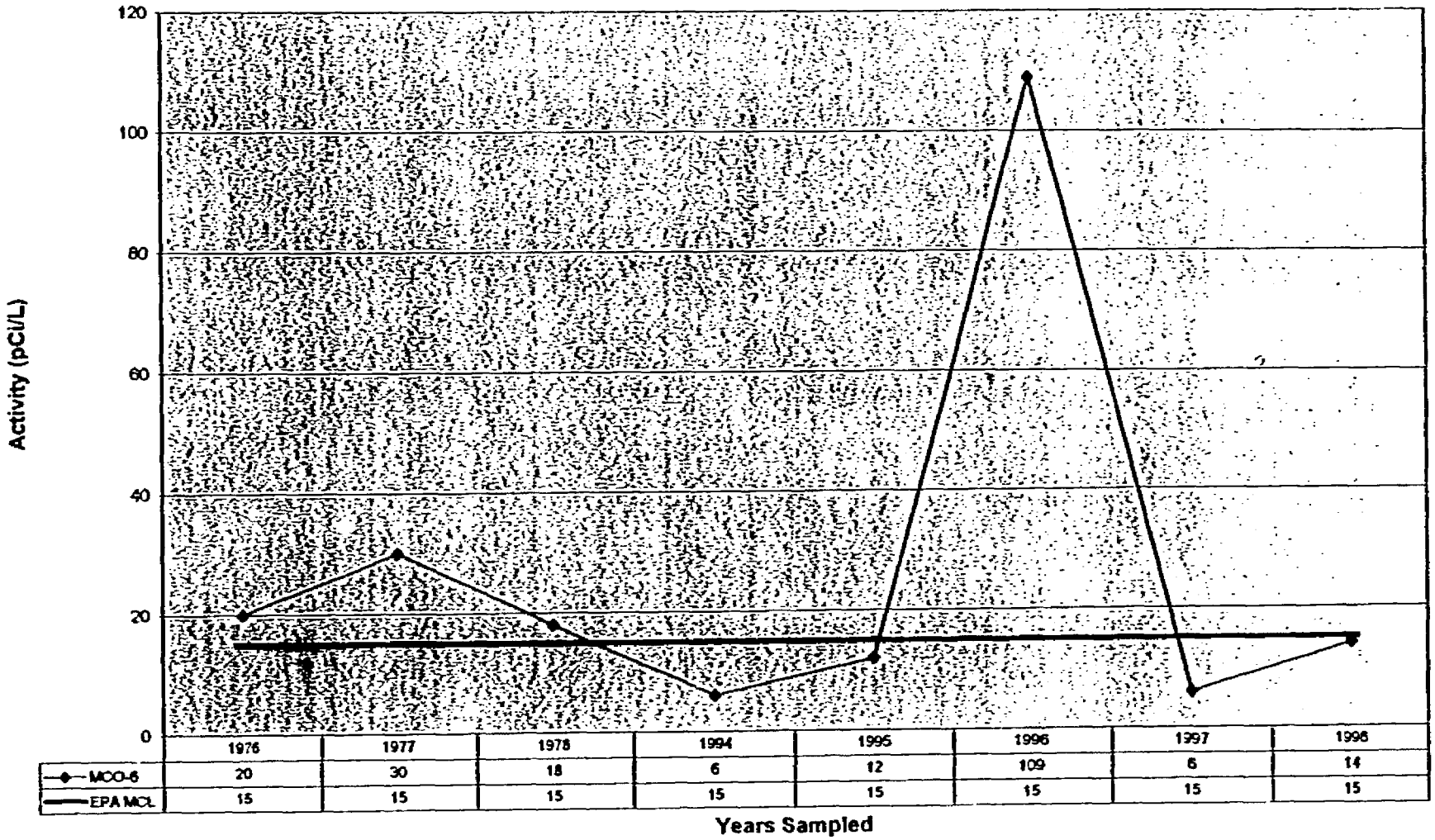
Gross Alpha Activity for Well MCO- 5



	1994	1995	1996	1997	1998
MCO-5	11	11	112	8	2
EPA MCL	15	15	15	15	15

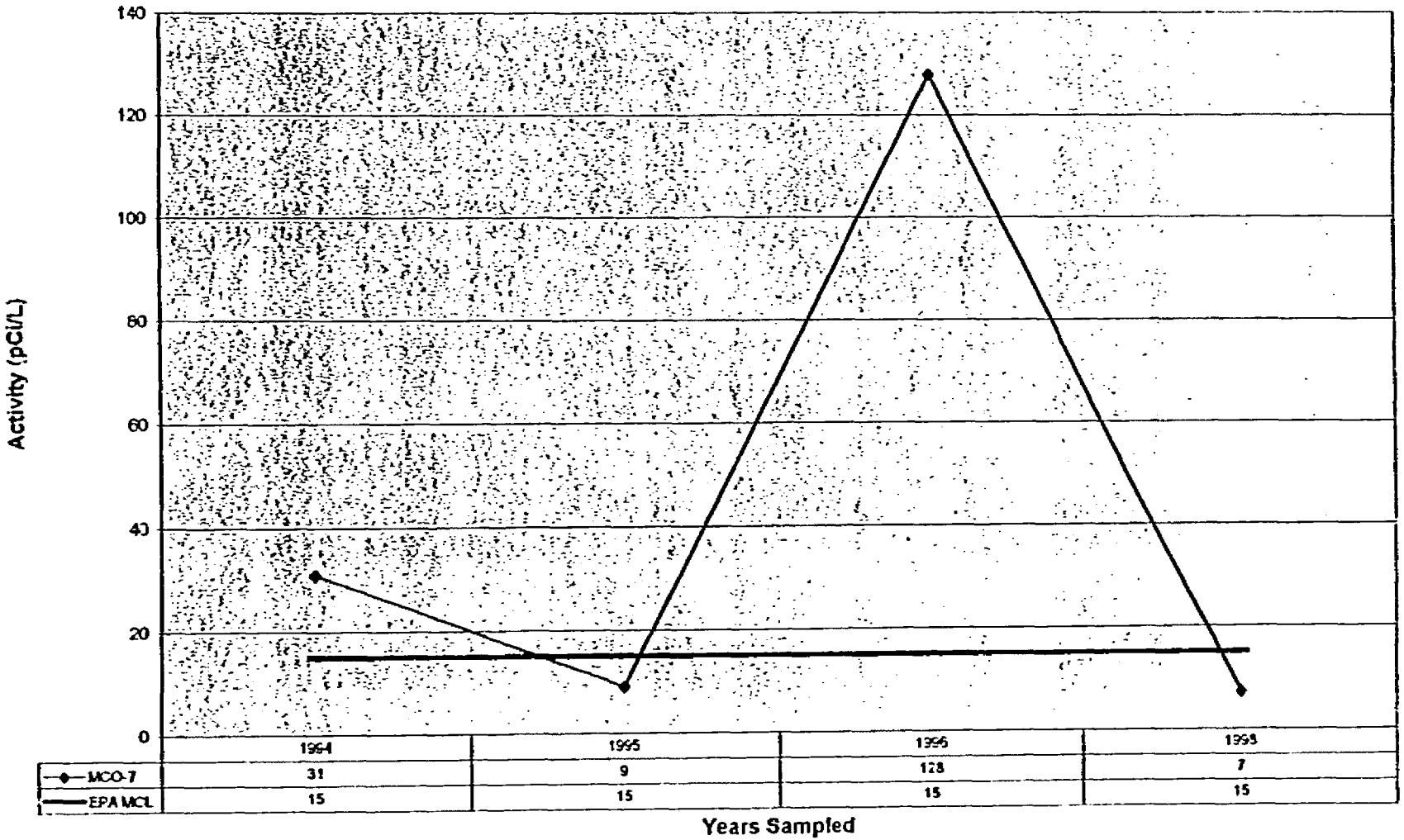
Years Sampled

Gross Alpha Activity for Well MCO-6



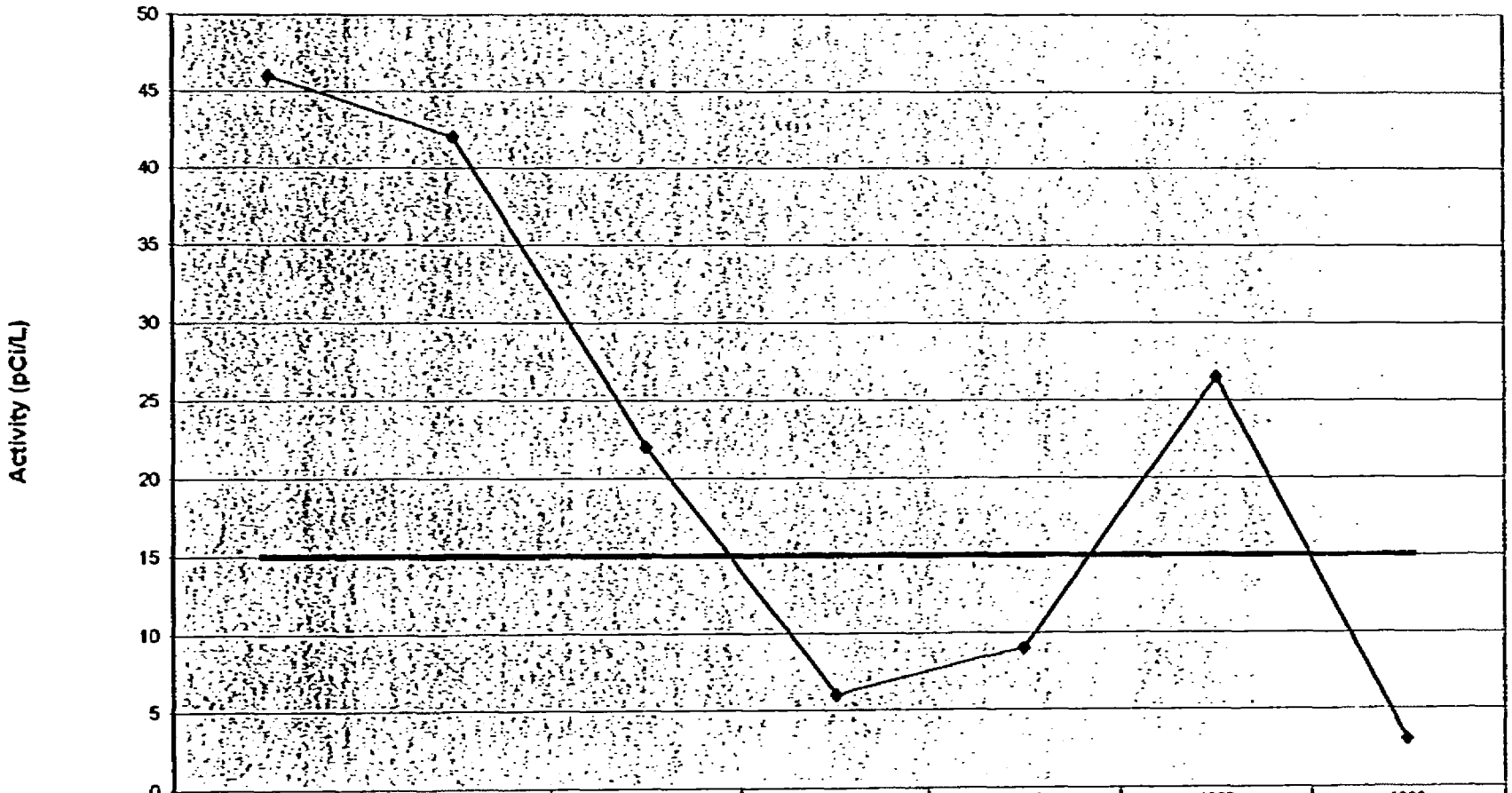
	1976	1977	1978	1994	1995	1996	1997	1998
MCO-6	20	30	18	6	12	109	6	14
EPA MCL	15	15	15	15	15	15	15	15

Gross Alpha Activity for Well MCO-7



	1994	1995	1996	1997
MCO-7	31	9	128	7
EPA MCL	15	15	15	15

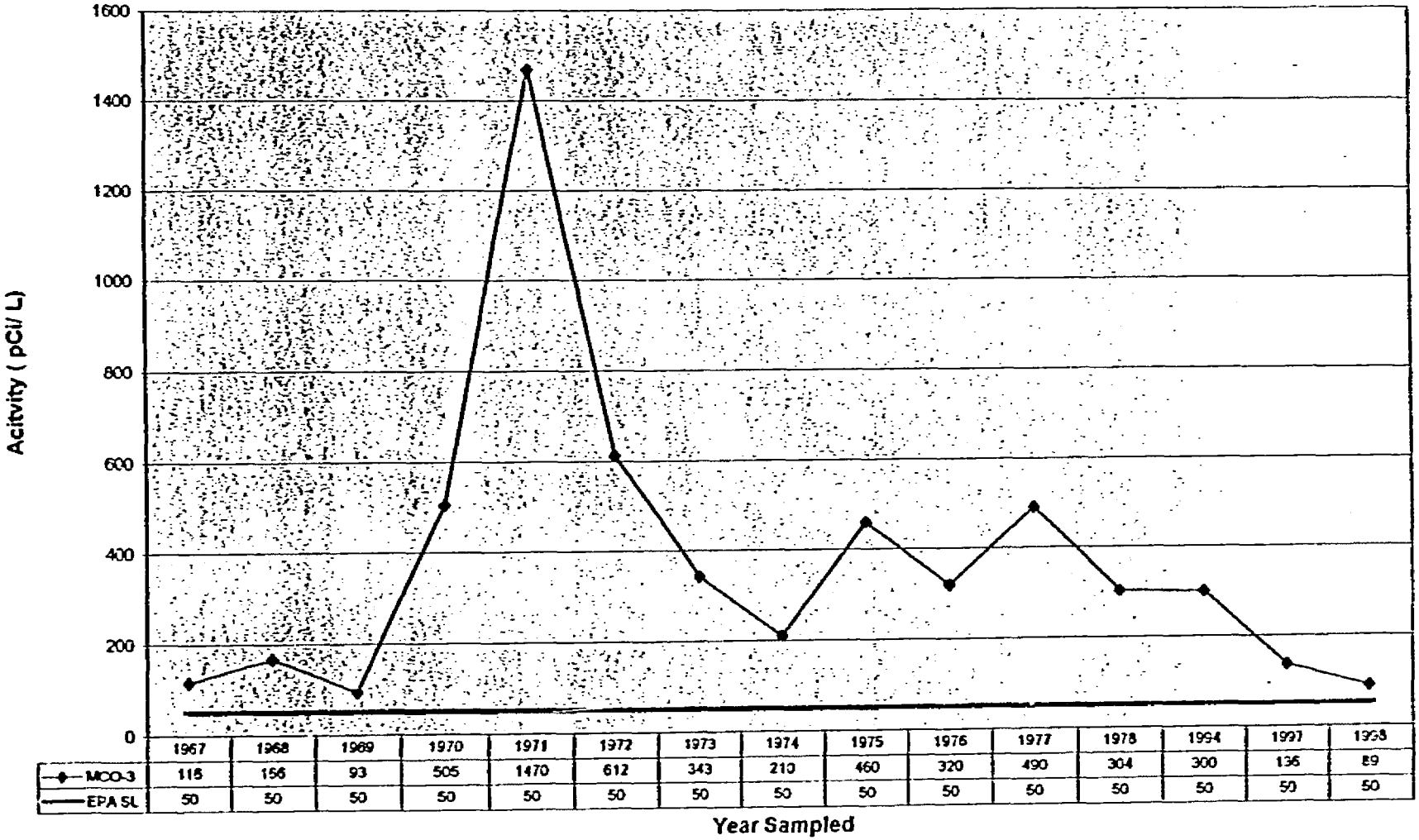
Gross Alpha Activity for Well MCO-7.5



	1976	1977	1978	1994	1995	1997	1998
MCO-7.5	46	42	22	6	9	27	3
EPA MCL	15	15	15	15	15	15	15

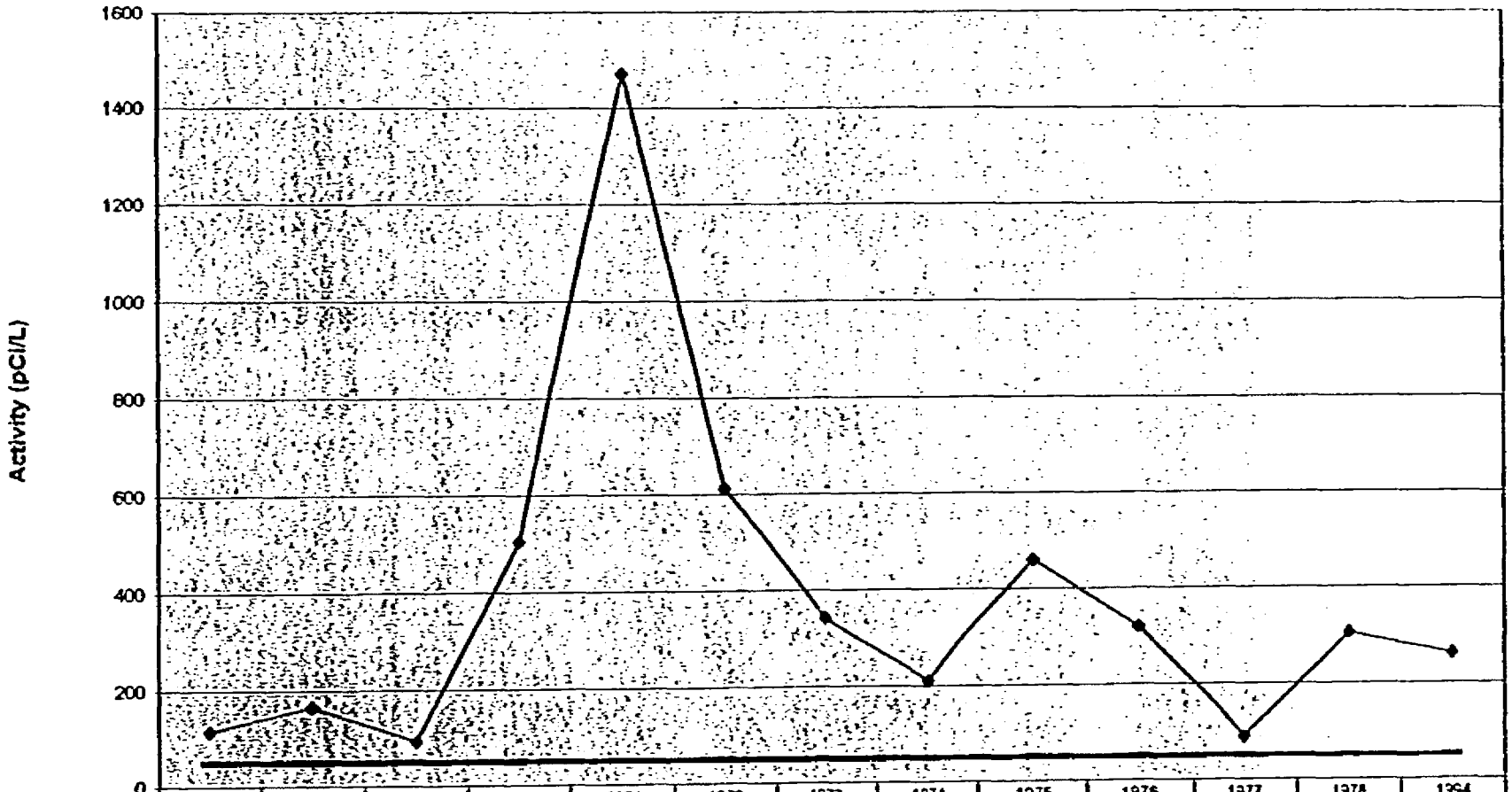
Years Sampled

Gross Beta Activity for Well MCO-3



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1994	1997	1998
MCO-3	115	156	93	505	1470	612	343	210	460	320	490	304	300	136	89
EPA SL	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

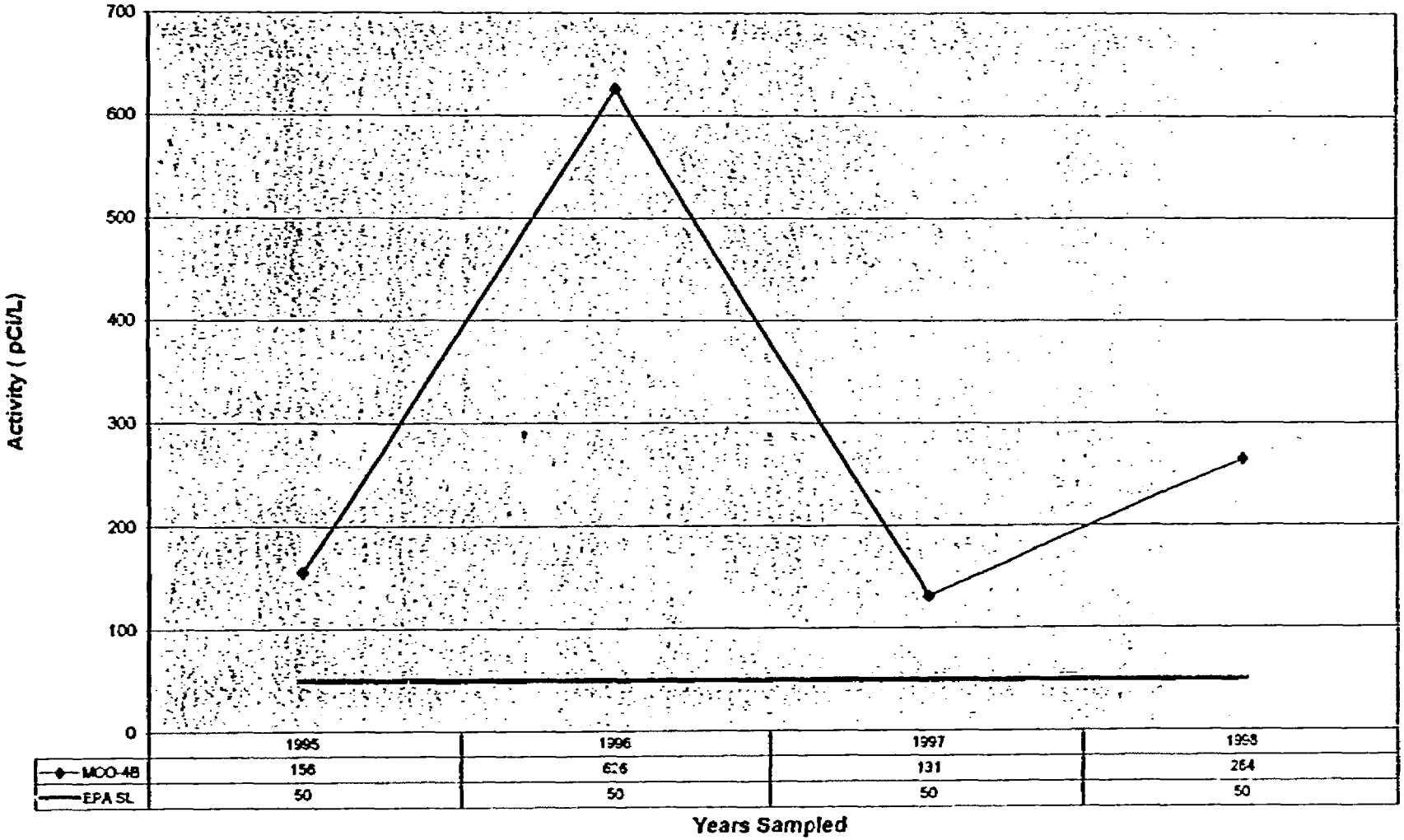
Gross Beta Activity for Well MCO-4



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1994
MCO-4	116	166	93	505	1470	612	343	210	460	320	90	304	250
EPA SL	50	50	50	50	50	50	50	50	50	50	50	50	50

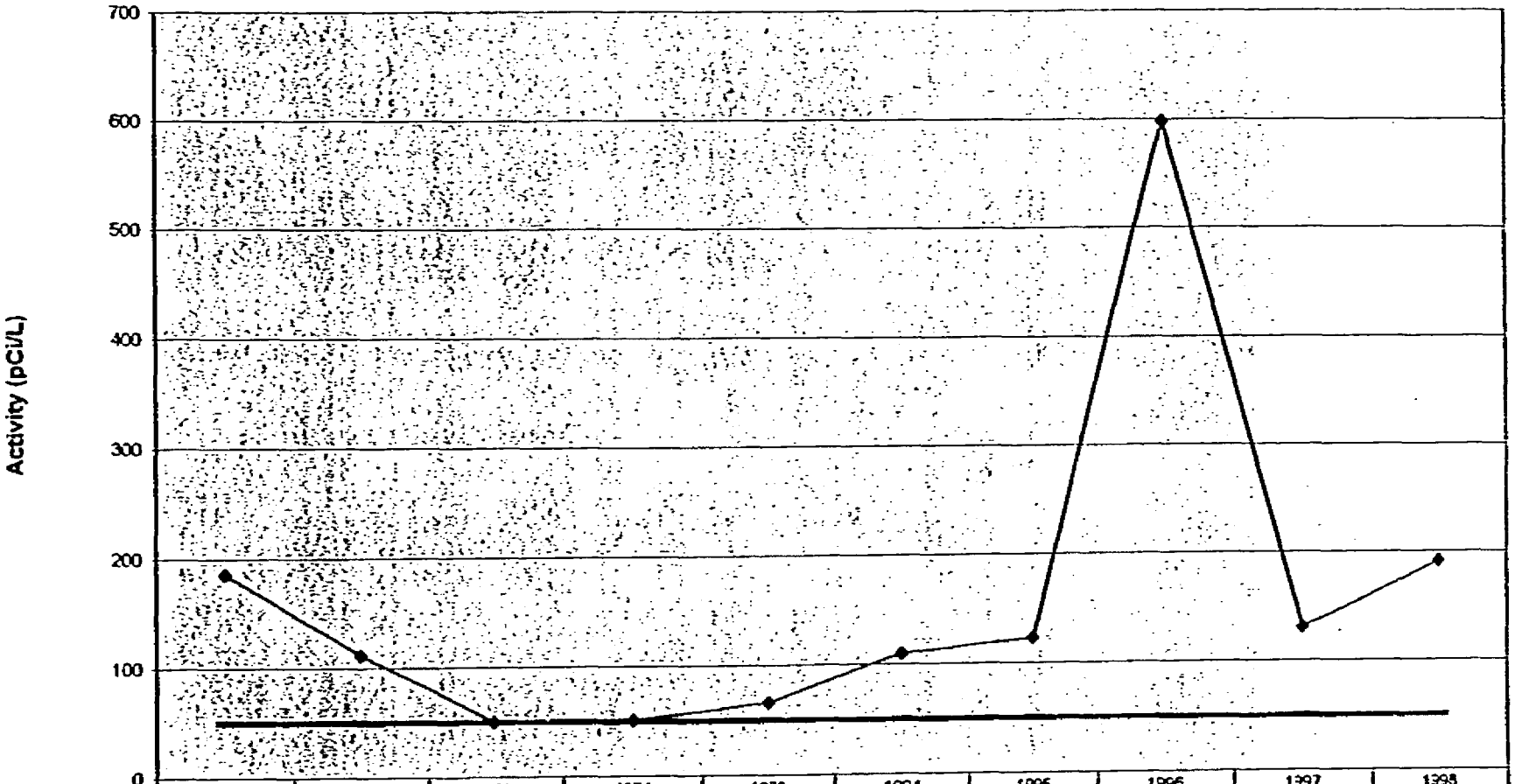
Years Sampled

Gross Beta Activity In Well MCO-4B



	1995	1996	1997	1998
MCO-4B	156	626	131	264
EPA SL	50	50	50	50

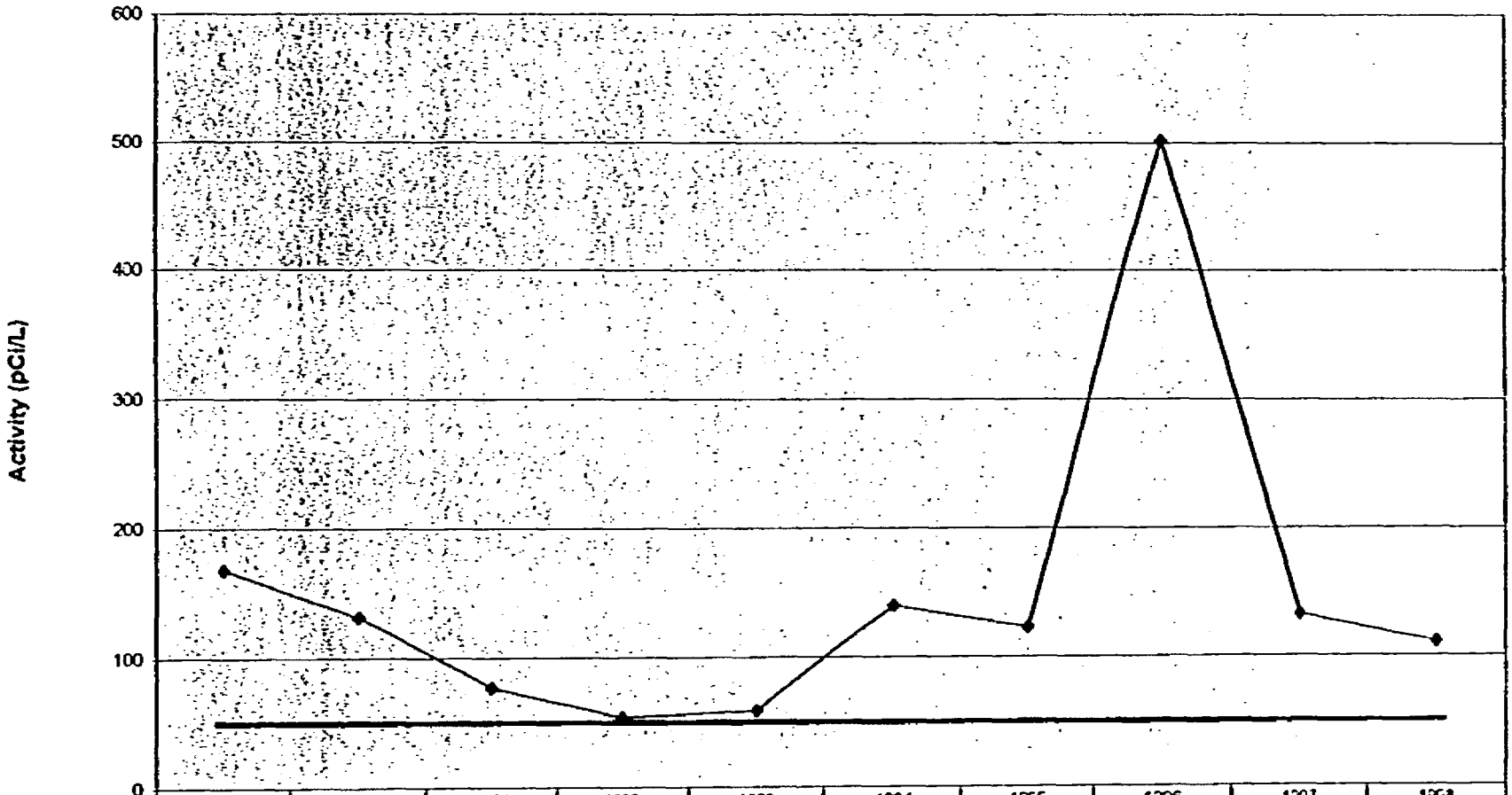
Gross Beta Activity for Well MCO-5



	1971	1972	1973	1974	1978	1994	1995	1996	1997	1998
MCO-5	186	112	50	51	66	110	123	598	131	191
EPA SL	50	50	50	50	50	50	50	50	50	50

Years Sampled

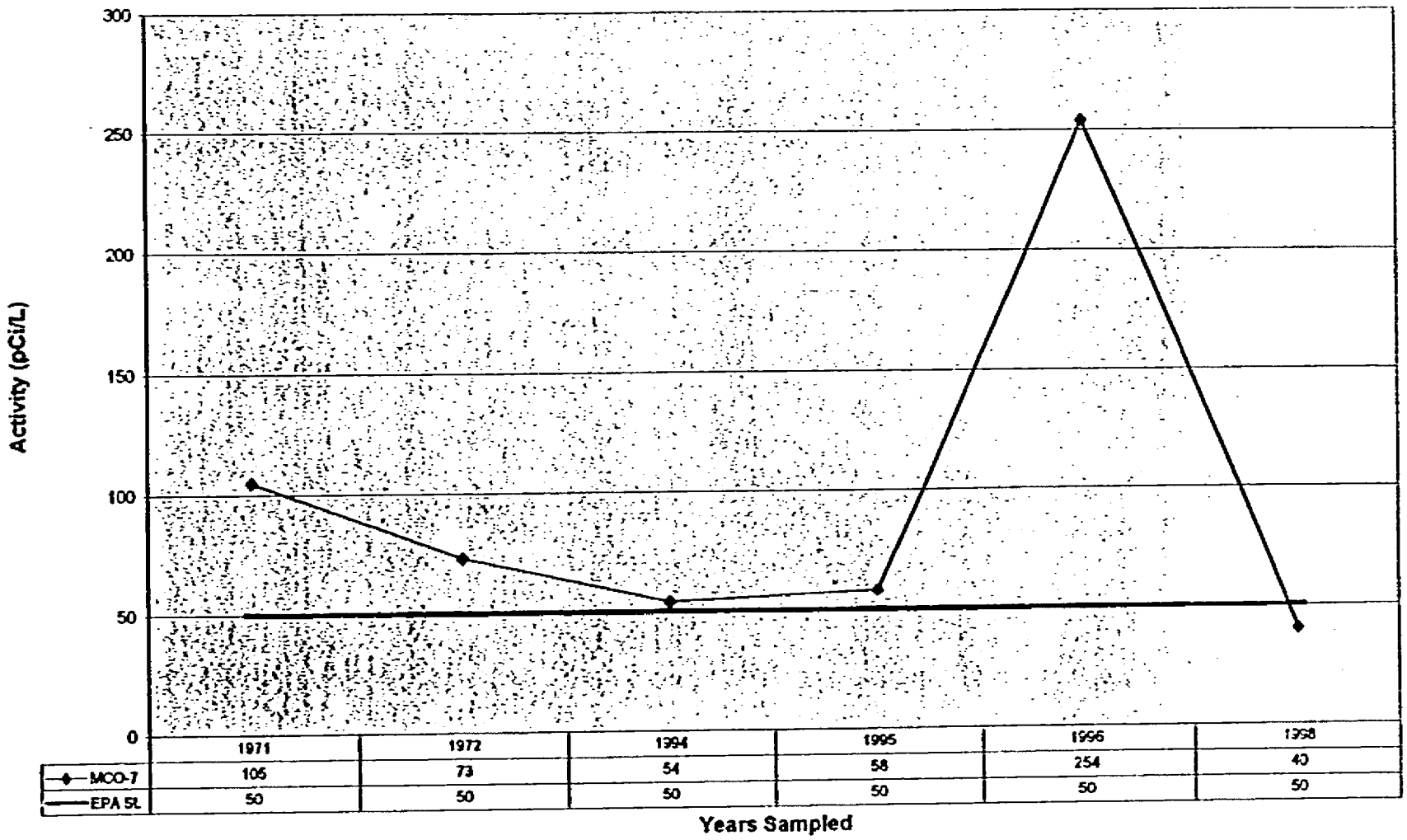
Gross Beta Activity for Well MCO-6



	1971	1972	1974	1977	1978	1994	1995	1996	1997	1998
MCO-6	168	132	77	54	59	140	123	502	133	111
EPA SL	50	50	50	50	50	50	50	50	50	50

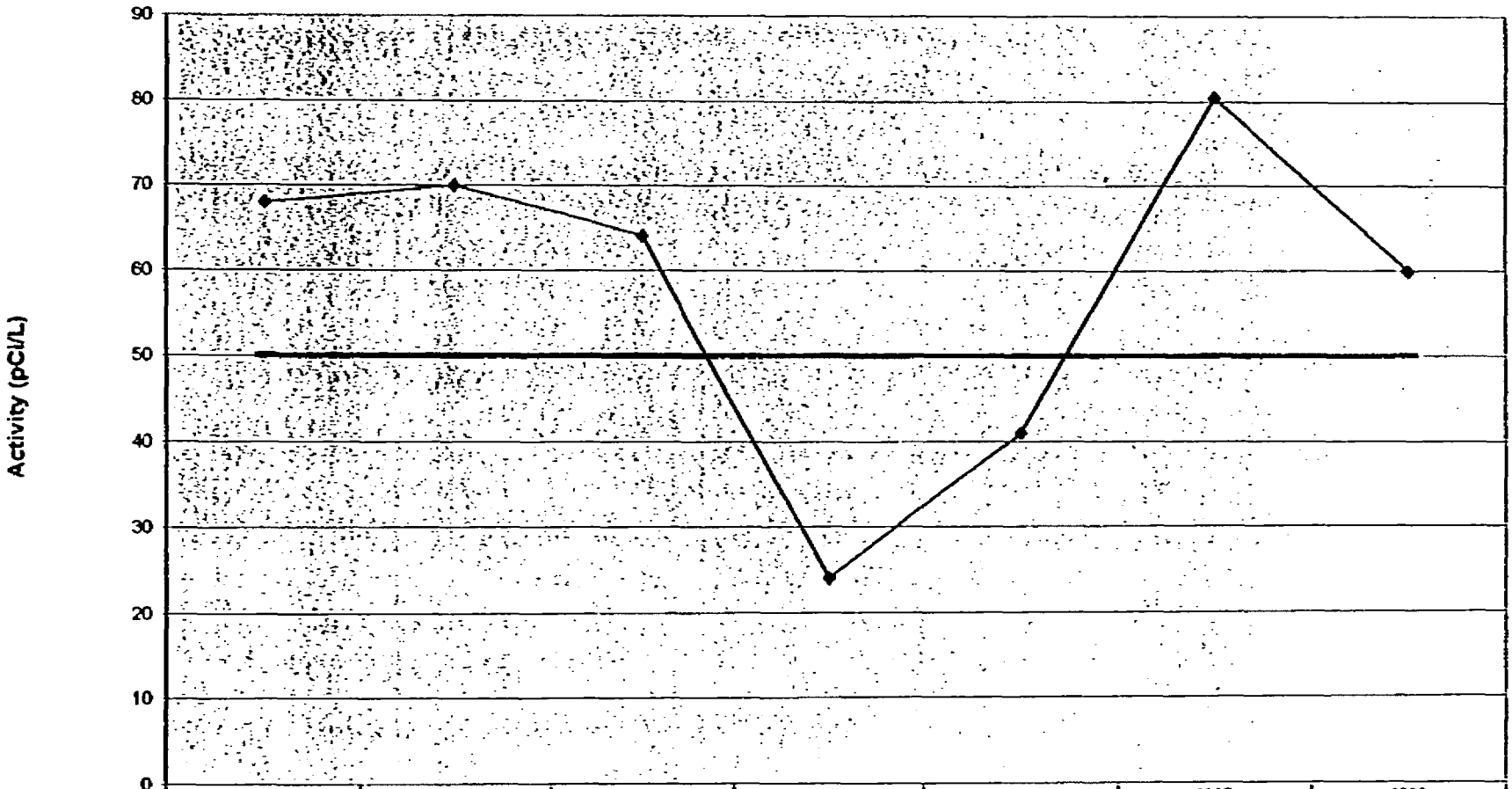
Years Sampled

Gross Beta Activity for Well MCO-7



	1971	1972	1994	1995	1996	1998
MCO-7	105	73	54	58	254	40
EPA SL	50	50	50	50	50	50

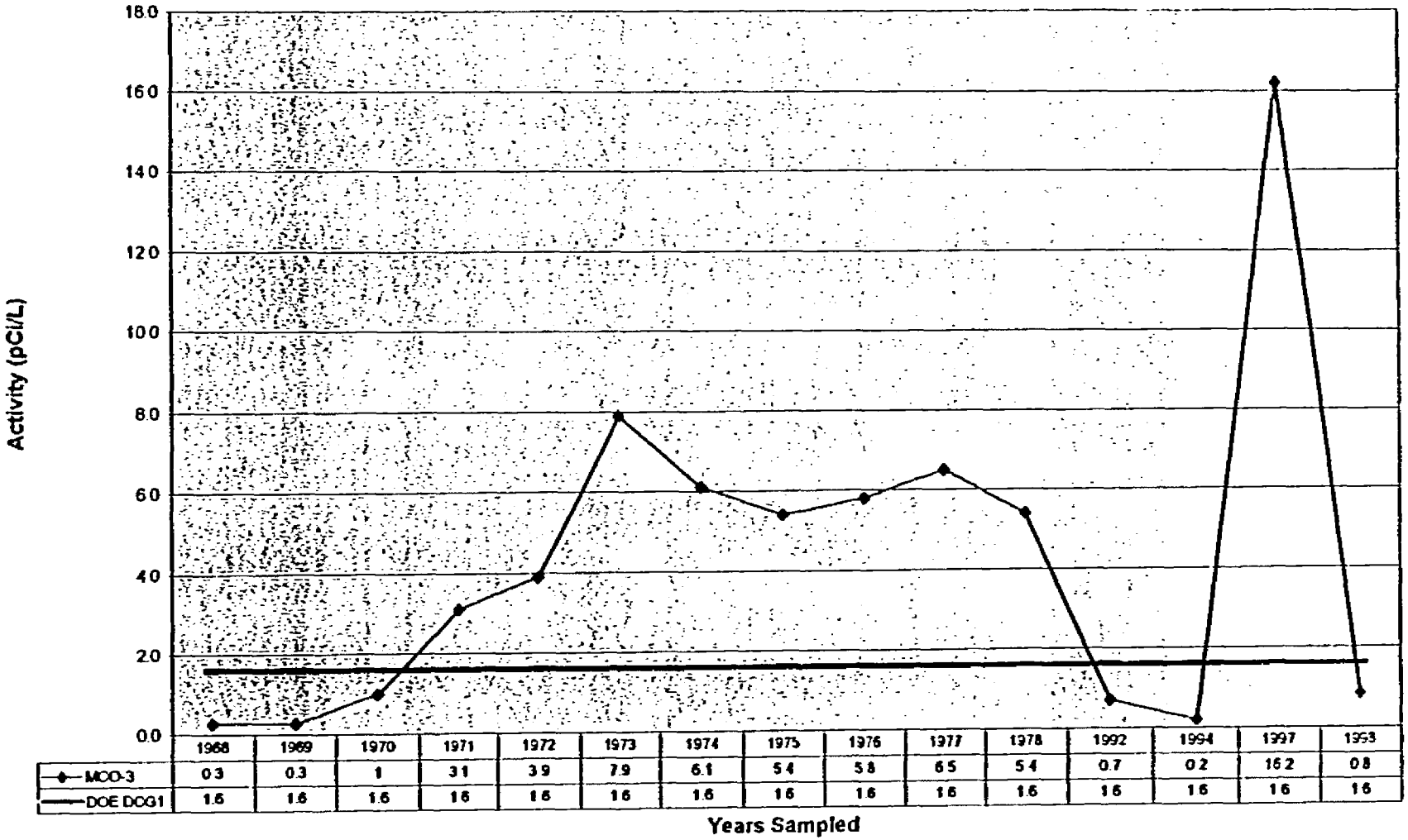
Gross Beta Activity for MCO- 7.5



	1971	1972	1977	1994	1995	1997	1998
MCO-7.5	68	70	64	24	41	81	60
EPA SL	50	50	50	50	50	50	50

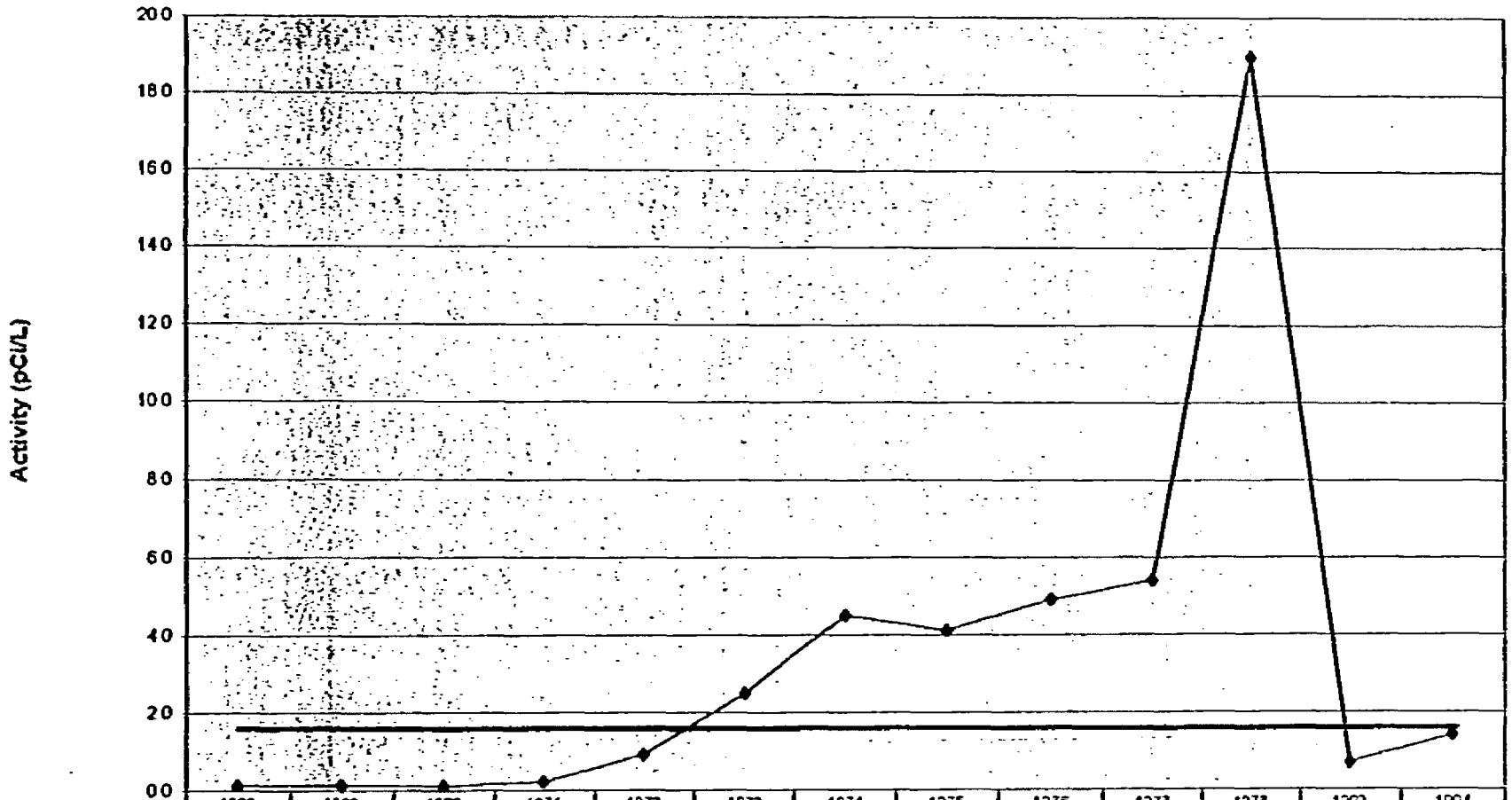
Years Sampled

Plutonium-238 Activity for Well MCO-3



	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1997	1998
MCO-3	0.3	0.3	1	3.1	3.9	7.9	6.1	5.4	5.8	6.5	5.4	0.7	0.2	16.2	0.8
DOE DCG1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

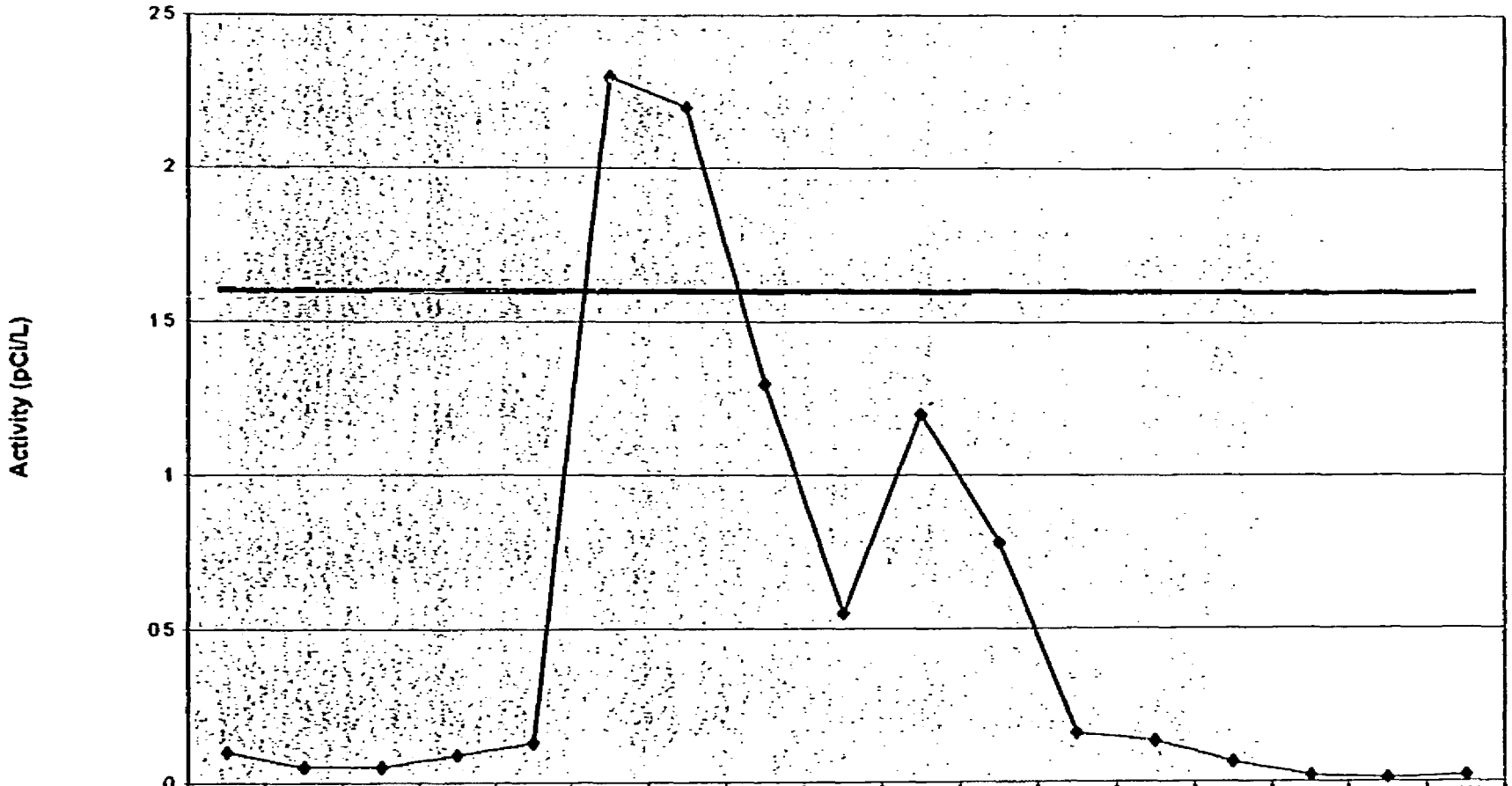
Plutonium-238 Activity for Well MCO-4



	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994
MCO-4	0.1	0.1	0.1	0.2	0.9	2.5	4.5	4.1	4.9	5.4	19	0.7	1.4
DOE DCG1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

Years Sampled

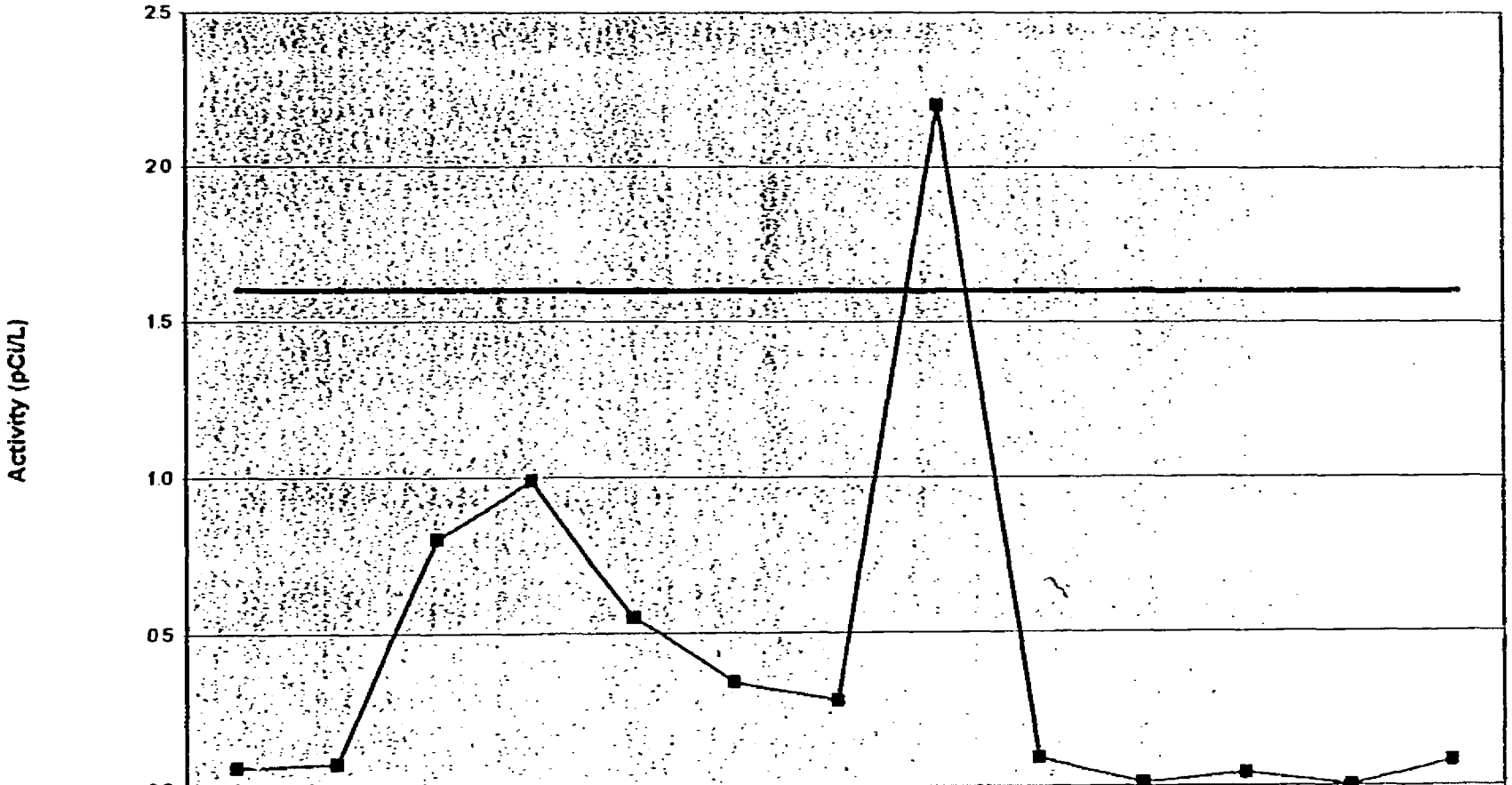
Plutonium-238 Activity for Well MCO-5



	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1995	1996	1997	1998
MCO-5	0.1	0.1	0.1	0.1	0.1	2.3	2.2	1.3	0.6	1.2	0.8	0.2	0.1	0.1	0.0	0.0	0.0
DOE DCG1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

Year Sampled

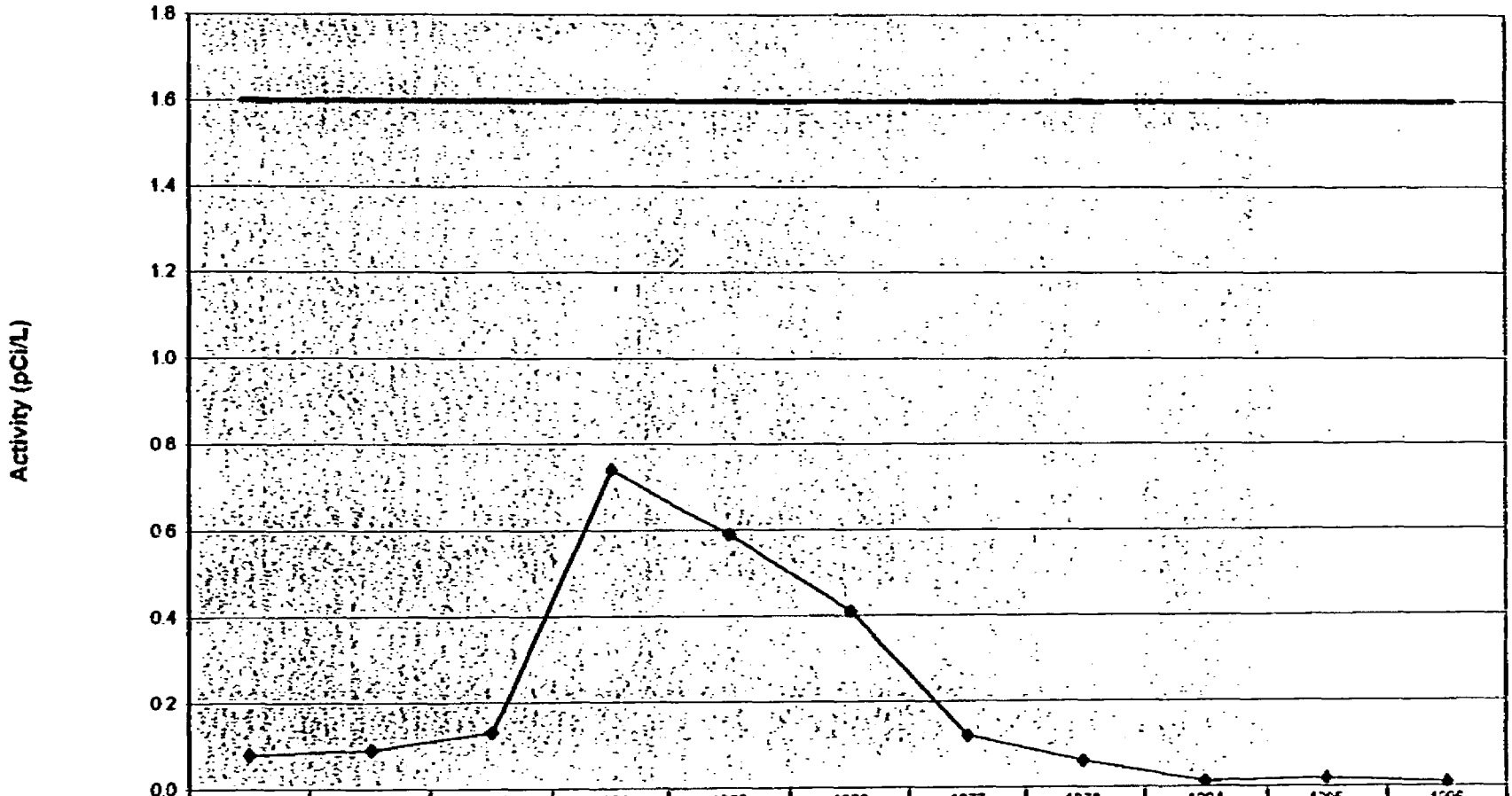
Plutonium-238 Activity for Well MCO-6



	1968	1972	1973	1974	1975	1976	1977	1978	1992	1994	1995	1996	1997
MCO-6	0.1	0.1	1	1.0	0.6	0.3	0.3	2.2	0.1	0.0	0.0	0.0	0.1
DOE DCG1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

Year Sampled

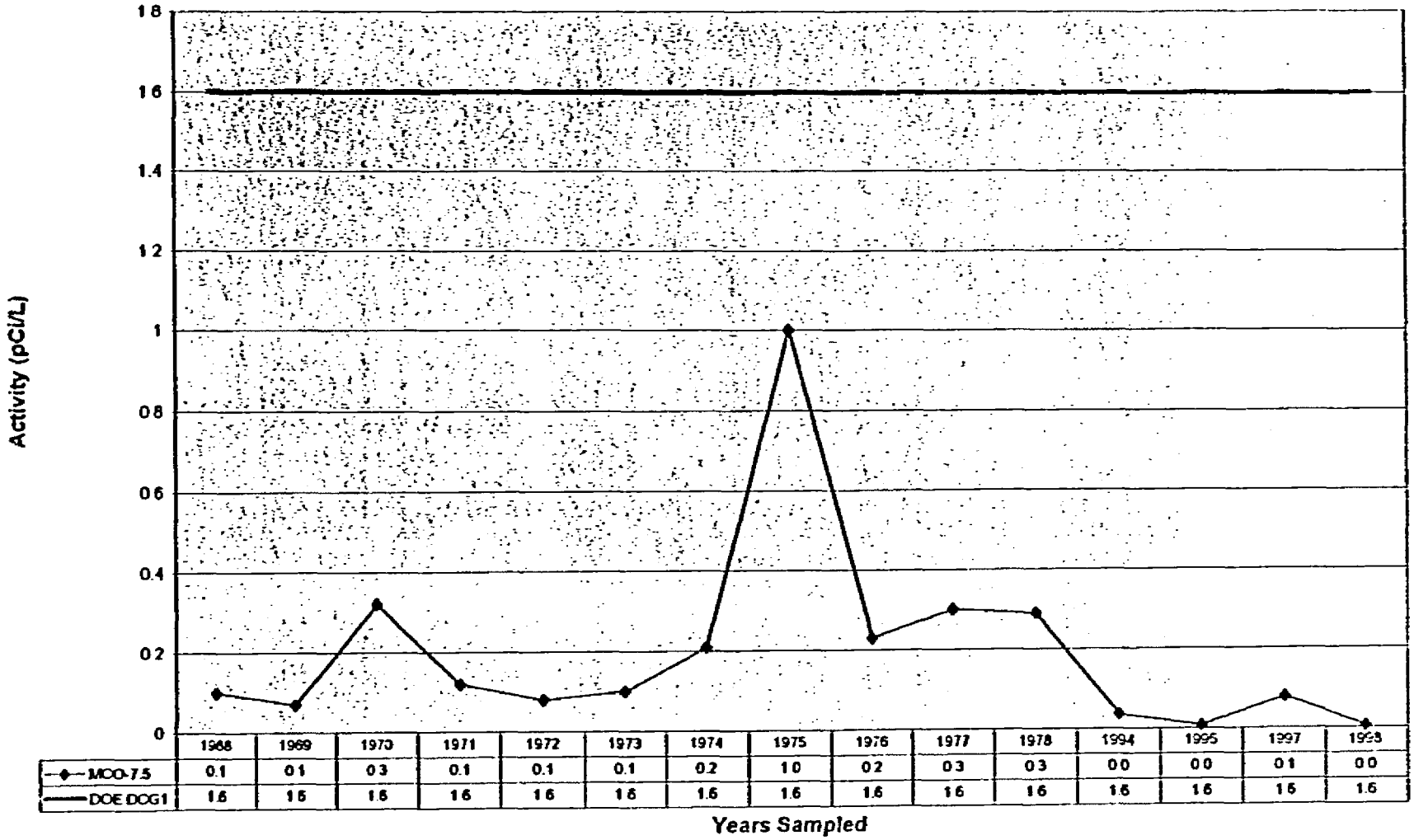
Plutonium-238 Activity for Well MCO-7



	1971	1972	1973	1974	1975	1976	1977	1978	1994	1995	1996
MCO-7	0.1	0.1	0.1	0.7	0.6	0.4	0.1	0.1	0.0	0.0	0.0
DOE DCG1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

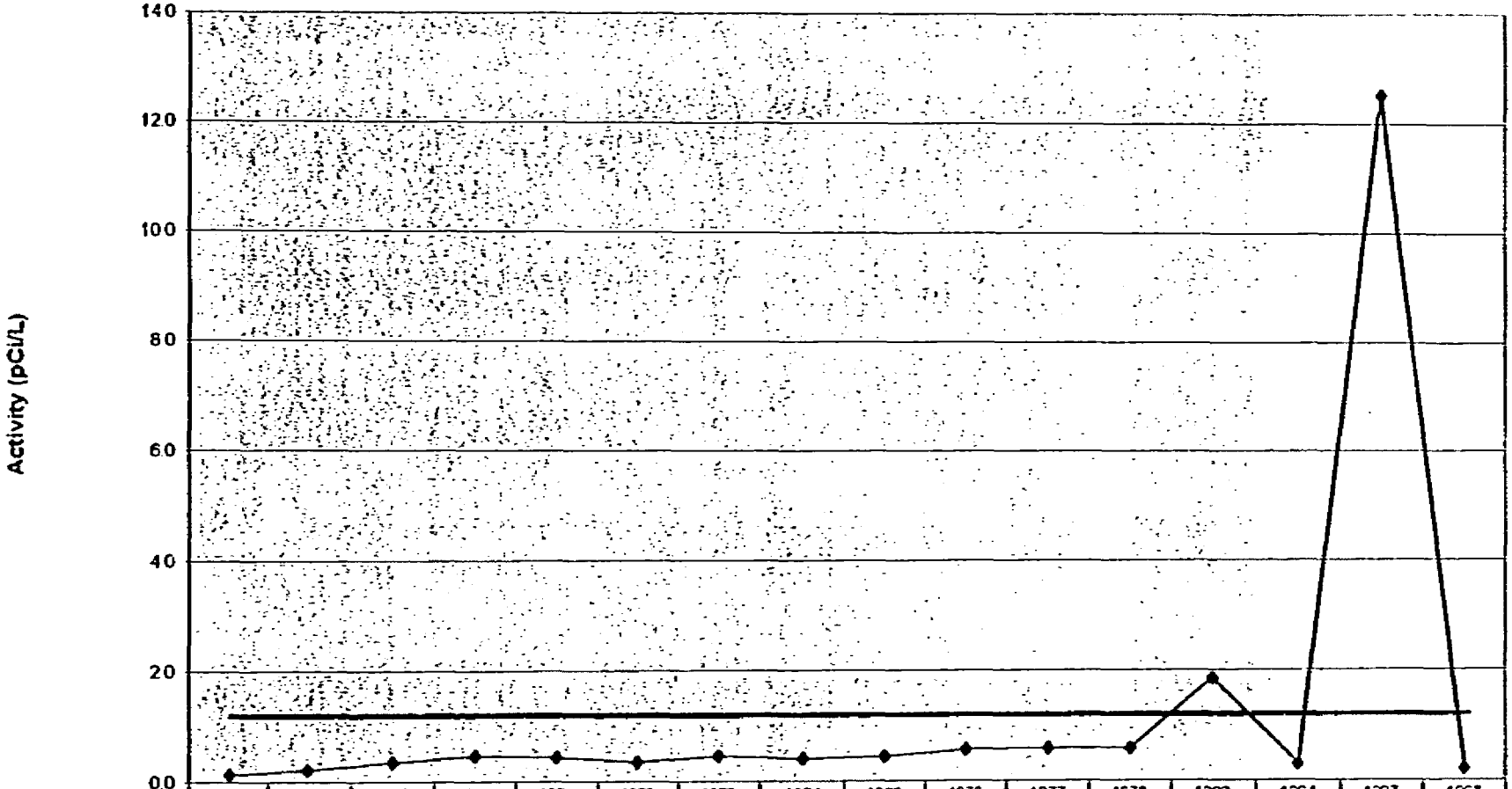
Years Sampled

Plutonium-238 Activity for Well MCO-7.5



	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1994	1995	1997	1998
MCO-7.5	0.1	0.1	0.3	0.1	0.1	0.1	0.2	1.0	0.2	0.3	0.3	0.0	0.0	0.1	0.0
DOE DCG1	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

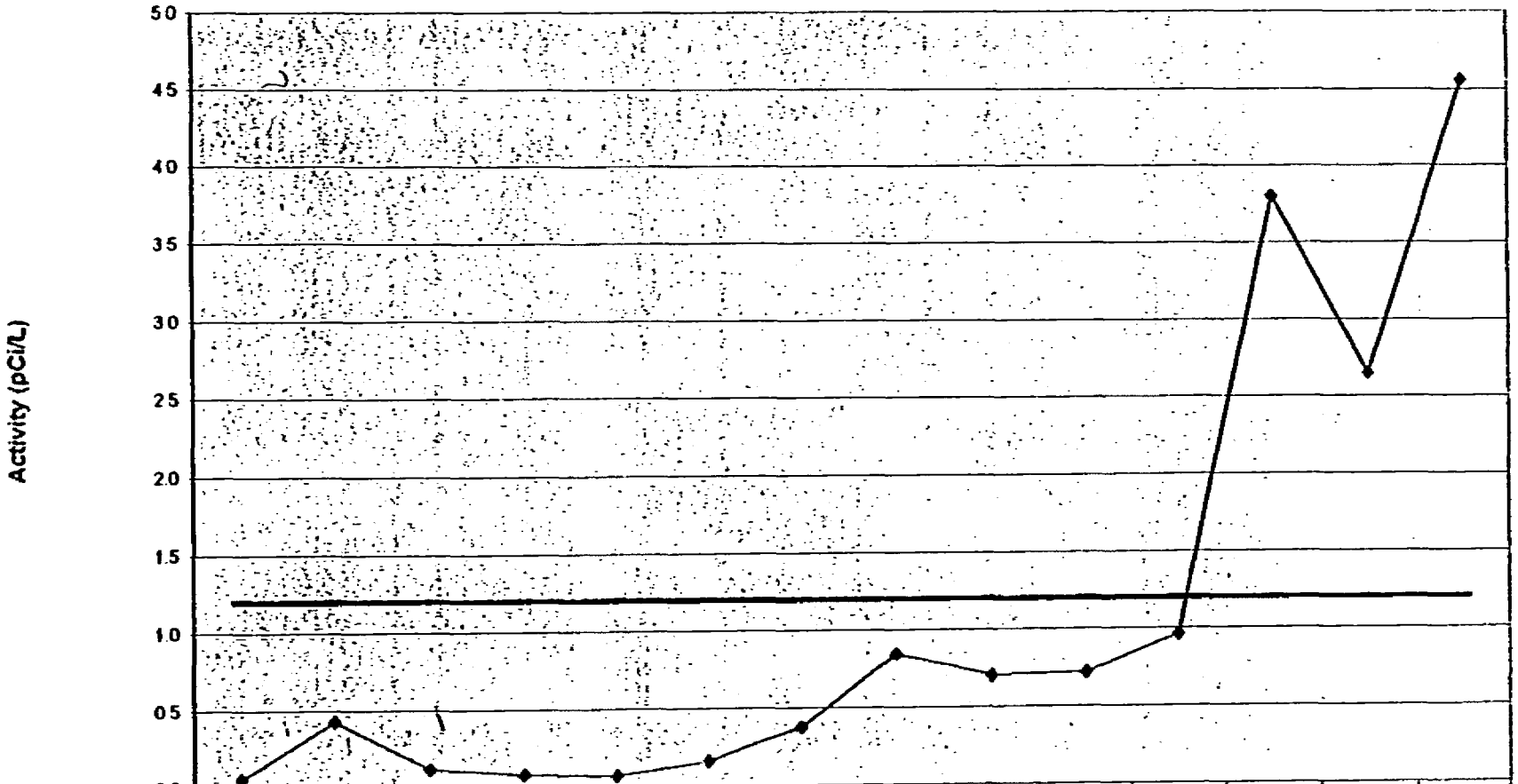
Plutonium-239/240 Activity for Well MCO-3



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994	1997	1998
MCO-3	0.1	0.2	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.6	0.6	0.6	1.8	0.3	12.5	0.2
DOE DCG-1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Years Sampled

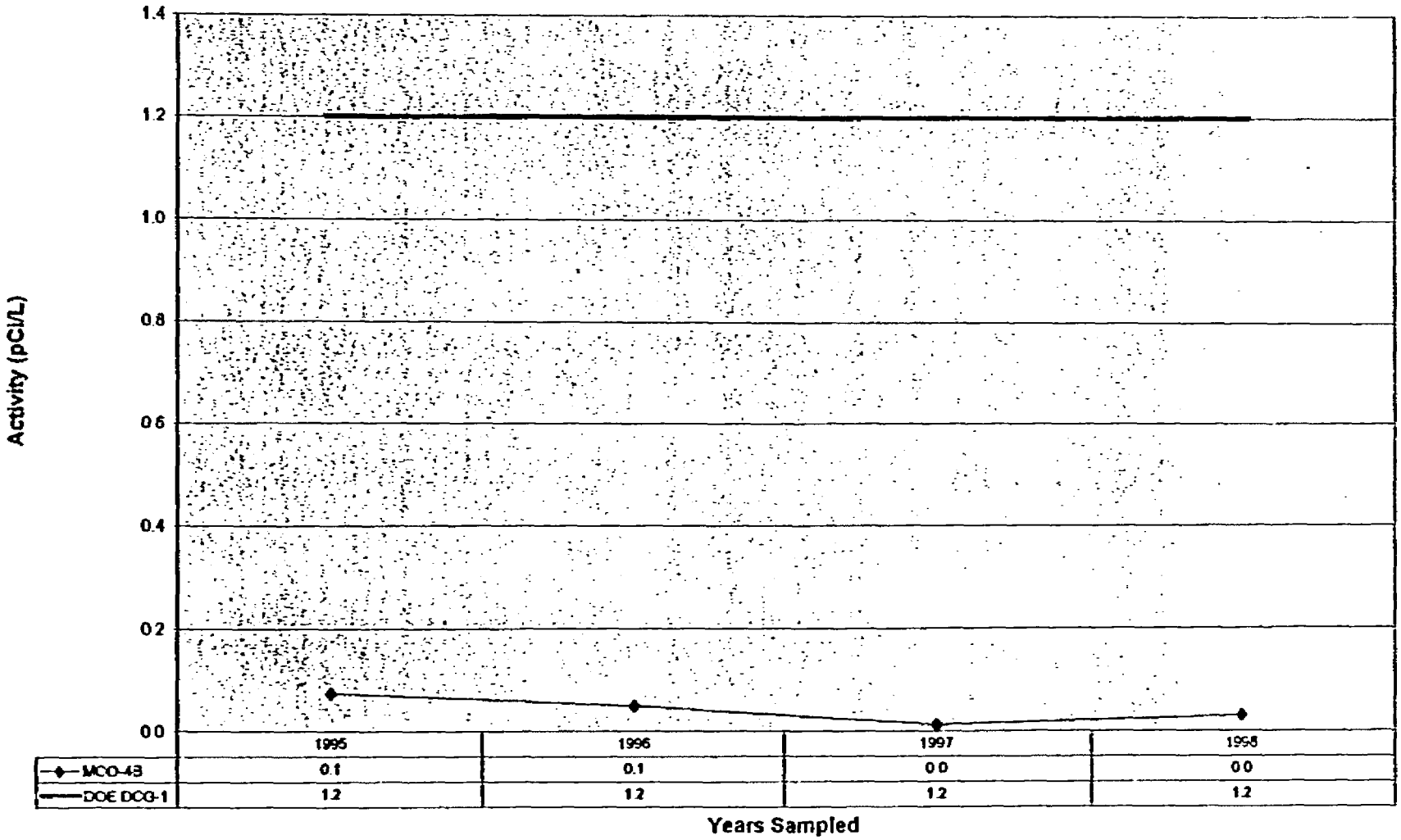
Plutonium-239/240 Activity for Well MCO-4



	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1992	1994
MCO-4	0.1	0.4	0.1	0.1	0.1	0.2	0.4	0.8	0.7	0.7	1.0	3.8	2.7	4.6
DOE DCG-1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

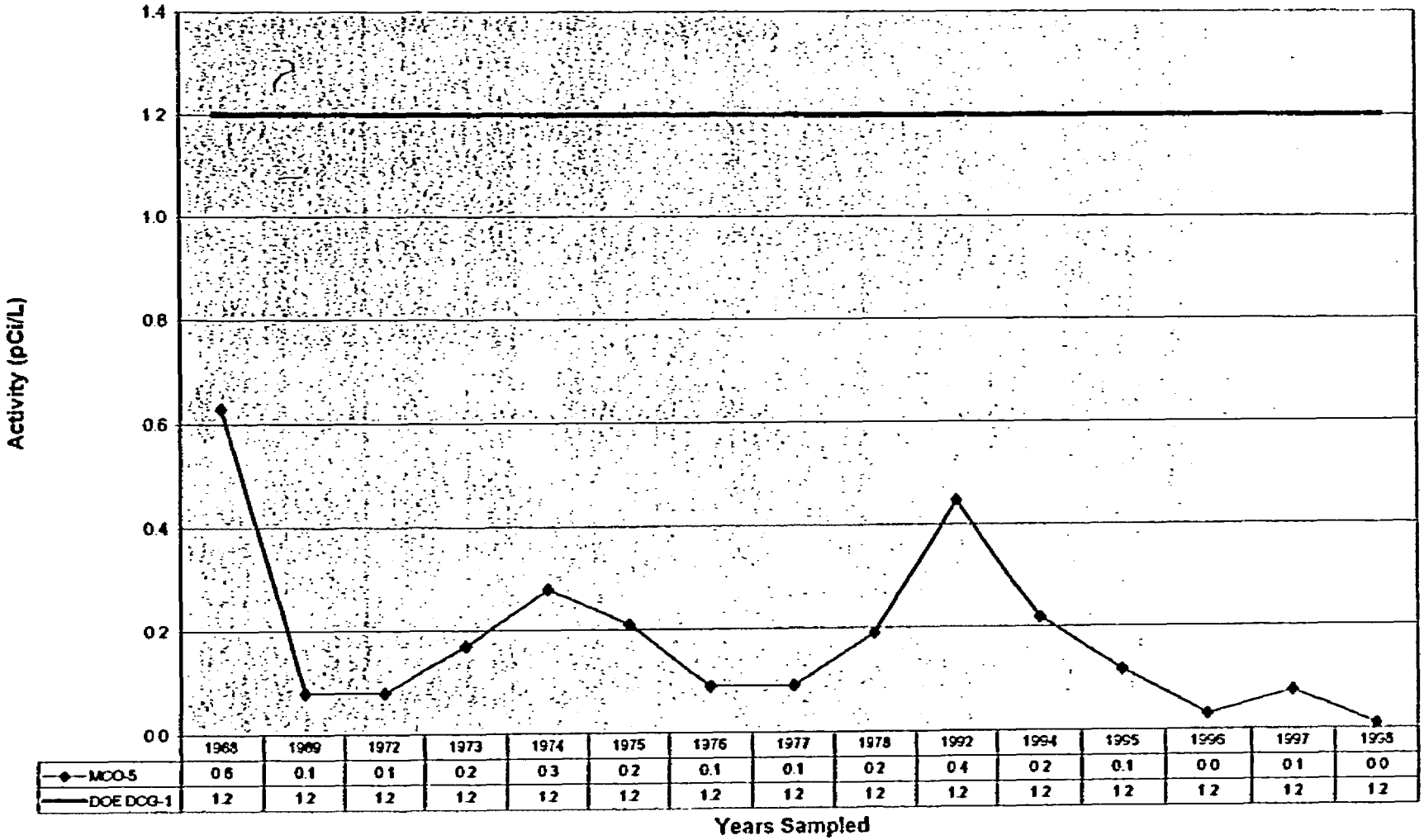
Years Sampled

Plutonium-239/240 Activity for Well MCO-4B



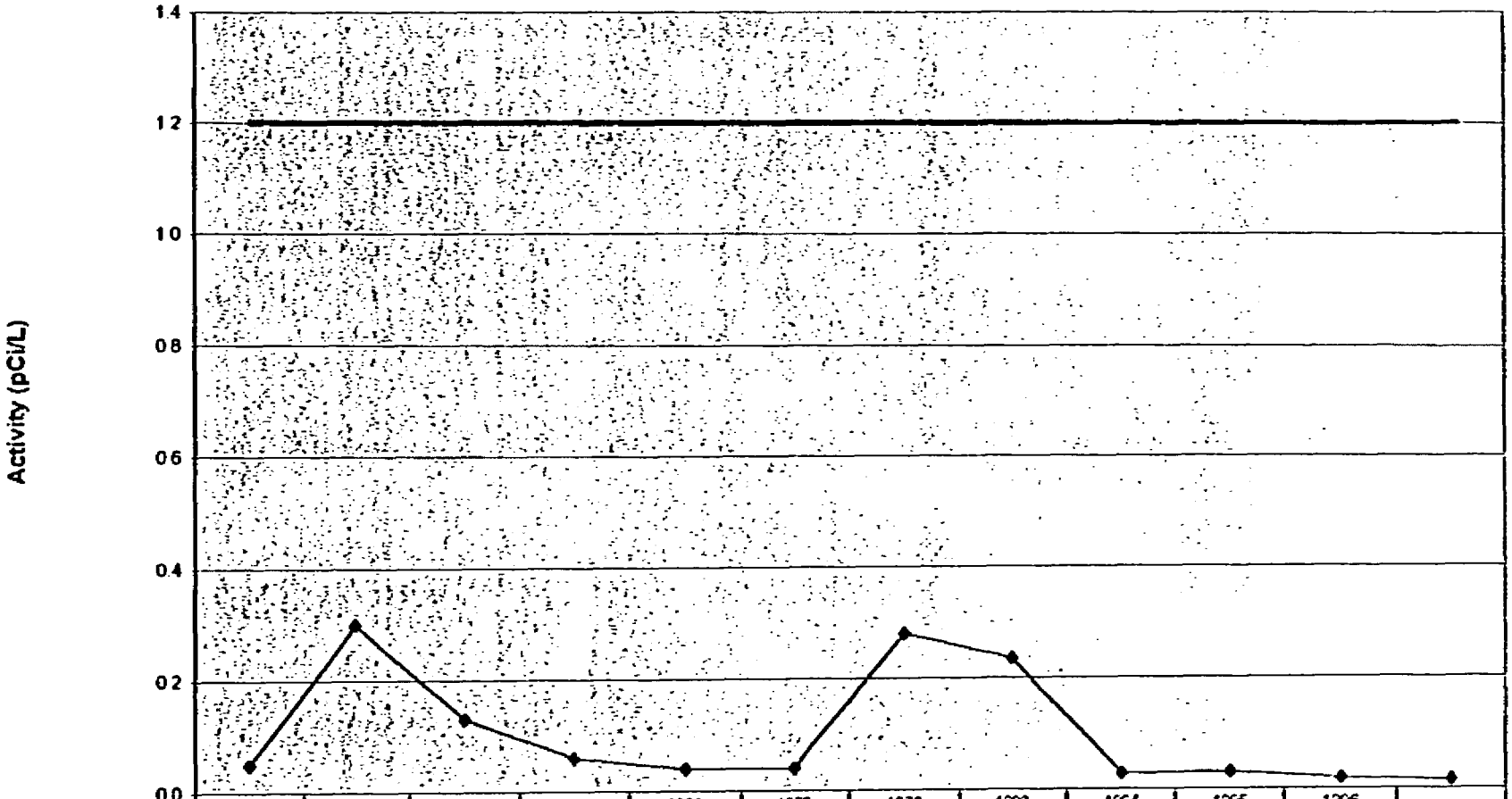
	1995	1996	1997	1998
MCO-4B	0.1	0.1	0.0	0.0
DOE DCG-1	1.2	1.2	1.2	1.2

Plutonium-239/240 Activity for Well MCO-5



	1968	1969	1972	1973	1974	1975	1976	1977	1978	1992	1994	1995	1996	1997	1998
MCO-5	0.6	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.4	0.2	0.1	0.0	0.1	0.0
DOE DCG-1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

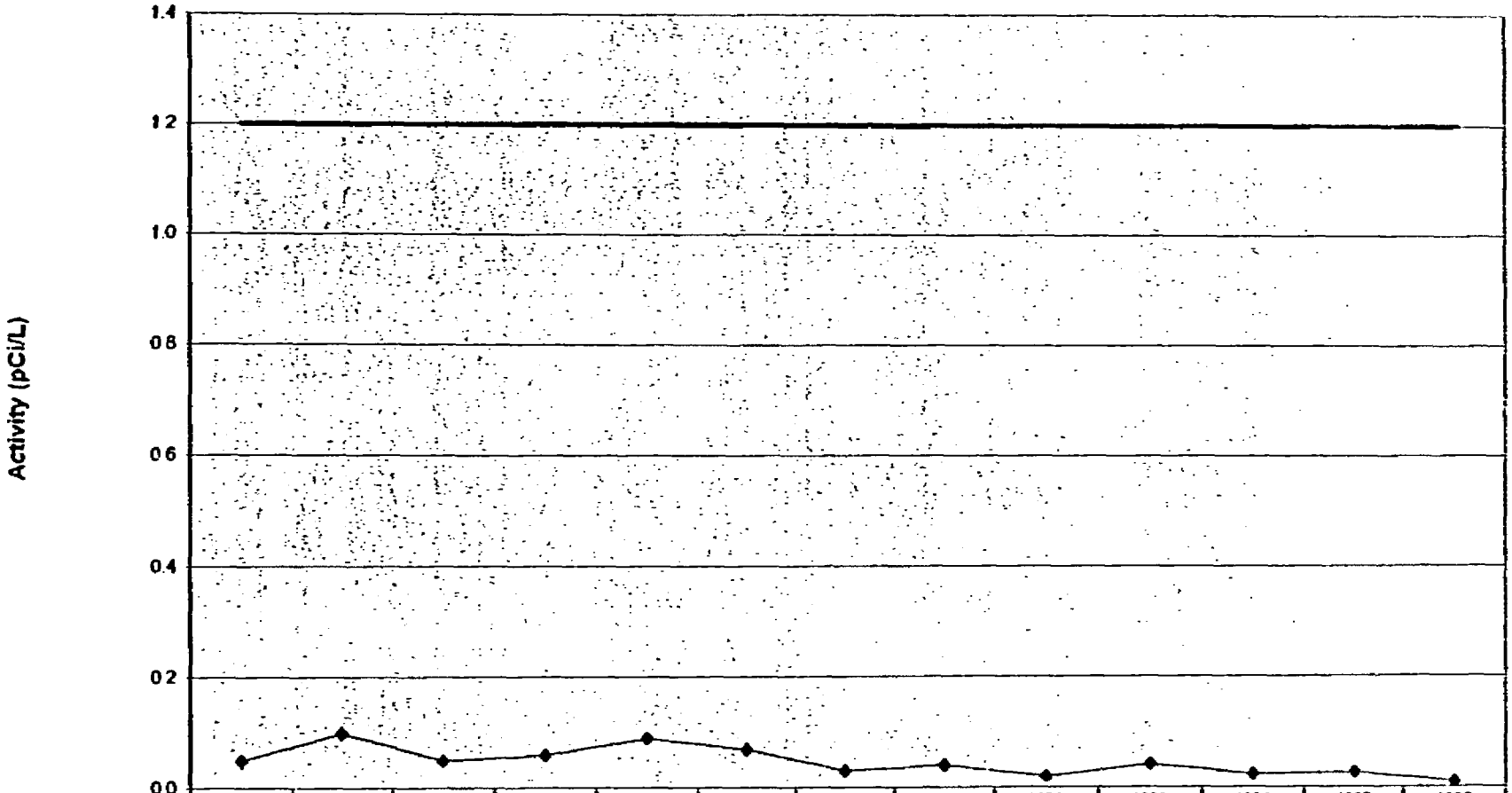
Plutonium-239/240 Activity for Well MCO-6



	1972	1973	1974	1975	1976	1977	1978	1992	1994	1995	1996	
MCO-6	0.1	0.3	0.1	0.1	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0
DOE DCG-1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Samples Collected

Plutonium-239/240 Activity for Well MCO-7

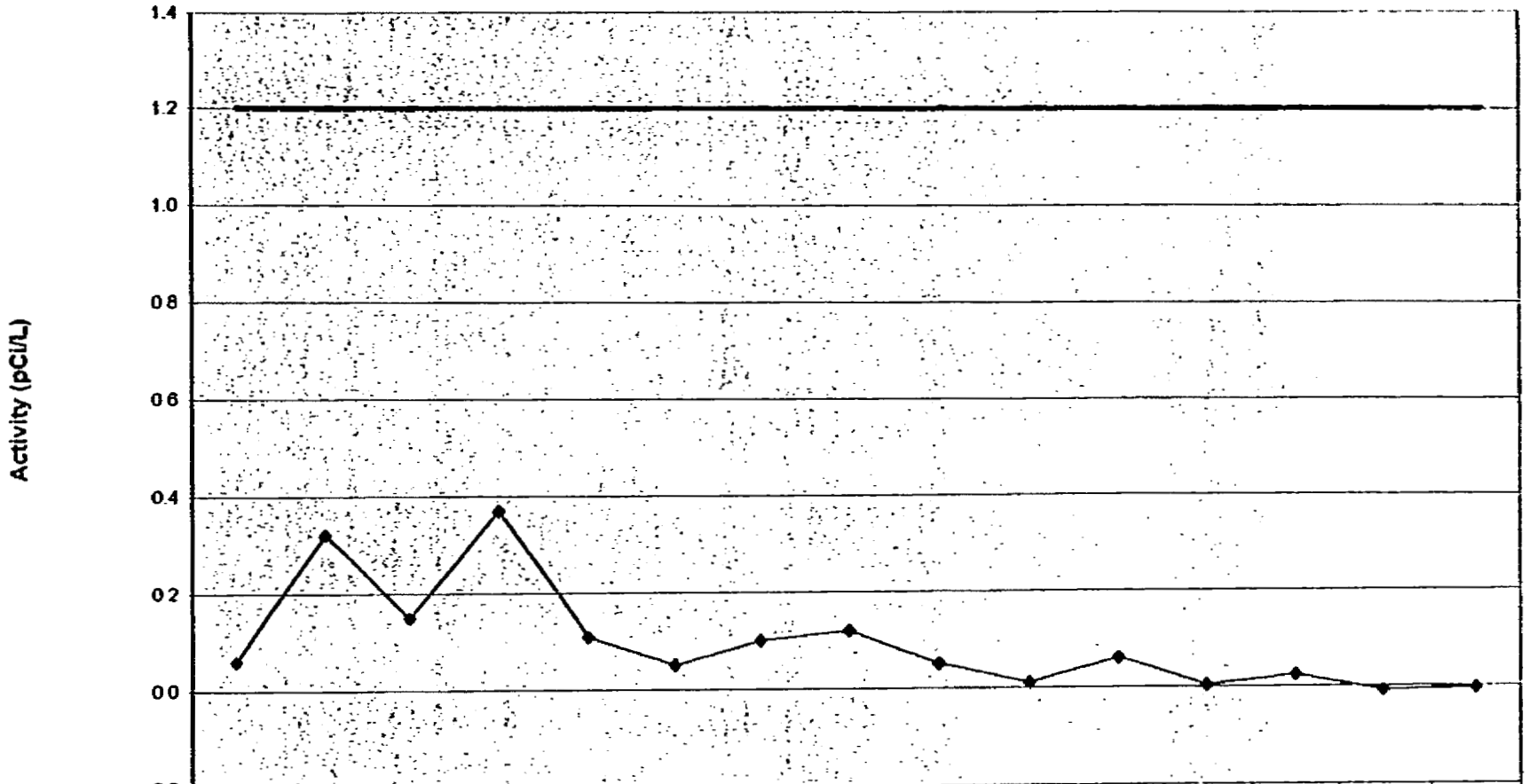


	1967	1968	1969	1972	1974	1975	1976	1977	1978	1992	1994	1995	1996
MCO-7	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DOE DCG-1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Samples Collected

5/5

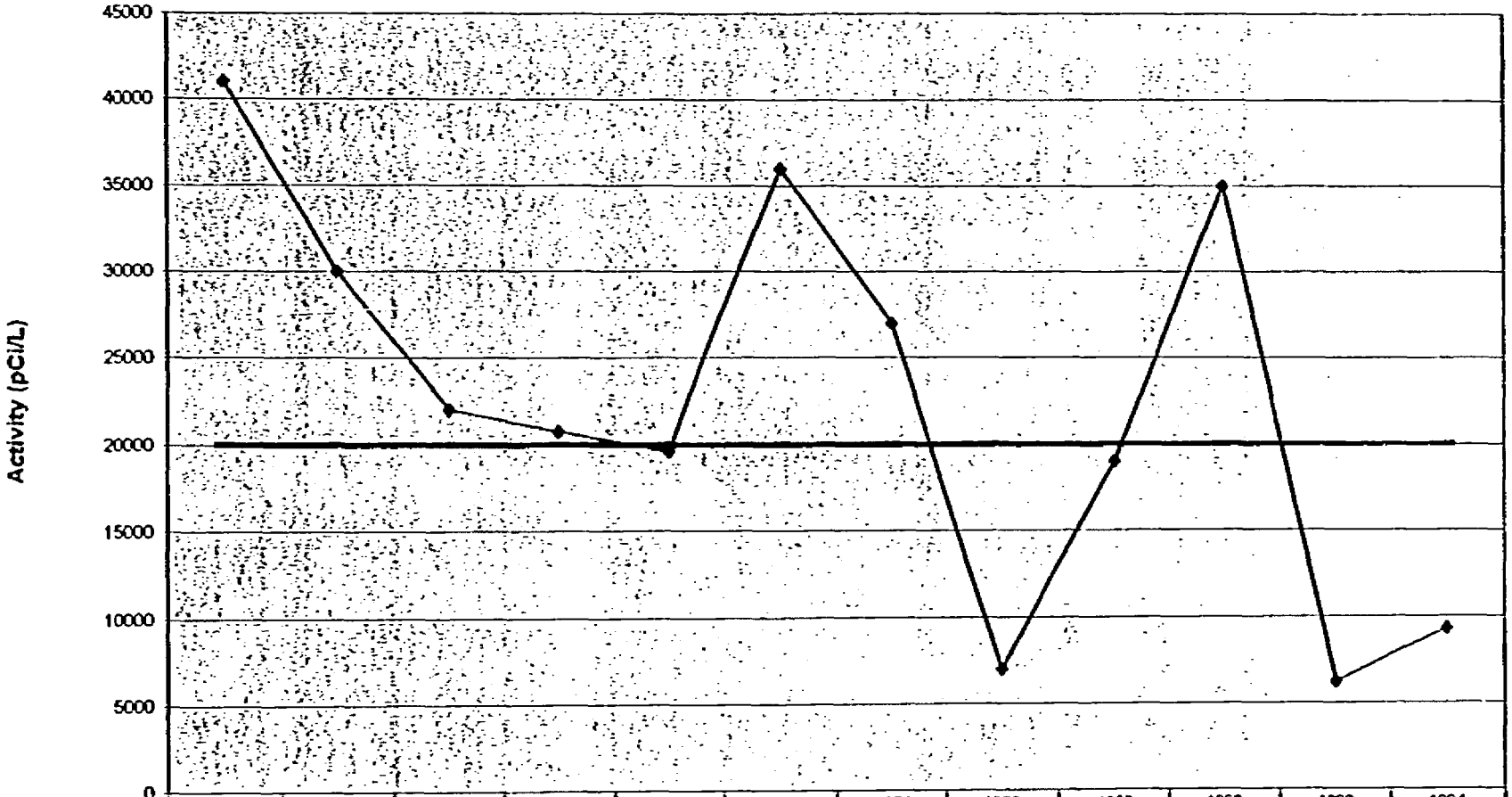
Plutonium-239/240 Activity for Well MCO- 7.5



	1967	1968	1969	1970	1972	1973	1974	1975	1976	1977	1978	1994	1995	1997	1998
MCO-7.5	0.1	0.3	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
DOE DCG-1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Year Sampled

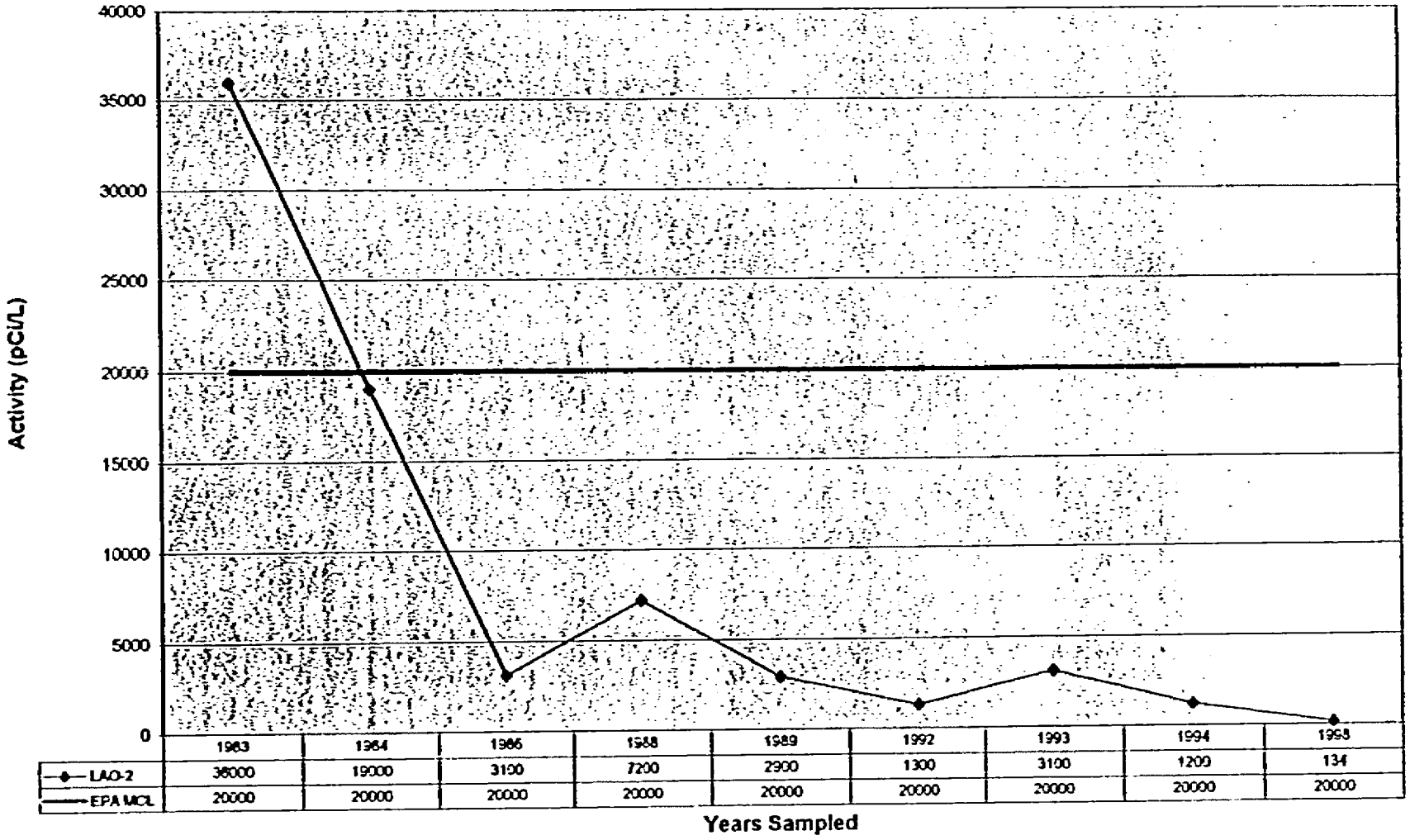
Tritium Activity in Well LAO-1



	1967	1968	1969	1971	1972	1973	1974	1975	1988	1992	1993	1994
LAO-1	41000	30000	22000	20750	19600	36000	27000	7000	19000	35000	6200	9300
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000

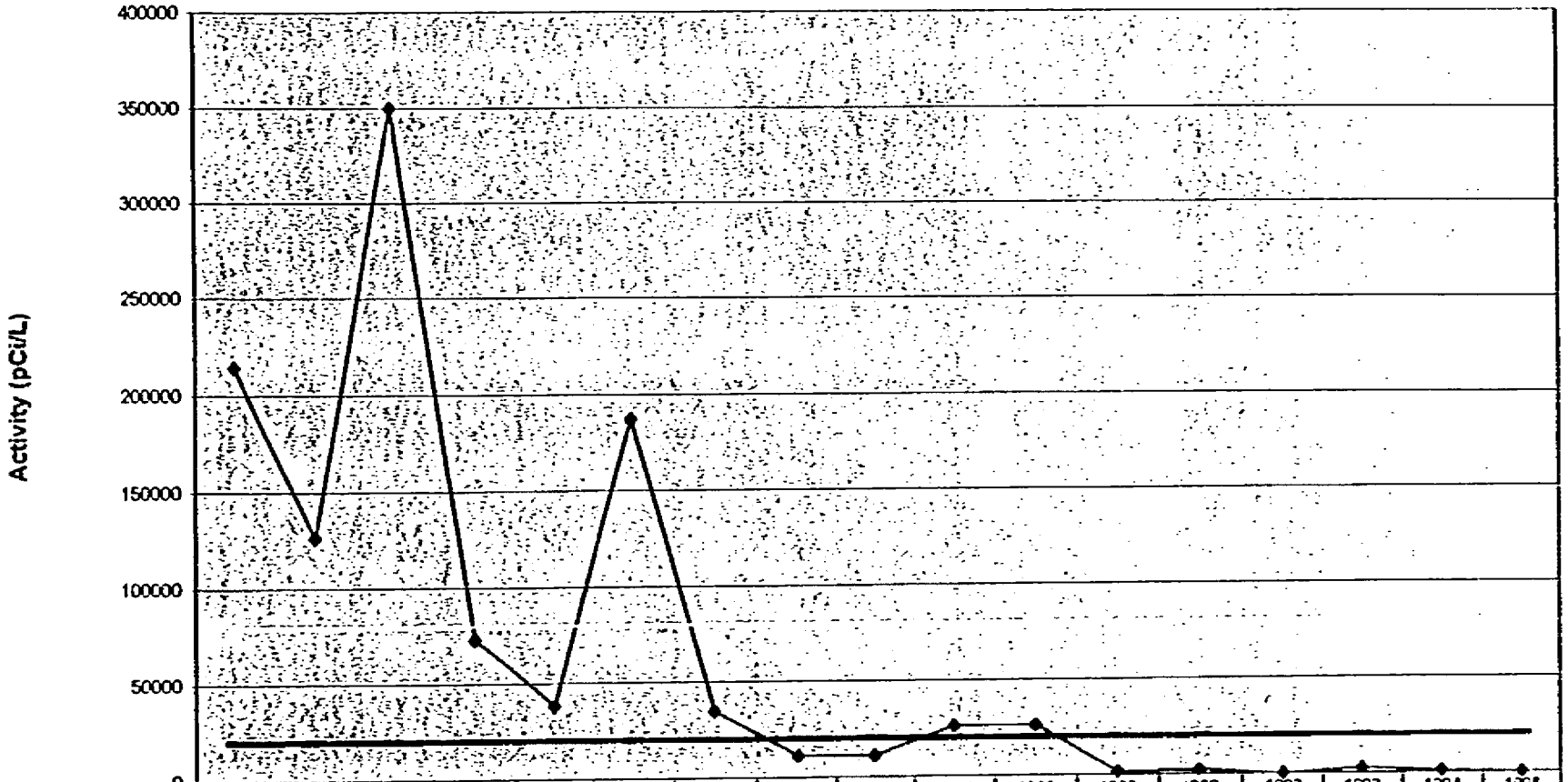
Years Sampled

Tritium Activity in Well LAO- 2



	1983	1984	1986	1988	1989	1992	1993	1994	1995
LAO-2	36000	19000	3100	7200	2900	1300	3100	1200	134
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000

Tritium Activity in Well LAO-3

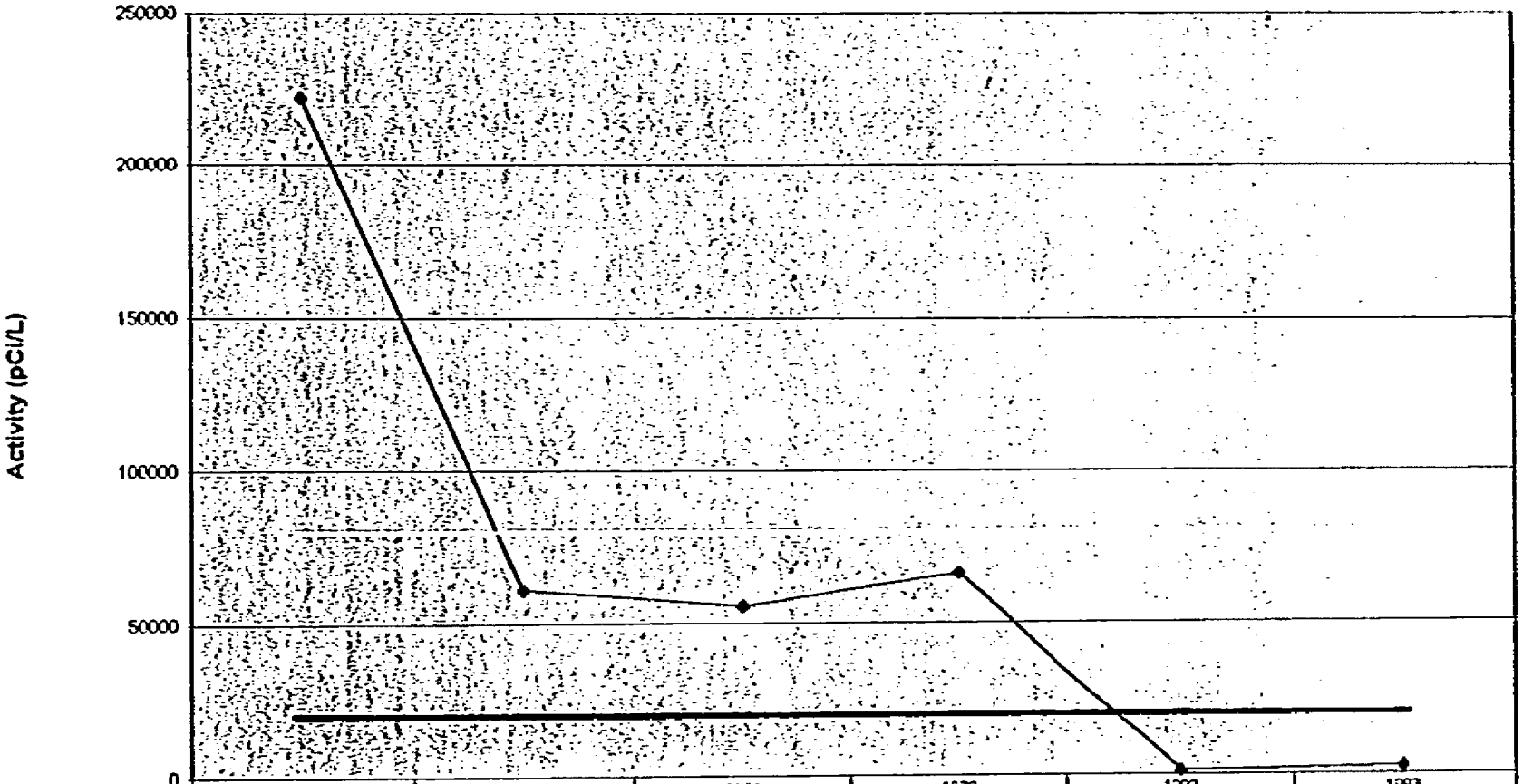


	1967	1968	1969	1970	1971	1972	1973	1974	1975	1984	1986	1988	1989	1992	1993	1994	1995
LAO-3	214000	126000	350000	73000	38000	187000	35000	11000	11000	26000	26000	1500	2100	100	2400	1000	99
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG-1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Years Sampled

FILE • 0000N • 0.0N

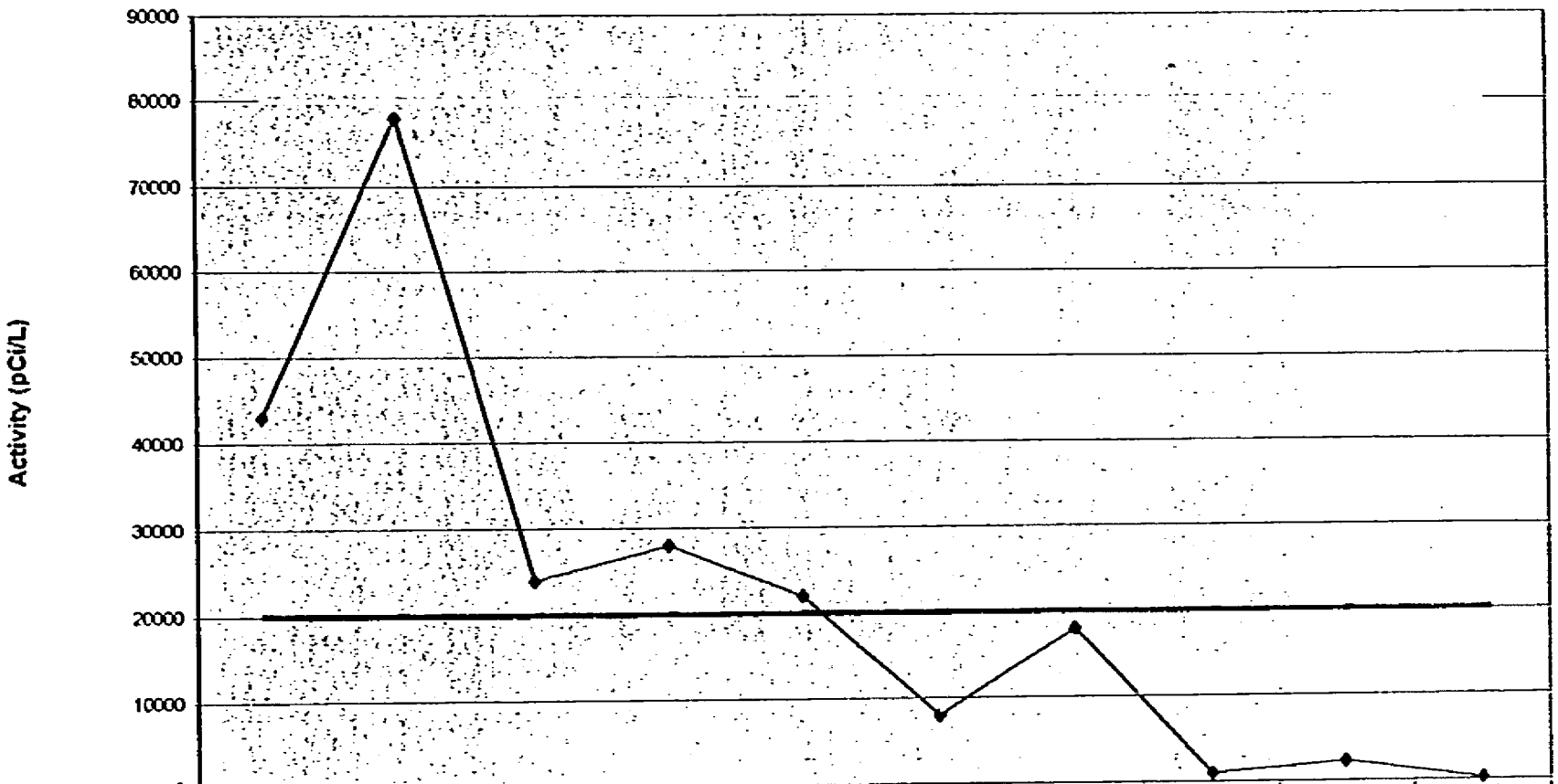
Tritium Activity in Well LAO-4



	1967	1968	1969	1970	1992	1993
LAO-4	222000	61000	55500	66000	1000	2300
EPA MCL	20000	20000	20000	20000	20000	20000
DOE DCG-1	80000	80000	80000	80000	80000	80000

Years Sampled

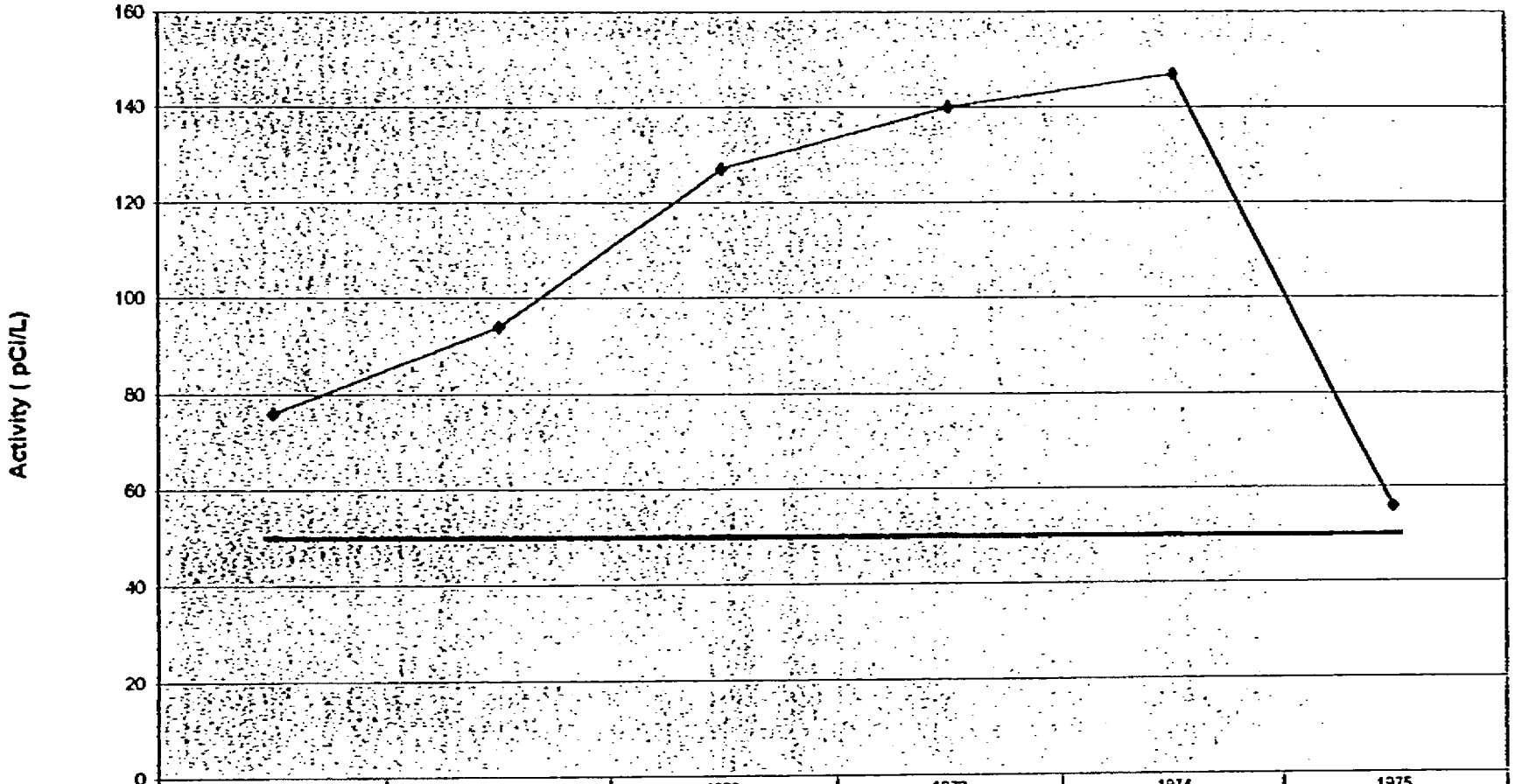
Tritium Activity in Well LAO-4.5



	1969	1970	1971	1972	1973	1974	1975	1992	1993	1995
LAO-4.5	43000	78000	24000	28000	22000	8000	18000	1000	2300	169
EPA MCL	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DOE DCG-1	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000

Years Sampled

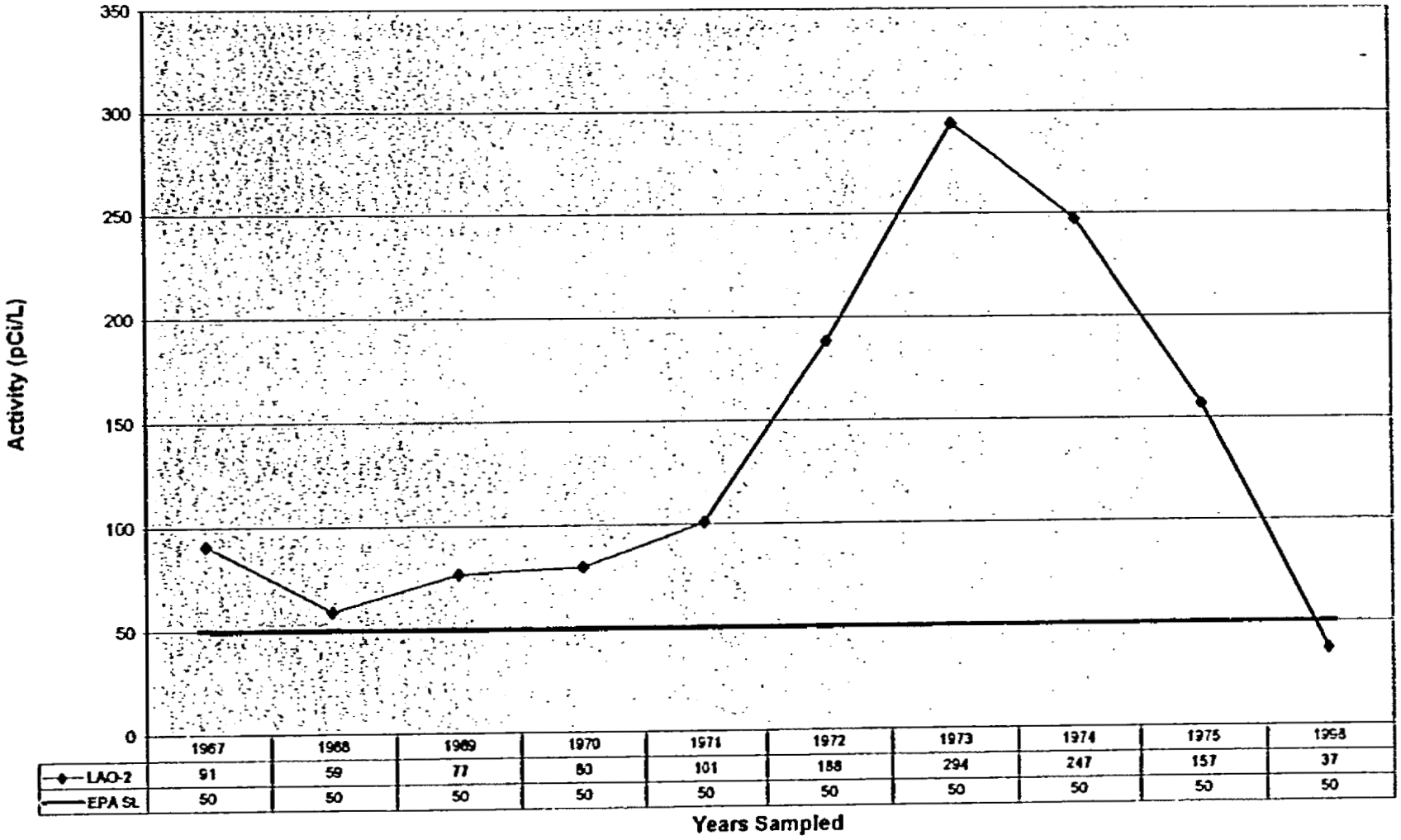
Gross Beta Activity in Well LAO-1



	1970	1971	1972	1973	1974	1975
LAO-1	76	94	127	140	147	56
EPA SL	50	50	50	50	50	50

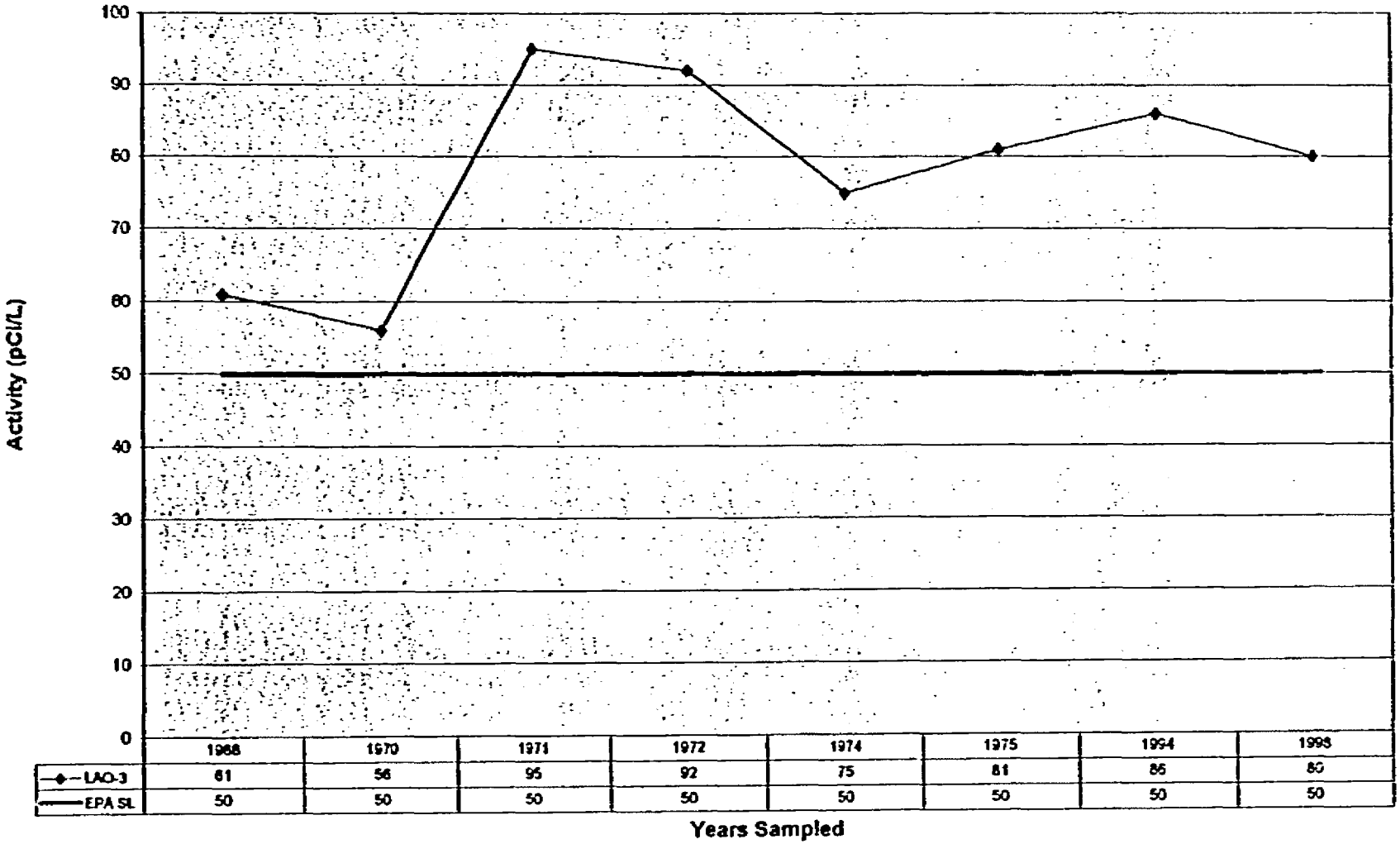
Years Sampled

Gross Beta Activity in Well LAO-2



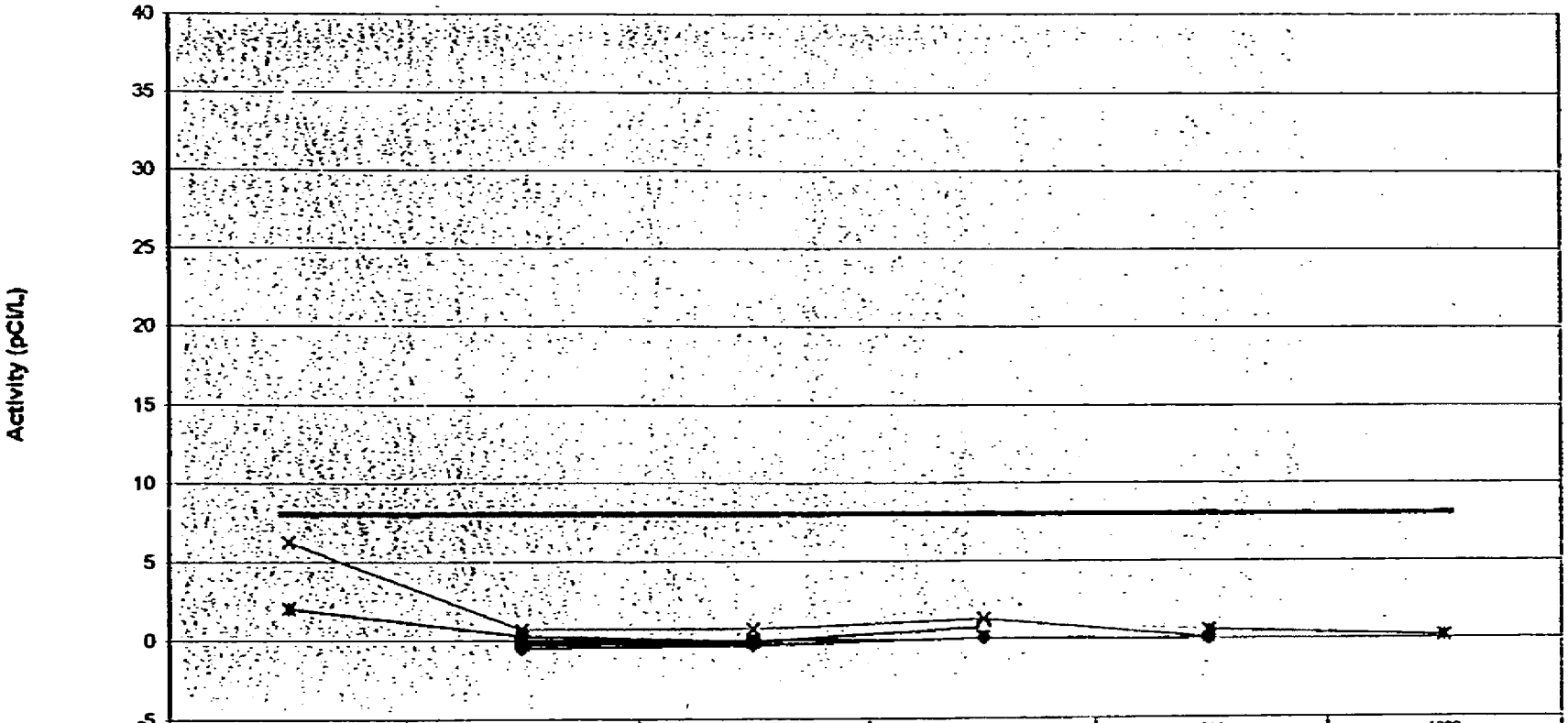
	1967	1968	1969	1970	1971	1972	1973	1974	1975	1998
LAO-2	91	59	77	80	101	188	294	247	157	37
EPA SL	50	50	50	50	50	50	50	50	50	50

Gross Beta Activity in Well LAO-3



	1968	1970	1971	1972	1974	1975	1994	1998
LAO-3	61	56	95	92	75	81	86	80
EPA SL	50	50	50	50	50	50	50	50

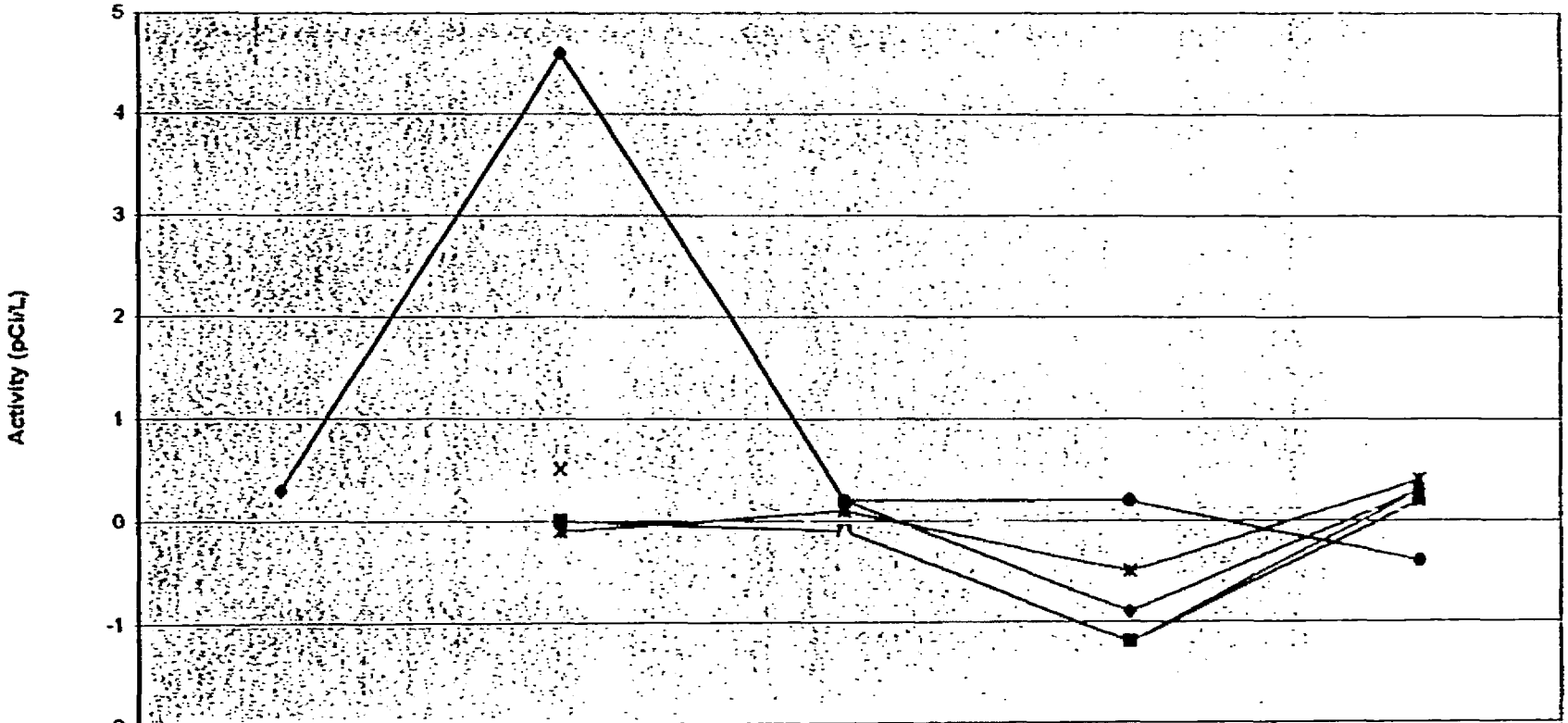
Strontium-90 Activiity in TW Series Wells



	1994	1995	1996	1997	1998	1999
TW-1		-0.5	-0.3	0.1	0	
TW-2		-0.2	-0.1	0.8		
TW-3	35.1	0.4	0.8	1	0.5	
TW-4	6.2	0.7	0.7	1.3	0.1	
TW-6	2.1	0.3	-0.1		0.6	0.2
EPA MCL	8	8	8	8	8	8

Year Sampled

Strontium-90 Activity in Supply Wells



	1994	1995	1996	1997	1998
PM-1	0.3	4.6	0.2	-0.9	0.3
PM-2		0	-0.1	-1.2	0.2
PM-3		0.67	-0.1	0.1	0.1
PM-4		0.5		-1.2	0.3
PM-5		-0.1	0.1	-0.5	0.4
O-4			0.2	0.2	-0.4

Year Sampled