Reports

Los Alamos
NATIONAL LABORATORY
EST. 1943

Los Alamos National Laboratory/University of California
Risk Reduction & Environmental Stewardship (RRES)
Remediation Services (RS), MS M992
Los Alamos, New Mexico 87545
(505) 667-0808/FAX (505) 665-4747

National Nuclear Security Administration
Los Alamos Site Operations, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-7203/FAX (505) 665-4504

Date: August 13, 2004
Refer To: ER2004-0421

Mr. John Young, Corrective Action Project Leader
Permits Management Program
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

RECEIVED
AUG 2004
NMED Hazardous
Waste Bureau

SUBJECT: QUARTERLY TECHNICAL REPORT FOR APRIL – JUNE 2004

Dear Mr. Young:

Enclosed are two copies of the Remediation Services Quarterly Technical Report, April – June 2004. The report presents information on the quarter's activities, including regulatory meetings, sampling, cleanups, and report writing. Also enclosed is a certification statement signed by the designee owner and operator for the Los Alamos National Laboratory. In accordance with Laboratory security requirements, copies of this report are available upon request through the external Remediation Services Web site at http://erproject.lanl.gov/documents/virtualhome.html. The report is also available on the internal Web site at http://erproject.lanl.gov/documents/VL/status.html.

If you have questions regarding this report, please contact Dave McInroy at (505) 667-0808 or David Gregory at (505) 667-5808.

Sincerely,

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

Sincerely,

David R Gregory

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Operations

DM/DG/MS/th

Enclosure: 1) Quarterly Technical Report for April - June 2004 (ER2004-0375)
2) Certification

8225

Cy:(w/ enc)
D. McInroy, RRES-RS, MS M992
C. Nylander, RRES-GPP, MS M992
N. Quintana, RRES-ECR, MS M992
C. Rodriguez, RRES-ECR, MS M992 (7 copies)
M. Sachdeva, RRES-ECR, MS M992
T. Trujillo, DOE-AL, MS A906
T. Longo, DOE-HQ, EM-453
D. Gregory, LASO, MS A316
G. Turner, LASO, MS A316
J. Schoeppner, NMED-GWQB
J. Kieling, NMED-HWB
V. Maranville, NMED-HWB
S. Yanicak, NMED-OB, J993
M. Leavitt, NMED-SWQB
A. Jordan, Washington, DC
L. King, EPA Region 6
D. M. Coontz, Los Alamos, NM 87544
Publications, S-7, MS F674
RRES-RS File, MS M992
IM-5, MS A150
RPF MS M707

Cy:(w/o enclosure)
B. Beers, RRES-WQH, MS K497
S. Bolivar, RRES-ECR, MS M992
A. Dorries, RRES-ECR, MS M992
T. Grieggs, RRES-SWRC, MS K490
B. Gallaher, RRES-WQH, MS K497
D. Hickmott, EES-6, MS D462
J. Hopkins, RRES-ECR, MS M992
R. Hutton, SAIC, MS J521
J. McCann, RRES-WQH, MS M992
P. Noll, RRES-ECR, MS M992
S. Rae, RRES-WQH, MS K497
D. Rogers, RRES-WQH, MS K497
S. Martin, NMED-HWB
C. Voorhees, NMED-OB

CERTIFICATION

CERTIFICATION BY THE RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP–REMEDIATION SERVICES (RRES–RS) PROJECT TECHNICAL REPRESENTATIVES

DOCUMENT TITLE: **QUARTERLY TECHNICAL REPORT, APRIL-JUNE 2004, LOS ALAMOS NATIONAL LABORATORY, RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP-REMEDIATION SERVICES**

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Name: _____ Date: 8/11/04

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

or

_____ Date: _____

Beverly A. Ramsey, Division Leader
Risk Reduction and Environmental Stewardship Division
Los Alamos National Laboratory

_____ Date: 8/12/04

David Gregory, Federal Project Director
Environmental Restoration Program
Department Of Energy/Los Alamos Site Office

or

_____ Date: _____

Herman LeDoux,
Assistant Area Manager of
Environmental Projects
Department Of Energy/Los Alamos Site Office

LIBRARY COPY

LA-UR-04-5103
August 2004
ER2004-0375

Quarterly Technical Report April–June 2004

Los Alamos
NATIONAL LABORATORY
Los Alamos NM 87545

Disclaimer

This document contains data on radioactive materials, including source, special nuclear, and by-product material. The management of these materials is regulated under the Atomic Energy Act and is specifically excluded from regulation under the Resource Conservation and Recovery Act and the New Mexico Hazardous Waste Act. These data are provided to the New Mexico Environment Department for informational purposes only.

Produced by Risk Reduction and Environmental Stewardship–Remediation Services

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by the University of California for the United States Department of Energy under contract W-7405-ENG-36.

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the Regents of the University of California, the United States Government nor any agency thereof, nor any of their employees make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represent that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the Regents of the University of California, the United States Government, or any agency thereof.

Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness. By acceptance of this article, the publisher recognizes that the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy.

Los Alamos
NATIONAL LABORATORY
EST. 1943

Los Alamos National Laboratory/University of California
Risk Reduction & Environmental Stewardship (RRES)
Remediation Services (RS), MS M992
Los Alamos, New Mexico 87545
(505) 667-0808/FAX (505) 665-4747

National Nuclear Security Administration
Los Alamos Site Operations, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-7203/FAX (505) 665-4504

Date: August 13, 2004
Refer To: ER2004-0421

Mr. John Young, Corrective Action Project Leader
Permits Management Program
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

RECEIVED
AUG 2004
NMED Hazardous
Waste Bureau

SUBJECT: QUARTERLY TECHNICAL REPORT FOR APRIL – JUNE 2004

Dear Mr. Young:

Enclosed are two copies of the Remediation Services Quarterly Technical Report, April – June 2004. The report presents information on the quarter's activities, including regulatory meetings, sampling, cleanups, and report writing. Also enclosed is a certification statement signed by the designee owner and operator for the Los Alamos National Laboratory. In accordance with Laboratory security requirements, copies of this report are available upon request through the external Remediation Services Web site at http://erproject.lanl.gov/documents/virtualhome.html. The report is also available on the internal Web site at http://erproject.lanl.gov/documents/VL/status.html.

If you have questions regarding this report, please contact Dave McInroy at (505) 667-0808 or David Gregory at (505) 667-5808.

Sincerely,

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

Sincerely,

David R Gregory

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Operations

DM/DG/MS/th

Enclosure: 1) Quarterly Technical Report for April - June 2004 (ER2004-0375)
2) Certification

Cy:(w/ enc)
D. McInroy, RRES-RS, MS M992
C. Nylander, RRES-GPP, MS M992
N. Quintana, RRES-ECR, MS M992
C. Rodriguez, RRES-ECR, MS M992 (7 copies)
M. Sachdeva, RRES-ECR, MS M992
T. Trujillo, DOE-AL, MS A906
T. Longo, DOE-HQ, EM-453
D. Gregory, LASO, MS A316
G. Turner, LASO, MS A316
J. Schoeppner, NMED-GWQB
J. Kieling, NMED-HWB
V. Maranville, NMED-HWB
S. Yanicak, NMED-OB, J993
M. Leavitt, NMED-SWQB
A. Jordan, Washington, DC
L. King, EPA Region 6
D. M. Coontz, Los Alamos, NM 87544
Publications, S-7, MS F674
RRES-RS File, MS M992
IM-5, MS A150
RPF MS M707

Cy:(w/o enclosure)
B. Beers, RRES-WQH, MS K497
S. Bolivar, RRES-ECR, MS M992
A. Dorries, RRES-ECR, MS M992
T. Grieggs, RRES-SWRC, MS K490
B. Gallaher, RRES-WQH, MS K497
D. Hickmott, EES-6, MS D462
J. Hopkins, RRES-ECR, MS M992
R. Hutton, SAIC, MS J521
J. McCann, RRES-WQH, MS M992
P. Noll, RRES-ECR, MS M992
S. Rae, RRES-WQH, MS K497
D. Rogers, RRES-WQH, MS K497
S. Martin, NMED-HWB
C. Voorhees, NMED-OB

CERTIFICATION

CERTIFICATION BY THE RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP–REMEDIATION SERVICES (RRES–RS) PROJECT TECHNICAL REPRESENTATIVES

DOCUMENT TITLE: **QUARTERLY TECHNICAL REPORT, APRIL-JUNE 2004, LOS ALAMOS NATIONAL LABORATORY, RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP-REMEDIATION SERVICES**

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Name: _____ Date: 8/11/04

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

or

_____ Date: _____

Beverly A. Ramsey, Division Leader
Risk Reduction and Environmental Stewardship Division
Los Alamos National Laboratory

_____ Date: 8/12/04

David Gregory, Federal Project Director
Environmental Restoration Program
Department Of Energy/Los Alamos Site Office

or

_____ Date: _____

Herman LeDoux,
Assistant Area Manager of
Environmental Projects
Department Of Energy/Los Alamos Site Office

CONTENTS

1.0 INTRODUCTION 1

2.0 WORK PACKAGES 1

2.1 Townsites — Project Leader: Terry Rust 1
2.2 Industrial Sites — Project Leader: Gabriela Lopez Escobedo 2
2.3 High Explosives Production Sites and MDA P Closure — Project Leaders: Don Hickmott and Bill Criswell 4
2.4 Canyon Investigations — Acting Project Leader: Kent Rich 5
2.5 Deep Groundwater Wells — Project Leader: John McCann 7
2.6 TA-21 MDAs — Project Leader: Ron Rager 7
2.7 TA-21 Non-Material Disposal Areas — Project Leaders: Mark Thacker and Becky Coel-Roback 8
2.8 TA-49, TA-50, and TA-54 — Project Leaders: John Hopkins and Dwain Farley 9
2.9 Corrective Action Strategy — Project Leader: Richard Mirenda 10
2.10 Regulatory Compliance — Project Leader: Phillip Noll 14
2.11 Land Transfer — Project Leader: Terry Rust 16
2.12 Documentation and Tracking — Project Leader: Stephen Bolivar 17
2.13 Facility Integration and Site Identification — Project Leader: Roy Bohn 18
2.14 Surface Water Programs and BMPs — Project Leader: Steve Veenis 20

3.0 REFERENCES 22

APPENDIX A GROUNDWATER SAMPLING RESULTS, WELLS R-12, R-14, R-23, AND R-32

APPENDIX B DP CANYON QUARTERLY INSPECTION REPORT, THIRD QUARTER, FISCAL YEAR 2004

APPENDIX C QUARTERLY MOISTURE-MONITORING REPORT, THIRD QUARTER, FISCAL YEAR 2004, TECHNICAL AREA 49, MATERIAL DISPOSAL AREA AB

APPENDIX D QUARTERLY PORE-GAS SAMPLING AT TECHNICAL AREA 54, MATERIAL DISPOSAL AREAS L AND G, THIRD QUARTER, FISCAL YEAR 2004

LIST OF ACRONYMS AND ABBREVIATIONS

ACA	accelerated corrective action
AOC	area of concern
BMP	best management practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	corrective measures study
COPC	chemical of potential concern
D&D	decontamination and decommissioning
DI	Desk Instruction
DOE	US Department of Energy
DSA	documented safety analysis
Eco-SSL	ecological soil screening level
EM	Office of Environmental Management (DOE)
EMS	Emergency Management System
EPA	US Environmental Protection Agency
ER	Environmental Restoration Project
ERDB	Environmental Restoration Database
ESH-ID	environment, safety, and health identification number
ESL	ecological screening levels
ET	evapotranspiration
FMU	Facilities Management Unit
FWO-IP	Facilities and Waste Operations Division–Infrastructure Projects Group
FWO-UI	Facilities and Waste Operations Division–Utilities and Infrastructure Group
FY	fiscal year
GIS	Geographic Information System
GPS	Global Positioning System
HSWA	Hazardous and Solid Waste Amendments
IM	interim measure
ISM	Integrated Safety Management
Laboratory	Los Alamos National Laboratory
LIR	Laboratory Implementation Requirement
MDA	material disposal area

NEPA	National Environmental Policy Act
NFA	no further action
NMED	New Mexico Environment Department
NMED-HWB	New Mexico Environment Department-Hazardous Waste Bureau
NMED-HRMB	New Mexico Environment Department-Hazardous and Radioactive Materials Bureau
NMED-SWQB	New Mexico Environment Department-Surface Water Quality Bureau
NNMCAB	Northern New Mexico Citizens Advisory Board
NNSA	National Nuclear Security Administration
NSSB	National Security Sciences Building
NOD	notice of deficiency
NTISV	nontraditional in situ vitrification
PAMG	Performance Assessment Maintenance Group
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PM	Program Management (Laboratory Division)
ppmv	parts per million by volume
PR-ID	permit and requirement identification
PRS	potential release site
QA	quality assurance
QP	quality procedure
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RPD	relative percent difference
RPF	Records Processing Facility
RRES	Risk Reduction and Environmental Stewardship Division
RRES-ECR	Risk Reduction and Environmental Stewardship Division–Environmental Characterization and Remediation Group
RRES-OEIM	Risk Reduction and Environmental Stewardship Division–Office of Environmental Information Management Group
RRES-RS	Risk Reduction and Environmental Stewardship Division–Remediation Services Group
RRES-SWRC	Risk Reduction and Environmental Stewardship Division–Solid Waste Regulatory Compliance Group
RRES WQH	Risk Reduction and Environmental Stewardship Division–Water Quality and Hydrology Group
RSI	request for supplemental information

SAP	sampling and analysis plan
SMART	Spatial Mapping and Reporting Tool
SMO	Sample Management Office
SOP	standard operating procedure
SVE	soil vapor extraction
SWAT	Surface Water Assessment Team
SWMU	solid waste management unit
TA	technical area
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TDR	time domain reflectometry
TPH	total petroleum hydrocarbons
TRV	toxicity reference value
VCA	voluntary corrective action
VCM	voluntary corrective measure
VOC	volatile organic compound
WCSF	Waste Characterization Strategy Form

QUARTERLY TECHNICAL REPORT

APRIL–JUNE 2004

LOS ALAMOS NATIONAL LABORATORY

RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP

REMEDIATION SERVICES

LOS ALAMOS SITE OFFICE

CONTRACTOR: University of California

DEPUTY PROJECT DIRECTOR: David McInroy

NUMBER OF POTENTIAL RELEASE SITES: Approximately 830

POTENTIAL WASTE: Radionuclides, High Explosives, Inorganic Chemicals, Organic Chemicals

1.0 INTRODUCTION

This quarterly report describes the technical status of activities in the Los Alamos National Laboratory (the Laboratory) Risk Reduction and Environmental Stewardship–Remediation Services (RRES-RS), formerly the Environmental Restoration (ER) Project. The activities are reported according to the current program structure and then, when applicable, by the technical area (TA) where the specific activity is located. The Hazardous and Solid Waste Amendments (HSWA) portion of the Laboratory's Hazardous Waste Facility Permit (Module VIII, Section P, Task V, C) requires the submission of a technical progress report on a quarterly basis. This report, submitted to fulfill the permit's requirement, summarizes much of the fieldwork and report-writing performed this quarter in RRES-RS.

2.0 WORK PACKAGES

2.1 Townsites — Project Leader: Terry Rust

2.1.1 TA-00

DP Road Land Transfer Tract [SWMUs 00-030(a), 00-030(b)-00, and 00-033(a) and part of SWMU 21-021-99] and AOCs 00-010(a,b), 00-027, and 00-029(a,b,c). Soil vapor extraction (SVE) continues at Area of Concern (AOC) 00-027; the extraction rate continues to be approximately 8–10 lb per day. The team has evaluated the removal trend since system start-up; conducted pulse-mode operational tests to evaluate removal rate differences resulting from differing operational methods; and is preparing for system shutdown, removal, and confirmatory sampling.

RRES-RS personnel responded to a notice of deficiency (NOD) received from the New Mexico Environment Department (NMED) this quarter for the voluntary corrective action (VCA) completion report for Solid Waste Management Units (SWMUs) 00-030(a), 00-030(b)-00, and 0-033(a), AOCs 00-010(a,b)

and 00-029(a,b,c). The report was subsequently approved by NMED, with modifications, on June 21, 2004. The team is preparing for additional sampling and remediation proposed in the NOD response to be conducted along with the AOC 00-027 confirmatory sampling.

2.1.2 TA-01

Preliminary procurement activities have begun in anticipation of start-up of the reinvestigation and additional remediation of the former TA-01 area in the fourth quarter.

2.1.3 TA-19

A letter of disapproval was received from NMED, and a response was submitted for the accelerated corrective action (ACA) work plan for the investigation and remediation of SWMU 19-001-99 (the former TA-19/East Gate Laboratory). The work plan was subsequently approved by NMED, with modifications, on June 23, 2004.

2.1.4 TA-73

Work continues on the development of a work plan for the construction of an appropriate cover for the airport landfill. Work included 60% and 90% design reviews as well as a review of the prepared work plan before submittal to the NMED.

Staff solicited bids from subcontractors to resume the remedial action at SWMU 73-002-99 (miscellaneous airport structures) but are awaiting a US Department of Energy (DOE) decision regarding alternative subcontracting options and the level, if any, of future Laboratory involvement in this project before awarding the work and beginning the project.

2.1.5 Facility Integration Activities

Land transfer, private property, Los Alamos community development, and other non-DOE property-related issues were addressed this quarter.

2.2 Industrial Sites — Project Leader: Gabriela Lopez Escobedo

2.2.1 TA-03

SWMU 03-010(a). Work being conducted to determine the relationship between precipitation and the water level in monitoring well MW-1 at SWMU 03-010(a), a former systematic release from a vacuum repair shop west of Building 03-30, was interrupted in April after the discovery of an opening in the well annulus. The water-level monitoring within MW-1 at SWMU 03-010(a) was being conducted according to a response to a request for supplemental information (RSI) for the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) report addendum for SWMU 03-010(a).

As a result of the meeting with NMED held on March 30, 2004, the groundwater investigation work plan for this site was approved with modifications. A decision was made to sample MW-1 once after a dry period and once after a wet period; an addendum to the investigation work plan (i.e., sampling and analysis plan [SAP]) was written; and a 10-day notification summarizing the methods and analyses was sent to NMED on April 15, 2004.

Wellhead improvement, as specified in the work plan, began April 16, 2004, and the MW-1 transducer was removed prior to the start of those activities at the site.

MW-1 Transducer Data Summary and Interpretation

The pressure transducer installed in MW-1 recorded temperature and pressure data hourly until April 16, 2004. At this time, the transducer was removed to investigate the integrity of MW-1. The trend in water-column height and precipitation events from February 20 to April 16, 2004, is shown in Figure 2.2-1.

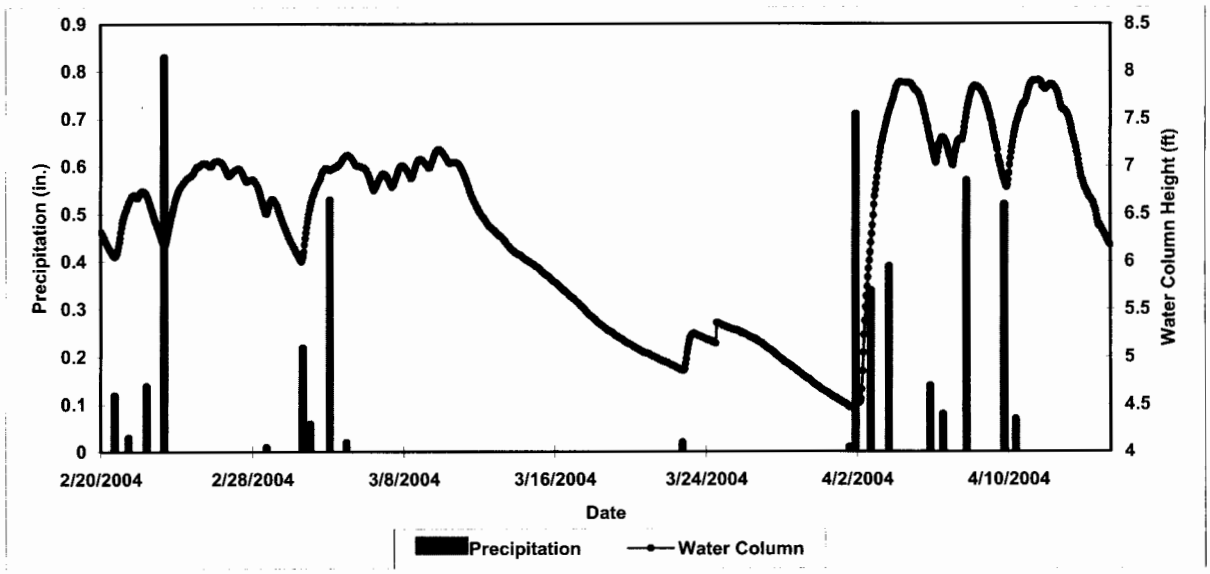

Figure 2.2-1. Water-column height in MW-1 versus precipitation events, February 20 through April 16, 2004

The pressure transducer data collected during this quarter again shows significant responses to precipitation events. The rapid response in MW-1 to precipitation events and daily freeze/thaw cycles probably results from rapid infiltration of surface water through the well annulus. Therefore, all data collected from this well are suspect, and additional data will be collected from new boreholes to be drilled in the vicinity of MW-1.

2.2.2 Middle Mortandad/Ten Site Aggregate

Supplement to the Sampling and Analysis Plan for Middle Mortandad and Ten Site Aggregate. A response to the NMED RSI for the supplement to the Middle Mortandad/Ten Site Aggregate SAP was submitted June 9, 2004. The Laboratory's response to the NOD was delivered to NMED on June 9, 2004. NMED sent its approval of the supplemental SAP on June 25, 2004. However, the approval letter stated that the Laboratory must provide documents supporting no further action (NFA) determinations by the Environmental Protection Agency (EPA) for seven AOCs listed in the supplemental SAP as NFA, or include the AOCs in the supplemental SAP. The Laboratory will send the supporting documentation from the EPA for AOCs 05-006(d), 05-006(f), 05-006(g), C-05-001, 52-002(g), 52-004, and 63-002. Excavation permits were initiated for TAs-04, -05, -52, -60, and -63 to begin geomorphic investigations of select drainage channels in early July. Because spotted owl habitat exists within the Middle Mortandad/Ten Site Aggregate near TA-35, geomorphic investigations of TAs-04, -05, -52, -60, and -63 will precede those at TA-35; however, mesa-top sampling at TA-35 will be performed.

2.2.3 TA-53

SWMU 53-002(a)-99, Northern and Southern Surface Impoundments. Personnel are awaiting comments on or approval of the investigation and remediation report for SWMU 53-002(a)-99 and AOC 53-008 (LANL 2004, 85221), which was delivered to NMED on January 30, 2004.

2.2.4 Facility Integration Activities

During the third quarter of fiscal year (FY) 2004, Industrial Sites Team members responded to approximately 240 requests for excavation permits, permit and requirement identification (PR-ID) questionnaires, and facility inquiries about new construction projects. In addition, the team worked with facility managers (by attending meetings, conducting field visits, and providing information) on ongoing projects and planned construction projects collocated with SWMUs and AOCs. Section 2.13 further describes the activities undertaken this quarter.

2.3 High Explosives Production Sites and MDA P Closure — Project Leaders: Don Hickmott and Bill Criswell

2.3.1 TA-16-260 Outfall Corrective Action

The TA-16-260 Outfall Corrective Action Team continued fieldwork, data analysis, and NOD response activities in support of the corrective measures study (CMS) at SWMU 16-021(c)-99 (the 260 Outfall). Hydrogeology studies and high-performance team activities also continued this quarter.

2.3.1.1 TA-16 CMS Hydrogeology and Monitoring

The field team continued to monitor water levels in the Cañon de Valle alluvial wells and in the intermediate-depth wells. The hydrologic system in that canyon became wet during spring runoff in March and remained wet through April and into May. Surface flow in Cañon de Valle extended from near the TA-16-260 outfall to several thousand feet past Material Disposal Area (MDA) P. All five alluvial wells in Cañon de Valle contained water during the first half of this quarter; the uppermost well was dry in the second half of the quarter. Surface flow was present in Martin Spring Canyon in April, and all three alluvial wells in that canyon contained standing water. Water persisted in the lowermost Martin Spring Canyon alluvial well throughout the quarter. Martin Spring and SWSC Spring both were flowing in April, and this flow persisted into May. The Fishladder seep and the 90s Line pond were wet during April and May. The Cañon de Valle headwaters were saturated, and a small new spring continued to flow in the headwaters region. The intermediate depth wells were dry. Quarterly sampling in the Cañon de Valle alluvial system was completed in April at the above locations containing water.

Deep wells CdV-R-15-3 and CdV-R-37-2 were sampled during April. Field parameters were consistent with previous sampling rounds. Screen 2 at CdV-R-37-2 continues to have relatively high turbidity (14.2 nephelometric turbidity units this quarter).

Three intermediate-depth boreholes continued to be monitored. The first borehole, CdV-16-1(i), will be sampled in the first quarter of FY2005. The second borehole, CdV-16-2(i), was drilled east of the TA-16 Burning Ground to a total depth of 1063 ft. It was completed as a two-screen well, with the screens located at approximately 860 and 1000 ft. This well became dry in January 2004. Another borehole, CdV-6-3(i), was drilled southeast of TA-16-340 to a depth of approximately 1400 ft. No water was observed in this borehole during drilling; therefore, it has not been completed as a well. Water-level measurements in CdV-16-2(i) suggest that little water is being produced in the borehole, whereas similar

measurements in CdV-16-3(i) suggest that water is present, but infiltration is extremely slow. Water levels remained relatively constant during this quarter. Low levels of high explosives were detected in the initial laboratory samples from two of these boreholes. Stable isotope samples were also collected during precipitation events.

An approval with modifications for the Phase III RFI report for SWMU 16-021(c)-99 was received in late June 2004. A response to this approval letter must be submitted to NMED by July 23, 2004.

2.3.1.2 SWMU 16-021(c)-99 CMS

The CMS report for SWMU 16-021(c)-99 was submitted to NMED on November 26, 2003. There was no new activity related to this report during this quarter.

2.3.1.3 Surface Water

Best management practices (BMPs) at SWMU 16-021(c)-99 were inspected and maintained.

2.3.2 TA-16-340 Complex

The investigation work plan for the TA-16-340 Complex was submitted to NMED on March 31, 2004. This work plan describes cleanup activities, which will be coordinated with decontamination and decommissioning (D&D) activities at the TA-16-340 Complex, and Phase II characterization activities for soils, tuff, and alluvial groundwater associated with SWMUs at the TA-16-340 Complex. The Laboratory received a notice of disapproval of this work plan in May 2004 and sent a response to NMED within 30 days. NMED approved this work plan on June 28, 2004. Preparations for the readiness review for this project began in June 2004.

2.3.3 MDA P Closure

The MDA P and Flash Pad 387 closure certification report was submitted to NMED October 31, 2003. The VCA report for SWMU 16-016(c)-99 (Flash Pad 386, a barium nitrate pile, and a septic system) was submitted to NMED November 26, 2003. A response to an RSI from NMED for the closure certification report was submitted on May 14, 2004.

2.4 Canyon Investigations — Acting Project Leader: Kent Rich

2.4.1 Los Alamos and Pueblo Canyons

The Los Alamos and Pueblo Canyons Investigation Report was submitted to the NMED on April 30, 2004. This report presents the results of studies conducted on sediment, surface water, alluvial groundwater, and biota from 1996 to 2003 in Los Alamos, Pueblo, DP, and Acid Canyons. The objectives of this investigation included defining the nature and extent of chemicals of potential concern (COPCs) and assessing the potential risks to human health and the environment from these COPCs. The Cerro Grande fire occurred during the investigation, and the report assesses the impact of the fire on COPC concentrations in canyons media. The results of this investigation indicate that, for contaminants released from Laboratory SWMUs and AOCs, human health risks are below NMED's and DOE's target levels for present-day and foreseeable future land uses, and adverse ecological effects have not been observed in terrestrial and aquatic systems in the watershed. Therefore, remedial actions are not needed to mitigate unacceptable risks.

2.4.2 Mortandad Canyon

Following the Laboratory's response to the NOD for the groundwater work plan for Mortandad Canyon (LANL 2003, 79557), a revised groundwater work plan was prepared and submitted to NMED on January 16, 2004 (LANL 2004, 82613). The NMED approved the work plan on February 11, 2004.

2.4.2.1 Sediment Investigation

Phase 2 sediment investigations in the Mortandad Canyon watershed included geomorphic mapping, associated geomorphic characterization, and sediment sampling in reaches E-1, M-1, M-4, M-5, M-6, TS-1, and TS-2 in Effluent, Mortandad, and Ten Site Canyons. This work included collecting 121 sediment samples for submission to off-site analytical laboratories. Three new investigation areas were added during this quarter to address potential data gaps. Reach E-1 Far West is located in Effluent Canyon upstream from TA-55 and will allow an evaluation of the relative impacts of discharges from TA-48 (upstream) and TA-55 (downstream). Reach M-1 Central is located in Mortandad Canyon upstream of TA-48 and will allow an evaluation of the relative impacts of discharges from TA-3 and TA-48. Reach M-5 West is located between the sediment traps and the San Ildefonso Pueblo boundary and will help constrain the downstream extent of contamination in Mortandad Canyon. Phase 2 sediment investigations will continue in the fourth quarter with additional work in reaches E-1, M-2, M-3, and M-4.

2.4.2.2 Surface and Alluvial Groundwater Investigation

In accordance with the approved Mortandad Canyon groundwater work plan (LANL 2004, 82613), planning for installation of alluvial groundwater monitoring wells has begun. Planning activities include procurement of drilling contractors, staking well and borehole locations, obtaining permits, and completing safety and waste management plans. Drilling is currently planned for August. A delay in the original schedule described in the previous quarterly report was caused by the presence of a pair of spotted owls in the canyon. A work exclusion area has been established in the canyon to avoid potential disruptions during the owls' mating season. Surface water sampling sites have been selected and are discussed in the approved groundwater work plan.

2.4.2.3 Infiltration Investigation

The primary goal of the infiltration study is to quantify subsurface fluxes in the zones from the land surface to the zone below the alluvial aquifer to better understand the rates of contaminant movement in the various parts of Mortandad Canyon. A temperature-probe will be used to determine the temporal and spatial variability in downward fluxes from stream channel, and Gee flux meters will be used to monitor fluxes in areas adjacent to the channel. Downhole temperature perturbation technology will be used to provide three-dimensional flux information in the alluvial aquifer to allow for a comparison of downward versus lateral fluxes in the aquifer. Water content and matric potential measurements in boreholes below the alluvial aquifer will be conducted to quantify fluxes in the zone between the alluvial and perched intermediate aquifers. Various flux measurement equipment will be installed in locations from just below the TA-50 outfall to near the Laboratory boundary to quantify fluxes in the various parts of the canyon. All approaches will allow temporal changes in flux to be evaluated. Upcoming characterization and monitoring drilling will be performed to install infiltration monitoring equipment. Target installation areas were selected according to existing hydrologic and contaminant information as well as recent geophysical surveys. Fourth quarter activities will include installing equipment in coordination with the drilling activities scheduled to begin in August.

2.4.2.4 Regional Groundwater Investigation

The observation of spotted owls in Mortandad Canyon has delayed the drilling planned as part of the Mortandad Canyon groundwater work plan (LANL 2004, 82613). Installation of boreholes R-33 and R-34 in Mortandad Canyon is now scheduled to be completed during the last quarter of FY2004. Field orientation with the drilling contractor was conducted in May 2004. Drilling will begin on July 6, 2004, at the site for R-34, to the south of the main channel of Mortandad Canyon and within the boundaries of San Ildefonso Pueblo. Upon completion of drilling at R-34, the drill rig will be moved to the R-33 drill site in lower Ten Site Canyon. This site is to the east of the provisional location for R-33 listed in the Mortandad Canyon groundwater work plan (LANL 2004, 82613). The new location was chosen to provide a better assessment of possible movement of contaminants from the region of the sediment traps in Mortandad Canyon toward production well PM-5.

2.5 Deep Groundwater Wells — Project Leader: John McCann

No drilling activities took place during the third quarter. Drilling is planned for the fourth quarter of FY2004 and will be reported in the next quarterly results.

Aquifer test analysis results were published for regional well R-15. Combined aquifer analysis results for intermediate well R-9i and regional wells R-13, R-19, and R-22 have been revised, and a report of testing results is being prepared. In addition, reports on aquifer test analysis results for regional wells R-14, R-16, R-20, and R-32 are being edited and will be released in the fourth quarter of FY2004.

Groundwater sampling activities for the regional and intermediate wells are as follows. The upper screen from well R-5 accessing intermediate groundwater was sampled in May 2004. Regional aquifer sampling was performed in April 2004 at R-14, CdV-R-15-3, and CdV-R-37-2. Sampling was conducted in May 2004 in regional wells R-5, R-8, R-16, R-20, and R-32. Sampling in June 2004 was conducted at wells R-9i, R-12, R-13, R-15, R-19, R-21, R-22, R-23, CdV-R-15-3, and CdV-R-37-2.

In March 2004, difficulties were encountered during sampling of R-31 zones 3 (670 ft), 4 (830 ft), and 5 (1011 ft). Field personnel were unable to open the sampling ports fully, resulting in the collection of deionized water from the inner annulus and thus corrupting the samples. Action is being taken to diagnose the problem. A hiatus in sampling of R-14 is in effect until August 2004 to avoid disruption to a pair of spotted owls observed nesting in upper Mortandad Canyon.

Hydrochemical groundwater data from R-12 (sixth sampling round), R-14 (first sampling round), R-23 (first and second sampling round), and R-32 (first and second sampling round) are presented in Appendix A.

2.6 TA-21 MDAs — Project Leader: Ron Rager

SWMU 21-014 (MDA A), General's Tanks. Because the General's Tanks contain radionuclide inventories that exceed the thresholds in DOE STD 1027, "Hazards Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports," safety-basis documentation is being prepared in compliance with 10 CFR 830 Subpart B, "Nuclear Safety Management—Safety Basis Requirements." The tanks have been categorized as containing Hazard Category 2 nuclear facility inventories; hence, a documented safety analysis (DSA) must be prepared and approved by DOE/National Nuclear Security Administration). The compilation and review of the safety analysis are being coordinated with the Laboratory's Safety Basis Office. The schedule for the plan has been delayed.

SWMU 21-014 (MDA A), SWMU 21-015 (MDA B), SWMU 21-016(a)-99 (MDA T), SWMU 21-017(a)-99 (MDA U), and SWMU 21-018(a)-99 (MDA V). Development of an investigation work plan continues for MDAs A and U. The investigation work plan for MDA B was submitted to NMED on June 30, 2004, proposing characterization of landfill contents within the MDA and sampling bedrock immediately below the disposal trenches. The investigation gathers needed information to identify corrective action alternatives. The investigation work plan for MDA T was submitted to NMED on February 29, 2004, with comments from NMED still pending. The investigation work plan for MDA V was submitted to NMED on June 30, 2004, incorporating a removal action for portions of the existing facility along with the investigation of nature and extent of subsurface contamination.

All of these MDAs have undergone categorization in accordance with 10 CFR 830. Based on the categorization, MDAs A and T are Hazard Category 2 nuclear facilities, MDA B is a Hazard Category 3 nuclear facility, MDA V is below Hazard Category 3 and is considered a radiological site, and MDA U is categorized as not a radiological site. At the Hazard Category 2 and 3 MDAs, all field activities will require a DSA if the operations will intrude on the facility boundary. A general environmental maintenance and surveillance DSA currently under development will support non-intrusive investigatory as well as routine in situ surveillance activities for these nuclear facilities. Compilation of DSAs for the work activities at MDA B and General's Tanks at MDA A has begun. The investigation for MDA T, currently planned to begin in the third quarter of FY2004, will not penetrate the area designated as a Hazard Category 2 nuclear facility and, therefore, will be included in the general environmental maintenance and surveillance DSA currently being developed. An implementation plan for the DSA surveillance and maintenance activities is being developed concurrently. Parallel efforts have been undertaken to complete the investigation work plans for the MDAs, the safety basis analyses, and the surveillance and maintenance implementation plans.

2.7 TA-21 Non-Material Disposal Areas — Project Leaders: Mark Thacker and Becky Coel-Roback

SWMU 21-011(k) VCM Activities. Personnel are awaiting comments on or approval of the voluntary correction measure (VCM) report documenting field activities at the SWMU 21-011(k) outfall, which was submitted to NMED at the end of October 2003. The VCM was successful in removing low-level radioactively contaminated soil, sediment, and tuff, and confirmation samples show the site meets the trail-user risk-based scenario.

SWMU 21-013(d)-99 VCA Activities. An NOD was received on the VCA completion report for SWMU 21-013(d)-99 surface disposal areas, and a response was submitted to NMED on April 7, 2004. A second NOD was received from NMED on April 29, 2004, stating that resampling must be conducted for chromium, copper, and nickel at eight sample locations. The Laboratory responded on May 14, 2004, agreeing to resample as requested, with slight modifications. The resampling is expected to take place in late July or early August, pending NMED approval of the second NOD response.

SWMU 21-018(a)-99 NTISV Hot Demonstration at MDA V. Personnel are awaiting comments on or approval of the interim measure completion report for the nontraditional in situ vitrification (NTISV) hot demonstration project at MDA V. The report was submitted to NMED on September 30, 2003.

SWMU 21-024(f) and AOCs 21-030 and C-21-015 VCA Activities. On April 15, 2004, the Laboratory received a disapproval of the VCA completion report for SWMU 21-024(f) (a septic system) and AOCs 21-030 and C-21-015 (a sump and footprint of former Building 21-45), respectively. The Laboratory responded to the disapproval on May 14, 2004. NMED sent its approval of the VCA completion report for SWMU 21-024(f) and AOCs 21-030 and C-21-015 on June 21, 2004.

SWMU 21-029 DP Tank Farm. The quarterly site inspection at the two hydrocarbon seep areas in DP Canyon was conducted at the end of June 2004. The inspection report for the third quarter of FY2004 is included as Appendix B of this document. A letter requesting that DP Canyon quarterly inspections cease was submitted to NMED in May 2003. Quarterly inspections will continue until RRES-RS receives concurrence from NMED.

TA-21 Combined Plans. Work is continuing on the DP site aggregate area investigation work plan for multiple SWMUs and AOCs that require additional investigation of the nature and extent of contamination or corrective actions and confirmatory sampling. The plan will be delivered to NMED on or before August 30, 2004.

2.8 TA-49, TA-50, and TA-54 — Project Leaders: John Hopkins and Dwain Farley

2.8.1 TA-49

SWMU 49-001(a)-00, MDA AB, Areas 2, 2A, and 2B. Moisture monitoring continued at this site during the third quarter of FY2004. In accordance with the NMED letter of April 4, 2003 (NMED 2003, 76023), the moisture-monitoring frequency was reduced to bi-monthly for the neutron-based measurements. The continuous measurements using the time domain reflectometry (TDR) probes remain unchanged.

Neutron moisture measurements were performed this quarter. During the quarter, TDR measurements and precipitation quantities were recorded twice a day to a Campbell Scientific datalogger. The TDR data, a discussion of moisture trends over time, and a discussion of the relationship between precipitation and moisture content are included in Appendix C.

Erosion-control BMPs were inspected following precipitation events and remain in good condition.

2.8.2 TA-50

SWMUs 50-004(c) and 50-011(a). No activities were undertaken at these SWMUs this quarter. The Laboratory received authorization basis approval for the pumphouse project, and the third round of sampling is anticipated during the fourth quarter of FY2004.

MDA C. The Laboratory is awaiting comments on or approval of the update to the MDA C investigation work plan, which was submitted to NMED in January 2004.

2.8.3 TA-54

MDA G. The investigation work plan and historical investigation report for MDA G were submitted to NMED on September 30, 2003. To adhere to NMED requirements for the organization of work plans, the MDA G work plan was reformatted and submitted to NMED on June 14, 2004.

MDA H. DOE completed the environmental assessment for MDA H with a finding of no significant impact for the corrective measure options specified in the MDA H corrective measures study.

MDA L. Laboratory personnel are awaiting comments on or approval of the revised MDA L investigation work plan, which was submitted to NMED on December 23, 2003.

Pore-Gas Monitoring. The quarterly pore-gas monitoring at MDA G and MDA L was completed as required by Module VIII of the Laboratory's Hazardous Waste Facility Permit. The field-screening

information and final analytical data for the first quarter of FY2004 is presented in Appendix D of this report.

2.9 Corrective Action Strategy — Project Leader: Richard Mirenda

2.9.1 Science-Based Monitoring Stewardship

The progress made on the three elements included in the science-based monitoring stewardship task is summarized below.

2.9.1.1 Risk-Based Vision Development and Maintenance

The preliminary risk-based end-state vision document submitted to DOE headquarters in November 2003 has been revised and is being prepared for internal review. The revision responds to both stakeholder and DOE comments.

2.9.1.2 Long-Term Environmental Stewardship Transition Planning

The task leader participated in RRES Environmental Management System (EMS) planning and implementation meetings and land transfer meetings. Task-team members have worked with NNSA personnel to incorporate information regarding long-term environmental stewardship site information into the NNSA Ten-Year Comprehensive Site Plan.

Staff members continued to incorporate peer review comments on a document addressing the technical strategy for long-term environmental stewardship at the Laboratory.

Staff members continued to participate as a member of the Trails Working Group established by the Environmental Assessment pursuant to the National Environmental Policy Act (NEPA).

Staff members began revitalization and revision of an externally oriented stewardship-related webpage that coordinates with the creation of an external website for the RRES Division.

2.9.1.3 Science-Based Risk Reduction

A quantitative risk-based decision analysis process is being developed and demonstrated for the groundwater pathway. Two sites are being analyzed. One site is Mortandad Canyon, where liquid from the Laboratory's main radioactive liquid waste treatment facility has been discharged for several decades. The other is MDA H, where classified solid-form waste (some of which is hazardous or includes radionuclides) generated by the Laboratory was disposed of between 1960 and 1986. The quantitative groundwater-pathway risk assessments are conducted according to the tiered framework recommended by EPA (Volume 3 of Risk Assessment Guidance for Superfund) to ensure a level of confidence necessary to support specific decisions in the corrective action process. The MDA H groundwater pathway risk assessment is a point-estimate (deterministic), following EPA's guidance for Tier 1 risk assessment. The Mortandad Canyon groundwater pathway risk assessment uses stochastic (probabilistic) methods consistent with EPA's Tier 3 risk assessment guidance.

During the third quarter, the team developed criteria for assigning relative weights to individual stochastic realizations (1000 realizations in total) of contaminant plume distributions (i.e., perchlorate from liquid discharges into Mortandad Canyon), based on goodness-of-fit to groundwater monitoring data from both the unsaturated and saturated zones. The team also conducted a supplemental groundwater-pathway

risk assessment to directly address the potential for fracture-facilitated transport of contaminants in a formerly used radioactive solid-waste landfill (i.e., MDA H). The preliminary results of both risk assessments indicate that the current state of knowledge is sufficient to demonstrate with a high degree of confidence that groundwater-pathway risks from sources in Mortandad Canyon and MDA H will not exceed drinking water standards for the foreseeable future.

2.9.2 Data Quality

Data quality activities for the third quarter of FY2004 include the following:

- Peer review of standard operating procedure (SOP) for collecting and submitting *x-y* coordinates for sampling locations.
- Update of the template for upload of sample locations and coordinate information and posted it on the RRES internal web page.
- Continued tracking of missing *x-y* coordinates for sample data by team leaders.
- Continued work on a pilot study to review previously submitted RFI reports against the Environmental Restoration Database (ERDB) to evaluate completeness and accuracy of data sets in the ERDB. Two randomly chosen reports submitted in different years were evaluated, and the results of their evaluation against the ERDB varied widely. It was determined that a third randomly chosen report would also be evaluated. The third report has been chosen and its evaluation is scheduled to begin in July 2004.
- Continued development, review, update, and revision of procedures assigned to the team as required to ensure that current processes are documented. The following procedures were evaluated during this quarter.

LANL-ER-DI-4.11, Rev. 0, ICN 1	Completing the SMO Analytical Order and Field Paperwork Request
LANL-ER-DI-4.12, Rev. 0	Upload of Geodetic Survey Information to the ERDB
LANL-ER-DI-4.13, Rev. 0	Creating Sample Events
LANL-ER-DI-4.22, Rev. 0	Electronic Data Deliverable Update Process
LANL-ER-DI-4.25, Rev. 0	Generating Standard ER Project Data Table Formats Using MS Excel Tools
LANL-ER-DI-4.26, Rev. 0	Review of Sample Field Data
LANL-ER-DI-4.28, Rev. 0	Quality Assurance Checklist for Preparation of Data Sets from the ER Project Technical Database
LANL-ER-DI-4.34, Rev. 1	Standard Layout for Feature Data Proof Sheets
LANL-ER-DI-4.9, Rev. 0	Managing Sample Updates
LANL-ER-QP-3.5, Rev. 1, ICN 2	Peer Review Process
LANL-ER-QP-4.10, Rev. 2, ICN 1	Document Development and Approval Process: Peer Review Not Required
LANL-ER-QP-4.9, Rev. 2, ICN 1	Document Development and Approval Process: Peer Review Required
LANL-ER-QP-5.10, Rev. 0	Change Control for Spatial Features
LANL-ER-QP-5.15, Rev. 0	Gaining Access to Digital GIS Resources
LANL-ER-SOP-01.02, Rev. 1	Sample Container and Preservation
LANL-ER-SOP-01.03, Rev. 2, ICN 2	Handling, Packaging, and Shipping of Samples
LANL-ER-SOP-01.04, Rev. 5, ICN 1	Sample Control and Field Documentation
LANL-ER-SOP-01.05, Rev. 2	Field Quality Control Samples

LANL-ER-SOP-01.13, Rev. 0	Initiating and Managing Data Set Requests
LANL-ER-SOP-15.01, Rev. 1	Routine Validation of Volatile Organic Data
LANL-ER-SOP-15.02, Rev. 1	Routine Validation of Semivolatile Organic Data
LANL-ER-SOP-15.03, Rev. 1	Routine Validation of Organochlorine Pesticides and Polychlorinated Biphenyls Data
LANL-ER-SOP-15.04, Rev. 1	Routine Validation of High Explosives Data
LANL-ER-SOP-15.05, Rev. 2	Routine Validation of Inorganic Data
LANL-ER-SOP-15.06, Rev. 1	Routine Validation of Gamma Spectroscopy Data
LANL-ER-SOP-15.07, Rev. 1	Routine Validation of Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Data
LANL-ER-SOP-15.09, Rev. 0	Chain of Custody for Analytical Data Packages
LANL-ER-SOP-15.12, Rev. 0	Performing Background Value Comparisons for Inorganic Chemicals
LANL-ER-SOP-15.13, Rev. 0	Performing Background Value Comparisons for Radionuclides

In addition, the data stewardship team continued to design and improve the external database web page to provide administrative authorities and other stakeholders real-time access to data.

2.9.3 Peer Review Team

Team members coordinated and participated in peer reviews for RRES-RS documents this quarter, as needed.

2.9.4 Data Validation

Data verifiers and validators completed the verification and validation of 82 request numbers during the quarter. Data validators remained current with incoming data packages. The process consists of validating external laboratory data packages, based on EPA's National Functional Guidelines. Team members follow quality procedure (QP), LANL-ER-QP-5.13, Rev. 0, "Analytical Data Verification/Validation Process." Data validators also assisted with the assignment and review of reporting qualifiers and reason codes for preparation of data sets as well as addressing duplicate sample analytes in the ERDB.

Data verifiers reviewed 400 analytical suites of vintage transition data and vintage Chemistry, Science and Technology data. Verification of these analytical suites is to ensure that the hard-copy data package agrees with the electronic record received in the electronic data deliverable file.

2.9.5 Data Stewardship

2.9.5.1 Integrated Information Management System Support

The Data Stewardship Team continued to work with the Information Management Team to design and implement the Integrated Information Management System. The system consists, in part, of software tools intended to ensure consistency and accuracy in data and information management and to allow tracking and traceability of environmental data. In this quarter, the Data Stewardship Team continued to provide technical support for developing and implementing the sample tracking application; verification and validation application; and the spatial mapping, analysis, and reporting tool (SMART) application.

2.9.5.2 Data Stewardship and Reporting

The Data Stewardship Team continued to deliver quality data sets to meet RRES-RS future needs. The team continued to make progress with the cleanup of legacy data. Data stewards also continued optimizing the data process.

Peer Review. Team members participated in peer reviews of reports submitted to NMED. A thorough review of each report was conducted to ensure they matched the data sets provided to the report team.

Data Set Preparation. Team members prepared and delivered 23 electronic data sets requested by RRES-RS data users and RRES Division. In addition, 15 new sampling events were documented, and the required field paperwork for 213 samples was generated.

Data Management and Legacy Data Cleanup. Data management and legacy data cleanup activities continued this quarter. Data stewards continued work on other types of global data cleanup, such as the removal of duplicate records in the ERDB, before use with the new SMART software. A field data information review of 10920 legacy sample records was performed using LANL-ER Desk Instruction (DI) 4.26, "Review of Sample Field Data." In addition to the legacy records reviewed, 17 new sample events were moved to "field complete," indicating that all 366 samples in the events had been accounted for and reviewed in accordance with LANL-ER-DI-4.26. Data stewards also uploaded and/or updated *x-y* coordinates and other location information for 903 sampling locations.

2.9.6 Risk Assessment

Personnel from the Human Health and Ecological Risk Assessment teams participated in peer reviews for the MDA B investigation work plan, the MDA V investigation work plan, and the MDA G revised investigation work plan. Team members also reviewed a paper on vapor-phase transport at MDA L and a draft of the fracture flow study at MDA H.

2.9.6.1 Human Health Risk

Human health risk team activities for the third quarter include the following:

- review of the human health risk assessment for the Los Alamos and Pueblo Canyons watershed investigation report;
- continued revision of the Standard Human Health Risk Assessment Scenarios document for the RRES-RS project;
- revision of the Human Health Risk-Based Screening Methodology document to include calculations of recreational soil screening levels for the RRES-RS project; and
- support for responses to NMED comments on the VCA reports for DP Road and for SWMU 21-013(d)-99; the RSI for the MDA P closure certification report; the supplemental SAP for the Middle Mortandad/Ten Site Aggregate; and the investigation work plan for the TA-16-340 Complex (Fish Ladder).

2.9.6.2 Ecological Risk

Ecological risk team activities for the third quarter include the following:

- review of the ecological risk assessment portion of the Los Alamos and Pueblo Canyons investigation report;

- revision of the Screening Level Ecological Risk Assessment Methods document for the RRES-RS project;
- review of toxicity reference value (TRV) summaries as part of the annual update to the Ecorisk Database;
- support for responses to NMED comments on the RSI for the MDA P closure certification report; and
- submission of two abstracts to the Society of Environmental Toxicology and Chemistry for consideration for poster presentations at the 2004 Fourth World Congress Meeting in Portland, Oregon.

2.9.6.3 Ecological Risk Database

Team members continued to conduct literature searches for primary inhalation toxicity references for volatile organic compounds in mammals. Literature searches were also done for hexavalent chromium, polycyclic aromatic hydrocarbons, and high explosives. Team members reviewed studies on volatile organic compounds and inhalation exposure to develop TRVs for inhalation ecological screening levels (ESLs). Also reviewed studies on hexavalent chromium in plants and mammals, and high explosive in plants, invertebrates, and birds to develop soil ESLs. The team completed TRV summaries for trichloroethylene, tetrachloroethylene, 1,1-dichloroethane, and 1,2-dichloroethane.

Work continued on the tiered TRV development process, which includes detailed information on the Primary Toxicity Study Evaluation Process for the Tier 1, 2, 3, and 4 TRVs as well as information on literature searches/retrievals and TRV derivation. Complete documentation of the new Tiered TRV Development Process is expected to be finished by the end of FY04.

2.9.7 Native American Risk

The team met with Department of Environmental and Cultural Preservation personnel at San Ildefonso Pueblo to continue training on risk assessment. The training involved data review, data quality, and risk calculations.

2.10 Regulatory Compliance — Project Leader: Phillip Noll

RRES personnel conducted peer and technical reviews of the following documents this quarter:

- the investigation work plan for MDA B
- the investigation work plan for MDA V
- revision of the investigation work plan for MDA G
- responses to NMED comments for the TA-19 ACA work plan
- response to the RSI on the MDA P closure certification report
- response to NOD on the Tract 8 Land Transfer at TA-0 and DP Road,
- response to NOD received on the VCA completion report for SWMU 21-013(d)-99
- 2003 Annual Unit Audit for corrective action units

- response to NMED comments for the VCA completion report for SWMU 21-024(f) and AOCs C-21-015 and 21-030
- response to the NOD for the supplement to the SAP for the Middle Mortandad/Ten Site Aggregate
- response to NMED comments on the TA-16-340 Complex investigation work plan

2.10.1 Waste Management and Waste Minimization

RRES-RS personnel participated in the review and revision of numerous Waste Characterization Strategy Forms (WCSFs) for upcoming field investigations. The purpose of the WCSF is to ensure that the appropriate waste management requirements are incorporated into the planning phase of any RRES-RS activities that potentially generate waste. The WCSFs prepared during this quarter addressed anticipated waste generation for the SWMU 19-001-99 ACA; borehole drilling and sampling activities at MDA L; borehole abandonment at TA-54; and VCA confirmation sampling as part of the TA-0 and DP Road land transfer parcel.

The staff provided regulatory support related to various storage and disposition requirements for wastes generated by RRES-RS field activities, including groundwater sampling at SWMU 03-010(a); the SWMU 19-001-99 ACA; and excavation and removal of environmental media at the TA-16-340 Complex. Additionally, staff reviewed, updated, and revised the SOPs that provide guidance for characterization and management of RRES-RS-generated waste.

The staff formally archived core from seven different DOE wells, disposed of approximately 195 core boxes (34 tons) of borehole materials, and are currently working on formally accepting core from two additional DOE boreholes into the archival system. The staff retrieved borehole materials requested by various groups within the Laboratory. In addition, the staff started disposing of legacy sample material and has successfully disposed of waste borehole material while managing the largest waste stream associated with the less-than-90-day storage requirement.

2.10.2 Stakeholder Involvement

2.10.2.1 Outreach Activities

Communications continue with the Northern New Mexico Citizen's Advisory Board (NNMCAB) on several environmental issues. Staff attended waste management, environmental monitoring, and environmental restoration subcommittee meetings this quarter.

Staff planned, coordinated, and implemented all logistics for the Groundwater Protection Program quarterly public poster session on Monday, April 12, 2004, as well as the groundwater public meeting on Tuesday, April 20, 2004. More than 70 and 100 people attended these meetings, respectively. Staff also supported the public hearing regarding the DOE MDA H environmental assessment on Wednesday, April 14, 2004.

The communications staff also accomplished the following activities this quarter:

- Responded to ten information requests for documents from students, businesses, stakeholders, and state and local officials.

- Attended diversity seminars this quarter and attended the Los Alamos County/DOE/Laboratory monthly SWMU meetings on May 3 and June 7, 2004.
- Coordinated tour logistics for the State and Tribal Government Working Group on May 11, 2004. The State and Tribal Government Working Group helps ensure that the DOE facilities and sites are operated and cleaned up in compliance with all applicable federal and state laws and regulations and Tribal rights, including those retained by treaty and conferred by statute and trust responsibility, as well as in a manner that protects human health, safety, and the environment.
- Participated in briefings to the Four Accord Pueblos on the MDA H environmental assessment. Briefings were held at San Ildefonso Pueblo on April 19, 2004; at Santa Clara Pueblo on April 12, 2004; at Jemez Pueblo on April 6, 2004; and at Cochiti Pueblo on April 27, 2004.
- Attended the Risk Assessment Corporation public forum on May 19, 2004. The meeting was held to inform the public about the risk analysis, communication, evaluation and reduction project at the Laboratory; answer questions and hear concerns; and inform scientists and associates about how to communicate effectively with lay citizens.

2.10.2.2 Virtual Library/Public Reading Room

Personnel continued to work with the Laboratory's information management expert to redesign the existing RRES-RS project web site to provide both internal and external sites. The new internal site will be launched and useable in the summer of 2004. Currently, documents in the Virtual Library are accessible only to internal staff, because the NNSA decision is still pending regarding the types of documents that can be available to the public on the external web pages. Documents in the Virtual Library may not be accessible to external audiences because of NNSA guidelines regarding documents on the Internet.

2.10.3 PRS Deliverable Information Management

2.10.3.1 Compliance Schedule Tracking

The staff continued to track the deliverables due to the various stakeholders on a monthly basis.

2.10.3.2 SWMU Report

The SWMU report remains in the final review process pending resolution of issues related to the consent order with NMED.

2.11 Land Transfer — Project Leader: Terry Rust

Staff members continue to participate as members of the Laboratory's Land Transfer Team and the DOE's Land Transfer Project Office Team by attending regularly scheduled land transfer working group meetings and responding to requests for information. These teams are responsible for the activities leading to the final transfer of Laboratory property.

Staff members completed Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 120(h) reports for the following land transfer tracts: TA-74-2 South (map designation A-18) and the mesa-top portion of Airport-3 South (map designation A-5-1). These documents will be used to compile the environmental baseline surveys needed for the conveyance and transfer of these tracts under CERCLA.

2.12 Documentation and Tracking — Project Leader: Stephen Bolivar

2.12.1 Information Management

The primary focus of Information Management personnel is business-process re-engineering. This effort focuses on four main activities: rebuilding ERDB (completed); developing a series of applications for the Sample Management Office (SMO) to enter data into the database (completed); developing a SMART application to retrieve data from the database (application now in testing); and developing a GeoPro application to track modeling input and output parameters. Development efforts this quarter focused on completing the first phase of SMART. The application was placed on a local server and is now being tested by users. Bugs in the initial version have been fixed, and a second release provides new graphical capability and new Geographical Information System (GIS) themes. SMART applications are used to produce data for evaluation in a web-based environment. The Phase I portion of this application allows user-determined data pulls and provides the ability to select and display a sample event in a GIS format (map) on a desktop environment.

A follow-up data request submitted by the Risk Assessment Corporation was completed. The latest release provides additional information and database updates as per the request (June 2004).

2.12.2 Records Management

Staff added 144 new documents to the Records Processing Facility (RPF) database; the RPF now contains more than 245,000 documents available for query. Staff prepared 18 boxes of permanent records, which will be shipped to the Laboratory's Information and Records Management Group (IM-5) for storage as soon as quality control checks are completed. Staff handled 41 walk-in-requests (up from 19 the previous quarter), 16 email requests (down from 19 the previous quarter), and 21 phone requests (up from 16 the previous quarter). The staff performed 309 record retrievals (up from 57 the previous quarter) and scanned 146 documents (down from 546 the previous quarter). SMO personnel are scanning more than 10,000 data packages to meet DOE dual-storage requirements. To date, all legacy documents have been scanned electronically, and the staff is now scanning this year's packages. A process improvement was incorporated whereby data packages, once scanned, are shipped directly to the Laboratory's Information and Records Management Group. Two shipments (80 boxes each) were sent to IM-5 this quarter.

A total of 324 rolls of film are being transferred to electronic media as part of the new scanning process. Deliverables are being received periodically, and the effort is approximately 50% complete. When completed, the scanned historical documents will be available for electronic viewing.

2.12.3 Sample Management Office

The SMO issued 43 field data groups (number of discrete samples) and had 173 customers this quarter. Personnel handled and shipped 4554 containers. These totals are well above the five-year average of 3051, and the two-year average of 2279. The increase results from new field activities and a wetter-than-normal spring, resulting in numerous water sample collections. The effort to scan 10,000 SMO legacy analytical data packages is 100% complete; over 700 boxes were scanned and converted to electronic media.

Efforts to move all equipment from the Field Support Facility building have been completed. Two truckloads of material were transferred to salvage, and the shop area floor was leveled by removing elevated areas. Several Laboratory groups have moved into the facility. RRES Environmental

Characterization and Remediation (RRES-ECR) still retains the core facility and the north and east gated areas (for trailer storage and staging).

The facility staff has been characterizing the samples and moving the appropriate core into B21 and B12 waste containers. Twelve of thirty-six boxes of legacy samples have also been moved into the waste stream.

2.12.4 Computer Support

Computer support personnel received 579 service requests this quarter, and 24 remain open. For the year, 1273 requests have been submitted, and 24 remain open. This rate is well above that of last year, and the increase is attributed to personnel recording the "hallway" fixes that are accomplished in a short period of time and not captured previously. As part of a four-year maintenance plan, all aging computer systems were replaced. Several security patches dealing with a recent rash of viruses and vulnerabilities against Microsoft Systems were employed. As part of the annual security requirements, mandatory annual security training for Building 1237 employees (i.e., Pueblo Complex) was conducted.

2.12.5 Geographic Information System

Users from ten unique groups accessed the flat-file repository and/or relational database management system to view spatial data. The RRES-RS GIS teams produced 295 map products and/or figures. Updated feature themes this quarter include SWMU and AOC boundaries and Los Alamos County features. A DI on standards, a QP on change control, and a QP on access to GIS resources were also released.

2.13 Facility Integration and Site Identification — Project Leader: Roy Bohn

Personnel continued to meet with the Laboratory's Facility Waste Operations–Infrastructure Projects Group (FWO-IP), D&D, and Program Management (PM) Division staff to provide information, regulatory status, current data and location maps and to recommend various approaches to address numerous issues associated with SWMUs/AOCs located at sites where D&D and construction/land development activities are planned.

RRES-RS Facility Integration staff continued to participate in the development of the Laboratory's EMS in accordance with DOE Order 450.1, "Environmental Protection Program," to ensure RRES-RS issues are adequately and consistently addressed by the system. Staff provided comments on the Laboratory's EMS roadmap, helped develop the environmental aspect identification procedure, and are assisting in revising the Laboratory's Integrated Safety Management (ISM) description document to ensure it will adequately substantiate integration of the EMS within the IMS for the purposes of upcoming third-party audits. In addition, RRES-RS Facility Integration staff participated in developing questions to address RRES-RS SWMU/AOC issues for the new hazard identification tool to be implemented throughout the Laboratory in September 2004.

Facility Integration personnel also performed the following activities this quarter:

- Participated in the review of approximately 228 excavation permit requests, 14 PR-IDs, and 17 structure-siting requests; 75 field sites visits were conducted as part of these reviews. Personnel also reviewed an additional 31 excavation permit requests for the fire road project and the SWMU stormwater sampling station installation project.

- Reviewed maps, Potential Release Sites (PRS) database, and work plans to determine if any SWMUs/AOCs will be affected by the D&D of structures/buildings planned for FY2004 and FY2005.
- Provided comments on the final review draft of the revised Laboratory Implementation Requirement (LIR) for comprehensive site planning, LIR 210-01-01, which is intended to be the implementing document for the new PR-ID process and will replace the current environment, safety, and health identification (ESH-ID) process.
- Continued to participate in the final revisions to the Excavation Permit LIR and Comprehensive Site Planning LIR to address how SWMUs/AOCs will be identified for all types of work activities such as locating utilities and outdoor research activities for the construction of new buildings. Both documents will be finalized during the fourth quarter of FY2004.
- Began compiling a spreadsheet listing building and Facility Management Unit (FMU) associations for each active site to support Active Facility Integration efforts. The staff also drafted a memo to accompany a listing to obtain FMU concurrence on ownership of sites. This process will be used to help clarify and formalize ownership and budgets needed to bring DOE Office of Environmental Management-funded activities to completion and reconcile the baseline and PRS database.

2.13.1 New Construction at TA-03

RRES-RS personnel continued to meet with RRES Water Quality and Hydrology (RRES-WQH) staff and FWO construction staff at the planned location of a new gas turbine and installation of major utility lines within the boundary of SWMU 03-012(b)-00. The final design and location of specific turbine components were discussed in relation to the requirements for working within a SWMU boundary. Excavation activities began in June 2004 for installing new utility lines; the installation and construction of the gas turbine and its components are scheduled to begin in early FY2005.

RRES-RS Facility Integration personnel continued to support the Security Perimeter Road Project by meeting with the project leaders for construction of the road and conducting numerous site visits to confirm the SWMUs/AOCs that may be impacted by the project. In June 2004, the RRES-RS project implemented the planning process to remediate the three sites [SWMU 61-002 and AOCs 03-020(b) and 03-001(i)] in the direct path of the Security Perimeter Road Project in addition to SWMU 03-029, which is located where a stormwater retention basin is planned for the gateway parking lot project at TA-03. In May 2004, the gateway parking structure project was replaced by the gateway parking lot project at the former location of the Asphalt Batch Plant at TA-03. The remediation of these SWMUs/AOCs will be implemented during the fourth quarter of FY2004.

RRES-RS Facility Integration personnel met with FWO-IP and PM Division staff regarding the removal and replacement of the Radio Shop at TA-03 (Building 03-23). The Radio Shop is located in the path of the new Security Perimeter Road; therefore, the structure will be removed and a new Radio Shop will be constructed south of the current location within TA-03. Based on numerous site visits and review of the latest design, a single site [SWMU 3-009(i)] will be impacted by the installation of a new electrical line to the new building.

RRES-RS Facility Integration personnel continued to support the National Security Sciences Building (NSSB) parking structure east of the Otowi Building at TA-03 by conducting several site visits with the Laboratory's FWO Utilities and Infrastructure (FMU-8–UI) Group to ensure that new storm drains from the parking structure discharging to SWMU 03-013(a)-00 do not adversely impact the SWMU.

RRES-RS coordinated with RRES-Solid Waste Regulatory Compliance (RRES-SWRC) to perform expedited sampling of oil-contaminated soil discovered at the former Cable Test Facility, located at TA-03, Buildings 246 and 247. RRES-SWRC personnel collected two samples, which were analyzed for polychlorinated biphenyls (PCBs), metals, organic chemicals, and total petroleum hydrocarbons (TPHs). No PCBs or organic chemicals were detected. Metals were detected below residential risk levels. TPH concentrations were detected up to 3600 parts per million. This site will be remediated in the summer of 2004, when the structures are decommissioned prior to the construction of the new DOE Office Building; the soil is expected to be managed and disposed of as New Mexico Special Waste. This site was determined to be a newly identified SWMU [SWMU 03-013(i)] and NMED was notified of the site on June 10, 2004.

2.13.2 New Construction at TA-33

RRES-RS Facility Integration personnel continued to meet with FWO-IP and TA-33 facility management staff to provide information, regulatory status, current data and location maps, and recommended approaches to address numerous issues associated with SWMUs/AOCs located at the planned locations of new security fences, buildings, parking lots, bunker refurbishments, and utility upgrades.

2.13.3 D&D Activities

RRES-RS staff continued integration activities with FWO-IP by attending weekly meetings and researching SWMUs/AOCs that may be impacted by FY2004 D&D projects. D&D projects scheduled for FY2004, including multiple buildings, will impact numerous SWMUs/AOCs. Ongoing D&D projects include

- D&D of Buildings 21-1, 21-228, and 21-402;
- D&D of Building 16-370;
- D&D of the TA-16-340 Complex;
- D&D of structures 06-1 through 06-9; and
- D&D of buildings/structures at TA-15, The Hollow.

2.14 Surface Water Programs and BMPs — Project Leader: Steve Veenis

2.14.1 BMP Installation, Inspection, and Maintenance

This quarter, the following activities were undertaken:

- Continued support of LANL-ER-SOP 2.01, "Surface Water Site Assessments," database updates and research on the potential for using Trimble Explorer hand-held global positioning system (GPS) units to support field inspections.
- Updated SWMU Working Group (Los Alamos County) on status of the proposed engineered solution for Hillside 137 to address an erosion problem below the Los Alamos Inn. The final engineering design for the project has begun, and the excavation permit and PR-ID have been submitted.
- Completed BMP maintenance and repair work at TA-46, TA-55, and SWMU 21-011(k).

- Conducted quarterly BMP inspections at 80 SWMUs.
- Continued archiving BMP inspection records and photographs.
- Continued efforts on Quality Assurance Plan for data entry into the Storm Water Tracking System.
- Submitted abstract for a poster presentation at the 2005 International Erosion Control Association conference in Dallas, Texas.

2.14.2 Surface Water Quality

Individual Permit Application. This quarter, staff members continued discussions with EPA Region VI regarding the content of an Individual Permit application for stormwater discharges from SWMUs. Further discussions with EPA will occur next quarter regarding the application process and required submittals.

Staff members continued efforts with the RRES-ECR Data Management Team to compile existing soil/sediment data for SWMUs/AOCs under consideration for the Individual Permit application and to support the stormwater monitoring effort. This process is about 50% complete. Staff members continued efforts with RRES-RS and RRES Office of Environmental Information Management (RRES-OEIM) to provide GIS map support for sites that require stormwater monitoring, and these maps will be provided as attachments to the Individual Permit application.

The draft Storm Water Monitoring Plan was submitted this quarter to EPA Region VI and NMED for review and comment. The plan provides details on the Laboratory's telemetry-based stormwater monitoring stations that will be used to implement the Federal Facility Compliance Agreement and/or the EPA Schedule Order during the transition period between now and the issuance of the Individual Permit. The Laboratory has received comments from NMED and met with members of the NMED Hazardous Waste Bureau (HWB), Surface Water Quality Bureau (SWQB), and Oversight Bureau to discuss the comments. Staff attended a briefing in Albuquerque where NMED–SWQB discussed its intention to apply to the EPA for National Pollutant Discharge Elimination System primacy.

Federal Facility Compliance Agreement/EPA Schedule Order Implementation. The staff continued progress on developing the SWMU Storm Water Pollution Prevention Plan. The plan is a requirement of the Federal Facility Compliance Agreement and/or the EPA Schedule Order during the transitional period between the present and the future issuance of the Individual Permit. Appendix 6 of the plan, which provides details on methods to monitor stormwater runoff from SWMUs/AOCs, was submitted to the NMED and EPA on July 1, 2004, for review and comment.

The staff completed final site selection of appropriate sample locations (42 sites covering 62 SWMUs/AOCs) in Los Alamos, Pueblo, Cañada del Buey, and Mortandad Canyons. The staff completed and submitted the excavation review for installing site-specific samplers at all sample locations by June 30, 2004.

Other activities this quarter included the following:

- Completion of the FY2004 Task Plan for Surface Water Programs.
- Completion of a database redesign (Storm Water Tracking System, Release 1.2.0) to track the progress of sampling, erosion controls, and inspections.

- Attendance at a meeting with DOE-Albuquerque Operations Office and RRES-RS personnel to discuss life-cycle budget issues associated with the Federal Facility Compliance Agreement.
- Re-activation of the Surface Water Assessment Team (SWAT), with members from the Laboratory, DOE, NMED-HWB, NMED-SWQB, and NMED-Oversight Bureau, to discuss issues associated with surface water. The team will meet monthly.

3.0 REFERENCES

LANL (Los Alamos National Laboratory), August 2003. "Mortandad Canyon Groundwater Work Plan," Los Alamos National Laboratory document LA-UR-03-6221, Los Alamos, New Mexico. (LANL 2003, 79557)

LANL (Los Alamos National Laboratory), January 2004. "Investigation and Remediation Report for Consolidated SWMU 53-002(a)-99, Inactive Wastewater Impoundments, and AOC 53-008, Storage Area, at Technical Area 53," Los Alamos National Laboratory document LA-UR-03-9119, Los Alamos, New Mexico. (LANL 2004, 85221)

LANL (Los Alamos National Laboratory), January 2004. "Mortandad Canyon Groundwater Work Plan, Revision 1," Los Alamos National Laboratory document LA-UR-04-0165, Los Alamos, New Mexico. (LANL 2004, 82613)

NMED (New Mexico Environment Department), April 4, 2003. "Change in Moisture Monitoring Frequency at Technical Area (TA) 49, Material Disposal Area (MDA) AB, Los Alamos National Laboratory (LANL)," NMED memorandum to R. Erickson (DOE-LAAO Area Manager) from J. Young (NMED-HWB Permits Management Program Project Lead), Santa Fe, New Mexico. (NMED 2003, 76023).

Appendix A

Groundwater Sampling Results,
Wells R-12, R-14, R-23, and R-32

CONTENTS

Table A-1 Samples Taken at Wells A-1

Table A-2 Well R-12 Screen 1 Sixth Round Sample Results: Data Summary for Inorganic Chemicals A-3

Table A-3 Well R-12 Screen 2 Sixth Round Sample Results: Data Summary for Inorganic Chemicals A-5

Table A-4 Well R-12 Screen 3 Sixth Round Sample Results: Data Summary for Inorganic Chemicals A-7

Table A-5 Well R-12 Screen 1 Sixth Round Sample Results: Data Summary for Detected Organic Chemicals A-9

Table A-6 Well R-12 Screen 2 Sixth Round Sample Results: Data Summary for Detected Organic Chemicals A-9

Table A-7 Well R-12 Screen 3 Sixth Round Sample Results: Data Summary for Detected Organic Chemicals A-10

Table A-8 Well R-12 Screen 1 Sixth Round Sample Results: Data Summary for Radionuclides A-11

Table A-9 Well R-12 Screen 2 Sixth Round Sample Results: Data Summary for Radionuclides A-12

Table A-10 Well R-12 Screen 3 Sixth Round Sample Results: Data Summary for Radionuclides A-13

Table A-11 Well R-14 Screen 1 First Round Sample Results: Data Summary for Inorganic Chemicals A-14

Table A-12 Well R-14 Screen 2 First Round Sample Results: Data Summary for Inorganic Chemicals A-17

Table A-13 Well R-14 Screen 1 First Round Sample Results: Data Summary for Detected Organic Chemicals A-18

Table A-14 Well R-14 Screen 2 First Round Sample Results: Data Summary for Detected Organic Chemicals A-18

Table A-15 Well R-14 Screen 1 First Round Sample Results: Data Summary for Radionuclides A-19

Table A-16 Well R-14 Screen 2 First Round Sample Results: Data Summary for Radionuclides A-19

Table A-17 Well R-23 Screen 1 First Round Sample Results: Data Summary for Inorganic Chemicals A-20

Table A-18 Well R-23 Screen 1 First Round Sample Results: Data Summary for Detected Organic Chemicals A-24

Table A-19 Well R-23 Screen 1 First Round Sample Results: Data Summary for Radionuclides A-25

Table A-20 Well R-23 Screen 1 Second Round Sample Results: Data Summary for Inorganic Chemicals A-26

Table A-21 Well R-23 Screen 1 Second Round Sample Results: Data Summary for Detected Organic Chemicals A-29

Table A-22 Well R-23 Screen 1 Second Round Sample Results: Data Summary for Radionuclides A-30

Table A-23 Well R-32 Screen 1 First Round Sample Results: Data Summary for Inorganic Chemicals A-31
Table A-24 Well R-32 Screen 3 First Round Sample Results: Data Summary for Inorganic Chemicals A-35
Table A-25 Well R-32 Screen 1 First Round Sample Results: Data Summary for Detected Organic Chemicals A-39
Table A-26 Well R-32 Screen 3 First Round Sample Results: Data Summary for Detected Organic Chemicals A-39
Table A-27 Well R-32 Screen 1 First Round Sample Results: Data Summary for Radionuclides A-40
Table A-28 Well R-32 Screen 3 First Round Sample Results: Data Summary for Radionuclides A-40
Table A-29 Well R-32 Screen 1 Second Round Sample Results: Data Summary for Inorganic Chemicals A-41
Table A-30 Well R-32 Screen 3 Second Round Sample Results: Data Summary for Inorganic Chemicals A-45
Table A-31 Well R-32 Screen 1 Second Round Sample Results: Data Summary for Detected Organic Chemicals A-48
Table A-32 Well R-32 Screen 3 Second Round Sample Results: Data Summary for Detected Organic Chemicals A-49
Table A-33 Well R-32 Screen 1 Second Round Sample Results: Data Summary for Radionuclides A-50
Table A-34 Well R-32 Screen 3 Second Round Sample Results: Data Summary for Radionuclides A-50

Table A-1
Samples Taken at Wells

Sample ID	Depth (ft)	Screen Number	Field Preparation	Alkalinity	Alpha Spectroscopy	Anions[a]	Cyanide (total)	Gamma Spectrometry	Gross Alpha/Beta	Tritium	High Explosives	Isotopic Radium	Metals	Ammonia (as N)	Nitrite-Nitrate (as N)	Phosphorus	Polychlorinated Biphenyls
R-12, Round 6																	
UU0311G12R101	468	1	NF[b]	X	X	X	X	X	X	X	—[c]	X	X	X	X	X	—
GU0311G12R201	507	2	NF	X	X	X	X	X	X	X	—	X	X	X	X	X	—
GU0311G12R301	811	3	NF	X	X	X	X	X	X	X	—	X	X	X	X	X	—
R-14, Round 1																	
GF0402G14R101	1205	1	F[d]	—	—	X	—	—	—	—	—	—	X	X	X	X	—
GU0402G14R101	1205	1	NF	X	X	X	X	X	X	X	X	X	X	X	X	X	X
UU0402G14R201	1289	2	NF	—	—	—	—	—	—	—	—	—	—	—	—	—	—
R-23, Round 1																	
GF03120GR2301		1	F	—	—	X	—	—	—	—	—	—	X	X	X	X	—
GU03120GR2301		1	NF	—	X	X	X	X	—	—	X	—	X	X	X	X	X
R-23, Round 2																	
GF04030GR2301		1	F	X	—	X	—	—	—	—	—	—	X	X	X	X	—
GU04030GR2301		1	NF	—	X	X	X	X	—	—	X	—	X	X	X	X	X
R-32, Round 1																	
GF0402G32R101	871	1	F	—	—	X	—	—	—	—	—	—	X	X	X	X	—
GU0402G32R101	871	1	UF	—	X	X	X	X	—	—	X	—	X	X	X	X	X
UU0402G32R101	871	1	UF	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GF0402G32R301	976	3	F	X	—	X	—	—	—	—	—	—	X	X	X	X	—
GU0402G32R301	976	3	UF	—	X	X	X	X	—	—	X	—	X	X	X	X	X
UU0402G32R301	976	3	UF	—	—	—	—	—	—	—	—	—	—	—	—	—	—
R-32, Round 2																	
GF0405G32R101	871	1	F	—	—	X	—	—	—	—	—	—	X	X	X	X	—
GU0405G32R101	871	1	UF	—	X	X	X	X	—	—	X	—	X	X	X	X	X
GF0405G32R301	976	3	F	X	—	X	—	—	—	—	—	—	X	X	X	X	—
GU0405G32R301	976	3	UF	—	X	X	X	X	—	—	X	—	X	X	X	X	X

Table A-1 (continued)

Sample ID	Depth (ft)	Screen Number	Field Preparation	Pesticides	pH	Specific Conductance	Semivolatile Organic Compounds	Total Dissolved Solids	Technetium-99	Temperature	Total Kjeldahl Nitrogen	Total Organic Carbon	Total Suspended Solids	Turbidity	Low-Level Tritium	Volatile Organic Compounds
R-12, Round 6																
UU0311G12R101	468	1	NF	—	X	X	—	X	X		—	X	X	—	X	—
GU0311G12R201	507	2	NF	—	X	X	—	X	X		—	X	X	—	X	—
GU0311G12R301	811	3	NF	—	X	X	—	X	X		—	X	X	—	X	—
R-14, Round 1																
GF0402G14R101	1205	1	F	—	—	—	—	—	—	—	X	—	—	—	—	X
GU0402G14R101	1205	1	NF	X	X	X	X	X	X		X	X	X	—	X	X
UU0402G14R201	1289	2	NF	—	—	—	—	—	—		—	—	—	—	X	—
R-23, Round 1																
GF03120GR2301		1	F	—	—	—	—	—	—	—	X	—	—	—	—	—
GU03120GR2301		1	NF	X	X	X	X	—	X	X	X	X	—	X	—	X
R-23, Round 2																
GF04030GR2301		1	F	—	—	—	—	—	—	—	X	—	—	—	—	—
GU04030GR2301		1	NF	X	—	—	X	—	X	—	X	X	—	—	—	X
R-32, Round 1																
GF0402G32R101	871	1	F	—	—	—	—	—	—	—	X	—	—	—	—	—
GU0402G32R101	871	1	UF	X	—	—	X	—	X	—	X	X	—	—	—	X
UU0402G32R101	871	1	UF	—	—	—	—	—	—	—	—	—	—	—	X	—
GF0402G32R301	976	3	F	—	—	—	—	—	—	—	X	—	—	—	—	—
GU0402G32R301	976	3	UF	X	—	—	X	—	X	—	—	X	—	—	—	X
UU0402G32R301	976	3	UF	—	—	—	—	—	—	—	—	—	—	—	X	—
R-32, Round 2																
GF0405G32R101	871	1	F	—	—	—	—	—	—	—	X	—	—	—	—	—
GU0405G32R101	871	1	UF	X	—	—	X	—	X	—	X	X	—	—	—	X
GF0405G32R301	976	3	F	—	—	—	—	—	—	—	X	—	—	—	—	—
GU0405G32R301	976	3	UF	X	—	—	X	—	X	—	—	X	—	—	—	X

[a] Anions = Ammonia, bromide, chloride, fluoride, nitrate/nitrite, oxalate, perchlorate, sulfate.
[b] NF = Nonfiltered.
[c] — = Not available or not applicable.
[d] F = Filtered.

Table A-2
Well R-12 Screen 1 Sixth Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	1	468.1	2/2/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	1	468.1	2/2/2004	NF	—	—	—	—	—	—	—	—
pH	1	468.1	2/2/2004	NF	1	1	8.18	—	>6 & <9	0/1	>6 & <9	0/1
Specific Conductance (µS/cm)	1	468.1	2/2/2004	NF	1	1	5.25	—	—	—	—	—
Temperature (°C)	1	468.1	2/2/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	1	468.1	2/2/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	1	468.1	2/2/2004	NF	1	1	45500	—	—	—	—	—
Aluminum	1	468.1	2/2/2004	NF	1	1	88.6	—	—	—	—	—
Ammonia as Nitrogen	1	468.1	2/2/2004	NF	1	1	1660	—	—	—	—	—
Antimony	1	468.1	2/2/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	1	468.1	2/2/2004	NF	1	0	—	2.24	—	—	—	—
Barium	1	468.1	2/2/2004	NF	1	1	43.3	—	—	—	—	—
Beryllium	1	468.1	2/2/2004	NF	1	0	—	0.158	—	—	—	—
Boron	1	468.1	2/2/2004	NF	1	1	75.7	—	—	—	—	—
Cadmium	1	468.1	2/2/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	1	468.1	2/2/2004	NF	1	1	3600	—	—	—	—	—
Chloride	1	468.1	2/2/2004	NF	1	1	9850	—	—	—	—	—
Chromium	1	468.1	2/2/2004	NF	1	1	6.03	—	—	—	—	—
Cobalt	1	468.1	2/2/2004	NF	1	0	—	0.541	—	—	—	—
Copper	1	468.1	2/2/2004	NF	1	1	2.87	—	—	—	—	—
Dissolved Solids (total)	1	468.1	2/2/2004	NF	1	1	77000	—	—	—	—	—
Fluoride	1	468.1	2/2/2004	NF	1	1	653	—	—	—	—	—
Iron	1	468.1	2/2/2004	NF	1	1	209	—	—	—	—	—
Lead	1	468.1	2/2/2004	NF	1	1	3.27	—	—	—	—	—

Table A-2 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Magnesium	1	468.1	2/2/2004	NF	1	1	486	—	—	—	—	—
Manganese	1	468.1	2/2/2004	NF	1	1	95.2	—	—	—	—	—
Mercury	1	468.1	2/2/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	1	468.1	2/2/2004	NF	1	1	19.2	—	—	—	—	—
Nickel	1	468.1	2/2/2004	NF	1	1	4.97	—	—	—	—	—
Nitrate + Nitrite (as N)	1	468.1	2/2/2004	NF	1	0	—	10	—	—	—	—
Perchlorate	1	468.1	2/2/2004	NF	1	0	—	4	—	—	—	—
Phosphorus (total)	1	468.1	2/2/2004	NF	1	1	304	—	—	—	—	—
Potassium	1	468.1	2/2/2004	NF	1	1	2000	—	—	—	—	—
Selenium	1	468.1	2/2/2004	NF	1	0	—	2.81	—	—	—	—
Silicon Dioxide	1	468.1	2/2/2004	NF	1	1	14200	—	—	—	—	—
Silver	1	468.1	2/2/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	1	468.1	2/2/2004	NF	1	1	20300	—	—	—	—	—
Strontium	1	468.1	2/2/2004	NF	1	1	15.4	—	—	—	—	—
Sulfate	1	468.1	2/2/2004	NF	1	1	379	—	—	—	—	—
Suspended Solids (total)	1	468.1	2/2/2004	NF	1	0	—	764	—	—	—	—
Thallium	1	468.1	2/2/2004	NF	1	1	0.416	—	—	—	—	—
Tin	1	468.1	2/2/2004	NF	1	0	—	3.26	—	—	—	—
Uranium	1	468.1	2/2/2004	NF	1	1	0.157	—	—	—	—	—
Vanadium	1	468.1	2/2/2004	NF	1	0	—	0.606	—	—	—	—
Zinc	1	468.1	2/2/2004	NF	1	1	3.85	—	—	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

Table A-3
Well R-12 Screen 2 Sixth Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	2	507	1/28/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	2	507	1/28/2004	NF	—	—	—	—	—	—	—	—
pH	2	507	1/28/2004	NF	1	1	9.04	—	>6 & <9	0/1	>6 & <9	0/1
Specific Conductance (µS/cm)	2	507	1/28/2004	NF	1	1	131	—	—	—	—	—
Temperature (°C)	2	507	1/28/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	2	507	1/28/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	2	507	1/28/2004	NF	1	1	56900	—	—	—	—	—
Aluminum	2	507	1/28/2004	NF	1	1	48.5	—	—	—	—	—
Ammonia as Nitrogen	2	507	1/28/2004	NF	1	1	220	—	—	—	—	—
Antimony	2	507	1/28/2004	NF	1	0	—	0.28	6	—	—	—
Arsenic	2	507	1/28/2004	NF	1	1	2.37	—	10	—	—	—
Barium	2	507	1/28/2004	NF	1	1	15.2	—	2000	—	—	—
Beryllium	2	507	1/28/2004	NF	1	0	—	0.158	4	—	—	—
Boron	2	507	1/28/2004	NF	1	1	26.8	—	—	—	—	—
Cadmium	2	507	1/28/2004	NF	1	0	—	0.04	5	—	—	—
Calcium	2	507	1/28/2004	NF	1	1	16300	—	—	—	—	—
Chloride	2	507	1/28/2004	NF	1	1	4570	—	—	—	—	—
Chromium	2	507	1/28/2004	NF	1	0	—	0.503	100	—	—	—
Cobalt	2	507	1/28/2004	NF	1	0	—	0.541	—	—	—	—
Copper	2	507	1/28/2004	NF	1	0	—	1.39	1300	—	—	—
Dissolved Solids (total)	2	507	1/28/2004	NF	1	1	110000	—	—	—	—	—
Fluoride	2	507	1/28/2004	NF	1	1	373	—	4000	—	—	—
Iron	2	507	1/28/2004	NF	1	1	13.2	—	—	—	—	—
Lead	2	507	1/28/2004	NF	1	1	0.05	—	15	—	—	—

Table A-3 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Magnesium	2	507	1/28/2004	NF	1	1	2000	—	—	—	—	—
Manganese	2	507	1/28/2004	NF	1	1	29	—	—	—	—	—
Mercury	2	507	1/28/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	2	507	1/28/2004	NF	1	1	4	—	—	—	—	—
Nickel	2	507	1/28/2004	NF	1	0	—	0.69	100	—	—	—
Nitrate + Nitrite (as N)	2	507	1/28/2004	NF	1	1	60	—	10000	—	—	—
Perchlorate	2	507	1/28/2004	NF	1	0	—	4	—	—	—	—
Phosphorus (total)	2	507	1/28/2004	NF	1	1	29	—	—	—	—	—
Potassium	2	507	1/28/2004	NF	1	1	1960	—	—	—	—	—
Selenium	2	507	1/28/2004	NF	1	0	—	2.81	50	—	—	—
Silicon Dioxide	2	507	1/28/2004	NF	1	1	35900	—	—	—	—	—
Silver	2	507	1/28/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	2	507	1/28/2004	NF	1	1	10600	—	—	—	—	—
Strontium	2	507	1/28/2004	NF	1	1	67.7	—	—	—	—	—
Sulfate	2	507	1/28/2004	NF	1	1	8110	—	—	—	—	—
Suspended Solids (total)	2	507	1/28/2004	NF	1	1	382	—	—	—	—	—
Thallium	2	507	1/28/2004	NF	1	1	0.095	—	2	—	—	—
Tin	2	507	1/28/2004	NF	1	0	—	3.26	—	—	—	—
Uranium	2	507	1/28/2004	NF	1	1	0.557	—	30	—	—	—
Vanadium	2	507	1/28/2004	NF	1	1	2.28	—	—	—	—	—
Zinc	2	507	1/28/2004	NF	1	1	3.4	—	—	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

Table A-4
Well R-12 Screen 3 Sixth Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	3	810.8	1/27/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	3	810.8	1/27/2004	NF	—	—	—	—	—	—	—	—
pH	3	810.8	1/27/2004	NF	1	1	7.51	—	>6 & <9	0/1	>6 & <9	0/1
Specific Conductance (µS/cm)	3	810.8	1/27/2004	NF	1	1	1.36	—	—	—	—	—
Temperature (°C)	3	810.8	1/27/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	3	810.8	1/27/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	3	810.8	1/27/2004	NF	1	1	141000	—	—	—	—	—
Aluminum	3	810.8	1/27/2004	NF	1	0	—	14.7	—	—	—	—
Ammonia as Nitrogen	3	810.8	1/27/2004	NF	1	0	—	24	—	—	—	—
Antimony	3	810.8	1/27/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	3	810.8	1/27/2004	NF	1	0	—	2.24	—	—	—	—
Barium	3	810.8	1/27/2004	NF	1	1	130	—	—	—	—	—
Beryllium	3	810.8	1/27/2004	NF	1	0	—	0.158	—	—	—	—
Boron	3	810.8	1/27/2004	NF	1	1	59.1	—	—	—	—	—
Cadmium	3	810.8	1/27/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	3	810.8	1/27/2004	NF	1	1	32700	—	—	—	—	—
Chloride	3	810.8	1/27/2004	NF	1	1	8840	—	—	—	—	—
Chromium	3	810.8	1/27/2004	NF	1	1	2.39	—	—	—	—	—
Cobalt	3	810.8	1/27/2004	NF	1	0	—	0.541	—	—	—	—
Copper	3	810.8	1/27/2004	NF	1	0	—	1.39	—	—	—	—
Dissolved Solids (total)	3	810.8	1/27/2004	NF	1	1	221000	—	—	—	—	—
Fluoride	3	810.8	1/27/2004	NF	1	1	368	—	—	—	—	—
Iron	3	810.8	1/27/2004	NF	1	1	406	—	—	—	—	—
Lead	3	810.8	1/27/2004	NF	1	1	0.088	—	—	—	—	—

Table A-4 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Magnesium	3	810.8	1/27/2004	NF	1	1	9120	—	—	—	—	—
Manganese	3	810.8	1/27/2004	NF	1	1	283	—	—	—	—	—
Mercury	3	810.8	1/27/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	3	810.8	1/27/2004	NF	1	1	5.93	—	—	—	—	—
Nickel	3	810.8	1/27/2004	NF	1	1	2.39	—	—	—	—	—
Nitrate + Nitrite (as N)	3	810.8	1/27/2004	NF	1	0	—	10	—	—	—	—
Perchlorate	3	810.8	1/27/2004	NF	1	0	—	4	—	—	—	—
Phosphorus (total)	3	810.8	1/27/2004	NF	1	1	31	—	—	—	—	—
Potassium	3	810.8	1/27/2004	NF	1	1	4070	—	—	—	—	—
Selenium	3	810.8	1/27/2004	NF	1	1	3.81	—	—	—	—	—
Silicon Dioxide	3	810.8	1/27/2004	NF	1	1	56600	—	—	—	—	—
Silver	3	810.8	1/27/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	3	810.8	1/27/2004	NF	1	1	19200	—	—	—	—	—
Strontium	3	810.8	1/27/2004	NF	1	1	209	—	—	—	—	—
Sulfate	3	810.8	1/27/2004	NF	1	1	8400	—	—	—	—	—
Suspended Solids (total)	3	810.8	1/27/2004	NF	1	0	—	394	—	—	—	—
Thallium	3	810.8	1/27/2004	NF	1	1	0.841	—	—	—	—	—
Tin	3	810.8	1/27/2004	NF	1	0	—	3.26	—	—	—	—
Uranium	3	810.8	1/27/2004	NF	1	1	1.64	—	—	—	—	—
Vanadium	3	810.8	1/27/2004	NF	1	0	—	0.606	—	—	—	—
Zinc	3	810.8	1/27/2004	NF	1	1	7.4	—	—	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

Table A-5
Well R-12 Screen 1 Sixth Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Cyanide (total)	1	468.1	2/2/2004	NF[e]	1	1	1.88	—[f]	200	0/1	200	0/1
Total Organic Carbon	1	468.1	2/2/2004	NF	1	1	5300	—	—	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-6
Well R-12 Screen 2 Sixth Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Total Organic Carbon	2	507	1/28/2004	NF[e]	1	1	866	—[f]	—	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-7
Well R-12 Screen 3 Sixth Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Cyanide (total)	3	810.8	1/27/2004	NF[e]	1	1	1.81	—[f]	200	0/1	200	0/1
Total Organic Carbon	3	810.8	1/27/2004	NF	1	1	1030	—	—	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-8
Well R-12 Screen 1 Sixth Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	1	468.1	2/2/2004	NF[c]	1	0	—[d]	0.007	—	—
Cesium-137	1	468.1	2/2/2004	NF	1	0	—	3.23	—	—
Cobalt-60	1	468.1	2/2/2004	NF	1	0	—	1.06	—	—
Gross Alpha Radiation	1	468.1	2/2/2004	NF	1	0	—	0.523	15	0/1
Gross Beta Radiation	1	468.1	2/2/2004	NF	1	1	2.77	—	—	—
Gross Gamma Radiation	1	468.1	2/2/2004	NF	1	0	—	81.6	—	—
Plutonium-238	1	468.1	2/2/2004	NF	1	0	—	—0.007	—	—
Plutonium-239/240	1	468.1	2/2/2004	NF	1	0	—	0.007	—	—
Strontium-90	1	468.1	2/2/2004	NF	1	0	—	0.026	8	0/1
Tritium	1	468.1	2/2/2004	NF	1	1	149.43	—	20000	0/1
Uranium-234	1	468.1	2/2/2004	NF	1	0	—	0.027	—	—
Uranium-235/236	1	468.1	2/2/2004	NF	1	0	—	0.00	—	—
Uranium-238	1	468.1	2/2/2004	NF	1	0	—	0.0146	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-9
Well R-12 Screen 2 Sixth Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	2	507	1/28/2004	NF[c]	1	0	—[d]	0.012	—	—
Cesium-137	2	507	1/28/2004	NF	1	0	—	0.035	—	—
Cobalt-60	2	507	1/28/2004	NF	1	0	—	–0.679	—	—
Gross Alpha Radiation	2	507	1/28/2004	NF	1	0	—	0.473	15	0/1
Gross Beta Radiation	2	507	1/28/2004	NF	1	0	—	1.73	—	—
Gross Gamma Radiation	2	507	1/28/2004	NF	1	0	—	99.9	—	—
Plutonium-238	2	507	1/28/2004	NF	1	0	—	0.004	—	—
Plutonium-239/240	2	507	1/28/2004	NF	1	0	—	–0.015	—	—
Strontium-90	2	507	1/28/2004	NF	1	0	—	0.0257	8	0/1
Tritium	2	507	1/28/2004	NF	1	1	60.25	—	20000	0/1
Uranium-234	2	507	1/28/2004	NF	1	1	0.306	—	—	—
Uranium-235/236	2	507	1/28/2004	NF	1	0	—	0.00	—	—
Uranium-238	2	507	1/28/2004	NF	1	1	0.15	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-10
Well R-12 Screen 3 Sixth Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	3	810.8	1/27/2004	NF[c]	1	0	—[d]	0.00183	—	—
Cesium-137	3	810.8	1/27/2004	NF	1	0	—	0.803	—	—
Cobalt-60	3	810.8	1/27/2004	NF	1	0	—	2.4	—	—
Gross Alpha Radiation	3	810.8	1/27/2004	NF	1	0	—	1.08	15	0/1
Gross Beta Radiation	3	810.8	1/27/2004	NF	1	1	3.98	—	—	—
Gross Gamma Radiation	3	810.8	1/27/2004	NF	1	0	—	188	—	—
Plutonium-238	3	810.8	1/27/2004	NF	1	0	—	0.004	—	—
Plutonium-239/240	3	810.8	1/27/2004	NF	1	0	—	0.002	—	—
Strontium-90	3	810.8	1/27/2004	NF	1	0	—	0.089	8	0/1
Tritium	3	810.8	1/27/2004	NF	1	1	45.34	—	20000	0/1
Uranium-234	3	810.8	1/27/2004	NF	1	1	0.812	—	—	—
Uranium-235/236	3	810.8	1/27/2004	NF	1	1	0.037	—	—	—
Uranium-238	3	810.8	1/27/2004	NF	1	1	0.427	—	—	—

[a] The static water level for the regional aquifer at R-12 was 805 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-11
Well R-14 Screen 1 First Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	1	1204.5	2/9/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	1	1204.5	2/9/2004	NF	—	—	—	—	—	—	—	—
pH	1	1204.5	2/9/2004	NF	—	—	—	—	>6 & <9	—	>6 & <9	—
Specific Conductance (µS/cm)	1	1204.5	2/9/2004	NF	—	—	—	—	—	—	—	—
Temperature (°C)	1	1204.5	2/9/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	1	1204.5	2/9/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	1	1204.5	2/9/2004	NF	—	—	—	—	—	—	—	—
Aluminum	1	1204.5	2/9/2004	F[h]	1	1	29.3	—	—	—	5000	0/1
Aluminum	1	1204.5	2/9/2004	NF	1	1	24.9	—	—	—	—	—
Ammonia as Nitrogen	1	1204.5	2/9/2004	F	1	0	—	24	—	—	—	—
Ammonia as Nitrogen	1	1204.5	2/9/2004	NF	1	0	—	24	—	—	—	—
Antimony	1	1204.5	2/9/2004	F	1	1	0.204	—	6	0/1	—	—
Antimony	1	1204.5	2/9/2004	NF	1	1	0.081	—	—	—	—	—
Arsenic	1	1204.5	2/9/2004	F	1	1	2.47	—	10	0/1	100	0/1
Arsenic	1	1204.5	2/9/2004	NF	1	0	—	2.24	—	—	—	—
Barium	1	1204.5	2/9/2004	F	1	1	47.9	—	2000	0/1	1000	0/1
Barium	1	1204.5	2/9/2004	NF	1	1	49.2	—	—	—	—	—
Beryllium	1	1204.5	2/9/2004	F	1	1	0.017	—	4	0/1	—	—
Beryllium	1	1204.5	2/9/2004	NF	1	0	—	0.08	—	—	—	—
Boron	1	1204.5	2/9/2004	F	1	1	12.4	—	—	—	750	0/1
Boron	1	1204.5	2/9/2004	NF	1	1	14.3	—	—	—	—	—

Table A-11 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Bromide	1	1204.5	2/9/2004	F	1	1	560	—	—	—	—	—
Cadmium	1	1204.5	2/9/2004	F	1	0	—	0.04	5	0/1	10	0/1
Cadmium	1	1204.5	2/9/2004	NF	1	1	0.021	—	—	—	—	—
Calcium	1	1204.5	2/9/2004	F	1	1	12000	—	—	—	—	—
Calcium	1	1204.5	2/9/2004	NF	1	1	12100	—	—	—	—	—
Chloride	1	1204.5	2/9/2004	F	1	1	1610	—	—	—	250000	0/1
Chromium	1	1204.5	2/9/2004	F	1	1	3.02	—	100	0/1	50	0/1
Chromium	1	1204.5	2/9/2004	NF	1	1	2.28	—	100	0/1	—	—
Cobalt	1	1204.5	2/9/2004	F	1	0	—	0.541	—	—	50	0/1
Cobalt	1	1204.5	2/9/2004	NF	1	0	—	0.541	—	—	—	—
Copper	1	1204.5	2/9/2004	F	1	0	—	1.39	1300	0/1	1000	0/1
Copper	1	1204.5	2/9/2004	NF	1	1	7.56	—	—	—	—	—
Fluoride	1	1204.5	2/9/2004	F	1	1	96	—	4000	0/1	1.6	0/1
Iron	1	1204.5	2/9/2004	F	1	1	127	—	—	—	1000	0/1
Iron	1	1204.5	2/9/2004	NF	1	1	157	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	1204.5	2/9/2004	F	1	1	140	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	1204.5	2/9/2004	NF	1	1	171	—	—	—	—	—
Lead	1	1204.5	2/9/2004	F	1	1	0.083	—	15	0/1	50	0/1
Lead	1	1204.5	2/9/2004	NF	1	1	0.093	—	—	—	—	—
Magnesium	1	1204.5	2/9/2004	F	1	1	3430	—	—	—	—	—
Magnesium	1	1204.5	2/9/2004	NF	1	1	3430	—	—	—	—	—
Manganese	1	1204.5	2/9/2004	F	1	1	104	—	—	—	200	0/1
Manganese	1	1204.5	2/9/2004	NF	1	1	106	—	—	—	—	—
Mercury	1	1204.5	2/9/2004	F	1	0	—	0.0472	2	0/1	2	0/1
Mercury	1	1204.5	2/9/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	1	1204.5	2/9/2004	F	1	1	1.36	—	—	—	1000	0/1
Molybdenum	1	1204.5	2/9/2004	NF	1	1	1.44	—	—	—	—	—

Table A-11 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Nickel	1	1204.5	2/9/2004	F	1	1	1.52	—	100	0/1	200	0/1
Nickel	1	1204.5	2/9/2004	NF	1	1	1.36	—	—	—	—	—
Nitrate	1	1204.5	2/9/2004	F	1	1	59	—	—	—	10	0/1
Nitrate + Nitrite (as N)	1	1204.5	2/9/2004	F	1	1	90	—	10000	0/1	10	0/1
Nitrate + Nitrite (as N)	1	1204.5	2/9/2004	NF	1	1	50	—	—	—	—	—
Nitrite	1	1204.5	2/9/2004	F	1	0	—	54.2	1000	0/1	—	—
Oxalate	1	1204.5	2/9/2004	F	1	0	—	346	—	—	—	—
Perchlorate	1	1204.5	2/9/2004	F	1	0	—	4	—	—	—	—
Perchlorate	1	1204.5	2/9/2004	NF	1	0	—	0.176	—	—	—	—
Phosphorus (total)	1	1204.5	2/9/2004	F	1	1	162	—	—	—	—	—
Phosphorus (total)	1	1204.5	2/9/2004	NF	1	1	175	—	—	—	—	—
Potassium	1	1204.5	2/9/2004	F	1	1	2290	—	—	—	—	—
Potassium	1	1204.5	2/9/2004	NF	1	1	2300	—	—	—	—	—
Selenium	1	1204.5	2/9/2004	F	1	0	—	2.81	50	0/1	50	0/1
Selenium	1	1204.5	2/9/2004	NF	1	0	—	2.81	—	—	—	—
Silicon	1	1204.5	2/9/2004	F	1	1	39600	—	—	—	—	—
Silicon	1	1204.5	2/9/2004	NF	1	1	39500	—	—	—	—	—
Silver	1	1204.5	2/9/2004	F	1	0	—	0.835	—	—	50	0/1
Silver	1	1204.5	2/9/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	1	1204.5	2/9/2004	F	1	1	11600	—	—	—	—	—
Sodium	1	1204.5	2/9/2004	NF	1	1	11600	—	—	—	—	—
Strontium	1	1204.5	2/9/2004	F	1	1	63.9	—	—	—	—	—
Strontium	1	1204.5	2/9/2004	NF	1	1	64.8	—	—	—	—	—
Sulfate	1	1204.5	2/9/2004	F	1	1	1640	—	—	—	600000	0/1
Thallium	1	1204.5	2/9/2004	F	1	1	0.023	—	2	0/1	—	—
Thallium	1	1204.5	2/9/2004	NF	1	1	0.009	—	—	—	—	—
Uranium	1	1204.5	2/9/2004	F	1	1	0.508	—	30	0/1	5000	0/1

Table A-11 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Uranium	1	1204.5	2/9/2004	NF	1	1	0.514	—	—	—	—	—
Vanadium	1	1204.5	2/9/2004	F	1	1	6.75	—	—	—	—	—
Vanadium	1	1204.5	2/9/2004	NF	1	1	6.45	—	—	—	—	—
Zinc	1	1204.5	2/9/2004	F	1	1	4.92	—	—	—	10000	0/1
Zinc	1	1204.5	2/9/2004	NF	1	1	4.47	—	—	—	—	—

[a] The static water level for the regional aquifer at R-14 was 1182 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-12
Well R-14 Screen 2 First Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
No inorganic results are available from this screen	2	—[e]	—	—	—	—	—	—	—	—	—	—

[a] The static water level for the regional aquifer at R-14 was 1182 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] — = Not available or not applicable.

Table A-13
Well R-14 Screen 1 First Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Total Organic Carbon	1	1204.5	2/9/2004	NF[e]	1	1	—	—[f]	—	—	—	—

[a] The static water level for the regional aquifer at R-14 was 1182 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-14
Well R-14 Screen 2 First Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
No organic results are available from this screen	2	—[e]	—	—	—	—	—	—	—	—	—	—

[a] The static water level for the regional aquifer at R-14 was 1182 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] — = Not available or not applicable.

Table A-15
Well R-14 Screen 1 First Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	1	1204.5	2/9/2004	NF[c]	1	0	—[d]	0.0156	—	—
Cesium-137	1	1204.5	2/9/2004	NF	1	0	—	–0.553	—	—
Plutonium-238	1	1204.5	2/9/2004	NF	1	0	—	0.00427	—	—
Plutonium-239/240	1	1204.5	2/9/2004	NF	1	0	—	0.00	—	—
Strontium-90	1	1204.5	2/9/2004	NF	1	0	—	–0.0144	8	0/1
Technetium-99	1	1204.5	2/9/2004	NF	1	0	—	0.518	—	—
Tritium	1	1204.5	2/9/2004	NF	1	1	2.55	—	20000	0/1
Uranium-234	1	1204.5	2/9/2004	NF	1	1	0.279	—	—	—
Uranium-235/236	1	1204.5	2/9/2004	NF	1	1	0.033	—	—	—
Uranium-238	1	1204.5	2/9/2004	NF	1	1	0.164	—	—	—

[a] The static water level for the regional aquifer at R-14 was 1182 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-16
Well R-14 Screen 2 First Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Tritium	2	1288.5	2/11/2004	NF[c]	1	1	0.51088	—[d]	20000	0/1

[a] The static water level for the regional aquifer at R-14 was 1182 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-17
Well R-23 Screen 1 First Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	1	816.0–873.2	12/17/2003	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	1	816.0–873.2	12/17/2003	NF	—	—	—	—	—	—	—	—
pH	1	816.0–873.2	12/17/2003	NF	1	1	7.88	—	>6 & <9	0/1	>6 & <9	0/1
Specific Conductance (µS/cm)	1	816.0–873.2	12/17/2003	NF	1	1	176.8	—	—	—	—	—
Temperature (°C)	1	816.0–873.2	12/17/2003	NF	1	1	21.9	—	—	—	—	—
Turbidity (NTU[g])	1	816.0–873.2	12/17/2003	NF	1	1	19.9	—	—	—	—	—
Analyte												
Aluminum	1	816.0–873.2	12/17/2003	F[h]	1	1	48.1	—	—	—	5000	0/1
Aluminum	1	816.0–873.2	12/17/2003	NF	1	1	42.2	—	—	—	—	—
Ammonia as Nitrogen	1	816.0–873.2	12/17/2003	F	1	1	50	—	—	—	—	—
Ammonia as Nitrogen	1	816.0–873.2	12/17/2003	NF	1	1	30	—	—	—	—	—
Antimony	1	816.0–873.2	12/17/2003	F	1	0	—	0.28	6	0/1	—	0/1
Antimony	1	816.0–873.2	12/17/2003	NF	1	0	—	0.28	—	—	—	—
Arsenic	1	816.0–873.2	12/17/2003	F	1	1	2.48	—	10	0/1	100	0/1
Arsenic	1	816.0–873.2	12/17/2003	NF	1	0	—	2.24	—	—	—	—
Barium	1	816.0–873.2	12/17/2003	F	1	1	37.8	—	2000	0/1	1000	0/1
Barium	1	816.0–873.2	12/17/2003	NF	1	1	34.6	—	—	—	—	—
Beryllium	1	816.0–873.2	12/17/2003	F	1	0	—	0.08	4	0/1	—	0/1
Beryllium	1	816.0–873.2	12/17/2003	NF	1	0	—	0.08	—	—	—	—
Boron	1	816.0–873.2	12/17/2003	F	1	1	13.2	—	—	—	750	0/1
Boron	1	816.0–873.2	12/17/2003	NF	1	1	13.9	—	—	—	—	—
Bromide	1	816.0–873.2	12/17/2003	F	1	1	529	—	—	—	—	—
Cadmium	1	816.0–873.2	12/17/2003	F	1	0	—	0.04	5	0/1	10	0/1

Table A-17 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Cadmium	1	816.0–873.2	12/17/2003	NF	1	0	—	0.04	—	—	—	—
Calcium	1	816.0–873.2	12/17/2003	F	1	1	17800	—	—	—	—	—
Calcium	1	816.0–873.2	12/17/2003	NF	1	1	17400	—	—	—	—	—
Chloride	1	816.0–873.2	12/17/2003	F	1	1	3520	—	—	—	250000	0/1
Chromium	1	816.0–873.2	12/17/2003	F	1	1	1.31	—	100	0/1	50	0/1
Chromium	1	816.0–873.2	12/17/2003	NF	1	1	0.518	—	—	—	—	—
Cobalt	1	816.0–873.2	12/17/2003	F	1	0	—	0.541	—	—	50	0/1
Cobalt	1	816.0–873.2	12/17/2003	NF	1	0	—	0.541	—	—	—	—
Copper	1	816.0–873.2	12/17/2003	F	1	0	—	1.39	1300	0/1	1000	0/1
Copper	1	816.0–873.2	12/17/2003	NF	1	0	—	1.39	—	—	—	—
Fluoride	1	816.0–873.2	12/17/2003	F	1	1	327	—	4000	0/1	1.6	0/1
Iron	1	816.0–873.2	12/17/2003	F	1	1	169	—	—	—	1000	0/1
Iron	1	816.0–873.2	12/17/2003	NF	1	1	92.9	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	816.0–873.2	12/17/2003	F	1	1	330	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	816.0–873.2	12/17/2003	NF	1	1	360	—	—	—	—	—
Lead	1	816.0–873.2	12/17/2003	F	1	1	2.04	—	15	0/1	50	0/1
Lead	1	816.0–873.2	12/17/2003	NF	1	1	0.258	—	—	—	—	—
Magnesium	1	816.0–873.2	12/17/2003	F	1	1	4150	—	—	—	—	—
Magnesium	1	816.0–873.2	12/17/2003	NF	1	1	4060	—	—	—	—	—
Manganese	1	816.0–873.2	12/17/2003	F	1	1	207	—	—	—	200	1/1
Manganese	1	816.0–873.2	12/17/2003	NF	1	1	108	—	—	—	—	—
Mercury	1	816.0–873.2	12/17/2003	F	1	0	—	0.033	2	0/1	2	0/1
Mercury	1	816.0–873.2	12/17/2003	NF	1	0	—	0.033	2	0/1	2	0/1
Molybdenum	1	816.0–873.2	12/17/2003	F	1	1	1.68	—	—	—	1000	0/1
Molybdenum	1	816.0–873.2	12/17/2003	NF	1	1	1.66	—	—	—	—	—
Nickel	1	816.0–873.2	12/17/2003	F	1	1	1.28	—	100	0/1	200	0/1

Table A-17 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Nickel	1	816.0–873.2	12/17/2003	NF	1	0	—	0.69	—	—	—	—
Nitrate + Nitrite (as N)	1	816.0–873.2	12/17/2003	F	1	1	520	—	10000	0/1	10000	0/1
Nitrate + Nitrite (as N)	1	816.0–873.2	12/17/2003	NF	1	1	460	—	—	—	—	—
Perchlorate	1	816.0–873.2	12/17/2003	NF	1	0	0.206	—	—	—	—	—
Phosphorus (total)	1	816.0–873.2	12/17/2003	F	1	0	—	11	—	—	—	—
Phosphorus (total)	1	816.0–873.2	12/17/2003	NF	1	1	14	—	—	—	—	—
Potassium	1	816.0–873.2	12/17/2003	F	1	1	1700	—	—	—	—	—
Potassium	1	816.0–873.2	12/17/2003	NF	1	1	1700	—	—	—	—	—
Selenium	1	816.0–873.2	12/17/2003	F	1	1	4.2	—	50	0/1	50	0/1
Selenium	1	816.0–873.2	12/17/2003	NF	1	1	4.35	—	—	—	—	—
Silicon Dioxide	1	816.0–873.2	12/17/2003	F	1	1	61700	—	—	—	—	—
Silicon Dioxide	1	816.0–873.2	12/17/2003	NF	1	1	61100	—	—	—	—	—
Silver	1	816.0–873.2	12/17/2003	F	1	0	—	0.835	—	—	50	0/1
Silver	1	816.0–873.2	12/17/2003	NF	1	0	—	0.835	—	—	—	—
Sodium	1	816.0–873.2	12/17/2003	F	1	1	10600	—	—	—	—	—
Sodium	1	816.0–873.2	12/17/2003	NF	1	1	10600	—	—	—	—	—
Strontium	1	816.0–873.2	12/17/2003	F	1	1	85.4	—	—	—	—	—
Strontium	1	816.0–873.2	12/17/2003	NF	1	1	83.4	—	—	—	—	—
Sulfate	1	816.0–873.2	12/17/2003	F	1	1	5390	—	—	—	600000	0/1
Thallium	1	816.0–873.2	12/17/2003	F	1	0	—	0.02	2	0/1	—	0/1
Thallium	1	816.0–873.2	12/17/2003	NF	1	0	—	0.02	—	—	—	—
Uranium	1	816.0–873.2	12/17/2003	F	1	1	0.802	—	30	0/1	5000	0/1
Uranium	1	816.0–873.2	12/17/2003	NF	1	1	0.854	—	—	—	—	—
Vanadium	1	816.0–873.2	12/17/2003	F	1	1	5.18	—	—	—	—	—
Vanadium	1	816.0–873.2	12/17/2003	NF	1	1	5.52	—	—	—	—	—

Table A-17 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Zinc	1	816.0–873.2	12/17/2003	F	1	1	1.13	—	—	—	10000	0/1
Zinc	1	816.0–873.2	12/17/2003	NF	1	0	—	0.883	—	—	—	—

[a] The static water level for the regional aquifer at R-23 was 829 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-18
Well R-23 Screen 1 First Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Acetone	1	816.0–873.2	12/17/2003	NF[e]	1	1	50.8	—[f]	—	—	—	—
Bis(2-ethylhexyl)phthalate	1	816.0–873.2	12/17/2003	NF	1	1	7.6	—	—	—	—	—
Butylbenzylphthalate	1	816.0–873.2	12/17/2003	NF	1	1	1.6	—	—	—	—	—
Endosulfan Sulfate	1	816.0–873.2	12/17/2003	NF	1	1	0.0185	—	—	—	—	—
Endrin Aldehyde	1	816.0–873.2	12/17/2003	NF	1	1	0.0334	—	—	—	—	—
Endrin Ketone	1	816.0–873.2	12/17/2003	NF	1	1	0.00909	—	—	—	—	—
Total Organic Carbon	1	816.0–873.2	12/17/2003	NF	1	1	1510	—	—	—	—	—

[a] The static water level for the regional aquifer at R-23 was 829 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-19
Well R-23 Screen 1 First Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	1	816.0–873.2	12/17/2003	NF[c]	1	0	—[d]	0.00176	—	—
Cesium-137	1	816.0–873.2	12/17/2003	NF	1	0	—	–0.0958	—	—
Plutonium-238	1	816.0–873.2	12/17/2003	NF	1	0	—	0.00624	—	—
Plutonium-239/240	1	816.0–873.2	12/17/2003	NF	1	0	—	–0.00624	—	—
Potassium-40	1	816.0–873.2	12/17/2003	NF	1	0	—	3.67	—	—
Strontium-90	1	816.0–873.2	12/17/2003	NF	1	0	—	0.141	8	0/1
Technetium-99	1	816.0–873.2	12/17/2003	NF	1	0	—	–0.86	—	—
Tritium	1	816.0–873.2	12/17/2003	NF	1	1	0.25544	—	20000	0/1
Uranium-234	1	816.0–873.2	12/17/2003	NF	1	1	0.706	—	—	—
Uranium-235/236	1	816.0–873.2	12/17/2003	NF	1	0	—	0.0472	—	—
Uranium-238	1	816.0–873.2	12/17/2003	NF	1	1	0.3	—	—	—

[a] The static water level for the regional aquifer at R-23 was 829 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-20
Well R-23 Screen 1 Second Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	1	816.0–873.2	3/23/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	1	816.0–873.2	3/23/2004	NF	—	—	—	—	—	—	—	—
pH	1	816.0–873.2	3/23/2004	NF	—	—	—	—	>6 & <9	—	>6 & <9	—
Specific Conductance (µS/cm)	1	816.0–873.2	3/23/2004	NF	—	—	—	—	—	—	—	—
Temperature (°C)	1	816.0–873.2	3/23/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	1	816.0–873.2	3/23/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	1	816.0–873.2	3/23/2004	NF	1	1	67400	—	—	—	—	—
Aluminum	1	816.0–873.2	3/23/2004	F[h]	1	0	—	14.7	—	—	5000	0/1
Aluminum	1	816.0–873.2	3/23/2004	NF	1	0	—	14.7	—	—	—	—
Ammonia as Nitrogen	1	816.0–873.2	3/23/2004	F	1	0	—	15.9	—	—	—	—
Ammonia as Nitrogen	1	816.0–873.2	3/23/2004	NF	1	0	—	15.9	—	—	—	—
Antimony	1	816.0–873.2	3/23/2004	F	1	0	—	0.28	6	0/1	—	—
Antimony	1	816.0–873.2	3/23/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	1	816.0–873.2	3/23/2004	F	1	0	—	2.24	10	0/1	100	0/1
Arsenic	1	816.0–873.2	3/23/2004	NF	1	0	—	2.24	—	—	—	—
Barium	1	816.0–873.2	3/23/2004	F	1	1	30.7	—	2000	0/1	1000	0/1
Barium	1	816.0–873.2	3/23/2004	NF	1	1	33.4	—	—	—	—	—
Beryllium	1	816.0–873.2	3/23/2004	F	1	0	—	0.08	4	0/1	—	—
Beryllium	1	816.0–873.2	3/23/2004	NF	1	0	—	0.08	—	—	—	—
Boron	1	816.0–873.2	3/23/2004	F	1	1	9.85	—	—	—	750	0/1
Boron	1	816.0–873.2	3/23/2004	NF	1	1	9.84	—	—	—	—	—

Table A-20 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Bromide	1	816.0–873.2	3/23/2004	F	1	0	—	97.8	—	—	—	—
Cadmium	1	816.0–873.2	3/23/2004	F	1	0	—	0.04	5	0/1	10	0/1
Cadmium	1	816.0–873.2	3/23/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	1	816.0–873.2	3/23/2004	F	1	1	17900	—	—	—	—	—
Calcium	1	816.0–873.2	3/23/2004	NF	1	1	17600	—	—	—	—	—
Chloride	1	816.0–873.2	3/23/2004	F	1	1	3870	—	—	—	250000	0/1
Chromium	1	816.0–873.2	3/23/2004	F	1	1	1.02	—	100	0/1	50	0/1
Chromium	1	816.0–873.2	3/23/2004	NF	1	1	1.36	—	—	—	—	—
Cobalt	1	816.0–873.2	3/23/2004	F	1	0	—	0.541	—	—	50	0/1
Cobalt	1	816.0–873.2	3/23/2004	NF	1	0	—	0.541	—	—	—	—
Copper	1	816.0–873.2	3/23/2004	F	1	0	—	1.39	1300	0/1	1000	0/1
Copper	1	816.0–873.2	3/23/2004	NF	1	0	—	1.39	—	—	—	—
Fluoride	1	816.0–873.2	3/23/2004	F	1	1	334	—	4000	0/1	1.6	0/1
Iron	1	816.0–873.2	3/23/2004	F	1	1	12.8	—	—	—	1000	0/1
Iron	1	816.0–873.2	3/23/2004	NF	1	1	61.3	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	816.0–873.2	3/23/2004	F	1	1	475	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	816.0–873.2	3/23/2004	NF	1	1	596	—	—	—	—	—
Lead	1	816.0–873.2	3/23/2004	F	1	1	0.67	—	15	0/1	50	0/1
Lead	1	816.0–873.2	3/23/2004	NF	1	1	2.89	—	—	—	—	—
Magnesium	1	816.0–873.2	3/23/2004	F	1	1	4320	—	—	—	—	—
Magnesium	1	816.0–873.2	3/23/2004	NF	1	1	4260	—	—	—	—	—
Manganese	1	816.0–873.2	3/23/2004	F	1	1	16.6	—	—	—	200	0/1
Manganese	1	816.0–873.2	3/23/2004	NF	1	1	139	—	—	—	—	—
Mercury	1	816.0–873.2	3/23/2004	F	1	0	—	0.0472	2	0/1	2	0/1
Mercury	1	816.0–873.2	3/23/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	1	816.0–873.2	3/23/2004	F	1	1	1.51	—	—	—	1000	0/1

Table A-20 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Molybdenum	1	816.0–873.2	3/23/2004	NF	1	1	1.38	—	—	—	—	—
Nickel	1	816.0–873.2	3/23/2004	F	1	0	—	0.69	100	0/1	200	0/1
Nickel	1	816.0–873.2	3/23/2004	NF	1	1	2.15	—	—	—	—	—
Nitrate + Nitrite (as N)	1	816.0–873.2	3/23/2004	F	1	1	650	—	10000	0/1	10000	0/1
Nitrate + Nitrite (as N)	1	816.0–873.2	3/23/2004	NF	1	1	880	—	—	—	—	—
Perchlorate	1	816.0–873.2	3/23/2004	NF	1	1	0.36	—	—	—	—	—
Phosphorus (total)	1	816.0–873.2	3/23/2004	F	1	1	28	—	—	—	—	—
Phosphorus (total)	1	816.0–873.2	3/23/2004	NF	1	1	46	—	—	—	—	—
Potassium	1	816.0–873.2	3/23/2004	F	1	1	1810	—	—	—	—	—
Potassium	1	816.0–873.2	3/23/2004	NF	1	1	1760	—	—	—	—	—
Selenium	1	816.0–873.2	3/23/2004	F	1	0	—	2.81	50	0/1	50	0/1
Selenium	1	816.0–873.2	3/23/2004	NF	1	1	4.04	—	—	—	—	—
Silicon Dioxide	1	816.0–873.2	3/23/2004	F	1	1	60400	—	—	—	—	—
Silicon Dioxide	1	816.0–873.2	3/23/2004	NF	1	1	60500	—	—	—	—	—
Silver	1	816.0–873.2	3/23/2004	F	1	0	—	0.835	—	—	50	0/1
Silver	1	816.0–873.2	3/23/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	1	816.0–873.2	3/23/2004	F	1	1	11000	—	—	—	—	—
Sodium	1	816.0–873.2	3/23/2004	NF	1	1	10800	—	—	—	—	—
Strontium	1	816.0–873.2	3/23/2004	F	1	1	88	—	—	—	—	—
Strontium	1	816.0–873.2	3/23/2004	NF	1	1	86.6	—	—	—	—	—
Sulfate	1	816.0–873.2	3/23/2004	F	1	1	7220	—	—	—	600000	0/1
Thallium	1	816.0–873.2	3/23/2004	F	1	1	0.37	—	2	0/1	2	0/1
Thallium	1	816.0–873.2	3/23/2004	NF	1	1	0.042	—	—	—	—	—
Uranium	1	816.0–873.2	3/23/2004	F	1	1	0.755	—	30	0/1	5000	0/1
Uranium	1	816.0–873.2	3/23/2004	NF	1	1	0.666	—	—	—	—	—
Vanadium	1	816.0–873.2	3/23/2004	F	1	1	6.46	—	—	—	—	—
Vanadium	1	816.0–873.2	3/23/2004	NF	1	1	7.41	—	—	—	—	—

Table A-20 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Zinc	1	816.0–873.2	3/23/2004	F	1	1	30.5	—	—	—	10000	0/1
Zinc	1	816.0–873.2	3/23/2004	NF	1	1	22.6	—	—	—	—	—

[a] The static water level for the regional aquifer at R-23 was 829 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-21
Well R-23 Screen 1 Second Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Acetone	1	816.0–873.2	3/23/2004	NF[e]	1	1	8.5	—[f]	—	—	—	—
Total Organic Carbon	1	816.0–873.2	3/23/2004	NF	1	1	1050	—	—	—	—	—

[a] The static water level for the regional aquifer at R-23 was 829 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-22
Well R-23 Screen 1 Second Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	1	816.0–873.2	3/23/2004	NF[c]	1	0	—[d]	0.0188	—	—
Cesium-137	1	816.0–873.2	3/23/2004	NF	1	0	—	0.411	—	—
Gross Gamma Radiation	1	816.0–873.2	3/23/2004	NF	1	0	—	91.3	—	—
Plutonium-238	1	816.0–873.2	3/23/2004	NF	1	0	—	0.00205	—	—
Plutonium-239/240	1	816.0–873.2	3/23/2004	NF	1	0	—	–0.00614	—	—
Potassium-40	1	816.0–873.2	3/23/2004	NF	1	0	—	13.6	—	—
Strontium-90	1	816.0–873.2	3/23/2004	NF	1	0	—	0.0982	8	0/1
Technetium-99	1	816.0–873.2	3/23/2004	NF	1	0	—	0.131	—	—
Uranium-234	1	816.0–873.2	3/23/2004	NF	1	1	0.519	—	—	—
Uranium-235/236	1	816.0–873.2	3/23/2004	NF	1	0	—	0.0326	—	—
Uranium-238	1	816.0–873.2	3/23/2004	NF	1	1	0.2	—	—	—

[a] The static water level for the regional aquifer at R-23 was 829 ft t when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-23
Well R-32 Screen 1 First Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	1	870.9	3/1/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	1	870.9	3/1/2004	NF	—	—	—	—	—	—	—	—
pH	1	870.9	3/1/2004	NF	—	—	—	—	>6 & <9	—	>6 & <9	—
Specific Conductance (µS/cm)	1	870.9	3/1/2004	NF	—	—	—	—	—	—	—	—
Temperature (°C)	1	870.9	3/1/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	1	870.9	3/1/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Aluminum	1	870.9	3/1/2004	F[h]	1	0	—	14.7	—	—	5000	0/1
Aluminum	1	870.9	3/1/2004	NF	1	0	—	14.7	—	—	—	—
Ammonia as Nitrogen	1	870.9	3/1/2004	F	1	0	—	24	—	—	—	—
Ammonia as Nitrogen	1	870.9	3/1/2004	NF	1	0	—	24	—	—	—	—
Antimony	1	870.9	3/1/2004	F	1	0	—	0.28	6	0/1	—	
Antimony	1	870.9	3/1/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	1	870.9	3/1/2004	F	1	0	—	2.24	10	0/1	100	0/1
Arsenic	1	870.9	3/1/2004	NF	1	0	—	2.24	—	—	—	—
Barium	1	870.9	3/1/2004	F	1	1	79.5	—	2000	0/1	1000	0/1
Barium	1	870.9	3/1/2004	NF	1	1	83	—	—	—	—	—
Beryllium	1	870.9	3/1/2004	F	1	0	—	0.08	4	0/1	—	
Beryllium	1	870.9	3/1/2004	NF	1	0	—	0.08	—	—	—	—
Boron	1	870.9	3/1/2004	F	1	1	8.62	—	—	—	750	0/1
Boron	1	870.9	3/1/2004	NF	1	1	8.13	—	—	—	—	—
Bromide	1	870.9	3/1/2004	F	1	0	—	97.8	—	—	—	—
Cadmium	1	870.9	3/1/2004	F	1	1	0.06	—	5	0/1	10	0/1

Table A-23 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Cadmium	1	870.9	3/1/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	1	870.9	3/1/2004	F	1	1	16600	—	—	—	—	—
Calcium	1	870.9	3/1/2004	NF	1	1	16700	—	—	—	—	—
Chloride	1	870.9	3/1/2004	F	1	1	3110	—	—	—	250000	0/1
Chromium	1	870.9	3/1/2004	F	1	0	—	0.503	100	0/1	50	0/1
Chromium	1	870.9	3/1/2004	NF	1	1	0.836	—	—	—	—	—
Cobalt	1	870.9	3/1/2004	F	1	0	—	0.541	—	—	50	0/1
Cobalt	1	870.9	3/1/2004	NF	1	0	—	0.541	—	—	—	—
Copper	1	870.9	3/1/2004	F	1	0	—	1.39	1300	0/1	1000	0/1
Copper	1	870.9	3/1/2004	NF	1	0	—	1.39	—	—	—	—
Fluoride	1	870.9	3/1/2004	F	1	1	351	—	4000	0/1	1.6	0/1
Iron	1	870.9	3/1/2004	F	1	1	121	—	—	—	1000	0/1
Iron	1	870.9	3/1/2004	NF	1	1	138	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	870.9	3/1/2004	F	1	1	260	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	870.9	3/1/2004	NF	1	1	260	—	—	—	—	—
Lead	1	870.9	3/1/2004	F	1	0	—	0.05	15	0/1	50	0/1
Lead	1	870.9	3/1/2004	NF	1	0	—	0.05	—	—	—	—
Magnesium	1	870.9	3/1/2004	F	1	1	4840	—	—	—	—	—
Magnesium	1	870.9	3/1/2004	NF	1	1	4900	—	—	—	—	—
Manganese	1	870.9	3/1/2004	F	1	1	73.8	—	—	—	200	0/1
Manganese	1	870.9	3/1/2004	NF	1	1	72.5	—	—	—	—	—
Mercury	1	870.9	3/1/2004	F	1	0	—	0.0472	—	—	—	—
Mercury	1	870.9	3/1/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	1	870.9	3/1/2004	F	1	1	3.36	—	—	—	1000	0/1
Molybdenum	1	870.9	3/1/2004	NF	1	1	3.31	—	—	—	—	—
Nickel	1	870.9	3/1/2004	F	1	1	1.63	—	100	0/1	200	0/1

Table A-23 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Nickel	1	870.9	3/1/2004	NF	1	1	1.01	—	—	—	—	—
Nitrate	1	870.9	3/1/2004	F	1	1	99	—	—	—	10	0/1
Nitrate + Nitrite (as N)	1	870.9	3/1/2004	F	1	0	—	50	10000	0/1	10000	0/1
Nitrate + Nitrite (as N)	1	870.9	3/1/2004	NF	1	1	60	—	—	—	—	—
Nitrite	1	870.9	3/1/2004	F	1	1	191	—	1	0/1	—	
Oxalate	1	870.9	3/1/2004	F	1	0	—	346	—	—	—	—
Perchlorate	1	870.9	3/1/2004	F	1	0	—	4	—	—	—	—
Perchlorate	1	870.9	3/1/2004	NF	1	1	0.213	—	—	—	—	—
Phosphorus (total)	1	870.9	3/1/2004	F	1	1	60	—	—	—	—	—
Phosphorus (total)	1	870.9	3/1/2004	NF	1	1	57	—	—	—	—	—
Potassium	1	870.9	3/1/2004	F	1	1	1700	—	—	—	—	—
Potassium	1	870.9	3/1/2004	NF	1	1	1700	—	—	—	—	—
Selenium	1	870.9	3/1/2004	F	1	0	—	2.81	50	0/1	50	0/1
Selenium	1	870.9	3/1/2004	NF	1	0	—	2.81	—	—	—	—
Silicon Dioxide	1	870.9	3/1/2004	F	1	1	64600	—	—	—	—	—
Silicon Dioxide	1	870.9	3/1/2004	NF	1	1	65000	—	—	—	—	—
Silver	1	870.9	3/1/2004	F	1	0	—	0.835	—	—	50	0/1
Silver	1	870.9	3/1/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	1	870.9	3/1/2004	F	1	1	11300	—	—	—	—	—
Sodium	1	870.9	3/1/2004	NF	1	1	11100	—	—	—	—	—
Strontium	1	870.9	3/1/2004	F	1	1	90.8	—	—	—	—	—
Strontium	1	870.9	3/1/2004	NF	1	1	91.1	—	—	—	—	—
Sulfate	1	870.9	3/1/2004	F	1	1	7290	—	—	—	600000	0/1
Thallium	1	870.9	3/1/2004	F	1	1	0.126	—	2	0/1	—	—
Thallium	1	870.9	3/1/2004	NF	1	1	0.05	—	—	—	—	—
Uranium	1	870.9	3/1/2004	F	1	1	1.69	—	30	0/1	5000	0/1
Uranium	1	870.9	3/1/2004	NF	1	1	1.61	—	—	—	—	—

Table A-23 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Vanadium	1	870.9	3/1/2004	F	1	1	0.811	—	—	—	—	—
Vanadium	1	870.9	3/1/2004	NF	1	0	—	0.606	—	—	—	—
Zinc	1	870.9	3/1/2004	F	1	1	2	—	—	—	10000	0/1
Zinc	1	870.9	3/1/2004	NF	1	1	2.97	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-24
Well R-32 Screen 3 First Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	3	976	3/3/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	3	976	3/3/2004	NF	—	—	—	—	—	—	—	—
pH	3	976	3/3/2004	NF	—	—	—	—	>6 & <9	—	>6 & <9	—
Specific Conductance (µS/cm)	3	976	3/3/2004	NF	—	—	—	—	—	—	—	—
Temperature (°C)	3	976	3/3/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	3	976	3/3/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	3	976	3/3/2004	NF	1	1	60200	—	—	—	—	—
Aluminum	3	976	3/3/2004	F[h]	1	1	70	—	—	—	5000	0/1
Aluminum	3	976	3/3/2004	NF	1	1	25.3	—	—	—	—	—
Ammonia as Nitrogen	3	976	3/3/2004	F	1	1	401	—	—	—	—	—
Ammonia as Nitrogen	3	976	3/3/2004	NF	1	1	375	—	—	—	—	—
Antimony	3	976	3/3/2004	F	1	0	—	0.28	6	0/1	—	—
Antimony	3	976	3/3/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	3	976	3/3/2004	F	1	0	—	2.24	10	0/1	100	0/1
Arsenic	3	976	3/3/2004	NF	1	0	—	2.24	—	—	—	—
Barium	3	976	3/3/2004	F	1	1	70.4	—	2000	0/1	1000	0/1
Barium	3	976	3/3/2004	NF	1	1	72.5	—	—	—	—	—
Beryllium	3	976	3/3/2004	F	1	0	—	0.08	4	0/1	—	—
Beryllium	3	976	3/3/2004	NF	1	0	—	0.08	—	—	—	—
Boron	3	976	3/3/2004	F	1	1	13.2	—	—	—	750	0/1
Boron	3	976	3/3/2004	NF	1	1	11.2	—	—	—	—	—

Table A-24 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Bromide	3	976	3/3/2004	F	1	0	—	97.8	—	—	—	—
Cadmium	3	976	3/3/2004	F	1	0	—	0.04	5	0/1	10	0/1
Cadmium	3	976	3/3/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	3	976	3/3/2004	F	1	1	11900	—	—	—	—	—
Calcium	3	976	3/3/2004	NF	1	1	11100	—	—	—	—	—
Chloride	3	976	3/3/2004	F	1	1	2300	—	—	—	250000	0/1
Chromium	3	976	3/3/2004	F	1	1	1.83	—	100	0/1	50	0/1
Chromium	3	976	3/3/2004	NF	1	1	2.49	—	—	—	—	—
Cobalt	3	976	3/3/2004	F	1	1	4.05	—	—	—	50	0/1
Cobalt	3	976	3/3/2004	NF	1	1	1.49	—	—	—	—	—
Copper	3	976	3/3/2004	F	1	1	2.95	—	1300	0/1	1000	0/1
Copper	3	976	3/3/2004	NF	1	1	1.98	—	—	—	—	—
Fluoride	3	976	3/3/2004	F	1	1	974	—	4000	0/1	1.6	0/1
Iron	3	976	3/3/2004	F	1	1	1070	—	—	—	1000	0/1
Iron	3	976	3/3/2004	NF	1	1	1090	—	—	—	—	—
Kjeldahl Nitrogen (total)	3	976	3/3/2004	F	1	1	1050	—	—	—	—	—
Kjeldahl Nitrogen (total)	3	976	3/3/2004	NF	1	1	1200	—	—	—	—	—
Lead	3	976	3/3/2004	F	1	1	0.441	—	15	0/1	50	0/1
Lead	3	976	3/3/2004	NF	1	1	0.46	—	—	—	—	—
Magnesium	3	976	3/3/2004	F	1	1	3600	—	—	—	—	—
Magnesium	3	976	3/3/2004	NF	1	1	3340	—	—	—	—	—
Manganese	3	976	3/3/2004	F	1	1	2120	—	—	—	200	0/1
Manganese	3	976	3/3/2004	NF	1	1	2030	—	—	—	—	—
Mercury	3	976	3/3/2004	F	1	0	—	0.0472				
Mercury	3	976	3/3/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	3	976	3/3/2004	F	1	1	1.89	—	—	—	1000	0/1

Table A-24 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Molybdenum	3	976	3/3/2004	NF	1	1	2.67	—	—	—	—	—
Nickel	3	976	3/3/2004	F	1	1	3.72	—	100	0/1	200	0/1
Nickel	3	976	3/3/2004	NF	1	1	4.58	—	—	—	—	—
Nitrate	3	976	3/3/2004	F	1	0	—	34.1	—	—	10	0/1
Nitrate + Nitrite (as N)	3	976	3/3/2004	F	1	1	10	—	10000	0/1	10000	0/1
Nitrate + Nitrite (as N)	3	976	3/3/2004	NF	1	1	10	—	—	—	—	—
Nitrite	3	976	3/3/2004	F	1	0	—	54.2	1	0/1	—	—
Oxalate	3	976	3/3/2004	F	1	0	—	346	—	—	—	—
Perchlorate	3	976	3/3/2004	F	1	0	—	4	—	—	—	—
Perchlorate	3	976	3/3/2004	NF	1	0	—	0.2	—	—	—	—
Phosphorus (total)	3	976	3/3/2004	F	1	1	3160	—	—	—	—	—
Phosphorus (total)	3	976	3/3/2004	NF	1	1	1660	—	—	—	—	—
Potassium	3	976	3/3/2004	F	1	1	1580	—	—	—	—	—
Potassium	3	976	3/3/2004	NF	1	1	1500	—	—	—	—	—
Selenium	3	976	3/3/2004	F	1	0	—	2.81	50	0/1	50	0/1
Selenium	3	976	3/3/2004	NF	1	1	4.06	—	—	—	—	—
Silicon Dioxide	3	976	3/3/2004	F	1	1	88000	—	—	—	—	—
Silicon Dioxide	3	976	3/3/2004	NF	1	1	82700	—	—	—	—	—
Silver	3	976	3/3/2004	F	1	1	2.07	—	—	—	50	0/1
Silver	3	976	3/3/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	3	976	3/3/2004	F	1	1	11200	—	—	—	—	—
Sodium	3	976	3/3/2004	NF	1	1	10600	—	—	—	—	—
Strontium	3	976	3/3/2004	F	1	1	103	—	—	—	—	—
Strontium	3	976	3/3/2004	NF	1	1	98.9	—	—	—	—	—
Sulfate	3	976	3/3/2004	F	1	1	1270	—	—	—	600000	0/1
Thallium	3	976	3/3/2004	F	1	1	0.442	—	2	0/1	—	—
Thallium	3	976	3/3/2004	NF	1	1	0.125	—	—	—	—	—

Table A-24 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Uranium	3	976	3/3/2004	F	1	1	0.086	—	30	0/1	5000	0/1
Uranium	3	976	3/3/2004	NF	1	1	0.088	—	—	—	—	—
Vanadium	3	976	3/3/2004	F	1	1	2.44	—	—	—	—	—
Vanadium	3	976	3/3/2004	NF	1	1	1.54	—	—	—	—	—
Zinc	3	976	3/3/2004	F	1	1	8.29	—	—	—	10000	0/1
Zinc	3	976	3/3/2004	NF	1	1	8.48	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-25
Well R-32 Screen 1 First Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
DDE[4,4'-]	1	870.9	3/1/2004	NF[e]	1	1	0.0453	—[f]	—	—	—	—
DDT[4,4'-]	1	870.9	3/1/2004	NF	1	1	0.0625	—	—	—	—	—
Total Organic Carbon	1	870.9	3/1/2004	NF	1	1	466	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.
[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.
[c] NMED = New Mexico Environment Department.
[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.
[e] NF = Nonfiltered.
[f] — = Not available or not applicable.

Table A-26
Well R-32 Screen 3 First Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Bis(2-ethylhexyl)phthalate	3	976	3/3/2004	NF[e]	1	1	3.7	—[f]	—	—	—	—
Total Organic Carbon	3	976	3/3/2004	NF	1	1	757	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.
[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.
[c] NMED = New Mexico Environment Department.
[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.
[e] NF = Nonfiltered.
[f] — = Not available or not applicable.

Table A-27
Well R-32 Screen 1 First Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Cesium-137	1	870.9	3/1/2004	NF[c]	1	0	—[d]	–1.27	—	—
Plutonium-238	1	870.9	3/1/2004	NF	1	0	—	0.015	—	—
Plutonium-239/240	1	870.9	3/1/2004	NF	1	0	—	0.0025	—	—
Strontium-90	1	870.9	3/1/2004	NF	1	0	—	0.0089	8	0/1
Technetium-99	1	870.9	3/1/2004	NF	1	0	—	–1.49	—	—
Tritium	1	870.9	3/1/2004	NF	1	1	–0.03193	—	20000	0/1
Uranium-234	1	870.9	3/1/2004	NF	1	1	1.03	—	—	—
Uranium-235/236	1	870.9	3/1/2004	NF	1	1	0.0444	—	—	—
Uranium-238	1	870.9	3/1/2004	NF	1	1	0.528	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-28
Well R-32 Screen 3 First Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Tritium	3	976	3/3/2004	NF[c]	1	1	2.84	—[d]	20000	0/1

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-29
Well R-32 Screen 1 Second Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	1	870.9	5/5/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	1	870.9	5/5/2004	NF	—	—	—	—	—	—	—	—
pH	1	870.9	5/5/2004	NF	—	—	—	—	>6 & <9	—	>6 & <9	—
Specific Conductance (µS/cm)	1	870.9	5/5/2004	NF	—	—	—	—	—	—	—	—
Temperature (°C)	1	870.9	5/5/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	1	870.9	5/5/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	1	870.9	5/5/2004	NF	1	1	65400	—	—	—	—	—
Aluminum	1	870.9	5/5/2004	F[h]	1	0	—	14.7	—	—	5000	0/1
Aluminum	1	870.9	5/5/2004	NF	1	0	—	14.7	—	—	—	—
Ammonia as Nitrogen	1	870.9	5/5/2004	F	1	0	—	15.9	—	—	—	—
Ammonia as Nitrogen	1	870.9	5/5/2004	NF	1	0	—	15.9	—	—	—	—
Antimony	1	870.9	5/5/2004	F	1	1	0.31	—	6	0/1	—	—
Antimony	1	870.9	5/5/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	1	870.9	5/5/2004	F	1	0	—	2.24	10	0/1	100	0/1
Arsenic	1	870.9	5/5/2004	NF	1	0	—	2.24	—	—	—	—
Barium	1	870.9	5/5/2004	F	1	1	85.4	—	2000	0/1	1000	0/1
Barium	1	870.9	5/5/2004	NF	1	1	86.5	—	—	—	—	—
Beryllium	1	870.9	5/5/2004	F	1	0	—	0.08	4	0/1	—	—
Beryllium	1	870.9	5/5/2004	NF	1	0	—	0.08	—	—	—	—
Boron	1	870.9	5/5/2004	F	1	1	15.8	—	—	—	750	0/1
Boron	1	870.9	5/5/2004	NF	1	1	14.8	—	—	—	—	—

Table A-29 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Bromide	1	870.9	5/5/2004	F	1	0	—	97.8	—	—	—	—
Cadmium	1	870.9	5/5/2004	F	1	0	—	0.04	5	0/1	10	0/1
Cadmium	1	870.9	5/5/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	1	870.9	5/5/2004	F	1	1	15700	—	—	—	—	—
Calcium	1	870.9	5/5/2004	NF	1	1	16300	—	—	—	—	—
Chloride	1	870.9	5/5/2004	F	1	1	3020	—	—	—	250000	0/1
Chromium	1	870.9	5/5/2004	F	1	0	—	0.503	100	0/1	50	0/1
Chromium	1	870.9	5/5/2004	NF	1	0	—	0.503	—	—	—	—
Cobalt	1	870.9	5/5/2004	F	1	1	3.9	—	—	—	50	0/1
Cobalt	1	870.9	5/5/2004	NF	1	0	—	0.541	—	—	—	—
Copper	1	870.9	5/5/2004	F	1	0	—	1.39	1300	0/1	1000	0/1
Copper	1	870.9	5/5/2004	NF	1	0	—	1.39	—	—	—	—
Fluoride	1	870.9	5/5/2004	F	1	1	220	—	4000	0/1	1.6	0/1
Iron	1	870.9	5/5/2004	F	1	1	18.2	—	—	—	1000	1/1
Iron	1	870.9	5/5/2004	NF	1	1	19.3	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	870.9	5/5/2004	F	1	1	74	—	—	—	—	—
Kjeldahl Nitrogen (total)	1	870.9	5/5/2004	NF	1	1	115	—	—	—	—	—
Lead	1	870.9	5/5/2004	F	1	0	—	0.05	15	0/1	50	0/1
Lead	1	870.9	5/5/2004	NF	1	0	—	0.05	—	—	—	—
Magnesium	1	870.9	5/5/2004	F	1	1	4810	—	—	—	—	—
Magnesium	1	870.9	5/5/2004	NF	1	1	4960	—	—	—	—	—
Manganese	1	870.9	5/5/2004	F	1	1	41	—	—	—	200	1/1
Manganese	1	870.9	5/5/2004	NF	1	1	33.6	—	—	—	—	—
Mercury	1	870.9	5/5/2004	F	1	0	—	0.0472	—	—	—	—
Mercury	1	870.9	5/5/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	1	870.9	5/5/2004	F	1	1	2.6	—	—	—	1000	0/1

Table A-29 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Molybdenum	1	870.9	5/5/2004	NF	1	1	2.7	—	—	—	—	—
Nickel	1	870.9	5/5/2004	F	1	0	—	0.69	100	0/1	200	0/1
Nickel	1	870.9	5/5/2004	NF	1	0	—	0.69	—	—	—	—
Nitrate + Nitrite (as N)	1	870.9	5/5/2004	F	1	1	290	—	10000	0/1	10000	0/1
Nitrate + Nitrite (as N)	1	870.9	5/5/2004	NF	1	1	260	—	—	—	—	—
Perchlorate	1	870.9	5/5/2004	NF	1	1	0.246	—	—	—	—	—
Phosphorus (total)	1	870.9	5/5/2004	F	1	0	—	11	—	—	—	—
Phosphorus (total)	1	870.9	5/5/2004	NF	1	1	61	—	—	—	—	—
Potassium	1	870.9	5/5/2004	F	1	1	1640	—	—	—	—	—
Potassium	1	870.9	5/5/2004	NF	1	1	1690	—	—	—	—	—
Selenium	1	870.9	5/5/2004	F	1	1	4.5	—	50	0/1	50	0/1
Selenium	1	870.9	5/5/2004	NF	1	1	3.4	—	—	—	—	—
Silicon Dioxide	1	870.9	5/5/2004	F	1	1	61300	—	—	—	—	—
Silicon Dioxide	1	870.9	5/5/2004	NF	1	1	62700	—	—	—	—	—
Silver	1	870.9	5/5/2004	F	1	0	—	—	—	—	50	0/1
Silver	1	870.9	5/5/2004	NF	1	0	—	—	—	—	—	—
Sodium	1	870.9	5/5/2004	F	1	1	10900	—	—	—	—	—
Sodium	1	870.9	5/5/2004	NF	1	1	11200	—	—	—	—	—
Strontium	1	870.9	5/5/2004	F	1	1	81.9	—	—	—	—	—
Strontium	1	870.9	5/5/2004	NF	1	1	85.3	—	—	—	—	—
Sulfate	1	870.9	5/5/2004	F	1	1	6600	—	—	—	600000	0/1
Thallium	1	870.9	5/5/2004	F	1	1	0.061	—	2	0/1	—	0/1
Thallium	1	870.9	5/5/2004	NF	1	1	0.14	—	—	—	—	—
Uranium	1	870.9	5/5/2004	F	1	1	1.8	—	30	0/1	5000	0/1
Uranium	1	870.9	5/5/2004	NF	1	1	1.7	—	—	—	—	—
Vanadium	1	870.9	5/5/2004	F	1	1	3.2	—	—	—	—	—
Vanadium	1	870.9	5/5/2004	NF	1	1	3.2	—	—	—	—	—

Table A-29 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Zinc	1	870.9	5/5/2004	F	1	1	9.6	—	—	—	10000	0/1
Zinc	1	870.9	5/5/2004	NF	1	1	8.6	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-30
Well R-32 Screen 3 Second Round Sample Results: Data Summary for Inorganic Chemicals

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Field Parameter												
Field Alkalinity (total as $CaCO_3$)	3	976	5/10/2004	NF[e]	—[f]	—	—	—	—	—	—	—
Dissolved Oxygen	3	976	5/10/2004	NF	—	—	—	—	—	—	—	—
pH	3	976	5/10/2004	NF	—	—	—	—	>6 & <9	—	>6 & <9	—
Specific Conductance (µS/cm)	3	976	5/10/2004	NF	—	—	—	—	—	—	—	—
Temperature (°C)	3	976	5/10/2004	NF	—	—	—	—	—	—	—	—
Turbidity (NTU[g])	3	976	5/10/2004	NF	—	—	—	—	—	—	—	—
Analyte												
Alkalinity (total as $CaCO_3$)	3	976	5/10/2004	NF	1	1	57200	—	—	—	—	—
Aluminum	3	976	5/10/2004	F[h]	1	0	—	14.7	—	—	5000	0/1
Aluminum	3	976	5/10/2004	NF	1	1	23.3	—	—	—	—	—
Ammonia as Nitrogen	3	976	5/10/2004	F	1	1	277	—	—	—	—	—
Ammonia as Nitrogen	3	976	5/10/2004	NF	1	1	289	—	—	—	—	—
Antimony	3	976	5/10/2004	F	1	0	—	0.28	6	0/1	—	—
Antimony	3	976	5/10/2004	NF	1	0	—	0.28	—	—	—	—
Arsenic	3	976	5/10/2004	F	1	0	—	2.24	10	0/1	100	0/1
Arsenic	3	976	5/10/2004	NF	1	0	—	2.24	—	—	—	—
Barium	3	976	5/10/2004	F	1	1	75.5	—	2000	0/1	1000	0/1
Barium	3	976	5/10/2004	NF	1	1	81.8	—	—	—	—	—
Beryllium	3	976	5/10/2004	F	1	0	—	0.08	4	0/1	—	—
Beryllium	3	976	5/10/2004	NF	1	0	—	0.08	—	—	—	—
Boron	3	976	5/10/2004	F	1	1	19.6	—	—	—	750	0/1
Boron	3	976	5/10/2004	NF	1	1	20.8	—	—	—	—	—

Table A-30 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Bromide	3	976	5/10/2004	F	1	0	—	97.8	—	—	—	—
Cadmium	3	976	5/10/2004	F	1	0	—	0.04	5	0/1	10	0/1
Cadmium	3	976	5/10/2004	NF	1	0	—	0.04	—	—	—	—
Calcium	3	976	5/10/2004	F	1	1	11400	—	—	—	—	—
Calcium	3	976	5/10/2004	NF	1	1	11200	—	—	—	—	—
Chloride	3	976	5/10/2004	F	1	1	2160	—	—	—	250000	0/1
Chromium	3	976	5/10/2004	F	1	1	1.3	—	100	0/1	50	0/1
Chromium	3	976	5/10/2004	NF	1	1	1.7	—	—	—	—	—
Cobalt	3	976	5/10/2004	F	1	1	3.7	—	—	—	50	0/1
Cobalt	3	976	5/10/2004	NF	1	0	—	0.541	—	—	—	—
Copper	3	976	5/10/2004	F	1	0	—	1.39	1300	0/1	1000	0/1
Copper	3	976	5/10/2004	NF	1	0	—	1.39	—	—	—	—
Fluoride	3	976	5/10/2004	F	1	1	823	—	4000	0/1	1.6	0/1
Iron	3	976	5/10/2004	F	1	1	1040	—	—	—	1000	1/1
Iron	3	976	5/10/2004	NF	1	1	1040	—	—	—	—	—
Kjeldahl Nitrogen (total)	3	976	5/10/2004	F	1	1	649	—	—	—	—	—
Kjeldahl Nitrogen (total)	3	976	5/10/2004	NF	1	1	744	—	—	—	—	—
Lead	3	976	5/10/2004	F	1	1	0.28	—	15	0/1	50	0/1
Lead	3	976	5/10/2004	NF	1	1	0.38	—	—	—	—	—
Magnesium	3	976	5/10/2004	F	1	1	3280	—	—	—	—	—
Magnesium	3	976	5/10/2004	NF	1	1	3380	—	—	—	—	—
Manganese	3	976	5/10/2004	F	1	1	1880	—	—	—	200	1/1
Manganese	3	976	5/10/2004	NF	1	1	2170	—	—	—	—	—
Mercury	3	976	5/10/2004	F	1	0	—	0.0472	—	—	—	—
Mercury	3	976	5/10/2004	NF	1	0	—	0.0472	2	0/1	2	0/1
Molybdenum	3	976	5/10/2004	F	1	1	1.5	—	—	—	1000	0/1

Table A-30 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Molybdenum	3	976	5/10/2004	NF	1	1	1.7	—	—	—	—	—
Nickel	3	976	5/10/2004	F	1	0	—	0.69	100	0/1	200	0/1
Nickel	3	976	5/10/2004	NF	1	0	—	0.69	—	—	—	—
Nitrate + Nitrite (as N)	3	976	5/10/2004	F	1	0	—	10	10000	0/1	10000	0/1
Nitrate + Nitrite (as N)	3	976	5/10/2004	NF	1	0	—	10	—	—	—	—
Perchlorate	3	976	5/10/2004	NF	1	0	—	0.2	—	—	—	—
Phosphorus (total)	3	976	5/10/2004	F	1	1	2360	—	—	—	—	—
Phosphorus (total)	3	976	5/10/2004	NF	1	1	2860	—	—	—	—	—
Potassium	3	976	5/10/2004	F	1	1	1540	—	—	—	—	—
Potassium	3	976	5/10/2004	NF	1	1	1610	—	—	—	—	—
Selenium	3	976	5/10/2004	F	1	1	3.3	—	50	0/1	50	0/1
Selenium	3	976	5/10/2004	NF	1	0	—	2.81	—	—	—	—
Silicon Dioxide	3	976	5/10/2004	F	1	1	80900	—	—	—	—	—
Silicon Dioxide	3	976	5/10/2004	NF	1	1	82500	—	—	—	—	—
Silver	3	976	5/10/2004	F	1	0	—	0.835	—	—	50	0/1
Silver	3	976	5/10/2004	NF	1	0	—	0.835	—	—	—	—
Sodium	3	976	5/10/2004	F	1	1	10700	—	—	—	—	—
Sodium	3	976	5/10/2004	NF	1	1	10900	—	—	—	—	—
Strontium	3	976	5/10/2004	F	1	1	109	—	—	—	—	—
Strontium	3	976	5/10/2004	NF	1	1	103	—	—	—	—	—
Sulfate	3	976	5/10/2004	F	1	1	1400	—	—	—	600000	0/1
Thallium	3	976	5/10/2004	F	1	1	0.31	—	2	0/1	—	—
Thallium	3	976	5/10/2004	NF	1	1	0.045	—	—	—	—	—
Uranium	3	976	5/10/2004	F	1	1	0.031	—	30	0/1	5000	0/1
Uranium	3	976	5/10/2004	NF	1	1	0.053	—	—	—	—	—
Vanadium	3	976	5/10/2004	F	1	0	—	0.606	—	—	—	—
Vanadium	3	976	5/10/2004	NF	1	0	—	0.606	—	—	—	—

Table A-30 (continued)

Parameter and Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Zinc	3	976	5/10/2004	F	1	1	11.2	—	—	—	10000	0/1
Zinc	3	976	5/10/2004	NF	1	1	9.7	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

[g] NTU = Nephelometric turbidity unit.

[h] F = Filtered.

Table A-31
Well R-32 Screen 1 Second Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Total Organic Carbon	1	870.9	5/5/2004	NF[e]	1	1	405	—[f]	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-32
Well R-32 Screen 3 Second Round Sample Results: Data Summary for Detected Organic Chemicals

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (µg/L)	Non-detected Value (µg/L)	Drinking Water MCL[b] (µg/L)	Frequency of Detects > Drinking Water MCL	NMED[c] Groundwater Standard[d] (µg/L)	Frequency of Detects > NMED Groundwater Standard
Cyanide (Total)	3	976	5/10/2004	NF[e]	1	1	2.16	—[f]	200	0/1	0.2	0/1
DDT[4,4'-]	3	976	5/10/2004	NF	1	1	0.0293	—	—	—	—	—
Total Organic Carbon	3	976	5/10/2004	NF	1	1	695	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NMED = New Mexico Environment Department.

[d] State of New Mexico groundwater standards are from *New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection*, 20 NMAC 6.2.

[e] NF = Nonfiltered.

[f] — = Not available or not applicable.

Table A-33
Well R-32 Screen 1 Second Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
Americium-241	1	870.9	5/5/2004	NF[c]	1	0	—[d]	0.0052	—	—
Cesium-137	1	870.9	5/5/2004	NF	1	0	—	0.958	—	—
Gross Gamma Radiation	1	870.9	5/5/2004	NF	1	0	—	79.2	—	—
Plutonium-238	1	870.9	5/5/2004	NF	1	0	—	0	—	—
Plutonium-239/240	1	870.9	5/5/2004	NF	1	0	—	0.00325	—	—
Strontium-90	1	870.9	5/5/2004	NF	1	0	—	0.232	8	0/1
Technetium-99	1	870.9	5/5/2004	NF	1	0	—	–1.83	—	—
Uranium-234	1	870.9	5/5/2004	NF	1	1	0.94	—	—	—
Uranium-235/236	1	870.9	5/5/2004	NF	1	1	0.119	—	—	—
Uranium-238	1	870.9	5/5/2004	NF	1	1	0.472	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] NF = Nonfiltered.

[d] — = Not available or not applicable.

Table A-34
Well R-32 Screen 3 Second Round Sample Results: Data Summary for Radionuclides

Analyte	Screen	Depth (ft)[a]	Collection Date	Field Preparation	Number of Analyses	Number of Detects	Detected Value (pCi/L)	Nondetected Value (pCi/L)	Drinking Water MCL[b] (pCi/L)	Frequency of Detects > Drinking Water MCL
No radionuclide results are available from this screen	3	—[c]	—	—	—	—	—	—	—	—

[a] The static water level for the regional aquifer at R-32 was 793.8 ft when the well was drilled.

[b] MCL = Maximum contaminant level. US Environmental Protection Agency (EPA) MCLs are from *National Primary Drinking Water Regulations*, 40 CFR Part 141. US EPA secondary MCLs are from *National Secondary Drinking Water Regulations*, 40 CFR Part 143. State of New Mexico MCLs are from *Drinking Water Regulations*, 20 NMAC 7.1.

[c] — = Not available or not applicable.

Appendix B

DP Canyon Quarterly Inspection Report,
Third Quarter, Fiscal Year 2004

DP Canyon Quarterly Inspection Report
June 30, 2004

Introduction: Regular inspections are conducted to assess the status of two petroleum hydrocarbon seeps in DP Canyon. These seeps, which are downgradient from Solid Waste Management Unit 21-029 (DP Tank Farm), are referred to as the upstream and downstream seeps (Figure 1). The frequency of the inspections has been reduced to quarterly, following nearly four years of monthly or semimonthly inspections. The results of these inspections are used to document any changes in the petroleum hydrocarbon seep areas in relation to seasonal changes and recent precipitation.

Date: June 30, 2004

Time: 4:00 p.m.

Personnel: Becky Coel-Roback and Robert Budd

Weather: 75 °C, dry, sunny, and breezy

Precipitation: 4.19 in., approximate total since the March inspection (Source: Los Alamos National Laboratory Weather Machine).

Presence of standing or running water: At the time of the June inspection, there was no flow coming from the culverts at the head of the canyon but some standing water. There was a trickle of water at the upstream seep area and abundant standing water at the downstream seep area but no flow. There was evidence of recent heavy flows and erosion in the drainage, including a new boulder in the middle of the drainage at the downstream seep area.

Location and intensity of odors, staining, or sheen (see Figure 1 for locations):

	Air	Water	Soil/Sediment
Upstream Location	No petroleum hydrocarbon odor in air	Petroleum hydrocarbon sheen on standing water following disturbance of sediments.	Petroleum hydrocarbon odor and sheen in disturbed sediments
Downstream Location	Faint petroleum hydrocarbon odor in air	No petroleum hydrocarbon sheen on standing water	Very faint petroleum hydrocarbon odor in disturbed sediments

Photographs: The photographs on the following pages were taken during the site visit (see Figure 1 for locations).

Location 1, canyon head. There was standing water but no flow from either culvert during the June 2004 inspection.

Location 2, upstream location. There was some sheen on standing water following disturbance of sediments during the June 2004 inspection.

Location 3, upstream location. During the June 2004 inspection, there was sheen and odor on disturbed sediments.

Location 4, upstream location. Stream channel, looking downstream from sample location 21-11136. There was abundant evidence of stream channel disturbance due to recent rain events during the June 2004 inspection.

Location 5, downstream location. There was abundant standing water but no sheen during the June 2004 inspection.

Location 6, downstream location. Petroleum hydrocarbon odors were very faint in air and sediments during the June 2004 inspection.

Location 7, downstream location. Stream channel, looking upstream from sample location 21-11176. The large boulder in the foreground eroded from approximately 20 ft up the south side of the drainage since the last inspection (March 2004).

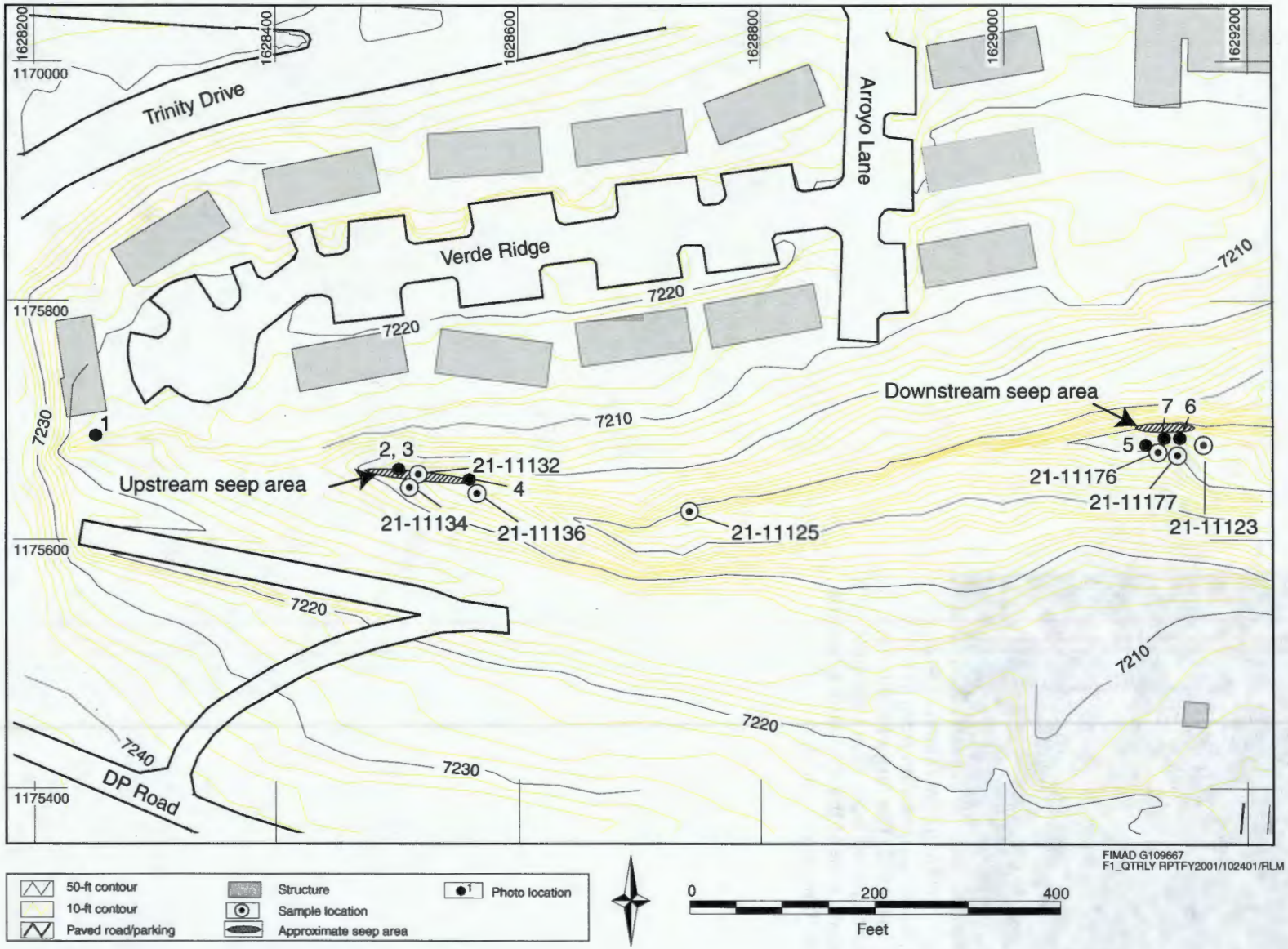

Figure 1. DP Tank Farm photo locations, seep areas, and sampling locations

Appendix C

Quarterly Moisture-Monitoring Report,
Third Quarter, Fiscal Year 2004,
Technical Area 49, Material Disposal Area AB

QUARTERLY MOISTURE-MONITORING REPORT, THIRD QUARTER, FISCAL YEAR 2004, TECHNICAL AREA 49, MATERIAL DISPOSAL AREA AB

Risk Reduction and Environmental Stewardship–Environmental Characterization and Remediation

Los Alamos National Laboratory

August 2004

CONTENTS

1.0 INTRODUCTION C-1

2.0 MOISTURE-MONITORING RESULTS C-3

2.1 Neutron Logging C-3

2.2 TDR and Precipitation Measurements C-3

3.0 MOISTURE-MONITORING RESULTS AND DATA ANALYSIS C-6

3.1 Correlation between TDR Measurements and Precipitation Events C-6

3.2 TDR and Neutron Comparisons C-6

3.3 Student's T-test of Neutron Data C-6

4.0 CONCLUSIONS C-7

5.0 RECOMMENDATIONS C-7

6.0 REFERENCES C-8

ATTACHMENT 1 NEUTRON MOISTURE MEASUREMENT

ATTACHMENT 2 TIME VERSUS MOISTURE CONTENT PLOTS

ATTACHMENT 3 CONDITION OF EVAPOTRANSPIRATION COVER

List of Figures

Figure 1 Location of instrumentation and neutron access holes on XY plane at TA-49 ..... C-2
Figure 2 TA-49 neutron access holes C-4
Figure 3 TDR measurements compared with neutron measurements at neutron access hole 10046, which is in close proximity and at the same corresponding depths as TDR1 ..... C-5
Figure 4 TDR measurements compared with neutron measurements at neutron access hole 10048, which is in close proximity and at the same corresponding depth as TDR3 ..... C-5

Figure 1-1 Neutron probe moisture measurements for neutron access holes TH-1 and TH-2 1-1
Figure 1-2 Neutron probe moisture measurements for neutron access holes TH-3 and TH-4 1-2
Figure 1-3 Neutron probe moisture measurements for neutron access holes TH-5 and 2A-0 1-3
Figure 1-4 Neutron probe moisture measurements for neutron access holes 2A-Y and 2B-Y 1-4
Figure 1-5 Neutron probe moisture measurements for neutron access holes 49-10046 and 49-10047 1-5
Figure 1-6 Neutron probe moisture measurements for neutron access holes 49-10048 and 1M-3 1-6
Figure 1-7 Neutron probe moisture measurements for neutron access holes 1M-3A and 2M-3 1-6
Figure 1-8 Neutron probe moisture measurements for neutron access holes 4M-4 and 5M-1 1-6
Figure 1-9 Neutron probe moisture measurements for neutron access holes 4M-3 and 49-2901 1-9
Figure 2-1 Trend plot of neutron moisture measurements, neutron access hole TH-1 2-1
Figure 2-2 Trend plot of neutron moisture measurements, neutron access hole TH-2 2-1
Figure 2-3 Trend plot of neutron moisture measurements, neutron access hole TH-3 2-2
Figure 2-4 Trend plot of neutron moisture measurements, neutron access hole TH-4 2-2
Figure 2-5 Trend plot of neutron moisture measurements, neutron access hole TH-5 2-3
Figure 2-6 Trend plot of neutron moisture measurements, neutron access hole 2A-O 2-3
Figure 2-7 Trend plot of neutron moisture measurements, neutron access hole 2A-Y 2-4
Figure 2-8 Trend plot of neutron moisture measurements, neutron access hole 2B-Y 2-4
Figure 2-9 Trend plot of neutron moisture measurements, neutron access hole 49-10046 2-5
Figure 2-10 Trend plot of neutron moisture measurements, neutron access hole 49-10047 2-5
Figure 2-11 Trend plot of neutron moisture measurements, neutron access hole 49-10048 2-6
Figure 3-1 Photo of evapotranspiration cover from outside Area 2 3-1
Figure 3-2 Photo of evapotranspiration cover from outside Area 2 3-1
Figure 3-3 Close up of evapotranspiration cover showing growth through cover 3-2
Figure 3-4 Close up of evapotranspiration cover showing growth through cover 3-2

List of Tables

Table 1 TDR Array Descriptions C-2
Table 2 Results of the Student's T-test Analysis, Based on a 95% Confidence Interval C-7
Table 3 Previously Drilled Neutron Access Holes Found in TA-49 and Recommended for Logging C-8

1.0 INTRODUCTION

The Technical Area (TA-) 49 moisture-monitoring system began collecting data in March 2000 to assess the performance of the MDA AB Area 2 cover with respect to maintaining and/or reducing subsurface moisture content. The Area 2 cover was installed after the historical asphalt pad was removed during an interim measure (IM) implemented in 1998 at the direction of New Mexico Environment Department Hazardous and Radioactive Materials Bureau (NMED-HRMB). The area was covered with soil, gravel, and a bio-barrier as part of stabilization activities. The IM was conducted to address concerns arising from moisture accumulation beneath the asphalt pad.

In 1998–1999, the IM and associated best management practice (BMP) activities conducted at Area 2 included

- installation of a run-on diversion channel to the west of Area 2;
- removal of the asphalt cover over Area 2;
- surface regrading of Area 2 to eliminate surface-water ponding;
- grouting and abandonment of CH-2 and the two 150-ft-deep Resource Conservation and Recovery Act facility investigation (RFI) neutron access holes;
- installation of an evapotranspiration (ET) cover composed of crushed tuff monofill with topsoil and covered with a steel mesh bio-barrier;
- installation of a silt fence surrounding the ET cover to control both erosion and contaminant transport; and
- seeding the ET cover with shallow-rooting grasses.

Details of the 1998–1999 BMPs at Area 2 are presented in three Environmental Restoration Project reports (LANL1998, 59166; LANL 1998, 63041; and LANL 1999, 63919).

In February 2000, a moisture-monitoring system was installed to monitor the ET cover at Area 2. Three shallow neutron logging access tubes were installed through the ET cover, and time domain reflectometry (TDR) probes were installed at two depths and at two locations in the ET cover. The TDR probes were wired into a Campbell Scientific, Inc., datalogger for automated measurements. The moisture-monitoring system uses three neutron access holes, four TDR probes, and a rain gauge to evaluate moisture content and relative changes within and beneath the new cover material. Additionally, eight neutron access holes located in the surrounding area are monitored monthly for moisture content. These neutron access holes characterize the moisture content of undisturbed areas immediately adjacent to the cover area. It is anticipated that the new cover material will behave similarly to native undisturbed areas by restoring the semi-arid, moisture-limited, near-surface environment.

Monthly moisture monitoring began at the site in March 2000. Monitoring is performed in accordance with LANL-ER-SOP-7.05, Rev. 1, "Subsurface Moisture Measurements Using a Neutron Probe." Neutron logging is performed with a dedicated CPN 503DR probe the last two work days of each month to provide a consistent data set for trend analysis. The TDR probes record moisture content measurements twice a day. The two TDR arrays are located adjacent to neutron access holes 49-10046 and -10048 for data comparison and confirmation. The TDR arrays consist of a shallow TDR probe positioned horizontally immediately beneath the surface soil (approximately 6 in.) and a TDR probe positioned vertically beneath the cover materials at 10 ft and 6 ft, respectively. The shallow TDR probes are positioned to detect infiltration through the topsoil. A rain gauge was located at the surface of the cover near neutron access hole 49-10046 to monitor levels of precipitation at the site. Continuous measurements of site precipitation

and the 12-hour TDR data characterize the cover's infiltration response to rain events. Figure 1 shows the locations of neutron access holes, TDR probes, the cover, and the gopher-barrier boundary. Table 1 gives the corresponding depths of the TDR probes.

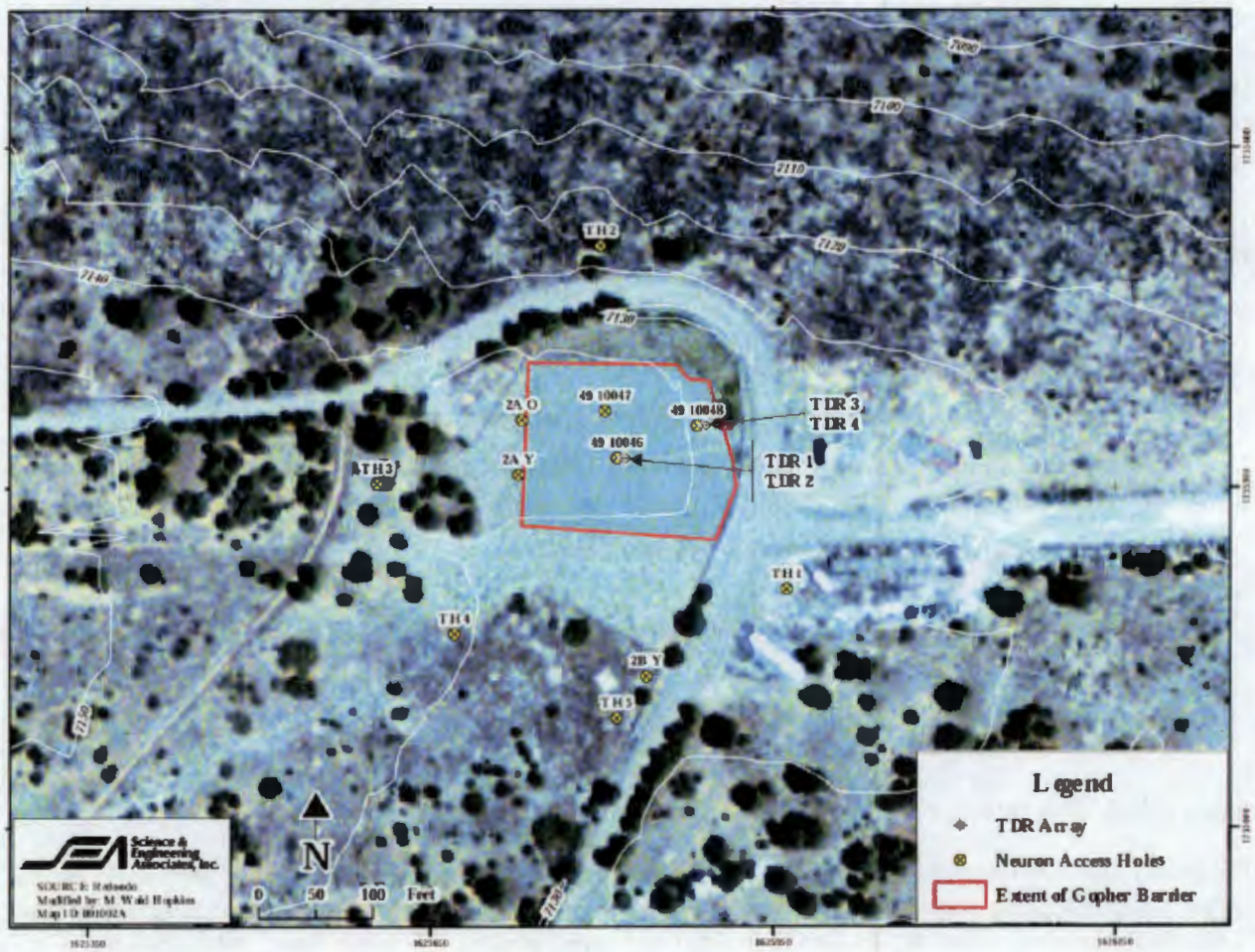

Figure 1. Location of instrumentation and neutron access holes on *XY* plane at TA-49, MDA AB Area 2

Table 1
TDR Array Descriptions

TDR Number	Array Type	Depth (ft)
TDR1	Vertical, within soil overlaying Bandelier Tuff	6
TDR2	Horizontal, at bottom of topsoil	0.5
TDR3	Vertical, within El Cajete pumice formation	10
TDR4	Horizontal, at bottom of topsoil	0.5

In May 2004, neutron moisture measurements were conducted at neutron access holes TH-1, TH-2, TH-3, TH-4, TH-5, 2A-O, 2A-Y, 2B-Y, 10046, 10047, 10048, 1M-3, 1M-3A, 2M-3, 5M-1, 4M-4, 4M-3, and 49-2901. TDR measurements and precipitation quantities were recorded twice a day to a Campbell Scientific datalogger over the same period. This report includes a discussion of moisture trends over time,

a comparison of moisture results from the neutron probe and the TDR instruments, and a discussion of the relationship between precipitation and moisture content.

2.0 MOISTURE-MONITORING RESULTS

2.1 Neutron Logging

Neutron-logging events occurred on May 19, 20, and 21, 2004. The results for May were compared to the average from April 2000 to March 2004. Logging was performed with a dedicated CPN 503DR probe at all neutron access holes. The neutron counts from each of the 16 monitoring holes were recorded on a spreadsheet, and corresponding volumetric moisture content was calculated for each hole. Plots of volumetric moisture content for each sampling period and all of the access holes are shown in Attachment 1. Third quarter data for neutron access holes TH-1, TH-2, TH-3, TH-4, TH-5, 2A-O, 2A-Y, 2B-Y, 10046, 10047, and 10048 is shown compared to the average for each hole from 2000 to the second quarter of 2004. All the data for the five "M" holes (1M-3, 1M-3A, 2M-3, 5M-1, 4M-4) are presented in Attachment 1.

The 700-ft deep neutron access hole, 49-02901, is located near TH-1 (Figure 2). Psychrometers and the positive-pressure membrane were removed from the hole during the second quarter of 2004, after which the hole was neutron logged and capped. The hole is 8 in. in diameter with a 3-ft steel stickup. Borehole 49-02901 has been neutron logged for the last two quarters as part of the TA-49 moisture monitoring program. The data from this location are presented in Attachment 1.

An additional "M" hole was added to the moisture-monitoring program this quarter. Neutron access hole 4M-3 is located on the south corner of MDA AB Area 4, outside the fence on the south side of the road (Figure 2) and is 18 ft deep. Bore 4M-3 has been neutron logged for the first time this quarter as part of the TA-49 moisture monitoring program. The data from this location are presented in Attachment 1.

2.2 TDR and Precipitation Measurements

TDR measurements and precipitation quantities were collected uninterrupted two times a day through the third quarter 2004 and were recorded to a Campbell Scientific datalogger. No data were recorded from February 11 through 19, 2004, because of a problem with the datalogger program. The Campbell Scientific datalogger was programmed to record a timestamp, temperature, TDR raw frequencies, and precipitation in inches. The program converts raw frequency to volumetric moisture content and then records the data (both raw and converted) to a *.dat file. Figures 3 and 4 show the moisture content and precipitation measurements since installation in April 2000 through June 2004. On December 9, 2003, TDRs 1 and 2 stopped recording data when the wires were disturbed by gophers. The wires were repaired on January 29, 2004. The cumulative precipitation was calculated from the on-site rain gauge from August 2000 to April 30, 2001. On May 1, 2001, it became apparent that the rain gauge was not functioning because debris was blocking the instrument. Therefore, from May 1, 2001, to date, precipitation data have been obtained from the TA-49 weather station.

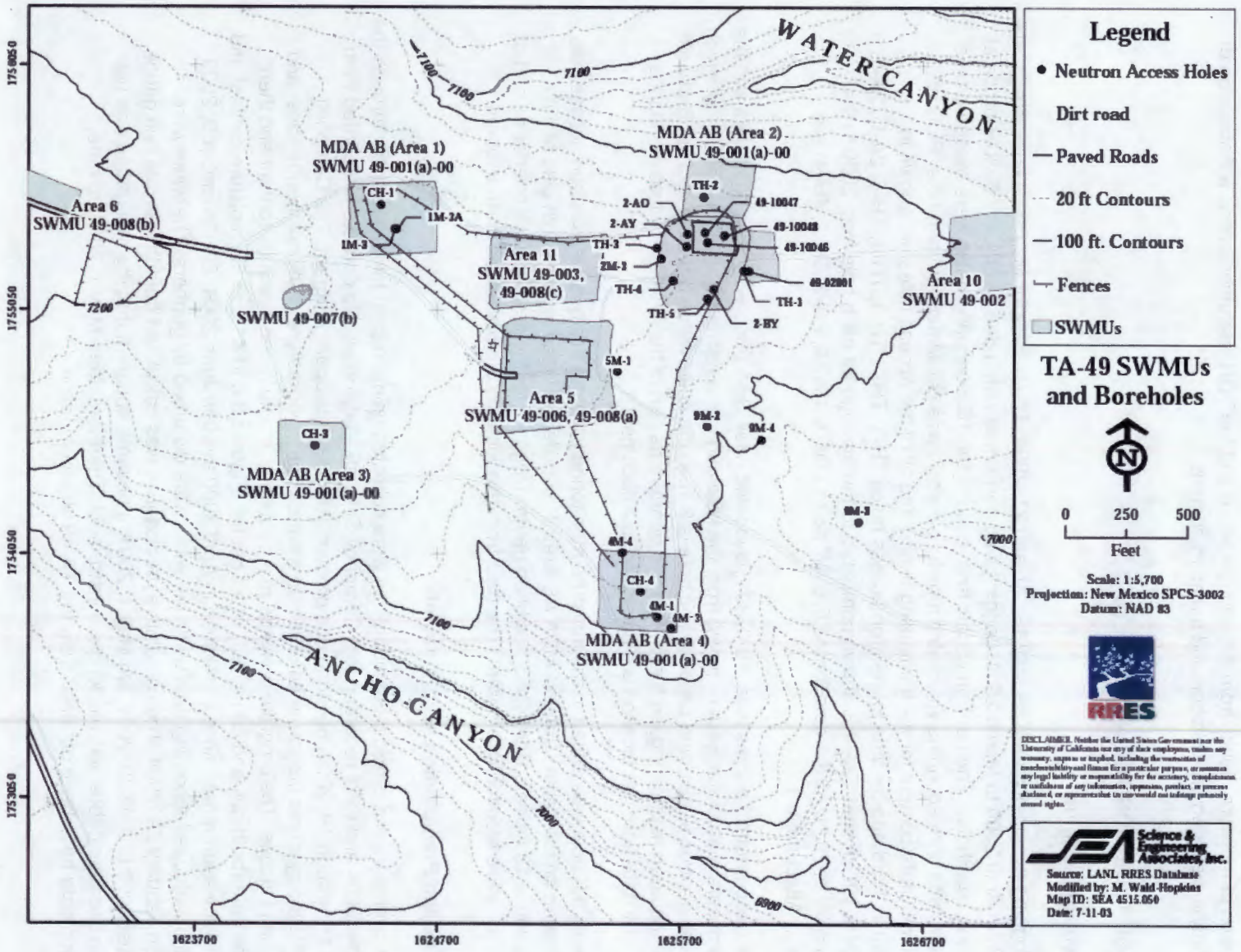

Figure 2. TA-49 neutron access holes

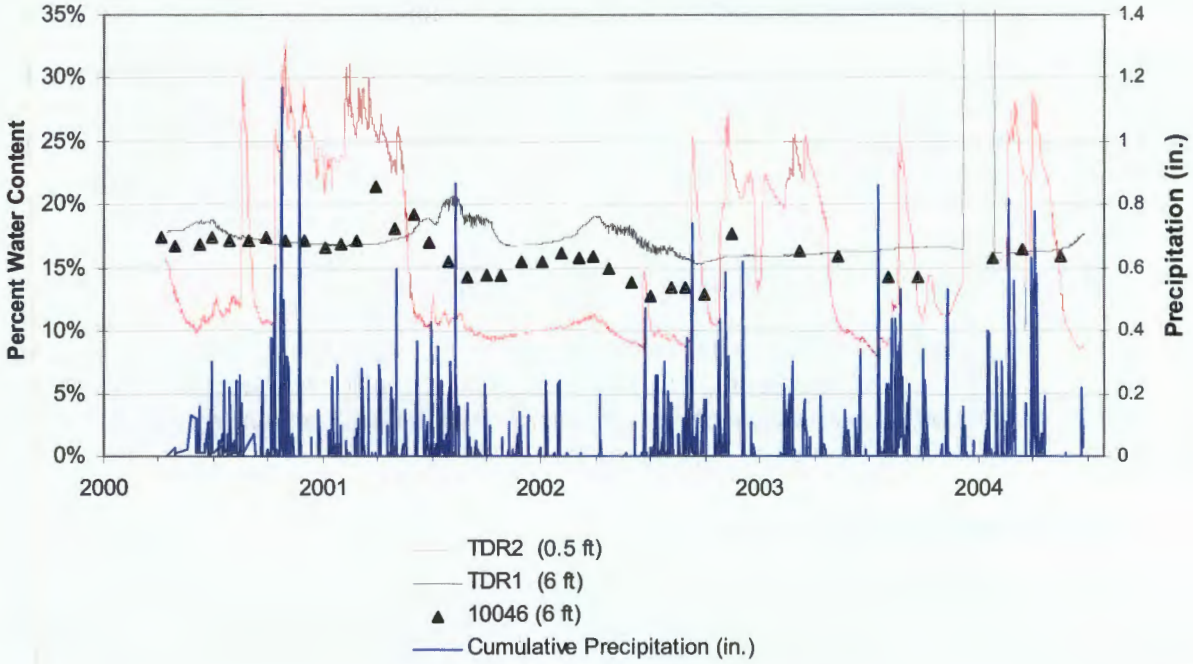

Figure 3. TDR measurements compared with neutron measurements at neutron access hole 10046, which is in close proximity and at the same corresponding depths as TDR 1

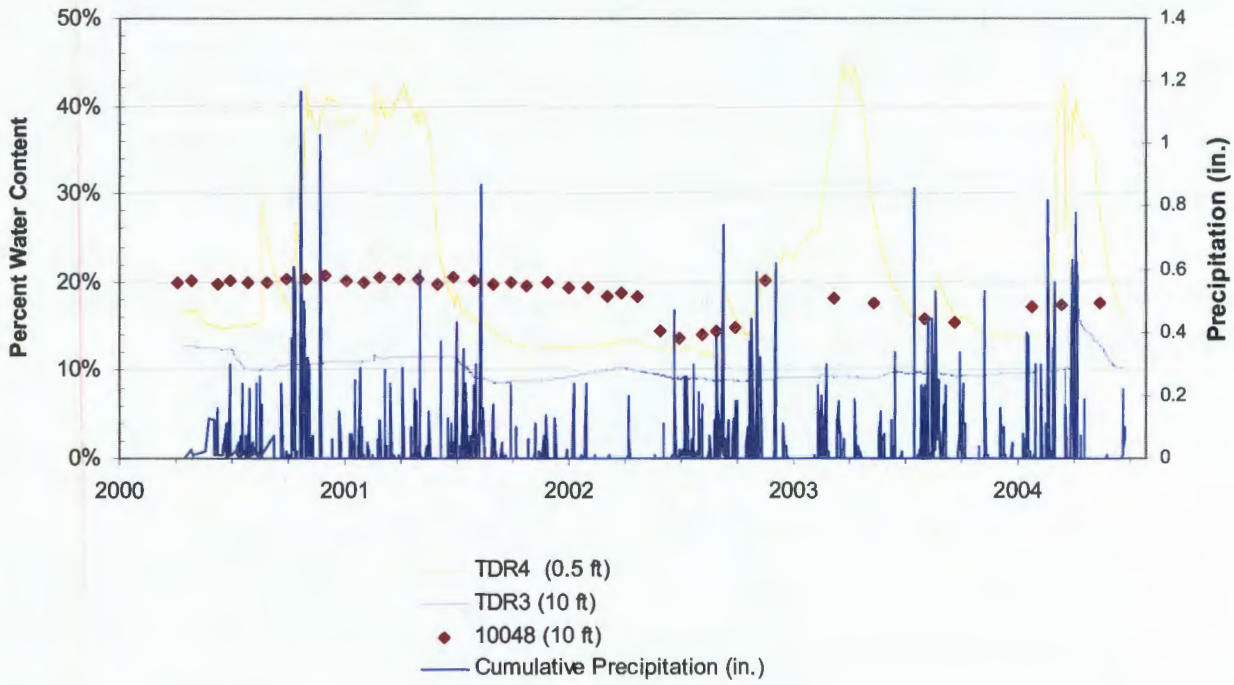

Figure 4. TDR measurements compared with neutron measurements at neutron access hole 10048, which is in close proximity and at the same corresponding depth as TDR 3

3.0 MOISTURE-MONITORING RESULTS AND DATA ANALYSIS

TDR and neutron data from April 2000 to June 2004 show fluctuations in volumetric moisture content near the surface. Measurements below the surface indicate that most of the moisture trends are relatively steady, while a few trends have decreased (Attachment 1). Table 2 shows the Student's t-test tracking these trends. Trend plots of time versus moisture content were created for specific depth intervals (Attachment 2).

3.1 Correlation between TDR Measurements and Precipitation Events

The results of the shallow TDR probes at 0.5 ft have ranged from between 8 and 28% (TDR 2) and 10 to 45% (TDR 4) moisture content, caused by precipitation seeping into the first few feet of soil. In contrast, the results of deeper TDR probes have remained constant through the quarter, ranging from between 15% and 20% for TDR 1 (6 ft) and 8% to 15% for TDR 3 (10 ft).

3.2 TDR and Neutron Comparisons

The moisture-monitoring system is performing as expected with consistent results between TDR arrays and neutron logging. Figures 3 and 4 show the deep TDR data associated with neutron access holes 49-10046 and 49-10048, respectively. The neutron probe data from the same depth as the deep TDR probes are also shown. The measurements are in agreement, differing by less than 2%.

3.3 Student's T-test of Neutron Data

A Student's t-test analysis was performed to statistically track trends in moisture over time for each neutron access holes. The Student's t-test evaluates the significance of an apparent trend based on a selected confidence interval. For the purpose of this analysis, a 95% confidence interval was selected.

As of May 2004, 40 months of data events were available for statistical analysis of 11 monitoring holes. Table 2 presents the results of the Student's t-test analyses for each of these neutron access holes. The trending analysis results show that moisture levels have decreased since measurements began in April 2000.

In addition to the Student's t-test analyses, trend plots of time versus moisture content for specific depth intervals in neutron access holes are shown in Figures 2-1 through 2-11 in Attachment 2.

Table 2
Results of the Student's T-test Analysis, Based on a 95% Confidence Interval

Neutron Access Hole Number	Moisture Trending Results
TH-1	Analysis shows a decreasing moisture trend from 1 to 111 ft.
TH-2	Analysis shows a decreasing moisture trend from 6 to 104 ft.
TH-3	Analysis shows a decreasing moisture trend from 1 to 5 ft, 46 to 108 ft.
TH-4	Analysis shows a decreasing moisture trend from 1 to 10 ft, and 16 to 90 ft.
TH-5	Analysis shows a decreasing moisture trend from 1 to 114 ft.
2B-Y	Analysis shows a increasing moisture trend from 21 to 29 ft.
2A-Y	Analysis shows no significant change in moisture trends.
2A-O	Analysis shows a decreasing moisture trend from 6 to 20 ft, and increasing moisture trend from 41 to 59 ft.
49-10046	Analysis shows a decreasing moisture trend from 5 to 13 ft.
49-10047	Analysis shows a decreasing moisture trend from 7 to 12 ft.
49-10048	Analysis shows a decreasing moisture trend from 3 to 10 ft.

4.0 CONCLUSIONS

The neutron log and TDR data indicate that the behavior of subsurface moisture levels fluctuate in the near surface (<10 ft) and remain constant at greater depth as expected for a moisture limited semi-arid climate. The precipitation at TA-49 has been average, 3.96 in. from April through June 2004 (source: http://www.weather.com). The moisture levels of the cover at the majority of the locations have decreased when compared to the average moisture levels from third quarter 2000 to second quarter 2004. The shallow TDR probes have shown moisture content responses to relatively small rainfall events, while the deeper probes (>6 ft) have remained constant. This finding can be attributed to precipitation events detected in the near-surface with no deep infiltration. The data from neutron access holes 10047 and 10048 show that the moisture content of the cover has decreased from the surface to the bottom of each neutron access hole. In neutron access holes adjacent to the cover, (TH-3, TH-4, TH-5) the moisture levels have decreased from the surface to the bottom. The data from two of the moderate depth neutron access holes (<60 ft) surrounding the cover (2A-Y, 2B-Y) have not shown significant changes in moisture content.

The cover over Area 2 has shown substantial vegetation growth. Attachment 3 shows photographs taken of the Area 2 cover during the third quarter of 2004. Photographs of the cover will be taken each quarter to document and show the condition and the vegetation growth of the cover.

5.0 RECOMMENDATIONS

The TA-49 moisture-monitoring system was installed to assess the performance of the MDA AB Area 2 cover with respect to maintaining and/or reducing subsurface moisture content. The Area 2 cover was installed as part of the 1998 IM to address concerns arising from moisture accumulation beneath the former asphalt pad on top of the test shafts. The routine moisture monitoring and site inspections conducted since March 2000 have shown the IM to be successful in eliminating run-on, reducing surface-water ponding, and promoting evapotranspiration, as evidenced by the reduction and/or stabilization of

the subsurface moisture content within the covered area. Additionally, the increased vegetation, site BMPs, and steel-mesh bio-barrier have controlled runoff, erosion, and bio-intrusion, thus reducing the potential for contaminant migration and cover degradation.

MDA G at TA-54 is a mesa-top setting similar to MDA AB. Routine moisture monitoring has been performed at MDA G for more than ten years. The results have indicated that very little, if any, detectable changes in moisture content occur below the near-surface environment and that any significant changes or trends are effectively captured by bimonthly monitoring. The moisture-monitoring results at MDA AB for the months since third quarter 2000 have been consistent with those for MDA G. Measurements of the moisture content within the Bandelier Tuff at both mesa-top sites indicate that seasonal precipitation results in little, if any, deep infiltration. The current frequency of TDR measurements will continue to monitor the performance of the cover materials.

Three additional neutron access holes located across the TA-49 site (Figure 2) are not currently neutron logged. These neutron access holes are listed in Table 3. Monitoring of these neutron access holes, along with the five for which monitoring began August 2003, will provide a more comprehensive data set of the moisture trends across TA-49. These holes have been identified and are considered to be in good condition for neutron logging. The melted casing will be cut away from the two neutron access holes, 9-M2 and 9M-4, and their condition will be noted.

Table 3
Previously Drilled Neutron Access Holes Found in TA-49 and Recommended for Logging

Neutron Access Hole ID	Condition	Depth from Top of Casing	Diameter of Casing	Y Coordinate	X Coordinate
9M-2	Casing melted	Unknown	2-in. PVC	1754574.50	1625811.19
9M-4	Casing melted	Unknown	2-in. PVC	1754518.73	1626037.78
4M-1	Good	Unknown	2-in. PVC	1753794.24	1625605

6.0 REFERENCES

LANL (Los Alamos National Laboratory), June 1998. "Stabilization Plan for Implementing Interim Measures and Best Management Practices at Potential Release Sites 49-001 (b, c, d, and g)," Los Alamos National Laboratory document LA-UR-98-1534, Los Alamos, New Mexico. (LANL 1998, 59166)

LANL (Los Alamos National Laboratory), September 1998. "Best Management Practices Report for Installation of Stabilization Measures at Potential Release Sites 49-001(b, c, d, and g)," Los Alamos National Laboratory document LA-UR-98-4170, Los Alamos, New Mexico. (LANL 1998, 63041)

LANL (Los Alamos National Laboratory), August 1999. "Interim Measures Report for Potential Release Sites 49-001(b), 49-001(c), 49-001(d), 49-001(g)," Los Alamos National Laboratory document LA-UR-99-2169, Los Alamos, New Mexico. (LANL 1999, 63919)

Attachment 1

Neutron Moisture Measurements

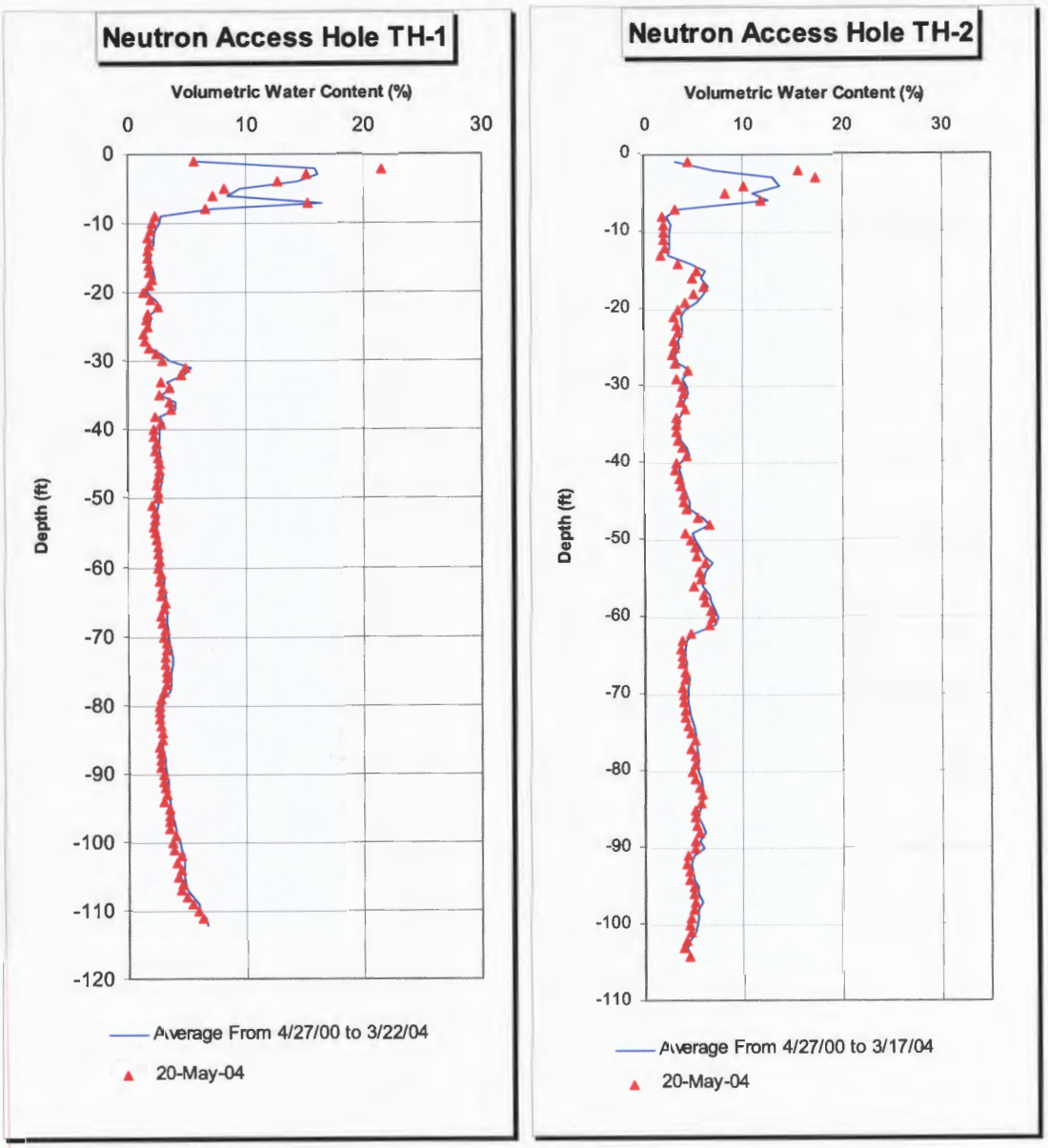

Figure 1-1. Neutron probe moisture measurements for neutron access holes TH-1 and TH-2

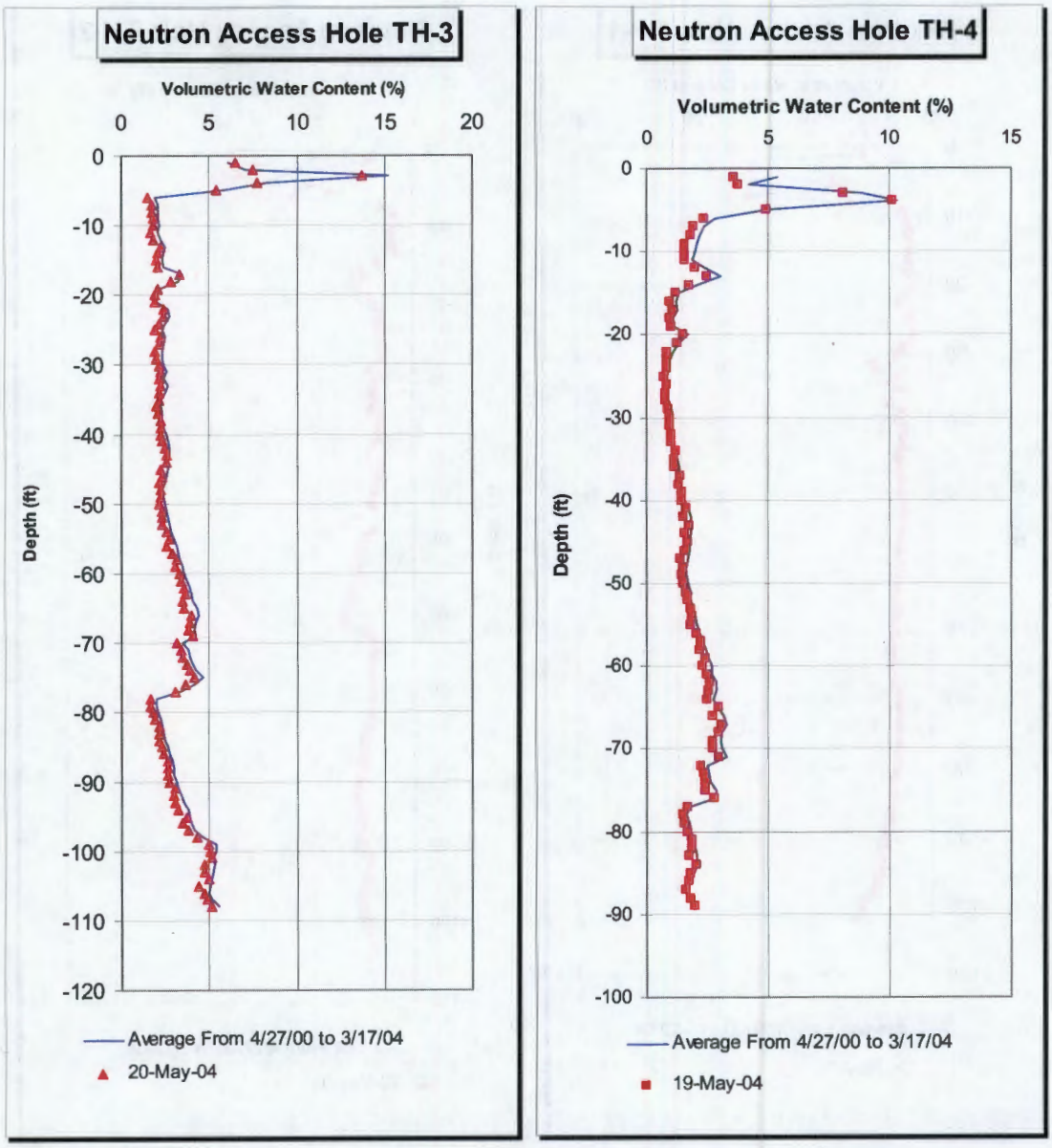

Figure 1-2. Neutron probe moisture measurements for neutron access holes TH-3 and TH-4

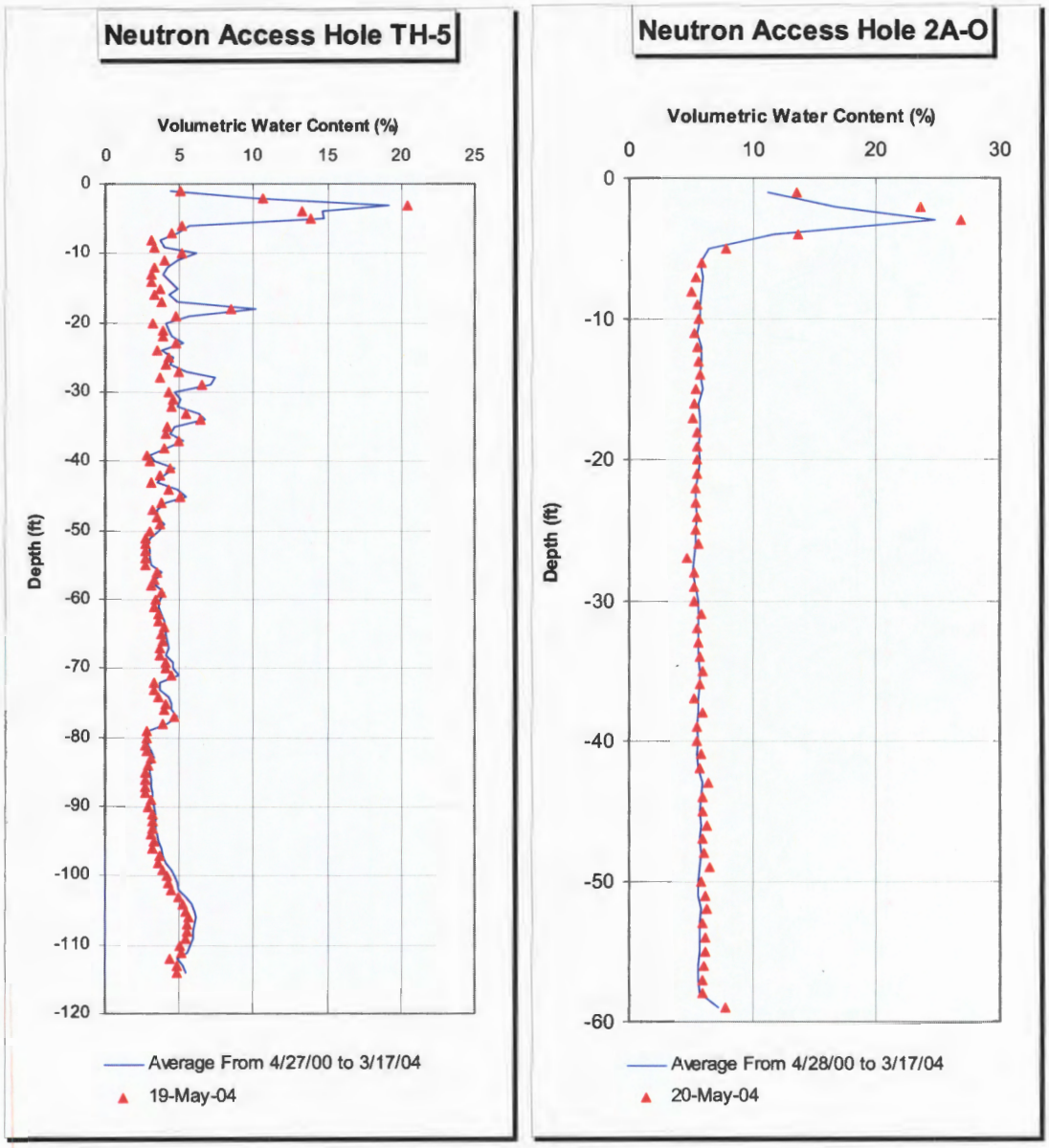

Figure 1-3. Neutron probe moisture measurements for neutron access holes TH-5 and 2A-0

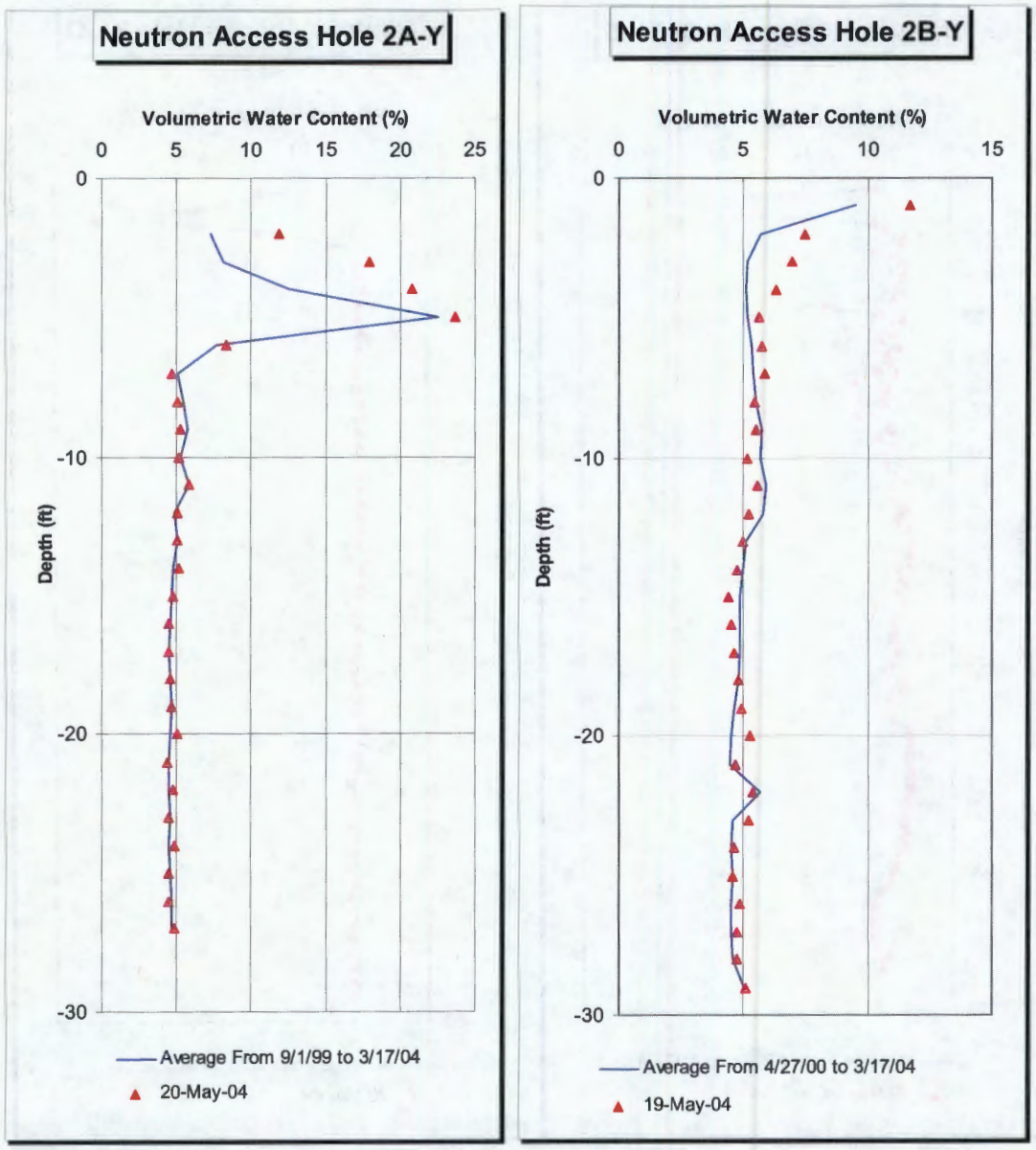

Figure 1-4. Neutron probe moisture measurements for neutron access holes 2A-Y and 2B-Y

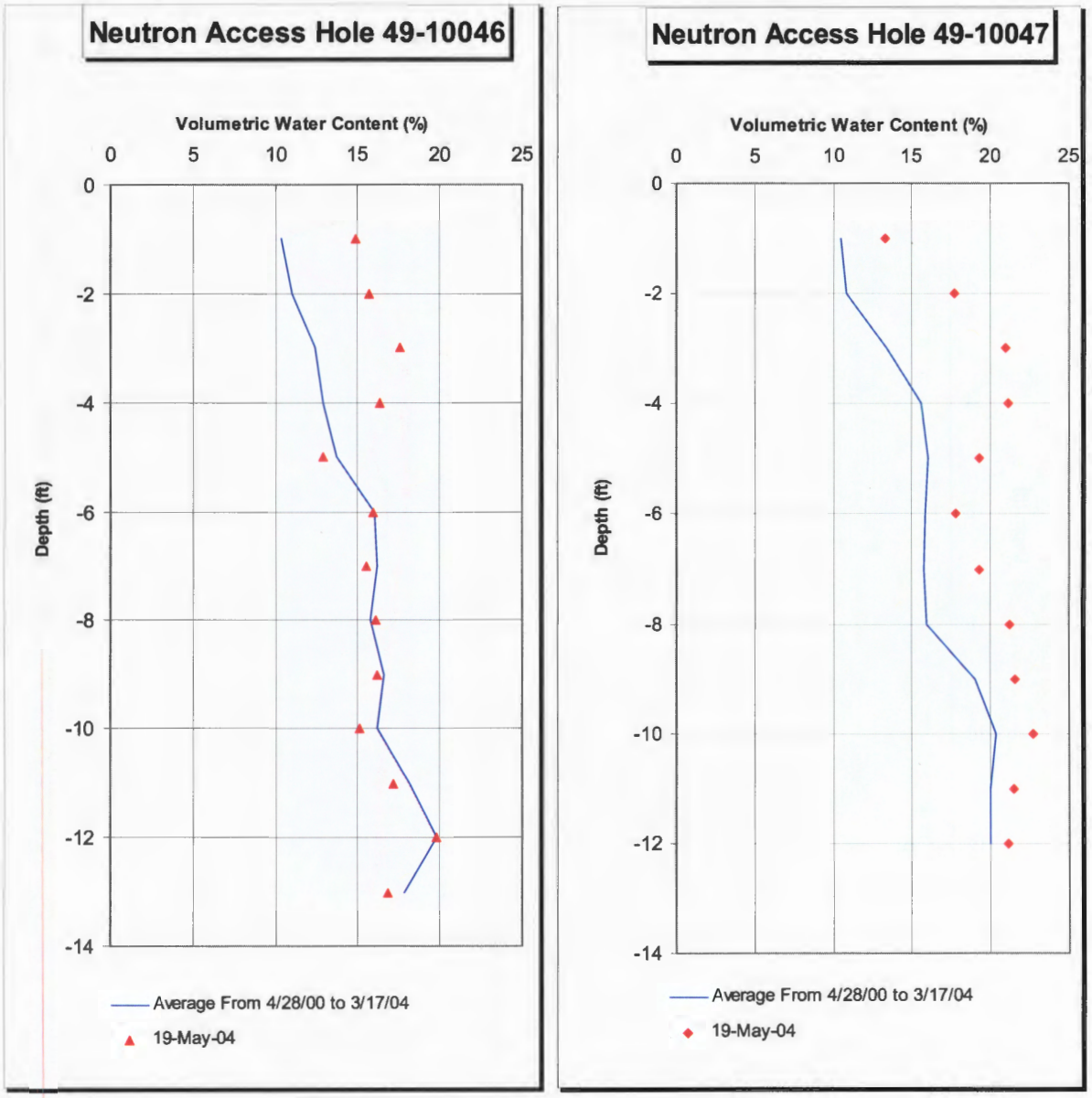

Figure 1-5. Neutron probe moisture measurements for neutron access holes 49-10046 and 49-10047

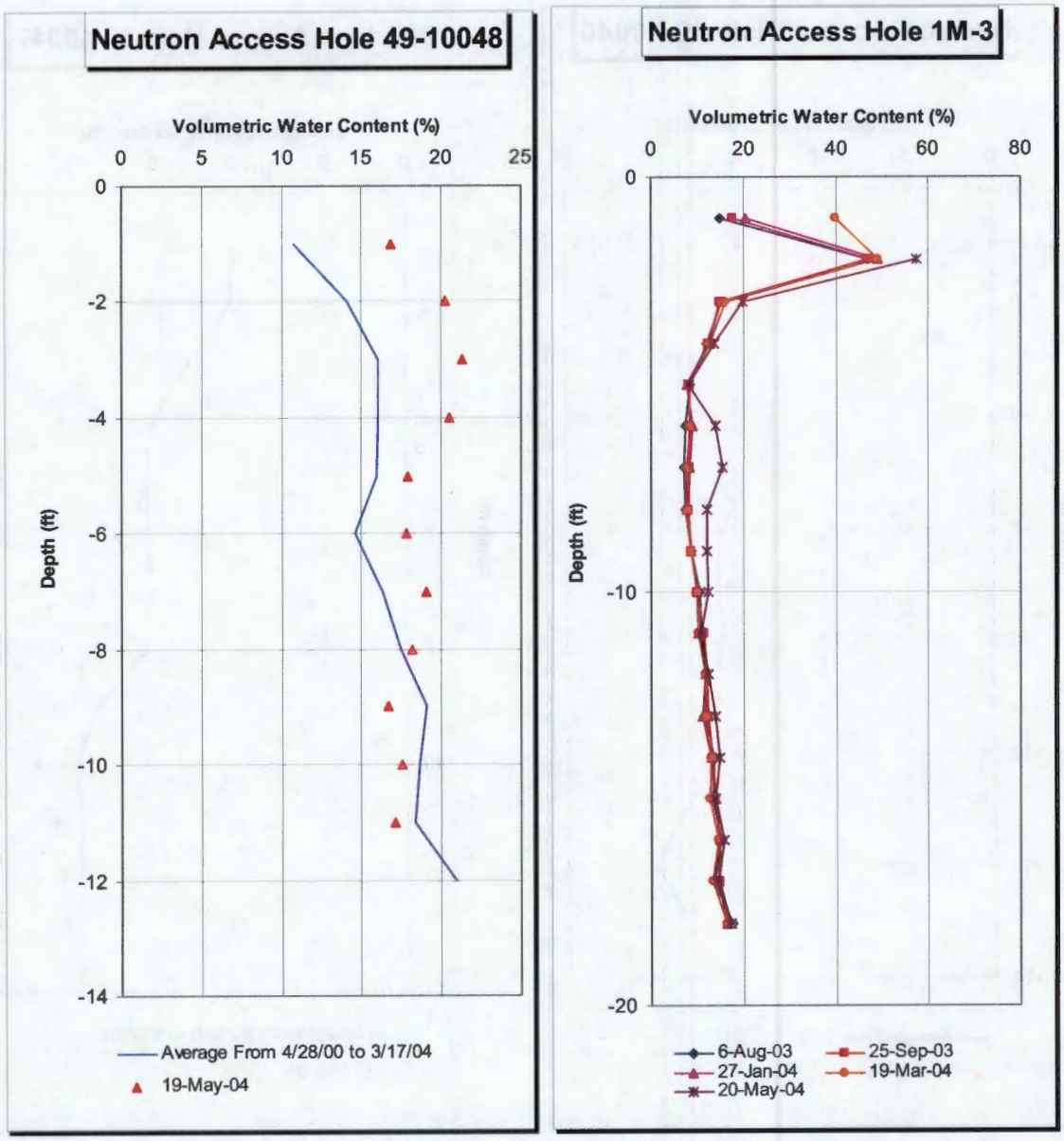

Figure 1-6. Neutron probe moisture measurements for neutron access holes 49-10048 and 1M-3

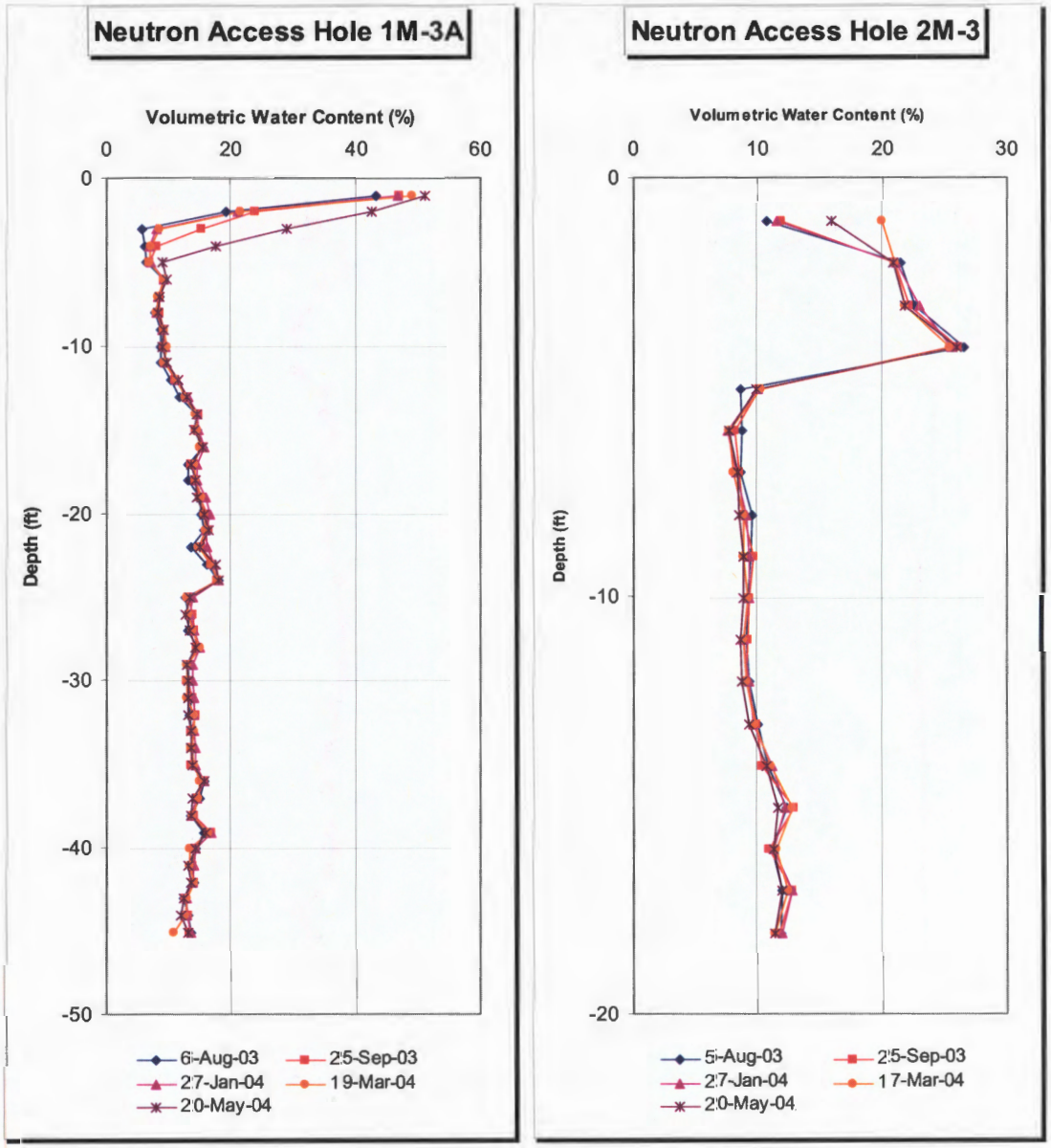

Figure 1-7. Neutron probe moisture measurements for neutron access holes 1M-3A and 2M-3

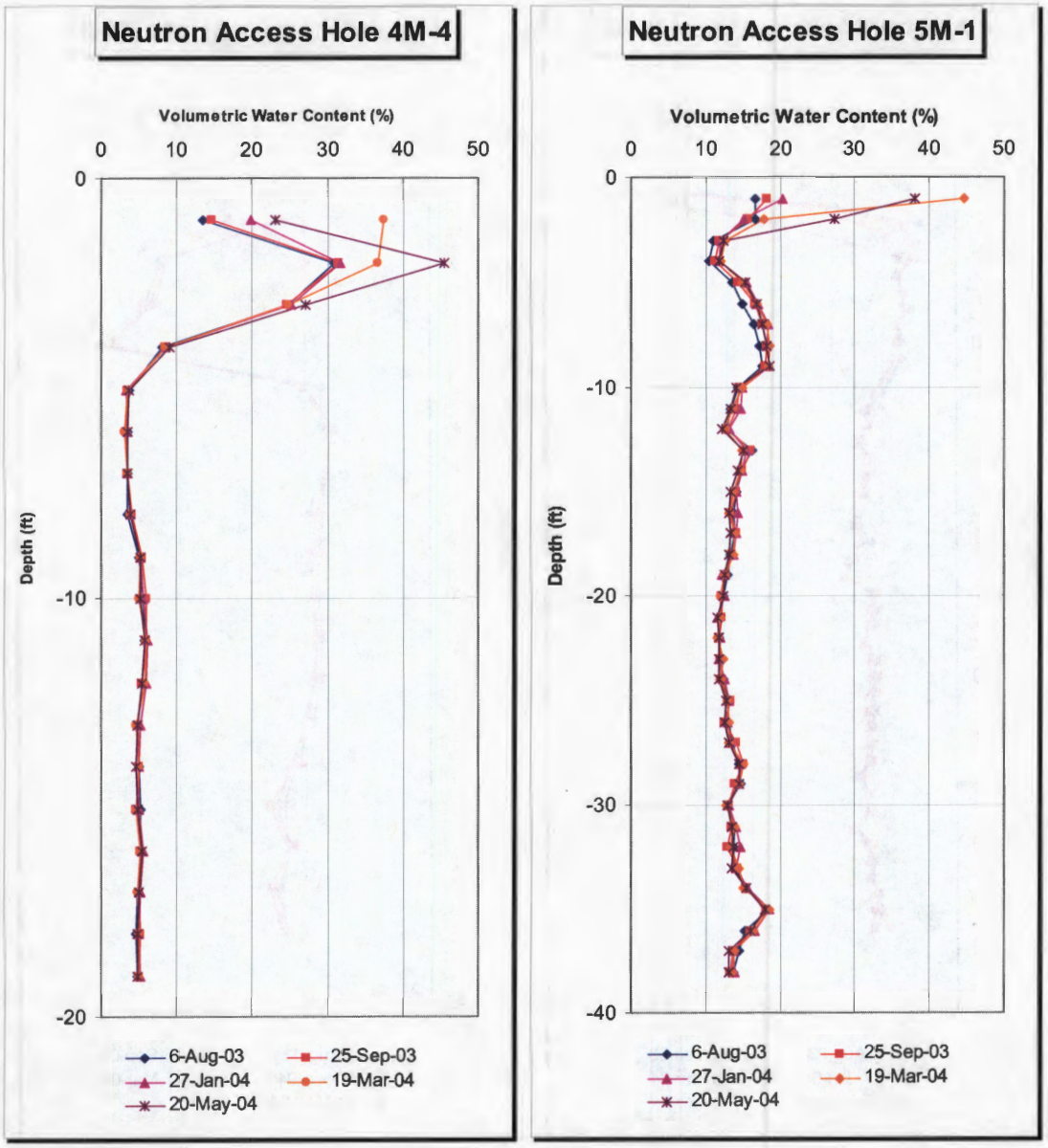

Figure 1-8. Neutron probe moisture measurements for neutron access holes 4M-4 and 5M-1

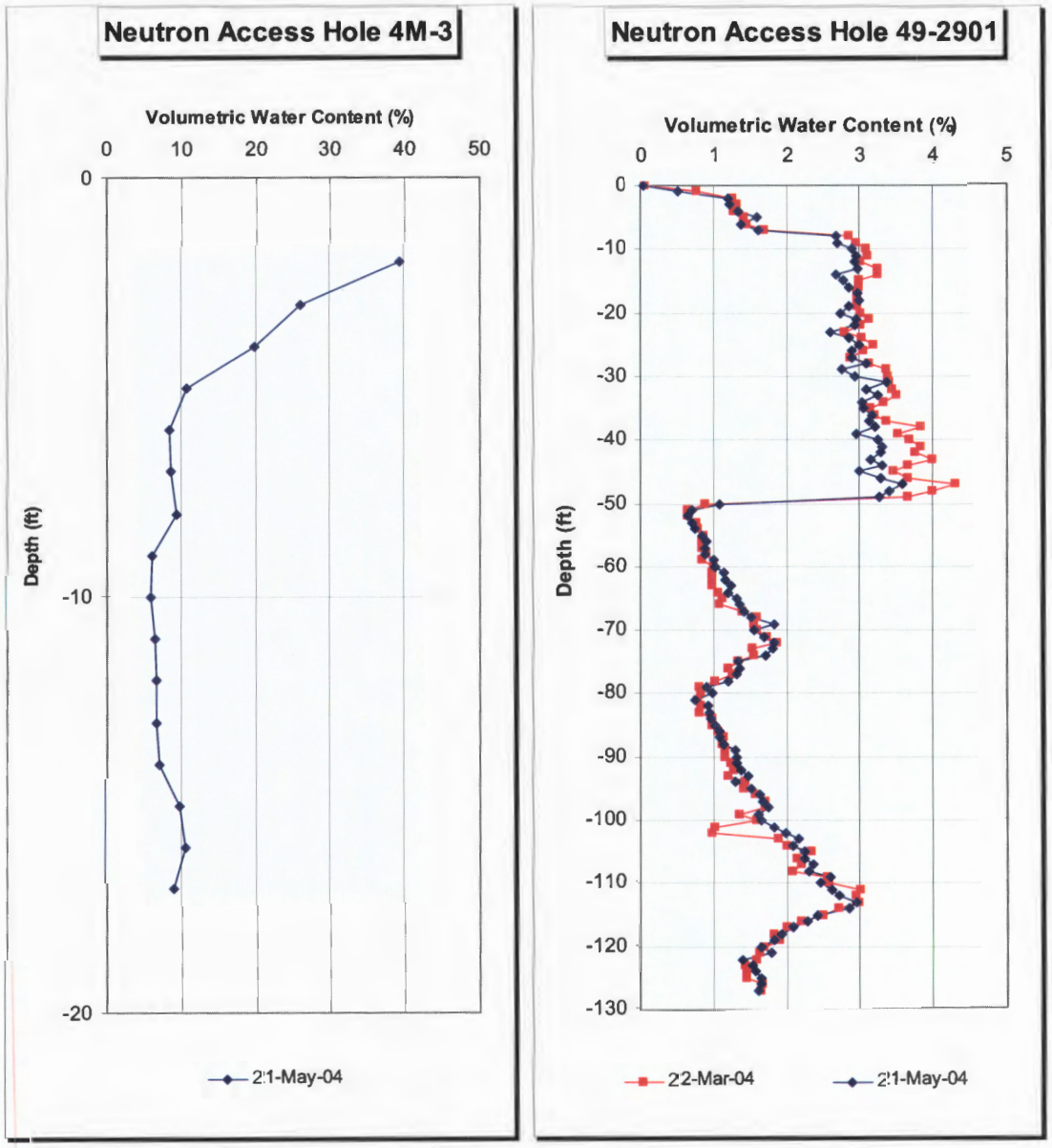

Figure 1-9. Neutron probe moisture measurements for neutron access holes 4M-3 and 49-02901

Attachment 2

Time Versus Moisture Content Plots

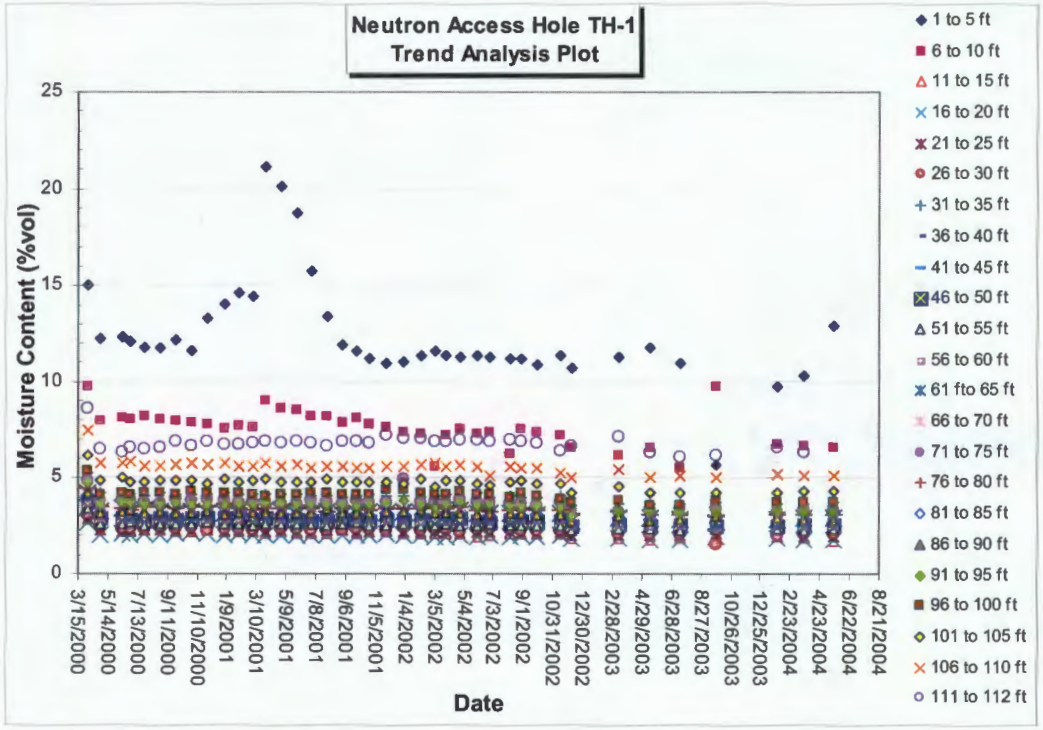

Figure 2-1. Trend plot of neutron moisture measurements, neutron access hole TH-1

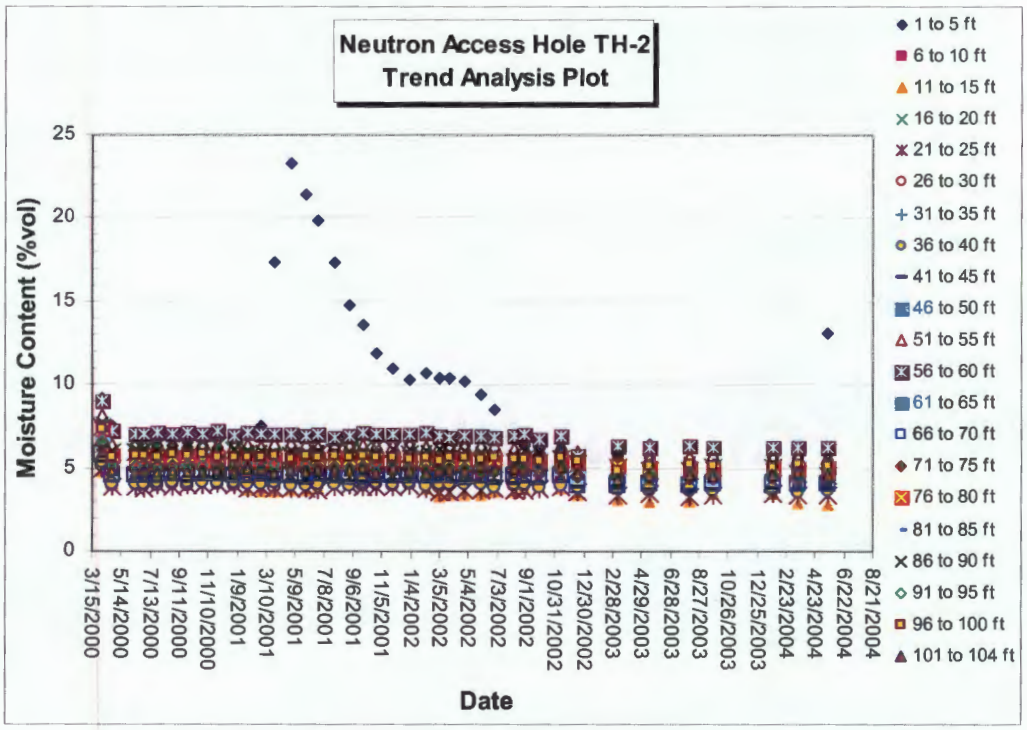

Figure 2-2. Trend plot of neutron moisture measurements, neutron access hole TH-2

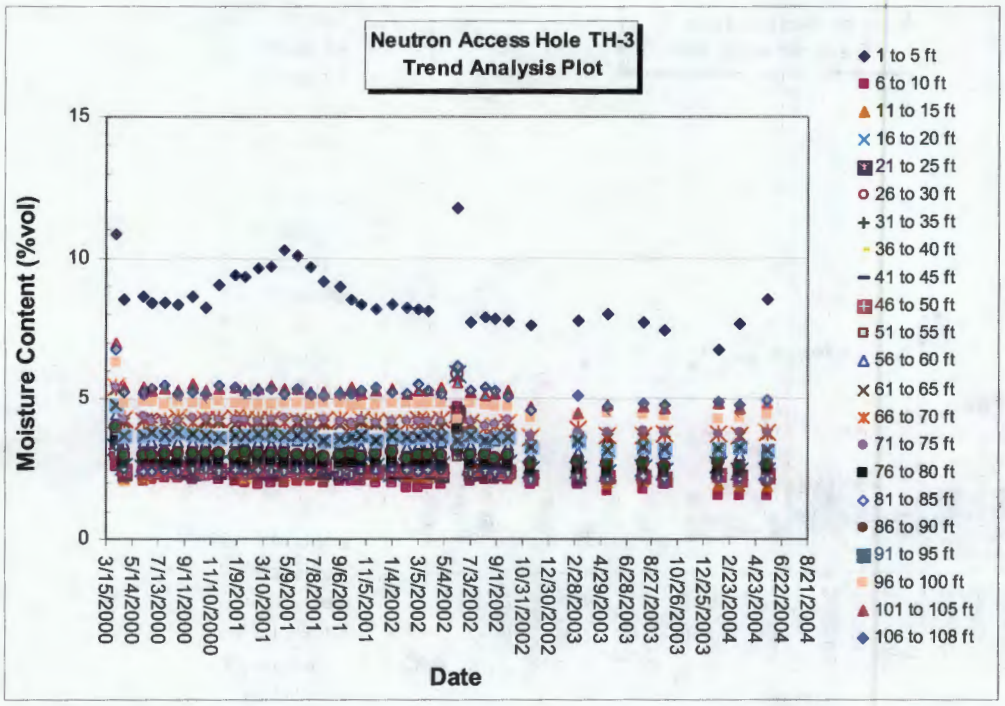

Figure 2-3. Trend plot of neutron moisture measurements, neutron access hole TH-3

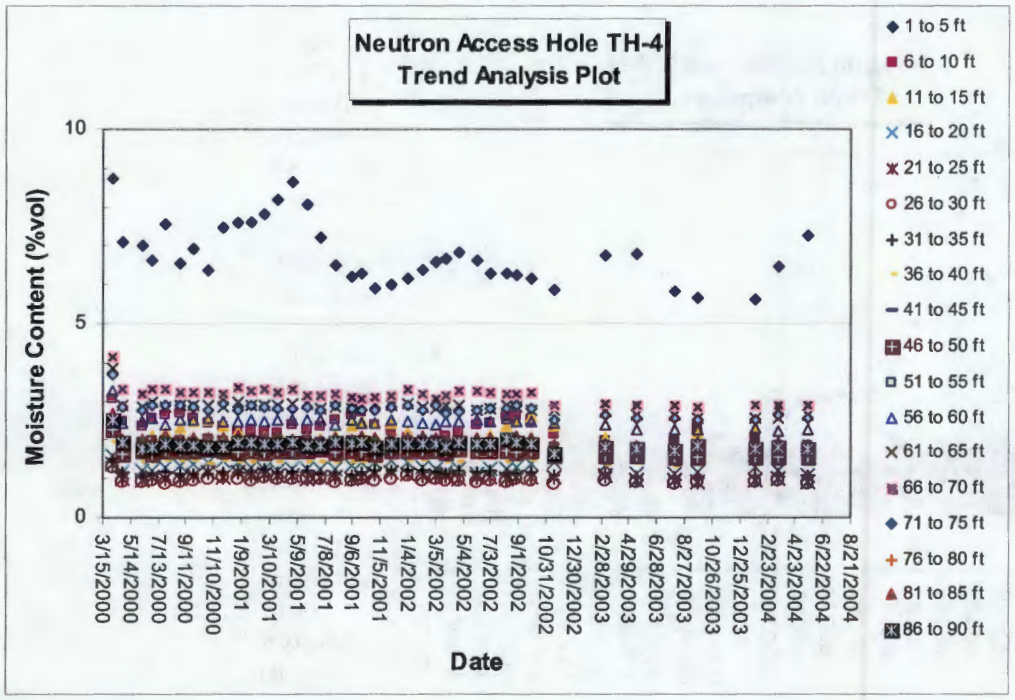

Figure 2-4. Trend plot of neutron moisture measurements, neutron access hole TH-4

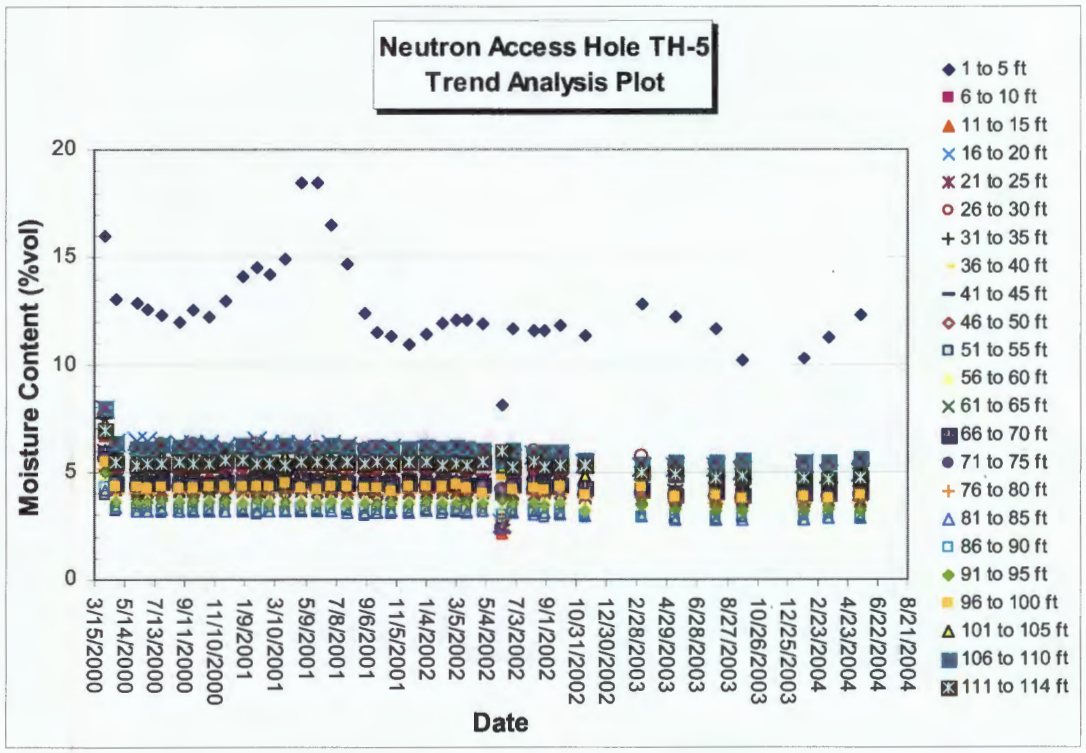

Figure 2-5. Trend plot of neutron moisture measurements, neutron access hole TH-5

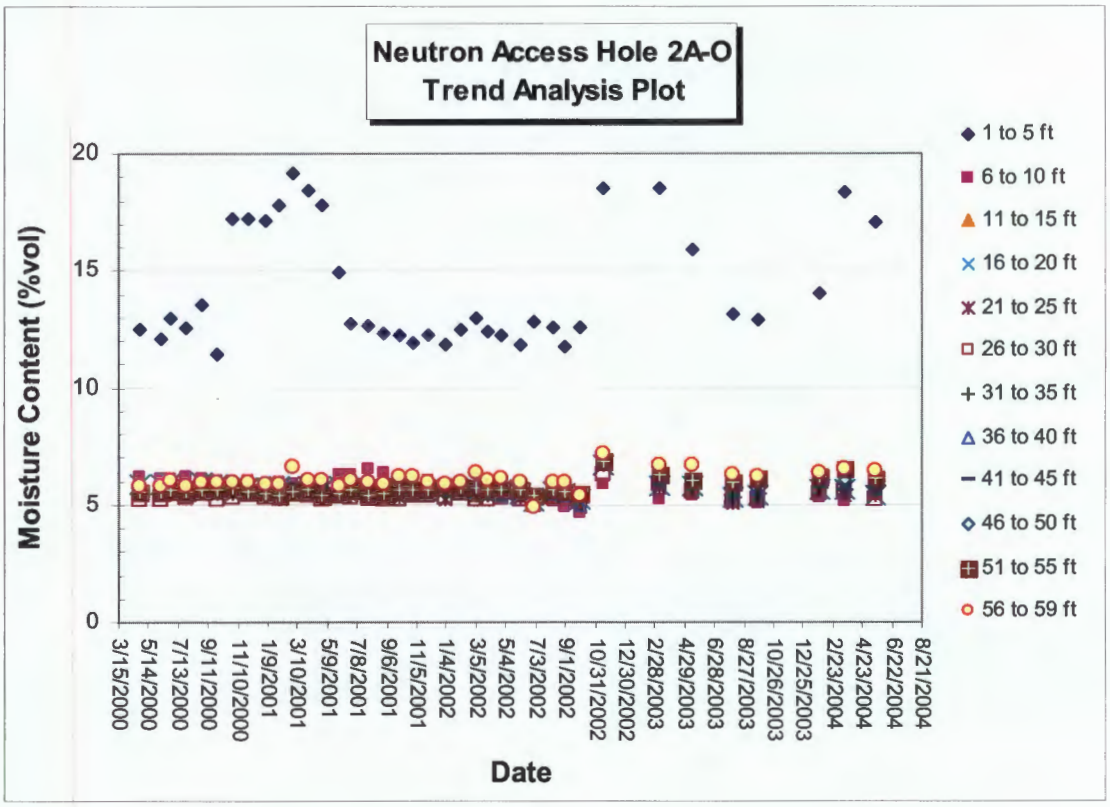

Figure 2-6. Trend plot of neutron moisture measurements, neutron access hole 2A-O

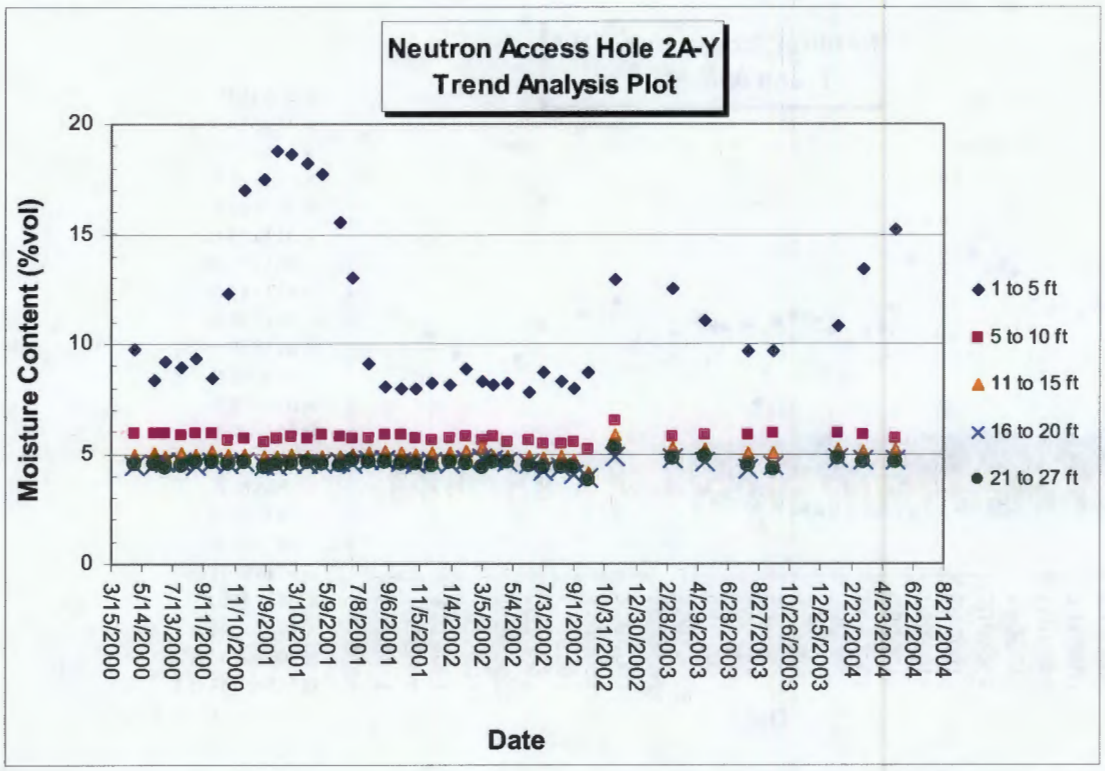

Figure 2-7. Trend plot of neutron moisture measurements, neutron access hole 2A-Y

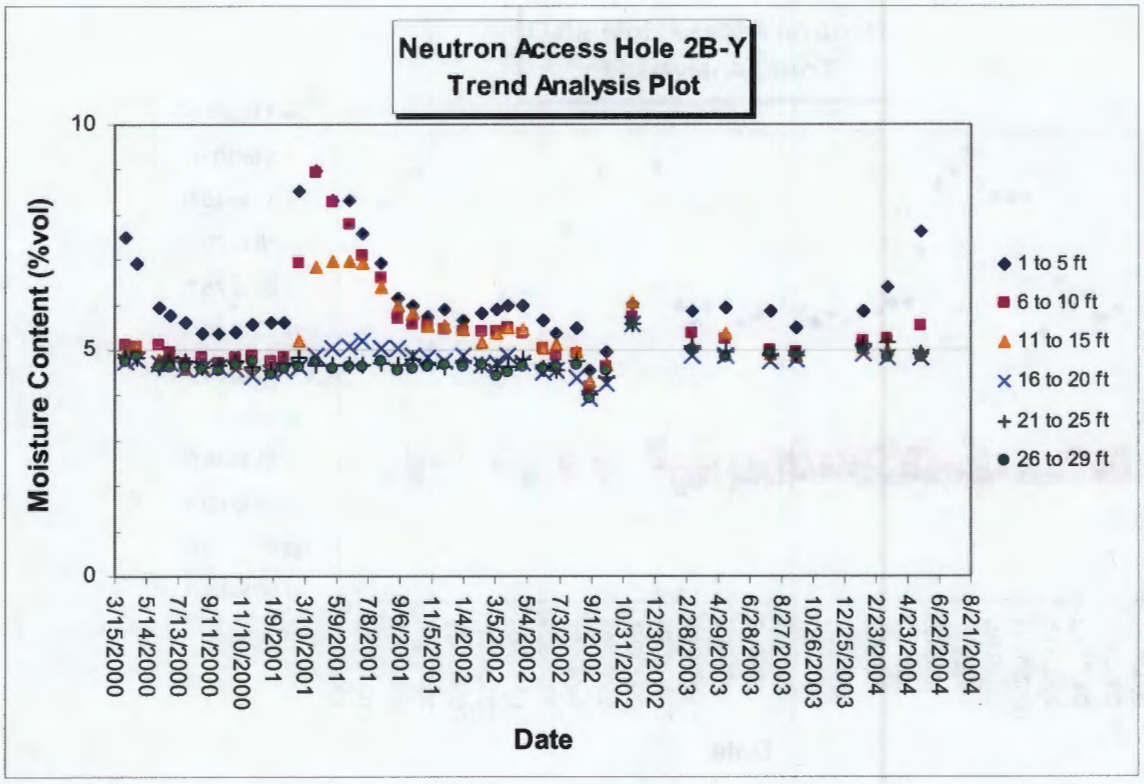

Figure 2-8. Trend plot of neutron moisture measurements, neutron access hole 2B-Y

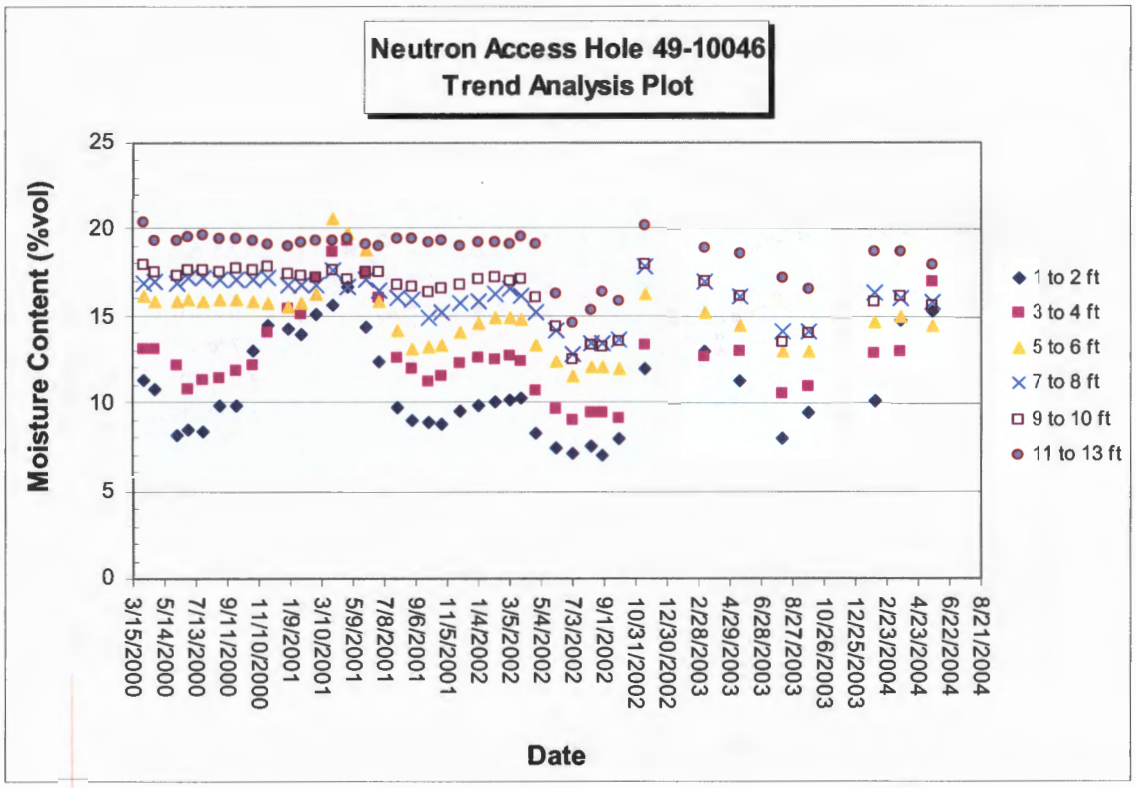

Figure 2-9. Trend plot of neutron moisture measurements, neutron access hole 49-10046

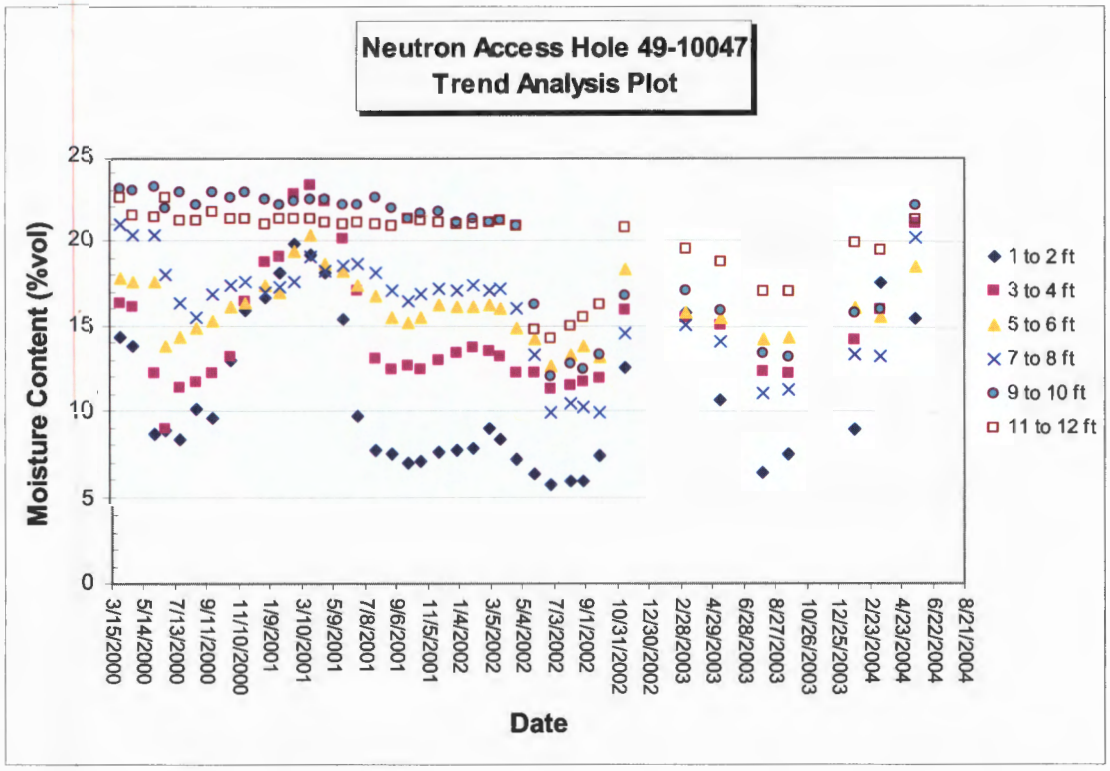

Figure 2-10. Trend plot of neutron moisture measurements, neutron access hole 49-10047

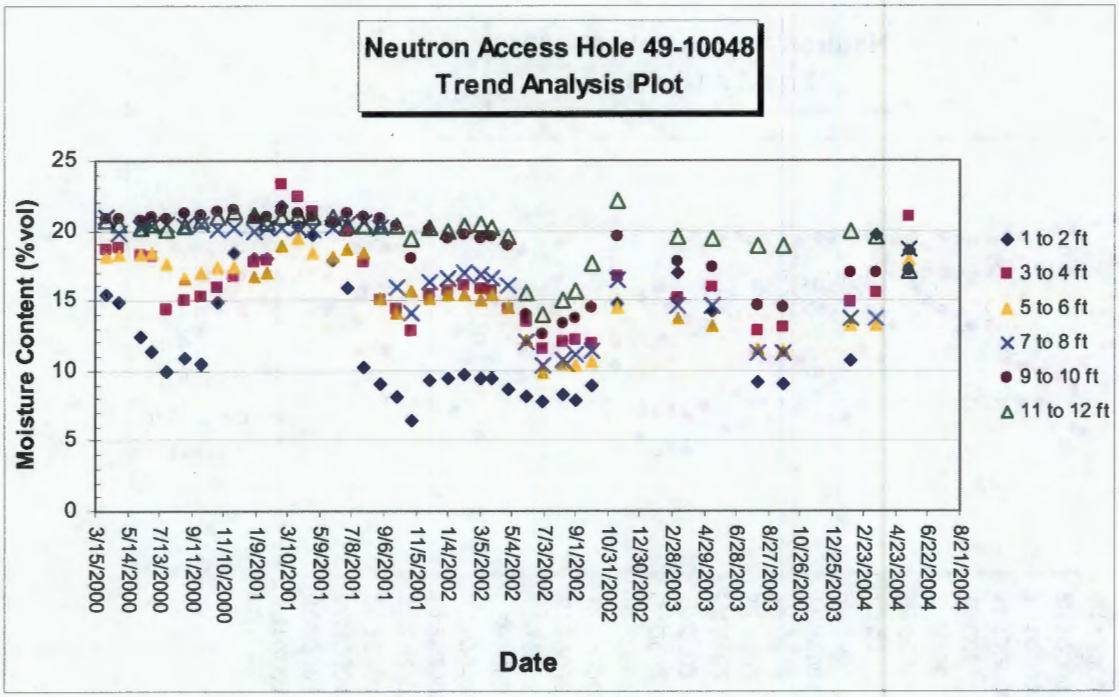

Figure 2-11. Trend plot of neutron moisture measurements, neutron access hole 49-10048

Attachment 3

Condition of Evapotranspiration Cover

Figure 3.1 Photo of evapotranspiration cover from outside Area 2

Figure 3.2 Photo of evapotranspiration cover from outside Area 2

Figure 3.3 Close-up of evapotranspiration cover showing growth through cover

Figure 3.4 Close-up of evapotranspiration cover showing growth through cover

Appendix D

Quarterly Pore-Gas Sampling at
Technical Area 54, Material Disposal Areas L and G,
Third Quarter, Fiscal Year 2004

PORE-GAS SAMPLING AT TECHNICAL AREA 54, MATERIAL DISPOSAL AREAS L AND G, THIRD QUARTER, FISCAL YEAR 2004

Risk Reduction and Environmental Stewardship–Remediation Services

Los Alamos National Laboratory

August 2004

CONTENTS

1.0 INTRODUCTION D-1
- 1.1 Sampling Plan Requirements D-1
- 1.2 Sampling Purpose D-1

2.0 THIRD-QUARTER SAMPLING D-2
- 2.1 Sampling Event D-2
- 2.2 Sampling Results D-2
- 2.3 Evaluation of Quality Assurance Samples D-2

3.0 SECOND-QUARTER SAMPLING D-7
- 3.1 Sampling Event D-7
- 3.2 Sampling Results D-9
- 3.3 Evaluation of Quality Assurance Samples D-9

4.0 REFERENCES D-9

List of Tables

Table 1 Summary of Sampling Event, Third Quarter FY2004 ..... D-3

Table 2 Results of Sampling Event, Third Quarter FY2004 ..... D-4

Table 3 Duplicate Sample Results Comparison (Well 54-02009, 62 ft), Third Quarter FY2004 ..... D-6

Table 4 Summary of Sampling Event, Second Quarter FY2004 ..... D-8

Table 5 Results of Sampling Event, Second Quarter FY2004 ..... D-10

Table 6 Duplicate Sample Results Comparison (Well 54-02009, 62 ft), Second Quarter FY2004 ..... D-13

1.0 INTRODUCTION

This report discusses second quarter subsurface pore-gas sampling at Los Alamos National Laboratory (the Laboratory), Technical Area (TA) 54, where monitoring is required by Module VIII of the Laboratory's Hazardous Waste Facility Permit in Section C.5, "Unsaturated Zone Monitoring" (EPA 1990, 1585). The approved plan (Davis 1993, 38812) for pore-gas sampling at TA-54 is described in the Laboratory's response (Glatzmaier 1993, 30987) to an Environmental Protection Agency (EPA) notice of deficiency (Driscoll 1992, 3849.3) addressing the Laboratory's Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan for TA-54 (LANL 1992, 7669).

1.1 Sampling Plan Requirements

Twenty-eight Risk Reduction and Environmental Stewardship Division–Remediation Services (RRES–RS) project wells are available for pore-gas sampling at TA-54. The sampling and analysis plan requires the collection of samples from 12 wells each quarter. These 12 samples are collected for analysis of volatile organic compounds (VOCs). Of these 12 samples, 7 are to be selected from a list of 10 wells located at Material Disposal Area (MDA) L, and 2 are to be selected from a list of 4 wells located at MDA G. Thus, 9 of the 12 samples collected each quarter are constrained to a defined set of 14 wells, leaving 3 samples per quarter to be collected from the remaining 14 available RRES-RS project pore-gas sampling wells or the boreholes provided by the TA-54 Area G Performance Assessment Maintenance Group (PAMG) wells.

The SUMMA canister sampling method is currently being used with analysis by EPA Method TO-14 (gas chromatography/mass spectrometry) (EPA 1999, 70063). SUMMA canister samples are drawn from one of the several sampling ports available at each well. Table 4 in Appendix F of the fourth-quarter technical report for fiscal year (FY) 2000 (LANL 2000, 70064) provides the rationale for selecting the ports to be sampled during FY2001.

Before the required sampling is performed, all available wells (RRES-RS project wells and PAMG wells) are screened with a Brüel and Kjaer multigas monitor, Type 1302. Each port is purged and monitored with field instruments until carbon dioxide levels have stabilized at values representative of subsurface pore-gas conditions and is then screened for four VOCs (1,1,1-trichloroethane (TCA), trichloroethene (TCE), perchloroethene, and Freon-11).

Three types of field quality assurance (QA) samples are collected and analyzed: (1) a duplicate sample; (2) an equipment blank of zero-grade air (zero-grade air is a common term for air that is certified to be free from VOC contamination) or nitrogen drawn through the sampling apparatus in the working area; and (3) a performance evaluation sample/calibration gas sample taken from a tank of a certified gas mixture. Laboratory QA for EPA Method TO-14 includes internal standards, surrogates, replicates, blanks, laboratory control samples, and reference standards.

1.2 Sampling Purpose

The purpose of the pore-gas sampling at TA-54 MDAs L and G is threefold:

- to identify changes in contaminant concentrations at the perimeter of the relatively well-characterized plume at MDA L as an indicator of outward plume expansion (i.e., extent);
- to monitor for contaminants and changes in contaminant concentration distributions within the plumes at MDAs L and G as an indicator of changes warranting further attention (i.e., nature); and
- to monitor wells for data-gap needs for future modeling and trend analyses.

2.0 THIRD-QUARTER SAMPLING

2.1 Sampling Event

Sampling for the third quarter of FY 2004 (April through June) was conducted during the period of April 14 though May 3, 2004. Table 1 identifies the wells sampled (from the list of all wells available) and lists the port at each well from which the SUMMA canister sample was drawn. Twelve wells were sampled in accordance with the approved sampling plan. Eight wells at MDA L were sampled, including seven from the defined list. Three wells at MDA G were sampled, including two from the defined list of wells. One well at PAMG was sampled. The two QA samples (field duplicate and equipment blank) were collected as planned. In total, fourteen samples were collected for laboratory analysis.

2.2 Sampling Results

Both the field screening and analytical sampling for MDAs G and L were finished by May 3, 2004. Field-screening results for third quarter are available upon request. Analytical results for the third quarter are reported in Table 2.

Wells 54-02002 and 54-02009 were selected to establish trends of TCA from 1997 to 2004 near the source areas of MDA L and MDA G, respectively. 54-02002 has a total of 16 sampling events at 100 ft, and 54-02009 has a total of 21 sampling events at 62 ft. These wells had the highest number of analytical samples taken since 1997. Well 54-02002 is immediately southeast of the disposal shafts located in MDA L. This well was sampled at 100 ft, and it consistently has the highest concentration of TCA. Well 54-2009 is located immediately south of disposal units 1 and 3 in the southeast corner of MDA G.

Both wells show a decreasing trend of TCA over time, Figure 1. Further comparison of lower concentration contaminants such as TCE and tetrachloroethene (PCE) also show no evidence of an increase near the source areas. These results are consistent with data collected since 1997, indicating no significant new release has occurred from the MDA. The extent of the plume will be evaluated in the fourth quarter annual report by comparing three-dimensional diagrams of the contaminant plume for each quarter of 2004.

2.3 Evaluation of Quality Assurance Samples

Field duplicate sample. A field duplicate sample is drawn from the same port on a well immediately after the original sample. The field duplicate was collected on well 54-02009 at the 62-ft sampling port, and the results are listed in Table 3.

Field equipment blank. A field equipment blank sample documents the effectiveness of equipment purges between samples. A sample was collected by drawing zero-grade air through the sample train after the normal purge performed before each sample. The field equipment blank was taken in the immediate vicinity of 54-02009 at ground level.

Calibration gas sample (performance evaluation sample). A calibration gas sample was drawn into a SUMMA canister and submitted to the analytical laboratory for analysis. The calibration gas contained 100 parts per million by volume (ppmv) of TCA, 50 ppmv of TCE, and 10 ppmv of PCE.

Table 1
Summary of Sampling Event, Third Quarter of FY2004

Well ID	Site	On Defined Sampling List?	# of Ports Screened	Depths of Screened Ports (ft)	Depth of Port Sampled (ft)	Sample ID
54-01015	MDA L	N	7	39.5, 164.3, 307.6, 338.3, 382.3, 426.2, 461.4	—	n/a
54-01016	MDA L	N	4	31, 162, 274, 336	336	MD54-04-53237
54-01107	PAMG	N	6	20, 44.5, 56.5, 74, 91, 100	—	n/a
54-01110	PAM G	N	6	20, 48, 60, 70, 85, 90	—	n/a
54-01111	PAMG	N	7	20, 39.5, 50, 70, 78, 100, 139	—	n/a
54-01115	PAMG	N	6	7.9, 26.5, 40.8, 53, 63.6, 68.9	—	n/a
54-01117	PAMG	N	6	20, 31.5, 55, 73, 82, 85	82	MD54-04-53243
54-01121	PAMG	N	7	20, 26, 61.5, 70, 76, 98, 121	—	n/a
54-02002	MDA L	Y	9	40, 60, 80, 100, 120, 140, 157, 180, 200	100	MD54-04-53238
54-01126	MDA G	N	6	7.5, 17.5, 28.5, 35, 42.5, 49.5	—	n/a
54-01128	MDA G	N	5	7.5, 15, 20, 30, 39	39	MD54-04-53244
54-02009	MDA G	Y	3	37, 62, 92	62 62	MD54-04-53239 MD54-04-53249
54-02010	MDA G	Y	3	30, 53, 95	—	n/a
54-02012	MDA L	Y	3	8, 28, 42	—	n/a
54-02013	MDA L	N	3	20, 43, 63	—	n/a
54-02014	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02016	MDA L	N	1	31	—	n/a
54-02020	MDA L	N	10	20, 40, 60, 80, 95, 120, 140, 160, 180, 200	—	n/a
54-02021	MDA L	Y	10	20, 40, 60, 80, 100, 120 140, 160, 180, 200	—	n/a
54-02022	MDA L	Y	10	20, 40, 60, 80, 100, 120, 140, 160, 180, 200	80	MD54-04-53240
54-02023	MDA L	Y	10	20, 40, 60, 80, 100, 120, 140, 159, 180, 200	159	MD54-04-53241
54-02024	MDA L	N	10	20, 40, 60, 80, 100, 120, 140, 160, 180, 200	—	n/a
54-02025	MDA L	N	5	20, 60, 100, 160, 190	—	n/a
54-02026	MDA L	Y	6	20, 60, 100, 160, 200, 215	160	MD54-04-53242
54-02027	MDA L	N	7	20, 60, 100, 160, 200, 220, 250	—	n/a
54-02028	MDA L	N	7	20, 60, 100, 160, 200, 220, 250	—	n/a
54-02029	MDA L	Y	8	20, 60, 100, 160, 200, 220, 260, 288	100	MD54-04-53235
54-02030	MDA L	Y	7	20, 60, 100, 160, 200, 220, 243	—	n/a
54-02031	MDA L	Y	7	20, 60, 100, 160, 200, 220, 260	100	MD54-04-53236
54-02032	MDA G	Y	5	20, 60, 100, 130, 156	156	MD54-04-53245
54-02033	MDA G	Y	8	20, 60, 100, 160, 200, 220, 260, 277	—	n/a
54-02034	MDA L	Y	8	20, 60, 100, 160, 200, 220, 260, 300	60	MD54-04-53246
54-02087	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02088	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02089	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02116	MDA G	N	15	28, 46, 64, 82, 100, 118, 136, 154, 172, 190, 208, 226, 244, 262, 280	—	n/a
Total wells sampled					12	
MDA L defined list wells sampled (7 expected)					7	
MDA G defined list wells sampled (2 expected)					2	
QA samples taken					1 field duplicate	1 equipment blank

Table 2
Results of Sampling Event, Third Quarter FY2004

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-02029	MD54-04-53235	9.6	100	Carbon Tetrachloride	56-23-5
54-02029	MD54-04-53235	34	100	Chloroform	67-66-3
54-02029	MD54-04-53235	12	100	Dichlorodifluoromethane	75-71-8
54-02029	MD54-04-53235	8.5	100	Dichloroethane[1,1-]	75-34-3
54-02029	MD54-04-53235	58	100	Dichloroethene[1,1-]	75-35-4
54-02029	MD54-04-53235	5.1	100	Methylene Chloride	75-09-2
54-02029	MD54-04-53235	25	100	Tetrachloroethene	127-18-4
54-02029	MD54-04-53235	280	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02029	MD54-04-53235	1300	100	Trichloroethane[1,1,1-]	71-55-6
54-02029	MD54-04-53235	300	100	Trichloroethene	79-01-6
54-02029	MD54-04-53235	49	100	Trichlorofluoromethane	75-69-4
54-02031	MD54-04-53236	210	100	Dichlorodifluoromethane	75-71-8
54-02031	MD54-04-53236	750	100	Dichloroethane[1,1-]	75-34-3
54-02031	MD54-04-53236	400	100	Dichloroethane[1,2-]	107-06-2
54-02031	MD54-04-53236	1400	100	Dichloroethene[1,1-]	75-35-4
54-02031	MD54-04-53236	560	100	Methylene Chloride	75-09-2
54-02031	MD54-04-53236	1400	100	Tetrachloroethene	127-18-4
54-02031	MD54-04-53236	2300	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02031	MD54-04-53236	45000	100	Trichloroethane[1,1,1-]	71-55-6
54-02031	MD54-04-53236	11000	100	Trichloroethene	79-01-6
54-02031	MD54-04-53236	400	100	Trichlorofluoromethane	75-69-4
54-01016	MD54-04-53237	4	336	Dichlorodifluoromethane	75-71-8
54-01016	MD54-04-53237	2.7	336	Dichloroethane[1,1-]	75-34-3
54-01016	MD54-04-53237	24	336	Dichloroethene[1,1-]	75-35-4
54-01016	MD54-04-53237	6	336	Tetrachloroethene	127-18-4
54-01016	MD54-04-53237	15	336	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-01016	MD54-04-53237	75	336	Trichloroethane[1,1,1-]	71-55-6
54-01016	MD54-04-53237	28	336	Trichloroethene	79-01-6
54-01016	MD54-04-53237	4.2	336	Trichlorofluoromethane	75-69-4
54-02002	MD54-04-53238	8000	100	Chloroform	67-66-3
54-02002	MD54-04-53238	5700	100	Dichloroethane[1,1-]	75-34-3
54-02002	MD54-04-53238	7300	100	Dichloroethane[1,2-]	107-06-2
54-02002	MD54-04-53238	8500	100	Dichloroethene[1,1-]	75-35-4
54-02002	MD54-04-53238	13000	100	Dichloropropane[1,2-]	78-87-5
54-02002	MD54-04-53238	15000	100	Methylene Chloride	75-09-2
54-02002	MD54-04-53238	20000	100	Propanol[2-]	67-63-0
54-02002	MD54-04-53238	6100	100	Tetrachloroethene	127-18-4
54-02002	MD54-04-53238	9000	100	Tetrahydrofuran	109-99-9
54-02002	MD54-04-53238	5500	100	Toluene	108-88-3
54-02002	MD54-04-53238	37000	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02002	MD54-04-53238	390000	100	Trichloroethane[1,1,1-]	71-55-6
54-02002	MD54-04-53238	71000	100	Trichloroethene	79-01-6
54-02002	MD54-04-53238	13000	100	Trichlorofluoromethane	75-69-4

Table 2 (continued)

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-02002	MD54-04-53238	2000	100	Xylene[1,3-]+Xylene[1,4-]	Xylene[1,3 and 1,4]
54-02009	MD54-04-53239	2400	62	Dichloroethane[1,1-]	75-34-3
54-02009	MD54-04-53239	2900	62	Dichloroethene[1,1-]	75-35-4
54-02009	MD54-04-53239	680	62	Tetrachloroethene	127-18-4
54-02009	MD54-04-53239	61000	62	Trichloroethane[1,1,1-]	71-55-6
54-02009	MD54-04-53239	350	62	Trichloroethene	79-01-6
54-02022	MD54-04-53240	3300	80	Dichloroethane[1,1-]	75-34-3
54-02022	MD54-04-53240	4100	80	Dichloroethane[1,2-]	107-06-2
54-02022	MD54-04-53240	2400	80	Dichloroethene[1,1-]	75-35-4
54-02022	MD54-04-53240	3300	80	Methylene Chloride	75-09-2
54-02022	MD54-04-53240	14000	80	Propanol[2-]	67-63-0
54-02022	MD54-04-53240	2200	80	Tetrachloroethene	127-18-4
54-02022	MD54-04-53240	1200	80	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02022	MD54-04-53240	230000	80	Trichloroethane[1,1,1-]	71-55-6
54-02022	MD54-04-53240	30000	80	Trichloroethene	79-01-6
54-02023	MD54-04-53241	150	159	Carbon Tetrachloride	56-23-5
54-02023	MD54-04-53241	640	159	Chloroform	67-66-3
54-02023	MD54-04-53241	150	159	Dichlorodifluoromethane	75-71-8
54-02023	MD54-04-53241	210	159	Dichloroethane[1,1-]	75-34-3
54-02023	MD54-04-53241	1500	159	Dichloroethene[1,1-]	75-35-4
54-02023	MD54-04-53241	190	159	Methylene Chloride	75-09-2
54-02023	MD54-04-53241	400	159	Tetrachloroethene	127-18-4
54-02023	MD54-04-53241	4500	159	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02023	MD54-04-53241	25000	159	Trichloroethane[1,1,1-]	71-55-6
54-02023	MD54-04-53241	6100	159	Trichloroethene	79-01-6
54-02023	MD54-04-53241	830	159	Trichlorofluoromethane	75-69-4
54-02026	MD54-04-53242	32	160	Carbon Tetrachloride	56-23-5
54-02026	MD54-04-53242	110	160	Chloroform	67-66-3
54-02026	MD54-04-53242	35	160	Dichlorodifluoromethane	75-71-8
54-02026	MD54-04-53242	29	160	Dichloroethane[1,1-]	75-34-3
54-02026	MD54-04-53242	250	160	Dichloroethene[1,1-]	75-35-4
54-02026	MD54-04-53242	60	160	Methylene Chloride	75-09-2
54-02026	MD54-04-53242	94	160	Tetrachloroethene	127-18-4
54-02026	MD54-04-53242	900	160	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02026	MD54-04-53242	4400	160	Trichloroethane[1,1,1-]	71-55-6
54-02026	MD54-04-53242	1000	160	Trichloroethene	79-01-6
54-02026	MD54-04-53242	160	160	Trichlorofluoromethane	75-69-4
54-01117	MD54-04-53243	2400	82	Dichloroethane[1,1-]	75-34-3
54-01117	MD54-04-53243	2400	82	Dichloroethene[1,1-]	75-35-4
54-01117	MD54-04-53243	570	82	Tetrachloroethene	127-18-4
54-01117	MD54-04-53243	1300	82	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-01117	MD54-04-53243	98000	82	Trichloroethane[1,1,1-]	71-55-6
54-01117	MD54-04-53243	1900	82	Trichloroethene	79-01-6
54-01128	MD54-04-53244	2900	39	Dichloroethane[1,1-]	75-34-3
54-01128	MD54-04-53244	3400	39	Dichloroethene[1,1-]	75-35-4

Table 2 (continued)

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-01128	MD54-04-53244	870	39	Tetrachloroethene	127-18-4
54-01128	MD54-04-53244	72000	39	Trichloroethane[1,1,1-]	71-55-6
54-01128	MD54-04-53244	400	39	Trichloroethene	79-01-6
54-02032	MD54-04-53245	1000	156	Dichloroethane[1,1-]	75-34-3
54-02032	MD54-04-53245	2200	156	Dichloroethene[1,1-]	75-35-4
54-02032	MD54-04-53245	640	156	Tetrachloroethene	127-18-4
54-02032	MD54-04-53245	64	156	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02032	MD54-04-53245	12000	156	Trichloroethane[1,1,1-]	71-55-6
54-02032	MD54-04-53245	240	156	Trichloroethene	79-01-6
54-02034	MD54-04-53246	120	60	Dichloroethane[1,1-]	75-34-3
54-02034	MD54-04-53246	47	60	Dichloroethane[1,2-]	107-06-2
54-02034	MD54-04-53246	160	60	Dichloroethene[1,1-]	75-35-4
54-02034	MD54-04-53246	61	60	Methylene Chloride	75-09-2
54-02034	MD54-04-53246	72	60	Tetrachloroethene	127-18-4
54-02034	MD54-04-53246	90	60	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02034	MD54-04-53246	8300	60	Trichloroethane[1,1,1-]	71-55-6
54-02034	MD54-04-53246	1500	60	Trichloroethene	79-01-6
54-02034	MD54-04-53246	41	60	Trichlorofluoromethane	75-69-4
54-02009	MD54-04-53249	2800	62	Dichloroethane[1,1-]	75-34-3
54-02009	MD54-04-53249	3600	62	Dichloroethene[1,1-]	75-35-4
54-02009	MD54-04-53249	850	62	Tetrachloroethene	127-18-4
54-02009	MD54-04-53249	75000	62	Trichloroethane[1,1,1-]	71-55-6
54-02009	MD54-04-53249	480	62	Trichloroethene	79-01-6

Table 3
Duplicate Sample Results Comparison (Well 54-02009, 62 ft), Third Quarter FY2004

Analyte	Sample MD54-03-53239[a] (ppmv[b])	Sample MD54-03-53249[c] (ppmv[b])	RPD[d]
Dichloroethane[1,1-]	2400	2800	15
Dichloroethene[1,1-]	2900	3600	22
Tetrachloroethene	680	850	22
Trichloroethane[1,1,1-]	61000	75000	21
Trichloroethene	350	480	31

[a]Detection Limit = 0.34 ppmv
[c]Detection Limit = 0.35 ppmv
[b]ppmv = Parts per million by volume
[d]Relative percent difference

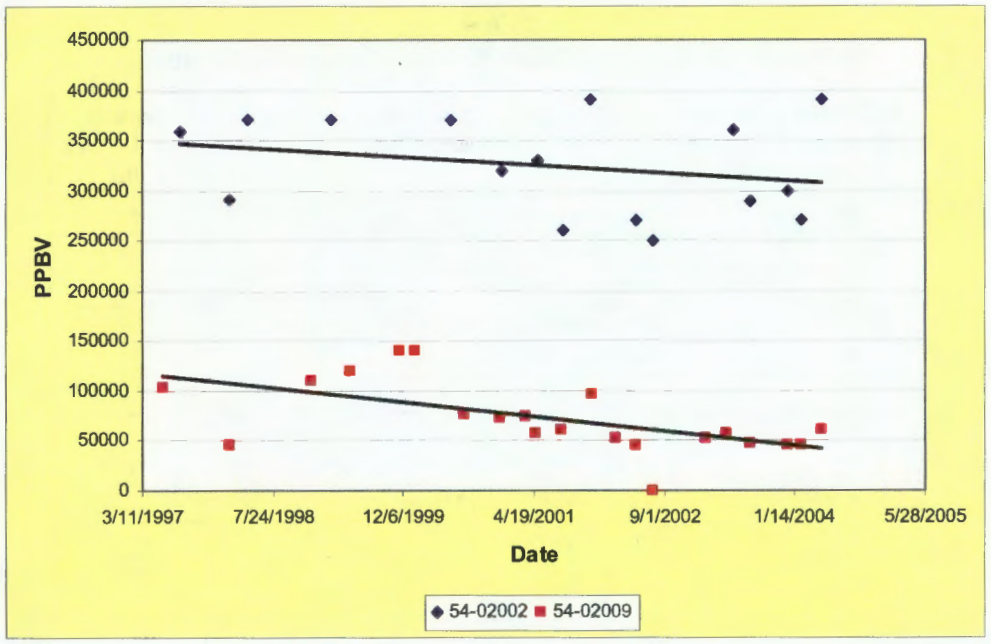

Figure 1. TCA trends of wells 54-02002 and 54-02009

3.0 SECOND-QUARTER SAMPLING

3.1 Sampling Event

Sampling for the second quarter of FY2004 (January through March) was conducted during the period of February 10 though February 26, 2004 (Table 4). Analytical results for the second quarter are reported in Table 5.

Table 4 identifies the wells sampled (from the list of all wells available) and lists the port at each well from which the SUMMA canister sample was drawn. Twelve wells were sampled in accordance with the approved sampling plan. Nine wells at MDA L were sampled, including eight from the defined list. Three wells at MDA G were sampled, including three from the defined list of wells. The two QA samples (field duplicate and equipment blank) were collected as planned. In total, fourteen samples were collected for laboratory analysis.

Table 4
Summary of Sampling Event, Second Quarter of FY2004

Well ID	Site	On Defined Sampling List (Y/N)	Number of Ports Screened	Depths of Screened Ports (ft)	Depth of Port Sampled (ft)	Sample ID
54-01015	MDA L	N	7	39.5, 164.3, 307.6, 338.3, 382.3, 426.2, 461.4	338.3	MD54-04-52969
54-01016	MDA L	N	4	31, 162, 274, 336	—	n/a
54-01107	PAMG	N	n/a	Well needs repair	—	n/a
54-01110	PAM G	N	0	Not screened (lack of time)	—	n/a
54-01111	PAMG	N	0	Not screened (lack of time)	—	n/a
54-01117	PAMG	N	0	Not screened (lack of time)	—	n/a
54-01121	PAMG	N	0	Not screened (lack of time)	—	n/a
54-02002	MDA L	Y	8	40, 60, 100, 120, 140, 157, 180, 200	100	MD54-04-52970
54-01126	MDA G	N	0	Not screened (lack of time)	—	n/a
54-01128	MDA G	N	0	Well needs repair	—	n/a
54-02009	MDA G	Y	3	37, 62, 92	62 62	MD54-04-52976 MD54-04-52977
54-02010	MDA G	Y	3	30, 53, 95	95	MD54-04-52971
54-02012	MDA L	Y	1	28	—	n/a
54-02013	MDA L	N	1	43	—	n/a
54-02014	MDA L	N	2	13, 86	—	n/a
54-02016	MDA L	N	2	18, 31	—	n/a
54-02020	MDA L	N	10	20, 40, 60, 80, 95, 120, 140, 160, 180, 200	—	n/a
54-02021	MDA L	Y	10	20, 40, 60, 80, 100, 120 140, 160, 180, 200	100	MD54-04-52967
54-02022	MDA L	Y	10	20, 40, 60, 80, 100, 120, 140, 160, 180, 200	80	MD54-04-52966
54-02023	MDA L	Y	9	20, 40, 80, 100, 120, 140, 159, 180, 200	159	MD54-04-52965
54-02024	MDA L	N	0	Not screened (lack of time)	—	n/a
54-02025	MDA L	N	4	20, 60, 100, 160	—	n/a
54-02026	MDA L	Y	6	20, 60, 100, 160, 200, 215	160	MD54-04-52972
54-02027	MDA L	N	5	20, 60, 100, 160, 200	—	n/a
54-02028	MDA L	N	7	20, 60, 100, 160, 200, 220, 250	—	n/a
54-02029	MDA L	Y	8	20, 60, 100, 160, 200, 220, 260, 288	100	MD54-04-52968
54-02030	MDA L	Y	6	20, 60, 100, 160, 200, 220	100	MD54-04-52975
54-02031	MDA L	Y	7	20, 60, 100, 160, 200, 220, 260	—	n/a
54-02032	MDA G	Y	0	Not screened (lack of time)	—	n/a
54-02033	MDA G	Y	8	20, 60, 100, 160, 200, 220, 260, 277	100	MD54-04-52974
54-02034	MDA L	Y	7	20, 60, 100, 160, 200, 220, 260	60	MD54-04-52973
54-02087	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02088	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02089	MDA L	N	4	13, 31, 46, 86	—	n/a
54-02116	MDA G	N	0	Not screened (lack of time)	—	n/a
Total wells sampled					12	
MDA L defined list wells sampled (7 expected)					8	
MDA G defined list wells sampled (2 expected)					3	
QA samples taken					1 field duplicate	1 equipment blank

3.2 Sampling Results

Both the field screening and analytical sampling for MDAs G and L were finished by February 26, 2004. Field-screening results for second quarter are available upon request. Analytical results for the second quarter are reported in Table 5.

3.3 Evaluation of Quality Assurance Samples

Field duplicate sample. A field duplicate sample is drawn from the same port on a well immediately after the original sample. The field duplicate was collected on well 54-02009 at the 62-ft sampling port, and the results in Table 6.

Field equipment blank. A field equipment blank sample documents the effectiveness of equipment purges between samples. A sample was collected by drawing zero-grade air through the sample train after the normal purge performed before each sample. The field equipment blank was taken in the immediate vicinity of 54-02009 at ground level.

Calibration gas sample (performance evaluation sample). A calibration gas sample was drawn into a SUMMA canister and submitted to the analytical laboratory for analysis. The calibration gas contained 100 ppmv of TCA, 50 ppmv of TCE, and 10 ppmv of PCE.

4.0 REFERENCES

Davis, A., December 14, 1993. "RFI Work Plan for OU 1148, Approval Los Alamos National Laboratory NM0890010515," Environmental Protection Agency memorandum to J. Vozella, Dallas, Texas. (Davis 1993, 38812)

Driscoll, B., November 30, 1992. "EPA NOD to LANL," EPA memorandum to C. Rofer, Los Alamos National Laboratory, Los Alamos, New Mexico. (Driscoll 1992, 3849.3)

EPA (US Environmental Protection Agency), April 1990. United States Environmental Protection Agency, Region 6 Hazardous Waste Permit (Hazardous and Solid Waste Amendments). (EPA 1990, 1585)

EPA (US Environmental Protection Agency), January 1999. "Compendium Method TA-14A, Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Specially Prepared Canisters with Subsequent Analysis by Gas Chromatography," in "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air," EPA/625/R-96/010b, Office of Research and Development, Cincinnati, Ohio. (EPA 1999, 70063)

Glatzmaier, T., November 12, 1993. "Final Notice of Deficiency (NOD) Response for Operable Unit (OU) 1148," Los Alamos National Laboratory memorandum EM-13:93-A232, Los Alamos, New Mexico. (Glatzmaier 1993, 30987)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1148," Los Alamos National Laboratory document LA-UR-92-855, Los Alamos, New Mexico. (LANL 1992, 7669)

LANL (Los Alamos National Laboratory), November 14, 2000. "Quarterly Technical Report, July–September 2000," Los Alamos National Laboratory report LA-UR-00-5107, Los Alamos, New Mexico. (LANL 2000, 70064)

Table 5
Results of Sampling Event, Second Quarter FY2004

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-01015	MD54-04-52969	1.4	338	Dichloroethane[1,1-]	75-34-3
54-01015	MD54-04-52969	1.5	338	Tetrachloroethene	127-18-4
54-01015	MD54-04-52969	2.8	338	Trichlorofluoromethane	75-69-4
54-01015	MD54-04-52969	22	338	Dichloroethene[1,1-]	75-35-4
54-01015	MD54-04-52969	28	338	Trichloroethane[1,1,1-]	71-55-6
54-01015	MD54-04-52969	3.8	338	Trichloroethene	79-01-6
54-01015	MD54-04-52969	4.5	338	Acetone	67-64-1
54-01015	MD54-04-52969	8.1	338	Dichlorodifluoromethane	75-71-8
54-01015	MD54-04-52969	9.4	338	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02002	MD54-04-52970	1000	100	Dichlorodifluoromethane	75-71-8
54-02002	MD54-04-52970	1200	100	Xylene[1,3-]+Xylene[1,4-]	Xylene[1,3 and 1,4]
54-02002	MD54-04-52970	12000	100	Dichloropropane[1,2-]	78-87-5
54-02002	MD54-04-52970	12000	100	Trichlorofluoromethane	75-69-4
54-02002	MD54-04-52970	1400	100	Carbon Tetrachloride	56-23-5
54-02002	MD54-04-52970	14000	100	Methylene Chloride	75-09-2
54-02002	MD54-04-52970	270000	100	Trichloroethane[1,1,1-]	71-55-6
54-02002	MD54-04-52970	30000	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02002	MD54-04-52970	3400	100	Toluene	108-88-3
54-02002	MD54-04-52970	4700	100	Dichloroethane[1,1-]	75-34-3
54-02002	MD54-04-52970	47000	100	Dichloroethene[1,1-]	75-35-4
54-02002	MD54-04-52970	5300	100	Tetrachloroethene	127-18-4
54-02002	MD54-04-52970	56000	100	Trichloroethene	79-01-6
54-02002	MD54-04-52970	6400	100	Dichloroethane[1,2-]	107-06-2
54-02009	MD54-04-52976	10000	62	Dichloroethene[1,1-]	75-35-4
54-02009	MD54-04-52976	170 (J)	62	Dichlorodifluoromethane	75-71-8
54-02009	MD54-04-52976	2000	62	Dichloroethane[1,1-]	75-34-3
54-02009	MD54-04-52976	300	62	Trichloroethene	79-01-6
54-02009	MD54-04-52976	3600	62	Propylene	115-07-1
54-02009	MD54-04-52976	45000	62	Trichloroethane[1,1,1-]	71-55-6
54-02009	MD54-04-52976	550	62	Tetrachloroethene	127-18-4
54-02009	MD54-04-52977	180	62	Dichlorodifluoromethane	75-71-8
54-02009	MD54-04-52977	2200	62	Dichloroethane[1,1-]	75-34-3
54-02009	MD54-04-52977	310	62	Trichloroethene	79-01-6
54-02009	MD54-04-52977	48000	62	Trichloroethane[1,1,1-]	71-55-6
54-02009	MD54-04-52977	580	62	Tetrachloroethene	127-18-4
54-02009	MD54-04-52977	9700	62	Dichloroethene[1,1-]	75-35-4
54-02010	MD54-04-52971	10000	95	Trichloroethane[1,1,1-]	71-55-6
54-02010	MD54-04-52971	130	95	Tetrachloroethene	127-18-4

Table 5 (continued)

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-02010	MD54-04-52971	180	95	Trichloroethene	79-01-6
54-02010	MD54-04-52971	2300	95	Dichloroethene[1,1-]	75-35-4
54-02010	MD54-04-52971	350	95	Trichlorofluoromethane	75-69-4
54-02010	MD54-04-52971	380	95	Dichlorodifluoromethane	75-71-8
54-02010	MD54-04-52971	50	95	Vinyl Chloride	75-01-4
54-02010	MD54-04-52971	510	95	Dichloroethane[1,1-]	75-34-3
54-02010	MD54-04-52971	830	95	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02021	MD54-04-52967	1000	100	Tetrachloroethene	127-18-4
54-02021	MD54-04-52967	1000	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02021	MD54-04-52967	15000	100	Trichloroethene	79-01-6
54-02021	MD54-04-52967	1600	100	Dichloroethane[1,2-]	107-06-2
54-02021	MD54-04-52967	1600	100	Methylene Chloride	75-09-2
54-02021	MD54-04-52967	1700	100	Dichloroethane[1,1-]	75-34-3
54-02021	MD54-04-52967	17000	100	Dichloroethene[1,1-]	75-35-4
54-02021	MD54-04-52967	75000	100	Trichloroethane[1,1,1-]	71-55-6
54-02021	MD54-04-52967	940	100	Dichlorodifluoromethane	75-71-8
54-02022	MD54-04-52966	1100	80	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02022	MD54-04-52966	1400	80	Dichlorodifluoromethane	75-71-8
54-02022	MD54-04-52966	1600	80	Tetrachloroethene	127-18-4
54-02022	MD54-04-52966	170000	80	Trichloroethane[1,1,1-]	71-55-6
54-02022	MD54-04-52966	24000	80	Trichloroethene	79-01-6
54-02022	MD54-04-52966	3000	80	Dichloroethane[1,1-]	75-34-3
54-02022	MD54-04-52966	34000	80	Dichloroethene[1,1-]	75-35-4
54-02022	MD54-04-52966	3600	80	Methylene Chloride	75-09-2
54-02022	MD54-04-52966	3800	80	Dichloroethane[1,2-]	107-06-2
54-02023	MD54-04-52965	120	159	Carbon Tetrachloride	56-23-5
54-02023	MD54-04-52965	140	159	Methylene Chloride	75-09-2
54-02023	MD54-04-52965	160	159	Dichloroethane[1,1-]	75-34-3
54-02023	MD54-04-52965	16000	159	Trichloroethane[1,1,1-]	71-55-6
54-02023	MD54-04-52965	280	159	Tetrachloroethene	127-18-4
54-02023	MD54-04-52965	330	159	Dichlorodifluoromethane	75-71-8
54-02023	MD54-04-52965	3700	159	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02023	MD54-04-52965	4000	159	Dichloroethene[1,1-]	75-35-4
54-02023	MD54-04-52965	4200	159	Trichloroethene	79-01-6
54-02023	MD54-04-52965	480	159	Chloroform	67-66-3
54-02023	MD54-04-52965	690	159	Trichlorofluoromethane	75-69-4
54-02026	MD54-04-52972	100	160	Dichlorodifluoromethane	75-71-8
54-02026	MD54-04-52972	12	160	Trimethylbenzene[1,2,4-]	95-63-6
54-02026	MD54-04-52972	1300	160	Tetrahydrofuran	109-99-9
54-02026	MD54-04-52972	160	160	Trichlorofluoromethane	75-69-4

Table 5 (continued)

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-02026	MD54-04-52972	24	160	Dichloroethane[1,1-]	75-34-3
54-02026	MD54-04-52972	27	160	Xylene[1,2-]	95-47-6
54-02026	MD54-04-52972	33	160	Xylene[1,3-]+Xylene[1,4-]	Xylene[1,3 and 1,4]
54-02026	MD54-04-52972	35	160	Carbon Tetrachloride	56-23-5
54-02026	MD54-04-52972	3600	160	Trichloroethane[1,1,1-]	71-55-6
54-02026	MD54-04-52972	46	160	Dichloropropane[1,2-]	78-87-5
54-02026	MD54-04-52972	54	160	Methylene Chloride	75-09-2
54-02026	MD54-04-52972	600	160	Dichloroethene[1,1-]	75-35-4
54-02026	MD54-04-52972	760	160	Trichloroethene	79-01-6
54-02026	MD54-04-52972	83	160	Tetrachloroethene	127-18-4
54-02026	MD54-04-52972	910	160	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02029	MD54-04-52968	150	100	Dichloroethene[1,1-]	75-35-4
54-02029	MD54-04-52968	19	100	Tetrachloroethene	127-18-4
54-02029	MD54-04-52968	200	100	Trichloroethene	79-01-6
54-02029	MD54-04-52968	210	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02029	MD54-04-52968	25	100	Dichlorodifluoromethane	75-71-8
54-02029	MD54-04-52968	39	100	Trichlorofluoromethane	75-69-4
54-02029	MD54-04-52968	4.7	100	Methylene Chloride	75-09-2
54-02029	MD54-04-52968	6.8	100	Dichloroethane[1,1-]	75-34-3
54-02029	MD54-04-52968	7.5	100	Carbon Tetrachloride	56-23-5
54-02029	MD54-04-52968	890	100	Trichloroethane[1,1,1-]	71-55-6
54-02030	MD54-04-52975	15	100	Dichloroethane[1,1-]	75-34-3
54-02030	MD54-04-52975	19	100	Carbon Tetrachloride	56-23-5
54-02030	MD54-04-52975	2300	100	Trichloroethane[1,1,1-]	71-55-6
54-02030	MD54-04-52975	380	100	Dichloroethene[1,1-]	75-35-4
54-02030	MD54-04-52975	460	100	Trichloroethene	79-01-6
54-02030	MD54-04-52975	530	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02030	MD54-04-52975	58	100	Tetrachloroethene	127-18-4
54-02030	MD54-04-52975	59	100	Dichlorodifluoromethane	75-71-8
54-02030	MD54-04-52975	92	100	Trichlorofluoromethane	75-69-4
54-02033	MD54-04-52974	17	100	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02033	MD54-04-52974	2300	100	Trichloroethane[1,1,1-]	71-55-6
54-02033	MD54-04-52974	2500	100	Trichloroethene	79-01-6
54-02033	MD54-04-52974	290	100	Dichloroethene[1,1-]	75-35-4
54-02033	MD54-04-52974	47	100	Trichlorofluoromethane	75-69-4
54-02033	MD54-04-52974	61	100	Dichloroethane[1,1-]	75-34-3
54-02033	MD54-04-52974	69	100	Dichlorodifluoromethane	75-71-8
54-02033	MD54-04-52974	750	100	Tetrachloroethene	127-18-4
54-02034	MD54-04-52973	1000	60	Trichloroethene	79-01-6
54-02034	MD54-04-52973	1300	60	Dichloroethene[1,1-]	75-35-4

Table 5 (continued)

Location ID	Sample ID	Sample Concentration (ppbv)	Depth (ft)	Analyte	Analyte Code
54-02034	MD54-04-52973	29	60	Methylene Chloride	75-09-2
54-02034	MD54-04-52973	33	60	Trichlorofluoromethane	75-69-4
54-02034	MD54-04-52973	36	60	Dichloroethane[1,2-]	107-06-2
54-02034	MD54-04-52973	46	60	Tetrachloroethene	127-18-4
54-02034	MD54-04-52973	4800	60	Trichloroethane[1,1,1-]	71-55-6
54-02034	MD54-04-52973	73	60	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76-13-1
54-02034	MD54-04-52973	80	60	Dichlorodifluoromethane	75-71-8
54-02034	MD54-04-52973	88	60	Dichloroethane[1,1-]	75-34-3

Table 6
Duplicate Sample Results Comparison (Well 54-02009, 62 ft), Second Quarter FY2004

Analyte	Sample MD54-03-52976[a] (ppmv[b])	Sample MD54-03-52977[c] (ppmv[b])	RPD[d]
Dichloroethene[1,1-]	10000	9700	3
Dichlorodifluoromethane	170	180	5.7
Dichloroethane[1,1-]	2000	2200	9.5
Trichloroethene	300	310	3.3
Propylene	3600	0	200
Trichloroethane[1,1,1-]	45000	48000	6.5
Tetrachloroethene	550	580	5.3

[a]Detection limit = 0.18 ppmv
[b]ppmv = Parts per million by volume
[c]Detection limit = 0.18 ppmv
[d]Relative percent difference