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RECEIVED

Date: June 6, 2000
Refer to: ER2000-0250

Mr. John Kieling
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: QUARTERLY TECHNICAL REPORT FOR JANUARY-MARCH 2000

Dear Mr. Kieling:

Enclosed are three copies of the Environmental Restoration Project's Quarterly Technical Report for January-March 2000. The Quarterly Technical Report presents information from each focus area 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.

If you have questions regarding this report, please contact Dave McInroy at (505) 667-0819 or Joe Mose at (505) 667-5808.

Sincerely,

Brad

Julie A. Canepa, Program Manager
Los Alamos National Laboratory
Environmental Restoration

JC/TT/MB/ev

Sincerely,

T. J. Taylor

Theodore J. Taylor, Program Manager
Department of Energy
Los Alamos Area Office

Enclosures: 1) Quarterly Technical Report, January-March 2000
2) Certification

8185

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CERTIFICATION

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.

Document Title: Quarterly Technical Report, January-March 2000

Name: _____ Date: 6/6/00

Julie A. Canepa, Program Manager
Environmental Restoration
Los Alamos National Laboratory

or

Tom Baca, Program Director
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Name: _____ Date: 6-6-00

Theodore J. Taylor, Program Manager
Environmental Restoration Program
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or

Joseph Vozella,
Acting Assistant Area Manager of
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Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

Report

LA-UR-00-2082
ER2000-0185

intend

Los Alamos National Laboratory

Environmental Restoration

A Department of Energy Environmental Cleanup Program

LANL/ER/Miscellaneous

QUARTERLY TECHNICAL REPORT

January–March 2000

June 5, 2000

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APPENDIX D QUARTERLY PORE GAS SAMPLING RESULTS, TA-54 MDA L AND MDA G, FIRST QUARTER FY2000

LIST OF ACRONYMS AND ABBREVIATIONS

BMP	best management practice
CAB	Citizens Advisory Board
CMS	corrective measures study
COPC	chemical of potential concern
DOE	US Department of Energy
DOE-AL	US Department of Energy-Albuquerque Operations Office
DOE-HQ	US Department of Energy-Headquarters
DOE-LAAO	US Department of Energy-Los Alamos Area Office
EPA	US Environmental Protection Agency
ER	environmental restoration
ERDB	Environmental Restoration Database
ESH	Environment, Safety, and Health (Division)
ESH-17	Air Quality Group
ESH-18	Water Quality and Hydrology Group
ESH-19	Hazardous and Solid Waste Group
ESH-20	Environmental Assessments and Resource Evaluations Group
FIMAD	Facility for Information Management, Analysis, and Display
FY	fiscal year
HE	high explosives
HRMB	Hazardous and Radioactive Materials Bureau
HSWA	Hazardous and Solid Waste Amendments
IM	interim measure
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
MDA	material disposal area
NFA	no further action
NMED	New Mexico Environment Department
NPDES	national pollutant discharge elimination system
NTISV	nontraditional in situ vitrification
NTU	nephelometric turbidity unit
NOI	notice of intent
PRS	potential release site
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RSI	request for supplemental information
SAP	sampling and analysis plan
SOP	standard operating procedure
SWMU	solid waste management unit
TA	technical area
UC	University of California
VCA	voluntary corrective action
VCM	voluntary corrective measure
WCSF	Waste Characterization Strategy Form
WNR	Weapons Neutron Research (Facility)
WWTP	Wastewater Treatment Plant

QUARTERLY TECHNICAL REPORT

JANUARY–MARCH 2000

LOS ALAMOS NATIONAL LABORATORY

ENVIRONMENTAL RESTORATION PROJECT

ALBUQUERQUE OPERATIONS OFFICE

CONTRACTOR: University of California

PROJECT MANAGER: Julie Canepa

NUMBER OF POTENTIAL RELEASE SITES: Approximately 2,000

POTENTIAL WASTE: Radionuclides, High Explosives, Metals, Organics

1.0 INTRODUCTION

This quarterly report describes the technical status of activities in the Los Alamos National Laboratory (the Laboratory) Environmental Restoration (ER) Project. The activities are divided according to the current focus area 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 efforts performed this quarter in the ER Project.

2.0 FOCUS AREAS

2.1 Canyon Investigations — Focus Area Leader: Allyn Pratt

2.1.1 Ongoing Reach Investigations

2.1.1.1 Acid Canyon (within the Pueblo Canyon watershed)

Analytical data packages were received for 47 Phase I sediment samples from 4 reaches in Acid Canyon, a major tributary to Pueblo Canyon. Focused data validation (an extensive in-depth review) was performed on these data packages to identify chemicals of potential concern (COPCs). COPCs include a variety of radionuclides and inorganic and organic chemicals. Preliminary risk assessments indicate that plutonium-239,240 is the primary contributor to potential human health risk, consistent with previous results downstream in Pueblo Canyon. An approach for conducting a preliminary human health radiation dose assessment for radioactive contaminants in Acid Canyon sediments was developed. This approach will be used to prepare an interim report to address specific concerns raised by stakeholders in the fall of 1999 and to evaluate the need for immediate remedial action. This approach is consistent with requirements and guidance in US Department of Energy (DOE) orders and companion materials (e.g., RESRAD software) and incorporates relevant US Environmental Protection Agency (EPA) risk

assessment guidance. This approach also incorporates specific input from the DOE Los Alamos Area Office (DOE-LAAO), the DOE Albuquerque Operations Office (DOE-AL), the New Mexico Environment Department (NMED), and EPA Region VI.

2.1.1.2 Pueblo Canyon

Analytical data packages were received for 18 Phase I sediment samples from Pueblo Canyon reach P-1, collected upstream and downstream of the former Pueblo Wastewater Treatment Plant (WWTP). Focused data validation was performed on these data packages. Assessment of these data will be used to determine the relative contribution of contaminants from the WWTP, Acid Canyon, and the townsite and to determine if there is a need for additional samples from this area.

2.1.1.3 Cañada del Buey (White Rock Land Transfer Parcel)

Analytical data packages were received for 30 Phase II sediment samples in Cañada del Buey reach CDB-4, within the proposed White Rock land transfer parcel. Focused data validation was performed on these data packages, and COPCs were evaluated. Several metals are present above the Laboratory-wide sediment background levels, but these may all reflect an elevated local background level due to the site-specific geology of this area. Two radionuclides, plutonium-239,240 and tritium, may also be present above background levels, but the results may also indicate natural background variability. A decision peer review was held to determine the scope of a report on this investigation, and report preparation was begun.

2.1.1.4 Cañon de Valle

The planning phase of an investigation of surface water and alluvial groundwater in Los Alamos and Pueblo Canyons has begun. The investigation will involve quarterly sampling at a series of alluvial groundwater monitoring wells and surface water locations throughout the length of the watershed. Sampling in each of these media will be conducted concurrently and at adjacent locations, where possible, to enhance understanding of the connection between the two media. To date, the investigation has involved documenting locations and variability of persistent surface water, including bedrock pools and flowing water in the channel. A sampling plan is being prepared for submittal to the NMED Hazardous and Radioactive Materials Bureau (HRMB).

2.2 Material Disposal Areas — Focus Area Leader: John Hopkins

2.2.1 General Information for Material Disposal Areas Focus Area

A core team with representatives from DOE-AL, the Laboratory, and the NMED-HRMB was formed to collaboratively write the Material Disposal Area (MDA) Focus Area implementation plan, which will incorporate the DOE "plug-in approach" for streamlining the corrective action process at the Laboratory's largest MDAs. The MDA core team developed a draft outline for the implementation plan and committed to a schedule for completing the plan in FY00. The implementation plan will supplant the draft MDA core document and tier to the ER Project installation work plan.

2.2.2 Technical Area Activities

2.2.2.1 TA-21

PRS 21-027(d)-99, NTISV Cold Demonstration VCM. Analytical results were received from confirmatory samples collected during November 1999 from the drainage of consolidated Potential Release Site (PRS) 21-027(d)-99, the nontraditional in situ vitrification (NTISV) cold demonstration. Validation of analytical results was completed, and preparation of the voluntary corrective measures (VCM) report proposing no further action (NFA) for the PRS has begun.

Analytical results for waste samples collected from the high-efficiency particulate air filters indicated the filters were mixed waste. Results from the scrubber waters indicated these waters would be managed as a low-level waste. The filters were transported to TA-54 in mid-February. The scrubber waters are still in the tanks of the off-gas treatment system for use during the NTISV hot demonstration.

PRS 21-018(a)-99, NTISV, Hot Demonstration at MDA V. All activities were restarted in mid-January following receipt of a DOE memorandum reestablishing DOE support for the NTISV Project at MDA V. All outstanding preparation and planning activities that had been stopped in November 1999 were completed by the end of January. The Laboratory's Air Quality Group (ESH-17) completed air emissions calculations and determined that the NTISV project does not require air emissions monitoring or preconstruction approval.

The interim measure (IM) plan for the NTISV hot demonstration at Material Disposal Area (MDA) V [consolidated PRS 21-018(a)-99] was submitted to NMED. NMED subsequently provided verbal approval of the plan.

Site preparation activities were initiated in early February. All heavy equipment operations and drilling activities were completed by the end of February, prior to the potential nesting period of the Mexican Spotted Owl (a threatened and endangered species). Pre-demonstration samples were collected in February in accordance with the IM plan. Field activities, using small equipment, continued in preparation for the demonstration.

PRS 21-005. Comments received from the DOE were resolved and incorporated into the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) report for PRS 21-005, a disposal pit. The RFI report was submitted to NMED on January 18, 2000.

PRS 21-024(i). Team members are still pursuing the "as found" interpretation of material remaining at PRS 21-024(i), a septic system, in an effort to find a path forward for waste disposal. A detailed operational history description was developed, all previous analytical data were reviewed, and one internal and two external waste profile forms were subsequently prepared and submitted to TA-54 for disposal of this waste stream. If an acceptable disposal facility is identified, then the planning of the voluntary corrective action (VCA) for the removal of this septic system will begin.

PRS 21-029, DP Tank Farm. Monthly site inspections of the hydrocarbon sheen area in DP Canyon were conducted on January 21, 2000, February 25, 2000, and March 24, 2000. Copies of these inspection reports are attached as Appendixes A, B, and C.

A meeting and site visit with NMED were held in early January 2000. The request for supplemental information (RSI) response amending the work plan was approved in mid-February 2000. Readiness review activities were initiated in late March in preparation for fieldwork.

2.2.2.2 TA-49

PRSs 49-001(b,c,d,g), MDA AB, Areas 2, 2A, and 2B. A revised moisture-monitoring plan was reviewed with NMED on January 19, 2000, and monthly moisture-monitoring activities were initiated in February. Three new boreholes for moisture monitoring were installed within the area of the new cover at MDA AB (two of these were replacement boreholes). In addition, time domain reflectometry probes were installed adjacent to two of the new boreholes, and a data logger will continuously record moisture levels in the vicinity of these probes.

2.2.2.3 TA-50

A site-specific health and safety plan was developed for installing pore gas monitoring equipment in an existing borehole at MDA C at TA-50.

2.2.2.4 TA-54

The TA-54 RFI report was submitted to NMED-HRMB this quarter, following incorporation of DOE comments. The report will be reviewed and completed as a task of the MDA core team, including representatives from DOE-AL, NMED-HRMB, and the Laboratory. This report is a pilot implementation of DOE's plug-in approach for expediting corrective actions as adopted by the ER Project MDA Focus Area and described in the MDA Focus Area Implementation Plan.

The quarterly pore gas monitoring at MDAs G and L was completed as required by Module VIII of the Laboratory's Hazardous Waste Facility Permit. The summary results are provided in Appendix D of this report. The field screening results referenced on page 2 of Appendix D are not included in this document because of space constraints but are available through the MDA data steward, Bill Hardesty of the ER Project (505-667-0808).

2.3 RCRA Corrective Actions — Focus Area Leader: Warren Neff

2.3.1 High Explosives Production Sites Team

The High Explosives Production Sites Team spent most of the last quarter in fieldwork and plan and report-writing activities in support of the PRS 16-021(c) (the 260 outfall) corrective measures study (CMS). The team initiated the work outlined in the IM plan for the 260 outfall and the deep drilling at well CdV-R-15-3. Hydrogeology studies, including stream profiles and quarterly sampling, were completed. High-performing team activities began, and the TA-6 RFI report was approved by NMED.

2.3.1.1 TA-16

Hydrogeology. The field team continued to monitor water levels in the Cañon de Valle alluvial wells and in the intermediate-depth wells. Four of the five alluvial wells in Cañon de Valle contained water; none of the intermediate-depth boreholes contained water during this quarter.

In March, quarterly samples were collected from Cañon de Valle springs and surface water. Stable isotope samples were collected at precipitation events and during quarterly sampling. Every-other-day water samples (bromide tracer) collected from the TA-16 springs showed no bromide tracer breakthrough. Flow-integrated samples were collected in SWSC, Burning Ground, and Martin Springs. All second quarter results are pending. Hydrogeologic data from FY99 were reviewed and discussed with NMED during a high-performing team meeting.

Site preparation activities were completed and drilling was initiated at deep groundwater well CdV-R-15-3. More than 1000 ft of drilling was completed this quarter. All drilling was completed "open hole" using tricone bits. Perched zones were detected at approximately 600 ft and 900 ft. Both perched zones appear to be ephemeral, and screening data showed little or no high explosives (HE). A geophysical log to a depth of approximately 700 ft was completed in the borehole.

PRS 16-021(c) CMS. The team finished its on-site study of zero-valent iron treatment of HE-contaminated soils. Results for this study suggest that the process degrades RDX and TNT but that HMX is much more recalcitrant. HE composting tests using clean soil were initiated as a backup to the partially successful zero-valent iron tests. A series of meetings was held with the NMED to discuss possible implementation of a passive-barrier best management practice (BMP) in Cañon de Valle. This BMP would remove HE from the surface water in the canyon.

PRS 16-021(c) IM. The IM plan was completed and submitted to NMED. Several meetings were held with NMED representatives to discuss technical and regulatory issues associated with the IM. The request for a health-based "contained-in" determination for F-listed waste was approved by NMED. The 401/404 dredge and fill permit and area of contamination were approved by NMED. Fieldwork at the IM was initiated. Soil staging areas were constructed, a zero-discharge BMP was completed, and soil excavation began in the low-level HE zones of the outfall. Approximately 130 yd^3 of soil were excavated and screened prior to staging within the area of contamination.

Surface Water. BMPs were inspected and maintained. Slash from the TA-16-260 IM and native rocks were used to construct a series of check dams within the main MDA R drainage.

2.3.1.2 TA-6

The RSI response for the 1998 TA-6 RFI report was submitted to NMED. That report was approved by NMED during this quarter.

2.3.2 Firing Sites Team

Final waste disposal operations continued at the TA-33 segmented gate system VCA. Preparation of the RSI response for the VCA plan for this effort was initiated. A meeting with HRMB was conducted in February to discuss the RSI and submittal of a status report on the project.

2.3.3 Industrial Sites Team

2.3.3.1 TA-3

PRS 03-010(a). PRS 03-010(a) was sampled to address NMED concerns regarding residual groundwater, soil, and sediment contamination. This PRS is located within the boundary of the West Connector road construction currently under way at TA-3. The sampling plan to collect additional groundwater samples, as well as sediment and surface water samples, was verbally approved by NMED and implemented. Analytical results were received for samples collected from the monitoring well and from channel bank deposits from the canyon below the site. Focused validation was completed for sediment and groundwater analytical data. Evaluation of the data is under way.

Surface water samples (filtered and unfiltered) were collected on March 13, 2000, from water standing in the channel following a rain/snow event. Between December 14, 1999, and March 8, 2000, there were site visits to the canyon to determine if water was present in the channel. Although the monitoring well

(MW-1) contained enough groundwater for development, no water was observed until there was a precipitation event. This appears to indicate that the water in the channel is related to water from precipitation and not to the groundwater encountered in the monitoring well (MW-1). The analytical results from surface water samples collected in the channel are still pending.

Analytical results of waste samples were used to complete the waste characterization profile form. The wastes created from development of the well and sediment sampling were determined to be mixed-low-level radioactive wastes and were transferred from a 90-day storage area to TA-54 pending transportation to an off-site facility for disposal.

PRS 03-055(c,d). The Industrial Sites Team provided information, maps, photographs, and field identification of PRSs 03-055(c,d) and 03-009(b) for the Research Park contractor. The request from the contractor required conducting archival research, compiling documentation, and producing the maps and photographs to ensure that construction of a parking area for the Research Park does not interfere with any PRS site.

PRS 03-056(c). The VCA plan for PRS 03-056(c), the transformer storage area, is currently undergoing review by the state. The VCA project is expected to start in April 2000.

2.3.3.2 TA-35

The TA-35 integrated sampling and analysis plan (SAP) is the first integrated SAP to be generated by the ER Project. The SAP will reflect the new watershed approach to characterization and risk, which was initiated by the ER Project in FY99. The integrated SAP will include, in addition to existing data for over 50 PRSs in TA-35, data from Ten-site Canyon, Mortandad Canyon, TA-50, surveillance reports, and watershed management sampling. The aggregate that will be the subject of the SAP is complex, as it includes sub-areas of varying sizes with varying processes and contaminants and a long period of Laboratory operation.

A high-performing team, which includes NMED and DOE personnel, has been assigned to develop the SAP approach. Development of this integrated SAP is a challenge due to the large amount of existing data from previous investigations, which vary in "pedigree" and quality. The data analysis and assessment process is under way, as well as efforts to select data visualization tools and methods to better present and analyze the data to help understand data gaps.

The high-performing team completed the team's accomplishments-by-quarter table, discussed Ten-site Slope data summaries and data presentation examples, worked on the sampling design for Ten-site Slope, and toured Ten-site Canyon and associated PRSs.

Progress on the TA-35 integrated SAP preparation includes completion of the data cleanup and pull-down and completion of data summary tables. Also, drafts have been completed for Chapter 1 (introduction, objectives and purpose, regulatory history, and previous investigations), Chapter 4 (data collection and sampling procedures), and Chapter 5 (project management). The following sections of Chapter 2 have also been completed: description, characterization and setting, existing data summaries, and conceptual models. PRS descriptions will be included as an appendix. Ten-site Slope, Pratt Canyon, Mortandad Slope, mesa-top, and Ten-site Canyon data have been summarized, and above-background and frequency-of-detected-chemicals tables have been created. Box plots and spoke plots have been created for the Ten-site Slope subaggregate. The Mortandad/Ten-site Canyon reaches data have been compiled and summarized. Frequencies-of-detection tables were created for all sub-areas.

2.3.3.3 TA-53

PRS 53-002(a)-99, Northern and Southern Surface Impoundments. Final results for sludge samples collected in the southern lagoon (PRS 53-002[b]) were received. Focused validation of the analytical data was completed. A waste determination for the sludge in the south lagoon also was completed, classifying the potential waste as low-level radioactive waste. During a meeting with NMED personnel, it was agreed that a source removal action would be conducted for the sludge in the south lagoon; the action will be treated as a deviation to the work plan and will be documented in a letter to NMED describing the action.

PRSs 53-006(a,b,c,d,e). ER Project and Los Alamos Neutron Science Center facility management (FM) personnel worked together to sample the sludge in the tanks at the Weapons Neutron Research Facility and Area A [PRSs 53-006(a–d)]. The sampling activity was in response to a notice of deficiency from NMED. The facility prepared a sampling plan, with ER Project personnel input. The tanks [PRSs 53-006(a–d)] were emptied and sampled. Analytical results are pending.

2.3.3.4 TA-55

Team personnel responded to a request to provide information to project management for a TA-55 construction project. The existence of the former TA-42 PRSs in the area where construction is being planned is impacting the construction project. ER Project personnel met with PM-2, DOE, and construction contractors to discuss the status of TA-42 PRSs.

2.3.4 Town Sites Team

Numerous issues related to land transfer and private property have arisen this quarter.

2.3.4.1 TA-0

PRS 00-003-99 [00-003, 00-012, and 00-030(i)]. The VCA for this PRS, the DOE-LAAO land transfer parcel, is awaiting threatened and endangered species clearance from the Laboratory's Environmental Assessments and Resource Evaluations Group (ESH-20). The VCA plan was submitted to the administrative authority in January for review. Readiness review preparation is complete, except for items that are time dependant (utility mark-out, etc.).

PRS 00-017. An RSI was received on the RFI report for PRS 00-017, waste lines 167, 170, and 171; the response is in preparation.

PRS 00-019. Fieldwork was completed at PRS 00-019 (Central Wastewater Treatment Plant) this quarter. Seventeen samples were collected from the two outfall areas in Graduation Canyon. The team leader of the Canyons Investigations Focus Area's Sediment Investigation Team was consulted regarding sampling site selection. Data have been received and are currently being edited and validated. Sampling was also completed on the mesa top from under the concrete structures, from the concrete itself, and from the fill used to bury the structures (54 total samples). Analytical results for the mesa-top sampling are being returned at this time. The site has been returned to prejob condition, and the recyclable materials have been recycled; remaining waste is awaiting transportation off-site.

Work has begun on the VCA completion report. Sections not reliant on analytical results are being prepared in accordance with the FY00 baseline schedule.

PRS 00-030(g). All fieldwork was completed at the old Catholic Church septic tank, and the site has been restored to prejob conditions.

The RFI report is being prepared; analytical data have been received, edited and validated, and evaluated. The report is in preliminary draft stage with a peer review scheduled for next quarter. Report preparation is proceeding as scheduled.

2.3.4.2 TA-73

PRS 73-001(a,b)-99 [73-001(a–d) and 73-004(d)]. A high-performing team was instituted with membership from DOE-LAAO, NMED, and the Laboratory to develop a final remedy for the airport landfill [PRSs 73-001(a–d) and 73-004(d)]. The team has met several times and toured the site and associated areas. The ER Project has accelerated this project, with initial activities now scheduled to begin in FY00.

PRS 73-005-99 [73-005, 73-007, and C-73-005(a–f)]. The RFI report for PRS 73-005-99, contractor's row (work plan PRS aggregate 73-2), is nearing completion; ER Project internal reviews were completed this quarter and the report is expected to be delivered according to schedule.

2.3.5 MDA P Closure

The MDA P closure project is currently in Phase I (excavation and disposal) of the closure. Excavation of soil and debris from the East Lobe of MDA P, using the remote excavator, continued this quarter. Approximately 3900 yd^3 of soil and debris were excavated from the East Lobe this quarter.

Disposal of soil and debris included the following volumes this quarter:

- contaminated soil (hazardous waste) 4340 yd^3
- solid waste soil 2300 yd^3
- decontaminated concrete 500 yd^3
- scrap metal (steel) 400 yd^3

To date, 2605 lb of asbestos and asbestos-containing material also has been disposed. Other disposal includes 236 lb of detonable HE and 4100 lb of barium nitrate.

NMED has issued an RSI on the Phase II Sampling and Analysis Plan/387 Burn Pad Closure Plan/Burning Ground–North VCA." A response to the RSI will be submitted within the regulatory response period.

2.4 Groundwater Investigations — Focus Area Leader: Deba Daymon

2.4.1 General Information for Groundwater Investigations Focus Area

The Groundwater Investigations Focus Area was formed during this quarter as a result of a new ER structure. The mission of this focus area is to install the regional and intermediate-depth characterization wells identified in the Laboratory's hydrogeologic work plan (LANL 1998, 59599). In addition, this focus area will perform quarterly sampling of these wells; collect and assess geologic, geochemical, and hydrologic data from these wells; and manage the Field Support Facility.

The Groundwater Investigations Focus Area team participated and gave a presentation at the annual Groundwater Integration Team meeting held at Ghost Ranch on March 29 and 30, 2000.

2.4.2 Regional Well Activities

2.4.2.1 R-7

A readiness review was held mid-February for activities at R-7, located in Los Alamos Canyon. Site preparation activities occurred during the remainder of February and were stopped the first of March because of a threatened and endangered species restriction. Surface drill casing was set to 13 ft below ground surface and cemented in site before demobilizing from the site. Site preparation will continue on May 15, 2000, when the time restriction is lifted.

2.4.2.2 R-9

Drilling was completed last quarter at R-9, located in Los Alamos Canyon. The following activities occurred this quarter:

- Schlumberger Oilfield Services performed geophysical logging.
- Well was developed by pumping until the turbidity was less than 5 nephelometric turbidity units (NTUs).
- Quarterly sampling was done.

2.4.2.3 R-9i

R-9i, located in Los Alamos Canyon 30 ft west of R-9, is being drilled to provide information on perched groundwater within the basalts beneath the canyon. Two perched zones were encountered and screened at approximately 180 to 230 ft and 275 to 282 ft. R-9i was drilled this quarter and finished on March 9, 2000. The following activities also occurred this quarter:

- Well construction (two screened intervals) was completed.
- Schlumberger performed geophysical logging.

2.4.2.4 R-12

Drilling at R-12, located in Sandia Canyon, was initiated last quarter and completed January 10, 2000. The following activities also occurred this quarter:

- Well construction (three screened intervals) was completed.
- Well was developed by pumping until the turbidity was less than 5 NTUs.
- Schlumberger performed geophysical logging.
- Westbay installation began the last week of the quarter.

2.4.2.5 R-15

Drilling at R-15, located in Mortandad Canyon, was completed last quarter. The following activities occurred this quarter:

- Schlumberger performed geophysical logging.
- Well was developed by pumping until the turbidity was less than 5 NTUs.
- Quarterly sampling was completed.

2.4.2.6 R-19

R-19, located in Pajarito Canyon, was drilled this quarter to a total depth of 1902.5 ft and finished on March 12, 2000. The following activities also occurred this quarter:

- Well construction (seven screens) is still in progress.
- Schlumberger performed geophysical logging.

2.5 Information Management — Focus Area Leader: Steve Bolivar

The Information Management Focus Area was formed during this quarter as a result of a new ER structure. The goal of this focus area is to bring all ER Project databases, software and hardware functions, and data management activities under one management arena.

2.5.1 Team Activities

2.5.1.1 Information Management

Information for the Integrated Planning, Accountability, and Budgeting System (a DOE Headquarters [DOE-HQ] database) was compiled and submitted to DOE as they requested. Several changes to the ER PRS database have been made to better meet future requests. The ER PRS database has been updated with work element codes from the baseline. A document catalog tracking number was created for internally generated documents and then linked to the PRS database so that all related documents can be called up for any selected PRS.

Centralized data management personnel prepared 350 sample-collection logs for sampling events and issued corresponding sets of chains of custody and electronic followers. Personnel edited and standardized 485 packages and validated 112 packages.

Computer support personnel received 319 computer service requests this quarter. Some are still being worked.

2.5.1.2 ER Database

The ER database is currently being reengineered. The new version consists of a dozen modules. Personnel are working with users to ensure the necessary fields (i.e., information) are captured within each module. This effort is being completed in concert with the Laboratory's Water Quality and Hydrology Group (ESH-18) to ensure that data from the hydrogeologic work plan (LANL 1998, 59599) are captured and accessible to the ER Project as well as ESH-18.

2.5.1.3 Sample Management Office

Personnel from the Sample Management Office continued to accept field samples, create the necessary paperwork, contact the appropriate laboratories, and ensure the requested information is received. Most of the ER Project samples are sent to four main laboratories, although 18 other specialty laboratories are used. The Sample Management Office issued 116 field data groups (number of samples), and had 490 customers this quarter. Personnel handled 1660 containers.

2.5.1.4 Facility for Information Management, Analysis, and Display (FIMAD).

Personnel from FIMAD continued to maintain the present ER database, as well as the spatial data (such as elevation, orthophotographs, etc.). The Cartographic Laboratory completed 175 requests from the ER Project this quarter. Personnel produced 243 new maps and 414 copies of existing maps.

2.6 Analysis and Assessment — Focus Area Leader: Alison Dorries

2.6.1 Team Activities

2.6.1.1 Data Analysis and Assessment Team

Data Quality. Two new technical papers, "Technical Guidance on EPA SW-846 Method 5035 Sampling," and "Approach to Gamma Spectroscopy Data Quality Evaluation," have been completed. Two key standard operating procedures (SOPs), LANL-ER-SOP-15.12, "Performing Background Value Comparisons for Inorganic Chemicals" and LANL-ER-SOP-15.13, "Performing Background Value Comparisons for Radionuclides," have been published. Three new data validation SOPs (LANL-ER-SOPs-15.01–15.03) are ready for publication. Team members continued work on one routine validation SOP and two new SOPs, "Routine Validation of Gamma Spectroscopy Data" and "Routine Validation of Radionuclide Data," in preparation for peer review. Work also continues on six new technical papers (two of which were peer-reviewed this quarter).

Data Stewardship. Work continues on (1) testing the new design for the environmental restoration database (ERDB) developed jointly with ESH-18; (2) developing a data migration strategy from the FIMAD Oracle tables to the new ERDB table structures; (3) locating, staging, and loading all the existing R-hole data into the new ERDB table structures; (4) developing data reporting tools using Microsoft Access as the front-end application; and (5) developing a data management plan specific to the deep-well drilling program. A plan for migration of existing data from the Oracle database staging tables to the production tables has been developed and implemented. Data reporting tools that create formatted data tables for RFI reports have been developed. Detailed design work has been completed for the location and well construction modules of the new database, and the sample and results modules are currently under review. A process to manage the R-hole geophysics data has been developed and implemented in collaboration with the Groundwater Investigations Focus Area, and an SOP is being prepared. Team members also participated in Information Management Focus Area group meetings for the reengineering of Field Support Facility processes.

Data stewards have been deployed to the operational focus areas to assist in task-specific data management and data-set preparation activities to ensure the quality and integrity of the electronic technical data. Two of the current major efforts are to provide data sets for the TA-35 integrated SAP and the RSI response for the Phase II SAP for MDA P.

Integrated Data Sets. This activity encompasses new and expanding responsibilities in support of the integrated technical strategy and the Integrated Information Management System, particularly with

respect to development of Laboratory-specific background and baseline data sets. A field implementation plan for the background groundwater study was prepared for the completion of two additional quarters of sampling. First quarter sampling activities began in December. The results of that sampling were presented to a technical peer review panel to discuss the practicability of obtaining data sufficient to characterize the background groundwater chemistry. That peer review determined that additional samples should be collected and analyzed so that a more statistically based determination could be made regarding practicability. Second-quarter sampling was initiated in March.

2.6.1.2 Risk Assessment and Review Team

Risk Assessment. Team members presented to NMED the current status of the EcoRisk database for screening assessments and began modifying the database to create reports that NMED specifically requested. Updates continued to be made to the ecological screening level database.

Team members continued work on the ecological risk screening results for Cañon de Valle. In addition, a focused evaluation of the information was performed in support of the draft problem formulation for ER Project 260 outfall baseline risk planning. The Risk Assessment Team met with the Ecological Risk Assessment High-Performing Team to discuss the draft screening of the Cañon de Valle RFI/CMS and initiated discussions of the problem formulation for the next phases of investigation. Team members submitted a preliminary screening assessment for internal review and reviewed NMED's field investigations of macroinvertebrate community parameters in Cañon de Valle and reference areas.

Team members worked with NMED and DOE to formulate definitions, criteria, and objectives for "hot spot" analysis. A preliminary dose assessment for Acid Canyon and "hot spot" evaluation was performed. The team also met several times with DOE and NMED to discuss issues related to dose assessment, DOE criteria for free release of real property, and NMED concerns about leaving residual radionuclides in the canyon. Team members continued to work with DOE to develop, under DOE Order 5400.5, "Radiation Protection of the Public and the Environment," an approach to determine further action, if any, required to protect the public. The team is also working with the Communications and Outreach Team to communicate conditions in the canyon to stakeholders, especially the County of Los Alamos and local residents who use the area for recreation.

Team members began analysis of field data on bluebird and ash-throated flycatcher nesting to determine if differences in fecundity, fledging success, or biochemical markers could be attributed to differences in ambient distribution patterns of contaminants of potential concern. Preliminary results were presented to the high-performing team for ecological risk assessment.

The Risk Assessment Team met several times with local pueblos to discuss risk assessment in relation to unique tribal exposure pathways and tribal environmental sampling to support the ER Project. Issues that arose included funding mechanisms for tribal participation, information sharing without compromising proprietary information about cultural uses of resources, and existing overlaps with DOE-funded Accord Tribe environmental activities. The team's goals are to allow Pueblo members to become familiar with risk assessment and management techniques, to frame risk-based decisions in ways relevant to Native American land uses, and to proceed with decision-making that protects culturally relevant resource uses while protecting the cultural privacy of Native American users.

Members of the Risk Assessment Team met with the East Jemez Natural Resources Council to discuss appropriate ecological receptors for natural resource management and ecological risk assessment. Team members also worked with the TA-35 High-Performing Team to develop conceptual models for exposure, to analyze data and identify important contaminants of potential concern, and to determine data gaps.

Peer Review. Twenty-nine peer reviews were conducted in this quarter, including eight read reviews, twelve statement-of-work reviews, and three decision reviews.

2.6.1.3 Strategic Decision Analysis Team

Good progress was made this quarter in the area of integrated modeling. This task incorporates mathematical models developed to (1) analyze geologic and hydrologic data in two and three dimensions, (2) use the spatially analyzed data to develop realistic meshes for numerical hydrology models, and (3) calibrate and validate site-specific numerical hydrology models to calculate contaminant fate and transport models in support of risk assessments and long-term monitoring, surveillance, and stewardship strategies. The infrastructure for spatial analyses is nearly fully developed and fully functional, and a commercial computer-automated design software package was acquired to develop a tool to automate the generation of numerical meshes. Two subsurface contaminant transport models were calibrated using field data, one representing a wet canyon hydrologic system, the other representing a dry mesa hydrologic system. Progress has also been made in calibrating surface-water runoff and erosion models. Finally, a calibrated three-dimension deterministic hydrology process model was successfully abstracted into a one-dimensional probabilistic systems model, which will be used to identify the most significant modeling uncertainties in the context of long-term risk associated with persistent contaminants in the environment.

2.7 Regulatory Compliance — Focus Area Leader: Dave McInroy

2.7.1 General Information for Regulatory Compliance Focus Area

The Regulatory Compliance Focus Area was reorganized this quarter to reflect the redistribution of team responsibilities.

Monthly meetings with NMED continued this quarter, as well as meetings regarding special topics such as permit modification, IMs, VCAs, and RSI responses.

Team members continued working with facility managers, the office of Deputy Director for Laboratory Operations, and ESH Division, focusing on Laboratory integration to enhance environmental protection and compliance.

2.7.2 Team Activities

2.7.2.1 Communications and Outreach Team

The Communications and Outreach Team prepared and distributed to the NMED facility mailing list two Class I Permit Modification Notifications this quarter: one for the ER Project installation work plan, and one for the ER Project FY99 work schedule.

Outreach Activities. The Communications and Outreach Team completed the following activities:

- Coordinated and completed three availability sessions at the Laboratory's Public Reading Room in Los Alamos on January 19, February 16, and March 15, 2000. Since the restart of these availability sessions in December, approximately 60 people have participated to discuss ER Project topics of current interest to the community.
- Prepared and hand-delivered letters to the businesses and residences near TA-21, informing them of the NTISV hot demonstration work to begin at TA-21 on April 4, 2000.

- Coordinated and scheduled presentations at the Bradbury Science Museum as part of a three-week visit from Russian high school students participating in the Russia/New Mexico Secondary Schools Exchange Project.

- Coordinated environmental education outreach presentations to four science classes (75 students) from Peñasco Junior and Senior High School (7th and 10th grades) on March 1, 2000. Staff made presentations on ER Project cleanup activities, and staff from ESH-20 discussed the environmental monitoring program at the Laboratory.

- Continued to work on the Laboratory's ER Project Virtual Reading Room Library and the Citizens Toolkit design and documentation.

Native American Outreach Activities. The team gave a brief presentation on the Native American Risk Initiative at the executive meeting between DOE-LAAO, the Laboratory director, and the governors of the Four Accord Tribes and their staff and separately briefed the San Ildefonso Tribal Council.

Team members held several discussions with staff from the Santa Clara Pueblo Environmental Office and the San Ildefonso Pueblo Environmental Office regarding the Native American Risk Initiative, groundwater, and other related subjects. An access agreement was finalized and signed in March by the Laboratory and the San Ildefonso Pueblo.

Staff participated in the Santa Fe Indian School Career Fair, and a staff member served as a judge at the American Indian Science and Engineering Fair in Albuquerque.

Northern New Mexico Citizens Advisory Board (CAB) Activities. The ER Project Communications and Outreach Team provided support for several CAB meetings this quarter; provided a tour of TA-54, Area G, for CAB members; participated in the CAB special meeting in Santa Fe, New Mexico, regarding long-term stewardship; provided support for presentations at the monthly meetings held in Española, New Mexico, in January and February; and attended several CAB Environmental Restoration Subcommittee meetings. At the January CAB retreat, staff presented an overview of the regulatory environment at the Laboratory's ER Project.

Land Transfer Activities. In support of land transfer activities this quarter, ER Project staff provided text for, and performed multiple reviews of, the DOE Combined Data Report (delivered to Congress in February 2000) and the Land Transfer Conveyance and Transfer Plan (to be submitted to Congress in April). Staff members also reviewed the draft Record of Decision for the Conveyance and Transfer Environmental Impact Statement (delivered to Congress and the public in February 2000).

2.7.2.2 Closeout, Tracking, and Contracts Team

PRS and Future Deliverables Tracking. In support of the PRS tracking effort, team members updated the regulatory status for PRSs, produced PRS reports to support the baseline effort, and continued conducting quality assurance checks on data for the PRS core database. The team also integrated the PRS database with other project databases to streamline the data entry effort and provided support to the Integrated Information Management Systems Team. In support of future deliverables tracking, team members coordinated with the ER Project Planning and Control Team to develop a formalized process for tracking regulatory deliverables in the baseline.

Closeout for PRSs. Team members continued progress on a quality review for existing PRS closeout files, developed new PRS closeout files, and coordinated with the ER Records Processing Facility on closeout issues and submission of closeout information.

2.7.2.3 Facility Integration and Guidance Team

Team members continue to provide assistance with regulatory compliance issues for activities within the ER Project this quarter. Personnel provided regulatory reviews of documents prepared by the ER Project and participated in peer reviews. Deployed personnel from the Laboratory's Hazardous and Solid Waste Group (ESH-19) participated in the reviews as subject matter experts regarding hazardous and solid waste issues. Documents receiving reviews included the Installation Work Plan, Revision 8; a portion of the environmental surveillance report; an RFI report, a standard operating procedure, a technical guidance paper on EPA method 5035; a quality procedure; a notice of intent to discharge, the ER Project's health and safety plan, a VCA plan addendum, an IM plan; responses to requests for supplemental information; ER Project glossary terms; monthly status reports; and a quarterly technical report.

ESH-19 deployed personnel prepared two quality procedures for peer review; one addressing identification, documentation, and reporting of newly discovered PRSs; and one addressing reporting newly identified releases from solid waste management units (SWMUs).

Permitting. Members of the team continued discussions and coordination of permit and permit-related issues with NMED; the Environment, Safety, and Health (ESH) Division; and DOE. In March, NMED notified DOE/University of California (UC) that the Laboratory's permit application was incomplete. DOE/UC subsequently proposed to NMED that the Laboratory draft the permit for their concurrence. NMED has yet to indicate when they will begin work on the HSWA module for the new permit.

Team members also began discussions with NMED on temporary authorizations for certain activities and closure or post-closure permits for active units.

TA-16 Activities. The team, working in conjunction with the high-performing team for the IM at PRS 16-021(c) (the 260 outfall), provided regulatory expertise in developing a position regarding the "contained-in" policy for certain wastes generated from that IM. NMED granted a contained-in determination, allowing that environmental media contaminated with organic solvents from listed processes that are below the EPA media-specific screening levels are not required to be managed as hazardous waste. This determination provides greater flexibility and economy in treatment and disposal options without compromising environmental protection.

Team members continue working with the high-performing team and NMED to identify a path forward for 260 outfall media contaminated with HE by helping identify a process for determining whether the wastes were reactive as defined by Title 20, Chapter 4, Part 1, Subpart II of the New Mexico Administrative Code and the RCRA. This determination is necessary to help ensure safety in handling, treating, or shipping these wastes and to maintain compliance. Team members also continued working with NMED on the ER Project's proposal to blend 260 outfall soils in situ to reduce or eliminate the potential for accidental detonation. Pending outcome of those discussions, a treatment/disposal path for those wastes will be identified.

Regulatory analysis and evaluation of treatment and disposal options for 260 outfall wastes continued. The HE Production Sites Team is still considering composting as an on-site treatment option. Numerous solid and hazardous waste issues need to be resolved and a path selected before the IM plan can be completed. Some of these operations may require a permit or temporary authorization. The high-performing team is addressing many of these issues.

ESH-19 deployed personnel provided regulatory support clarifying issues associated with the area-of-contamination boundary for PRS 16-021(c).

Lastly, team members continue providing regulatory expertise for closure of the flash pad at TA-16-387 and the oil burn tray at TA-16-394. Personnel also provided information during an HRMB monthly meeting regarding lack of notification to persons on the facility mailing list regarding an amendment to the approved closure plan for MDA P.

Institutional Issues. Team members worked on the following issues:

- Continued working with the Laboratory's Integrated Resource Management Steering Committee. The committee is identifying roles and responsibilities of Laboratory and DOE organizations currently involved in the various aspects of resource management and completed the draft Integrated Resource Management Plan required under the Site-Wide Environmental Impact Statement.
- Participated on the ecological risk subteam by identifying the applicable regulatory drivers that affect or require ecological risk assessment.
- Participated on the Laboratory's Watershed Management Team.
- Provided regulatory and permit expertise on a completion strategy for regional well R-9.

Clean Water Compliance Activities. Team members participated in various meetings addressing clean water compliance issues. SWMU Working Group meetings were held with representatives from Los Alamos County, DOE, and the ER Project. Issues discussed included an update on fieldwork at PRS 00-019 (Central Wastewater Treatment Plant), land transfer parcels, use of MDA B for recreational vehicle parking, access agreements, and a proposed development by Rollin Jones near PRS 00-030(m).

A Surface Water Assessment Team meeting was held to discuss recommendations for BMPs needed at ER/facility management sites. The team also compared the list of sites with existing erosion matrix scores and made several recommendations regarding completion of Part A of LANL-ER-SOP-2.01, "Surface Water Site Assessments."

Team members continued meetings with the Watershed Integration Team to begin discussions on the development of a watershed-based conceptual model and to finalize details of the surface water sampling approach. Additional meetings were held with the Pajarito Plateau Watershed Partnership, including field trips sponsored by the Santa Fe National Forest and Bandelier National Monument staff.

Other clean water compliance activities included the following:

- Initiated discussions with the Army Corp of Engineers and the NMED Surface Water Quality Bureau regarding a 401/404 dredge and fill permit for the PRS 16-021(c) (the 260 outfall) IM and proposed the filter weir project in Cañon de Valle and the R-7 access road; obtained the 401/404 permit for the 16-260 IM project after a field visit with a representative of the Surface Water Quality Bureau to Cañon de Valle and the 260 outfall site.
- Participated in a needs assessment for the development of the Water Quality Database and how it relates to watershed management. This effort is key to the implementation of an effective information management system for surface- and groundwater programs.
- Participated on the TA-35 Integrated SAP Team.

- Ordered and received a variety of BMP materials for use throughout the ER Project.
- Participated in the development of a draft notice-of-intent (NOI) procedure to address the problem of water disposal for the ER Groundwater Investigations Focus Area. The draft NOI procedure proposes a consistent process for the disposal of water generated during well drilling and development.

Waste Management Activities. Team members reviewed and provided comments on waste characterization strategy forms and waste profile forms, conducted waste storage area inspections and coordinated waste transportation and disposal from several sites. Team members are also pursuing the Toxic Substances Control Act "as found" interpretation of waste remaining at PRS 21-024(i), a septic system, in an effort to find a path forward for waste disposal; a detailed operational history description was developed, all previous analytical data were reviewed, and one internal and two external waste profile forms were subsequently prepared and submitted to TA-54 for disposal of this waste stream. Team members coordinated on-site waste management, characterization, transportation, and disposal for wastes generated at MDAs B and U, TA-49 MDA AB, and the NTISV site. Regulatory support continued for the MDA P project.

Other Activities. Team members performed the following miscellaneous tasks:

- participated as members of high-performing teams for the TA-35 integrated SAP, ecological risk assessment, and the 260 outfall;
- continued working with ER Project and NMED personnel to review and revise the RFI report annotated outline;
- continued supporting technology development initiatives, including the NTISV hot demonstration;
- provided regulatory expertise in support of cleanup initiatives at TA-53; and
- conducted operations and waste management audits of ER field operations.

2.7.2.4 Special Projects and Deployed Generalist Team

High-performing teams continue to show progress. Members of the permit modification/annual unit audit team continued information-gathering, meetings, and site visits to address NFA proposals . Approximately 40 PRSs are being located, and sample locations for those PRSs are being identified. Those PRSs require between two and five samples to confirm NFA.

Team personnel have finalized a proposal to NMED associated with consolidation of PRSs as part of the FY00 annual unit.

Natural Resource Damage Assessment Activities. A representative of the Special Projects and Deployed Generalist Team is involved with National Resource Damage Assessment issues and continues to represent ER as part of the Interagency Wildfire Management Team.

Support to Focus Areas. Personnel from the Special Projects and Deployed Generalist Team are deployed to the operational focus areas to provide support regarding regulatory issues. In addition to providing general regulatory compliance assistance this quarter, such as reviewing documents, attending operational focus area meetings, and participating in peer reviews for operational focus area documents, the deployed members of the team assisted with the following tasks in the operational focus areas.

Canyon Investigations Activities. The deployed regulatory generalist assigned to the Canyon Investigations Focus Area provided support for submitting a letter to NMED-HRMB on March 20, 2000, requesting a revision to Table 1-1 of the Canyons core document. This letter requested that the remaining four canyon groups be consolidated into two task/site work plans. It also requested a schedule for submittal of the task/site work plans.

The deployed generalist also participated in several meetings with DOE, NMED, and the Laboratory regarding the Acid Canyon dose assessment approach.

Groundwater Investigations Activities. The deployed regulatory generalist assigned to the Groundwater Investigations Focus Area provided support by submitting notification letters to NMED for R-7, R-31, and R-9i drilling activities. The generalist also provided support for NOI discharges from R-31, R-9, R-19, and R-7 drilling activities. Other activities included developing draft NOI discharge procedures with ESH-18 and providing oversight for quarterly sampling of wells R-9 and R-15 and for Westbay well sampling training.

ESH-19 deployed personnel participated in internal, Laboratory, and external discussions with NMED-HRMB regarding regulatory requirements relative to sampling groundwater prior to discharge.

MDA Activities. The deployed regulatory generalist assigned to the MDA Focus Area participated in numerous meetings regarding the pending NTISV hot demonstration at MDA V, which is currently scheduled for early April 2000. Other activities included assisting with preparation, review, and comment resolution of several documents, including the draft IM plan for the NTISV hot demonstration and the TA-54 RFI report.

In support of field activities, the team member completed waste management and stormwater inspections at TA-49 and TA-21 and supervised the BMP maintenance activities to repair storm damage to the cap on MDA AB. The team member communicated and met with NMED numerous times regarding the content and approach of the DP Tank Farm (PRS 21-029) RSI response and the status of the IM plan for the NTISV hot demonstration [PRS 21-018(e)-99)]. An additional meeting and a site visit with NMED were held in January 2000 where NMED approved the DP Tank Farm RSI Response amending the work plan; fieldwork will begin in early May 2000. The deployed team member also assisted in the preparation and review of the scope of work and field implementation plan for the remaining fieldwork at DP Tank Farm (PRS 21-029). The team is working with NMED staff to ensure timely approval of investigation results.

The deployed team member reviewed data from confirmatory samples collected from the drainage of consolidated PRS 21-027(d)-99. NMED agreed to the sample locations and analytical suite; preparation of the VCM report proposing NFA for the site has begun.

The deployed team member assisted in the presentation to NMED in early January, of the scope of work for the installation of a new moisture monitoring system and approach for MDA AB at TA-49. NMED agreed with the revised approach, and the deployed team member helped oversee the implementation and subsequent monitoring and waste management activities at the site.

The deployed team member is participating in the MDA/TA-54 High-Performing Team meetings to review and revise the TA-54 RFI report.

RCRA Corrective Actions Activities. The deployed regulatory generalist assigned to the RCRA Corrective Actions Focus Area participated in meetings, site tours, and peer and document reviews this quarter. Meeting discussions and/or topics included:

- issues associated with identifying an area of contamination at PRS 16-021(c) (the 260 outfall);
- identification of data gaps, modeling needs, gas monitoring, drainage cleanup, and path forward activities with the TA-73 Airport Landfill High-Performing Team;
- RSI comments associated with the TA-33 VCA plan;
- RSI comments associated with the MDA P SAP, VCA Plan for PRS 16-016(c), and Closure Plan for Flash Pad TA-16-387;
- informal NMED review comments associated with the Closure Plan for Burn Tray TA-16-364; and
- coordination of TA-53 facility waste management activities with ER activities, needs, and strategies.

The deployed generalist provided additional support to the focus area by preparing various sampling notifications and extension requests and accompanying the ER Project project manager and Industrial Sites Team leader on a safety walk-around of the TA-53 lagoons [PRSs 53-002(a,b)], PRS 03-056(c), and all mesa-top PRSs at TA-35.

Additional activities performed to support the Regulatory Compliance Focus Area included the following tasks:

- reviewing preliminary consolidation worksheets and providing descriptors for consolidated units;
- researching and reviewing TA-53 building drawings, former and current satellite accumulation and storage areas, and spill reports;
- continuing with the integrated safety management task involving review and comparison of ER Project standard operating procedures with Laboratory implementation requirements;
- continued reviewing and compiling background documentation (for Laboratory Legal Counsel) related to field activities associated with PRS 00-016, the Small-Arms Firing Range; and
- preparing meeting summaries from the August, November, and December 1999 monthly meetings with NMED-HRMB.

3.0 REFERENCE

LANL (Los Alamos National Laboratory), 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory Report, Los Alamos, New Mexico. (LANL 1998, 59599)

Appendix A

DP Tank Farm Site Inspection, January 21, 2000

APPENDIX A

DP Tank Farm "Localized Hydrocarbon Sheen Area" Site Inspection

1. Date and time of visit:

The site was visited on **Friday, January 21, 2000,** at 2:15 pm by Rick Kelley and Robert Trujillo. Conditions were partly cloudy, warm (50°), and calm. Note: A foundation for a cellular phone tower has been constructed on the access pathway to this area, causing access to be more difficult than previously.

2. Presence of standing or running water:

A small amount of standing water was present, but appeared to be from melting ice in the stream channel. A thick layer of ice still covered most of the canyon stream channel. Precipitation of 0.12 in. has fallen since last month's visit.

3. Location and intensity of odors, staining, or sheens:

No odors were detected in the ambient air at the location of the hydrocarbon sheen, due to low temperatures and the thickness of ice. No soil staining was observed. No hydrocarbon sheens were observed in the ice.

4. Medium in which stains or sheens are observed:

No stains or sheens were observed.

5. How odors were identified:

No hydrocarbon odors were detected in the ambient air near the stream channel or when loose sediment was held to the nose.

6. Photographs:

The following photographs were taken during the site visit.

Photo 1. Culverts at the head of DP Canyon, showing no water flow.

Photo 2. Small pool of solid ice with submerged clay-filled fracture in stream channel.

Photo 3. Stream channel in the area of soil staining, looking downstream, showing ice build-up.

Photo 4. Thick ice build-up in the area of previous sample locations, looking downstream.

Photo 5. Area of previous sample locations, looking upstream, showing ice build-up.

Photo 6. Close-up of ice build-up in the area of soil staining.

Appendix B

DP Tank Farm Site Inspection, February 25, 2000

APPENDIX B

DP Tank Farm "Localized Hydrocarbon Sheen Area" Site Inspection

1. Date and time of visit:

The site was visited on **Friday, February 25th, 2000,** at 2:15 pm by Rick Kelley and Robert Trujillo. Conditions were partly cloudy, cold (35°), and breezy. A light dusting of snow fell the previous night Note: A foundation for a cellular phone tower has been constructed on the access pathway to this area, causing access to be more difficult than previously.

2. Presence of standing or running water:

A small amount of standing water was present, but appeared to be from melting ice in the stream channel. Areas of ice still covered most of the canyon stream channel; however, some areas of standing water were present where the ice had melted through. Precipitation of 0.13 in. has fallen since last month's visit.

3. Location and intensity of odors, staining, or sheens:

Faint hydrocarbon odors were detected in the ambient air at the location of the hydrocarbon sheen. Stronger odors were noted after breaking a thin layer of ice in the stream channel. Soil staining was observed where ice had melted away. A hydrocarbon sheen was observed on the water and ice after disturbing soil in the stream channel.

4. Medium in which stains or sheens are observed:

Stains were observed in loose soil in the stream channel and a sheen was observed on water after the soil was disturbed.

5. How odors were identified:

A faint hydrocarbon odor was detected in the ambient air near the stream channel. Petroleum hydrocarbon odors were identified in loose sediment held to the nose.

6. Photographs:

The following photographs were taken during the site visit.

Photo 1. Culverts at the head of DP Canyon, showing no water flow.

Photo 2. Small pool of water, partially frozen, with submerged clay-filled fracture in stream channel.

Photo 3. Stream channel in the area of soil staining, looking upstream, showing variable ice thickness and recently fallen light snow.

Photo 4. Area of previous sample locations, looking downstream.

Photo 5. Area of previous sample locations, looking upstream, showing ice and recent light snow.

Photo 6. Close-up of the area of soil staining, odors, and sheen.

Appendix C

DP Tank Farm Site Inspection, March 24, 2000

APPENDIX C

DP Tank Farm "Localized Hydrocarbon Sheen Area" Site Inspection

1. Date and time of visit:

The site was visited on **Friday, March 24th, 2000,** at 4:00 pm by Rick Kelley. Conditions were partly cloudy, warm (55°), and calm. A three day period of rain and snow ended two days ago. All snow, as well as most of the ice in the stream channel, is now melted.

2. Presence of standing or running water:

A large amount of standing water was present, and a slight water flow was observed; however, no water was currently flowing from the culverts at the head of the canyon. Approximately 1.02 in. of precipitation has fallen since last month's visit.

3. Location and intensity of odors, staining, or sheens:

Faint hydrocarbon odors were detected in the ambient air at the location of the hydrocarbon sheen. Stronger odors were noted after disturbing gravels in the stream channel. Soil staining was observed in the disturbed gravels. A hydrocarbon sheen was observed on the water in the area of disturbed gravels. A more significant hydrocarbon sheen was observed just downstream at the area of previous sampling activities

4. Medium in which stains or sheens are observed:

Stains were observed in loose soil and gravel in the stream channel and sheens were observed on water after the soil was disturbed and at the area of previous sampling.

5. How odors were identified:

A faint hydrocarbon odor was detected in the ambient air near the stream channel. Stronger petroleum hydrocarbon odors were identified in loose sediment held to the nose.

6. Photographs:

The following photographs were taken during the site visit and during a follow-up visit on April 5, 2000.

Photo 1. Culverts at the head of DP Canyon, showing no water flow.

Photo 2. Small pool of water with submerged clay-filled fracture in stream channel.

Photo 3. Stream channel in the area of soil staining, looking upstream, showing standing water from recent rains and snows.

Photo 4. Close-up of soil staining area, showing sheen on water and gravel.

Photo 5. Area of previous sample locations, looking upstream, showing slight water flow.

Photo 6. Close-up of the area of hydrocarbon sheens near the area of previous sampling.

Photo 7. Stream channel in the area of previous sample locations, looking upstream, showing slight water flow with hydrocarbon sheen.

Appendix D

Quarterly Pore Gas Sampling Results,
TA-54 MDA L and MDA G, First Quarter FY2000

APPENDIX D

QUARTERLY PORE GAS SAMPLING AT TA-54 MDA L AND MDA G FIRST QUARTER FY2000

prepared for:

MDA Focus Area
Environmental Restoration Project
Los Alamos National Laboratory

February 2000

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QUARTERLY PORE GAS SAMPLING AT TA-54 MDA L AND MDA G FIRST QUARTER FY2000

MDA Focus Area
Environmental Restoration Project
Los Alamos National Laboratory

February 2000

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1. *INTRODUCTION*

This report documents the results from quarterly subsurface pore gas sampling at Los Alamos National Laboratory ("the Laboratory") Technical Area 54 (TA-54) as required by the HSWA Module (Module VIII) of the Laboratory's RCRA Operating Permit in Section C.5, Unsaturated Zone Monitoring (EPA 1990). The approved plan (EPA 1993b) for pore gas sampling is described in the Laboratory's response (LANL 1993a) to an EPA Notice of Deficiency (EPA 1993a) addressing the Laboratory's RFI work plan for TA-54 (LANL 1992).

1.1 *SAMPLING PLAN*

A total of 27 ER Project wells are available for pore gas sampling at TA-54. The sampling and analysis plan calls for the collection of samples from 12 wells each quarter. Of these 12, seven are to be selected from a list of ten wells located at Material Disposal Area L (MDA L), and two are to be selected from a list of four wells located at MDA G. Thus nine of the 12 samples collected each quarter are constrained to a defined set of 14 wells. This leaves three samples per quarter that may be distributed among the remaining 14 available pore gas sampling wells. In addition to the required sampling, all available wells are now screened with field instruments, rather than only those formally sampled.

Two methods for sampling and analysis were identified in the work plans (LANL 1992, LANL 1993a). The SUMMA canister method with analysis by gas chromatography/mass spectrometry by EPA TO-14 (EPA 1988, LANL 1997) is currently being used.

SUMMA canister samples are drawn from one of the several sampling ports available at each well. The port sampled is the one showing the highest contaminant concentrations as determined by field screening of every port using field instruments. Each port is purged and monitored with field instruments until CO_2 levels have stabilized at values representative of subsurface pore gas conditions and is then screened for four volatile organic compounds.

Field quality assurance samples are a duplicate sample drawn from one well, an equipment blank of "zero" air or nitrogen drawn through the sampling apparatus in the working area, and a sample of a known "calibration" gas. Laboratory quality assurance for the TO-14 gas chromatography method includes internal surrogates, replicates, blanks, laboratory control samples, and reference standards.

1.2 *SAMPLING STRATEGY*

The defined set of wells on which the quarterly sampling focuses is biased toward 1) identifying changes in contaminant concentrations at the perimeter of the relatively well characterized plume at MDA L as an indicator of outward plume expansion, and 2) monitoring for changes in contaminant concentrations within the plume at MDA G as an indicator of changes warranting further attention.

2. *QUARTERLY SAMPLING FOR FIRST QUARTER FY2000*

The sampling for the first quarter of FY2000 (October - December 1999) was conducted in the period from November 8 to December 2, 1999.

2.1 *SAMPLING EVENT*

Table 2-1 identifies the wells sampled (from the list of all wells available), indicates how the selection of wells for this quarter matched against the expectations for the plume monitoring program, and lists the port at each well from which the SUMMA canister sample was drawn. The list of wells has been updated to remove some wells that have been taken out of service because of either failure of SEAMIST® membranes or irreparable blocked ports.

Twelve wells were sampled as expected in accordance with the approved sampling plan. Ten wells identified for MDA L were sampled, including 8 wells from the defined list in the sampling plan.

Two of the four identified MDA G wells were sampled, meeting sampling plan expectations. The nitrogen purge "field blank" and the calibration gas "known" QA samples were collected as planned. One sample was taken from the canyon well 54-1015. The well was sampled from the 350 ft port immediately above the upper surface of the Cerros del Rio basalt formation.

A total of 15 samples were collected for laboratory analysis:

- 9 samples from within and around MDA L,
- 2 samples from within and around MDA G,
- 1 sample from the one canyon well beneath MDA L,
- 1 field duplicate sample,
- 1 equipment blank sample, and
- 1 laboratory performance (calibration gas) sample.

Monitoring of the pore gas sampling ports with field instruments to identify the port having the highest contaminant concentrations for each well was conducted as planned. Field screening includes all available wells, including 8 wells maintained by the Performance Assessment Management Group (PAMG). This change was made at the request of the ER Project MDA Focus Area TA-54 Team Leader. The field screening results are discussed in Attachment 1.

Table 2-1 Summary of Sampling Event

Well ID	Site	On Defined Sampling List	Number of Pore Gas Ports Monitored with Field Instruments (port depths, ft)		Depth of Port Sampled with SUMMA Canister (in ft) — Sample ID
54-1015	MDA L	X	7	(45, 187, 350, 385, 435, 485, 525)	350 — MD54-99-0055
54-1016	MDA L		7	(36, 188, 318, 390, 481, 533, 601)	
54-1018	MDA L		Well needs repair		
54-1107	PAMG		Well needs repair		
54-1110	PAMG		6	(20, 48, 60, 70, 85, 90)	
54-1111	PAMG		7	(20, 40, 50, 70, 78, 100, 139)	
54-1115	PAMG		6	(15, 50, 77, 100, 120, 130)	
54-1117	PAMG		6	(20, 32, 55, 73, 82, 85)	
54-1121	PAMG		7	(20, 26, 62, 70, 76, 98, 121)	
54-1126	PAMG		6	(15, 35, 57, 70, 85, 99)	
54-1128	PAMG		5	(15, 30, 40, 60, 78)	
54-2001	MDA L		Well needs repair		
54-2002	MDA L	X	10	(20, 40, 60, 80, 100, 120, 140, 157, 180, 200)	180 — MD54-99-0059
54-2009	MDA G		4	(37, 62, 79, 92)	62 — MD54-99-0054
54-2010	MDA G	X	3	(30, 53, 95)	
54-2012	MDA L	X	3	(8, 28, 42)	28 — MD54-99-0061
54-2013	MDA L		3	(20, 43, 63)	
54-2014	MDA L		4	(13, 31, 46, 86)	
54-2016	MDA L		3	(18, 31, 82)	
54-2020	MDA L		10	(20, 40, 60, 80, 95, 120, 140, 160, 180, 200)	
54-2021	MDA L	X	10	(20, 40, 60, 80, 100, 120, 140, 160, 180, 200)	
54-2022	MDA L	X	10	(20, 40, 60, 80, 100, 120, 140, 160, 180, 200)	60 — MD54-99-0056
54-2023	MDA L	X	9	(20, 40, 60, 80, 100, 120, 140, 159, 200)	159 — MD54-99-0049
54-2024	MDA L		10	(20, 40, 60, 80, 100, 120, 140, 160, 180, 200)	
54-2025	MDA L		5	(20, 60, 100, 160, 180)	
54-2026	MDA L	X	6	(20, 60, 100, 160, 200, 215)	60 — MD54-99-0050
54-2027	MDA L		6	(20, 60, 100, 160, 200, 220)	
54-2028	MDA L		7	(20, 60, 100, 160, 200, 220, 250)	
54-2029	MDA L	X	8	(20, 60, 100, 160, 200, 220, 260, 288)	20 — MD54-99-0048
54-2030	MDA L	X	7	(20, 60, 100, 160, 200, 220, 243)	100 — MD54-99-0051
54-2031	MDA L	X	7	(20, 60, 100, 160, 200, 220, 260)	
54-2032	MDA G		5	(20, 60, 100, 130, 156)	
54-2033	MDA G	X	8	(20, 60, 100, 160, 200, 220, 260, 277)	20 — MD54-99-0052
54-2034	MDA L	X	7	(20, 40, 60, 80, 100, 160, 200, 220, 260)	60 — MD54-99-0053
54-2087	MDA L		4	(13, 31, 46, 86)	
54-2088	MDA L	X	4	(13, 31, 46, 86)	46 — MD54-99-0060
54-2089	MDA L		4	(13, 31, 46, 86)	

Total wells sampled	12
MDA L defined list wells sampled (7 expected)	10
MDA G defined list wells sampled (2 expected)	2
QA samples taken	1 Field duplicate 1 Calibration gas 1 Equipment blank

2.2 *OVERVIEW OF RESULTS*

Valid results were received for 15 SUMMA canister samples submitted for analysis. Appendix A contains the analyte list for the gas chromatograph/mass spectrometer method and the typical detection limits. Appendix B provides tables giving the detected compounds for each well. Tables 2-2 and 2-3 summarize this quarter's results, along with previous results for each well. All sample results were in the approximate expected concentration ranges. However, ignoring the 1998 samples that had anomalously high analytical results, six wells (54-2009, 54-2022, 54-2026, 54-2030, 54-2033 and 54-2034) have TCA concentrations that are higher than previously measured since the first quarter of FY97. This is not true for the Brüel and Kjaer (B&K) screening results for the same wells, which may indicate a high bias to this quarters fixed lab results.

Table 2-2 Summary of SUMMA Canister Results for TCA (ppmv*)

Well ID	FY97 1Q	FY97 2Q	FY97 3Q	FY97 4Q	FY98 1Q	FY98 2Q	FY98 3Q	FY98 4Q	FY99 1Q	FY99 2Q	FY99 3Q	FY99 4Q	FY2000 1Q	FY2000 2Q	FY2000 3Q	FY2000 4Q	Average		Std Dev
54-1003		12.700							Out of service				Out of service				12.700		
54-1004		82.100	106.000			90.900	82.900		Out of service				Out of service				90.475	+/-	11.086
54-1005		21.900							Out of service				Out of service				21.900		
54-1015					0.860		0.090			0.046	0.160		0.056				0.242	+/-	0.348
54-1016							19.200		14.000		1.100						11.433	+/-	9.319
54-1018		37.500							Out of service				Out of service				37.500		
54-2001									Well needs repair				Well needs repair						
54-2002				358.000	398.000	291.000	424.000			370.000	520.000		400.000				394.429	+/-	69.890
54-2009			104.000	69.200		46.500			110.000		120.000		140.000				98.283	+/-	34.378
54-2010			18.800		14.500		167.000	19.000		22.000							48.260	+/-	66.431
54-2012					100.000	2830.000			2500.000	3500.000			3500.000				2486.000	+/-	1402.491
54-2013																			
54-2014	1000.000	837.000							1400.000								1079.000	+/-	289.695
54-2016								1300.000		670.000							985.000		445.477
54-2020	38.300			95.600			70.100		73.000								69.250	+/-	23.573
54-2021			125.000			29.500		50.000		54.000	64.000						64.500	+/-	36.076
54-2022				98.400	76.300	56.600	819.000		110.000		120.000		140.000				202.900	+/-	273.066
54-2023	12.000		20.000	27.700			216.000	22.000	22.000		20.000		25.000				45.588	+/-	69.008
54-2024		59.200					492.000	45.000									198.733	+/-	254.076
54-2025	216.000	163.000		136.000			159.000										168.500	+/-	33.828
54-2026	2.690	1.470	2.800		2.690			4.200		3.400			5.100				3.193	+/-	1.178
54-2027	14.200	24.500			514.000			23.000									143.925	+/-	246.758
54-2028	3.860		3.000					4.900									3.920	+/-	0.951
54-2029			0.790		0.380	16.900	15.800	1.000	1.100	1.000			0.570				4.693	+/-	7.205
54-2030	1.820		2.100	1.290		15.900	37.200	1.400		2.300	2.600		5.300				7.768	+/-	11.964
54-2031				24.900	345.000		240.000	20.000	27.000		29.000						114.317	+/-	141.990
54-2032			29.700	15.400		10.900		13.000		14.000							16.600	+/-	7.504
54-2033			0.190		0.070		0.020		0.020		0.000		7.500				1.300	+/-	3.038
54-2034			3.620	2.700		7.530	41.500		4.900	0.190	7.300		9.400				9.643	+/-	13.208
54-2087	2540.000	3110.000		3610.000													3086.667	+/-	535.381
54-2088	1410.000	6970.000								2400.000			2700.000				3370.000	+/-	2462.478
54-2089	1760.000	1910.000	5540.000														3070.000	+/-	2140.397

* ppmv = parts per million by volume.

Table 2-3 Summary of Associated B&K Screening Results TCA (ppmv[a])

Well ID	FY97 1Q	FY97 2Q	FY97 3Q	FY97 4Q	FY98 1Q	FY98 2Q	FY98 3Q	FY98 4Q	FY99 1Q	FY99 2Q	FY99 3Q	FY99 4Q	FY2000 1Q	FY2000 2Q	FY2000 3Q	FY2000 4Q	Average	Std Dev
54-1003									Out of service				Out of service				n/a[b]	n/a
54-1004			15.100			133.000	150.000		Out of service				Out of service				99.367 +/-	73.470
54-1005									Out of service				Out of service				n/a	n/a
54-1015					0.000					0.600	4.500		15.400				5.125 +/-	7.135
54-1016					0.000	17.600			12.500		5.200						8.825 +/-	7.779
54-1018									Out of service				Out of service				n/a	n/a
54-2001									Well needs repair				Well needs repair				n/a	n/a
54-2002				402.000	380.000	505.000	490.000			338.000	321.000		304.000				391.429 +/-	79.912
54-2009			90.900	95.300		113.000			85.100		78.300		56.800				86.567 +/-	18.710
54-2010			49.300		3.900		24.400	40.800		0.000							23.680 +/-	21.806
54-2012																		
54-2013						3760.000	3570.000		2360.000	2140.000			1650.000				2696.000 +/-	923.596
54-2014	488.000	297.000															n/a	n/a
54-2016									1250.000								678.333 +/-	504.205
54-2020	22.600			154.000		1050.000		986.000		590.000							875.333 +/-	249.169
							107.000		64.700								87.075 +/-	56.373
54-2021			81.700	38.900		45.500		53.400		33.700	31.000						47.367 +/-	18.682
54-2022				72.400	81.600	88.600	96.600		87.600		73.400		79.500				82.814 +/-	8.717
54-2023	7.700		11.500	25.100			28.700	36.000	8.600		13.900		14.500				18.250 +/-	10.380
54-2024		34.200					62.700	51.600									49.500 +/-	14.366
54-2025	92.300	146.000		70.400			203.000										127.925 +/-	59.277
54-2026	4.000	4.100	7.500		0.000			2.700		2.600			0.000				2.986 +/-	2.605
54-2027	12.400	18.100			109.000			25.600									41.275 +/-	45.472
54-2028	3.700		5.500					6.100									5.100 +/-	1.249
54-2029	5.300		5.100		0.000	72.300	0.000	0.000	0.000	0.000			0.000				9.189 +/-	23.774
54-2030	4.100		5.100	2.800		4.900	4.700	0.000		1.100	6.250		0.000				3.217 +/-	2.343
54-2031				27.500	28.200		32.800	25.900	13.500		19.000						24.483 +/-	6.997
54-2032			17.300	10.400		8.800		19.200		5.000							12.140 +/-	5.950
54-2033			2.800		0.000		0.000		0.000		0.000		0.000				0.433 +/-	1.061
54-2034			8.900	3.800		0.000	10.500		0.000	0.000	6.700		0.000				3.738 +/-	4.425
54-2087	1270.000	871.000		2330.000													1490.333 +/-	754.043
54-2088	2680.000	2450.000								1650.000			854.000				1908.500 +/-	830.106
54-2089	989.000	826.000	1850.000														1221.667 +/-	550.222

[a] ppmv = parts per million by volume.
[b] n/a = not applicable.

2.3 *EVALUATION OF QUALITY ASSURANCE SAMPLES*

A field duplicate sample was submitted for analysis. The duplicate sample was drawn from the same port on a well immediately after the original sample.

The field duplicate was collected on well 54-2022 at the 60 ft sampling port. As indicated in Table 2-4, the agreement between the two samples was very good, with RPDs less than 10% for all but 1 analyte.

Table 2-4 Field Duplicate Sample Results Comparison: Well 54-2022 (60 ft)

		Sample MD54-99-0056 (Det Lmt 0.0026)	Sample MD54-99-0057 (Det Lmt 0.0005)	
CAS No.	**Compound**	**ppmv[a]**	**ppmv**	**RPD[b]**
75-35-4	Dichloroethene[1,1-]	1.2	1.1	8.7%
75-09-2	Methylene Chloride	3.1	3.0	3.3%
75-34-3	Dichloroethane	4.0	3.9	2.5%
79-00-5	Trichloroethane[1,1,2-]	22.0	Not Detected	-
127-18-4	Tetrachloroethene	1.8	1.6	11.8%
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.9	1.9	0.0%
71-55-6	Trichloroethane[1,1,1-]	140.0	140.0	0.0%
79-01-6	Trichloroethene	37.0	35.0	5.6%

[a] ppmv = parts per million by volume.

[b] rpd = relative percent difference.

A field equipment blank was collected to document the effectiveness of equipment purges between samples. The sample was collected by drawing "zero air" through the sample train after the normal purge performed before each sample. The blank was drawn at Well 54-2022 on November 29, 1999. Five compounds were detected at low levels (<0.2 ppmv). The results for two of these analytes should be regarded as estimated (J) because the results were less than the 0.0045 ppm reporting limit for this sample. This is much improved from the previous quarter where 21 compounds were reported in the blank sample.

A calibration gas sample (performance evaluation sample) was drawn into a SUMMA canister and submitted to the laboratory for analysis. The calibration gas contained 500 ppmv of TCA and 100 ppmv of TCE. The results of the analysis (MD54-99-0062) were 1400 ppmv for TCA and 250 ppmv for TCE. This is the second quarter in a row where the calibration gas sample has shown a high bias. These results may indicate a high bias for the TO-14 analysis for the last two quarters and may explain the somewhat elevated results seen in this quarters results.

3. *REFERENCES*

EPA 1988 Compendium Method TO-14, "The Determination of Volatile Organic Compounds in Ambient Air Using SUMMA Passivated Canister Sampling and Gas Chromatography Analysis. May 1988.

EPA 1990 "Hazardous Waste Permit, Module VIII, Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for Los Alamos National Laboratory." US Environmental Protection Agency, Region 6, ID Number NM0890010515. May 23, 1990.

EPA 1993a "Notice of Deficiency, RFI Work Plan for OU-1148." US Environmental Protection Agency, Region 6. Date Not Known, 1993.

EPA 1993b "RFI Work Plan for OU-1148" US Environmental Protection Agency, Region 6. Approval letter from A. Davis to J. Vozella. December 14, 1993.

EPA 1993c "Pilot Extraction Study Plan for the Organic Vapor Plume." US Environmental Protection Agency, Region 6. Approval letter from W. Honker to J. Vozella. August 25, 1993

LANL 1992 "RFI Work Plan for Operable Unit OU-1148." Los Alamos National Laboratory Report LA-UR-92-855. May 1992 (ER ID 7669).

LANL 1993a "Response to EPA Notice of Deficiency, RFI Work Plan for OU-1148." Los Alamos National Laboratory. November 12, 1993.

LANL 1993b "Pilot Extraction Study Plan for the Organic Vapor Plume at MDA L." Los Alamos National Laboratory, July 1993 (ER ID 22430)

LANL 1997 "Sampling of Vapor Port Equipped Monitoring Wells" LANL ER SOP-06.3, Draft in review. May, 1999.

APPENDIX A

ANALYTE LIST AND DETECTION LIMITS FOR SUMMA CANISTER ANALYSIS

Detection limits vary from sample to sample depending on the compounds present, their concentrations, and the dilutions that are made by the laboratory. The lowest detection limits that have been obtained are presented below.

CAS No.	Compound	Concentration (ppmv*)
67-64-1	Acetone	0.01200
75-05-8	Acetonitrile	0.00250
107-02-8	Acrolein	0.00120
107-13-1	Acrylonitrile	0.00120
71-43-2	Benzene	0.00050
100-44-7	Benzyl Chloride	0.00050
75-27-4	Bromodichloromethane	0.00050
75-25-2	Bromoform	0.00050
74-83-9	Bromomethane	0.00050
106-99-0	Butadiene[1,3-]	0.00050
106-97-8	Butane[n-]	0.00050
71-36-3	Butanol[1-]	0.00120
78-93-3	Butanone[2-]	0.00120
75-15-0	Carbon Disulfide	0.00050
56-23-5	Carbon Tetrachloride	0.00050
107-05-1	Chloro-1-propene[3-]	0.00050
108-90-7	Chlorobenzene	0.00050
124-48-1	Chlorodibromomethane	0.00050
75-45-6	Chlorodifluoromethane	0.00050
75-00-3	Chloroethane	0.00050
67-66-3	Chloroform	0.00050
74-87-3	Chloromethane	0.00120
110-82-7	Cyclohexane	0.00050
124-18-5	Decane[n-]	0.00050
106-93-4	Dibromoethane[1,2-]	0.00050
74-95-3	Dibromomethane	0.00050
76-14-2	Dichloro-1,1,2,2-tetrafluoroethane[1,2-]	0.00050
95-50-1	Dichlorobenzene[1,2-]	0.00050
541-73-1	Dichlorobenzene[1,3-]	0.00050
106-46-7	Dichlorobenzene[1,4-]	0.00050
75-71-8	Dichlorodifluoromethane	0.00050
75-34-3	Dichloroethane[1,1-]	0.00050
107-06-2	Dichloroethane[1,2-]	0.00050
75-35-4	Dichloroethene[1,1-]	0.00050
156-59-2	Dichloroethene[cis-1,2-]	0.00050
156-60-5	Dichloroethene[trans-1,2-]	0.00050
78-87-5	Dichloropropane[1,2-]	0.00050
10061-01-5	Dichloropropene[cis-1,3-]	0.00050
10061-02-6	Dichloropropene[trans-1,3-]	0.00050
60-29-7	Diethyl Ether	0.00120
112-40-3	Dodecane[n-]	0.00050
100-41-4	Ethylbenzene	0.00050
142-82-5	Heptane	0.00050
87-68-3	Hexachlorobutadiene	0.00050
110-54-3	Hexane	0.00050
591-78-6	Hexanone[2-]	0.00120
98-82-8	Isopropylbenzene	0.00050
67-56-1	Methanol	0.02500
1634-04-4	Methyl tert-Butyl Ether	0.00120
108-10-1	Methyl-2-pentanone[4-]	0.00120
75-09-2	Methylene Chloride	0.00050
98-83-9	Methylstyrene[alpha-]	0.00050

91-20-3	Naphthalene	0.00050
111-84-2	Nonane[1-]	0.00050
111-65-9	Octane[n-]	0.00050
109-66-0	Pentane	0.00120
103-65-1	Propylbenzene[1-]	0.00050
100-42-5	Styrene	0.00050
79-34-5	Tetrachloroethane[1,1,2,2-]	0.00050
127-18-4	Tetrachloroethene	0.00050
108-88-3	Toluene	0.00050
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.00050
120-82-1	Trichlorobenzene[1,2,4-]	0.00050
71-55-6	Trichloroethane[1,1,1-]	0.00050
79-00-5	Trichloroethane[1,1,2-]	0.00050
79-01-6	Trichloroethene	0.00050
75-69-4	Trichlorofluoromethane	0.00050
95-63-6	Trimethylbenzene[1,2,4-]	0.00050
108-67-8	Trimethylbenzene[1,3,5-]	0.00050
1120-21-4	Undecane[n-]	0.00050
108-05-4	Vinyl Acetate	0.00120
75-01-4	Vinyl Chloride	0.00050
1330-20-7	Xylene (Total)	0.00050
95-47-6	Xylene[1,2-]	0.00050

*ppmv = parts per million by volume.

APPENDIX B

SUMMA CANISTER RESULTS ABOVE DETECTION LIMITS

Well:	**54-2029**	**FY2000 1st Quarter**
Depth:	**20 FT**	**MDA L**
Date:	**11/16/99**	
Sample ID:	**MD54-99-0048**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.0059	0.0096	J
75-69-4	Trichlorofluoromethane	0.022	0.0096	
75-35-4	Dichloroethene[1,1-]	0.012	0.0096	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.15	0.0096	
67-66-3	Chloroform	0.017	0.0096	
71-55-6	Trichloroethane[1,1,1-]	0.57	0.0096	
79-01-6	Trichloroethene	0.14	0.0096	
127-18-4	Tetrachloroethene	0.014	0.0096	

Well:	**54-2023**	**FY2000 1st Quarter**
Depth:	**159 FT**	**MDA L**
Date:	**11/17/99**	
Sample ID:	**MD54-99-0049**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.3	0.46	J
75-69-4	Trichlorofluoromethane	0.89	0.46	
75-35-4	Dichloroethene[1,1-]	1.4	0.46	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	7	0.46	
75-09-2	Methylene Chloride	0.38	0.46	J
67-66-3	Chloroform	0.66	0.46	
71-55-6	Trichloroethane[1,1,1-]	25	0.46	
79-01-6	Trichloroethene	6.4	0.46	
127-18-4	Tetrachloroethene	0.39	0.46	J

Well:	**54-2026**	**FY2000 1st Quarter**
Depth:	**60 FT**	**MDA L**
Date:	**11/17/99**	
Sample ID:	**MD54-99-0050**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.049	0.068	J
75-69-4	Trichlorofluoromethane	0.17	0.068	
75-35-4	Dichloroethene[1,1-]	0.16	0.068	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.3	0.068	
75-34-3	Dichloroethane[1,1-]	0.043	0.068	J
67-66-3	Chloroform	0.19	0.068	
71-55-6	Trichloroethane[1,1,1-]	5.1	0.068	
79-01-6	Trichloroethene	1.2	0.068	
127-18-4	Tetrachloroethene	0.12	0.068	

Well:	**54-2030**	**FY2000 1st Quarter**
Depth:	**100 FT**	**MDA L**
Date:	**11/18/99**	
Sample ID:	**MD54-99-0051**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.074	0.1	J
75-69-4	Trichlorofluoromethane	0.24	0.1	
75-35-4	Dichloroethene[1,1-]	0.2	0.1	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.4	0.1	
67-66-3	Chloroform	0.2	0.1	
71-55-6	Trichloroethane[1,1,1-]	5.3	0.1	
79-01-6	Trichloroethene	1.1	0.1	
127-18-4	Tetrachloroethene	0.15	0.1	

Well:	**54-2033**	**FY2000 1st Quarter**
Depth:	**20 FT**	**MDA G**
Date:	**11/18/99**	
Sample ID:	**MD54-99-0052**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.006	0.00049	
75-45-6	Chlorodifluoromethane	0.0019	0.00049	
75-69-4	Trichlorofluoromethane	0.014	0.00049	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.0042	0.00049	
156-59-2	Dichloroethene[cis-1,2-]	0.0004	0.00049	J
67-66-3	Chloroform	0.00066	0.00049	
71-55-6	Trichloroethane[1,1,1-]	0.0075	0.00049	
79-01-6	Trichloroethene	0.00037	0.00049	J
127-18-4	Tetrachloroethene	0.0061	0.00049	
67-64-1	Acetone	0.0075	0.012	J
108-05-4	Vinyl Acetate	0.00081	0.0012	J

Well:	**54-2034**	**FY2000 1st Quarter**
Depth:	**60 FT**	**MDA L**
Date:	**11/19/99**	
Sample ID:	**MD54-99-0053**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.067	0.099	J
75-69-4	Trichlorofluoromethane	0.094	0.099	J
75-35-4	Dichloroethene[1,1-]	0.14	0.099	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.16	0.099	
75-09-2	Methylene Chloride	0.12	0.099	
75-34-3	Dichloroethane[1,1-]	0.17	0.099	
67-66-3	Chloroform	0.051	0.099	J
71-55-6	Trichloroethane[1,1,1-]	9.4	0.099	
79-01-6	Trichloroethene	1.6	0.099	

Well:	**54-2009**	**FY2000 1st Quarter**
Depth:	**62 FT**	**MDA L**
Date:	**11/19/99**	
Sample ID:	**MD54-99-0054**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-35-4	Dichloroethene[1,1-]	5.3	2.3	
75-34-3	Dichloroethane[1,1-]	5	2.3	
71-55-6	Trichloroethane[1,1,1-]	140	2.3	

Well:	**54-1015**	**FY2000 1st Quarter**
Depth:	**350 FT**	**MDA L**
Date:	**11/23/99**	
Sample ID:	**MD54-99-0055**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-71-8	Dichlorodifluoromethane	0.0031	0.00048	
75-69-4	Trichlorofluoromethane	0.0067	0.00048	
109-66-0	Pentane	0.0009	0.0012	J
75-35-4	Dichloroethene[1,1-]	0.0084	0.00048	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.022	0.00048	
75-09-2	Methylene Chloride	0.00076	0.00048	
75-34-3	Dichloroethane[1,1-]	0.00091	0.00048	
67-66-3	Chloroform	0.00044	0.00048	J
71-55-6	Trichloroethane[1,1,1-]	0.056	0.00048	
110-82-7	Cyclohexane	0.001	0.0012	J
56-23-5	Carbon Tetrachloride	0.00072	0.00048	
79-01-6	Trichloroethene	0.019	0.00048	
108-88-3	Toluene	0.00041	0.00048	J
127-18-4	Tetrachloroethene	0.0033	0.00048	
67-56-1	Methanol	0.0039	0.024	J
67-64-1	Acetone	0.0031	0.012	J

Well:	**54-2022**	**FY2000 1st Quarter**
Depth:	**60 FT**	**MDA L**
Date:	**11/29/99**	
Sample ID:	**MD54-99-0056**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-35-4	Dichloroethene[1,1-]	1.2	2.2	J
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.9	2.2	J
75-09-2	Methylene Chloride	3.1	2.2	
75-34-3	Dichloroethane[1,1-]	4	2.2	
71-55-6	Trichloroethane[1,1,1-]	140	2.2	
79-01-6	Trichloroethene	37	2.2	
79-00-5	Trichloroethane[1,1,2-]	22	2.2	
127-18-4	Tetrachloroethene	1.8	2.2	J

Well:	**54-2022**	**FY2000 1st Quarter**
Depth:	**60 FT**	**MDA L**
Date:	**11/29/99**	
Sample ID:	**MD54-99-0057**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-35-4	Dichloroethene[1,1-]	1.1	2.2	J
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.9	2.2	J
75-09-2	Methylene Chloride	3	2.2	
75-34-3	Dichloroethane[1,1-]	3.9	2.2	
71-55-6	Trichloroethane[1,1,1-]	140	2.2	
79-01-6	Trichloroethene	35	2.2	
127-18-4	Tetrachloroethene	1.6	2.2	J

Well:	**54-2022**	**FY2000 1st Quarter**
Depth:	**NA (BLANK)**	**MDA L**
Date:	**11/29/99**	
Sample ID:	**MD54-99-0058**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.0023	0.0045	J
75-09-2	Methylene Chloride	0.0038	0.0045	J
75-34-3	Dichloroethane[1,1-]	0.0045	0.0045	
71-55-6	Trichloroethane[1,1,1-]	0.17	0.0045	
79-01-6	Trichloroethene	0.043	0.0045	

Well:	**54-2002**	**FY2000 1st Quarter**
Depth:	**180 FT**	**MDA L**
Date:	**12/1/99**	
Sample ID:	**MD54-99-0059**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-69-4	Trichlorofluoromethane	38	3.6	
75-35-4	Dichloroethene[1,1-]	9.9	3.6	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	76	3.6	
75-09-2	Methylene Chloride	51	3.6	
75-34-3	Dichloroethane[1,1-]	7.5	3.6	
67-66-3	Chloroform	13	3.6	
71-55-6	Trichloroethane[1,1,1-]	400	3.6	
56-23-5	Carbon Tetrachloride	2.2	3.6	J
71-43-2	Benzene	2.5	3.6	J
79-01-6	Trichloroethene	120	3.6	
78-87-5	Dichloropropane[1,2-]	17	3.6	
108-88-3	Toluene	6.9	3.6	
127-18-4	Tetrachloroethene	8.8	3.6	
60-29-7	Diethyl Ether	4.4	9.1	J

Well:	**54-2088**	**FY2000 1st Quarter**
Depth:	**46 FT**	**MDA L**
Date:	**12/2/99**	
Sample ID:	**MD54-99-0060**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-69-4	Trichlorofluoromethane	81	26	
75-35-4	Dichloroethene[1,1-]	49	26	
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	400	26	
75-34-3	Dichloroethane[1,1-]	54	26	
67-66-3	Chloroform	39	26	
71-55-6	Trichloroethane[1,1,1-]	2700	26	
56-23-5	Carbon Tetrachloride	17	26	J
79-01-6	Trichloroethene	350	26	
78-87-5	Dichloropropane[1,2-]	71	26	

Well:	**54-2012**	**FY2000 1st Quarter**
Depth:	**28 FT**	**MDA L**
Date:	**12/2/99**	
Sample ID:	**MD54-99-0061**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
75-35-4	Dichloroethene[1,1-]	15	27	J
76-13-1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	51	27	
75-09-2	Methylene Chloride	270	27	
75-34-3	Dichloroethane[1,1-]	140	27	
71-55-6	Trichloroethane[1,1,1-]	3500	27	
79-01-6	Trichloroethene	2600	27	
127-18-4	Tetrachloroethene	160	27	

Well:	**NA (Performance Blank)**	**FY2000 1st Quarter**
Depth:	**NA**	**MDA L**
Date:	**11/29/99**	
Sample ID:	**MD54-99-0062**	

CAS Analyte Code	Compound Analyte Code Desc	Result (ppmv)	Reporting Limit (ppmv)	Qualifier
71-55-6	Trichloroethane[1,1,1-]	1400	12	
79-01-6	Trichloroethene	250	12	

ATTACHMENT 1

FIELD SUMMARY

The following data spreadsheets summarize the screening results for the boreholes that were sampled for the first quarter FY2000. In this quarter's sampling event the field screening included all available wells, including those maintained by the Performance Assessment Monitoring Group (PAMG). Our list of available wells has been updated to remove some that have been taken out of service because of either failure of the SEAMIST membranes or irreparable blocked ports.

SUMMA canister sampling was conducted on the following twelve wells:

LANL Sample ID	Well ID
MD54-99-0048	54-2029 Area L*
MD54-99-0049	54-2023 Area L*
MD54-99-0050	54-2026 Area L*
MD54-99-0051	54-2030 Area L*
MD54-99-0052	54-2033 Area G*
MD54-99-0053	54-2034 Area L*
MD54-99-0054	54-2009 Area G*
MD54-99-0055	54-1015 Area L
MD54-99-0056	54-2022 Area L*
MD54-99-0057	54-2022 Area L* (Duplicate of MD54-99-0056)
MD54-99-0058	54-2022 Area L* (Equipment Blank)
MD54-99-0059	54-2002 Area L*
MD54-99-0060	54-2088 Area L
MD54-99-0061	54-2012 Area L*
MD54-99-0062	Performance Blank

Note: * Denotes wells on the defined sampling.

Eight area L wells from the defined sampling list were sampled. The two required Area G wells were sampled. Two discretionary wells were sampled at MDA L. The nitrogen purge equipment blank, field duplicate and calibration gas sample were all collected. In summary:

- The 12 planned wells were all sampled.
- Eight of the ten wells for MDA L were on the defined sampling list as planned. The two discretionary wells at MDA L were sampled as planned.
- Two of the four MDA G wells were sampled, as planned.
- All quality control samples were collected as planned.

Blank
SUMMA Canister Quanterra SUMMA ID # 92070
SMO Sample ID - MD54-99-0058

Duplicate
SUMMA Canister Quanterra SUMMA ID # 0077
SMO Sample ID -MD54-99-0057

Calibration QC Sample
SUMMA Canister Quanterra SUMMA ID #12272
SMO Sample ID -MD54-99-0062

Well 54-1015 low concentration well
SUMMA Canister Quanterra SUMMA ID # 03849
SMO Sample ID - MD54-99-0055
Sampling Date - November 23, 1999
Atmospheric Pressure 11.41 psi, Temperature 30 F
SUMMA vacuum pressure -0.01 psi.
SUMMA pressure when full 11.37 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	10:54	-0.116	0.286	-0.251	1.8	344	5,060	0.055	
Ambient 2	10:57	-0.178	0.285	-0.236	1.67	351	4,800	0.055	
Ambient 3	11:00	-0.166	0.249	-0.242	1.73	340	4,740	0.055	
Low standard	11:03	41.5	6.52	-0.304	1.68	39.9	3,570	NA	
Purge	11:05	0.362	0.38	-0.237	1.69	329	4,300	NA	
High standard	11:07	384	62.3	-0.949	2.68	35	3,270	NA	
Purge	11:10	0.696	0.735	-0.221	1.61	336	4,250	0.12	
45 ft.	11:12	-0.207	0.482	-0.244	1.73	751	6,610	0.13	
187 ft.	11:15	-0.473	0.562	-0.229	1.79	981	7,000	0.135	
350 ft.	11:20	14.5	-39	-13	130	1,300	7,460	0.085	
385 ft.	11:22	0.964	-0.17	-0.43	3.33	360	6,380	0.085	Possibly Plugged
435 ft.	11:24	0.115	0.365	-0.272	1.79	345	6,140	0.085	Possibly Plugged
485 ft.	11:31	0.263	0.322	-0.246	1.71	339	5,850	0.085	
525 ft.	11:36	0.277	0.424	-0.261	1.72	346	7,310	0.085	
SUMMA 350 ft.	12:00	15.4	-31	-10	112	1130	8,150	0.09	

Well 54-1016 low concentration well
Sampling Date - November 23,1999
Atmospheric Pressure 11.39 psi, Temperature 20 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:35	-0.738	0.401	-0.287	1.95	438	4,360	0.035	
Ambient 2	9:40	-0.592	0.28	-0.265	1.87	365	4,520	0.035	
Ambient 3	9:45	-0.56	0.318	-0.265	1.81	368	4,510	0.035	
Low standard	9:50	45.2	6.76	-0.29	1.68	28.3	2,920	NA	
Purge	9:55	-0.008	0.376	-0.245	0.8	350	4,330	NA	
High standard	9:57	407	60.7	-1	3.35	18.2	3,070	NA	
Purge	9:59	0.626	0.824	-0.244	1.74	340	4,770	NA	
36 ft.	10:04	-1.2	0.726	-0.268	2.05	1,210	6,470	0.14	
188 ft.	10:06	34.8	-79	-28	255	866	7,520	0.105	
318 ft.	10:10	0.542	-4.1	-1.8	14.7	352	5,780	0.08	Possibly Plugged
390 ft.	10:23	0.04	0.248	-0.351	2.36	378	6,760	0.145	
481 ft.	10:28	0.165	-2.1	-1.1	8.76	348	5,670	0.085	Possibly Plugged
533 ft.	10:33	-0.278	0.17	-0.254	1.83	341	5,610	0.085	Possibly Plugged
601 ft.	10:38	1.12	-6.7	-3	23.1	488	6,040	0.12	

Well 54-1018 low concentration well
Sampling Date - Not Sampled due to failed sock.
Atmospheric Pressure _____, Temperature _____ C
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1									
Ambient 2									
Ambient 3									
Low standard								NA	
Purge								NA	
High standard								NA	
21.7 ft.									
39.2 ft.									
50.6 ft.									
70.7 ft.									
111.2 ft.									
123.7 ft.									
141.4 ft.									
181.1 ft.									
228.5 ft.									
254.7 ft.									
263.3 ft.									
306 ft.									
SUMMA ft.									

Well 54-2010 low concentration well Area G
Sampling Date - November 16,1999
Atmospheric Pressure 11.46 psi., Temperature 50 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	10:50	-1.4	0.247	-0.251	1.85	476	3,230	0.05	
Ambient 2	10:55	-0.544	0.198	-0.234	1.72	380	3,100	0.05	
Ambient 3	11:00	-0.574	0.237	-0.242	1.71	378	3,190	0.05	
Low standard	11:05	42.8	6.62	-0.287	1.62	68.9	2,780	NA	
Purge	11:10	-0.151	-0.349	-0.242	1.72	402	3,400	NA	
High standard	11:13	393	62.1	-0.946	2.87	62.1	2,830	NA	
Purge	11:15	0.193	0.523	-0.227	1.77	405	3,430	NA	
30 ft.	11:20	-0.294	1.32	-0.448	6.76	35,800	13,800	3.76	
53 ft.	11:30	-22	1.59	-0.385	7.03	38,900	14,700	3.76	
95 ft.	11:40	-20	1.52	-0.32	6.75	31,700	14,900	3.5	

Well 54-2013 low concentration well
Sampling Date - November 8,1999
Atmospheric Pressure 11.56 psi, Temperature 60 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	11:00	-0.548	0.255	-0.253	1.79	415	5,330	0.065	
Ambient 2	11:05	-0.334	0.236	-0.247	1.74	346	5,350	0.065	
Ambient 3	11:10	-0.393	0.25	-0.24	1.68	368	5,580	0.065	
Low standard	11:15	43.3	6.44	-0.289	1.64	24.7	3,090	NA	
Purge	11:20	0.038	0.35	-0.242	1.74	358	5,500	NA	
High standard	11:25	407	63.3	-1	2.72	16.2	3,190	NA	
Purge	11:30	-0.016	0.316	-0.237	1.66	347	5,720	NA	
20 ft.	11:35	-6	0.521	-0.382	2.61	4.61	15,100	0.46	
43 ft.									Plugged Port
63 ft.									Plugged Port

Well 54-2023 low concentration well Area L
SUMMA Canister Quanterra SUMMA ID # 9718B
SMO Sample ID - MD54-99-0049
Sampling Date - November 17, 1999
Atmospheric Pressure 11.36 psi, Temperature 40 F
SUMMA vacuum pressure -0.01 psi.
SUMMA pressure when full 11.43 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:05	-0.674	0.409	-0.356	2.45	406	8,990	0.065	
Ambient 2	9:08	-0.64	0.369	-0.363	2.49	385	10,500	0.065	
Ambient 3	9:10	-0.627	0.363	-0.346	2.38	381	11,400	0.065	
Low standard	9:15	44.1	6.83	-0.369	2.1	61	10,100	NA	
Purge	9:17	-0.042	0.579	-0.296	2	370	9,210	NA	
High standard	9:22	417	65.3	-1.1	3.18	36.2	6,190	NA	
Purge	9:30	0.606	0.842	-0.236	1.74	349	6,520	NA	
20 ft.	9:36	-17	2.12	-0.345	6.84	17,800	14,300	1.815	
40 ft.	9:40	-11	2.67	-0.216	6.68	14,800	14,000	1.505	
60 ft.	9:45	0.87	1.21	-0.243	2.35	1,620	9,280	0.5	
80 ft.	9:50	2.47	2.24	-0.152	3.72	4,090	10,600	0.94	
100 ft.	9:55	9.18	4.14	-0.112	6.74	8,450	13,700	0.855	
120 ft.	10:00	11	4.15	-0.184	7.04	7,540	13,200	0.715	
140 ft.	10:05	3.04	1.67	-0.149	2.89	1,870	9,440	0.575	
159 ft	10:09	12.5	4.08	0.196	6.73	5630	14200	0.585	
180 ft.	10:15	11.4	3.84	-0.208	6.38	4950	13300	0.52	
200 ft.	10:19	10.8	3.55	0.237	6.19	4440	15100	0.475	
SUMMA 159 ft.	10:30	14.5	4.21	0.22	6.64	5720	15600	0.585	

Well 54-2026 low concentration well
SUMMA Canister Quanterra SUMMA ID # 04729
SMO Sample ID - MD54-99-0050
Sampling Date - November 17, 1999
Atmospheric Pressure 11.40 psi, Temperature 64 F
SUMMA vacuum pressure -0.05 psi.
SUMMA pressure when full 11.40 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	11:10	-1.2	0.199	-0.236	1.79	498	5,970	0.065	
Ambient 2	11:13	-0.286	0.28	-0.218	1.54	408	4,520	0.065	
Ambient 3	11:16	-0.138	0.264	-0.22	1.5	364	4,210	0.065	
Low standard	11:21	41.6	6.97	-0.29	1.45	55.1	3,590	NA	
Purge	11:23	0.628	0.397	-0.207	1.53	336	3,550	NA	
High standard	11:28	389	65.3	-1	2.31	37.3	3,230	NA	
Purge	11:33	1.25	0.907	-0.221	1.55	341	3,440	NA	
20 ft.	11:40	-1	1.06	-0.292	2.28	5,650	10,600	0.585	
60 ft.	11:45	-0.666	1.26	-0.259	2.48	5,170	11,600	0.438	
100 ft.	11:49	0.0161	1.18	-0.212	2.68	4,530	12,200	0.47	
160 ft.	11:53	0.396	1.18	-0.185	2.73	3,800	12,600	0.41	
200 ft.	11:57	0.0689	1.15	-0.19	2.58	3,580	12,900	0.39	
215 ft.	12:02	-0.302	0.838	-0.169	2.42	3,180	16,400	0.35	
SUMMA 60 ft.	12:10	-0.583	1.02	-0.253	2.54	5,170	13,800	0.535	

Well 54-2028 low concentration well
Sampling Date - November 16, 1999
Atmospheric Pressure 11.42 Temperature 72 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	14:25	-8.4	-0.013	-0.283	2.4	1220	5,350	0.05	
Ambient 2	14:30	-2.7	0.0142	-0.221	1.73	580	4,380	0.05	
Ambient 3	14:33	-2.2	0.12	-0.229	1.77	551	4,010	0.05	
Low standard	14:35	40.4	7.03	-0.267	1.67	233	2,890	NA	
Purge	14:38	-0.649	-0.34	-0.255	1.72	444	3,570	NA	
High standard	14:42	403	68.3	-0.996	2.43	143	2,330	NA	
Purge	14:45	0.338	0.741	-0.21	1.6	400	3,310	NA	
20 ft.	14:50	-1.5	0.905	-0.247	2.44	4,160	9,490	4.4	
60 ft.	14:55	-0.669	1.19	-0.244	2.71	4,220	10,300	4.35	
100 ft.	15:00	0.348	1.59	-0.239	2.83	4,330	10,400	0.405	
160 ft.	15:05	0.118	0.854	-0.202	3.04	3,340	10,800	0.36	
200 ft.	15:10	-0.262	0.903	-0.169	2.67	2,970	12,400	0.33	
220 ft.	15:15	-0.996	0.668	-0.186	2.42	2,590	12,000	0.32	
250 ft.	15:20	-0.0697	0.683	-0.192	2.44	2600	11,500	0.3	

Well 54-2029 low concentration well Area L
SUMMA Canister Quanterra SUMMA ID #12460
SMO Sample ID - MD54-99-0048
Sampling Date - November 16, 1999
Atmospheric Pressure 11.41 psi., Temperature 62 F
SUMMA vacuum pressure -0.10 psi.
SUMMA pressure when full 11.40 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	15:25	-0.697	0.683	-0.192	2.44	2600	11,500	0.075	
Ambient 2	15:30	-0.128	0.218	-0.243	1.63	391	4,100	0.075	
Ambient 3	15:35	-0.062	0.194	-0.219	1.55	367	3,660	0.075	
Low standard	15:40	41.4	7.23	-0.272	1.47	60.9	3,310	NA	
Purge	15:45	1.32	0.792	-0.208	1.61	342	3280	NA	
High standard	15:47	374	64.1	-0.989	2.16	64.4	3,420	NA	
Purge	15:50	1.32	0.792	-0.208	1.61	342	3280	NA	
20 ft.	15:55	-1.3	0.605	-0.289	1.88	3,660	10,300	0.395	
60 ft.	16:00	-1.1	0.507	-0.265	1.98	3,470	10,800	0.38	
100 ft.	16:05	-1.1	0.593	-0.254	1.98	3,220	11,200	0.355	
160 ft.	16:10	-1.3	0.589	-0.259	1.93	2,920	11,500	0.33	
200 ft.	16:15	-1.2	0.496	-0.235	1.86	2,700	11,900	0.305	
220 ft.	16:20	-1.2	0.464	-0.264	1.89	2,560	12,000	0.295	
260 ft.	16:25	-1.2	0.431	-0.249	1.78	2330	11,800	0.275	
288 ft.	16:30	-1.2	0.487	-0.291	1.87	2,170	11,900	0.265	
SUMMA 20 ft.	16:35	-1.6	0.526	-0.269	1.85	3,670	11,800	0.4	

Well 54-2030 low concentration well Area L
SUMMA Canister Quanterra SUMMA ID #92092
SMO Sample ID - MD54-99-0051
Sampling Date - November 18, 1999
Atmospheric Pressure 11.38 psi., Temperature 50 F
SUMMA vacuum pressure 0.10 psi.
SUMMA pressure when full 11.38 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:30	-1.2	0.207	-0.25	1.85	444	3,430	0.04	
Ambient 2	9:35	-0.0652	0.245	-0.235	1.7	417	3,450	0.04	
Ambient 3	9:40	-0.477	0.278	-0.233	1.69	357	3,460	0.04	
Low standard	9:45	43.1	6.64	-0.272	1.59	43.6	1,940	NA	
Purge	9:50	-0.226	0.318	-0.24	1.68	349	3,380	NA	
High standard	9:55	406	65	-0.968	2.98	34.1	1,930	NA	
Purge	10:00	0.159	0.494	-0.227	1.69	342	3,360		
20 ft.	10:05	-9	0.558	-0.345	2.7	5,100	8,930	0.495	
60 ft.	10:10	-7.9	0.709	-0.324	2.94	5,020	9,580	0.495	
100 ft.	10:15	-7.1	0.78	-0.29	2.95	4,700	10,100	0.465	
160 ft.	10:20	-6.1	0.69	-0.266	2.86	4,130	10,300	0.415	
200 ft.	10:25	-5.5	0.613	-0.249	2.63	3,660	10,600	0.38	
220 ft.	10:30	-5.1	0.602	-0.243	2.5	3,410	10,700	0.355	
243 ft.	10:35							0.1	Blocked Port
SUMMA 100 ft.	10:45	-5.6	0.727	-0.267	2.79	4,650	10,700	0.47	

Well 54-2032 low concentration well Area G

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	14:55	0.073	0.221	-0.229	1.62	334	4,730	0.035	
Ambient 2	15:00	0.186	0.224	-0.22	1.53	324	4,090	0.035	
Ambient 3	15:05	0.152	0.253	-0.221	1.5	337	3,970	0.035	
Low standard	15:10	37.2	6.49	-0.272	1.41	59.6	3,080	NA	
Purge	15:15	1.84	0.504	-0.216	1.54	319	3,670	NA	
High standard	15:20	344	58.7	-0.914	1.85	40.2	2,890	NA	
20 ft.	15:30	2.02	0.703	-0.371	2.35	7,220	12,100	0.75	
60 ft.	15:35	3.61	0.832	-0.325	2.27	7,470	13,400	0.74	
100 ft.	15:40	4.09	0.763	-0.29	2.21	6,620	11,700	0.695	
130 ft.	15:40								Plugged Port
156 ft.	15:45	5.04	0.813	-0.264	2.41	7,620	12,700	0.745	

Well 54-2033 low concentration well Area G
SUMMA Canister Quanterra SUMMA ID #12829
SMO Sample ID - MD54-99-0052
Sampling Date - November 18, 1999
Atmospheric Pressure 11.39 psi., Temperature 52 F
SUMMA vacuum pressure 0.02 psi.
SUMMA pressure when full 11.39 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	10:50	-1.1	0.155	-0.221	1.7	431	4,800	0.05	
Ambient 2	10:55	-0.345	0.214	-0.241	1.64	351	4,000	0.05	
Ambient 3	11:00	-0.911	0.201	-0.223	1.65	370	4,200	0.05	
Low standard	11:05	41.7	6.97	-0.284	1.56	52.8	3,250	NA	
Purge	11:10	0.594	0.553	-0.234	1.59	380	4,100	NA	
High standard	11:15	381	62.7	-0.965	2.35	43	3,100	NA	
Purge	11:20	0.948	0.769	-0.217	1.58	329	3,440	NA	
20 ft.	11:25	-5.4	0.537	-0.326	2.16	4780	10,100	0.39	
60 ft.	11:30	-4.5	0.503	-0.294	2.03	4090	10,600	0.34	
100 ft.	11:35	-4.7	0.437	-0.284	2.04	3960	10,900	0.415	
160 ft.	11:40	-4.4	0.426	-0.275	1.98	3720	11,300	0.39	
200 ft.	11:45	-2.9	0.467	-0.296	1.88	2800	10,600	0.36	
220 ft.	11:50	-3.5	0.438	-0.286	1.91	3230	11,700	0.35	
260 ft.	11:55	-1.8	0.428	-0.263	1.72	2020	9,970	0.31	
277 ft.	12:00	-0.765	0.433	-0.228	1.78	2000	9,860	0.3	
SUMMA 20 ft.	12:05	-4.2	0.559	-0.336	1.97	4780	11,500	0.495	

Well 54-2034 low concentration well Area L
SUMMA Canister Quanterra SUMMA ID #11156
SMO Sample ID - MD54-99-
Sampling Date - November 19, 1999
Atmospheric Pressure 11.37 psi., Temperature 60 F
SUMMA vacuum pressure 0.23 psi.
SUMMA pressure when full 11.37 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	2:00	-0.677	0.202	-0.235	1.66	396	4,480	0.045	
Ambient 2	2:05	-0.187	0.227	-0.219	1.57	341	3,690	0.045	
Ambient 3	2:10	-0.022	0.188	-0.218	1.57	335	3,500	0.045	
Low standard	2:15	41.8	7.07	-0.284	1.47	40	3,920	NA	
Purge	2:20	0.458	0.364	-0.219	1.61	327	3,400	NA	
High standard	2:25	380	63.9	-0.939	2.42	48.1	3,760	NA	
Purge	2:30	1.3	0.894	-0.183	1.6	354	3,380	NA	
20 ft.	2:35	-6.4	1.06	-0.415	2.64	10,700	11,600	1.08	
60 ft.	2:40	-4.7	1.1	-0.372	2.52	8,190	14,900	0.83	
100 ft.	2:45	-4.2	1.05	-0.352	2.45	7,250	13,500	0.72	
160 ft.	2:50	-4.2	0.681	-0.284	2.24	5,050	13,700	0.515	
200 ft.	2:55	-3.7	0.452	-0.243	2.17	4,010	13,700	0.425	
220 ft.	3:00	-3	0.478	-0.261	2.03	3,420	13,300	0.39	
260 ft.	3:05	-2.8	0.418	-0.279	1.89	2440	13,400	0.3	
300 ft.	3:10							0.11	Port Blocked
SUMMA 60 ft.	3:15	-3	1.04	-0.359	2.32	8160	16300	0.83	

Well 54-2009 medium concentration well Area G
SUMMA Canister Quanterra SUMMA ID #93286
SMO Sample ID - MD54-99-
Sampling Date - November 19, 1999
Atmospheric Pressure 11.54 psi., Temperature 32 F
SUMMA vacuum pressure -0.01 psi.
SUMMA pressure when full 11.52 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:07	-1.7	0.208	-0.256	1.89	473	2,670	0.065	
Ambient 2	9:14	-7.15	0.224	-0.251	1.76	370	2,770	0.065	
Ambient 3	9:16	-0.598	0.211	-0.247	1.77	352	2,780	0.065	
Low standard	9:24	43.7	6.68	-0.286	1.63	52.2	1,940	NA	
Purge	9:26	0.115	0.424	-0.233	1.71	336	2,830	NA	
High standard	9:31	412	64.4	-0.992	3.41	40.7	1,890	NA	
Purge	9:36	0.778	0.851	-0.224	1.73	335	2,860	NA	
37 ft.	9:56	41.2	0.474	-0.629	4.77	13,700	8,490	1.33	
62 ft.	10:00	53.6	0.437	-0.619	5.15	13,200	9,300	1.255	
79 ft.									Port Blocked
92 ft.	10:04	44.1	0.44	-0.438	4.25	10,100	9,320	0.855	
SUMMA 62 ft.	10:18	56.8	0.51	-0.61	4.98	13,400	10,700	1.265	

Well 54-2020 medium concentration well
Sampling Date - November 22,1999
Atmospheric Pressure 11.25 psi., Temperature 30 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	14:50	-0.271	0.392	-0.237	1.65	357	6,980	0.095	
Ambient 2	14:52	-0.19	0.332	-0.247	1.67	344	6,820	0.095	
Ambient 3	14:54	-0.208	0.32	-0.248	1.66	342	6,940	0.095	
Low standard	14:59	42.6	6.74	-0.293	1.62	40.5	4,270	NA	
Purge	15:01	0.281	0.42	-0.228	1.66	334	6,440	NA	
High standard	15:06	403	64	-1	2.96	21.1	4,430	NA	
Purge	15:11	0.385	0.653	-0.236	1.71	336	6,500	NA	
20 ft.	15:18	18.9	3.42	0.748	9.04	5,630	6,900	0.53	
40 ft.	15:22	32.4	4.85	1.2	12.3	5,730	6,930	0.52	
60 ft.	15:26	39.1	5.27	1.37	13.8	5,470	6,880	0.48	
80 ft.	15:30	53.7	7.53	1.55	15.9	5,270	6,830	0.48	
95 ft.	15:34	54.6	6.62	1.51	16.3	5,050	6,870	0.41	
120 ft.	15:40	52.4	6.1	1.22	16.2	4,480	6,950	0.39	
140 ft.	15:43	54.9	7.29	1.04	16.2	4,200	6,940	0.39	
160 ft.	15:50	31.9	4.55	0.433	9.78	2,410	6,860	0.35	
180 ft.	15:54	27.3	4.19	0.348	8.67	2,060	6,730	0.22	
200 ft.	15:58	37.9	5.8	0.893	14.5	4,000	6,980	0.40	

Well 54-2021 medium concentration well Area L
Sampling Date - November 23,1999
Atmospheric Pressure 11.38 psi., Temperature 40 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	13:57	-0.109	0.134	-0.274	2.2	349	4,320	0.07	
Ambient 2	13:59	-0.141	0.273	-0.245	1.72	340	4,100	0.07	
Ambient 3	14:01	-0.058	0.298	-0.249	1.68	337	3,810	0.07	
Low standard	14:06	43.2	7.03	-0.295	1.67	33.6	4,700	NA	
Purge	14:09	0.177	0.317	-0.244	1.77	365	3,940	NA	
High standard	14:13	387	62.6	-0.969	2.84	34.5	4,510	NA	
Purge	14:19	0.314	0.328	-0.23	1.77	327	4,100	NA	
20 ft.	14:26	13.4	4.83	-0.406	3.44	7,850	6,800	0.51	
40 ft.	14:32	6.51	2.37	-0.29	2.21	1690	5960	0.1	
60 ft.	15:35	27.4	7.22	-0.332	3.65	6,300	8,090	0.325	
80 ft.	14:46	17.4	4.6	-0.286	2.51	2,720	6,140	0.175	
100 ft.	14:52	30.8	6.9	-0.302	3.48	5,250	6,820	0.255	
120 ft.									Port Blocked
140 ft.	15:11	28.3	6.52	-0.224	3.64	5,080	7,100	0.26	
160 ft.	15:17	10.6	3.16	-0.228	2.54	2100	6230	0.125	
180 ft.	15:23	22.9	5.5	-0.18	3.49	5090	7570	0.125	
200 ft.	15:30	13.5	4.05	-0.095	3.12	4090	7820	0.24	

Well 54-2022 medium concentration well Area L
Blank
SUMMA Canister Quanterra SUMMA ID #92070
SMO Sample ID - MD54-99-0058

SUMMA Canister Quanterra SUMMA ID #04734
SMO Sample ID - MD54-99-0056
Sampling Date - November 29, 1999
Atmospheric Pressure 11.59 psi, Temperature 45 F
SUMMA vacuum pressure 0.08 psi.
SUMMA pressure when full 11.59 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

Calibration QC Sample
SUMMA Canister Quanterra SUMMA ID #12272
SMO Sample ID - MD54-99-0062

Duplicate
SUMMA Canister Quanterra SUMMA ID #0077
SMO Sample ID - MD54-99-0057

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	1:00	-0.259	0.226	-0.235	1.79	358	4,940	0.065	
Ambient 2	1:05	-0.251	0.261	-0.229	1.63	349	5,600	0.065	
Ambient 3	1:10	-0.266	0.216	-0.22	1.6	405	5,020	0.065	
Low standard	1:15	38.6	6.72	-0.282	1.64	178	5,910	NA	
Purge	1:20	0.96	0.818	-0.236	1.63	359	5,570	NA	
High standard	1:25	392	62.9	-0.963	2.67	68.4	5,710	NA	
Purge	1:30	0.56	0.588	-0.219	1.56	334	5,010	NA	
20 ft.	1:35	39.9	11	-0.519	4.2	12,500	8,880	0.615	
40 ft.	1:40	65.6	15.7	-0.505	4.36	10,700	8,680	0.905	
60 ft.	1:45	73.7	16.7	-0.449	4.38	9,270	8,820	0.845	
80 ft.	1:50	73.8	16.3	-0.401	4.28	8,300	8,900	0.68	
100 ft.	1:55	25	7.48	-0.333	2.53	3,590	7,300	0.645	
120 ft.	2:00	60	13.4	-0.29	3.77	7,420	8,680	0.62	
140 ft.	2:05	45.7	11.3	-0.175	3.42	6,360	8,800	0.745	
160 ft.	2:10	33.8	7.62	-0.087	3.12	5,150	8,550	0.32	
180 ft.	2:15	15.7	3.92	-0.123	2.33	2,700	7,520	0.22	
200 ft.	2:20	16.1	4	-0.03	2.82	4,140	8,430	0.24	
SUMMA 60 ft.	2:25	74.5	17	-0.453	4.23	9,270	8,960	0.825	

Well 54-2024 medium concentration well
Sampling Date - November 24,1999
Atmospheric Pressure 11.39, Temperature 34 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:07	-1.00	0.35	-0.26	1.84	455	4970	0.070	
Ambient 2	9:09	-6.06	0.24	-0.24	1.74	379	4530	0.070	
Ambient 3	9:12	-0.53	0.26	-0.25	1.74	371	4510	0.070	
Low standard	9:17	44.00	6.91	-0.28	1.57	59	2460	NA	
Purge	9:19	0.03	0.42	-0.24	1.71	352	4290	NA	
High standard	9:24	407.00	64.00	-1.00	3.15	36	2510	NA	
Purge	9:29	0.27	0.64	-0.22	1.69	352	4400	NA	
20 ft.	9:37	2.73	2.26	0.26	5.88	5940	5890	0.320	
40 ft.	9:42	6.50	2.85	0.45	6.79	5980	6030	0.295	
60 ft.	9:46	12.10	3.52	0.63	7.99	5760	6190	0.280	
80 ft.	9:52	18.30	4.13	0.79	9.06	5450	6240	0.250	
100 ft.	9:56	21.50	4.59	0.83	9.80	5170	6370	0.240	
120 ft.	10:00	23.60	5.10	0.75	9.65	4890	6470	0.225	
140 ft.	10:04	28.30	5.45	0.80	11.20	4680	6760	0.215	
160 ft.	10:09	29.30	5.57	0.72	11.50	4500	6840	0.195	
180 ft.	10:13	20.60	4.13	0.39	8.41	2950	6260	0.145	
200 ft.								0.080	Port Blocked

Well 54-2025 medium concentration well
Sampling Date - November 19,1999
Atmospheric Pressure 11.39, Temperature 34 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	10:50	-1.9	0.247	-0.258	1.9	557	4,240	0.065	
Ambient 2	10:52	-0.592	0.246	-0.248	1.72	383	3,340	0.065	
Ambient 3	10:55	-0.478	0.235	-0.225	1.67	370	3,200	0.065	
Low standard	11:00	40	6.6	-0.292	1.62	103	2,890	NA	
Purge	11:02	0.223	0.404	-0.221	1.61	344	2,860	NA	
High standard	11:06	403	65.8	-1	2.75	51.8	2,690	NA	
Purge	11:11	0.898	0.753	-0.211	1.59	331	2,690	NA	
20 ft.	11:17	50.2	8.36	2.96	13.8	5,960	8,260	0.585	
60 ft.	11:22	4.42	1.36	-0.177	2.11	517	6,390	0.095	Possibly Plugged
100 ft.	11:27	112	16.7	5.5	27.3	6,450	8,840	0.625	
160 ft.	11:31	98.2	15.3	4.13	25.4	5,910	9,330	0.56	
190 ft.	11:36	20.4	4.28	0.548	7.88	2,610	9,230	0.11	Loose fittings at well head

Well 54-2027 medium concentration well
Sampling Date - November 19,1999
Atmospheric Pressure 11.47, Temperature 60 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	13:39	-0.426	0.35	-0.247	1.74	366	6,220	0.075	
Ambient 2	13:41	-0.402	0.247	-0.243	1.79	350	6,490	0.075	
Ambient 3	13:44	-0.343	0.283	-0.249	1.75	346	6,520	0.075	
Low standard	13:49	43.3	6.79	-0.28	1.66	38.8	3,640	NA	
Purge	13:52	0.125	0.466	-0.244	1.74	336	6,570	NA	
High standard	13:56	413	65.6	-0.997	3.11	19.3	3,450	NA	
Purge	14:02	0.549	0.792	-0.233	1.7	337	6,650	NA	
20 ft.	14:09	-2.9	1.68	-0.189	4.48	5,670	7,170	0.55	
100 ft.	14:15	5.52	2.65	0.008	6.38	5,300	7,290	0.54	
60 ft.	14:17	10.6	3.28	0.102	7.31	4,920	7,380	0.485	
160 ft.	14:21	3.71	1.64	-0.107	3.83	2,030	7,120	0.365	
200 ft.	14:26	7.1	2.38	0.185	6.24	3,540	7,270	0.35	
220 ft.	14:30	0.996	0.899	-0.159	2.67	1,030	6,920	0.245	
250 ft.	14:34	-0.529	0.636	-0.201	2.36	1190	6,910	0.24	

Well 54-2031 medium concentration well Area L
Sampling Date - November 22,1999
Atmospheric Pressure 11.22, Temperature 30 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	10:23	-0.733	0.245	-0.252	1.9	387	3,680	0.07	
Ambient 2	10:25	-0.679	0.292	-0.269	1.85	372	4,320	0.07	
Ambient 3	10:28	-0.578	0.27	-0.254	1.79	3.52	4,410	0.07	
Low standard	10:33	45.8	6.71	-0.288	1.72	47.8	2,710	NA	
Purge	10:41	4.38	2	-0.229	2.1	337	4,550	NA	
High standard	10:45	404	62.4	-1	3.19	33.6	3,130	NA	
Purge	10:50	0.983	0.993	-0.221	1.74	349	4,940	NA	
20 ft.	10:57	-17	2.51	-0.474	5.08	13,800	7,380	1.315	
60 ft.	11:02	2.66	4.33	-0.294	4.82	7,860	7,680	0.745	
100 ft.	11:06	8.92	5.13	-0.21	4.99	6,600	7,830	0.625	
160 ft.	11:10	6.82	4.04	-0.099	4.99	5,190	8,040	0.5	
200 ft.	11:14	3.75	3.06	-0.054	4.75	4,430	8,030	0.435	
220 ft.	11:19	-0.483	0.718	-0.246	2.15	901	6,910	0.305	
260 ft.	11:23	0.0922	1.15	-0.192	2.5	1,420	6,920	0.305	

Well 54-2002 high concentration well Area L
SUMMA Canister Quanterra SUMMA ID #93026
SMO Sample ID - MD54-99-0059
Sampling Date - December 1,1999
Atmospheric Pressure 11.43, Temperature 38 F
SUMMA vacuum pressure -0.02 psi.
SUMMA pressure when full 11.44 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:26	-0.581	0.274	-0.256	1.87	369	4,030	0.070	
Ambient 2	9:28	-0.537	0.308	-0.252	1.77	363	4,400	0.070	
Ambient 3	9:30	-0.511	0.259	-0.249	1.81	353	4,470	0.070	
Low standard	9:35	41.4	6.17	-0.276	1.69	66.7	2,130	NA	
Purge	9:37	0.104	0.449	-0.267	1.79	342	4,510	NA	
High standard	9:42	358	55.4	-0.883	2.94	62.9	2,420	NA	
Purge	9:46	0.191	0.623	-0.232	1.79	384	4,760	NA	
20 ft.									Port Blocked
40 ft.	10:00	78.9	13.6	6.58	21.2	9,220	7,890	0.605	
60 ft.	10:01	225	39.3	18	54.4	13,600	8,950	0.31	
80 ft.								0.08	Port Blocked
100 ft.	10:10	298	48.5	22.3	66.7	13,000	9,310	0.37	
120 ft.	10:14	272	41.6	21.1	61.6	11,700	9,240	0.23	
140 ft.	10:21	276	44.7	19	61.9	10500	8,990	0.295	
157 ft.								0.085	Port Blocked
180 ft.	10:32	299	49.3	21.9	64.4	11,800	9,740	0.33	
200 ft.	10:37	193	35.1	7.99	51.9	7,480	9,610	0.275	
SUMMA 180 ft.	10:46	304	51.4	21.7	63.7	11,700	9940	0.365	

Well 54-2012 high concentration well Area L
SUMMA Canister Quanterra SUMMA ID # 03541
SMO Sample ID - MD54-99-0047
Sampling Date - September 28, 1999
Atmospheric Pressure 11.46, Temperature 75 F
SUMMA vacuum pressure 0.11 psi.
SUMMA pressure when full 11.46 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	11:15	-0.478	0.252	-0.247	1.58	365	4,112	0.075	
Ambient 2	11:17	-0.532	0.241	-0.261	1.67	362	4,093	0.075	
Ambient 3	11:18	1.517	0.241	-0.258	1.53	370	4,106	0.075	
Low standard	11:20	41.3	6.22	-0.274	1.69		67	2163	
Purge	11:22	0.117	0.443	-0.267	1.55	346	4,090	NA	
High standard	11:24	424	58.5	-0.821	3.01	58.5	2,396	NA	
Purge	11:25	0.173	0.584	-0.244	1.66	291	4,123	NA	
8 ft.									Port Blocked
28 ft.	11:30	1650	764	-6.2	68.1	19,800	8,650	0.38	
42 ft.									Port Blocked
SUMMA 28 ft.	11:30	1650	764	-6.2	68.1	19,800	8,650	0.38	

Well 54-2014 high concentration well
Sampling Date - December 2,1999
Atmospheric Pressure 11.35 psi, Temperature 30 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:07	-0.479	0.305	-0.222	1.94	392	4,050	0.070	
Ambient 2	9:09	-0.271	0.303	-0.222	1.7	354	4,050	0.070	
Ambient 3	9:11	-0.307	0.286	-0.237	1.69	351	4,070	0.070	
Low standard	9:13	35.4	6.11	-0.262	1.7	170	5,540	NA	
Purge	9:15	-0.05	0.417	-0.177	1.73	312	4,863	NA	
High standard	9:16	412	57.8	-1.03	4.11	137	5,204	NA	
Purge	9:18	0.786	0.711	-0.211	1.88	369	4,799	NA	
13 ft.	9:20	724	87	15.4	130	21,300	7,270	0.325	
31 ft.								0.080	Port blocked
46 ft.									Port blocked
86 ft.									Port blocked

Well 54-2016 high concentration well
Sampling Date - September 28, 1999
Atmospheric Pressure 11.41 psi., Temperature 50 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	10:32	-1.9	0.564	-0.197	2.37	572	4,830	0.075	
Ambient 2	10:35	-0.818	0.485	-0.222	2.09	486	4,650	0.075	
Ambient 3	10:37	-0.917	0.374	-0.222	1.98	445	4,700	0.075	
Low standard	10:42	15.3	2.82	-0.239	1.97	422	4,030	NA	
Purge	10:45	-0.412	0.355	-0.211	1.87	404	4,660	NA	
High standard	10:49	347	55.1	-0.881	2.58	171	4,120	NA	
Purge	10:54	-0.154	0.63	-0.211	1.86	400	4,630	NA	
18 ft.									Port Blocked
31 ft.	11:00	202	38.2	6.86	19.6	8,680	6,860	0.225	
82 ft.									Port Blocked

Well 54-2087 high concentration well
Sampling Date - December 1,1999
Atmospheric Pressure 11.38 psi, Temperature 38 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	14:48	-1.1	0.742	-0.191	2.34	516	4,910	0.08	
Ambient 2	14:50	-0.552	0.408	-0.203	1.86	426	4,520	0.08	
Ambient 3	14:52	-0.544	0.37	-0.221	1.8	416	4,460	0.08	
Low standard	14:54	36.1	6.03	-0.27	1.72	170	5,650	NA	
Purge	14:55	-0.063	0.415	-0.199	1.73	377	4,920	NA	
High standard	14:57	345	55.8	-1.1	4.06	123	5,210	NA	
Purge	14:59	0.872	0.845	-0.211	1.91	373	4,800	NA	
13 ft.								0.08	Port Blocked
31 ft.	15:02	921	174	14	271	31,000	11,300	1.29	
46 ft.	15:08	913	172	14.8	254	30,700	12,100	0.905	
86 ft.	15:11	732	125	15.1	132	22,000	12,000	0.38	

Well 54-2088 high concentration well
SUMMA Canister Quanterra SUMMA ID #12164
SMO Sample ID - MD54-99-0060
Sampling Date - December 2,1999
Atmospheric Pressure 11.34, Temperature 30 F
SUMMA vacuum pressure -0.01 psi.
SUMMA pressure when full 11.34 psi.
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:28	-0.384	0.392	-0.218	2.01	398	4,400	0.08	
Ambient 2	9:30	-0.319	0.305	-0.21	1.72	366	4,380	0.08	
Ambient 3	9:33	-0.294	0.282	-0.234	1.73	359	4,420	0.08	
Low standard	9:34	35.4	6.11	-0.262	1.7	170	5,540	NA	
Purge	9:36	-0.05	0.417	-0.177	1.73	312	4,863	NA	
High standard	9:37	412	57.8	-1.03	4.11	137	5,204	NA	
Purge	9:38	0.786	0.711	-0.211	1.88	369	4,799	NA	
13 ft.	9:40	748	108	14.1	147	25,700	7,280	0.79	
31 ft.	9:44	728	108	14.6	150	24,700	7,680	0.535	
46 ft.	9:50	817	124	16	157	25,100	8,010	0.59	
86 ft.	9:57	771	116	16.1	134	21,100	8,180	0.57	
SUMMA 46 ft.	10:06	854	133	16.4	162	25,300	8,510	0.695	

Well 54-2089 high concentration well
Sampling Date - December 1,1999
Atmospheric Pressure 11.38 psi, Temperature 38 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	14:13	-0.071	0.392	-0.2	1.63	357	4,690	0.075	
Ambient 2	14:15	0.061	0.356	-0.221	1.71	355	4,560	0.075	
Ambient 3	14:17	0.098	0.298	-0.221	1.67	343	4,470	0.075	
Low standard	14:25	36.1	6.03	-0.27	1.72	170	5,650	NA	
Purge	14:27	-0.063	0.415	-0.199	1.73	377	4,920	NA	
High standard	14:30	345	55.8	-1.1	4.06	123	5,210	NA	
Purge	14:32	0.872	0.845	-0.211	1.91	373	4,800	NA	
13 ft.	14:34	986	116.0	10.20	126.0	30,100	10,100	1.24	
31 ft.	14:36	1,380	139	13	188	31,200	11,100	1.11	
46 ft.	14:38	1,060	154	16.3	195	29,600	11,300	0.985	
86 ft.	14:41	876	145	17.4	148	23,600	11,800	1.115	

Well 54-1126 PAM Area G well
Sampling Date - December 1, 1999
Atmospheric Pressure11.38 psi, Temperature 30 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	8:05	-0.281	0.256	-0.282	2.01	356	4,850	0.055	
Ambient 2	8:10	-0.254	0.264	-0.275	2.13	365	5,410	0.055	
Ambient 3	8:15	-0.231	0.194	-0.272	1.95	348	5,160	0.055	
Low standard	8:20	40.5	6.2	-0.269	1.77	48.2	5,200	NA	
Purge	8:25	0.565	0.351	-0.286	1.89	322	5,180	NA	
High standard	8:30	396	50.4	-0.263	2.85	46.5	5,450	NA	
15 ft.	8:35	50.4	2.9	-0.774	7.25	1,650	7,400	1.7	
35 ft.	8:40	161	274	-1.1	11.5	23,100	8,500	2.15	
57 ft.	8:45	209	2.81	-1.2	13.4	27,500	9,560	2.35	
70 ft.	8:50	251	2.9	-1.3	14.2	28,100	10,100	2.7	
85 ft.	8:55	263	2.94	-1.3	14.6	28,800	11,200	2.8	
99 ft.	9:00	260	3.22	-1.6	14.2	28,900	11,500	2.95	
99 ft.									

Well 54-1110 PAM Area G well
Sampling Date - December 1, 1999
Atmospheric Pressure11.6 psi, Temperature 30 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	1:10	-0.252	0.213	-0.227	2.56	351	5,660	0.055	
Ambient 2	1:15	-0.233	0.254	-0.217	2.45	344	5,680	0.055	
Ambient 3	1:20	-0.236	0.256	-0.225	2.58	345	5,230	0.055	
Low standard	1:25	43.2	6.8	-0.236	2.28	52.9	5,450	NA	
Purge	1:30	0.135	0.221	-0.233	2.38	341	5,460	NA	
High standard	1:35	392	59.9	-0.238	2.36	56	4,390	NA	
20 ft.	1:40	-0.1	5.84	-0.333	2.49	5,210	14,640	0.445	
48 ft.	1:45	-0.115	4.98	-0.295	2.44	5,600	13,900	0.5	
60 ft.	1:50	-0.13	4.56	-0.273	2.39	5,710	14,000	0.525	
70 ft.	1:55	-0.674	3.87	-0.281	2.34	5,730	14,300	0.54	
85 ft.	2:00	-0.705	3.84	-0.289	2.79	5,910	15,000	0.565	
90 ft.	2:05	-0.801	3.21	-0.297	2.24	5,500	13,500	0.495	

Well 54-1111 PAM Area G well
Sampling Date - December 1, 1999
Atmospheric Pressure11.39 psi, Temperature 50 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	11:25	-0.399	0.154	-0.242	1.67	390	12,500	0.055	
Ambient 2	11:30	-0.356	0.164	-0.237	1.64	360	11,900	0.055	
Ambient 3	11:35	-0.379	0.148	-0.232	1.51	360	11,300	0.055	
Low standard	11:40	42.8	6.54	-0.237	1.48	40.8	10,700	NA	
Purge	11:45	0.152	0.154	-0.242	1.55	336	10,600	NA	
High standard	11:50	395	60.1	-0.247	1.62	47.4	11,500	NA	
Port 1	11:55	2.48	5.9	-0.296	2.26	3,450	13,400	0.365	
Port 2	12:00	0.212	4.85	-0.337	2.93	4,670	15,600	0.475	
Port 3	12:05	-0.325	4.05	-0.378	3.6	4,320	12,400	0.44	
Port 4	12:10	-0.254	4.01	-0.378	2.87	4,630	14,100	0.46	
Port 5	12:15	-0.254	3.56	-0.46	2.44	4,670	13,100	0.49	
Port 6	12:20	-0.387	3.45	-0.373	2.37	4,900	15,200	0.505	
Port 6	12:25	-0.356	3.05	-0.333	2.14	4,900	15,100	0.495	

Well 54-1117 PAM Area G well (SOCK FAILURE NOT SAMPLED)
Sampling Date - December 1, 1999
Atmospheric Pressure11.6 psi, Temperature 30 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1									
Ambient 2									
Ambient 3									
Low standard									
Purge									
High standard									
Port 6									
Port 5									
Port 4									
Port 3									
Port 2									
Port 1									

Well 54-1121 PAM Area G well
Sampling Date - December 1, 1999
Atmospheric Pressure11.36 psi, Temperature 40 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	2:00	-0.213	0.195	-0.211	2	366	2,560	0.055	
Ambient 2	2:05	-0.056	0.215	-0.219	2.53	359	2,460	0.055	
Ambient 3	2:10	-0.026	0.221	-0.212	2.61	348	2,360	0.055	
Low standard	2:15	41.8	6.5	-0.203	2.63	47.8	2,260	NA	
Purge	2:20	0.621	0.211	-0.197	2.65	342	2,160	NA	
High standard	2:25	386	62	-0.201	2.85	48.5	2,350	NA	
Port 1	2:30	48.7	31.8	-0.324	4.78	15,500	10,700	0.475	
Port 2	2:40	36.6	25.5	-0.368	4.01	11,200	12,700	0.48	
Port 3	2:45	34.5	18.1	-0.316	4.27	17,700	10,300	0.35	
Port 4	2:50	22.4	16.2	-0.395	3.95	17,200	14,900	1.25	
Port 5	2:55	35.4	15.9	-0.382	4.1	19,800	15,400	1.95	
Port 6	3:00	25.5	13.1	-0.438	3.3	19,600	21,200	2.15	
Port 7	3:05	20	12.4	-0.433	3.06	18,000	21,550	2.05	

Well 54-1128 PAM Area G well
Sampling Date - December 1, 1999
Atmospheric Pressure11.38 psi, Temperature 40 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	9:10	0.095	0.254	-0.324	1.85	368	6,280	0.05	
Ambient 2	9:15	0.089	0.223	-0.351	1.88	315	6,280	0.05	
Ambient 3	9:20	0.01	0.212	-0.314	1.85	362	6,340	0.05	
Low standard	9:25	40	6.3	-0.277	1.85	309	7,400	NA	
Purge	9:30	0.054	0.272	-0.24	1.81	356	6,500	NA	
High standard	9:35	395	60.1	-0.203	1.73	87.4	10,500	NA	
15 ft.	9:40	2.01	3.98	-0.521	1.65	10,800	10,700	0.835	
30 ft.	9:45	10.05	3.62	-0.644	1.57	16,500	11,500	0.945	
40 ft.	9:50	9.3	3.12	-0.764	5.245	19,200	11,400	1.5	
60 ft.	9:55	31.5	3.1	-0.892	5.66	21,700	12,000	2.25	
78 ft.	10:00	48	3.5	-0.781	6.325	24,300	12,400	2.2	

Well 54-1115 PAM Area G well
Sampling Date - December 1, 1999
Atmospheric Pressure11.39 psi, Temperature 50 F
Low standard TCA = 50 ppm, TCE = 10 ppm.
High standard TCA = 500 ppm, TCE = 100 ppm.

B&K Results

Depth (ft.)	Time	TCA (ppm)	TCE (ppm)	Freon-11 (ppm)	Freon-113 (ppm)	CO2 B&K (ppm)	Water Vapor (ppm)	CO2 Visalia (percent)	Port Condition
Ambient 1	12:00	1.01	0.012	-0.216	1.45	354	14,900	0.05	
Ambient 2	12:05	0.056	0.056	-0.398	1.71	348	14,100	0.05	
Ambient 3	12:10	0.094	0.047	-0.216	1.69	350	14,300	0.05	
Low standard	12:15	41.1	6	-0.034	1.68	44	12,050	NA	
Purge	12:20	0.568	0.778	-0.287	1.67	360	13,900	NA	
High standard	12:25	398	68.1	-0.223	1.76	54	12,400	NA	
15 ft.	12:30	-1.2	4.56	-0.465	2.71	9,000	15,840	0.93	
50 ft.	12:35	-4.4	4.9	-0.489	3.72	21,600	15,640	2.3	
77 ft.	12:40	-5.2	4.95	-0.365	4.15	25,000	14,800	2.6	
100 ft.	12:45	-2.3	5.14	-0.6	4.89	26,900	13,650	2.75	
120 ft.	12:50	-1.8	4.5	-0.594	4.61	27,900	13,600	2.95	
130 ft.	12:55	-1.2	4.12	-0.587	4.56	28,100	14,150	2.95	