Department of Energy
Field Office, Albuquerque
Los Alamos Area Office
Los Alamos, New Mexico 87544

Relief

2167
TA-21

NOV 16 1992

Mr. William K. Honker, Chief
RCRA Permits Branch
U. S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, TX 75202-2733

Dear Mr. Honker:

This letter is to convey Quarterly Technical Progress Reports (QTPRs) for Technical Area (TA) 21. The enclosure contains the information for the TA-21 Operable Unit for the period of April through June 1992, January through March 1992, and October through December 1991.

As detailed in the 3rd Quarter FY 1992 Report, the major activities during the reporting period were as follows:

- Mobilization and conduct of field activities continued according to the revised schedule presented in the work plan addendum:
  - First round of surface of soil sampling was completed.
  - Second round of surface soil sampling was initiated.
- Stratigraphic and geomorphic studies of DP Mesa continued throughout the quarter.

If you have any questions, please contact me or have your staff contact Steve Slaten of my staff at FTS 8-505-665-5050.

Sincerely yours,

Joseph C. Vozella

Joseph C. Vozella, Acting Chief
Environment, Safety and Health
Branch

LESH:4SS-023

Enclosures
See Page 2

10150

NOV 1 6 1992

Enclosure:
Hard copies of the QTPR
for the TA-21 OU 3rd Quarter
FY92, 2nd Quarter FY92,
1st Quarter FY92

cc w/enclosure:
K. Sisneros, State of New Mexico
Environment Department
Harold Runnels Building
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502
B. Swanton, AIP, MS MK571

cc w/o enclosure:
K. Bitner, AFO, MS A906
A. Tiedman, ADO, MS A120
J. Shipley, EP-AEPO, LANL, MS F641
R. Vocke, EP-AEPO, LANL, MS M992
L. Soholt, EM-13, LANL, MS M992
C. Mack, LC, LANL, MS A187
K. Hargis, EM-8, LANL, MS K490
G. Eller, INC-9, LANL, MS J519
LANL RPF, MS M707
M. Duran, MMES, LAAO

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who managed this 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 violations.

Document Title:

Quarterly Technical Progress Report
TA-21 Operable Unit
RCRA Facility Investigation
Third Quarter FY92
April-June, 1992
Los Alamos National Laboratory

Name: L H Gritzo Acting Date 10/15/92
Associate Director for Operations
Los Alamos National Laboratory

Name: Joseph L. Vigil Date 11/12/92
Environment, Safety, and
Health Branch
Los Alamos Area Office - DOE

OCT 21 1992

2161
TA-21

QUARTERLY TECHNICAL PROGRESS REPORT

TA-21 OPERABLE UNIT

RCRA FACILITY INVESTIGATION

THIRD QUARTER FY92

(APRIL--JUNE, 1992)

AUGUST 15, 1992

LAUR # 92-2846

ENVIRONMENTAL RESTORATION GROUP

LOS ALAMOS NATIONAL LABORATORY

RCTR vol 34

TABLE OF CONTENTS

List of Tables ii

List of Figures ii

1. Summary of Activities 1-1

2. Administrative and Planning Activities 2-1

    2.1. Third Quarter Activities 2-1

    2.2. Activities Planned for Fourth Quarter 2-1

    2.3. Delay of Scheduled Activities 2-1

    2.4. Progress Against Schedule 2-2

3. Mesa-Wide Surface Grid Sampling 3-1

    3.1. Summary of Investigations 3-1

        3.1.1. Deposition-Layer Sampling 3-1

        3.1.2. Surface Soil Sampling 3-2

        3.1.3. Field-Collected Data 3-2

    3.2. Data Assessment and Presentation 3-3

        3.2.1. Field Survey Data 3-3

        3.2.2. Field Screening Data 3-3

        3.2.3. Field Laboratory Data 3-4

4. Geomorphologic Studies 4-1

    4.1. Stratigraphy/Lithology 4-1

    4.2. Geomorphology 4-1

    4.3. Faults/Fractures 4-2

5. Surface Water Investigations 5-1

    5.1. Tracer Experiment, DP Spring 5-1

    5.2. Data Presentation 5-1

6. Biological Survey 6-1

    6.1. Field Work Constraints 6-1

        6.1.1. Peregrine Falcon 6-1

        6.1.2. Northern Goshawk 6-1

        6.1.3. Cooper's Hawk 6-2

7. References Cited 7-1

LIST OF TABLES

Table 3.2-I Field-Collected Data from Surface Grid Sampling, Round 1 3-5

Table 3.2-II Field-Collected Data from Surface Grid Sampling, Round 2 3-13

Table 5.2-I Sample Analysis Results from Dye Tracer Experiment 5-4

LIST OF FIGURES

Figure 2.3-1 TA-21 OU RFI Progress: Near Surface Investigations (6/30/92) 2-3

Figure 2.3-2 TA-21 OU RFI Progress: Subsurface Investigations (6/30/92) 2-4

Figure 4.1-1 Stratigraphic Sections and Lateral Fracture Traverse on North Wall of Los Alamos Canyon 4-3

Figure 5.1-1 Sampling Locations for Dye Tracer Experiment 5-3

Figure 6.1-1 Location of Municipal Well in Los Alamos Canyon, and Extent of Half-Mile Radius drilling Exclusion Area 6-3

Map 1. TA-21 Surface Characterization Sample Locations ..... Map Pocket

1. SUMMARY OF ACTIVITIES

This Quarterly Technical Progress Report is the third addressing the Technical Area 21 (TA-21) Operable Unit (OU) RCRA Facility Investigation (RFI) conducted by the Los Alamos National Laboratory (the Laboratory). The TA-21 OU RFI is conducted according to the plans presented in the TA-21 Operable Unit Work Plan for Environmental Restoration (LANL 1991a) as amended by the Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration (LANL 1991b) and approved by the U.S. Environmental Protection Agency (EPA 1992).

Activities conducted during the third quarter of Fiscal Year 1992 (FY92), April through June 1992, are reported herein. The major activities were:

- The first round of surface grid sampling was completed early in the quarter (see Chapter 3).
- Mobilization was completed and field work began for the second round of surface grid sampling (see Chapter 3). The investigation will be concluded early in the fourth quarter. This investigation includes:
    - Surveying of grid locations,
    - Environmental radiation surveys, and
    - Sampling of surface soils at the grid points.
- Field-collected data from the first and second rounds of surface grid sampling are reported herein (see Chapter 3).
- Mobilization for outfall investigations and filter building investigations began during the quarter (see Chapter 2).
- Stratigraphic and geomorphic studies of DP Mesa continued throughout the third quarter (see Chapter 4).
- Other activities reported in this progress report include the dye-tracer experiment at DP Spring (see Chapter 5), and new constraints on field investigations to protect sensitive and endangered species (see Chapter 6).

2. ADMINISTRATIVE AND PLANNING ACTIVITIES

2.1. THIRD QUARTER ACTIVITIES

During the third quarter of FY92 (April - June 1992), administrative support continued for: RFI field work continuing from second quarter, mobilization and implementation of scheduled third quarter field work, and compilation of field-collected data. Analytical results from early field work began to be received late in the quarter and data management activities were initiated.

2.2. ACTIVITIES PLANNED FOR FOURTH QUARTER

Planning continued, and mobilization began, during the quarter for some of the scheduled fourth quarter field work:

- The outfall investigations described in the work plan in Chapter 15, Outfalls Description and Sampling Plan, and
- The filter building investigations described in the work plan in Chapter 13, Surface Contamination from Airborne Emissions.

As the quarter ended these investigations were set to begin during July, with the exception that there was uncertainty whether the subsurface (hollow-stem coring) portions of the investigations would be allowed. The uncertainty stems from issues of Laboratory compliance with the EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) for radioactive emissions (40 CFR 61, Subpart H).

The time required for resolution of NESHAP issues has the potential to delay the drilling portion of the planned investigations. Assessments of the potential for airborne radioactive emissions during the subsurface investigations may have to be made, and any required mitigative measures may have to be approved and implemented prior to the investigations. At the end of the quarter it is not clear if a delay to these planned activities will occur, nor how long the delay may be if it does occur.

2.3. DELAY OF SCHEDULED ACTIVITIES

Budget and schedule reviews conducted during the quarter indicate that because of funding limitations some activities cannot be conducted in the fourth quarter as scheduled, and must be delayed. These activities are:

- The initial vadose zone investigations described in the work plan at Section 12.5, Subsurface Sampling Plan, and
- Initial investigations at a liquid waste disposal area as described in the work plan at Section 16.7, SWMU 21-018, Material Disposal Area V (MDA V).

During the fourth quarter, budget and schedule revisions will address the future schedule for these activities as part of the DOE five-year budget request process. A revised RFI schedule will be matched against the fixed budgets specified for the next two budget years and against the budget-growth guidelines for the out-years. As soon as this process is complete a TA-21 OU RFI Work Plan modification will be prepared and submitted to EPA.

2.4. PROGRESS AGAINST SCHEDULE

Figures 2.3-1 and 2.3-2 illustrate current progress through June 30, 1992 against the schedule for the TA-21 OU RFI. These figures are based on those given in the work plan addendum (LANL 1991b), representing the RFI schedule which EPA approved (EPA 1992).

FIGURE 2.3-1. TA-21 OU RFI PROGRESS: NEAR-SURFACE INVESTIGATIONS (6/30/92)

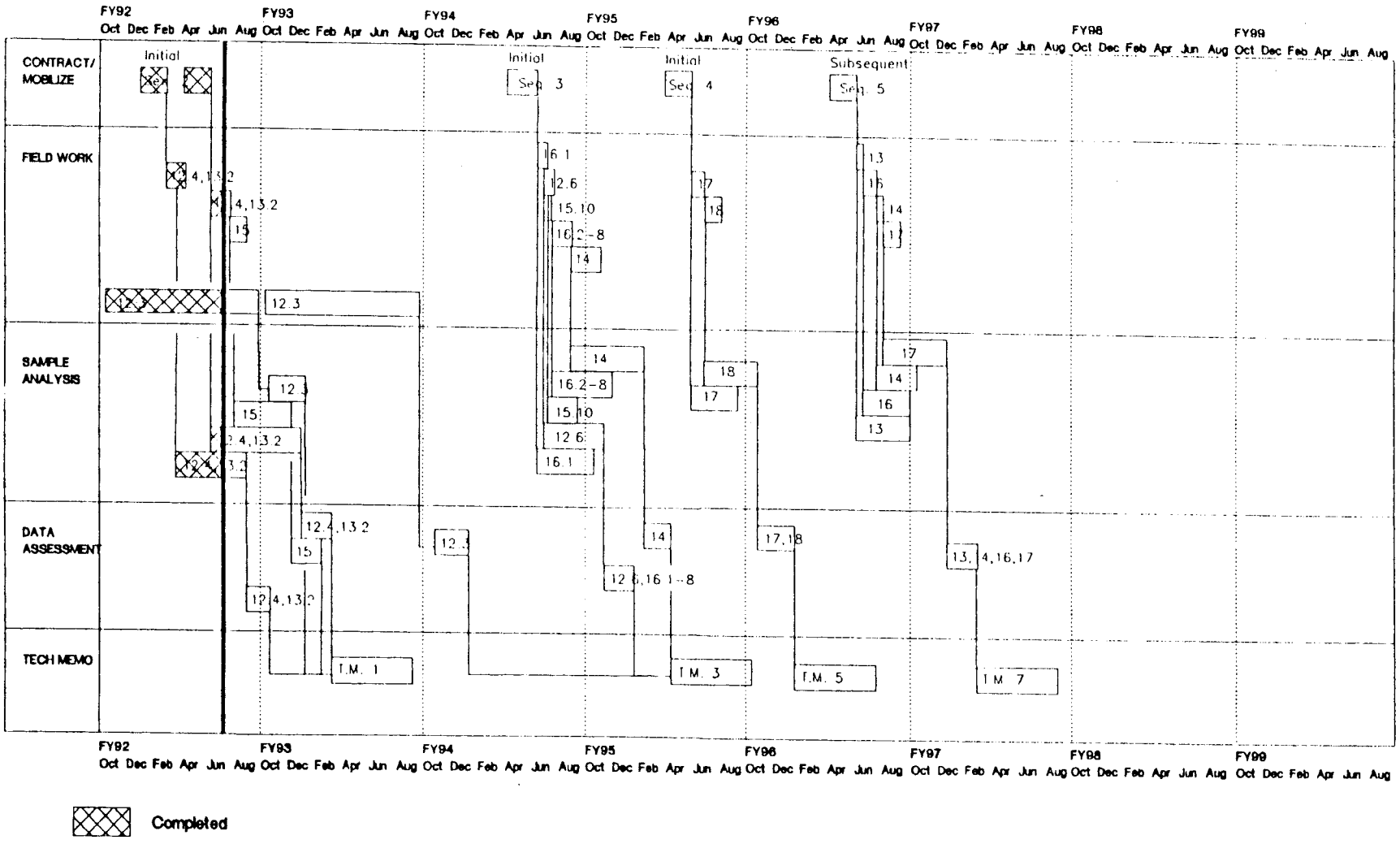
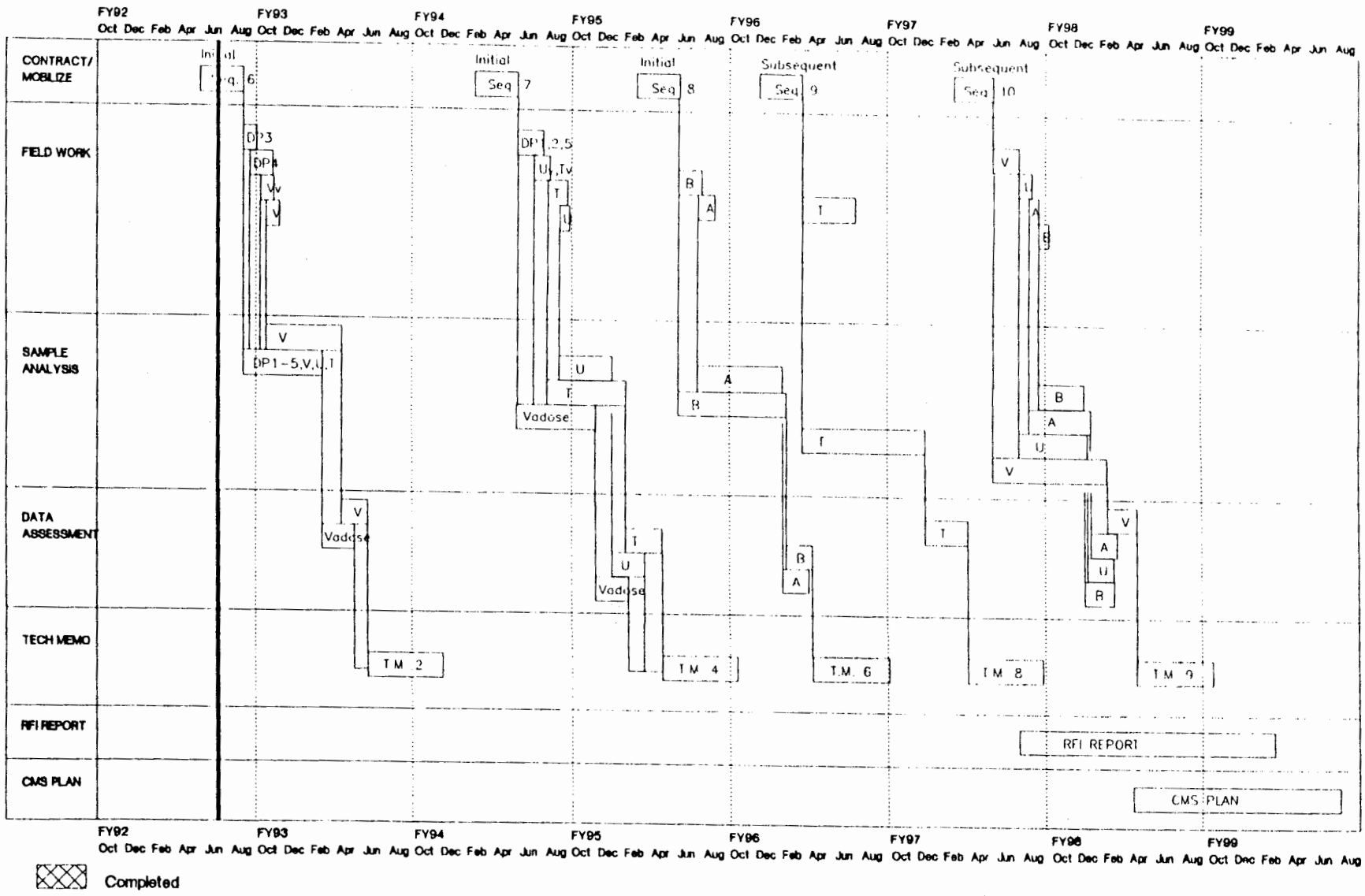


FIGURE 2.3-2. TA-21 OU RFI PROGRESS: SUBSURFACE INVESTIGATIONS (6/30/92)



3. MESA-WIDE SURFACE GRID SAMPLING

The investigations described in this chapter are those planned in the work plan at Section 12.4, Surface Grid Sampling Plan, and in Chapter 13, Surface Soil Contamination from Airborne Emissions. Those plans were found to have been based on erroneous information, as described in the Quarterly Technical Progress Report for the Second Quarter FY92 (LANL 1992a). A replacement sampling plan was presented in that report, and has been implemented. Map 1 (map pocket) identifies planned sampling locations for these investigations.

The first round of surface soil grid sampling was started in March 1992 and completed in April 1992 (green and yellow dots on Map 1). The second round was started in June 1992. Land surveying of the grid started approximately three weeks late, and delayed the start of environmental radiation surveys and soil sampling. At the end of the quarter (end of June 1992) all locations outside the building area at TA-21 had been sampled (red and black dots on Map 1). At the remaining locations (red and black squares on Map 1) environmental radiation surveys were completed during the quarter, and sampling was completed early in July 1992.

Although sampling at the surface grid locations was not completed until early in July 1992, all of the field-collected data are summarized in this report. Analytical laboratory results for samples from the first round began to be delivered during the third quarter, but these are not yet complete enough to be reported.

3.1. SUMMARY OF INVESTIGATIONS

As noted above, the surface grid investigations address two separate RFI sampling plans. The goals of the two plans are summarized below.

3.1.1. Deposition-Layer Sampling

The deposition-layer sampling (0-1 in.) described in the work plan in Chapter 13 is intended to address the presence, in the surficial layer of the soil, of contaminants deposited from airborne releases. The 40-m by 40-m surface sampling grid was sized on the basis of a statistical assessment of the spacing required to identify any depositional area greater than 3000 m^2. This remains the goal of this sampling plan as revised in the Quarterly Technical Progress Report for the Second Quarter FY92 (LANL 1992a).

3.1.2. Surface Soil Sampling

The surface grid sampling plan originally described in the work plan at Section 12.4 has objectives which are different from those of the deposition-layer sampling of Chapter 13. This investigation is intended to establish the "TA-21 OU local background" levels, and to provide a basis against which contaminant levels at SWMUs can be compared. This investigation uses the same sampling increment, 0-6 in., that is to be used at the SWMUs to ensure data comparability. As revised in the Quarterly Technical Progress Report for the Second Quarter FY92 (LANL 1992a), this investigation addresses its goal with fewer samples than are required for the purposes of the deposition-layer sampling.

3.1.3. Field-Collected Data

Certain field-collected data were specified in the analytical tables for the surface grid investigations. In the work plan (LANL 1991a) the analytical specifications are given in Table 12.4-I, Mesa Top Surface Soil Samples, and Table 13.2-VI, Screening and Analysis for Initial Investigations for Airborne Deposition.

Work plan specified field-collected data are summarized below:

- Field surveys: gross gamma radioactivity and low-energy gamma radioactivity. (Field surveys are measurements made at sampling locations. In areas where contaminants are present, field surveys can contribute to site knowledge in lieu of sample collection and analysis.)

- Field screening: gross gamma radioactivity, gross alpha radioactivity, and volatile organic compounds. (Field screening measurements are made on samples at the point of sample collection to identify gross contamination of significance to worker health or safety.)

- Field laboratory measurements: none specified. (Field laboratory measurements are made under controlled conditions in a field laboratory to provide real-time guidance to the conduct of field operations, or to aid in the selection of samples to be submitted for laboratory analysis.)

In implementing these sampling plans several changes were made to the specified field-collected data. These are summarized below:

- Field surveys: to address the capabilities of other radiation survey techniques, some additional measurements were made.

    - gross gamma radioactivity was measured as planned, but with two different instruments: an exposure rate meter (microR meter), and a 2x2 inch NaI detector.

- low-energy gamma radioactivity was measured as planned using a FIDLER instrument. However, the instrument was used twice at each location: once optimized for detection of low energy X-ray photons from plutonium and other transuranic radionuclides, and again optimized for the higher energy gamma-ray photons from americium-241.

- beta radioactivity was measured using a pancake Geiger-Mueller detector which is sensitive to beta particles in addition to alpha particles and gamma radiation.

- alpha radioactivity was measured using a large surface area alpha scintillometer.

- Field screening: measurements were made as specified during the first round of surface grid sampling. However, during the second round the use of the volatile organic compound screening device was eliminated based on accumulated evidence that VOC's were not a health and safety concern in these investigations.

- Field laboratory measurements: None were specified for technical purposes for these investigations. However, Laboratory procedures for the transportation of potentially radioactive samples require certain radioactivity measurements to ensure compliance with DOT transportation regulations. Thus, three field laboratory measurements were made on all samples: gross alpha, gross beta, and gross gamma.

3.2. PRESENTATION OF FIELD-COLLECTED DATA

The presentation of data given here is based on a rapid review and compilation of the field data logs. This information is presented to document progress to date. These data and their assessment are subject to revision after later review. This should be considered a "raw data" report.

3.2.1. Field Survey Data

Field survey data for the six environmental radioactivity measurements are summarized in Table 3.2-I (Round 1) and Table 3.2-II (Round 2) under the heading "Field Surveys."

For comparison to the values in the tables, background measurements on natural soils were made with each of the instruments. The mean and standard deviation of the background measurements are given in Table 3.2-III.

3.2.2. Field Screening Data

Field screening of samples in this investigation identified no samples as grossly contaminated. Since these data are primarily qualitative, and all results were non-detects or background, no specific data presentation is given.

3.2.3. Field Laboratory Data

Although most of the data reported by the field laboratory are less than detection limit, these data are quantitative and are reported as documentation of the low levels encountered. These results are given in Table 3.2-I (Round 1) and Table 3.2-II (Round 2) under the heading "Field Laboratory."

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1029	AAA0202	1"	<MDA	<MDA	<MDA	28.7	840,000	115,000	22.0	20.0	25,000	24,000	525
21-1030	AAA0203	1"	<MDA	<MDA	<MDA	29.3	720,000	98,000	18.0	18.0	20,000	20,000	490
	AAA0204	6"	<MDA	<MDA	<MDA								
21-1031	AAA0247	1"	<MDA	<MDA	<MDA	20.7	720,000	98,000	16.0	16.0	20,000	19,000	525
	AAA0248	6"	1.7	<MDA	<MDA	12.6	720,000	0	16.0	16.0	20,000	19,000	490
21-1032	AAA0249	1"	<MDA	<MDA	<MDA	25.9	720,000	98,000	17.0	16.5	19,000	19,000	420
21-1033	AAA0205	1"	<MDA	<MDA	<MDA	27.0	800,000	109,000	19.5	19.5	22,000	21,000	420
21-1034	AAA0250	1"	<MDA	<MDA	<MDA	17.2	760,000	98,000	17.0	17.0	20,000	20,000	350
21-1035	AAA0251	1"	<MDA	<MDA	<MDA	10.9	680,000	82,000	15.5	15.5	18,000	17,000	350
21-1036	AAA0083	1"	<MDA	<MDA	5.3	17.2	720,000	93,000	16.0	16.0	19,000	19,000	350
21-1037	AAA0084	1"	1.7	<MDA	<MDA	19.0	680,000	87,000	17.0	17.0	18,000	19,000	315
	AAA0085	6"	<MDA	<MDA	<MDA								
21-1038	AAA0206	1"	<MDA	<MDA	<MDA	42.5	840,000	115,000	20.0	20.0	24,000	23,000	420
	AAA0207	5"	<MDA	<MDA	<MDA								
21-1039	AAA0208	1"	<MDA	<MDA	<MDA	12.6	720,000	104,000	18.5	17.5	22,000	20,000	350
21-1040	AAA0252	1"	<MDA	<MDA	<MDA	17.2	680,000	98,000	16.0	15.0	19,000	18,000	350
	AAA0253	6"	<MDA	<MDA	<MDA								
21-1041	AAA0088	1"	<MDA	<MDA	6.1								
21-1042	AAA0209	1"	<MDA	<MDA	0.4	24.1	840,000	109,000	19.0	20.0	24,000	23,000	490
21-1043	AAA0210	1"	<MDA	<MDA	<MDA	30.5	720,000	93,000	18.0	17.0	20,000	20,000	559
21-1044	AAA0089	1"	0.9	1.6	4.7	26.4	720,000	98,000	16.0	16.0	18,000	19,000	420
21-1045	AAA0092	1"	6.9	<MDA	<MDA	16.7	600,000	82,000	15.0	15.0	17,000	17,000	420
	AAA0093	6"	<MDA	<MDA	<MDA								
21-1046	AAA0094	1"	<MDA	<MDA	5.5	36.2	600,000	82,000	15.0	15.0	17,000	17,000	420
21-1047	AAA0211	1"	<MDA	<MDA	<MDA	27.0	880,000	115,000	21.0	21.0	24,000	25,000	420
	AAA0212	6"	<MDA	<MDA	<MDA								
	AAA0213	6"dup	<MDA	<MDA	<MDA								
21-1048	AAA0216	1"	<MDA	<MDA	<MDA	17.2	800,000	109,000	18.0	18.0	21,000	21,000	490
	AAA0217	6"	<MDA	<MDA	<MDA								
21-1049	AAA0218	1"	<MDA	<MDA	<MDA	26.4	800,000	109,000	20.0	20.0	23,000	23,000	559
	AAA0218	1"	<MDA	<MDA	<MDA								
21-1050	AAA0219	1"	<MDA	<MDA	<MDA	48.3	840,000	109,000	21.0	20.0	24,000	24,000	490

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location	Sample	Sample	Alpha	Beta	Gamma		(Pu-238)	(Am-241)	Surface	3 ft	Surface	3 ft	
Identification	Number	Depth	pCi/g	pCi/g	pCi/g	dpm	dpm	dpm	µR/hr	µR/hr	cpm	cpm	dpm
21-1052	AAA0096	1"	8 6	<MDA	<MDA	47 1	600,000	82,000	16 0	16 0	18,000	18,000	350
	AAA0097	6"	3 5	<MDA	<MDA								
	AAA0098	6"dup	<MDA	<MDA	<MDA								
21-1053	AAA0095	1"	<MDA	<MDA	4 7	31 6	640,000	82,000	15 0	15 0	18,000	17,000	420
21-1054	AAA0230	1"	<MDA	<MDA	<MDA	24 3	833,000	109,000	19 0	20 0	23,000	24,000	350
	AAA0231	6"	<MDA	<MDA	<MDA								
	AAA0232	1"dup	<MDA	<MDA	<MDA								
21-1055	AAA0223	1"	<MDA	<MDA	<MDA	21 3	800,000	109,000	20 0	21 0	23,000	24,000	490
	AAA0224	6"	<MDA	<MDA	0 2								
21-1056	AAA0225	1"	<MDA	<MDA	<MDA	26 4	720,000	104,000	20 0	19 0	22,000	23,000	490
	AAA0226	6"	<MDA	<MDA	0 2								
21-1057	AAA0221	1"	<MDA	<MDA	<MDA	20 1	840,000	104,000	20 0	19 0	21,000	22,000	490
	AAA0222	6"	<MDA	<MDA	<MDA	26 4							
21-1058	AAA0220	1"	<MDA	<MDA	<MDA	30 5	800,000	104,000	19 0	19 0	21,000	21,000	490
21-1060	AAA0101	1"	1 7	<MDA	<MDA	16 7	680,000	93,000	16 0	16 0	19,000	18,000	350
	AAA0102	6"	8 6	<MDA	0 2								
21-1061	AAA0099	1"	<MDA	<MDA	<MDA	21 8	640,000	87,000	15 0	15 0	18,000	18,000	350
	AAA0100	6"	<MDA	<MDA	<MDA								
21-1062	AAA0233	1"	<MDA	<MDA	0 4	31 6	880,000	109,000	21 0	20 0	25,000	23,000	420
	AAA0234	6"	<MDA	<MDA	0 3								
21-1063	AAA0235	1"	<MDA	<MDA	0 4	17 2	800,000	109,000	19 0	19 0	22,000	23,000	490
21-1066	AAA0103	1"	17 3	<MDA	<MDA	27 0	720,000	93,000	16 0	16 0	19,000	18,000	350
21-1067	AAA0104	1"	1 7	<MDA	<MDA	9 2	600,000	77,000	15 0	15 5	18,000	17,000	420
	AAA0105	6"	<MDA	<MDA	<MDA								
21-1068	AAA0106	1"	<MDA	<MDA	<MDA	24 7	680,000	87,000	15 0	15 0	18,000	18,000	420
21-1069	AAA0236	1"	<MDA	<MDA	1 3	31 6	920,000	126,000	21 0	21 0	26,000	25,000	490
	AAA0237	6"	<MDA	<MDA	0 5								
21-1072	AAA0108	1"	<MDA	<MDA	<MDA	17 8	600,000	82,000	15 0	15 0	17,000	18,000	315
	AAA0109	6"	<MDA	<MDA	<MDA								
21-1073	AAA0107	1"	<MDA	<MDA	<MDA	33 3	680,000	87,000	17 0	16 0	19,000	19,000	350
21-1074	AAA0238	1"	<MDA	<MDA	0 9	33 3	800,000	109,000	20 0	19 0	24,000	24,000	490

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1077	AAA0110	1"	<MDA	<MDA	<MDA	19.5	640,000	93,000	15.0	15.0	18,000	18,000	420
	AAA0111	6"	<MDA	<MDA	<MDA								
21-1078	AAA0114	1"	<MDA	<MDA	<MDA	36.8	600,000	82,000	14.0	14.0	17,000	18,000	490
21-1079	AAA0239	1"	<MDA	<MDA	<MDA	47.4	875,000	109,000	19.0	18.5	23,000	21,000	490
	AAA0240	6"	<MDA	<MDA	0.4								
21-1080	AAA0245	1"	<MDA	<MDA	<MDA	23.6	840,000	109,000	20.0	19.0	24,000	24,000	490
	AAA0246	6"	<MDA	<MDA	<MDA								
21-1083	AAA0117	1"	<MDA	<MDA	<MDA	12.1	640,000	87,000	16.0	15.0	18,000	18,000	420
21-1084	AAA0115	1"	<MDA	<MDA	<MDA	16.1	600,000	77,000	14.0	13.0	15,000	16,000	420
	AAA0116	6"	<MDA	<MDA	<MDA								
21-1087	AAA0122	1"	<MDA	<MDA	1.3	32.2	840,000	109,000	21.0	20.0	25,000	24,000	350
21-1088	AAA0123	1"	<MDA	<MDA	1.1	32.8	840,000	104,000	20.0	20.0	24,000	24,000	420
	AAA0124	6"	<MDA	<MDA	1.5								
21-1091	AAA0118	1"	<MDA	<MDA	<MDA	15.5	600,000	77,000	15.0	14.0	16,000	16,000	455
	AAA0119	6"	<MDA	<MDA	<MDA								
21-1095	AAA0125	1"	<MDA	<MDA	1.0	38.2	750,000	93,000	17.0	17.0	20,000	20,000	490
	AAA0126	6"	<MDA	<MDA	1.3								
21-1096	AAA0127	1"	<MDA	<MDA	<MDA	16.1	880,000	109,000	21.0	21.0	26,000	26,000	490
	AAA0128	6"	<MDA	<MDA	<MDA								
21-1099	AAA0120	1"	<MDA	<MDA	<MDA	20.7	600,000	82,000	14.0	14.0	17,000	16,000	455
	AAA0121	6"	<MDA	<MDA	0.3								
21-1100	AAA0129	1"	<MDA	<MDA	<MDA	29.3	800,000	109,000	21.0	21.0	24,000	24,000	490
	AAA0130	6"	<MDA	<MDA	0.5								
21-1104	AAA0131	1"	<MDA	<MDA	0.7	28.7	800,000	109,000	20.0	20.0	24,000	25,000	490
	AAA0132	6"	<MDA	<MDA	1.5								
21-1119	AAA0135	1"	<MDA	<MDA	1.0	52.0	750,000	93,000	18.0	17.0	21,000	20,000	350
	AAA0136	6"	<MDA	<MDA	<MDA								
21-1124	AAA0168	1"	<MDA	<MDA	0.6	31.0	720,000	98,000	17.0	17.0	20,000	20,000	420
	AAA0169	6"	<MDA	<MDA	0.3								
21-1125	AAA0139	1"	<MDA	<MDA	<MDA	34.1	792,000	98,000	17.0	17.5	21,000	21,000	420
	AAA0140	6"	<MDA	<MDA	0.2								

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1133	AAA0141	1"	<MDA	<MDA	1.0	45.1	720,000	87,000	15.0	15.0	19,000	18,000	455
	AAA0142	6"	5.2	<MDA	1.0								
21-1136	AAA0143	1"	<MDA	<MDA	1.3	21.4	800,000	93,000	17.0	16.0	20,000	19,000	420
	AAA0144	6"	<MDA	<MDA	1.2								
21-1142	AAA0172	1"	<MDA	<MDA	1.3	16.9	917,000	126,000	23.0	24.0	24,000	27,000	490
21-1143	AAA0175	1"	<MDA	<MDA	<MDA	34.9	750,000	98,000	18.0	18.0	20,000	21,000	490
	AAA0176	6"	<MDA	<MDA	0.1								
21-1144	AAA0145	1"	<MDA	<MDA	<MDA	23.7	720,000	93,000	17.0	17.0	21,000	19,000	490
	AAA0146	6"	<MDA	<MDA	0.3								
21-1148	AAA0177	1"	<MDA	<MDA	<MDA	10.5	833,000	109,000	18.0	19.5	23,000	23,000	490
	AAA0178	6"	<MDA	<MDA	<MDA								
21-1149	AAA0179	1"	<MDA	<MDA	1.0	41.4	792,000	93,000	17.5	18.0	19,000	20,000	420
	AAA0180	6"	<MDA	<MDA	0.8								
21-1154	AAA0183	1"	<MDA	<MDA	<MDA	37.9	708,000	87,000	7.0	15.0	19,000	18,000	350
	AAA0184	6"	<MDA	<MDA	<MDA								
21-1155	AAA0147	1"	<MDA	<MDA	<MDA	20.3	720,000	93,000	16.5	16.0	19,000	19,000	385
	AAA0148	6"	<MDA	<MDA	<MDA								
21-1160	AAA0185	1"	<MDA	<MDA	<MDA	42.6	792,000	93,000	17.0	17.0	20,000	20,000	490
	AAA0186	6"	<MDA	<MDA	<MDA								
21-1162	AAA0149	1"	<MDA	<MDA	<MDA	50.1	800,000	98,000	18.0	18.5	21,000	21,000	420
	AAA0150	6"	<MDA	<MDA	<MDA								
	AAA0151	6"dup	<MDA	<MDA	<MDA								
21-1166	AAA0187	1"	<MDA	<MDA	<MDA	15.2	833,000	104,000	17.5	18.0	21,000	20,000	420
	AAA0188	6"	<MDA	<MDA	<MDA								
21-1168	AAA0152	1"	<MDA	<MDA	<MDA	24.8	720,000	93,000	15.5	15.0	20,000	19,000	280
	AAA0153	6"	<MDA	<MDA	<MDA								
21-1172	AAA0189	1"	<MDA	<MDA	<MDA	20.9	708,000	93,000	17.0	16.5	20,000	19,000	490
	AAA0190	6"	<MDA	<MDA	<MDA								
21-1173	AAA0159	1"	<MDA	<MDA	<MDA	24.8	800,000	104,000	17.0	16.5	21,000	19,000	559
	AAA0160	6"	<MDA	<MDA	<MDA								
	AAA0161	1"dup	<MDA	<MDA	<MDA								

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1178	AAA0191	1"	<MDA	<MDA	<MDA	20.4	667,000	93,000	16.0	16.0	18,000	19,000	350
	AAA0192	6"	<MDA	<MDA	<MDA								
21-1179	AAA0162	1"	<MDA	<MDA	<MDA	27.6	680,000	93,000	16.0	16.0	19,000	18,000	490
	AAA0163	6"	<MDA	<MDA	0.2								
21-1184	AAA0193	1"	<MDA	<MDA	<MDA	13.4	667,000	93,000	16.0	15.0	18,000	18,000	350
	AAA0194	6"	<MDA	<MDA	<MDA								
21-1186	AAA0164	1"	<MDA	<MDA	0.5	35.5	720,000	93,000	17.0	16.5	21,000	20,000	350
	AAA0165	6"	<MDA	<MDA	0.3								
21-1192	AAA0195	1"	<MDA	<MDA	<MDA	18.1	708,000	93,000	16.0	16.0	18,000	18,000	350
	AAA0196	6"	<MDA	<MDA	<MDA								
21-1193	AAA0197	1"	<MDA	<MDA	<MDA	30.5	680,000	77,000	15.0	15.0	17,000	17,000	420
	AAA0198	6"	<MDA	<MDA	<MDA								
	AAA0199	1"dup	<MDA	<MDA	<MDA								
21-1194	AAA0030	1"dup	<MDA	<MDA	<MDA	31.6	750,000	93,000	15.5	15.0	18,000	19,000	281
21-1197	AAA0200	1"	<MDA	<MDA	<MDA	29.7	750,000	98,000	16.5	17.0	19,000	19,000	525
	AAA0201	6"	<MDA	<MDA	<MDA								
21-1198	AAA0050	1"	8.6	9.8	<MDA	33.8	600,000	77,000	15.5	14.0	17,000	16,000	490
	AAA0051	6"	12.1	<MDA	<MDA								
21-1199	AAA0047	1"	<MDA	<MDA	<MDA	25.3	750,000	82,000	16.0	15.0	19,000	18,000	491
	AAA0048	6"	<MDA	<MDA	<MDA								
	AAA0049	1"dup	<MDA	<MDA	<MDA								
21-1200	AAA0029	1"	2.6	<MDA	<MDA	31.0	708,000	87,000	17.0	16.0	19,000	18,000	491
21-1203	AAA0081	1"	<MDA	<MDA	<MDA	31.5	750,000	98,000	18.0	18.0	20,000	20,000	559
	AAA0082	6"	<MDA	<MDA	<MDA								
21-1204	AAA0079	1"	<MDA	<MDA	<MDA	15.2	667,000	93,000	15.0	15.0	17,000	17,000	350
	AAA0080	6"	0.9	<MDA	<MDA								
21-1205	AAA0052	1"	<MDA	<MDA	<MDA	29.9	600,000	82,000	14.0	15.0	17,000	17,000	490
21-1206	AAA0045	1"	<MDA	<MDA	<MDA	29.3	667,000	82,000	15.5	15.0	18,000	17,000	386
	AAA0046	6"	1.7	<MDA	<MDA								
21-1207	AAA0044	1"	<MDA	<MDA	<MDA	13.8	667,000	82,000	16.0	15.0	18,000	18,000	421
21-1208	AAA0027	1"	<MDA	<MDA	<MDA	16.7	708,000	98,000	15.5	16.0	18,000	18,000	316
	AAA0028	6"	<MDA	<MDA	<MDA								

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1211	AAA0078	1"	<MDA	<MDA	0.8	57.1	667,000	87,000	15.0	15.0	18,000	17,000	420
21-1212	AAA0053	1"	<MDA	<MDA	<MDA	42.8	720,000	93,000	16.0	16.0	19,000	19,000	420
	AAA0054	6"	8.6	<MDA	<MDA								
21-1213	AAA0041	1"	<MDA	<MDA	<MDA	41.4	750,000	93,000	16.0	15.5	18,000	19,000	491
21-1214	AAA0042	1"	<MDA	<MDA	<MDA	21.3	708,000	87,000	16.5	16.0	19,000	19,000	421
	AAA0043	6"	6.1	13.1	<MDA								
21-1215	AAA0026	1"	<MDA	<MDA	<MDA	31.6	750,000	98,000	16.5	16.0	20,000	19,000	421
21-1218	AAA0076	1"	8.6	<MDA	<MDA	32.1	750,000	98,000	17.0	16.5	21,000	20,000	559
	AAA0077	6"	5.2	<MDA	<MDA								
21-1219	AAA0057	1"	3.5	<MDA	1.3	26.3	720,000	98,000	18.5	17.0	23,000	20,000	420
21-1220	AAA0036	1"	<MDA	<MDA	<MDA	35.1	750,000	77,000	17.5	17.0	20,000	19,000	491
	AAA0037	6"	4.3	2.3	<MDA	34.3	600,000	0	15.0	15.0	18,000	18,000	455
21-1221	AAA0040	1"	<MDA	<MDA	<MDA	31.0	708,000	93,000	17.0	16.0	21,000	19,000	491
21-1222	AAA0022	1"	0.0	<MDA	<MDA	22.4	792,000	93,000	16.5	16.0	20,000	19,000	456
	AAA0023	6"	0.0	<MDA	<MDA								
21-1225	AAA0075	1"	0.0	<MDA	<MDA	26.8	750,000	98,000	16.0	17.0	21,000	20,000	525
21-1226	AAA0058	1"	<MDA	<MDA	2.3	18.3	720,000	98,000	17.0	16.5	19,000	19,000	455
	AAA0059	6"	1.7	<MDA	3.0								
21-1227	AAA0035	1"	0.9	7.1	<MDA	33.8	720,000	98,000	17.5	17.0	21,000	20,000	385
21-1228	AAA0033	1"	18.2	27.8	<MDA	13.8	750,000	98,000	16.0	17.0	19,000	19,000	351
	AAA0034	6"	7.8	1.7	<MDA								
21-1229	AAA0019	1"	<MDA	<MDA	<MDA	18.4	708,000	87,000	15.5	15.0	19,000	19,000	456
21-1230	AAA0016	1"	1.7	9.7	<MDA	20.7	833,000	104,000	18.0	17.5	22,000	21,000	421
	AAA0017	6"	<MDA	<MDA	<MDA								
	AAA0018	6"	<MDA	<MDA	<MDA								
21-1233	AAA0073	1"	1.7	<MDA	<MDA	30.9	708,000	87,000	17.0	17.0	19,000	19,000	350
	AAA0074	6"	1.7	2.9	<MDA								
21-1234	AAA0062	1"	<MDA	<MDA	<MDA	22.9	800,000	98,000	19.0	19.0	20,000	22,000	420
21-1235	AAA0015	1"	<MDA	<MDA	<MDA	12.1	750,000	104,000	18.0	16.5	20,000	19,000	351
21-1238	AAA0072	1"	0.0	<MDA	<MDA	49.1	720,000	93,000	17.5	17.5	21,000	20,000	490
21-1239	AAA0063	1"	10.4	22.9	<MDA	26.3	800,000	104,000	19.0	18.0	23,000	22,000	420
	AAA0064	6"	<MDA	<MDA	<MDA								

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1240	AAA0031	1"	0.9	25.5	<MDA	29.3	720,000	98,000	16.0	16.0	20,000	20,000	490
	AAA0032	6"	2.6	23.3	<MDA								
21-1241	AAA0013	1"	<MDA	<MDA	<MDA	45.4	833,000	98,000	19.0	18.0	23,000	21,000	491
	AAA0014	6"	<MDA	<MDA	<MDA								
21-1244	AAA0070	1"	<MDA	<MDA	<MDA	24.6	760,000	98,000	19.0	17.5	21,000	20,000	420
	AAA0071	6"	<MDA	<MDA	<MDA								
21-1245	AAA0065	1"	<MDA	<MDA	<MDA	25.7	720,000	104,000	18.0	17.5	22,000	21,000	490
21-1246	AAA0010	1"	0.0	18.2	<MDA	14.7	667,000	93,000	16.5	15.5	19,000	19,000	350
21-1249	AAA0069	1"	<MDA	<MDA	<MDA	18.9	760,000	98,000	17.0	17.0	21,000	20,000	385
21-1250	AAA0066	1"	0.0	<MDA	<MDA	18.2	760,000	104,000	16.0	17.0	19,000	20,000	420
	AAA0067	6"	<MDA	<MDA	<MDA								
21-1251	AAA0007	1"	0.0	1.7	<MDA	38.2	792,000	87,000	18.0	17.0	22,000	21,000	319
	AAA0008	6"	<MDA	<MDA	<MDA								
	AAA0009	1"dup	<MDA	<MDA	<MDA								
21-1252	AAA0005	1"	<MDA	<MDA	<MDA	23.5	750,000	93,000	17.0	16.0	21,000	20,000	319
	AAA0006	6"	<MDA	<MDA	<MDA								
21-1253	AAA0004	1"	6.9	12.8	<MDA	32.3	875,000	93,000	20.0	18.5	24,000	22,000	398
21-1256	AAA0068	1"	<MDA	<MDA	0.1	26.9	800,000	104,000	19.0	18.0	22,000	21,000	525
21-1258	AAA0001	1"	13.0	13.5	<MDA	29.4	750,000	93,000	18.0	17.0	21,000	20,000	334
21-1259	AAA0002	1"	<MDA	<MDA	<MDA	23.5	750,000	93,000	17.5	16.0	21,000	20,000	319
	AAA0003	6"	0.9	9.1	<MDA								
21-1286	AAA0011	1"	<MDA	<MDA	<MDA	41.1	792,000	93,000	18.0	17.0	21,000	20,000	382
	AAA0012	6"	1.7	<MDA	<MDA								
21-1287	AAA0024	1"	<MDA	<MDA	<MDA	19.5	750,000	82,000	15.5	15.0	18,000	19,000	351
	AAA0025	6"	<MDA	<MDA	<MDA								
21-1288	AAA0055	1"	1.7	<MDA	0.1	57.5	720,000	93,000	16.5	16.0	19,000	19,000	350
	AAA0056	6"	7.4	<MDA	<MDA								
21-1289	AAA0133	1"	1.7	<MDA	2.7	36.8	800,000	109,000	21.0	21.0	25,000	25,000	490
	AAA0134	6"	<MDA	<MDA	1.3								
21-1290	AAA0181	1"	<MDA	<MDA	<MDA	11.7	708,000	87,000	17.0	16.5	19,000	19,000	280
	AAA0182	6"	<MDA	<MDA	<MDA								

Table 3.2-I. Field-Collected Data from Surface Grid Sampling, First Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1291	AAA0254	1"	<MDA	<MDA	0.2	38.5	720,000	98,000	15.5	16.0	19,000	19,000	420
	AAA0255	6"	<MDA	<MDA	<MDA								
21-1292	AAA0227	1'	<MDA	<MDA	<MDA	31.6	760,000	98,000	19.0	19.0	22,000	22,000	490
	AAA0228	6"	<MDA	<MDA	<MDA								
	AAA0229	6"dup	<MDA	<MDA	<MDA								
21-1293	AAA0086	1"	<MDA	<MDA	<MDA	35.1	720,000	87,000	15.0	16.0	20,000	18,000	280
	AAA0087	6"	1.7	<MDA	<MDA								
21-1294	AAA0170	1"	<MDA	<MDA	0.9	23.6	720,000	98,000	16.0	17.0	20,000	20,000	490
	AAA0171	6"	<MDA	<MDA	0.7								
21-1295	AAA0154	1"	<MDA	<MDA	<MDA	34.4	760,000	98,000	20.0	18.0	22,000	21,000	490
	AAA0155	6"	<MDA	<MDA	<MDA								
	AAA0156	1"dup	<MDA	<MDA	<MDA								

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1001	AAA0451	1"	<MDA	<MDA	<MDA	32.1	556,000	100,000	14.0	13.5	14,700	14,400	250
21-1002	AAA0452	1"	<MDA	<MDA	<MDA	39.4	593,000	94,000	15.0	14.5	15,700	14,900	420
	AAA0453	6"	<MDA	<MDA	<MDA								
21-1003	AAA0457	1"	<MDA	<MDA	<MDA	23.1	481,000	84,000	13.0	12.5	13,700	13,800	380
21-1004	AAA0458	1"	<MDA	<MDA	<MDA	46.8	593,000	103,000	14.5	14.5	16,300	15,900	420
	AAA0459	6"	<MDA	<MDA	<MDA								
21-1005	AAA0460	1"	<MDA	<MDA	<MDA	59.7	593,000	94,000	13.5	14.0	15,700	15,400	420
21-1006	AAA0461	1"	<MDA	<MDA	<MDA	42.8	630,000	100,000	15.0	15.0	15,500	15,400	460
	AAA0462	6"	<MDA	<MDA	<MDA								
	AAA0463	1" dup	<MDA	<MDA	<MDA								
21-1007	AAA0464	1"	<MDA	<MDA	<MDA	69.3	648,000	106,000	15.5	15.5	17,500	17,500	330
21-1008	AAA0456	1"	<MDA	<MDA	<MDA			94,000					
21-1009	AAA0472	1"	<MDA	<MDA	<MDA	48.5	630,000	106,000	16.0	15.0	16,900	16,700	330
						38.9	519,000		13.5	13.5	14,000	14,000	420
21-1010	AAA0465	1"	<MDA	<MDA	<MDA	32.1	704,000	116,000	15.0	15.0	17,500	17,300	330
	AAA0466	6"	<MDA	<MDA	<MDA								
21-1011	AAA0473	1"	<MDA	<MDA	<MDA	33.8	648,000	109,000	16.0	15.5	17,500	17,200	500
21-1012	AAA0474	1"	<MDA	<MDA	<MDA	132.4	667,000	113,000	16.5	16.5	18,100	17,600	460
21-1013	AAA0469	1"	<MDA	<MDA	<MDA	32.1	704,000	131,000	17.5	17.5	19,300	19,200	420
21-1014	AAA0476	6"	<MDA	<MDA	<MDA	35.5	704,000	119,000	17.5	17.0	18,400	17,600	420
21-1015	AAA0477	1"	<MDA	<MDA	<MDA	51.3	741,000	119,000	17.0	16.5	18,000	17,800	380
21-1016	AAA0478	1"	<MDA	<MDA	<MDA	23.1	704,000	113,000	17.0	16.0	17,500	17,300	420
21-1017	AAA0479	1"	<MDA	<MDA	<MDA	102.5	667,000	113,000	16.0	16.0	18,500	17,400	460
	AAA0480	4"	<MDA	<MDA	<MDA								
21-1018	AAA0481	1"	<MDA	<MDA	5.8	41.7	741,000	116,000	17.0	17.0	18,200	17,800	460
21-1019	AAA0482	1"	<MDA	<MDA	<MDA	31.0	667,000	119,000	16.5	16.0	17,200	17,000	420
21-1020	AAA0483	1"	<MDA	<MDA	<MDA	48.5	667,000	113,000	16.0	15.0	17,700	17,000	330
	AAA0484	6"	<MDA	<MDA	<MDA								
21-1021	AAA0485	1"	<MDA	<MDA	<MDA	26.5	704,000	106,000	17.0	16.0	17,800	17,500	460
	AAA0486	1" dup	<MDA	<MDA	<MDA								
21-1022	AAA0487	1"	<MDA	<MDA	4.6	55.8	667,000	113,000	17.0	17.0	18,200	17,700	380

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1023	AAA0494	1"	<MDA	<MDA	<MDA		704,000	122,000	17.5	18.5	21,000	19,800	420
	AAA0495	6"	<MDA	<MDA	<MDA	38.3							
21-1024	AAA0488	1"	<MDA	<MDA	<MDA	37.7	704,000	116,000	17.0	16.5	18,200	18,000	330
	AAA0489	3"	<MDA	<MDA	<MDA								
21-1025	AAA0492	1"	<MDA	<MDA	<MDA	47.9	667,000	113,000	17.0	17.0	19,100	18,000	540
21-1026	AAA0496	1"	<MDA	<MDA	<MDA	23.1	833,000	138,000	19.5	19.0	20,900	20,400	500
21-1027	AAA0497	1"	<MDA	<MDA	<MDA	42.8	704,000	119,000	17.0	16.5	18,200	18,400	460
21-1028	AAA0493	1"	<MDA	<MDA	<MDA	160.0	741,000	122,000	19.0	17.5	18,500	17,700	460
21-1051	AAA0450	1"	<MDA	<MDA	<MDA	39.0	704,000	101,000	18.0	17.5	19,100	19,200	330
21-1059	AAA0446	1"	<MDA	<MDA	<MDA	38.4	630,000	93,000	16.0	16.5	17,600	17,000	330
	AAA0447	6"	<MDA	<MDA	<MDA								
21-1064	AAA0498	1"	<MDA	<MDA	4.9	42.0	926,000	150,000	24.0	24.0	25,800	25,700	330
	AAA0499	6"	<MDA	<MDA	<MDA								
21-1065	AAA0445	1"	<MDA	<MDA	<MDA	26.7	630,000	98,000	15.0	16.0	17,500	17,400	330
21-1070	AAA0502	1"	<MDA	<MDA	<MDA	55.4	1,037,000	156,000	26.0	26.0	26,800	26,400	460
21-1071	AAA0441	1"	<MDA	<MDA	<MDA	35.5	667,000	101,000	16.5	16.0	17,500	17,600	290
	AAA0442	6"	<MDA	<MDA	<MDA								
21-1075	AAA0503	1"	<MDA	<MDA	<MDA	29.2	1,000,000	156,000	22.5	24.0	26,600	26,500	420
21-1076	AAA0440	1"	<MDA	<MDA	<MDA	16.9	630,000	87,000	16.0	16.0	16,700	16,200	420
21-1081	AAA0504	1"	<MDA	<MDA	<MDA	14.6	1,000,000	156,000	22.0	22.5	25,400	25,400	250
	AAA0505	6"	<MDA	<MDA	<MDA								
21-1082	AAA0438	1"	<MDA	<MDA	<MDA	49.4	667,000	93,000	16.5	16.5	17,200	17,300	420
	AAA0439	6"	<MDA	<MDA	<MDA								
21-1085	AAA0564	1"	<MDA	<MDA	<MDA	43.6	635,000	87,000	15.0	14.0	15,700	15,100	380
21-1086	AAA0565	1"	<MDA	<MDA	<MDA	57.0	481,000	66,000	12.0	12.5	13,000	13,500	330
	AAA0566	6"	<MDA	<MDA	<MDA								
21-1089	AAA0506	1"	<MDA	<MDA	<MDA	43.1	963,000	144,000	24.0	24.5	25,400	26,200	330
21-1090	AAA0437	1"	<MDA	<MDA	<MDA	35.5	593,000	87,000	15.0	15.0	15,800	15,600	330
21-1092	AAA0567	1"	<MDA	<MDA	<MDA	55.2	636,000	93,000	20.0	20.0	17,400	23,300	460
	AAA0568	6"	<MDA	<MDA	<MDA								
21-1093	AAA0569	1"	<MDA	<MDA	<MDA	52.7	615,000	82,000	14.5	14.0	15,900	15,600	460

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1094	AAA0570	1"	<MDA	<MDA	<MDA	55.8	577,000	71,000	12.5	12.5	14,300	14,000	420
21-1097	AAA0507	1"	<MDA	<MDA	<MDA	44.3	1,000,000	159,000	26.0	25.5	27,200	27,500	420
	AAA0508	6"	<MDA	<MDA	<MDA								
21-1098	AAA0434	1"	<MDA	<MDA	<MDA	22.7	556,000	82,000	15.0	15.0	15,800	15,900	330
	AAA0435	6"	<MDA	<MDA	<MDA								
	AAA0436	6" dup	<MDA	<MDA	<MDA								
21-1101	AAA0509	1"	<MDA	<MDA	<MDA	47.8	963,000	150,000	24.0	25.0	24,600	26,300	330
21-1102	AAA0432	1"	<MDA	<MDA	<MDA	26.7	667,000	82,000	16.0	15.5	16,800	16,700	330
	AAA0433	1" dup	<MDA	<MDA	<MDA								
21-1103	AAA0571	11"	<MDA	<MDA	<MDA	40.0	692,000	85,000	15.5	15.0	16,100	15,000	420
	AAA0572	6"	<MDA	<MDA	<MDA								
21-1105	AAA0510	1"	<MDA	<MDA	<MDA	45.5	981,000	159,000	23.5	23.5	26,100	26,100	420
	AAA0511	6"	<MDA	<MDA	<MDA								
	AAA0512	6" dup	<MDA	<MDA	<MDA								
21-1106	AAA0575	1"	<MDA	<MDA	<MDA	41.8	560,000	68,000	14.0	13.0	13,800	13,000	330
	AAA0576	1" dup	<MDA	<MDA	<MDA								
21-1107	AAA0580	1"	<MDA	<MDA	<MDA	35.7	481,000	68,000	12.0	12.5	13,500	13,700	460
21-1108	AAA0430	1"	<MDA	<MDA	<MDA	33.1	667,000	87,000	17.5	16.5	18,100	17,300	330
	AAA0431	6"	<MDA	<MDA	<MDA								
21-1109	AAA0516	1"	<MDA	<MDA	<MDA	42.0	963,000	153,000	27.0	26.5	26,600	26,100	500
21-1110	AAA0577	1"	<MDA	<MDA	<MDA	24.1	2,000,000	273,000	100.0	160.0	89,200	123,200	580
21-1111	AAA0578	1"	<MDA	<MDA	<MDA	51.8	760,000		17.0	16.0	18,700	17,700	420
	AAA0579	6"	<MDA	<MDA	<MDA								
21-1112	AAA0429	1"	<MDA	<MDA	<MDA	40.7	667,000	93,000	16.0	16.5	16,900	16,900	460
21-1113	AAA0581	1"	<MDA	<MDA	<MDA	18.2	481,000	66,000	11.5	13.0	13,100	13,100	330
	AAA0582	6"	<MDA	<MDA	<MDA								
	AAA0583	6" dup	<MDA	<MDA	<MDA								
21-1114	AAA0517	1"	<MDA	<MDA	<MDA	40.8	926,000	147,000	23.5	22.0	24,000	24,900	500
	AAA0518	6"	<MDA	<MDA	<MDA								
21-1115	AAA0586	1"	<MDA	<MDA	<MDA	30.0	600,000	74,000	14.0	14.5	14,800	15,100	330
	AAA0587	6"	<MDA	<MDA	<MDA								

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location	Sample	Sample	Alpha	Beta	Gamma		(Pu-238)	(Am-241)	Surface	3 ft	Surface	3 ft	
Identification	Number	Depth	pCi/g	pCi/g	pCi/g	dpm	dpm	dpm	μR/hr	μR/hr	cpm	cpm	dpm
21-1116	AAA0588	1"	<MDA	<MDA	<MDA	63.2	593,000	82,000	15.0	15.0	15,900	15,000	330
21-1117	AAA0427	1"	<MDA	<MDA	<MDA	43.6	667,000	93,000	17.0	16.0	18,200	17,400	420
	AAA0428	6"	<MDA	<MDA	<MDA								
21-1118	AAA0589	1"	<MDA	<MDA	<MDA	51.2	600,000	82,000	14.0	14.5	15,700	15,700	460
21-1120	AAA0519	1"	<MDA	<MDA	<MDA	56.0	926,000	153,000	23.0	23.5	26,300	26,500	460
21-1121	AAA0590	1"	<MDA	<MDA	<MDA	63.7	630,000	85,000	15.5	15.0	16,300	15,400	630
21-1122	AAA0591	1"	<MDA	<MDA	<MDA	56.5	520,000	71,000	13.0	13.0	14,300	14,200	330
	AAA0592	6"	<MDA	<MDA	<MDA								
21-1123	AAA0425	1"	<MDA	<MDA	<MDA	33.1	630,000	93,000	17.0	16.0	17,300	17,100	330
21-1126	AAA0520	1"	<MDA	<MDA	<MDA	33.2	889,000	150,000	22.0	22.5	24,700	25,000	420
	AAA0521	6"	<MDA	<MDA	<MDA								
21-1127	AAA0593	1"	<MDA	<MDA	<MDA	16.4	519,000	74,000	14.0	14.0	14,200	14,900	380
21-1128	AAA0423	1"	<MDA	<MDA	<MDA	29.4	667,000	90,000	16.0	16.0	16,900	17,400	380
	AAA0424	6"	<MDA	<MDA	<MDA								
21-1129	AAA0522	1"	<MDA	<MDA	<MDA	41.4	1,037,000	163,000	25.0	24.0	27,300	27,000	500
21-1130	AAA0594	1"	<MDA	<MDA	<MDA	34.7	600,000	79,000	16.0	16.0	16,500	16,500	330
21-1131	AAA0422	1"	<MDA	<MDA	<MDA	31.4	741,000	104,000	18.0	18.0	17,800	17,000	290
21-1132	AAA0595	1"	<MDA	<MDA	<MDA	37.0	692,000	98,000	16.5	15.5	17,100	15,900	420
21-1133						52.6	630,000		15.0	15.0	15,800	17,400	420
21-1134	AAA0525	1"	<MDA	<MDA	<MDA	49.0	926,000	150,000	22.5	23.0	24,100	24,100	380
	AAA0526	6"	<MDA	<MDA	5.4								
21-1135	AAA0420	1"	<MDA	<MDA	<MDA	27.9	815,000	115,000	22.0	22.0	21,000	21,800	420
	AAA0421	6"	<MDA	<MDA	<MDA								
21-1137	AAA0529	1"	<MDA	<MDA	<MDA	28.6	963,000	144,000	22.5	23.0	24,800	24,800	420
21-1138	AAA0596	1"	<MDA	<MDA	<MDA	18.8	577,000	82,000	15.0	15.0	15,500	15,100	330
	AAA0597	6"	<MDA	<MDA	<MDA								
21-1139	AAA0598	1"	<MDA	<MDA	<MDA								
21-1140	AAA0417	1"	<MDA	<MDA	<MDA	25.4	667,000	115,000	18.0	20.0	18,800	19,800	420
21-1141	AAA0418	1"	<MDA	<MDA	<MDA	46.2	1,259,000	213,000	30.0	36.0	34,100	42,900	420
	AAA0419	6"	<MDA	<MDA	<MDA								

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1145	AAA0530	1"	<MDA	<MDA	<MDA	30.3	926,000	144,000	22.0	22.0	24,600	24,800	460
	AAA0531	4"	<MDA	<MDA	<MDA								
21-1146	AAA0416	1"	<MDA	<MDA	<MDA	22.5	917,000	131,000	23.0	26.0	22,900	25,600	420
21-1147	AAA0415	1"	<MDA	<MDA	<MDA	25.4	815,000	115,000	21.0	21.0	20,900	22,700	330
21-1150	AAA0599	1"	<MDA	<MDA	<MDA	29.1	615,000	82,000	15.0	14.5	15,300	14,400	500
	AAA0600	1" dup	<MDA	<MDA	<MDA								
21-1151	AAA0532	1"	<MDA	<MDA	<MDA	43.1	926,000	141,000	23.0	23.5	25,200	25,400	630
21-1152	AAA0413	1"	<MDA	<MDA	<MDA	27.7	750,000	98,000	18.0	17.5	18,200	18,600	330
	AAA0414	6"	78.7	<MDA	<MDA								
21-1153	AAA0412	1"	<MDA	<MDA	<MDA	54.8	875,000	109,000	20.0	19.5	19,800	19,800	420
21-1156	AAA0533	1"	<MDA	<MDA	<MDA	39.7	926,000	144,000	23.0	23.0	24,300	24,600	460
	AAA0534	1"	<MDA	<MDA	<MDA								
21-1157	AAA0601	1"	<MDA	<MDA	<MDA	34.5	538,000	74,000	13.0	14.0	13,800	13,800	500
21-1158	AAA0410	1"	<MDA	<MDA	<MDA	27.1	792,000	104,000	18.0	17.5	17,900	17,700	420
21-1159	AAA0411	1"	<MDA	<MDA	<MDA	40.9	792,000	109,000	18.5	19.0	18,600	18,900	420
21-1161	AAA0602	1"	<MDA	<MDA	<MDA	29.4	720,000	93,000	16.5	15.5	17,400	16,500	420
21-1163	AAA0535	1"	<MDA	<MDA	<MDA	40.8	963,000	150,000	23.5	23.0	24,800	24,600	500
21-1164	AAA0404	1"	<MDA	<MDA	<MDA	31.7	750,000	87,000	16.0	16.0	17,200	17,100	420
	AAA0405	6"	<MDA	<MDA	<MDA								
21-1165	AAA0403	1"	<MDA	<MDA	<MDA	35.2	792,000	104,000	18.5	18.0	18,800	18,100	330
21-1167	AAA0603	1"	<MDA	<MDA	<MDA	22.3	640,000	82,000	16.0	15.0	16,400	15,500	330
	AAA0604	6"	<MDA	<MDA	<MDA								
21-1169	AAA0536	1"	<MDA	<MDA	<MDA	34.5	778,000	125,000	21.0	21.5	22,000	23,200	330
	AAA0537	6"	<MDA	<MDA	<MDA								
21-1170	AAA0399	1"	<MDA	<MDA	<MDA	36.9	667,000	98,000	16.0	16.0	16,600	17,000	290
	AAA0400	1" dup	<MDA	<MDA	<MDA								
21-1171	AAA0401	1"	<MDA	<MDA	<MDA	42.1	708,000	104,000	17.0	16.0	17,700	17,600	330
	AAA0402	6"	<MDA	<MDA	<MDA								
21-1174	AAA0538	1"	<MDA	<MDA	<MDA	44.9	852,000	141,000	23.0	22.5	24,600	23,700	460
21-1175	AAA0607	1"	<MDA	<MDA	<MDA	24.1	520,000	71,000	13.0	12.5	12,500	12,900	380

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1176	AAA0397	1"	<MDA	<MDA	<MDA	23.1	792,000	104,000	15.0	17.0	17,400	18,000	380
	AAA0398	6"	<MDA	<MDA	<MDA								
21-1177	AAA0396	1"	<MDA	<MDA	<MDA	32.3	792,000	98,000	18.0	18.0	17,500	17,100	250
21-1180	AAA0539	1"	<MDA	28.1	<MDA	26.8	963,000	156,000	22.5	23.0	24,300	24,700	420
	AAA0540	6"	<MDA	<MDA	<MDA								
	recount	1"	<MDA	<MDA									
	recount	1"	<MDA	<MDA									
21-1181	AAA0608	1"	<MDA	<MDA	<MDA	56.5	680,000	85,000	15.0	15.0	16,100	15,300	420
21-1182	AAA0394	1"	<MDA	<MDA	6.6	36.3	1,125,000	148,000	28.0	26.0	28,600	23,900	460
21-1183	AAA0395	1"	<MDA	<MDA	<MDA	47.9	741,000	104,000	19.0	18.0	18,900	19,000	380
21-1185	AAA0609	1"	<MDA	<MDA	<MDA	17.6	720,000	93,000	15.0	15.0	16,400	16,200	420
21-1187	AAA0541	1"	<MDA	<MDA	<MDA	48.4	1,000,000	169,000	28.0	26.0	27,000	26,200	580
21-1188	AAA0612	1"	<MDA	<MDA	<MDA	49.4	640,000	87,000	15.5	15.5	16,700	16,200	380
21-1189	AAA0610	1"	<MDA	<MDA	<MDA	14.1	560,000	82,000	13.5	13.0	14,400	13,800	250
	AAA0611	6"	<MDA	<MDA	<MDA								
21-1190	AAA0392	1"	<MDA	<MDA	<MDA	55.3	833,000	115,000	18.0	18.0	21,000	19,400	250
	AAA0393	6"	<MDA	<MDA	<MDA								
21-1191	AAA0391	1"	<MDA	<MDA	<MDA	42.8	741,000	109,000	20.0	19.5	20,200	20,000	330
21-1195	AAA0542	1"	<MDA	<MDA	<MDA	23.3	889,000	150,000	20.5	20.5	23,300	23,700	460
	AAA0543	6"	<MDA	<MDA	<MDA								
21-1196	AAA0389	1"	<MDA	<MDA	<MDA	37.2	741,000	107,000	20.0	20.0	20,300	19,900	330
	AAA0390	6"	<MDA	<MDA	<MDA								
21-1201	AAA0544	1"	<MDA	<MDA	<MDA	22.2	1,074,000	166,000	25.0	24.5	27,200	26,700	330
21-1202	AAA0388	1"	<MDA	<MDA	<MDA	47.9	778,000	115,000	24.0	22.0	20,800	20,300	420
21-1209	AAA0545	1"	<MDA	<MDA	<MDA	49.6	852,000	144,000	20.0	21.0	23,100	23,700	500
	AAA0546	6"	<MDA	<MDA	<MDA								
21-1210	AAA0386	1"	<MDA	<MDA	<MDA	35.4	815,000	120,000	21.0	20.0	20,200	20,500	460
	AAA0387	6"	<MDA	<MDA	<MDA								
21-1216	AAA0547	1"	<MDA	<MDA	<MDA	39.1	815,000	147,000	21.5	22.0	22,400	23,000	330
21-1217	AAA0385	1"	<MDA	<MDA	<MDA	27.7	778,000	115,000	21.0	20.0	21,100	21,400	500

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1223	AAA0548	1"	<MDA	<MDA	<MDA	20.4	778,000	125,000	21.0	21.0	20,300	21,400	380
	AAA0549	1" dup	<MDA	<MDA	<MDA								
	AAA0550	2"	<MDA	<MDA	<MDA								
21-1224	AAA0383	1"	<MDA	<MDA	<MDA	29.5	778,000	115,000	21.0	19.5	20,300	20,500	420
	AAA0384	6"	<MDA	<MDA	<MDA								
21-1231	AAA0551	1"	<MDA	<MDA	<MDA	37.9	889,000	144,000	22.5	22.0	24,600	24,700	500
21-1232	AAA0382	1"	<MDA	<MDA	<MDA	24.2	778,000	115,000	20.0	19.0	20,800	20,400	460
21-1236	AAA0552	1"	<MDA	24.2	7.5	33.8	963,000	163,000	24.0	24.5	26,700	25,800	630
21-1237	AAA0381	1"	<MDA	<MDA	<MDA	35.4	778,000	109,000	19.0	19.0	21,100	20,600	580
21-1242	AAA0553	1"	<MDA	<MDA	<MDA	44.9	889,000	150,000	22.0	22.0	24,000	23,500	500
	AAA0554	6"	<MDA	<MDA	<MDA								
21-1243	AAA0375	1"	<MDA	<MDA	<MDA	35.4	815,000	126,000	20.0	21.0	22,300	22,000	540
	AAA0376	4"	<MDA	<MDA	<MDA								
21-1247	AAA0557	1"	<MDA	<MDA	<MDA	32.7	889,000	144,000	24.0	24.5	24,500	24,700	460
21-1248	AAA0374	1"	<MDA	<MDA	<MDA	37.8	778,000	120,000	19.0	19.0	19,800	19,800	380
21-1254	AAA0558	1"	<MDA	<MDA	<MDA	40.9	889,000	138,000	21.5	22.0	23,600	23,700	500
21-1255	AAA0373	1"	<MDA	<MDA	<MDA	24.2	741,000	115,000	18.5	19.0	19,800	20,200	290
21-1257	AAA0365	1"	<MDA	<MDA	<MDA	32.4	741,000	177,000	20.0	19.5	19,400	19,500	330
21-1260	AAA0559	1"	<MDA	<MDA	<MDA		963,000	150,000	26.0	25.0	25,600	25,000	500
	AAA0560	6"	<MDA	<MDA	<MDA	35.7							
21-1261	AAA0372	1"	<MDA	<MDA	<MDA	43.7	778,000	11,000	20.0	19.0	20,000	20,200	500
21-1262	AAA0363	1"	<MDA	<MDA	<MDA	37.2	778,000	109,000	18.5	18.0	19,500	18,900	380
	AAA0364	6"	<MDA	<MDA	<MDA								
21-1263	AAA0270	1"	<MDA	<MDA	<MDA	51.4	667,000	96,000	18.0	17.0	17,000	17,400	580
	AAA0271	6"	<MDA	<MDA	<MDA								
21-1264	AAA0269	1"	<MDA	<MDA	<MDA	63.6	667,000	98,000	17.0	17.0	17,700	17,600	330
21-1265	AAA0561	1"	<MDA	<MDA	<MDA	57.3	889,000	138,000	24.0	24.0	25,500	24,700	420
21-1266	AAA0370	1"	<MDA	<MDA	<MDA	31.9	778,000	120,000	20.0	19.0	21,900	20,300	420
	AAA0371	6"	<MDA	<MDA	<MDA								
21-1267	AAA0362	1"	<MDA	<MDA	<MDA	31.8	778,000	120,000	19.0	20.0	20,900	20,300	290
21-1268	AAA0268	1"	<MDA	<MDA	<MDA	27.3	704,000	104,000	20.0	19.0	18,900	18,200	420

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1269	AAA0267	1"	<MDA	<MDA	<MDA	56.8	667,000	104,000	18.0	17.5	17,900	17,400	420
21-1270	AAA0368	1"	<MDA	<MDA	<MDA	23.0	852,000	177,000	20.0	19.0	20,500	20,400	460
	AAA0369	1" dup	<MDA	<MDA	<MDA								
21-1271	AAA0367	1"	<MDA	<MDA	<MDA	28.9	778,000	115,000	20.0	18.0	20,300	19,800	380
21-1272	AAA0361	1"	<MDA	<MDA	<MDA	40.9	852,000	120,000	21.0	20.0	21,900	21,000	540
21-1273	AAA0355	1"	<MDA	<MDA	<MDA	29.0	741,000	115,000	19.5	18.5	19,300	19,400	420
21-1274	AAA0354	1"	<MDA	<MDA	<MDA	41.5	704,000	120,000	19.0	19.0	21,500	20,800	460
21-1275	AAA0265	1"	<MDA	<MDA	<MDA	27.8	630,000	104,000	18.0	17.0	18,500	17,100	500
	AAA0266	6"	<MDA	<MDA	<MDA								
21-1276	AAA0366	1"	<MDA	<MDA	<MDA	38.9	815,000	123,000	21.0	21.0	21,100	20,800	500
21-1277	AAA0357	1"	<MDA	<MDA	<MDA	36.9	778,000	120,000	21.0	21.0	21,500	21,300	380
	AAA0358	6"	<MDA	<MDA	<MDA								
21-1278	AAA0356	1"	<MDA	<MDA	<MDA	59.0	741,000	115,000	20.5	21.0	19,900	20,700	420
21-1279	AAA0351	1"	<MDA	<MDA	<MDA	40.3	778,000	115,000	20.0	19.5	20,600	20,400	580
	AAA0352	5"	<MDA	<MDA	<MDA								
	AAA0353	5" dup	<MDA	<MDA	<MDA								
21-1280	AAA0263	1"	<MDA	<MDA	<MDA	30.7	704,000	104,000	19.0	18.0	17,700	17,300	380
	AAA0264	1"	<MDA	<MDA	<MDA								
21-1281	AAA0258	1"	<MDA	<MDA	<MDA	35.8	667,000	98,000	19.0	18.5	19,500	18,300	460
21-1282	AAA0275	1"	<MDA	<MDA	<MDA	30.7	741,000	109,000	20.0	20.0	20,600	20,300	460
21-1283	AAA0274	1"	<MDA	<MDA	<MDA	30.1	796,000	123,000	20.0	20.0	21,100	20,800	500
21-1284	AAA0259	1"	<MDA	<MDA	<MDA	42.6	667,000	104,000	19.0	18.0	18,600	18,600	380
	AAA0260	6"	<MDA	<MDA	<MDA								
21-1285	AAA0257	1"	<MDA	<MDA	<MDA	22.2	704,000	115,000	21.0	19.5	20,400	18,900	460
21-1296	AAA0467	1"	<MDA	<MDA	<MDA	42.8	704,000	119,000	16.5	16.5	17,800	17,500	330
	AAA0468	1"	<MDA	<MDA	<MDA								
21-1297	AAA0490	1"	<MDA	<MDA	<MDA	40.0	704,000	116,000	16.5	16.5	18,300	18,200	500
	AAA0491	1"	<MDA	<MDA	<MDA								
21-1298	AAA0513	1"	<MDA	<MDA	<MDA	46.6	926,000	150,000	23.0	23.5	26,000	25,500	420
	AAA0514	1" dup	<MDA	<MDA	<MDA								
	AAA0515	6"	<MDA	<MDA	<MDA								

Table 3.2-II. Field-Collected Data from Surface Grid Sampling, Second Round (continued)

			Field Laboratory			Field Surveys							
						Gross Alpha	Low-Energy Gamma		Gross Gamma				Beta-Gamma
			Gross	Gross	Gross	Alpha Scintillometer	FIDLER	FIDLER	Micro R Meter		2x2 NaI Detector		Pancake GM
Location Identification	Sample Number	Sample Depth	Alpha pCi/g	Beta pCi/g	Gamma pCi/g	dpm	(Pu-238) dpm	(Am-241) dpm	Surface µR/hr	3 ft µR/hr	Surface cpm	3 ft cpm	dpm
21-1299	AAA0555	1"	<MDA	<MDA	4.7	25.1	852,000	138,000	21.0	21.0	23,200	22,800	420
	AAA0556	6"	<MDA	<MDA	<MDA								
21-1300	AAA0573	1"	<MDA	<MDA	<MDA	20.0	538,000	87,000	14.0	13.5	15,000	14,300	380
	AAA0574	6"	<MDA	<MDA	<MDA								
21-1301	AAA0606	6"	<MDA	<MDA	<MDA	31.8	720,000	87,000	16.5	16.5	16,500	16,700	420
21-1467	AAA0261	1"	<MDA	<MDA	<MDA	56.3	704,000	98,000	18.0	18.0	18,800	18,200	460
	AAA0262	6"	<MDA	<MDA	<MDA								
21-1468	AAA0359	1"	<MDA	<MDA	<MDA	37.5	815,000	120,000	22.0	21.0	22,400	21,500	630
	AAA0360	6"	<MDA	<MDA	<MDA								
21-1469	AAA0406	1"	<MDA	<MDA	<MDA	45.5	625,000	90,000	17.5	17.0	16,900	17,200	330
	AAA0407	6"	<MDA	<MDA	<MDA								
21-1470	AAA0443	1"	<MDA	<MDA	<MDA	24.4	667,000	90,000	17.0	16.5	16,600	16,800	330
	AAA0444	6"	<MDA	<MDA	<MDA								

Table 3.2-III. Field Survey Radiation Background Measurements on Natural Soils

	Gross Alpha	Low-Energy Gamma		Gross Gamma		Beta-Gamma
	Alpha Scintillometer	FIDLER (Pu-238)	FIDLER (Am-241)	Micro R Meter	2x2 NaI Detector	Pancake GM
	dpm	dpm	dpm	µR/hr	cpm	dpm
Mean	26.0	729,000	90,000	14.5	16,100	380
Std. Dev. (s)	11.0	68,000	6,000	1.0	1,300	60
Mean + 3s	59.0	933,000	108,000	17.5	20,000	560

4. GEOMORPHOLOGIC STUDIES

As part of the TA-21 mesa-top characterization, several geologic studies are scheduled throughout FY92 and FY93. The studies are described at Section 12.3, Geomorphologic Sampling Plan, of the TA-21 OU RFI Work Plan (LANL 1991a).

4.1. STRATIGRAPHY/LITHOLOGY

Three stratigraphic sections were measured for tuff units exposed on the north wall of Los Alamos Canyon. Lithologic characteristics including rock type, degree of welding, type of alteration, lithic content, phenocryst assemblage, pumice size and color, bedding features, and weathering characteristics were described at 5 meter intervals or at major changes in lithology. The locations of the three stratigraphic sections are identified on Figure 4.1-1.

The stratigraphic sequence is similar in each of the three measured sections and consists of, in ascending order: the lower Bandelier Tuff (Otowi Member)(5 to 19 m thick, base not exposed), fluvial and pumice fall deposits of the Cerro Toledo interval (2.5 to 8.8 m thick), Tsankawi plinian pumice falls (0.7 m thick), and the upper Bandelier Tuff (Tshirege Member) (89 to 98 m thick).

4.2. GEOMORPHOLOGY

Work on the geomorphic characterization of TA-21 in the third quarter included preparation of an approximately 1:5000 scale map of geomorphic features in the operable unit. Approximately 75 percent of the OU has been mapped. Mapping relied on both an examination of 1:7200 scale air photographs and on field traverses.

During this mapping, significant variations in mass wasting processes were identified along the margins of DP Mesa. These processes have bearing on the relative stability of different sites near the mesa edges. On the south edge of the mesa, the cliffs facing Los Alamos Canyon exhibit partially intact landslide blocks that extend up to 50 feet or more into the mesa and extend downward through multiple stratigraphic units of tuff. Cliff retreat is probably fastest along this mesa edge, where deep failure planes can develop through the tuff.

In contrast, no evidence for similar failures exists along the mesa edge immediately south of MDA B and MDA V, adjacent to a much shallower canyon (see Figure 4.1-1). Geomorphic features suggest a much slower rate of lateral erosion on this slope.

Samples of tuff from the cliff faces are being prepared for analysis of cosmogenically-produced neon-20. These analyses may allow quantitative estimates of long-term lateral erosion rates to be made of the canyon walls.

4.3. FAULTS/FRACTURES

Fracture studies at TA-21 were directed towards mapping fractures along a lateral traverse at the base of the most resistant cliff-forming unit on the north side of Los Alamos Canyon. The eventual extent of the lateral fracture traverse is indicated in Figure 4.1-1. Through the third quarter, fractures along 2000 feet of the lateral traverse have been documented in photographs and located on maps. Measurements of strike, dip, and aperture as well as descriptions of fracture filling material are being conducted. Each fracture is assigned a unique identifier. The identifier and associated measurements will be stored in a database for statistical analysis. When completed, the traverse will document fractures for 4000 feet of linear exposure.

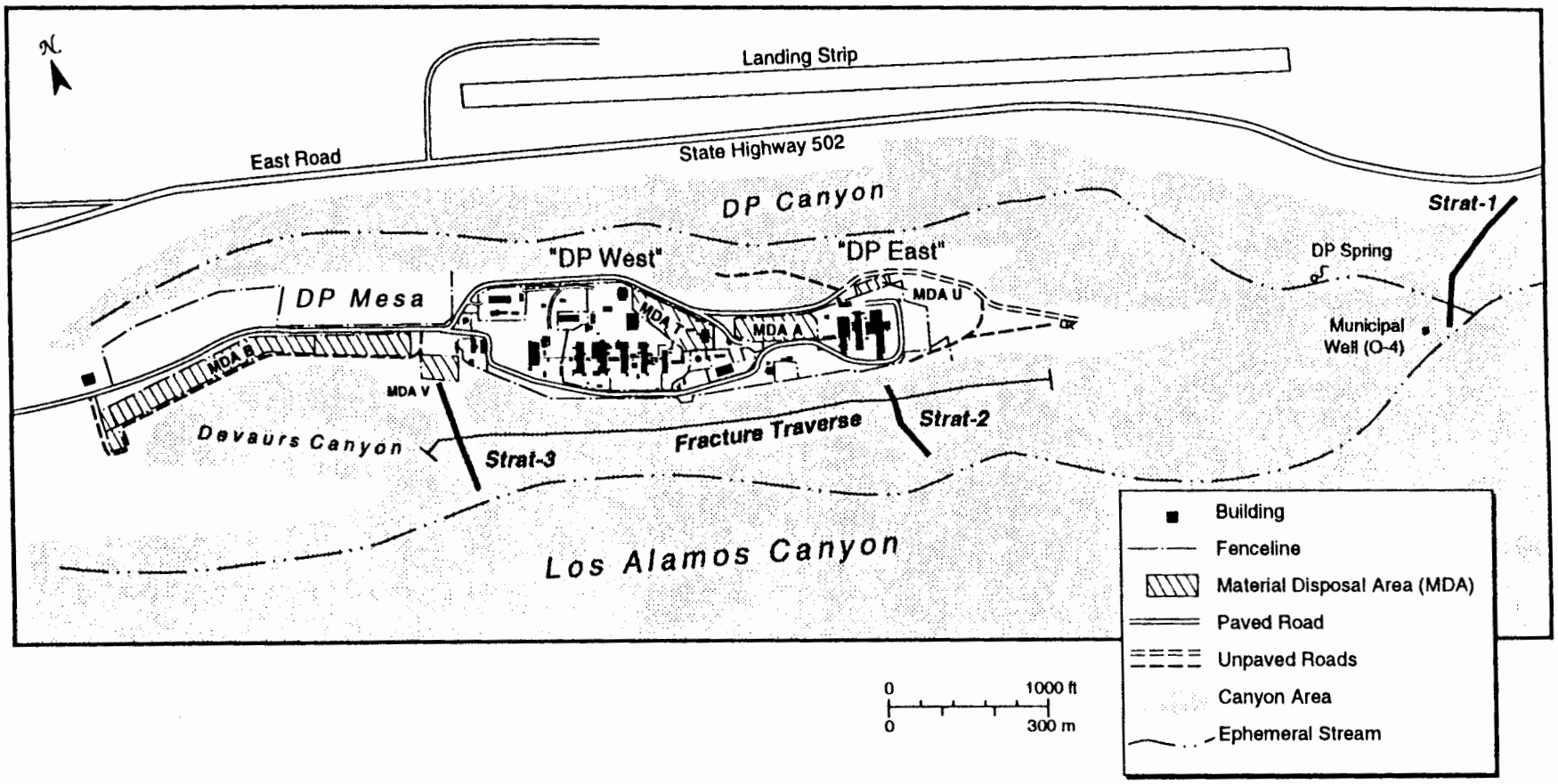


Figure 4.1-1 Stratigraphic sections and lateral fracture traverse on north wall of Los Alamos Canyon.

5. SURFACE WATER INVESTIGATIONS

Surface water studies to be conducted around DP Mesa at TA-21 are described in the TA-21 OU RFI Work Plan (LANL 1991a) at Section 12.6, Transient Groundwater Emergence Sampling Plan. The first investigation, a dye tracer study at DP Spring, is reported below.

5.1. TRACER EXPERIMENT, DP SPRING

DP Spring was first identified in 1989 or 1990. It is located on the north wall of DP Canyon (across DP Canyon from TA-21). The location of the spring is shown in Figure 5.1-1. The spring issues at the contact between the Tshirege member of the upper Bandelier tuff and overlying colluvium which is composed primarily of tuff debris. The shape of the colluvium body suggests it is filling in a paleocanyon cut into the tuff before the present canyon was formed.

Work plan Section 12.6.1.1, DP Spring, gives tritium measurement data for the spring which indicate above background levels in the water. The source of the tritium is not known and may be from the mesa to the north of the spring or from upper DP Canyon. A possible source may be the TA-21 sewage treatment plant outfall which has exhibited elevated tritium concentrations. The effluent from the sewage treatment plant enters DP Canyon from the south shortly above DP Spring.

To identify any hydrologic connection between the sewage treatment effluent and DP Spring, the fluorescein dye tracer experiment described in the work plan was conducted in the summer of 1991. On June 19, 1991 approximately 20 liters of a dye-water solution having a concentration of 22.4 grams per liter was dumped into the cattail pond directly below the TA-21 sewage treatment plant outfall. This pond occurs in a small branch canyon south of DP Canyon and north of the main portion of DP Mesa. Three sampling locations were selected downstream of the cattail pond and above DP Spring. Their locations are shown in Figure 5.1-1. Sites A and B are in the small branch canyon. Site C is in the main part of DP Canyon about 50 m upstream DP Spring.

5.2. DATA PRESENTATION

The presentation of data given here is based on a rapid review and compilation. This information is presented to document progress to date. These data and their assessment are subject to revision after later review. This should be considered a "raw data" report.

Fluorescein was detected at each of the three sampling stations, but never in DP Spring. The data are summarized in Table 5.1-I.

In addition to fluorescein, several anions and other parameters were also measured in the water samples. The results are also tabulated in Table 5.1-I. Of particular interest is the presence of the chlorate ion (ClO_3) in DP Spring. This ion does not naturally occur in groundwater and is not present in the samples from the other three sampling stations. Also of interest is the observation that B, NO_3, PO_4 and SO_4 are low in DP Spring but relatively high in water from the other sampling stations.

As a preliminary conclusion, it appears that the sewage treatment outfall has little or no influence on the water discharging from DP Spring. Water at DP Spring may have its source farther up DP Canyon or on the mesa north of DP Canyon.

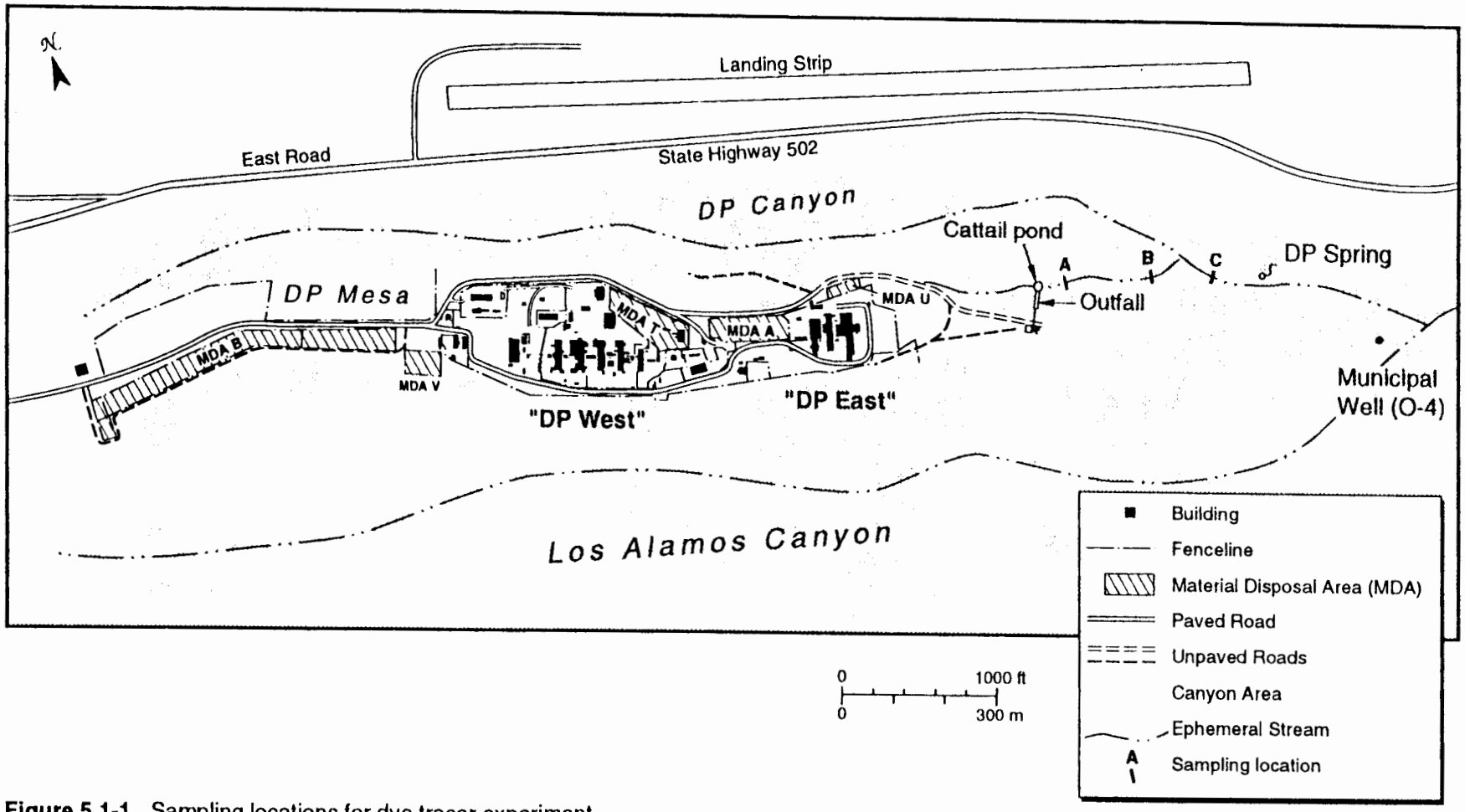


Figure 5.1-1 Sampling locations for dye tracer experiment.

Table 5.1-I. Sample Analysis Results from Dye Tracer Experiment

Location	Sample No	Date	Temperature C	Fluorescein ppb	B ppm	Br ppm	BrO3 ppm	Cl ppm	ClO3 ppm	F ppm	NO2 ppm	NO3 ppm	pH (field)	PO4 ppm	SO4 ppm
Prior to Tracer Experiment															
DP Spring	PP-1	5/30/90	8.4	NR	<0.05	<0.05	NR	39.5	NR	1.88	NR	5.78	NR	1.17	14.50
DP Spring	PP-2	8/1/90	10.0	NR	0.53	<0.05	NR	24.7	NR	1.73	<0.05	3.41	NR	1.18	10.10
DP Spring	PP-4	9/6/90	16.0	NR	0.10	<0.05	NR	21.1	NR	1.69	<0.05	2.45	NR	1.16	9.23
DP Spring	Va345	5/14/91	11.4	NR	<0.02	0.03	<0.02	119.0	0.78	1.26	<0.05	4.29	5.8	0.47	11.80
DP Spring	Va363	6/26/91	8.0	NR	<0.02	0.02	<0.02	76.0	0.43	1.37	<0.05	3.64	5.8	0.60	9.88
A	DP91-1	6/19/91	20.0	<0.05	0.60	0.09	NR	75.5	<0.10	1.54	<0.02	70.60	6.5	16.60	24.90
DP Spring	DP91-2	6/19/91	9.3	<0.05	0.05	0.02	NR	78.3	0.39	1.40	<0.02	5.22	5.8	0.64	11.20
Tracer Experiment															
A	DP91-3	6/19/91	NR	16100.00	0.15	0.03	NR	30.1	NR	1.41	0.7	53.40	NR	14.60	53.40
DP Spring	DP91-4	6/20/91	9.3	<0.05	<0.02	0.02	NR	76.1	0.42	1.38	<0.02	4.93	5.5	0.68	11.10
DP Spring	DP91-5	6/21/91	8.9	<0.05	<0.02	0.02	NR	70.7	0.37	1.38	<0.02	3.96	5.8	0.64	10.00
DP Spring	DP91-6	6/22/91	9.0	<0.05	<0.02	0.02	NR	71.8	0.42	1.37	<0.02	4.25	NR	0.65	9.98
B	DP91-7	6/22/91	16.8	0.10	0.16	0.03	NR	36.9	<0.05	1.81	<0.02	0.06	6.5	6.50	29.70
DP Spring	DP91-8	6/23/91	7.9	<0.05	<0.02	0.02	NR	72.6	0.39	1.37	<0.02	4.25	6.5	0.66	9.92
DP Spring	DP91-9	6/24/91	8.0	<0.05	<0.02	0.02	NR	73.5	0.44	1.34	<0.02	4.35	5.8	0.67	9.81
DP Spring	DP91-10	6/25/91	8.0	<0.05	<0.02	0.02	NR	74.6	0.45	1.39	<0.02	1.17	6.0	0.42	9.84
DP Spring	DP91-11	6/26/91	8.0	<0.05	<0.02	0.02	NR	75.5	0.44	1.44	<0.02	1.65	5.8	0.47	9.79
DP Spring	DP91-12	6/28/91	8.1	<0.05	0.02	0.02	NR	76.6	0.46	1.37	<0.02	1.27	5.8	0.46	9.49
DP Spring	DP91-13	6/30/91	8.6	<0.05	<0.02	0.02	NR	77.0	0.45	1.36	<0.02	1.92	5.8	0.52	9.44
B	DP91-14	6/30/91	NR	0.16	0.13	0.04	NR	28.2	<0.05	0.99	<0.02	<0.05	NR	8.60	33.80
DP Spring	DP91-15	7/1/91	7.9	<0.05	<0.02	0.02	NR	77.2	0.45	1.40	<0.02	2.01	5.8	0.55	9.41
DP Spring	DP91-16	7/3/91	8.2	<0.05	<0.02	0.02	NR	72.9	0.38	1.38	<0.02	2.45	5.5	0.55	9.50
DP Spring	DP91-17	7/5/91	8.7	<0.05	<0.02	<0.02	<0.02	60.0	0.29	1.00	<0.02	1.70	6.0	0.53	8.69
DP Spring	DP91-18	7/7/91	8.0	<0.05	<0.02	<0.02	<0.02	59.9	0.27	1.16	<0.02	2.19	5.8	0.54	9.37
DP Spring	DP91-19	7/9/91	8.0	<0.05	<0.02	<0.02	<0.02	58.7	0.28	1.14	<0.02	1.67	5.8	0.49	9.49
C	DP91-20	7/9/91	NR	0.29	<0.02	<0.02	<0.02	6.9	<0.05	0.22	<0.02	0.91	NR	0.13	3.23
DP Spring	DP91-21	7/11/91	8.4	<0.05	<0.02	<0.02	<0.02	50.9	0.18	1.20	<0.02	1.97	5.8	0.61	8.28
DP Spring	DP91-22	7/12/91	8.0	<0.05	<0.02	<0.02	<0.02	50.8	0.22	1.09	<0.02	1.10	5.5	0.51	8.48
DP Spring	DP91-23	7/15/91	8.1	<0.05	<0.02	<0.02	<0.02	53.4	0.21	1.15	<0.02	1.15	5.5	0.61	8.69
DP Spring	DP91-24	7/17/91	8.2	<0.05	<0.02	<0.02	<0.02	53.4	0.22	1.05	<0.02	1.25	5.8	0.57	8.48
DP Spring	DP91-25	7/19/91	8.6	<0.05	<0.02	<0.02	<0.02	54.0	0.21	1.07	<0.02	2.24	5.5	0.61	8.48
C	DP91-26	7/19/91	NR	0.07	0.06	<0.02	<0.02	15.5	<0.05	0.56	<0.02	1.47	NR	0.07	6.06
B	DP91-27	7/19/91	NR	0.21	0.30	<0.02	<0.02	21.0	<0.05	2.03	<0.02	6.00	NR	4.89	44.60
A	DP91-28	7/19/91	NR	30.20	0.18	<0.02	<0.02	41.0	<0.05	1.12	<0.02	61.90	NR	6.38	79.80
DP Spring	DP91-29	7/22/91	9.1	<0.05	<0.02	<0.02	<0.02	49.1	0.14	1.08	<0.02	1.81	5.5	0.69	7.94
C	DP91-30	7/22/91	NR	<0.05	<0.02	<0.02	<0.02	12.7	<0.05	0.57	<0.02	<0.05	NR	<0.05	3.70
DP Spring	DP91-31	7/24/91	9.0	<0.05	0.02	<0.02	<0.02	37.8	0.11	1.49	<0.02	2.22	6.0	0.71	7.47
DP Spring	DP91-32	7/26/91	9.6	<0.05	<0.02	0.02	<0.02	34.0	0.08	1.69	<0.02	1.28	6.0	0.68	8.85
C	DP91-33	7/26/91	NR	0.07	<0.02	<0.02	<0.02	15.9	<0.02	0.69	<0.02	0.02	5.8	0.17	4.78
B	DP91-34	7/26/91	NR	6.80	0.13	<0.02	<0.02	31.7	<0.05	1.39	<0.02	1.51	6.0	5.50	48.10
A	DP91-35	7/26/91	NR	28.80	0.09	0.02	<0.02	33.4	<0.10	1.27	<0.02	26.10	6.0	9.10	46.20
DP Spring	DP91-36	8/1/91	9.4	NR	<0.02	0.02	<0.02	33.1	0.04	1.62	<0.02	2.95	NR	0.83	11.7

6. BIOLOGICAL SURVEY

The TA-21 Operable Unit (OU) biological survey and results were reported in the Quarterly Technical Progress Report for First Quarter FY92 (LANL 1992b). A revised draft of the biological evaluation (LANL 1992c) was received during the third quarter, and some new constraints have been imposed on RFI field work in certain parts of the OU. It appears that the new constraints will not impact planned sampling activities in Los Alamos Canyon.

6.1. FIELD WORK CONSTRAINTS

Constraints on field work to protect the spotted bat were discussed in the Quarterly Technical Progress Report for First Quarter FY92 (LANL 1992b). In the latest draft of the biological evaluation (LANL 1992c) two additional protected or sensitive species were addressed, and field work constraints were recommended to mitigate impacts to their environment.

6.1.1. Peregrine Falcon

The peregrine falcon is a state and federally protected endangered species. In order to maintain the habitat in lower Los Alamos Canyon as an alternate nesting area for falcons, disturbance within a half-mile radius of the municipal well in the lower part of Los Alamos Canyon should be kept to a minimum. Sampling with heavy equipment (drill rig) should be done between the months of September and February, leaving the months of March through August free of heavy disturbance. Figure 6.1-1 shows the location of the municipal well and the half-mile drilling exclusion radius.

6.1.2. Northern Goshawk

The northern goshawk is a federal candidate for protected status. In order to protect possible goshawk habitat in lower Los Alamos Canyon, disturbance within a half-mile radius of the municipal well in the lower part of Los Alamos Canyon should be kept to a minimum (see Figure 6.1-1). Sampling with heavy equipment (drill rig) should be done between the months of September and February, leaving the months of March through August free of heavy disturbance.

6.1.3. Cooper's Hawk

Cooper's hawk is a sensitive species. A productive nest exists with in the TA-21 OU in Los Alamos Canyon. To prevent adverse impacts to the hawk, sampling within the nesting area of the Cooper's hawk should be done outside the mating, nesting, and fledging times. Sampling in Los Alamos Canyon within a half-mile radius of the municipal well (see Figure 6.1-1) should be conducted during the months of September through March.

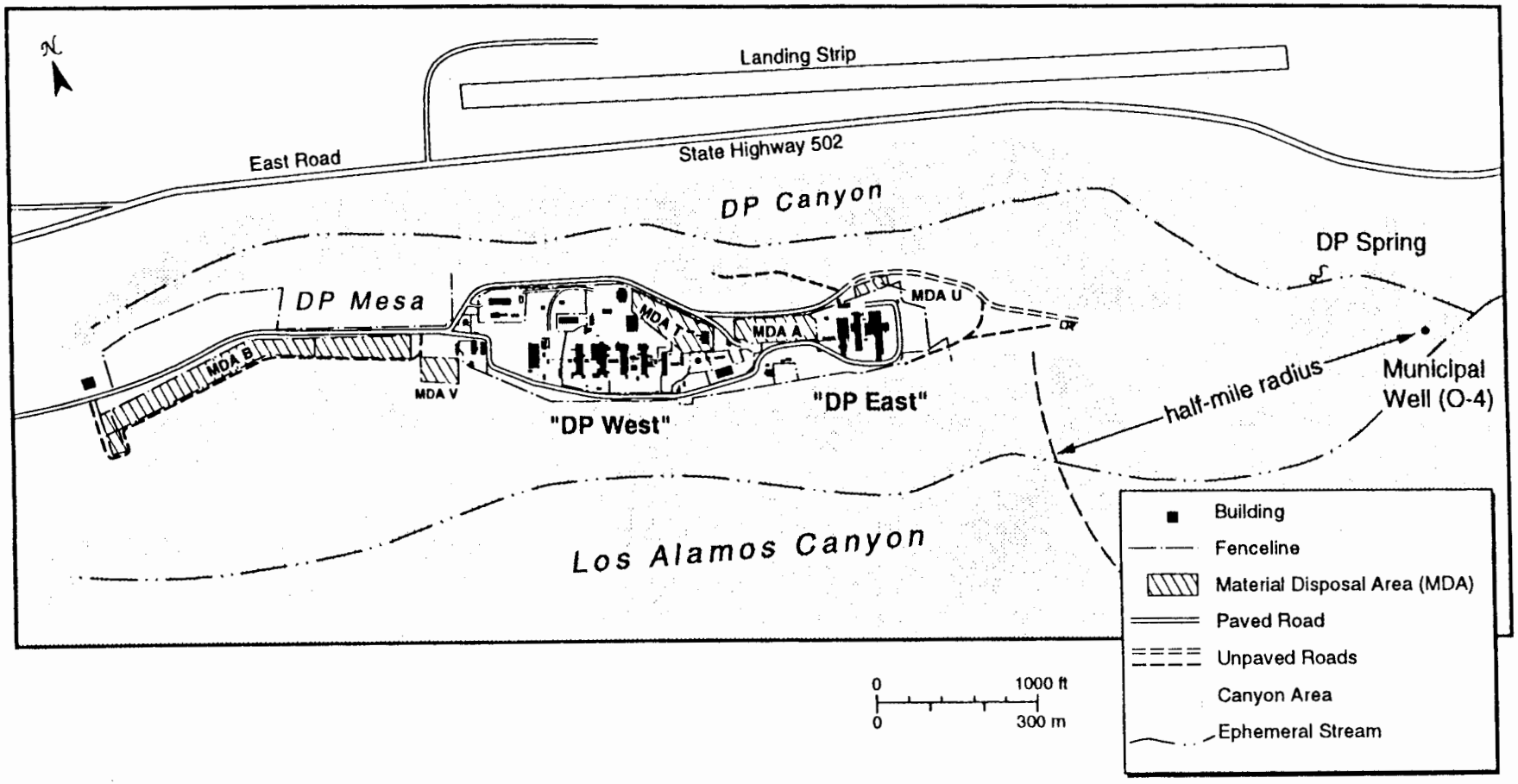


Figure 6.1-1 Location of municipal well in Los Alamos Canyon, and extent of half-mile radius drilling exclusion area.

7. REFERENCES CITED

EPA 1992 Letter from Allyn M. Davis, Director, Hazardous Waste Management Division, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. January 9, 1992.

LANL 1991a TA-21 Operable Unit RFI Work Plan for Environmental Restoration, LAUR-91-962, Los Alamos National Laboratory, Los Alamos NM 87545. May 1991.

LANL 1991b Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration, Los Alamos National Laboratory, Los Alamos NM 87545. December 1991.

LANL 1992a Quarterly Technical Progress Report, TA-21 Operable Unit, RCRA Facility Investigation, Second Quarter FY92. Environmental Restoration Group, Los Alamos National Laboratory, Los Alamos, NM. May 15, 1992.

LANL 1992b Quarterly Technical Progress Report, TA-21 Operable Unit, RCRA Facility Investigation, First Quarter FY92. Environmental Restoration Group, Los Alamos National Laboratory, Los Alamos, NM. February 15, 1992.

LANL 1992c Biological Evaluation for Environmental Restoration Program, Operable Unit 1106 and 1078, TA-1 and TA-21, Los Alamos Canyon and DP Canyon. Environmental Protection Group, EM-8, Los Alamos National Laboratory, Los Alamos NM, Draft: March 1992.

QUARTERLY TECHNICAL PROGRESS REPORT

TA-21 OPERABLE UNIT

RCRA FACILITY INVESTIGATION

SECOND QUARTER FY92

(JANUARY--MARCH, 1992)

MAY 15, 1992

ENVIRONMENTAL RESTORATION GROUP

LOS ALAMOS NATIONAL LABORATORY

TABLE OF CONTENTS

List of Tables ii

List of Figures ii

1. Summary of Activities 1-1

2. Administrative and Planning Activities 2-1

3. Geomorphologic Studies 3-1

    3.1. Stratigraphy/Lithology 3-1

    3.2. Geomorphology 3-1

4. First Round Surface Soil Sampling 4-1

    4.1. Deviation from Sampling Plan 4-1

        4.1.1. Error in Surface Grid Drawings 4-1

        4.1.2. Deposition-Layer Sampling 4-1

        4.1.3. Surface Soil Sampling 4-2

        4.1.4. Budget and Schedule 4-2

        4.1.5. New Sampling Strategy 4-2

    4.2. Execution of the New Strategy 4-3

5. Deviation from Quality Assurance Project Plan 5-1

6. References Cited 6-1

LIST OF TABLES

Table 4.1-I Comparison of Sample Distribution:

Original Sampling Plan vs. New Strategy 4-4

Table 5.1-I Detection Limit Changes 5-1

LIST OF FIGURES

Map 1. ..... Map pocket

1. SUMMARY OF ACTIVITIES

This Quarterly Technical Progress Report is the second addressing the Technical Area 21 (TA-21) Operable Unit (OU) RCRA Facility Investigation (RFI) conducted by the Los Alamos National Laboratory (the Laboratory). The TA-21 OU RFI is conducted according to the plans presented in the TA-21 Operable Unit Work Plan for Environmental Restoration (LANL 1991a) as amended by the Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration (LANL 1991b) and approved by the U.S. Environmental Protection Agency (EPA 1992).

Technical activities conducted during the second quarter of Fiscal Year 1992 (FY92), January through March 1992, are reported herein. The major activities were:

- Approval of the work plan by EPA on January 9, 1992 (EPA 1992).
- Mobilization and initialization of spring field activities continued according to the revised schedule presented in the work plan addendum.
    - Surveying of grid locations for the first round of surface soil sampling was completed in mid-March.
    - Sampling of the grid points began on March 19, 1992, and will be completed in early April.
- Stratigraphic and geomorphic studies of DP Mesa continued throughout the second quarter.

2. ADMINISTRATIVE AND PLANNING ACTIVITIES

During the second quarter of FY92 (January - March 1992), EPA's approval was received for the TA-21 OU RFI Work Plan (LANL 1991a) as amended by the Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration (LANL 1991b).

In March, planning was initiated for field work scheduled during the summer. In particular, plans were being developed for drilling support for outfalls investigations (Work Plan Chapter 15), which require a small, compact drilling rig able to hollow-stem core 20 to 50 feet in areas of difficult access.

The second round of surface soil sampling is scheduled in June 1992 to complete the TA-21 OU RFI Work Plan objectives described in Section 12.4, Surface Grid Sampling Plan and Chapter 13, Surface Soil Contamination from Airborne Emissions. Planning for this activity will begin in April and is expected to proceed smoothly based on the experience gained from the first round (described below).

3. GEOMORPHOLOGIC STUDIES

As part of the TA-21 mesa-top characterization, several geomorphologic studies are scheduled throughout FY92 and FY93. The studies are described in Section 12.3, Geomorphologic Sampling Plan, of the TA-21 OU RFI Work Plan (LANL 1991a).

3.1. STRATIGRAPHY/LITHOLOGY

Work on lithologic studies of the Bandelier tuff were initiated during the quarter, and a common stratigraphic nomenclature was agreed upon by TA-21 geologists. The color and black-and-white photographs of the north face of Los Alamos Canyon, taken during the first quarter of FY92, are being used to map lithologic variations in the Bandelier tuff and to document sample locations for lithologic studies. Field parties have been examining canyon walls to select suitable locations for vertical measured sections. Sites for three of the minimum of four measured sections have been identified.

3.2. GEOMORPHOLOGY

Work on geomorphic characterization of TA-21 began this quarter. Field reconnaissance and examination of 1:7000 scale aerial photographs focused on identifying drainages where sediment storage sites need to be characterized, and on identifying areas of mesa edge landsliding. Evidence for episodic deposition and erosion of sediment was found in DP Canyon. Probable landslides were discovered on both the north and south edges of DP Mesa.

4. FIRST ROUND SURFACE SOIL SAMPLING

Planning, mobilization, and land surveying of the sampling grid for the first round of surface soil sampling were completed during the second quarter of FY92. The soil sampling was started late in the quarter (March 19, 1992) and will be completed early in the third quarter (April). This program was on schedule at the end of the second quarter.

During the planning for this investigation, problems with the original sampling plan presented in the TA-21 OU RFI Work Plan were identified, necessitating a deviation from the plan. The following sections describe the problem and the changes made to ensure the investigation will satisfy its intended purpose.

4.1. DEVIATION FROM SAMPLING PLAN

4.1.1. Error in Surface Grid Drawings

In early preparation for the first round of surface soil sampling, an error was found in the drawing used as the basis for the plan. The official Laboratory drawing set, the "Grey Book," has an error in the scale for the TA-21 site drawing. The scale is off by a factor of two, indicating 500 ft where the actual distance is 1000 ft. This error was propagated through much of the TA-21 OU RFI Work Plan (LANL 1991a). It affects all drawings similar to Figure 1.1-1 of the work plan. The error was discovered when drawings were generated from the FIMAD graphical information system for setting the grid to be used for the surface soil sampling.

The grid and the proposed sampling plans were described in the work plan at Section 12.4, Surface Grid Sampling Plan and at Chapter 13, Surface Contamination from Airborne Emissions. The grid is shown in work plan Figure 13.2-3 as a 40-m by 40-m grid. It was on the basis of this figure that the number of samples to be collected was determined: approximately 180 grid points. Because of the error in the scale, however, the grid in the figure actually represents an 80 m by 80 m grid. A true 40-m by 40-m grid would include approximately four times as many sampling points, about 720.

4.1.2. Deposition-Layer Sampling

The deposition-layer sampling (0-1 in.) described in Chapter 13 is intended to address the presence, in the surficial layer of the soil, of contaminants deposited from airborne releases.

Originally, the 40-m by 40-m grid size was selected on the basis of a statistical assessment of the spacing required to identify any depositional area greater than 3000 m^2. This remains a valid goal of this sampling plan, as described in work plan Section 13.2.4.1, Initial Investigation.

4.1.3. Surface Soil Sampling

The surface grid sampling plan described in Section 12.4 has objectives which are different from those of the deposition-layer sampling of Chapter 13. This investigation is intended to establish the "TA-21 OU local background" levels, and to provide a basis against which contaminant levels at SWMUs can be compared. This investigation uses the same sampling increment, 0-6 in., that is to be used at the SWMUs to ensure data comparability. This investigation was tied to the 40-m by 40-m grid since the resulting (apparent) number of samples and sample spacing was sufficient to provide the needed information. The goals for this investigation, however, do not rely on the statistical assessment used to select the 40-m by 40-m grid.

4.1.4. Budget and Schedule

The budget and schedule for the surface grid sampling was based on the estimated 180 grid points for each of the two investigations described above. A program requiring four times as many points cannot be conducted.

4.1.5 New Sampling Strategy

After discovery of the grid error, careful assessments were made of a true 40-m by 40-m grid and a replacement sampling strategy was developed. The new strategy, shown on Map 1 (map pocket), results in the same number of samples as originally planned. The new strategy has the following attributes:

- It accounts for inaccessible terrain on the walls of DP Canyon and Los Alamos Canyon (reducing the total number of grid points it is feasible to sample),
- It eliminates sampling at grid points which fall within SWMUs, and in areas around the MDAs that will be addressed in the MDA surface sampling plans (eliminating bias due to the potential presence of SWMU-related contaminants),
- It uses the 40-m by 40-m grid for deposition-layer sampling (retaining the focus on 3000 m^2 depositional areas),

- It maintains the same number of deposition-layer sampling points in the area of buildings as proposed in the work plan (30 locations),
- It reduces the total number of "local background" surface soil samples by focusing them on specific areas of greatest need (the number is reduced both mesa-wide and in the area of the buildings), and
- It maintains the number of samples originally planned for estimating spatial variability (20 deposition-layer samples and 20 "local background" surface soil samples).

A summary of the numbers of samples of different types and purposes is given in Table 4.1-I for the original plan and the new strategy. The details of the new strategy are represented by Map 1. The new strategy will achieve the original investigation goals, and will conform to the number of samples used in the development of the RFI budget and schedule as presented in the addendum to the work plan (LANL 1991b).

4.2 EXECUTION OF THE NEW STRATEGY

The surface grid sampling was planned in two rounds, the first (March-April 1992) is reported here. The second round is scheduled for June 1992. Half of the sampling locations selected for the new strategy are scheduled for the first round; these are identified on Map 1 (map pocket) with yellow and green symbols as noted in the map legend.

Surveying of the grid locations for the first round began in February and was completed in mid-March. Sampling began on March 19, 1992. By March 31, 1992 a total of 72 of the 133 locations scheduled for the first round had been sampled.

TABLE 4.1-I. COMPARISON OF SAMPLE DISTRIBUTION: ORIGINAL SAMPLING PLAN VS. NEW STRATEGY.

	Original Plan	New Strategy
Deposition-layer Samples		
Mesa-wide	180	255
Building area	30	30
Spatial Variability	20	20
Subtotal	230	305
"Local Background" Samples		
Mesa-wide	180	125
Building area	30	10
Spatial Variability	20	20
Subtotal	230	155
Total	460	460

5. DEVIATION FROM QUALITY ASSURANCE PROJECT PLAN

5.1 DETECTION LIMITS: AM-241, U- AND TH-ISOTOPIC ANALYSES

The Quality Assurance Project Plan (QAPjP) in the TA-21 OU RFI Work Plan (Appendix A, LANL 1991a) refers to the Laboratory's Generic QAPjP (LANL 1991c) for analytical methods and detection limits. The detection limits specified for radiological measurements (Table V.8, LANL 1991c) are based on methods used by the Laboratory's Environmental Chemistry Group (EM-9).

For several measurements, the Sample Coordination Facility (SCF) arranged for the analyses to be done at another laboratory. (The role of the SCF is described in the Laboratory's Installation Work Plan in Appendix N, LANL 1991d.) The external laboratory could not achieve the levels proposed, and the changes given in Table 5.1-I were needed. These detection limit changes do not affect our ability to use the analysis results to identify the presence of contaminants in samples from TA-21.

TABLE 5.1-I. DETECTION LIMIT CHANGES

Radionuclide	Detection Limits from Generic QAPjP Table V.8 (pCi/g)	New Detection Limits (pCi/g)
Isotopic uranium	0.01	0.1
Isotopic thorium	0.01	0.1
Am-241	0.002	0.1

6. REFERENCES CITED

LANL 1991a TA-21 Operable Unit RFI Work Plan for Environmental Restoration, LAUR-91-962, Los Alamos National Laboratory, Los Alamos NM 87545. May 1991.

LANL 1991b Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration, Los Alamos National Laboratory, Los Alamos NM 87545. December 1991.

EPA 1991 Letter from William K. Honker, Chief, RCRA Permits Branch, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. October 30, 1991.

EPA 1992 Letter from Allyn M. Davis, Director, Hazardous Waste Management Division, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. January 9, 1992.

EPA ID # N M 0 8 9 0 0 1 0 5 1 5

FACILITY NAME Los Alamos Scientific

MAP/OTHER

(See Non-Scanned Objects for Location and Description)

TA-21 Surface Characterization Sample Location

QUARTERLY TECHNICAL PROGRESS REPORT

TA-21 OPERABLE UNIT

RCRA FACILITY INVESTIGATION

FIRST QUARTER FY92

(OCTOBER--DECEMBER, 1991)

FEBRUARY 15, 1992

ENVIRONMENTAL RESTORATION GROUP

LOS ALAMOS NATIONAL LABORATORY

LIST OF FIGURES

Figure 4-1. Potential Wetlands at Operable Unit TA-21 4-4

1. SUMMARY OF ACTIVITIES

This Quarterly Technical Progress Report is the first addressing the Technical Area 21 (TA-21) Operable Unit (OU) RCRA Facility Investigation (RFI) conducted by the Los Alamos National Laboratory (the Laboratory). The TA-21 OU RFI is conducted according to the plans presented in the TA-21 Operable Unit Work Plan for Environmental Restoration (LANL 1991a) as amended by the Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration (LANL 1991b) and approved by the U.S. Environmental Protection Agency (EPA 1992).

Technical activities conducted during the first quarter of Fiscal Year 1992 (FY92), October through December 1991, are reported herein. The major activities were:

- Revision of the TA-21 OU RFI Work Plan (LANL 1991a), in the form of an addendum to the plan (LANL 1991b), in response to EPA's Notice of Deficiency (EPA 1991),
- Planning for mobilization for spring field activities according to the revised schedule presented in the addendum.
- Completion of the biological survey required prior to RFI field work, and
- Completion of the cultural resources survey required prior to RFI field work,

EPA approved the work plan and addendum on 9 January 1992.

2. ADMINISTRATIVE AND PLANNING ACTIVITIES

During the first quarter of FY92 (October - December 1991), a response to EPA's notice of deficiency (EPA 1991) for the TA-21 OU RFI Work Plan was prepared. The response (LANL 1991a) was prepared as an addendum to the work plan, and required a rearranging of the schedule for the RFI field work. The schedule changes were coupled with schedule and budget estimates being prepared for the Laboratory's budget request to DOE. Following submission of the addendum, planning and preparations were begun for the initial field work in the spring of 1992. The work plan and addendum were approved by EPA on 9 January 1992.

The initial field work includes geologic mapping, geomorphic, stratigraphic, and fracture and fault studies as described in the TA-21 OU RFI Work Plan at Section 12.3, Geomorphologic Sampling Plan. A geology field team was assembled, and has begun the investigations. Progress during the quarter included photographing the north wall of Los Alamos Canyon at TA-21 to initiate mapping of lithologic zones in the exposed Bandelier Tuff.

A first round of surface soil sampling is scheduled in March 1992 to accomplish the TA-21 OU RFI Work Plan objectives described in Section 12.4, Surface Grid Sampling Plan and Chapter 13, Surface Soil Contamination from Airborne Emissions. Since this will be the first formal RFI-related sampling program to be conducted at the Laboratory, there are numerous institutional issues to be worked out. These include health and safety plan approval within the Laboratory, coordination with the new Sample Coordination Facility for the laboratory analysis services required for the samples to be collected, and finalization and approval of the Laboratory's Environmental Restoration SOPs. Meetings have been scheduled early in the second quarter of FY92 to address these and other issues. Mobilization activities for the surface grid sampling are scheduled to begin in January 1992.

3. CULTURAL RESOURCES SURVEY

The TA-21 OU RFI Work Plan (LANL 1991a) at Section 11.2.2, Archaeological, Cultural, and Ecological Evaluations, identifies requirements for surveys which must be completed prior to intrusive RFI field work. This section provides a summary of the cultural resources (archaeological) survey (LANL 1992).

This survey is intended to provide compliance with the following: National Historic Preservation Act of 1966, Executive Order 11593, Archaeological Resources Protection Act of 1979, Indian Religious Freedom Act of 1978, and the Native American Grave Protection and Repatriation Act of 1990.

Approximately 60 percent of the Laboratory's land has been surveyed for prehistoric and historic cultural resources. Close to 1000 sites have been recorded. Over 95 percent of these ruins date from the fourteenth and fifteenth centuries. Most of the sites are found in the pinon-juniper vegetation zone, with 80 percent lying between 5,800 and 7,100 ft in elevation, as does the TA-21 Operable Unit. Almost three-quarters of all ruins are found on mesa tops, as are the developed areas of TA-21. The sites, Laboratory-wide, can be dated to the following time periods.

Paleo-Indian Period, 10,000 B.C. to 4,000 B.C. Characterized by small groups of big game hunters who may have followed game herds up and down the Rio Grande, with trips onto the Pajarito Plateau to procure obsidian and other resources. This period is represented on Laboratory land by occasional surface finds of diagnostic projectile points made from both local obsidian and exotic unidentified chert.

Archaeic Period, 4,000 B.C. to A.D. 600. Characterized by small groups who may have used the Pajarito Plateau for hunting expeditions and for seasonal exploitation of certain wild plants. This period is represented as scatters of lithic tools, chipping debris, and diagnostic projectile points. Little research has been conducted for this period. It is possible that buried habitation sites are also present on Laboratory land.

Early Developmental Period, A.D. 600 to A.D. 900. Characterized by settled hunter-gatherers living in semi-subterranean pithouses and making simple pottery. Some possible pithouse locations and associated artifacts have been identified on Laboratory land but the identification is tenuous.

Late Developmental Period, A.D. 900 to A.D. 1100. Characterized by small groups of maize horticulturalists still relying to a great extent on gathered wild plants. Sites are typically small adobe, sometimes crude masonry, pueblo structures. Very few sites from this period are located on Laboratory land. Most of those recorded are close to the Rio Grande in the vicinity of Chaquihui Mesa and lower Water Canyon.

Coalition Period, A.D. 1100 to A.D. 1325. Characterized by maize horticulturalists. Early sites are adobe and masonry rectangular structures, and later sites are large masonry enclosed plaza roomblocks of over 100 rooms. Most of the ruins recorded at the Laboratory date to this time period (700 have been recorded). Most researchers attribute the increase in site density during this period to migration, but others see the increase in site numbers as a result of local population growth.

Classic Period, A.D. 1325 to A.D. 1600. Characterized by intensive maize horticulture. Settlements on the Pajarito Plateau aggregated into three population clusters with outlying 1-2 room fieldhouses. The central site cluster consists of four temporally overlapping sites: Navawi, Otowi, Tsankawi, and Tsirege. Otowi and Tsirege are on Laboratory land. These ruins are ancestral to the Tewa speakers now living at San Ildefonso Pueblo.

Spanish Colonial and Territorial Periods, A.D. 1600 to A.D. 1900. Grazing and seasonal utilization of the Pajarito Plateau during this time by Indian and non-Indian groups is highly probable but has not been thoroughly documented.

Homesteading Period. A.D. 1890 to A.D. 1943. This was an outgrowth of the earlier undocumented use of the Plateau for cattle grazing, timbering, and farming activities. Hispanic and Anglo homestead sites are characterized by wooden cabin and corral structures, rock or cement cisterns, and a scattering of debris associated with household, farming, and grazing activities.

Post-1943 Period. The Los Alamos Ranch School, a school for boys founded by Ashley Pond, was located at the site of the present-day town of Los Alamos. In the 1940's, during the early stages of the Manhattan Project, many of the Ranch School buildings were appropriated for use by the U.S. Government. The central portion of the Pajarito Plateau is now owned by either the Department of Energy, Los Alamos County, San Ildefonso Pueblo, or by private citizens.

3.2. CULTURAL RESOURCES LOCATED WITHIN THE TA-21 OPERABLE UNIT

A cultural resource survey was conducted in the undeveloped areas of the TA-21 Operable Unit. Two archaeological sites were identified in this area:

LA (Laboratory of Anthropology) 86544 is a low rock wall located on a shelf 10 meters from the cliff edge on the south side of the eastern toe of DP Mesa. The wall consists of three segments of unshaped tuff rocks piled among naturally occurring boulders. The wall segments are on the approximate west, south and east sides of the enclosure. On the northeast corner the tuff rocks have been shaped to fit around the trunk of a juniper tree. The enclosure measures 4.3 meters north-south by 10.5 meters east-west. It may have served as an animal pen, based on its similarity to others documented to the Spanish Colonial to Homesteading Periods.

LA 86545 is a cavate located on the north wall above a narrow bench in Los Alamos Canyon, west of the main portion of TA-21. The cavate consists of one room approximately 2 meters deep. Some interior surfaces are blackened. Based on the presence of several smeared indented potsherds and Pedernal chert flakes, the site was occupied during the Coalition Period.

3.3. CONSTRAINTS ON RFI FIELD WORK

During field activities both of the identified sites will be avoided. No vehicular traffic, physical disturbance, or sampling activities will be conducted in the area of either site.

4. BIOLOGICAL SURVEY

The TA-21 OU RFI Work Plan (LANL 1991a) at Section 11.2.2, Archaeological, Cultural, and Ecological Evaluations, identifies requirements for surveys which must be completed prior to intrusive RFI field work. This section provides a summary of the biological (ecological) survey.

Field surveys were conducted during 1991 by the Biological Resource Evaluations Team of the Environmental Protection Group (EM-8) for the TA-21 Operable Unit RFI site characterization field work. The RFI field work requires surface and subsurface soil sampling within TA-21, Los Alamos Canyon, and DP Canyon. The field surveys were conducted for compliance with the Federal Endangered Species Act of 1973; New Mexico Wildlife Conservation Act; New Mexico Endangered Species Act; Executive Order 11990, "Protection of Wetlands;" Executive Order 11988, "Floodplain Management;" 10 CFR 1022; and DOE Order 5400.1.

The TA-21 Operable Unit survey has three aspects:

- To determine the presence or lack of critical habitat for any State or Federal sensitive, threatened, or endangered plant or animal species,
- To identify the presence or lack of sensitive areas such as floodplains and wetlands, and
- To provide additional plant and wildlife habitat data.

4.1. SENSITIVE PLANT AND ANIMAL SPECIES

The EM-8 database containing habitat requirements for all State and Federally listed threatened or endangered plant and animal species known to occur in the vicinity of the Laboratory was searched. This search indicated that the species of concern for this Operable Unit were:

- peregrine falcon (*Falco peregrinus* - Federally Endangered),
- bald eagle (*Haliaeetus leuccephalus* - Federally Endangered),
- common black hawk (*Buteogallus anthracinus* - State Endangered),
- Mississippi kite (*Ictinia mississippiensis* - State Endangered),
- broad-billed hummingbird (*Cynanthus latirostris* - State Endangered),

- willow flycatcher (*Empidonax trailii* - State Endangered and Federal Candidate),
- spotted bat (*Euderma maculatum* - State Endangered),
- meadow jumping mouse (*Zapus hudsonius* - State Endangered and Federal Candidate),
- Say's pond snail (*Lymnaea captera* - State Endangered),
- Wright's fishhook cactus (*Mammillaria wrightii* - State Endangered),
- Santa Fe cholla (*Opuntia viridiflora* - State Endangered), and
- grama grass cactus (*Pediocactus papyracanthus* - State Endangered and Federal Candidate),

Based on these identified species, a habitat evaluation survey (Level 2) was conducted. The Level 2 survey is performed for areas that are not highly disturbed and which could potentially support threatened or endangered species. The techniques used in a Level 2 survey are designed to gather data on the percent cover, density, and frequency of both the understory and overstory components of the plant community.

As a result of the habitat evaluation and a review of previous data for the Operable Unit, only one of the above-listed species appears to have the potential for occurrence in the area, the spotted bat.

4.1.1. Spotted Bat

The spotted bat is found in pinon-juniper, ponderosa, mixed conifer and riparian habitats. The two critical requirements for the spotted bat are a source of water and roost sites (caves in cliffs or rock crevices). In Los Alamos Canyon appropriate roost sites were plentiful, however water appears to be somewhat limited. In April of 1991, a portion of the cliff face of Los Alamos Canyon was searched for any physical evidence of usage by bats. No evidence was found. The floor of Los Alamos Canyon was explored to identify any suitable water sources. Suitable water is defined as small ponds or pools of slow moving water. A few marginal watering areas were found. Mist netting for bats in Los Alamos Canyon was scheduled, but because of heavy rains during the summer of 1991, netting was not done.

Mist netting has been done at the Laboratory's TA-16 and in the Bandelier National Monument adjacent to the Laboratory on the south. These surveying efforts have not

yielded any spotted bats. An intensive bat survey at LANL is scheduled for the summer of 1992 and will include portions of Los Alamos Canyon.

Due to the nature and extent of the proposed RFI field work for the TA-21 Operable Unit, no adverse impact will occur to the spotted bat (if present) as long as:

- Small caves and rock crevices are not disturbed, and
- Water sources within the canyon are not altered.

With those two conditions, the RFI characterization of the TA-21 Operable Unit should have no impact on sensitive species.

4.2 WETLANDS AND FLOODPLAINS

Throughout the TA-21 Operable Unit, the presence of wetlands and floodplains was evaluated using National Wetland Inventory Maps and field checks. Characteristics of wetlands, floodplains, and riparian areas are noted using criteria outlined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

4.2.1. Wetlands

There are some potential wetland areas located within the Operable Unit. The extent of the potential areas is indicated in Figure 4-1. Monitoring and actual delineation of wetland areas of concern will be required prior to sampling in the canyon bottoms. Sampling in canyon bottoms may have to be modified to avoid impact to a wetland. This will be addressed on an investigation by investigation basis. For the surface soil sampling planned in March, no modifications are needed.

4.2.2. Floodplains

Potential floodplains are found within the canyon systems. Although present, these floodplains will not be adversely impacted by the proposed RFI field work and no mitigation measures are necessary.

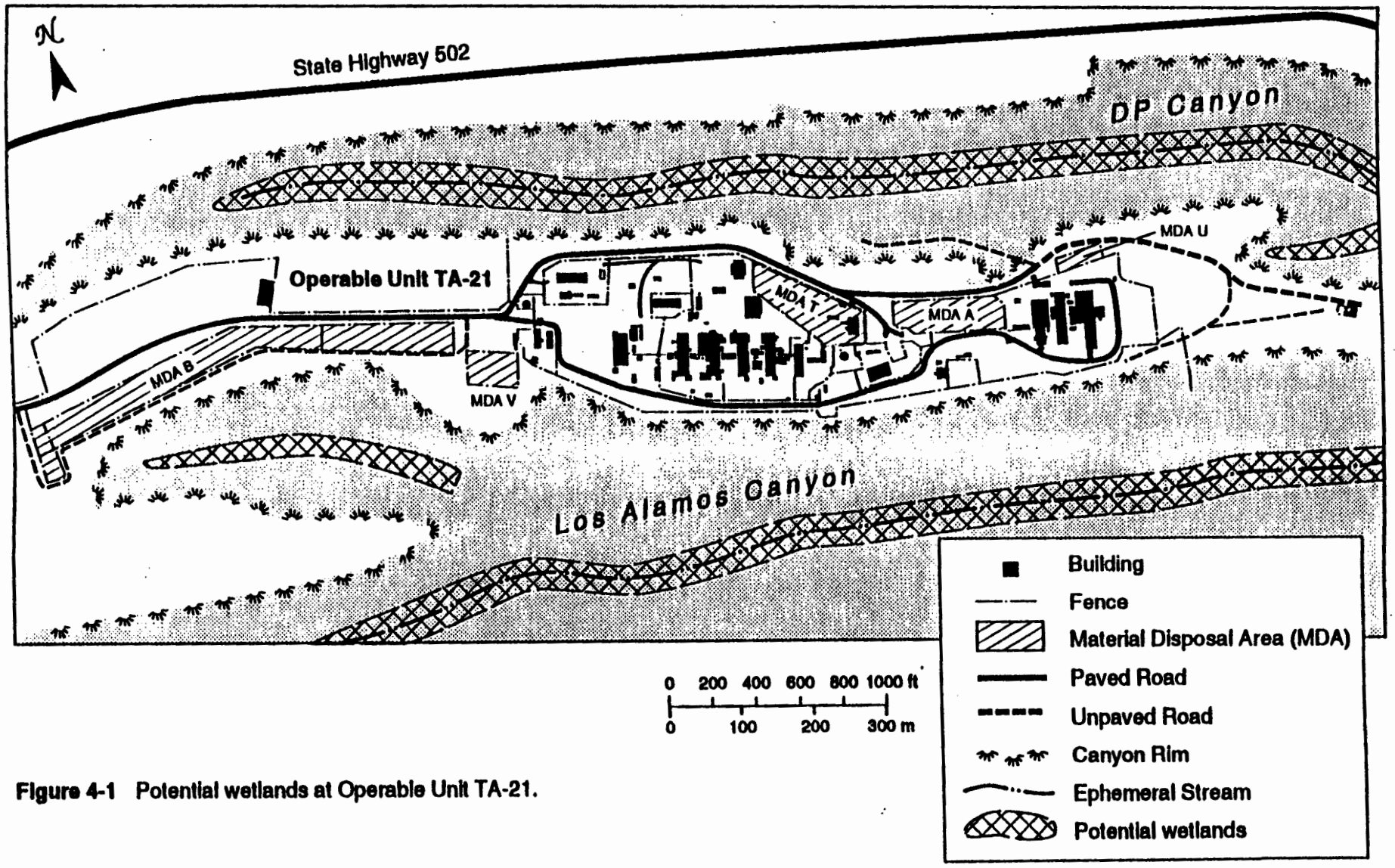


Figure 4-1 Potential wetlands at Operable Unit TA-21.

4.3. CONSTRAINTS ON RFI FIELD WORK

To protect the habitat of the spotted bat (which may not be present in the area), the RFI field work should not be allowed to disturb small caves and rock crevices which may be used as roosting sites. The water sources in Los Alamos Canyon, which could be used as watering areas, also should not be disturbed.

Impacts to non-sensitive plant species should be avoided when possible. Off-road driving is especially harmful to plants and soil crust. Vehicular travel should be restricted to existing roads whenever possible. If off-road travel is required, EM-8 should be contacted to monitor the activity. Revegetation may be required at some sites. A list of native plants suitable for revegetation is available from EM-8.

5. REFERENCES CITED

LANL 1991a TA-21 Operable Unit RFI Work Plan for Environmental Restoration, LAUR-91-962, Los Alamos National Laboratory, Los Alamos NM 87545. May 1991.

LANL 1991b Addendum to TA-21 Operable Unit RFI Work Plan for Environmental Restoration, Los Alamos National Laboratory, Los Alamos NM 87545. December 1991.

LANL 1992 McGehee, E.D., K.L. Manz, A.N. Parish, M.D. Hannaford, M.A. Schillaci, "Environmental Restoration Program, Operable Unit (OU) 1106, Cultural Resources Survey Report", Survey No. 501, Environmental Protection Group EM-8, Los Alamos National Laboratory, Los Alamos National Laboratory 87545. January 15, 1992.

EPA 1991 Letter from William K. Honker, Chief, RCRA Permits Branch, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. October 30, 1991.

EPA 1992 Letter from Allyn M. Davis, Director, Hazardous Waste Management Division, Region VI, U.S. Environmental Protection Agency, Dallas TX to Mr. Jerry Bellows, Area Manager, Los Alamos Area Office, U.S. Department of Energy, Los Alamos NM. January 9, 1992.