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Mr. William Honker
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Date: July 18, 1995
Refer to: EM/ER:95-348

SUBJECT: ADDENDUM 1 TO WORK PLAN FOR OPERABLE UNIT (OU) 1114

Dear Mr. Honker:

The US Department of Energy (DOE) and the Los Alamos National Laboratory (the Laboratory) are required by the Environmental Protection Agency to submit draft facility investigation work plans according to a schedule specified in the Module VIII of the Laboratory's operating permit.

Enclosed are two copies of the work plan for OU 1114. It is the final addendum to the original work plan and is required to be submitted by July 7, 1995. This work plan has received formal, documented reviews, including reviews by DOE, during its preparation.

Sincerely,

Jorg Jansen, Project Manager
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Los Alamos Area Office

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JJ/TT/bp

Enclosure: Addendum 1 to Work Plan for OU 1114 (2 copies)

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CERTIFICATION

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

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Addendum 1 To Work Plan For Operable Unit 1114

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memorandum

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SUBJECT: FORMAT CHANGES FOR OU 1114 RFI WORK PLAN, ADDENDUM 1

This memorandum outlines the format changes in the RFI Work Plan for OU 1114, Addendum 1, as compared to the RFI Work Plan for OU 1114 submitted in 1993.

The attached document, RFI Work Plan for OU 1114, Addendum 1 contains only Chapters 4, 5, 6; Appendixes C, D, E; and Annex II.

Chapters 1 through 3 of the RFI Work Plan for OU 1114 outlined the statutory and regulatory background of the Environmental Restoration Project, background information for OU 1114, and the environmental setting for OU 1114, respectively. None of the information in Chapters 1 through 3 has changed; therefore it is not iterated in this addendum. If you would like to review the materials in Chapters 1 through 3 or the appendixes and annexes that have not been updated and attached in Addendum 1, please refer to the RFI Work Plan for OU 1114 published in July 1993.

The format and/or numbering for the chapters that are included in Addendum 1 may vary from the work plan published in 1993. Both Chapters 5 and 6 contain an introductory subsection (numbered 5.0 and 6.0), respectively. This introductory subsection iterate some of the information in the introductory subsection of the work plan published in 1993. However, there is updated information pertaining to potential release sites (PRSs) discussed within that chapter.

Listed below is a description of how each chapter differs from the RFI work plan for OU 11114 published in 1993.

Chapter 4: Written as an updated version of the technical approach. The list of chemicals of potential concern (COPC) and exposure models address only the new group of PRSs.

Chapter 5: Written as a supplement to Chapter 5. The subsection numbers start at 5.12 (after the initial 5.0), continuing from the work plan submitted in 1993 (Subsections 5.0 - 5.10) and subsequent addition (5.11) which was a response to a notice of deficiency (NOD).

Chapter 6: Written as a supplement to Chapter 6. The subsection numbers start at 6.4 (after the initial 6.0), continuing from the work plan published in 1993 (Subsection 6.0 - 6.3).

Annex II: Note 2A is a supplement to Note 2 in the Quality Assurance Project Plan from the work plan published in 1993.

Appendix C: Updated list of contributors who worked on Addendum 1.

Appendix D: Updated to reflect any changes or clarify techniques used in the field.

Appendix E: Appendix E map numbers start at E-12, continuing from the work plan published in 1993 (E-1 through E-11).

Table of Contents

Table of Contents
Tables vi
Figures viii

Chapter 4 TECHNICAL APPROACH
4.0 Technical Approach 4-1
4.1 Aggregation of Potential Release Sites 4-1
4.2 Site Characterization Decision Model 4-1
4.3 Sitewide Investigation Approach 4-14
4.3.1 State the Problem 4-14
4.3.2 Identify the Decision 4-14
4.3.3 Identify Decision Input 4-16
4.3.4 Define the Study Boundaries 4-16
4.3.5 Decision Logic 4-17
4.3.6 Design Criteria: Limits on Decision Errors 4-20
4.3.7 Optimize Design: Develop a Sampling and Analysis Plan 4-21
4.4 Conceptual Site Model for OU 1114 4-23
4.4.1 Potential Human Exposure 4-26
4.4.1.1 Continues Laboratory Operations Scenario 4-26
4.4.1.2 Recreational Scenario 4-28
4.4.1.3 Residential Scenario 4-30
4.5 Identifying Chemicals of Potential Concern 4-30
4.6 References 4-33

Chapter 5 EVALUATION OF PRS AGGREGATES
5.0 Evaluation of Potential Release Site Aggregates 5-0-1
5.0.1 Data Quality Objectives 5-0-3
5.0.2 Development of Site-Specific Sampling and Analysis Plans 5-0-3
5.0.3 Biased Sampling Approach 5-0-3
5.0.4 Random Sampling Approach 5-0-4
5.0.5. Sampling Methods 5-0-5
5.0.5.1 Field Screening 5-0-6
5.0.5.2 Field Laboratory Analysis 5-0-6
5.0.6 Support Activities Prior to Mobilization 5-0-7
5.12 SWMU 3-054(e) and C-3-006: Mortandad Canyon Outfall 5-12-1
5.12.1 Description and History 5-12-1
5.12.2 Investigation Approach and Objectives 5-12-3
5.12.3 Sample Locations and Methods 5-12-4
5.12.4 Laboratory Analyses 5-12-6
5.12.5 Sampling Event 5-12-7
5.13 SWMU 3-049(a) : Outfall South of TA-3-66 5-13-1
5.13.1 Description and Location 5-13-1
5.13.2 Investigation Approach and Objectives 5-13-3
5.13.3 Sample Locations and Methods 5-13-5
5.13.4 Laboratory Analyses 5-13-6
5.14 SWMU 3-021: Former Outfall Near the Compressed Gas Facility 5-14-1
5.14.1 Description and History 5-14-1
5.14.2 Investigation Approach and Objectives 5-14-3
5.14.3 Sample Locations and Methods 5-14-5

5.14.4 Laboratory Analyses 5-14-7
5.15 SWMUs 3-056(k) and 3-052(b): Storm Drains and Drum Storage North of TA-3-66 5-15-1
5.15.1 Description and History 5-15-1
5.15.2 Investigation Approach and Objectives 5-15-4
5.15.3 Sample Locations and Methods 5-15-4
5.15.4 Laboratory Analyses 5-15-7
5.16 SWMUs 3-052(a,e) and 3-054(b): Shops Outfall 5-16-1
5.16.1 Description and History 5-16-1
5.16.2 Investigation Approach and Objectives 5-16-5
5.16.3 Sample Locations and Methods 5-16-7
5.16.4 Laboratory Analyses 5-16-8
5.17 SWMU 3-001(e): Drum Storage West of TA-3-30 5-17-1
5.17.1 Description and History 5-17-1
5.17.2 Investigation Objectives and Approach 5-17-3
5.17.3 Sample Locations and Methods 5-17-4
5.17.4 Laboratory Analyses 5-17-6
5.18 SWMU 3-049(b) and C-3-014: TA-3-35, Outdoor Storage Area 5-18-1
5.18.1 Description and History 5-18-1
5.18.2 Investigation Approach and Objectives 5-18-5
5.18.3 Sample Locations and Methods 5-18-5
5.18.4 Laboratory Analyses 5-18-7
5.19 SWMUs 3-059 and 3-003(n): Salvage Yard Adjacent to TA-3-271 5-19-1
5.19.1 Description and History 5-19-1
5.19.1.1 SWMUs 3-059 and 3-003(n) 5-19-1
5.19.2 Investigation Approach and Objectives 5-19-4
5.19.2.1 SWMUs 3-059 and 3-003(n) 5-19-4
5.19.3 Sample Locations and Methods 5-19-5
5.19.3.1 Random Locations 5-19-5
5.19.3.2 Biased Locations 5-19-7
5.19.4 Sample Collection Methods 5-19-8
5.19.4.1 Field Screening 5-19-8
5.19.4.2 SWMU 3-059 5-19-8
5.19.4.3 SWMU 3-003(n) 5-19-9
5.19.4.4 SOP Methods 5-19-10
5.19.5 Laboratory Analyses 5-19-10
5.19.5.1 SWMU 3-059 5-19-10
5.19.5.2 SWMU 3-003(n) 5-19-11
5.20 SWMU 3-001(i): Salvage/Storage Yard East of the Asphalt Batch Plant 5-20-1
5.20.1 Description and History 5-20-1
5.20.2 Investigation Approach and Objectives 5-20-4
5.20.3 Sample Locations and Methods 5-20-4
5.20.4 Laboratory Analyses 5-20-5
5.21 SWMU 3-043(a): Liquid Waste Underground Storage Tanks West of the CMR Building 5-21-1
5.21.1 Description and History 5-21-1
5.21.2 Investigation Approach and Objectives 5-21-3
5.21.3 Sample Locations and Methods 5-21-4
5.21.4 Laboratory Analyses 5-21-8
5.22 SWMU 3-007: Decommissioned Firing Site 5-22-1
5.22.1 Description and History 5-22-1
5.22.2 Investigation Approach and Objectives 5-22-1

5.22.3 Sample Locations and Methods 5-22-3
5.22.4 Laboratory Analyses 5-22-5
5.23 SWMUs 3-004(c,d): Dumpsters West of the CMR Building 5-23-1
5.23.1 Description and History 5-23-1
5.23.2 Investigation Approach and Objectives 5-23-3
5.23.3 Sample Locations and Methods 5-23-3
5.23.4 Laboratory Analyses 5-23-6
5.24 SWMU 3-053: Basement of Rolling Mill Building, TA-3-141 5-24-1
5.24.1 Description and History 5-24-1
5.24.2 Investigation Summary 5-24-2
5.25 SWMU 3-052(f): Outfall Northeast of TA-3-207 5-25-1
5.25.1 Description and History 5-25-1
5.25.2 Investigation Summary 5-25-3
5.26 SWMU 3-042: Former Containment Sump West of TA-3-218 5-26-1
5.26.1 Description and History 5-26-1
5.26.2 Investigation Summary 5-26-1
5.27 SWMU 3-045(b,c): Outfalls from Cooling Towers 5-27-1
5.27.1 Description and History 5-27-1
5.27.2 Investigation Summary 5-27-2
5.28 References 5-28-1

Chapter 6 POTENTIAL RELEASE SITES RECOMMENDED FOR NO FURTHER ACTION OR DEFERRED ACTION

6.0 PRSs Recommended for No Further Actionor Deferred Action 6-1
6.4.1 PRSs Recommended for NFA under Criterion 1 6-2
6.4.1.1 PRSs Never Used for the Management of RCRA or Hazardous Wastes or Hazardous Substances 6-3
6.4.1.1.1 Asphalt Batch Plant 6-12
6.4.1.1.1.1 Asphalt Emulsion (85-100 oil) Storage Tanks 6-17
6.4.1.1.1.2 Gasoline Tanks 6-20
6.4.1.1.1.3 Outdoor Storage Areas 6-21
6.4.1.1.1.4 Storage Sheds 6-22
6.4.1.1.1.5 Asphalt Emulsion and Road Construction Debris as Landfill 6-23
6.4.1.1.1.6 NPDES Permitted Outfall and One Time Release to the Outfall 6-25
6.4.1.1.1.7 Deferred Action: Active PRSs with No Credible, Off-site Pathways 6-26
6.4.1.2 PRSs with only a Radionuclide Component 6-28
6.4.1.3 PRSs Incorrectly Identified or No Longer Existent 6-37
6.4.1.4 Duplicate PRSs 6-39
6.4.2 PRSs Recommended for NFA Under Criterion 2 6-41
6.4.2.1 Industrial Waste Line Aggregate 6-41
6.4.2.2 Storage Units 6-45
6.4.2.3 Tanks/Pits/Sumps 6-50
6.4.2.4 Miscellaneous PRSs 6-52
6.4.3 PRSs Recommended for NFA Under Criterion 3 6-57
6.4.3.1 Underground Storage Tanks 6-58
6.4.3.2 Aboveground Storage Tanks 6-61
6.4.3.3 PCB Transformers and Capacitors 6-63
6.4.3.4 NPDES Permitted Outfalls 6-71
6.4.3.5 Temporary Storage Areas 6-73
6.4.4 PRSs Recommended for NFA Under Criterion 4 6-76
6.4.4.1 One-time Spills 6-76
6.4.4.2 Characterized or Remediated PRSs 6-78

6.4.4.3 Voluntary Corrective Action/Expedited Cleanup 6-80
6.4.5 PRSs Recommended for Deferred Action 6-84
6.4.5.1 PRS is Active With No Credible Off-Site Pathway 6-84
6.4.6 References 6-95

Annex II QUALITY ASSURANCE PROJECT PLAN
Note 2A Supplement to Quality Control Samples II-1
1.0 Introduction to Quality Assurance/Quality Control Samples II-1
2.0 Blank Samples II-1
3.0 Estimation of Sampling Error and Population Variability II-5
4.0 Spiked Samples II-7
5.0 References II-8

Appendix C LIST OF CONTRIBUTORS

Appendix D FIELD INVESTIGATION APPROACH AND METHODS
1.0 Introduction D-1
2.0 General Field Operations D-2
2.1 Archaeological, Cultural, and Ecological Evaluations D-2
2.2 Excavation Permits D-3
2.3 Health and Safety D-3
2.4 Support Services D-3
2.5 Environmental and QC Sample Coordination D-4
2.6 Site Control D-4
2.7 Site Monitoring D-5
2.8 Contamination Control D-5
2.9 Sample Control and Documentation D-6
2.10 Equipment Decontamination D-7
2.11 Waste Management D-7
3.0 Standard Screening Methods D-8
3.1 Samples and Sampling Methods D-8
3.1.1 Use of the Standard Screening and Analysis Tables D-8
3.2 Screening, Surveying, and Analysis Methods D-10
4.0 Field Surveys and Screening D-12
4.1 Field Surveys D-12
4.1.1 Radiological Surveys D-12
4.1.1.1 Gross Gamma Surveys D-13
4.1.1.2 Low-Energy Gamma Surveys D-13
4.1.2 Organic Vapor Surveys D-13
4.1.2.1 Photoionization Detectors D-13
4.1.2.2 Flame Ionization Detectors D-14
4.1.3 Combustible Gas/Oxygen Detector D-14
4.1.4 Land Surveys D-14
4.1.5 Geomorphic Mapping D-14
4.2 Field Screening D-15
4.2.1 Radiological Screening D-15
4.2.1.1 Gross-Gamma Radiological Screening D-15
4.2.1.2 Gross-Alpha Radiological Screening D-16
4.2.1.3 Gross-Beta Radiological Screening D-16
4.2.2 Organic Vapor Detectors D-16
4.2.3 Polychlorinated Biphenyls D-16
4.2.4 Lithologic Logging D-17
5.0 Field Analysis D-17
5.1 Field Radiological Analyses D-17
5.1.1 Gross-Alpha and Gross-Beta Radioactivity D-18

5.1.2 Gamma Spectrometry D-18
5.2 Field GC/FID D-18
5.3 Mobile Chemistry Analyses D-19
5.3.1 X-ray Fluorescence Probe for Metals D-19
6.0 Laboratory Analyses D-19
7.0 Sampling Methods D-23
7.1 Introduction D-23
7.2 Soil Sampling Methods D-23
7.2.1 Surface Soil Samples D-23
7.2.2 Undisturbed Surface Soil Samples D-24
7.2.3 Deposition-Layer Soil Samples D-24
7.2.4 Manual Shallow-Core Samples D-24
7.3 Chip Samples D-24
7.4 Liquid Samples D-25
8.0 References D-26

Appendix E OU 1114 TOPOGRAPHIC MAPS SHOWING PRS LOCATIONS

Tables

Table 4-1 Aggregates in Chapter 5, Addendum 1 4-2

Table 4-2 PRSs Proposed for No Further Action or Deferred Action in Chapter 6, Addendum 1 4-3

Table 4-3 Background and Screening Action Levels for Regulated Substances at OU 1114 4-15

Table 4-4 Summary of Release Pathways 4-24

Table 4-5 Summary of Exposure Routes in the Continued Laboratory Operations Scenario 4-28

Table 4-6 Summary of Exposure Routes in the Recreational Scenario 4-29

Table 4-7 Summary of Exposure Routes in the Residential Scenario 4-31

Table 5-0-1 Aggregates in Chapter 5, Addendum 1 5-0-2

Table 5-12-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-054(e) and C-3-006, Mortandad Canyon Outfall 5-12-8

Table 5-13-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-049(a), TA-3-66 Outfall 5-13-7

Table 5-14-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-021, Compressed Gas Facility Outfall 5-14-8

Table 5-15-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-052(b) and 3-056(k), Storm Drain System and Storage Area... 5-15-8

Table 5-16-1 Sampling Results at SWMUs 3-052(a,e) Compared to SALs 5-16-4

Table 5-16-2 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMUs 3-054(b) and 3-052(a,e), Twomile Canyon Outfall 5-16-9

Table 5-17-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-001(e), Former Waste Oil Storage Area 5-17-7

Table 5-18-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-049(b) and C-3-014, Press Building Exhaust Outlet and Equipment Storage Area 5-18-8

Table 5-19-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMUs 3-059 and 3-003(n), Former JCI Salvage Yard 5-19-12

Table 5-20-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-001(i) Asphalt Batch Plant Aggregate 5-20-6

Table 5-21-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-034(a), radioactive Liquid Waste Underground Storage Tanks 5-21-9

Table 5-22-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-007, Decommissioned Firing Site 5-22-6

Table 5-23-1 Screening and Analysis for OU 1114 Phase 1 Sampling Plan Summary of SWMU 3-004(c,d), Dumpster Areas Behind the CMR Building 5-23-7

Table 6-1 NFA Criteria 6-1

Table 6-2 Criterion 1 Aggregates 6-2

Table 6-3 PRS Number and Description 6-16

Table 6-4 Radioactive Storage Areas in TA-3-29 6-29

Table 6-5 Radioactive Air Emission Summary 6-33

Table 6-6 Criterion 2 Aggregates 6-41

Table 6-7 Criterion 3 Aggregates 6-58

Table 6-8 PCB Capacitor/Transformer Aggregate 6-64

Table 6-9 Approved Satellite and Less-Than-90-Day Accumulation Areas 6-74

Table 6-10 Criterion 4 Aggregates 6-76

Table 6-11 PRSs Proposed for No Further Action or Deferred Action in Chapter 6 Addendum 1 6-85

Table II-1 Analytes Detected in Twenty-Five Blank Samples II-2

Table II-2 Recommended Number of Blank Samples II-4

Table II-3 Recommended Number of Collocated and Field Duplicate Samples II-6

Table C-1 List of Contributors C-1

Table D-1 Example of Screening And Analytical Requirements for Sampling Plan D-9

Table D-2 Instrumentation and Methods for Proposed Analytical Levels D-10

Table D-3 Summary of Analytical Methods Used for Analysis of Samples Collected at OU 1114 ..... D-20

Table D-4 Analyte Lists Compared D-22

Figures

Fig. 4-1 Framework for project-wide decision flow 4-13

Fig. 4-2 Screening assessment flow chart 4-18

Fig 4-3 Conceptual site model for OU 1114, Addendum 1 4-22

Fig. 5-12-1 Site location map of SWMU 3-054(e) and C-3-006 5-12-2

Fig. 5-12-2 Location of sample sites for SWMU 3-054(e) and C-3-006 5-12-5

Fig. 5-13-1 Site location map of SWMU 3-049(a) 5-13-2

Fig. 5-13-2 Location of sample sites for SWMU 3-049(a) 5-13-4

Fig. 5-14-1 Site location map of SWMU 3-021 5-14-2

Fig. 5-14-2 Location of sample sites for SWMU 3-021 5-14-4

Fig. 5-15-1 Site location map of SWMUs 3-56(k) and 3-052(b) 5-15-2

Fig. 5-15-2 Location of sample sites for SWMUs 3-056(k) and 3-052(b) 5-15-5

Fig. 5-16-1 Site location map of SWMUs 3-054(b), 3-052(a,e) 5-16-2

Fig. 5-16-2 Location of sample sites for SWMUs 3-054(b), 3-052(a,e) 5-16-3

Fig. 5-17-1 Site location map of SWMU 3-001(e) 5-17-2

Fig. 5-17-2 Location of sample sites for SWMU 3-001(e) 5-17-5

Fig. 5-18-1 Site location map of SWMU 3-049(b) and C-3-014 5-18-2

Fig. 5-18-2 Schematic representation of sample sites for SWMU 3-049(b) and C-3-014 5-18-3

Fig. 5-19-1 Site location map of SWMUs 3-059 and 3-003(n) 5-19-2

Fig. 5-19-2 Locations of sample sites for SWMUs 3-059 ad 3-003(n) 5-19-6

Fig. 5-20-1 Site location map of SWMU 3-001(i) 5-20-2

Fig. 5-20-2 Location of sample sites for SWMU 3-001(i) 5-20-3

Fig. 5-21-1 Site location map of SWMU 3-034(a) 5-21-2

Fig. 5-21-2 Location of sample sites for SWMU 3-034(a) 5-21-5

Fig. 5-22-1 Site location map of SWMU 3-007 5-22-2

Fig. 5-22-2 Location of sample sites for SWMU 3-007 5-22-4

Fig. 5-23-1 Site location map of SWMUs 3-004(c,d) 5-23-2

Fig. 5-23-2 Location of sample sites for SWMUs 3-004(c,d) 5-23-4

Fig. 6-1 Asphalt Batch Plant Operations and PRS locations 6-14

Fig. E-12 Topographic map of TA-3 (NW quadrant) showing sampling locations of PRSs E-1

Fig. E-12-NFA Topographic map of TA-3 (NW quadrant) showing location of PRSs proposed for NFA E-2

Fig. E-13 Topographic map of TA-3 (NE quadrant) showing sampling locations of PRSs E-3

Fig. E-13-NFA Topographic map of TA-3 (NE quadrant) showing locations of PRSs proposed for NFA E-4

Fig. E-14 Topographic map of TA-3 (SW quadrant) showing sampling locations of PRSs E-5

Fig. E-14-NFA Topographic map of TA-3 (SW quadrant) showing locations of PRSs proposed for NFA E-6

Fig. E-15 Topographic map of TA-3 (SE quadrant) showing sampling locations of PRSs E-7

Fig. E-15-NFA Topographic map of TA-3 (SE quadrant) showing locations of PRSs proposed for NFA E-8

Fig. E-16-TA-59 NFA Topographic map of TA-59 showing PRS proposed for NFA E-9

Fig. E-17-TA-60 NFA Topographic map of TA-60 (western half) showing locations of PRSs proposed for NFA E-10

Executive Summary

Chapter 1
Introduction

Chapter 2
Background Information

Chapter 3
Environmental Setting

Chapter 4
Technical Approach

Chapter 5
Evaluation of PRS Aggregates

Chapter 6
PRSs Recommended for No Further Action or Deferred Action

Annexes

Appendixes

Chapter 4

RFI Work Plan (1993)

- Aggregation of Potential Release Sites (PRSs)
- Approaches to Site Characterization
- Conceptual Exposure Models
- Potential Response Actions and Evaluation Criteria
- Sampling Strategies
- Analytical Methods

Addendum 1

- Aggregation of Potential Release Sites
- Site Characterization Decision Model
- Sitewide Investigation Approach
- Conceptual Site Model for OU 1114

4.0 TECHNICAL APPROACH

4.1 Aggregation of Potential Release Sites

The potential release sites (PRSs) to be evaluated in this Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan were aggregated for Operable Unit (OU) 1114 by proximity, physical similarity, and similarity of historical use. Chapter 5 in the RFI Work Plan for OU 1114 covered 10 aggregates composed of 53 PRSs (LANL 1993, 1090). Chapter 5 in Addendum 1 to the RFI Work Plan for OU 1114 covers 16 aggregates composed of 24 PRSs. Table 4-1 lists aggregates in Chapter 5 of Addendum 1, the PRS numbers, and generic strategies used for aggregation. The first digit(s) of the solid waste management unit (SWMU) or area of concern (AOC) number identifies the technical area in which it is located. Table 4-2 lists PRSs discussed in Chapter 6 of Addendum 1 that are candidates for no further action (NFA) or deferred action (DA), including criteria used for these decisions. An NFA decision that is based on absence of human health risk does not imply that ecological risks do not exist. The ecological risk assessment process is described in Subsection 4.5.

4.2 Site Characterization Decision Model

This work plan adheres to the Laboratory's Environmental Restoration (ER) Project technical approach for data collection and evaluation as documented in Chapter 3 of the Installation Work Plan (IWP) (LANL 1995, 1164). This technical approach is an efficient, defensible, and effective method of data collection for support of environmental decision-making. The Laboratory's approach is an adaptation of the Department of Energy's (DOE's) streamlined approach for environmental restoration (SAFER) which combines elements of the data quality objectives (DQO) process (Chapter 3 of the IWP) and the observational approach (Appendix G of the IWP) (LANL 1995, 1164; LANL 1993, 1017). At Los Alamos National Laboratory (LANL), these tools are applied within the framework of a project-wide decision flow (Fig. 4-1) which uses human health and environmental risk as the basis for site-specific decision-making.

TABLE 4-1

AGGREGATES IN CHAPTER 5, ADDENDUM 1

SWMU OR AOC NUMBER	AGGREGATE DESCRIPTION	SUBSECTION	BASIS OF AGGREGATION	NUMBER OF PRSs IN AGGREGATE
3-054(e), C-3-006	Outfall	5.12	C-3-006 is source to 3-054(e)	2
3-049(a)	Outfall	5.13	NA	1
3-021	Outfall	5.14	NA	1
3-052(b), 3-056(k)	Storm drains and storage area	5.15	3-056(k) is source to 3-052(b)	2
3-054(b), 3-052(a,e)	Outfall	5.16	3-052(a,e) are sources to 3-054(b)	3
3-001(e)	Storage area	5.17	NA	1
3-049(b), C-3-014	Outlet discharge area and equipment storage area	5.18	Proximity	2
3-059, 3-003(n)	Salvage yard	5.19	Proximity	2
3-001(i)	Two former storage areas	5.20	Related to the Asphalt Batch Plant	1
3-034(a)	Radioactive liquid waste tanks	5.21	NA	1
3-007	Decommissioned firing site	5.22	NA	1
3-004(c,d)	Dumpster areas	5.23	Similarity	2
3-053	Duplicate of SWMU 3-015	5.24	NA	1
3-052(f)	Duplicate of SWMUs 3-013(a,b)	5.25	NA	1
3-042	Duplicate of SWMU 3-003(a)	5.26	NA	1
3-045(b,c)	Duplicates of SWMU 3-012(b)	5.27	Proximity	2

TABLE 4-2

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-001(d)	TA-3-170	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(f)	TA-3-038	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(g)	TA-3-473	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(h)	TA-3-066	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(j)	TA-3-034	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(l)	TA-3-316	Storage area	6.4.1.3	1	Not RCRA hazardous wastes/substances
NO	3-001(n)	TA-3-032	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(o)	TA-3-035	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(q)	TA-3-043	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(s)	TA-3-494	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(t)	TA-3-502	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(u)	TA-3-1485 TA-60-19	Satellite accumulation	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-001(v)	TA-3-1486 TA-60-29	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(w)	TA-3-1888	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(x)	TA-3-022	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(y)	TA-3-029	Satellite accumulation	6.4.3.5	3	Approved accumulation area
YES	3-002(a)	TA-3-066	Satellite accumulation	6.4.3.5	3	Approved accumulation area
YES	3-002(d)	TA-3-040	Drum storage	6.4.2.2	2	No release to environment
NO	3-003(d)	TA-3-141	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-003(e)	TA-3-029	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(f)	TA-3-066	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(g)	TA-3-035	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(h)	TA-3-039	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(i)	TA-3-032	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(j)	TA-3-040	PCB-containing capacitors, transformers, drums	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(k)	TA-3-316	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(l)	TA-3-016	PCB-containing capacitors and transformers	6.4.4.3	4	Voluntary Corrective Action
NO	3-003(m)	TA-3-022	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-003(o)	TA-3-287	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(p)	TA-3-142	Storage of elecrical capacitors and transformers	6.4.4.3	4	Voluntary Corrective Action
NO	3-004(a)	TA-3-029	Drum storage/ temporary	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-004(b)	TA-3-029	Drum storage	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-004(e)	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-004(f)	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-005		Renumbered; addressed in 1993 RFI Work Plan	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-006(a)	TA-3-012	HE-associated	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-008(a)	Old TA-3	HE-associated	6.4.1.3	1	Not RCRA hazardous wastes/substances
NO	3-008(b)	TA-3-43	HE-associated	6.4.2.4	2	No release to environment
YES	3-009(i)	TA-3-170	Debris pile	6.4.1.1	1	Not RCRA hazardous wastes/substances
YES	3-009(j)	TA-3-142	Debris pile	6.4.1.1	1	Not RCRA hazardous wastes/substances
YES	3-011	TA-3-031 TA-3-101	Outfall	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(a)	TA-3-130 TA-3-1484	Septic tank & seepage pit	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(b)	TA-3-272	Septic tank	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(c)	TA-3-079	Septic tank	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	3-016(d)	TA-3-443	Septic pit	6.4.1.1	1	Not RCRA hazardous wastes/substances

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-016(e)	TA-3-1639	Lift station	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-016(f)	TA-3-1617	Septic pit	6.4.1.4	1	Not RCRA hazardous wastes/substances
YES	3-019	TA-3-018 TA-3-015	Septic tank	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-022	TA-3-316	Sump	6.4.4.3	4	Voluntary Corrective Action
NO	3-023	TA-3-105 TA-3-148	Sump pit	6.4.2.3	2	No release to environment
YES	3-024	TA-3-141 TA-3-174	Pump pit	6.4.2.3	2	No release to environment
YES	3-025(a)	TA-3-034	Oil trap sump	6.4.1.3	1	Not RCRA hazardous wastes/substances
YES	3-025(b)	TA-3-102	Oil trap	6.4.2.1	2	No release to environment
NO	3-025(c)	TA-3-039	Sump	6.4.2.1	2	No release to environment
YES	3-026(b)	TA-3-132	Sump	6.4.2.3	2	No release to environment
YES	3-026(c)	TA-3-029	Sump	6.4.2.1	2	No release to environment
NO	3-027	TA-3-036	Sump/lift wells	6.4.2.4	2	No release to environment
NO	3-029	TA-3-73 TA-2-271	Asphalt waste/ oil spill	6.4.1.1.1.5	1	Not RCRA hazardous wastes/substances
NO	3-030	TA-3-066	Temporary pit; addressed in RFI Work Plan	6.4.1.4	1	Not RCRA hazardous wastes/substances
YES	3-031	TA-3-029	Industrial Waste Line	6.4.2.1	2	No release to environment
YES	3-032	TA-3-038	Aboveground storage tank	6.4.2.~~4~~ 3	2	No release to environment
YES	3-034(b)	TA-3-141	Contaminated soil	6.4.2.1	2	No release to environment
	3-036(a)	TA-3-75 TA-3-76	Asphalt emulsion tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
	3-036(b)	none	Above ground storage tank	6.4.1.1.1.7	1	Not RCRA hazardous wastes/substances
	3-036(c)	TA-3-178	Asphlat emulsion tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
	3-036(d)	TA-3-335	Asphalt emulsion tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances

6-5

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-036(e)		Asphalt storage tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
NO	3-036(f)	none	Aboveground storage tank	6.4.1.1.1.2	1	Not RCRA hazardous wastes/substances
NO	3-036(g)	TA-3-022	Aboveground storage tank	6.4.3.2	3	Site regulated or closed under different authority
NO	3-036(h)	TA-3-022	Aboveground storage tank	6.4.2.3	2	No release to environment
NO	3-036(i)	TA-3-022	Aboveground storage tank	6.4.4.2	4	No threat-characterized/ remediated
NO	3-036(j)	TA-3-022	Aboveground storage tank	6.4.4.2	4	Site regulated or closed by different authority
NO	3-038(c)	TA-3-028	Industrial waste line left in place	6.4.3.4	3	Site regulated or closed by different authority
NO	3-038(e)	TA-3-065	Sink drains	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-038(f)	TA-3-2009	Industrial waste line left in place	6.4.5	DA	Active; no pathway to environment
NO	3-040(a)	TA-3-030	Photographic film	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-040(b)	TA-3-043	Photographic film	6.4.2.4	2	No release to environment
NO	3-038(d)	TA-3-034 TA-3-50	Removed industrial waste line	6.4.2.1	2	No releases to environment
NO	3-041	TA-3-066	Holding tank	6.4.2.1	2	No release to environment
NO	3-043(a)	TA-3-70 TA-3-74	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous waste/substance
NO	3-043(b)	TA-3-70 TA-3-77	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substance
YES	3-043(c)	TA-3-040 TA-3-718	Storage tank	6.4.4.2	4	No threat-characterized/ remediated
NO	3-043(d)	TA-3-70 TA-3-76	Aboveground storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(f)	TA-3-070 TA-3-178	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-043(g)	TA-3-070 TA-3-335	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(h)	TA-3-070 TA-3-75	Aboveground storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(i)	TA-3-040 TA-3-93	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	3-044(a)	TA-3-70	Storage area	6.4.1.1.1.3	1	Non RCRA hazardous wastes/substances
YES	3-045(a)	TA-3-022	Outfall	6.4.3.4	3	Site regulated or closed under different authority
YES	3-045(d)	TA-3-022	Aboveground storage tank	6.4.1.4	1	Not RCRA or hazardous wastes/substances
YES	3-045(e)	TA-3-057	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-045(f)	TA-3-223	Outfall from drain	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-045(g)	TA-3-073	Outfall	6.4.1.1.1.6	1	Non RCRA hazardous wastes/substances
YES	3-045(h)	TA-3-066 TA-3-187	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-045(i)	TA-3-034	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-046	TA-3-022	Aboveground storage tank	6.4.3.2	3	Site regulated or closed under different authority
NO	3-047(a)	TA-3-236	Storage	6.4.2.4	2	No release to environment
NO	3-047(b)	TA-3-1501	Storage	6.4.1.1.1.4	1	Non RCRA hazardous wastes/substances
NO	3-047(c)	TA-3-070	Drum storage	6.4.1.1.1.3	1	Not RCRA hazardous wastes/substances
NO	3-047(d)	TA-3-22	Storage	6.4.4.3	4	Voluntary Corrective Action
NO	3-047(e)	TA-3-1963	Storage	6.4.1.1.1.4	1	Non RCRA hazardous wastes/substances
NO	3-047(f)	TA-3-1976	Storage	6.4.1.1.1.4	1	Not RCRA hazardous wastes/substances
NO	3-047(g)	TA-3-141	Drum storage	6.4.2.2	2	No release to environment
NO	3-047(h)	TA-3-170	Waste oil leaks, spills	6.4.2.2	2	No release to environment
NO	3-047(k)	TA-3-374	Drum Storage	6.4.2.2	2	No releases to environment

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-047(i)	TA-3-216	Satellite accumulation	6.4.2.4	2	No release to environment
NO	3-047(j)	TA-3-016	Drum storage	6.4.2.4	2	No release to environment
NO	3-048	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-049(c)	TA-3-066	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-049(d)	TA-3-066	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-049(e)	TA-3-066	Outfall	6.4.1.4	1	Not RCRA or hazardous wastes/substances
YES	3-050(a)	TA-3-029	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(b)	TA-3-034	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(c)	TA-3-35	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(d)	TA-3-102	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(e)	TA-3-39	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(f)	TA-3-40	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(g)	TA-3-16	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	3-051(a)	TA-3-039	Oil from leaking compressor	6.4.3.3	3	Site regulated or closed by different authority
NO	3-051(b)	TA-3-102	Oil/leaking compressor	6.4.3.3	3	Site regulated or closed by different authority
YES	3-051(c)	TA-3-141	Vacuum pump leaking	6.4.4.3	4	Voluntary Corrective Action
NO	3-051(d)	TA-3-040	Oil/leaking compressor	6.4.2.4	2	No release to environment
YES	3-052(c)	TA-3-422	Storm drains	6.4.4.1	4	One-time release
NO	3-052(d)	TA-3-287	Storm drains	6.4.3.3	3	Site regulated or closed by different authority
YES	3-054(a)	TA-3-016 TA-3-019	Outfall	6.4.2.4	2	No release to environment

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
YES	3-054(c)	TA-3-105 TA-3-156	Outfall	6.4.3.4	3	Site regulated or closed by different authority
YES	3-054(d)	TA-3-016 TA-3-208	Outfall	6.4.2.4	2	No release to environment cvbnm
YES	3-055(a)	TA-3-016	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-055(c)	TA-3-041	Outfall	6.4.1.3	1	Not RCRA or hazardous wastes/substances
YES	3-055(d)	TA-3-059	Outfall	6.4.1.3	1	Not RCRA or hazardous wastes/substances
NO	3-056(b)	TA-3-70	Storage area	6.4.1.1.1.3	1	Non RCRA hazardous wastes/substances
YES	3-056(c)	TA-3-223	Storage area	6.4.4.3	4	Expedited Cleanup
YES	3-056(d)	TA-3-047	Drum storage	6.4.2.2	2	No release to environment
NO	3-056(e)	TA-3-34	Satellite storage	6.4.1.4	1	Not RCRA or hazardous wastes/substances
NO	3-056(f)	TA-3-316	Drum storage	6.4.1.4	1	Not RCRA or hazardous wastes/substances
NO	3-056(g)	TA-3-016	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-056(h)	TA-3-105 TA-3-287	PCB-containing capacitors and transformers	6.4.3.3	4	No threat-characterized / remediated
NO	3-056(i)	TA-3-038	Drum storage	6.4.2.2	2	No release to environment
NO	3-056(j)	TA-3-473	Storage	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	3-056(l)	TA-3-141	Drum Storage	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-056(m)	TA-3-322	Drum storage	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-056(n)	TA-3-379	Drum storage	6.4.2.2	2	No release to environment
NO	3-057	TA-3-100 TA-3-688	Grease trap	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	3-058	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA or hazardous wastes/substances

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	C-3-001	TA-3-28 TA-3-1872 TA-3-1498	Gas trap	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	C-3-002	TA-3-035	Leak from asphalt machine	6.4.4.1	4	One-time release
NO	C-3-003	TA-3-039	Stained asphalt	6.4.4.1	4	One-time release
NO	C-3-004	TA-3-066	Misc. debris	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	C-3-005	TA-3-073	Storm drains	6.4.1.1.1.6	1	Non RCRA hazardous wastes/substances
NO	C-3-007	TA-3-035	Storage	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	C-3-008	TA-3-164	Storage/rad contaminated	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	C-3-009	TA-3-169	Storage	6.4.2.4	2	No release to environment
NO	C-3-010	TA-3-019	Outfall	6.4.2.4	2	No release to environment
NO	C-3-011	TA-3-070	Storage tank	6.4.1.1.1.2	1	Non RCRA hazardous wastes/substances
NO	C-3-012	TA-3-029	Satellite accumulation	6.4.2.4	1	Not RCRA or hazardous wastes/substances
NO	C-3-015	TA-3-036	Underground storage tank	6.4.3.1	3	Site regulated or closed under different authority
	C-3-016		Oil metal bin	6.4.1.1.1.7	1	Non RCRA hazardous wastes/substances
NO	C-3-017	TA-3-028	Underground storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-3-018	TA-3-028 TA-3-157	Underground storage tank	6.4.2.3	2	No release to environment
NO	C-3-019	TA-3-016	Underground storage tank	6.4.1.3	1	Not RCRA or hazardous wastes/substances
	C-3-020	TA-3-105	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-3-021	TA-3-016 TA-3-191	Underground storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-3-022	TA-3-070	Kerosene tanker trailer	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances

TABLE 4-2 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION[a] IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	C-59-001	TA-59-184	PCB-containing capacitors and transformers	6.4.3.3	3	Site regulated or closed under different authority
NO	C-60-001	TA-60-1 TA-3-382	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-60-002	TA-60-45	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-60-003	TA-60-29	One-time release at pest shed	6.4.4.1	4	No threat-characterized / remediated
NO	C-60-004	TA-60-1	Storage tank	6.4.1.4	1	Not RCRA or hazardous wastes/substances
NO	C-61-001	TA-61-23	PCB oil leak	6.4.1.4	1	Not RCRA or hazardous wastes/substances

[a] Environmental Restoration Project 1995, 1173.

In this approach, investigations are phased to address decisions in a sequential manner, where each decision brings the efforts at OU 1114 closer to the ultimate goal of selecting and implementing an appropriate corrective action. The LANL ER Project decision sequence (Fig. 4-1) is applied, along with a series of corresponding technical assumptions, to each decision. The decision flow translates each phase of the RCRA corrective action process into an operational sequence of questions (i.e., it addresses each phase of the corrective action process by identifying one or more decisions that can be made based on the collection and evaluation of defensible data sets). The decision flow and technical assumptions were formally discussed and approved by a task force consisting of senior representatives from DOE, the Environmental Protection Agency (EPA), Region 6, New Mexico Environment Department (NMED), LANL, and Sandia National Laboratory.

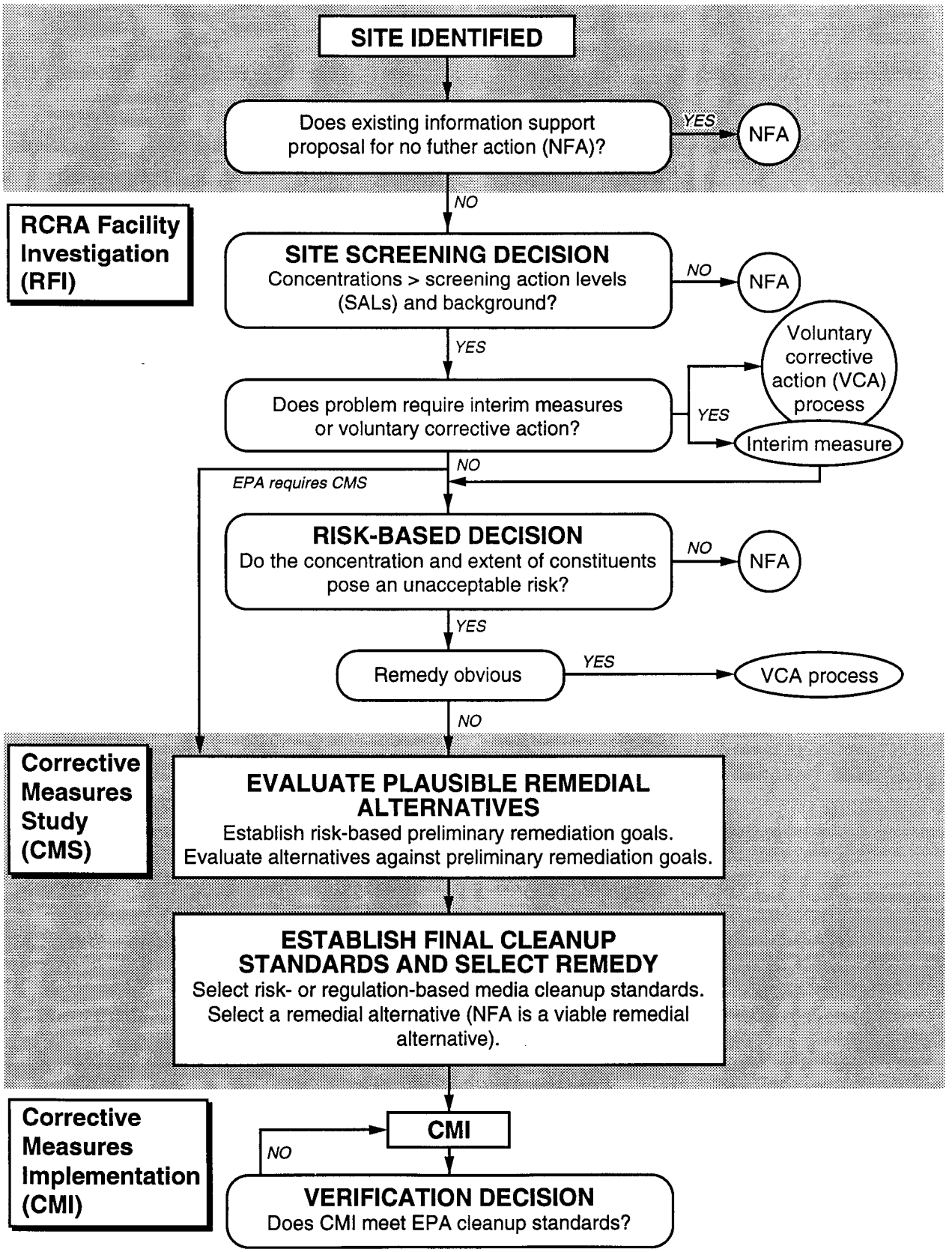


Fig. 4-1. Framework for project-wide decision flow.

4.3 Sitewide Investigation Approach

DQOs are requirements that specify the quality of data collected during the RFI. The formal DQO planning approach developed by EPA consists of seven steps: 1) state the problem, 2) identify the decision, 3) identify input to the decision, 4) define the study boundaries, 5) develop a decision rule, 6) specify limits on decision uncertainty, and 7) optimize the design for collecting data. The sampling and analysis plans for most PRSs are based on the screening assessment decision in which DQO input is prespecified; therefore, a formal DQO process is not followed for these PRSs. The prespecified, generic DQO input for screening assessment decisions is presented below, along with a description of the approach used to specify DQOs for all PRSs in Chapter 5, Addendum 1.

4.3.1 State the Problem

The purpose of the first step of the DQO process is to summarize what is known about the potential contamination problem at each PRS. Archival information is compiled and evaluated and field reconnaissance visits are made to formulate a conceptual mode. This information is summarized in the description and history subsection for each aggregate in Chapter 5, Addendum 1. These historical data help develop a list of chemicals of potential concern (COPCs), summarized in Table 4-3, and a conceptual exposure model for each aggregate, which is discussed in Subsection 4.4 of this chapter.

4.3.2 Identify the Decision

After the description and history have been documented, the next step in the DQO process is to identify the decision to be made. The planning team determines where each PRS falls in the RCRA decision sequence (Fig. 4-1). As noted above, PRSs are sampled to evaluate the site screening or screening assessment decision (Fig. 4-2). The objective of the generic screening assessment decision statement is to determine if a release has occurred in which the environmental concentration exceeds conservative screening action levels.

TABLE 4-3

BACKGROUND AND SCREENING ACTION LEVELS FOR REGULATED SUBSTANCES AT OU 1114

CHEMICALS OF CONCERN	CRQL[a] (mg/kg)	UPPER TOLERANCE LIMITS FOR LANL SOIL BACKGROUND (mg/kg)	SCREENING ACTION LEVEL IN SOIL (mg/kg)
Metals			
Antimony	12[b]	NA[c]	32
Arsenic	2	11.6	d
Barium	40	1 140	5 600
Beryllium	1[b]	3.31	d
Cadmium	1	NA	80
Chromium III	2	NA	80 000
Chromium VI	2	NA	400
Cyanide	2	0	1 600
Lead	0.6	39	400[e]
Mercury	0.04	NA	24
Nickel	8	26.7	1 600
Silver	2	NA	400
Uranium (natural)	NA	NA	66
Volatile organic compounds			
Acetone	0.01	0	8 000
Benzene	0.01[b]	0	0.67
Ethylbenzene	0.01	0	3 100
Toluene	0.01	0	910
Trichloroethene	0.01	0	3.2
1,1,1-Trichloroethane	0.01	0	1 000
1,1,2-Trichloroethane	0.01	0	6.3
Xylene	0.01	0	16 000
Semivolatile organic compounds			
Benzo(a)pyrene	0.33[b]	0	0.10
Herbicides	NA	NA	NA
PCBs	NA	0	0.09
Pesticides	NA	NA	NA
Phenol	0.33	0	48 000
Radionuclides (pCi/g)	**CRQL (pCi/g)**	**REGIONAL BACKGROUND (pCi/g)**	**SCREENING ACTION LEVEL (pCi/g)**
Cesium-137	Not required	0.43/64[f]	4[g]
Plutonium-238	Not required	0.001/76[f]	20[g]
Plutonium-239	Not required	0.007/76[f]	18[g]
Tritium	Not required	0.98/43[f,h]	810[g]
Uranium-235	Not required	NA	18[g]

[a] Contract-required quantitation limits (CRQLs) for soil [Appendix J of IWP (LANL 1993, 1017)].
[b] The screening action level (SAL) is less than the CRQL; therefore, special analytical services may be required.
[c] NA = Not available.
[d] Background comparison should be performed for this compound to determine if further action is required.
[e] Soil SAL based on EPA OSWER Directive 9355.4-12, "Revised Interim Guidance on Establishing Lead Cleanup Levels at Superfund Site," (EPA 1994, 1209).
[f] Purtymun et al. 1987, 0211.
[g] Determined by Laboratory risk assessment committee.
[h] Assuming 10% soil moisture.

For certain PRSs, historical information is adequate to identify potential contaminants and estimate the volume of contaminated media. For these PRSs, it is more efficient to collect sufficient data to conduct a voluntary corrective action (VCA) an expedited cleanup (EC), or to conduct the RFI Phase I and Phase II investigations within a single field mobilization. Such exceptions to the generic screening assessment decision statement will be documented in the investigation approach and objectives subsection for each aggregate in Chapter 5, Addendum 1.

4.3.3 Identify Decision Input

After specifying the decision to be made, the third step of the DQO process involves identifying the input to the decision. The objective is to identify all informational input required to resolve the decision [including, when possible, the screening action level(s)] and to list all the environmental variables or characteristics that need to be measured to provide information required to make the decision. The generic screening assessment decision input states that the decision input includes the screening action levels or background levels for each potential contaminant. In cases where screening action levels are not available, they will be calculated.

In some cases the PRS archival data are adequate to focus the investigation on particular contaminants. For example, at capacitor storage sites a defensible approach may be to focus the study on polychlorinated biphenyls (PCBs) alone. If the historical data are uncertain, a complete analyte suite may be needed to determine the list of constituents of concern (COCs). If fewer analytes than the standard list of RCRA analytes are being analyzed at a PRS, then the information supporting a reduced analyte suite will be included in the investigation approach and objectives subsection for each aggregate in Chapter 5, Addendum 1.

4.3.4 Define the Study Boundaries

The generic screening assessment decision boundary states that the spatial domain is the boundaries of the PRS as defined in the Facility for Information Management, Analysis, and Display (FIMAD) database. Samples submitted for laboratory analysis will be collected from the portion of the soil (or bedrock) horizon that is most likely to contain COPCs. For example, samples collected for volatile organic compounds (VOCs) will be from

deep-surface corings (greater than six inches depth). Temporal variation is not an issue for sampling any PRS. This generic statement applies to all PRSs in Chapter 5, Addendum 1. The rationale for PRS-specific soil sampling depths is presented in Subsection 5.0 and the investigation approach and objectives subsection for each aggregate in Chapter 5, Addendum 1.

4.3.5 Decision Logic

The main goal of the screening assessment is to determine if there are any COCs in site media (Fig. 4-2). The generic screening assessment decision rule statement declares: if the maximum concentration of all hazardous constituent concentrations is below the screening action level (SAL) or background concentration, then propose NFA for this PRS. Comparison to LANL background will be made according to guidance provided in ER Project Policy Paper, Statistical Comparisons to Background, Part 1 (ER Project Assessments Council 1995, 1218). Before proposing NFA for a site, the data will be reviewed for multiple constituents that are marginally less than the SAL. If any hazardous constituent concentration is greater than the SAL or background concentration, then either conduct a Phase II RFI investigation, a VCA, or proceed to a corrective measures study (CMS) for this PRS.

A Phase II investigation, VCA, or CMS will be selected based on the ability to conduct a baseline risk assessment with Phase I data and availability of an obvious remedy for the site. Decision rules for sites where screening assessment is not planned will be presented in the investigation approach and objectives subsection for each aggregate in Chapter 5, Addendum 1.

SALs are media-specific, risk-based concentration levels for potential contaminants derived using conservative criteria. The motivation for developing SALs is to adequately discriminate between problem and non-problem sites so that resources are used effectively. SALs for the primary COPCs at OU 1114 are provided in Table 4-3. In most cases, SALs for nonradiological constituents are based on the methodology in Proposed Subpart S of RCRA to calculate action levels (EPA 1990, 0432). Radiological SALs are based on a 10 mrem per year dose using a conservative

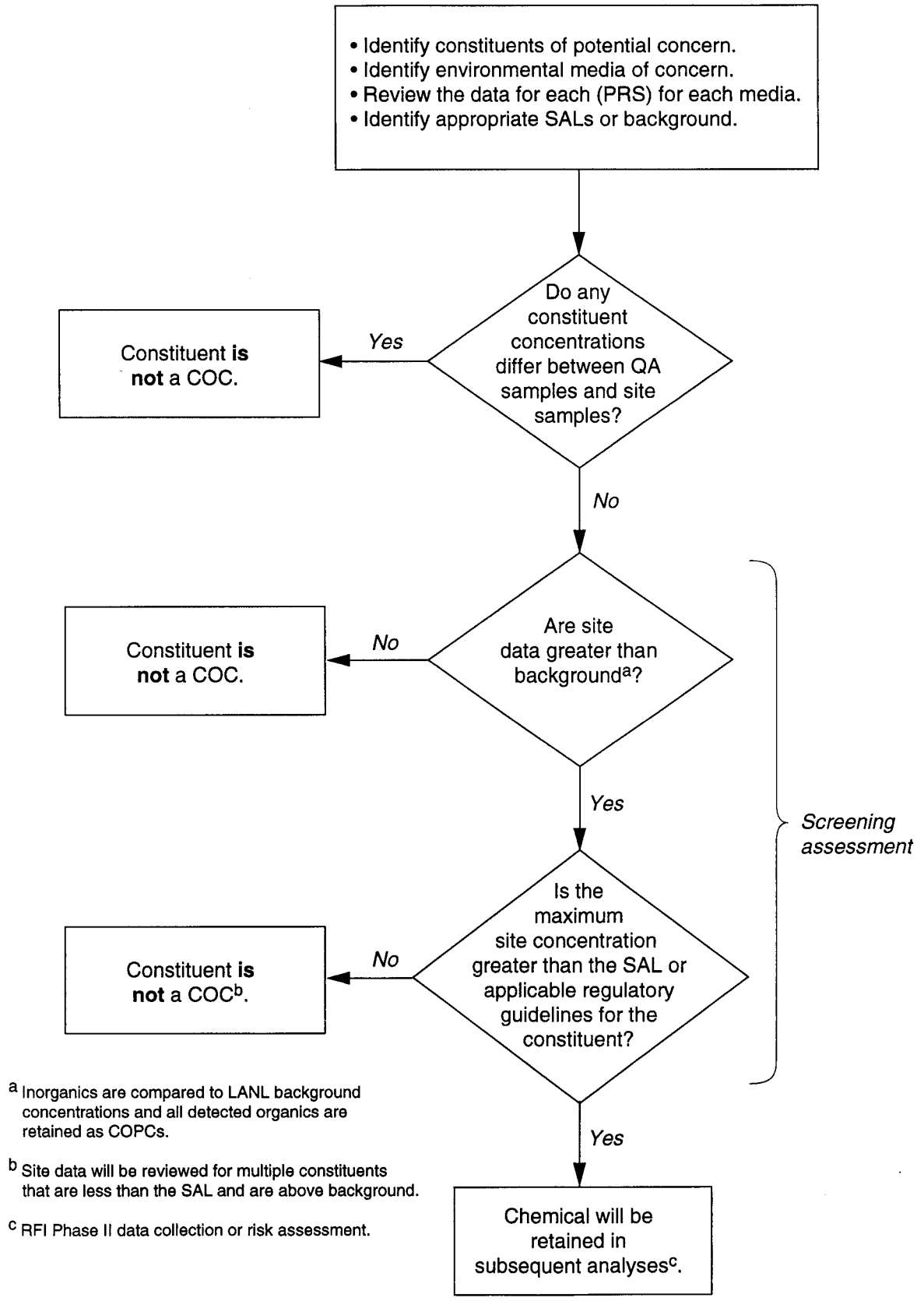


Fig. 4-2. Screening assessment flow chart.

residential-use exposure scenario. SALs for radionuclides can be derived using the residual radioactive material (RESRAD) model that has been developed for the DOE (Yu et al. 1993, 1014). However, if a regulatory standard exists and is lower than the value derived by these methods, this lower value will be used for the SAL. The derivation of SALs and their values is discussed in Appendix J of the IWP (LANL 1993, 1017).

It is important to note that PRS decisions beyond the screening assessment will not be made based on the maximum observed value. SALs are not cleanup levels. Cleanup levels will be based on site-specific risk evaluations and as low as reasonably achievable (ALARA) criteria. Risk assessment is typically based on the 95% upper confidence limit of the average concentration. LANL's approach adopts the Superfund risk assessment guidance for chemical constituents (EPA 1991, 0746) and DOE's RESRAD model for radionuclides (Yu et al. 1993, 1014). In both cases the average concentrations within appropriate exposure units (EUs) should be used as input to the decision.

If the site investigation results in a determination that remediation is necessary, the selected remediation alternatives must achieve acceptable risk levels. Choices between alternatives that meet the human health risk requirements will be based on additional factors such as ecological impact, cost, socioeconomic impact, public/community input, regulatory concerns (in addition to risk), and impact on Laboratory operations (Appendix I of the IWP) (LANL 1993, 1017). Note that all actions refer to potential or known contamination in surface or subsurface soil. There is no indication that other contaminated media exist which might require other technologies (e.g., steam injection for vadose zone contaminants).

A PRS may be proposed for NFA if: 1) no COCs are known or found present at concentrations above SALs or background (whichever is appropriate) based on historical data or Phase I sampling; 2) COCs are judged not to have been released and are unlikely to be released in the future; or, 3) some other regulatory program takes precedence. NFA designations are possible at any point in the remedial process. Appendix I, Subsection 4.1 of the IWP presents a detailed discussion of the rationale for NFA or DA based on archival information (LANL 1993, 1017).

Chapter 6, Section 6.0 briefly presents the basis for NFA and DA decisions for PRSs in Addendum 1. PRSs proposed for NFA or DA in Addendum 1 are listed in Table 4-2.

VCAs will be undertaken when necessary to protect the health and safety of the public or Laboratory personnel, when waste site conditions are such that a VCA is an appropriate response to stop further migration or dispersion of contaminants into the environment, or when cost-effective. In units of limited area where hazardous constituents are known or suspected, a VCA will be initiated (e.g., removal of soil), guided by field screening to the point where regulatory cleanup levels are accomplished. After the VCA is complete, confirmatory samples will be submitted for fixed-laboratory analyses.

4.3.6 Design Criteria: Limits on Decision Errors

The limits on decision uncertainty or survey design criteria are specific for each PRS aggregate. Most screening assessment decisions are based on judgmental design criteria because there are no quantitative historical data to use in a statistical survey design. Judgmental designs are based on biasing sample locations to visual or geomorphic indicators so that there is increased probability of hitting the maximum constituent concentration in a PRS. Key assumptions of the biasing scheme are tested by collecting field quality assessment samples. Field quality assessment samples include collocated samples and samples downgradient of the expected maximum constituent concentration.

For sites where a more sophisticated approach is taken beyond the screening assessment, quantitative decision performance requirements will be developed. The assumptions behind these statistically designed sampling and analysis plans include: the spatial heterogeneity of contamination at the site, the desired probability of detecting contamination, and the likely concentrations of COCs given the historical site information. The expected heterogeneity of the site will be summarized by a simple conceptual model of contaminant release and subsequent environmental transport. For example, historical photographs of a salvage yard show the location of equipment storage and staining that will be preferentially sampled in the RFI investigation. This information also bounds the probability of detecting stains of this size. Site-specific information used to design the sampling and

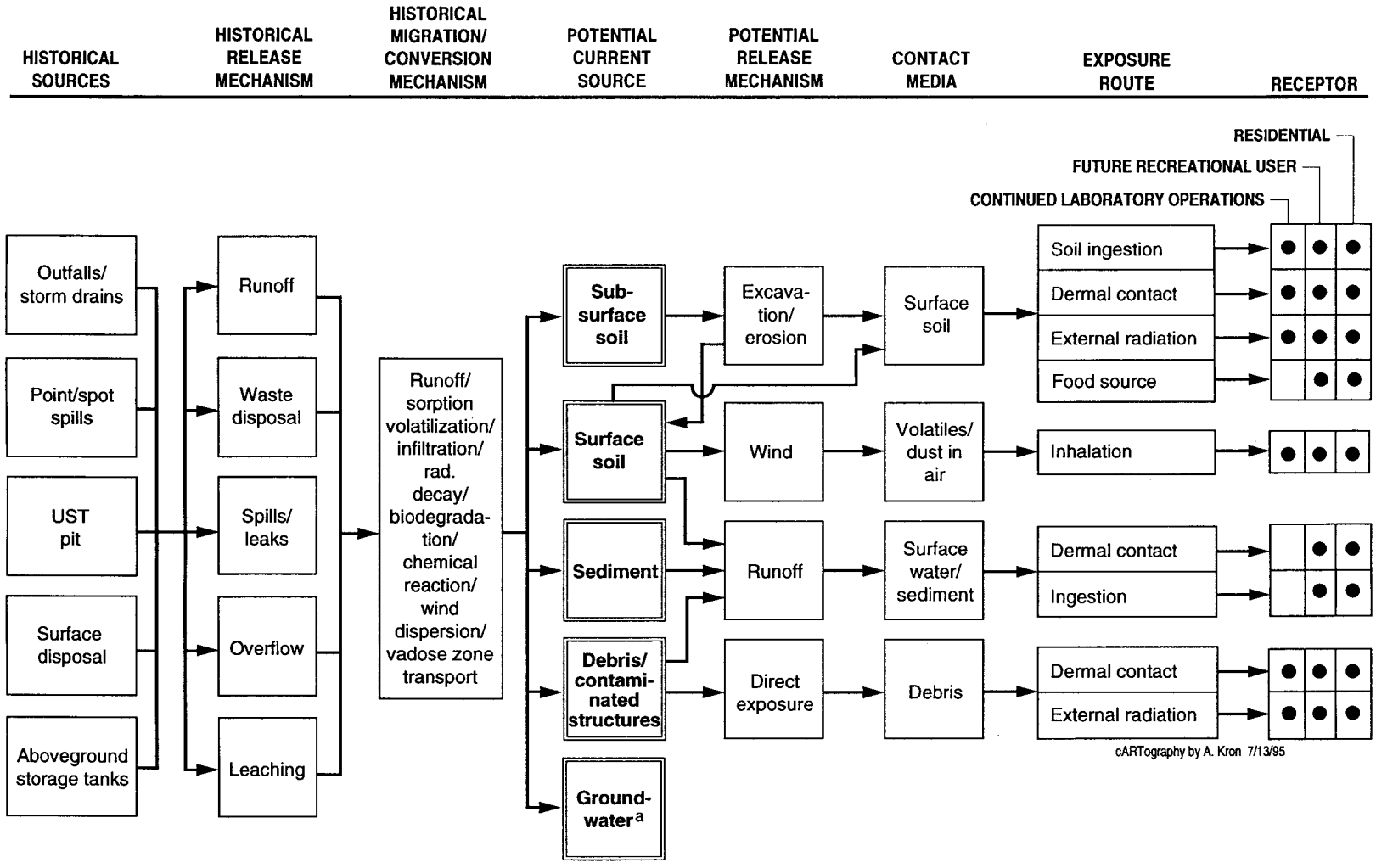
analysis plan will be presented in the investigation approach and objectives subsection for each aggregate in Chapter 5, Addendum 1.

No RFI investigation is currently designed to collect data that meet requirements of a baseline risk assessment. Developing a defensible sampling and analysis plan for risk assessment investigations requires specifying decision error tolerances. However, data obtained from an RFI investigation can be used to determine if contaminant concentration limits established by SALs have been exceeded, and if additional data collection is necessary for risk assessment.

4.3.7 Optimize Design: Develop a Sampling and Analysis Plan

The last step of the DQO process is to evaluate alternative sampling and analysis plans for data collection and to select the plan that is expected to meet the DQOs in the most cost-effective manner. For most sites in Chapter 5, Addendum 1, a judgmental sampling-analysis plan was developed to meet the screening assessment DQOs. The sampling and analysis plan is presented in the sample locations and methods and laboratory analyses subsections for each aggregate in Chapter 5, Addendum 1.

For a small subset of sites, some quantitative decision performance requirements were established and a statistically based sampling and analysis plan was developed. Statistical design optimization requires pertinent estimates of uncertainty, general understanding of the underlying distribution of the COCs, and a complete set of DQOs. Professional judgment is relied upon to determine sampling locations. However, even a sampling and analysis plan that uses a statistical model to help select the number of samples, the choice of analytical methods for a screening assessment or risk-based decision involves working with the chemists and statisticians to determine the most efficient way to generate data of acceptable quality as defined by the end data user. Some issues considered include: the sensitivity of the analytical method compared to the SAL or other decision point, the method's performance on LANL matrix samples, turnaround times, and ability to measure multiple constituents of potential interest at once. In most cases, the magnitude of analytical error is expected to be small compared to sampling error. However, when evaluating statistical designs, measurement error is simultaneously evaluated to ensure that the expected performance of the method will achieve the stated DQOs.



[a] No apparent releases occur from perched groundwater to an exposure pathway.

Fig. 4-3. Conceptual site model for OU 1114, Addendum 1.

Assuming that the screening assessment yields values higher than SALs and background for constituents of interest, these data are often valuable in evaluating alternative designs for further data collection in support of risk-based decisions. A variety of statistical survey methods appropriate for estimating means are discussed in the IWP and will be considered in future phases of data collection (LANL 1993, 1017). In addition, future phases of the RFI investigation will consider the impact of multiple source terms on contaminant migration and distribution.

4.4 Conceptual Site Model for OU 1114

A conceptual site model was developed for each PRS aggregate to help identify the location and magnitude of sampling needed to accurately characterize the PRSs at OU 1114. The conceptual site model shown in Fig. 4-3 identifies historical sources of environmental release, migration, potential current sources of contaminants, potential release mechanisms, contact media, and exposure routes and receptors for OU 1114. Formulation of the conceptual site model for OU 1114 is based on available PRS information. Further refinement or development of separate models may be necessary based on data gathered through the RFI.

Chemicals or radionuclides at OU 1114 may have been released into the environment via drainages, outfalls, landfill areas, spills, leaks, or spattering to surface soil from storage areas, storage tanks, or surface impoundments. After contaminants have been released into the environment, they can potentially migrate via: 1) liquid infiltration into near-surface or subsurface soils that may reach groundwater via faults or surface water via seeps, 2) volatilization into ambient air, 3) wind entrainment of contaminated dust and deposition onto surface soils, and 4) surface water overflow and then runoff resulting in the contamination of sediments in drainage channels. These pathways are further described in Table 4-4.

The major environmental media that may be contacted by receptors, and the resulting potential human exposure pathways are described below.

TABLE 4-4

SUMMARY OF RELEASE PATHWAYS

PATHWAYS/MECHANISM	CONCEPT/HYPOTHESES
HISTORICAL SOURCES	• Operations/processes that contributed to the creation of the PRS (i.e., storage area, etc.)
PRS RELEASE MECHANISM	• Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, leaching, dumping, or disposing into the environment
MIGRATION PATHWAY/ CONVERSION MECHANISM	
Atmospheric dispersion	• Entrainment is limited to chemicals in surface soils
Particulate dispersion	• Entrainment and deposition are controlled by soil properties, surface roughness, vegetative cover and terrain, as well as atmospheric conditions
Volatilization	• Volatilization occurs to volatile organic compounds in surface soils, subsurface soils, and surface water
Surface water runoff	• Surface runoff is directed by natural topographic features or man-made diversions and flows toward the canyons. A topographic low can cause the water to pond on the mesa top, but in most cases the water will flow into the canyon
	• Chemical transport by surface runoff can occur in solution, sorbed to suspended sediments, or as mass movement of heavier bed sediments
	• Surface runoff may carry chemicals beyond the OU boundary
	• Contaminated surface runoff may infiltrate the canyon-bottom alluvium
Sediments	• Surface soil erosion and sediment transport is a function of runoff intensity and soil properties
	• Chemicals dispersed on the soil surface can be collected by surface water runoff and concentrated in sedimentation areas in drainages
	• Erosion of drainage channels can extend the area of contaminant dispersal in the drainage
Alluvial aquifers	• Surface runoff discharged to the canyons may infiltrate into sediments of channel alluvium
Infiltration	• Infiltration into surface soils depends on the rate of precipitation or snowmelt, antecedent soil water status, depth of soil, and soil hydraulic properties
	• Infiltration into the tuff depends on the unsaturated flow properties of the tuff
POTENTIAL RELEASE MECHANISM	
	• Joints and fractures in the tuff may provide additional pathways for infiltration to enter the subsurface regime
Leaching	• Storm water/snowmelt can dissolve chemicals from soil or other solid media, making them available for contact
	• Water solubility of chemicals and their relative affinity for soil or other solid media affects the ability of leaching to cause a release

TABLE 4-4 (continued)

SUMMARY OF RELEASE PATHWAYS

PATHWAYS/MECHANISM	CONCEPT/HYPOTHESES
	• Leaching and subsequent resorption can extend the area of contamination
Soil erosion	• The erosion of surface soils is dependent on soil properties, vegetative cover, slope and aspect, exposure to the force of the wind, and precipitation intensity and frequency
	• Depositional areas as well as erosional areas exist, and erosive loss of soil may not occur in all locations
	• Storm water runoff can mobilize soils/sediments, making them available for contact
	• Storm intensity/frequency, physical properties of soils, topography, and ground cover determine the effectiveness of erosion as a release mechanism
	• Erosion may also enlarge the contaminated area
Mass wasting	• The loss of rock from the canyon walls is a discontinuous, observable process
	• The rate of the process is extremely slow
Resuspension (wind suspension)	• Wind suspension of contaminated soil/sediment as dust makes chemicals available for contact via inhalation/ingestion
	• Physical properties of soil (e.g., silt content, moisture content), wind speed, and size of exposed ground surface determine effectiveness of wind suspension as a release mechanism
	• Wind suspension can enlarge the area of contamination and create additional exposure pathways, such as deposition on plants followed by plant consumption by humans/animals
Excavation	• Manual or mechanical movement of contaminated soil during construction, remediation, or other activities makes contaminated soil available for dermal contact, ingestion, and inhalation as dust
	• The method of excavation (i.e., type of equipment), physical properties of soil, weather conditions, and magnitude of excavation activity (i.e., depth and total area of excavation) influence the effectiveness of excavation as a release mechanism
	• Excavation can increase or decrease the size of the contaminated area, depending on how the excavated material is handled

4.4.1 Potential Human Exposure

The environmental media through which human exposure could occur include soil, air, surface water/sediment, and debris. Although contaminants could migrate to perched groundwater via faults or fractures, it does not present a potential exposure pathway because the main aquifer, at more than 800 ft deep, is the only aquifer used for domestic water supply. It is highly unlikely that contaminants could migrate to this depth. Section 3.0 of Chapter 3 contains a discussion of the hydrology of the main aquifer beneath OU 1114 (LANL 1993, 1090). Currently, there are no groundwater wells on site.

If environmental media are found to be contaminated and SALs are exceeded, the human exposure to these contaminants will be quantified in a baseline risk assessment. Human exposure may be estimated for both current and future land use assumptions. Currently, the land within the boundaries of OU 1114 is used for Laboratory operations, two privately owned cement mixing plants (on land leased from DOE), and the privately owned Royal Crest Trailer Court (on privately owned land) located approximately 0.25 mile east of the nearest PRS (61-004) within OU 1114. Future land use could encompass recreational users and continued Laboratory operations; future residential use is possible but not as likely. Therefore, the following general land-use categories for OU 1114 have been identified: 1) continued Laboratory operations; 2) recreational land use; and 3) residential land use. Assumptions made for the three land-use scenarios are described below.

4.4.1.1 Continued Laboratory Operations Scenario

In the foreseeable future, land use is likely to be similar to current Laboratory operations. Populations of on-site workers (individuals who work on or near the site) and construction workers (individuals who would be exposed to

near-surface and subsurface soils through various activities including excavation) are likely to be the reasonable maximum-exposed individuals for the continued Laboratory operations exposure scenarios.

On-site workers (e.g., maintenance workers, office workers) could be routinely exposed to contaminated media; therefore, this scenario is considered a reasonable-maximum exposure scenario for those PRSs in OU 1114 that consist of potential surface contamination (0 to 6 in.) on the mesa top. Surface contamination above SALs will be evaluated for both current and future risks in a baseline risk assessment using the on-site worker scenario. The types of PRS aggregates with potential surface contamination on the mesa top include: surface disposal, point/spot spill(s), outfalls, and storm drains.

The construction worker could be exposed to subsurface contamination during excavation activities. Once subsurface soil is excavated and brought to the surface, on-site workers could also be exposed. Therefore, PRSs in OU 1114 that consist of subsurface contamination above SALs will be evaluated in a baseline risk assessment using the construction worker and on-site worker scenarios. The types of PRS aggregates with potential subsurface contamination include: surface disposal, storm drains, USTs, outfalls, point/spot spills, and disposal pits.

Exposure pathways relevant to workers include: 1) inhalation of fugitive dust or volatile compounds; 2) incidental ingestion of contaminated soils; 3) direct dermal contact with contaminated soils; and 4) external radiation (Table 4-5).

TABLE 4-5

SUMMARY OF EXPOSURE ROUTES IN THE CONTINUED LABORATORY OPERATIONS SCENARIO

EXPOSURE ROUTE	ASSUMPTIONS
1. Inhalation of ambient air (fugitive dust or volatiles)	• Fugitive dust is generated by soil disturbances (i.e., bulldozers, trucks, and other earth-moving equipment) during construction activities • Construction activities may expose subsurface chemicals to the surface (i.e., excavation) • There may be volatile organic compounds in near-surface and subsurface soils that would contribute to the inhalation exposure • For dust transport indoors, it can be assumed that indoor concentrations are less than those outdoors • For vapor transport indoors, concentrations indoors and outdoors can be assumed to be equivalent, except at sites where subsurface soil gases are entering indoors; in this case, vapor concentrations inside could exceed those outdoors
2. Incidental ingestion of soil	• Incidental ingestion of surface or subsurface soils may occur as a result of construction activities • Office workers would be expected to contact much less soil and dust than construction workers
3. Dermal contact with soil or debris	• Skin surface area available for contact with soil includes arms, hands, face, and head
4. External radiation	• Irradiation from radionuclides on the ground surface or debris may occur

4.4.1.2 Recreational Scenario

The recreational scenario is a current scenario in some areas of OU 1114 and is the most probable future scenario for PRSs consisting of surface contamination (0 to 6 in.) on the canyon wall or canyon bottom. The recreational scenario may include camping, hiking, and hunting.

PRSs in OU 1114 that consist of surface contamination above SALs on canyon walls and/or canyon bottoms will be evaluated in a baseline risk assessment using the recreational scenario. PRSs that are located on the canyon walls and/or bottoms are primarily outfalls. PRSs that have surface water runoff into a drainage channel or an associated outfall, will also be evaluated using the recreational scenario.

Recreational users of the area could come into contact with COPCs through ambient air, surface soil, sediments in drainage channels, and pooled surface water.

Exposure pathways associated with recreational activities include: 1) inhalation of fugitive dust; 2) soil ingestion; 3) dermal contact with soil; 4) external radiation; 5) dermal contact with surface water; 6) incidental ingestion of surface water; and 7) ingestion of contaminated edible plants (piñon nuts and berries). No body of water large enough to support a consistent supply of game fish exists; therefore, exposure to contaminants by consuming contaminated fish is not a viable pathway for this site. Recreational exposure routes are further described in Table 4-6.

TABLE 4-6

SUMMARY OF EXPOSURE ROUTES IN THE RECREATIONAL SCENARIO

EXPOSURE ROUTE	ASSUMPTIONS
1. Inhalation of ambient air (fugitive dust or volatiles)	• Fugitive dust is generated by the wind and during recreational activities (e.g., dirt biking) • There may be volatile constituents on site that would contribute to the inhalation exposure
2. Incidental ingestion of soil/sediment	• Incidental ingestion of surface soil or sediments may occur as a result of recreational activities (standard daily soil ingestion rates for adults and children are used)
3. Dermal contact with soil/sediment/ debris	• Skin surface area available for contact includes arms, hands, face, legs, upper body, and head (the camping event occurs in warm weather).
4. External radiation	• Irradiation from radionuclides on the ground surface or debris may occur
5. Dermal contact with surface water	• Ephemeral streams may be present as a result of snowmelt and summer rainfall • Rainfall events result in pooled water • Standing water occurs after the rainfall event before it seeps into the ground
6. Accidental ingestion of surface water	• Ephemeral streams may be present as a result of snowmelt and summer rainfall • Rainfall events result in pooled water • Standing water occurs after the rainfall event before it seeps into the ground
7. Ingestion of produce	• Piñon nuts and wild berries growing in the canyon may have taken up contaminants from soil/runoff

4.4.1.3 Residential Scenario

The residential scenario is considered an unlikely future land-use scenario for OU 1114; however, because residential development cannot be ruled out, this potential exposure scenario must be considered. Potential future on-site residents would be exposed routinely to near-surface soils through activities such as recreation and gardening; therefore, this scenario is considered a conservative exposure scenario for PRSs in OU 1114 that consist of potential surface contamination (0 to 6 in.) on the mesa top. Surface contamination above SALs will be evaluated for both current and future risks in a baseline risk assessment using the on-site residential scenario.

The on-site resident may also be exposed to subsurface contamination if it is brought to the surface during excavation for a home, or may be exposed to subsurface volatile contamination that migrates in vapor form into the on-site residence. Therefore, PRSs in OU 1114 that consist of subsurface contamination above SALs will be evaluated in a baseline risk assessment using the on-site residential scenario.

The potentially applicable exposure routes for a resident are described in Table 4-7.

4.5 Identifying Chemicals of Potential Concern

The first step in evaluating risks at a site is to identify the COPCs. COPCs are defined as chemicals, resulting from current or past activities, that are detected above reportable levels or at concentrations above naturally occurring levels and that have been determined not to be sampling or laboratory artifacts.

The objectives of the Phase I sampling activity, or screening assessment, are to accomplish the following:

1. Confirm the presence or absence of anticipated COPCs from known site activities;

TABLE 4-7

SUMMARY OF EXPOSURE ROUTES IN THE RESIDENTIAL SCENARIO

EXPOSURE ROUTE	ASSUMPTIONS
1. Inhalation of ambient air (fugitive dust or volatiles)	• There may be volatile organic compounds in near-surface and subsurface soils that would contribute to the inhalation exposure • For dust transport indoors, it can be assumed that indoor concentrations are less than those outdoors • For vapor transport indoors, concentrations indoors and outdoors can be assumed to be equivalent, except at sites where subsurface soil gases are entering indoors; in this case, vapor concentrations inside could exceed those outdoors
2. Incidental ingestion of soil/sediment	• Incidental soil ingestion of surface or subsurface soil may occur as a result of residential activities • Children would be expected to ingest more soil and dust than adults
3. Dermal contact with soil/sediment/ debris	• Skin surface area available for contact includes arms, hands, face, legs, upper body, head, feet and legs
4. External radiation	• Irradiation from radionuclides on the ground surface or debris may occur
5. Dermal contact with surface water	• Ephemeral streams may be present as a result of snowmelt and summer rainfall • Rainfall events result in pooled water • Standing water occurs after the rainfall event before it seeps into the ground
6. Incidental ingestion of surface water	• Ephemeral streams may be present as a result of snowmelt and summer rainfall • Rainfall events result in pooled water • Standing water occurs after the rainfall event before it seeps into the ground
7. Ingestion of piñon nuts and berries	• Produce from home gardens may take up contaminants from soil/surface water • Piñon nuts and wild berries may have taken up contaminants from soil/runoff

2. Use broad-spectrum analytical methods that will allow for a reasonable determination that additional COPCs are not present (e.g., the evaluation of tentatively identified compounds from mass spectral scans);

3. Select analytical methods primarily on the basis of sensitivity for anticipated COPCs at their SALs and secondarily for broad-band spectrum capability; and,

4. Estimate if the concentration of each COPC is greater than some method threshold.

Chemical constituents that are essential human nutrients such as potassium and magnesium, may also be screened if they are present at concentrations that are not toxic (EPA 1989, 0305).

The main classes of COPCs identified for OU 1114 are VOCs, semivolatile organic compounds (SVOCs), metals, and radionuclides. These categories correspond to a method of analysis used to quantify their presence in samples. Section 7.0 of Appendix D, Sampling Methods, lists the LANL ER standard operating procedures used for these standard suites of chemicals. Types of VOCs found at OU 1114 include solvents and chemicals used in laboratory projects. SVOCs that may be found at OU 1114 include PCBs used in transformers. Pesticides and herbicides were also stored, handled, or applied at specific locations. These substances are measured by specific analytical suites.

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Executive Summary

Chapter 1
Introduction

Chapter 2
Background Information

Chapter 3
Environmental Setting

Chapter 4
Technical Approach

Chapter 5
Evaluation of PRS Aggregates

Chapter 6
PRSs Recommended for No Further Action or Deferred Action

Annexes

Appendixes

Chapter 5

RFI Work Plan (1993)

- Decommissioned Storage
- Motor Pool
- Outfalls
- Point/Spot Spill
- Sanitary Treatment System
- Septic Tank
- Sigma Mesa East End
- Sigma Mesa Solar Pond
- Storm Drains
- Waste Oil Storage Areas

Addendum 1

- Mortandad Canyon Outfall
- Outfall South of TA-3-66
- Former Outfall Near the Compressed Gas Facility
- Storm Drains and Drum Storage North of TA-3-66
- Shops Outfall
- Drum Storage West of TA-3-30
- TA-3-35-Outdoor Storage Area
- Salvage Yard Adjacent to TA-3-271
- Salvage/Storage Yard East of the Asphalt Batch Plant
- Underground Storage Tanks West of the CMR Building
- Decommissioned Firing Site
- Dumpsters West of the CMR Building
- Basement of TA-3-141
- Outfall Northeast of TA-3-207
- Former Containment Sump West of TA-3-218
- Outfalls from Cooling Towers

5.0 EVALUATION OF POTENTIAL RELEASE SITE AGGREGATES

Table 5-0-1 lists all potential release sites (PRSs), aggregates, descriptions, subsections, location of the PRSs, and chemicals of potential concern (COPCs) in Chapter 5, Addendum 1.

This subsection presents the generic aspects of data quality objectives (DQOs) applied to the site investigations described in Chapter 5, Addendum 1. See Chapter 4, Addendum 1 for a brief discussion of the DQO process. The presence of contamination is not known for most PRSs in this chapter. Therefore, the sampling and analysis plans are designed to determine if there has been a release at a site where observed contaminant concentrations exceed screening action levels (SALs). The sampling and analysis plans are also designed to ensure sufficient data are collected to make a decision about a site.

Each sampling and analysis plan begins with a presentation of background information on the types of past and present site activities and information describing potential or documented releases. COPCs and site boundaries are then identified from this archival information.

Sample collection will be biased or random, or a combination of both, depending on what is known about potential contamination at a site. The key assumptions of the sampling schemes will be confirmed by collection of quality control (QC) samples, including duplicates and samples downgradient of expected maximum COPC concentration locations.

If analytical results indicate that the maximum concentration of all COPCs is below SALs or background levels, the PRS will be recommended for no further action (NFA). If concentrations of COPCs exceed SALs or background levels, a baseline risk assessment may be conducted to determine whether to proceed to NFA, expedited cleanup (EC), or corrective measures study (CMS). The selection of additional action will be based on risk assessment results and the availability of an obvious site remedy.

TABLE 5-0-1

AGGREGATES IN CHAPTER 5, ADDENDUM 1

SWMU OR AOC NUMBER	AGGREGATE DESCRIPTION/ NUMBER OF PRSs IN AGGREGATE	SUBSECTION	LOCATION	CPOCs
3-054(e), C-3-006	Outfall/2	5.12	Head of Mortandad Canyon	Metals, SVOCs, PCBs, plutonium, uranium, tritium, cesium
3-049(a)	Outfall/1	5.13	South of Sigma Complex	Metals, cyanide, depleted uranium
3-021	Outfall/1	5.14	North of TA-3-170	Metals, SVOCs
3-052(b), 3-056(k)	Storm drains and storage area/2	5.15	North of TA-3-66	Metals, depleted uranium
3-054(b), 3-052(a,e)	Outfall/3	5.16	South of TA-3-316	Metals, SVOCs
3-001(e)	Storage area/1	5.17	West of TA-3-30	VOCs, tritium, metals, TPH
3-049(b), C-3-014	Exhaust discharge area and equipment storage area/2	5.18	South and west of TA-3-35	TPH, metals, uranium, PCBs
3-059, 3-003(n)	Salvage yard/2	5.19	Old salvage yard at TA-3-271	TPH, PCBs, SVOCs, metals
3-001(i)	Two former storage areas/1	5.20	Northeast of Asphalt Batch Plant area TA-3-70	PCBs, VOCs, TPH
3-034(a)	Radioactive liquid waste tanks/1	5.21	Southwest of TA 3-29	Isotopic plutonium, uranium, cesium, strontium-90
3-007	Decommissioned firing site/1	5.22	Southwest of TA 3-141	SVOCs, isotopic thorium, HE, metals
3-004(c,d)	Dumpster areas/2	5.23	South and west of TA-3-29	Plutonium, uranium, cesium, SVOCs, metals
3-053	Duplicate of SWMU 3-015/1	5.24	East of TA-3-141	Depleted uranium, SVOCs, metals
3-052(f)	Duplicate of SWMUs 3-013(a,b)/1	5.25	North of Study Center TA-3-1498	VOCs, SVOCs, PCBs, metals
3-042	Duplicate of SWMU 3-003(a)/1	5.26	East of TA-3-40	VOCs, SVOCs, PCBs, metals
3-045(b,c)	Duplicates of SWMU 3-012(b)/2	5.27	South of TA-3-22	Metals, VOCs, SVOCs, pesticides, herbicides, radionuclides

5.0.1 Data Quality Objectives

DQOs specify the quality (and quantity) of data collected during a RCRA facility investigation (RFI) to ensure a technically sound basis for evaluating the need and approaches for no further action, expedited cleanup, or corrective measures study. DQOs set acceptable limits for uncertainty in sampling data for each specific investigation activity in accordance with the intended data use. Different data uses require different levels of analytical and sampling certainty.

5.0.2 Development of Site-Specific Sampling and Analysis Plans

The site-specific sampling and analysis plans present a preliminary evaluation of existing data and information collected during the initial scoping process. These plans summarize site backgrounds and physical settings, as well as outline the sampling rationale and guidelines for field implementation. Site-specific information and data used to develop the initial site descriptions and plans include aerial photographs, site history, ownership (operating Laboratory group), occurrence reports, engineering drawings, topography, geology, chemicals of potential concern, media, and other pertinent details. The information may also include previous site visits, sampling events, and previous cleanup actions. Results from any previous sampling events are summarized in terms of physical and chemical characteristics, contaminants identified, and concentrations of contaminants.

5.0.3 Biased Sampling Approach

Biased sampling involves sampling areas where contaminants are known or suspected to have been released, but quantitative information on contaminant concentration is not available. Thus, biased sampling schemes are based on historical information about the PRSs, the topography of the site, the chemical properties and migration potential of the COPCs, and the chemical and physical properties of the soil.

Historical information about PRSs is derived from archival and site investigations, interviews with personnel assigned to the area at the time of the release, and period maps and photographs.

Topographic factors affecting the migration potential of COPCs include drainage patterns and likely sediment deposition areas, the presence of low-lying areas in which water might pool, and soil conditions.

Site-specific soil factors affecting the migration potential of the COPCs include soil and sediment pH, texture, permeability, moisture, temperature, organic matter content, and the presence of fractures in the tuff. For example, most heavy metals are relatively immobile in the environment unless acidic conditions are present in the soil. Semivolatile organic compound (SVOC) migration potential is dependent upon the organic compound's solubility, polarity, and susceptibility to photo-oxidation. Polychlorinated biphenyl (PCB) mobility is dependent upon soil moisture, temperature, and microbiology. While no composite samples will be taken specifically to characterize these factors at each PRS, the effects of observable or predictable soil characteristics on COPC migration will be considered in developing the biased sampling plans.

Further, chemical and physical properties of the COPCs, regardless of soil conditions, will also affect the migration potential of COPCs. For example, volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) are susceptible to volatilization in surface soils and during transport, and are therefore not expected to be found at any distance from the source.

Using this information, sampling sites can be selected where contaminants are most likely to exist. The primary advantage of biased sampling over random sampling is that fewer samples are collected with biased sampling and with a greater degree of confidence that contamination, if present, will be detected. This degree of confidence is directly related to the confidence placed in the historical data and understanding the factors listed above.

5.0.4 Random Sampling Approach

Random sampling is a statistical sampling method that is not based on prior knowledge of contaminant distribution. In the random sampling design, a grid system is established and used together with a random number generator to select sampling points at node locations on the grid. The number of samples collected is determined by a variety of factors, including the degree of confidence desired that any contamination present will be detected, the

viability of the media from which the samples are to be taken, and the cost of collecting and analyzing the samples.

The higher the level of confidence desired, the greater the number of samples that must be collected. The number of samples may also be determined by the following equation:

$$P = 1 - (1-f)^N$$

Where: P = desired probability;
N = number of samples;
f = fraction of site assumed to be contaminated

5.0.5 Sampling Methods

Soil samples will be collected in 12-in. intervals from the surface down to the clay-rich horizon expected to be found above the soil-tuff interface throughout much of Operable Unit (OU) 1114 (Nyhan et al. 1978, 0161). The clay-rich horizon is expected to form a permeability barrier through which most COPCs will not migrate. If no clay-rich horizon is found, samples will be collected in 12-in. intervals down to the soil-tuff interface unless otherwise stated. To minimize volatilization, an aliquot of soil will be removed for laboratory analyses of SVOCs and/or TPH (if applicable) prior to homogenization of each interval. VOCs will be collected as described in field screening, Subsection 5.0.5.1. Because of the expected shallow depth to the soil-tuff interface for all outfalls being sampled in this work plan, one sample will be taken from the 0 to 12-in. interval or to depth if the depth to the soil-tuff interface is 18 in. or less. If the depth to the soil-tuff interface is greater than 18 in., an additional sample will be collected as described above. Composite samples will be taken at the discretion of the field team leader in order to ensure sufficient volume of sampling material to complete the required analyses.

All sample sites will be land surveyed and assigned a sample location identification number from the Facility for Information Management, Analysis, and Display (FIMAD). The number of samples collected at each site will depend upon the depth to bedrock.

5.0.5.1 Field Screening

For health and safety purposes, all soil samples will be field screened for VOCs with a photoionization detector (PID) and/or a flame ionization detector (FID) prior to homogenization. If VOC field screening indicates a concentration greater than background readings, an adjacent sample will be collected at the sample interval where the highest VOC concentrations were detected in the original sample. Background is defined as the PID/FID reading in ambient air prior to screening the soil samples.

In the absence of field-detected VOCs, 10% of sample locations will be randomly selected for confirmatory sampling. In no case will fewer than two confirmatory samples be collected. Because volatile organic constituents are less likely to be seen in the surface soil, adjacent confirmatory VOC samples will be collected from the 6 to 18-in. depth interval and will be submitted for laboratory analysis to validate field-screening data.

All samples will also be field screened for radiological constituents for health and safety purposes using a hand-held gross gamma survey instrument. If the radioactivity field screening results are three standard deviations or more above background for a sample, the sample will be submitted for gross alpha/beta , gamma spectroscopy, and tritium laboratory analyses.

5.0.5.2 Field Laboratory Analysis

At each PRS, the mobile chemistry van and/or the mobile radiological laboratory may be utilized for sample analysis instead of a fixed laboratory if the mobile laboratories can perform the appropriate analysis method and at the required level of detection. Use of the mobile laboratories will be determined based on the need for real-time data in order to make additional sampling decisions and on the cost-effectiveness of bringing the mobile laboratories to the PRS. Additional information on the use of the mobile chemical analysis van and the mobile radiation detection van is found in Appendix D of Addendum 1 to the RFI Work Plan for OU 1114.

5.0.6 Support Activities Prior to Mobilization

Existing information and data will be reviewed and visual site inspections will be completed prior to starting fieldwork. Information and data obtained after the sampling plans are drafted will be documented within this review process. Quality assurance information regarding existing data will be considered because it is important to establish if sampling will be needed to verify or simply supplement existing information.

Visual inspections will be conducted at each site to confirm the locations and dimensions of structures, fencing, utilities, drainage ditches, vegetation, topography, and other relevant physical features. Field notes documenting current site conditions will be compared to (or supplement) site descriptions in the sampling plan. Additionally, site observations will be used to evaluate proposed sampling strategies (visual evidence, methods, and locations) and potential work and support areas at each site. Specific biased and/or random sampling locations can be established during visual site inspections. Biased locations are selected based on visual observations, evidence of contamination, and sampling rationale. Random locations are selected using area grids and a random number generator to identify specific grid nodes as sampling points.

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5.12 SWMU 3-054(e) and C-3-006: Mortandad Canyon Outfall

5.12.1. Description and History

The PRSs evaluated in this aggregate include an industrial waste line manhole, area of concern (AOC) C-3-006, that overflowed to a Technical Area (TA) 3 storm sewer and discharged to an outfall at Solid Waste Management Unit (SWMU) 3-054(e). The industrial waste line manhole was located near the corner of Diamond Drive and Pajarito Road. SWMU 3-054(e) is an outfall located in upper Mortandad Canyon (Fig. 5-12-1). Because overflow from the manhole is a potential source of contamination for outfall SWMU 3-054(e), these PRSs can be evaluated using a single sampling and analysis plan.

SWMU 3-054(e) is the outfall of a TA-3 storm sewer that discharges via a corrugated metal pipe to Mortandad Canyon. Effluent flows down a steep slope (45°) for a distance of approximately 20 ft before it joins the ephemeral stream on the bottom of the canyon. Three sediment catchment basins have formed within the discharge area. The outfall typically discharges a steady, low-volume flow of effluent that originates from several sources at Chemistry and Metallurgy Research (CMR) Building, TA-3-29. These sources include drainage from roofs over the west wing, where towers vent filtered exhaust, and surface water runoff from the asphalt area around the building [including the dumpster areas identified as SWMUs 3-004(c and d)]. This outfall is identified by National Pollutant Elimination Discharge System (NPDES) permit Environmental Protection Agency (EPA) 03A021. Currently, the Laboratory monitors the outfall effluent quarterly and reports flow rate, total suspended solids, chlorine, pH, and total phosphorus as required under NPDES.

SWMU 3-054(e) received effluent from a one-time overflow in 1974 from the industrial waste manhole, C-3-006. The overflow resulted from a plug in the industrial waste line and was estimated to be between 500 to 1 000 gal. of radioactive liquid waste. The effluent from the overflow spilled to the surrounding paved area, traveled north along Diamond Drive, flowed into the storm sewer via a storm drain grate, and ultimately discharged into upper Mortandad Canyon through outfall SWMU 3-054(e) (Soholt 1990, 17-325). A small dam was built in the streambed at the base

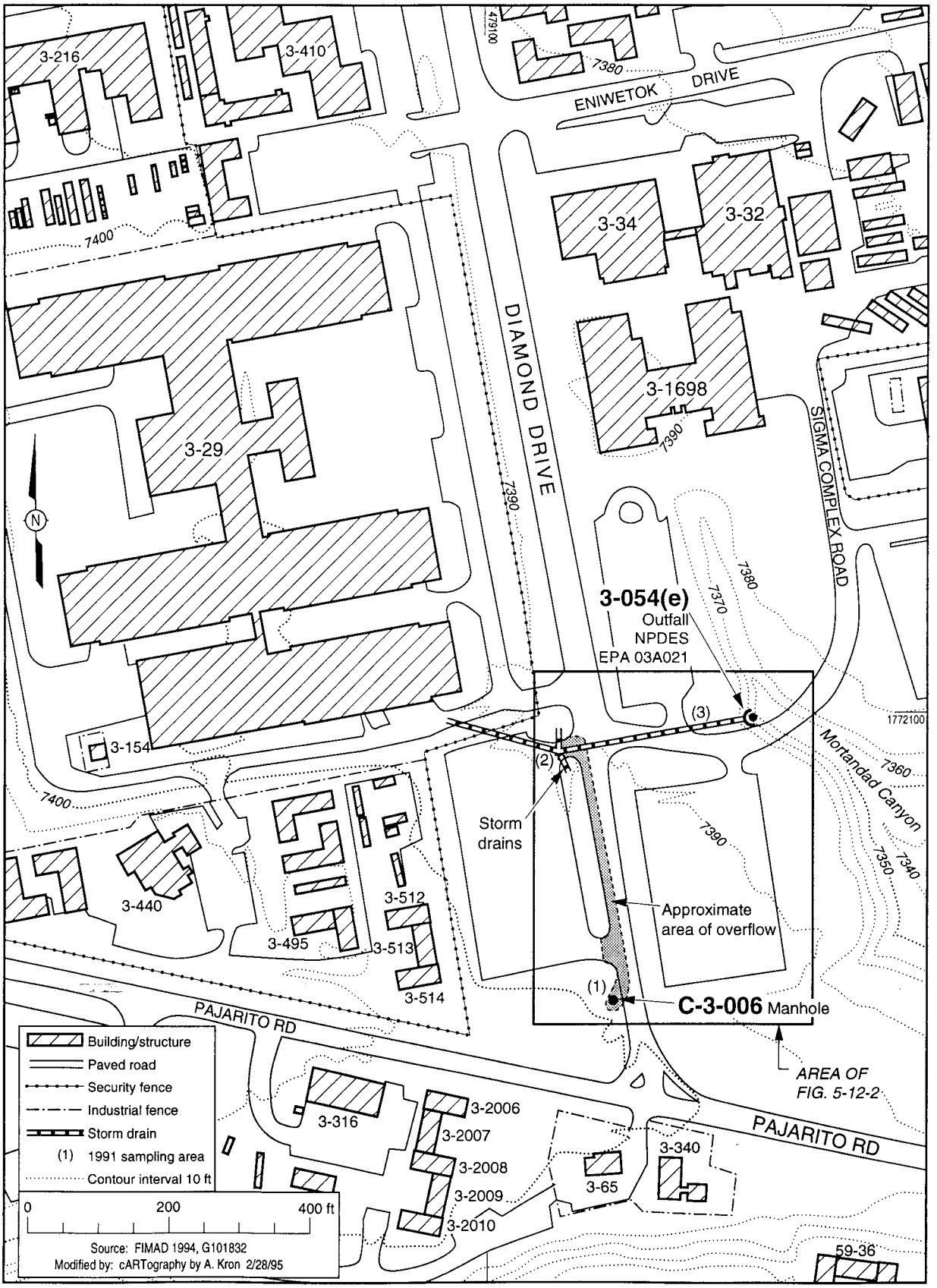


Fig. 5-12-1. Site location map of SWMU 3-054(e) and C-3-006.

of the canyon to contain the effluent. Subsequent cleanup action, based solely on residual radioactive contamination levels of 25 pCi/g, removed approximately 142 ft^3 of contaminated soil from Mortandad Canyon (Soholt 1990, 17-325). Hazardous constituents were not evaluated during the cleanup action.

In 1991 an interim action investigation was conducted prior to the construction of the Sanitary Wastewater System Consolidation (SWSC) line. Surface and subsurface soil samples were collected from three areas: 1) around C-3-006; 2) at the location of the new storm drain line on the east side of Diamond Drive; and 3) at a new manhole located in the old storm drain system before discharging into Mortandad Canyon (Fig. 5-12-1). Soil samples were analyzed for toxicity characteristic leaching procedures (TCLP) metals, radionuclides, VOCs, SVOCs, and PCBs. All COPCs were below current SALs except PCBs. PCBs were detected at four parts per million (ppm) in one sample at the location of the new storm drain line; the current SAL is 1 ppm (Fresquez 1991, 17-297). Since this interim action investigation was conducted in 1991, the area surrounding C-3-006 has been repaved.

5.12.2. Investigation Approach and Objectives

Investigation activities for this aggregate will focus on detecting the presence and nature of potentially contaminated soils at the outfall, SWMU 3-054(e). Because this outfall receives water from several potential sources of contamination in addition to the one-time discharge from the industrial drain manhole, COPCs for this aggregate include metals, SVOCs, PCBs, and radionuclides, specifically plutonium, uranium, tritium, and cesium. It is unlikely that volatile constituents discharged via the outfall would accumulate in soils at the outfall because of aeration during transport through the storm drain. However, samples will be field screened and collected for VOCs as described in Subsection 5.0.5.1 of Addendum 1.

Biased sampling will be conducted soils in the outfall drainage soils where contamination is most likely to exist. This biased approach is based on the known history of the PRSs and the COPC and soil migration potential described in Subsection 5.0.3 of Addendum 1.

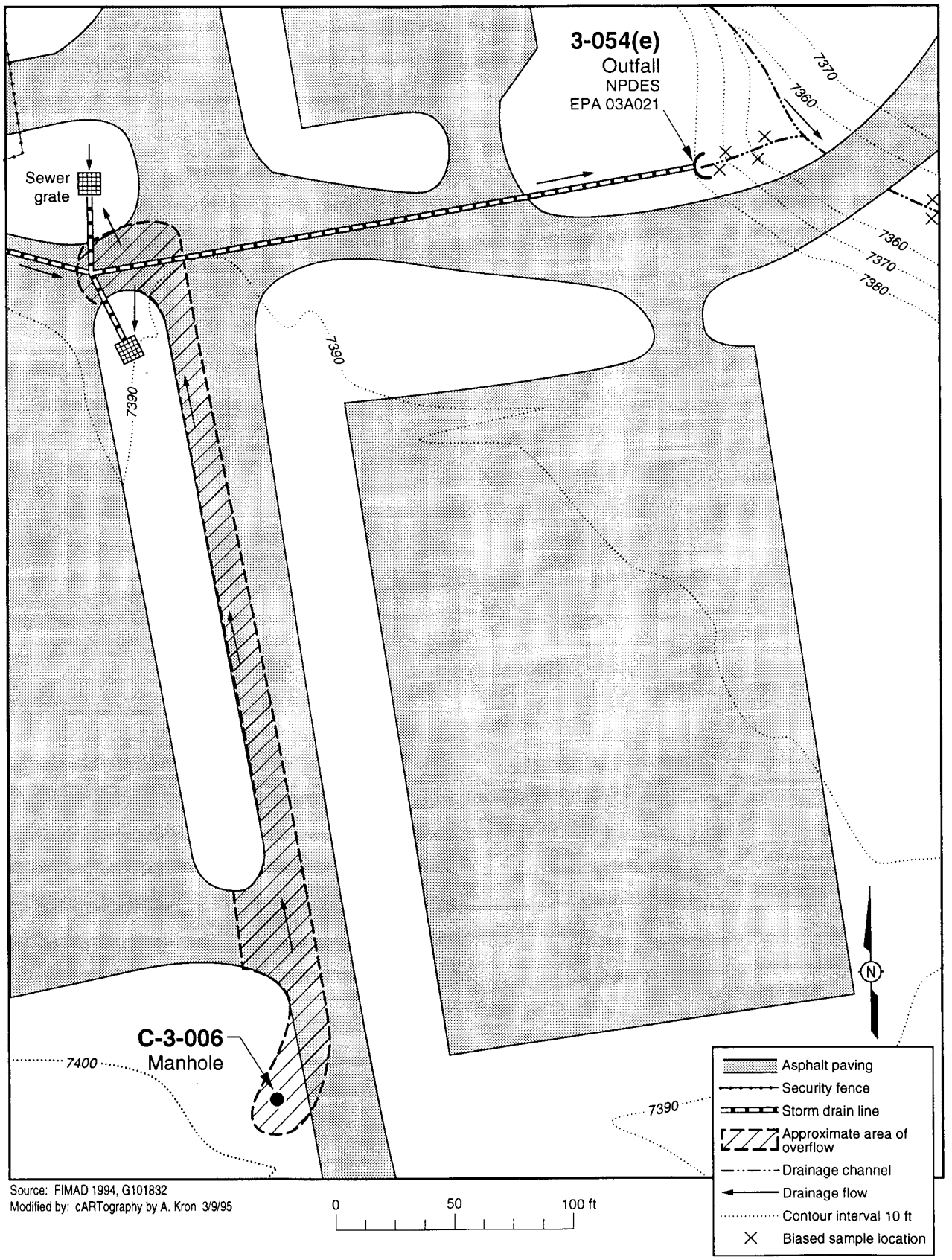
Six sample locations along the outfall drainage were selected based on existing topography and soil deposition. For the most part, the drainage channel is exposed tuff with only a few areas where sediment deposition has occurred. Sample spacing was chosen to bound the extent of contamination down the outfall and the number of samples was based on drainage topography, width, and soil deposition. Based on the factors listed above, the COPCs identified for this site are most likely to have accumulated in the surface soil and at the soil-tuff interface; therefore, the biased samples will target these depths.

5.12.3 Sample Locations and Methods

Figure 5-12-2 identifies the sampling locations that will be used to determine the presence and nature of the COPCs. The area directly between the outfall discharge and the confluence with the stream at the bottom of Mortandad Canyon will be sampled from three distinct depositional areas along the outfall but upgradient of the confluence. Two samples will be taken from separate locations within the first depositional area that is located approximately 10 ft downstream from the discharge pipe. A second depositional area is located approximately 25 ft downstream from the discharge pipe and two samples will be taken at separate locations within this area. The third depositional area is located approximately 15 ft south of the bride over the Mortandad Canyon stream. Two soil samples will be taken at separate locations within this depositional area.

The depth from the soil surface to the soil-tuff interface is expected to be no greater than 12 in. within each depositional area. Prior to sample collection at each location, the depth to the soil-tuff interface will be determined by driving a blunt, stainless steel rod into the ground.

Depending upon the amount and frequency of sediment deposition, COPCs may be found at the soil/tuff interface as well as in the surface soil. All VOC samples will be screened and collected as described in Subsection 5.0.5.1 of Addendum 1. In addition, all soil samples will be field screened for radioactivity using a hand-held gross gamma survey instrument as described in Subsection 5.0.5.1 of Addendum 1.



Source: FIMAD 1994, G101832
Modified by: cARTography by A. Kron 3/9/95

Fig. 5-12-2. Location of sample sites for SWMU 3-054(e) and C-3-006.

Soil samples will be collected from the 0 to 12-in. interval or to depth if the depth to the soil-tuff interface is 18 in. or less. If the depth to the soil-tuff interface is greater than 18 in., an additional sample will be collected as described above from the interval immediately above the soil-tuff interface. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for laboratory analysis of SVOCs. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals, PCBs, isotopic plutonium, isotopic uranium, gamma spectroscopy, and tritium.

Surface samples will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples to ensure adequate sample volume. The soil samples from the soil-tuff interface will be collected using LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler. A split-tube will be used to facilitate sample removal. The adjacent samples for VOC analysis will be collected using a hand auger fitted with a brass sleeve. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.12.4 Laboratory Analyses

All samples will be analyzed in the laboratory for constituents described above using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-12-1. One field duplicate and one collocated sample will be submitted for analyses as the maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

5.12.5 Sampling Event

Samples were collected April 6, 1995, as outlined above. Erosion was occurring around the outfall culvert at an alarming rate. Engineering personnel from FSS-6 were tasked to restabilize the culvert and outfall area just north of the new footings supporting the bridge over Mortandad Canyon. Field Unit 1 personnel wanted to collect samples before the soil was further disturbed; therefore, EPA was notified of the event and samples were collected at risk. Results are pending and will be presented in the RFI Report associated with the PRSs presented in this subsection.

TABLE 5-12-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-054(e) and C-3-006, MORTANDAD CANYON OUTFALL

SAMPLE DESCRIPTION					FIELD SCREEN			LABORATORY ANALYSIS				
								Radio-nuc-lides	Organics			Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic plutonium and uranium, gamma spec., tritium	VOCs (SW 8240)	PCBs (SW 8080)	SVOCs (SW 8270)	Appendix VIII metals (SW 6010, 7000)
Mortandad Canyon												
Depositional area 1	2	0–12	2		2	2	2	2		2	2	2
		s/t[c]	2		2	2	2	2		2	2	2
Depositional area 2	2	0–12	2		2	2	2	2		2	2	2
		s/t[c]	2		2	2	2	2		2	2	2
Depositional area 3	2	0–12	2		2	2	2	2		2	2	2
		s/t[c]	2		2	2	2	2		2	2	2
QC samples[d]												
Field duplicate	1	TBD[e]	1		1	1	1	1	1		1	1
Field collocated	1	TBD	1		1	1	1	1	1		1	1
Rinsate blank												
Confirmatory samples	2	TBD	2		2	2	2		2[f]			
TOTALS	10		16		16	16	16	14	4	12	14	14

rev. 7/13/95

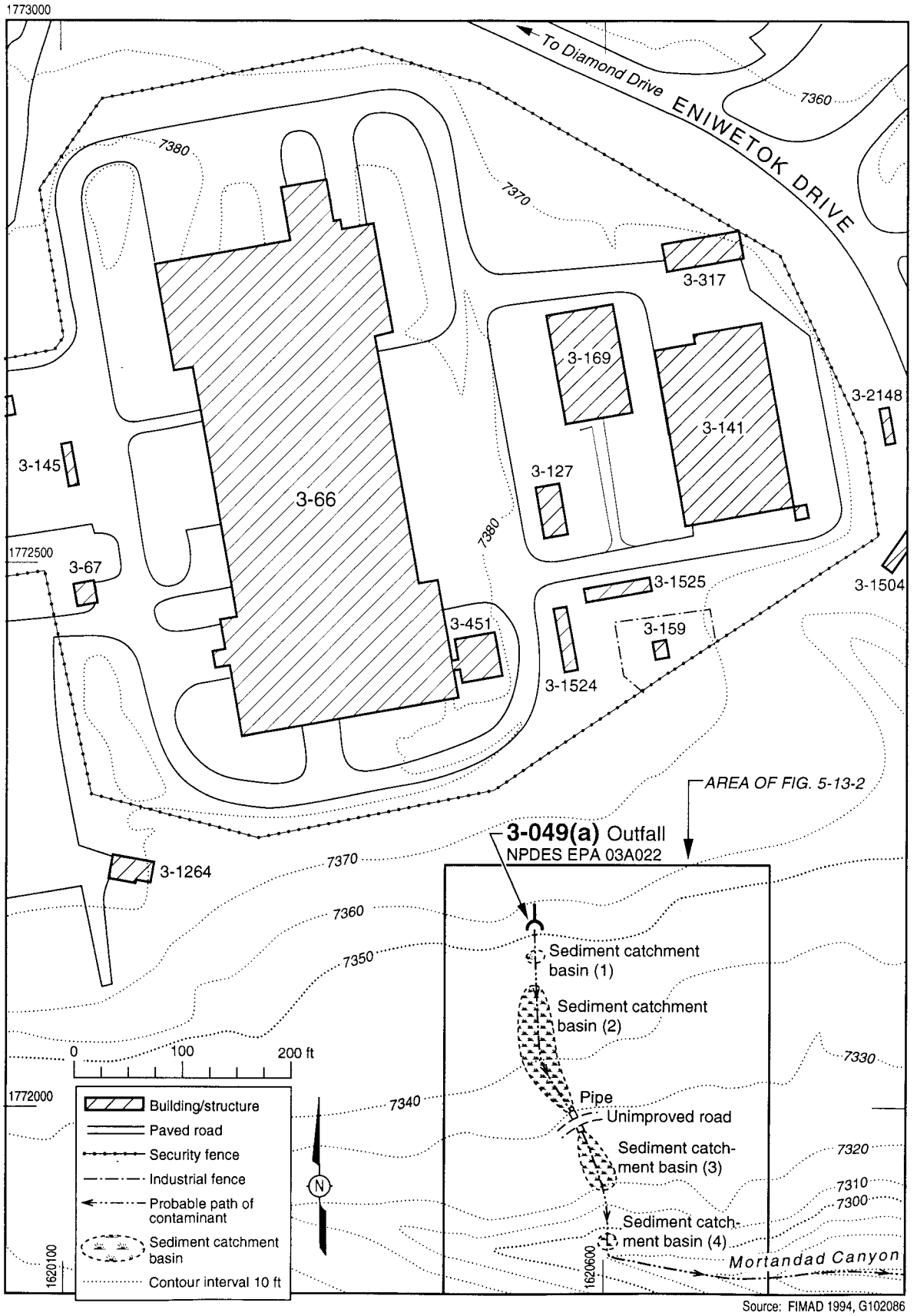
[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]s/t = soil/tuff interface (12-in. interval above interface).
[d]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[e]TBD = To be determined in the field.
[f]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

5.13 SWMU 3-049(a): Outfall South Of TA-3-66

5.13.1 Description and History

SWMU 3-049(a) is an outfall located south of TA-3-66, the Sigma Building, that discharges effluent to Mortandad Canyon. The point of discharge, located approximately 130 ft south of the southern security fence that surrounds TA-3-66, supports native forbs and grasses. Effluent from the outfall pipe flows south approximately 25 ft in a narrow drainage channel eroded into the tuff before it falls over a 15-ft rocky ledge into a shallow sediment catchment basin. This first sediment catchment basin is about 4 ft in diameter. The drainage then continues southward for approximately 100 ft and discharges into an 8 to 10-ft wide sediment accumulation area consisting of cattails and tall grasses and a small basin of water at the south end. Effluent from this second sediment catchment basin is then routed under an unimproved maintenance road through a corrugated metal pipe and collects in another basin containing cattails and grasses. The drainage flows out of the third sediment catchment basin and forms a fourth basin at the edge of the mesa before draining into Mortandad Canyon (Fig. 5-13-1).

The outfall area is designated NPDES EPA 03A022 and is permitted to discharge treated cooling water from cooling tower TA-3-127, which serves TA-3-66. Cooling tower TA-3-127 has been in operation since 1960. From 1984 to 1990 the outfall also received discharge from rinse tanks associated with the electroplating operation located in TA-3-66 (Mitchell 1990, 17-1050; LANL 1990 17-1051). The tanks contained the final rinse from electroplating and surface finishing of experimental components. After an item was plated, it was suspended over a process tank to drain residual plating solution and then immersed in the rinse water tank. Although these rinse tanks were continually flushed with tap water to preclude the buildup of contaminants, trace amounts of metals, acids, cyanide, and depleted uranium were introduced into the rinse water (LANL 1993, 1090). According to the supporting documentation for modification of the Laboratory NPDES



Source: FIMAD 1994, G102086
Modified by: cARTography by A. Kron 3/6/95

Fig. 5-13-1. Site location map of SWMU 3-049(a).

permit, this outfall was permitted to discharge 4 680 gal./day of treated cooling water from TA-3-127 and 24 000 gal./day of electroplating rinse water from TA-3-66 (DOE 1987, 17-1049). Currently, SWMU 3-049(a) outfall receives only treated cooling water from TA-3-127 and runoff from six roof drains on TA-3-66. As required in the NPDES permit, the Laboratory monitors discharge quarterly and reports flow rate, total suspended solids, chlorine, pH, and total phosphorus.

5.13.2 Investigation Approach and Objectives

Investigation activities for SWMU 3-049(a) will focus on detecting the presence and nature of potential contamination in sediments and soils at the outfall and in the drainage area below the point of discharge. If results of this investigation indicate contaminants are present in the fourth sediment catchment basin, additional sampling may be performed as part of a Phase II investigation to further evaluate the spatial distribution of COPCs. Because treated cooling water may have contained chromates and rinse water may have contained trace amounts of electroplating contaminants, the COPCs for this SWMU include Appendix VIII metals, cyanide, and depleted uranium.

Biased sampling will be conducted in sediments and soils along the drainage where contamination is most likely to exist (Fig. 5-13-2). Sampling locations will be based on the known history of the SWMU and the COPC and soil migration potential as discussed in Subsection 5.0.3.

Biased samples will be collected from the media in obvious accumulation areas within the four sediment catchment basins. The number of samples and locations were selected based on drainage topography and dimensions and media deposition. Additionally, sample locations were selected at sites along the drainage to bound the lateral extent of contamination. In the event that the results of this investigation indicate contaminants are present at the soil-tuff interface, additional sampling may be performed during a Phase II investigation to further evaluate the vertical distribution of COPCs.

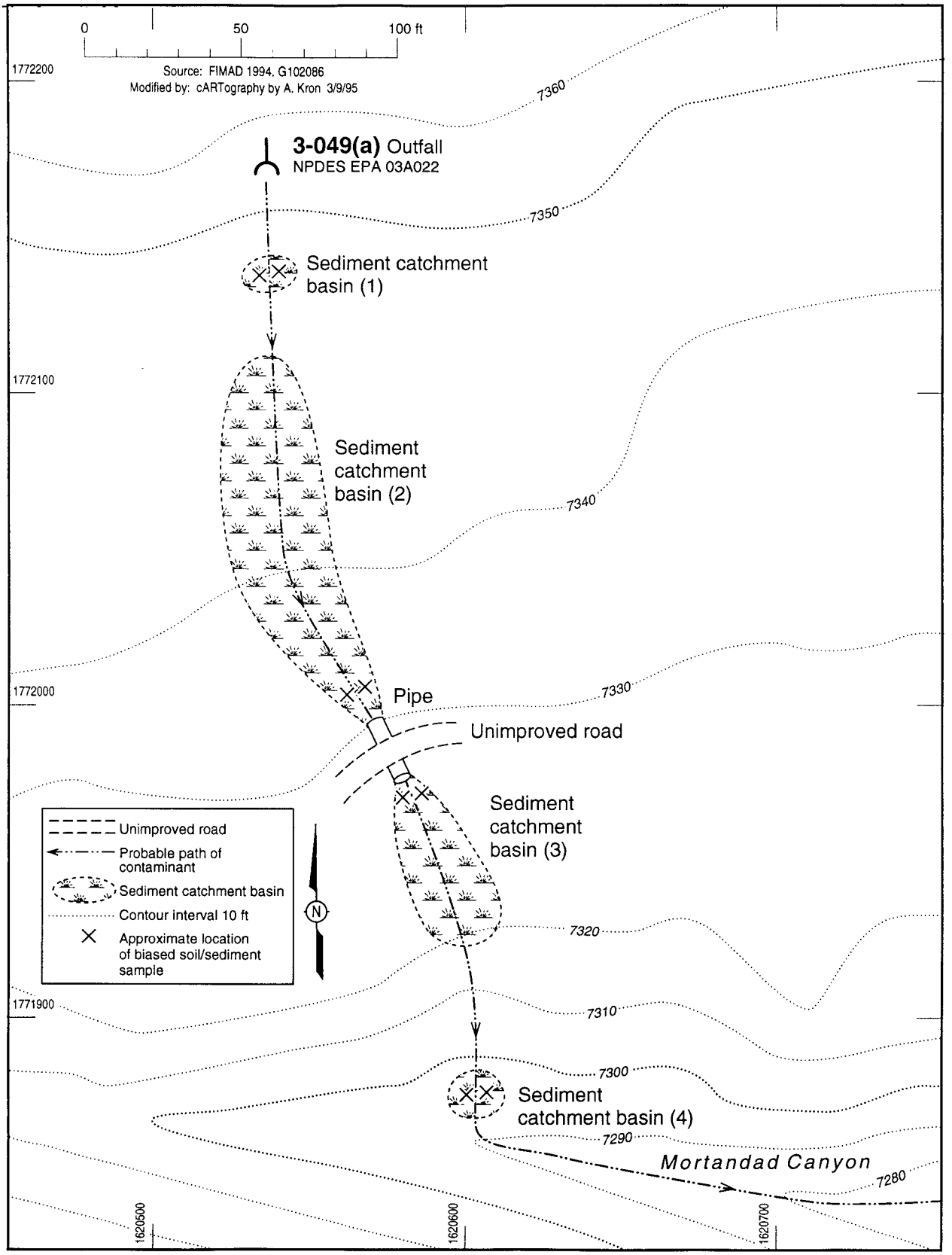


Fig. 5-13-2. Location of sample sites for SWMU 3-049(a).

5.13.3 Sample Locations and Methods

Figure 5-13-2 identifies the eight sampling locations that will be used to identify the presence and nature of the COPCs. Sediment and soil samples will be collected from two locations within each of the four sediment catchment basins.

Because seasonal variations influence the size of the sediment catchment basins, specific sample locations will be selected based on field observations.

All samples will be screened and collected for VOCs as described in Subsection 5.0.5.1. The confirmatory VOC samples for this site will be collected from the first sediment catchment basin and will consist of two water and two sediment samples collected from the six-inch interval immediately above the soil-tuff interface. The samples will be placed in appropriate glass containers and submitted for analysis at a fixed laboratory. All samples will be field screened for radiological constituents as described in Subsection 5.0.5.1.

The depth of sediment within the first sediment catchment basin is expected to be about six inches. The depth to the soil-tuff interface in the second, third, and fourth sediment catchment basins is expected to be no greater than one foot. Prior to sample collection in any of the sediment catchment basins, depth to the soil-tuff interface will be determined at each sample location by driving a blunt, stainless steel rod into the ground.

As previously noted, the media where COPCs have most likely accumulated are sediments, surface soil, and at the soil-tuff interface. These may all fall within the 0- to 12-in. interval. Soil samples in the first basin will be collected from the surface to the soil-tuff interface. If the depth to the soil-tuff interface is greater than 12 in., one sample will also be collected from the 12-in. interval immediately above the soil-tuff interface.

Soil samples in the second, third, and fourth catchment basins will be collected from the 0 to 12-in. interval or to depth if the depth to the soil-tuff interface is 18-in. or less. If the depth to the soil-tuff interface is greater than 18 in., an additional sample will be collected as described above from the interval immediately above the soil-tuff interface. Samples from all four sediment catchment basins will be homogenized prior to submittal for

analysis of Appendix VIII metals and cyanide. Four composite samples, one from each of the four sediment catchment basins, will also be analyzed for isotopic uranium.

The sediment samples will be collected using LANL-ER-SOP-06.14, R0, Sediment Material Collection. Soil samples will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples. If necessary, the adjacent samples for VOC analysis will be collected using the LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler if amenable to site conditions. Water samples will be collected using LANL-ER-SOP-06.03, R0, Sampling for Volatile Organics. A split-tube fitted with a brass sleeve will be used during soil sample collection to facilitate sample removal if amenable to site conditions. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.13.4 Laboratory Analyses

Sediment and soil samples will be analyzed in the laboratory for Appendix VIII metals, cyanide, total uranium, and VOCs using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-13-1. One rinsate blank and one field duplicate will be submitted for analyses as a maximum number of QC samples as determined using the guidelines in the site-specific QAPjP, Annex II, Note 2A. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation listed in Appendix D.

TABLE 5-13-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-049(a), TA-3-66 OUTFALL

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LABORATORY ANALYSIS			
								Radio-nuc-lides	Organics	Metals	Misc.
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic uranium	VOCs (SW 8240)	Appendix VIII metals (SW 6010,7000)	Cyanide (SW 9010, 9012)
Sediment catchment basin 1	2	0–s/t[c]	2		2	2	2	1		2	2
Sediment catchment basin 2	2	0–12	2		2	2	2	1		2	2
		s/t[c]	2		2	2	2			2	2
Sediment catchment basin 3	2	0–12	2		2	2	2	1		2	2
		s/t[c]	2		2	2	2			2	2
Sediment catchment basin 4	2	0–12	2		2	2	2	1		2	2
		s/t[c]	2		2	2	2			2	2
QC samples[d]											
Field duplicate	1	TBD[e]	1		1	1	1	1		1	1
Rinsate blank	NA[f]	NA	1					1		1	1
Confirmatory samples (sediment)	2	TBD	2		2	2	2		2[g]		
Confirmatory samples (water)	2	NA	2		2	2	2		2[g]		
TOTALS	13		20		19	19	19	6	4	16	16

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]s/t = soil/tuff interface (12-in. interval above interface).
[d]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[e]TBD = To be determined in the field.
[f]NA = Not applicable.
[g]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

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5.14 SWMU 3-021: Former Outfall Near the Compressed Gas Facility

5.14.1 Description and History

SWMU 3-021 is a former outfall located approximately 60 ft north of the north exterior wall of TA-3-170, the compressed gas facility (Fig. 5-14-1). The exact location and dimensions of the outfall area are unknown because regrading and construction work for TA-3-1650, the compressed gas cylinder storage building, have resulted in placement of 5 to 10 ft of fill material over the former outfall area. From approximately 1964 to 1976 the outfall discharged caustic wash and rinse water from compressed gas cylinder cleaning operations in TA-3-170. The SWMU 3-021 outfall has not been used since 1976 when cylinder washing and painting responsibilities were assumed by the compressed gas suppliers (LANL 1993, 17-908; LANL 1993, 17-904).

SWMU 3-021 received wash and rinse wastewater from gas cylinder cleaning operations that occurred in TA-3-170 (LANL 1993, 17-908; LANL 1993, 17-906; LANL 1993, 17-905; LANL 1993, 17-904). The gas cylinders were washed and stripped of paint using a caustic soda solution before being repainted. No documentation is available on the chemicals and processes associated with the SWMU 3-021 outfall (LANL 1993, 17-907; LANL 1993, 17-905; LANL 1993, 17-904). However, paint used during the 1960s and 1970s typically contained heavy metals, such as lead. The washing and stripping operation occurred in a below-floor-grade pit in the northern portion of TA-3-170 (LANL 1993, 17-904; LANL 1993, 17-908; LANL 1993, 17-906; LANL 1993, 17-905). Any exterior dirt, oil, and grease was washed from the cylinders in the adjacent parking lot prior to being washed and stripped with caustic soda in TA-3-170 (LANL 1993, 17-906). Before being transported to TA-3-170, the cylinders were screened for radioactive contamination and decontaminated at the user's facilities (LANL 1993, 17-906).

Based on a field examination of the outfall exit pipe from the north exterior wall of TA-3-170 and interviews with previous site workers, a 2-in. diameter iron outfall pipe in an open ditch carried the caustic wash and rinse water

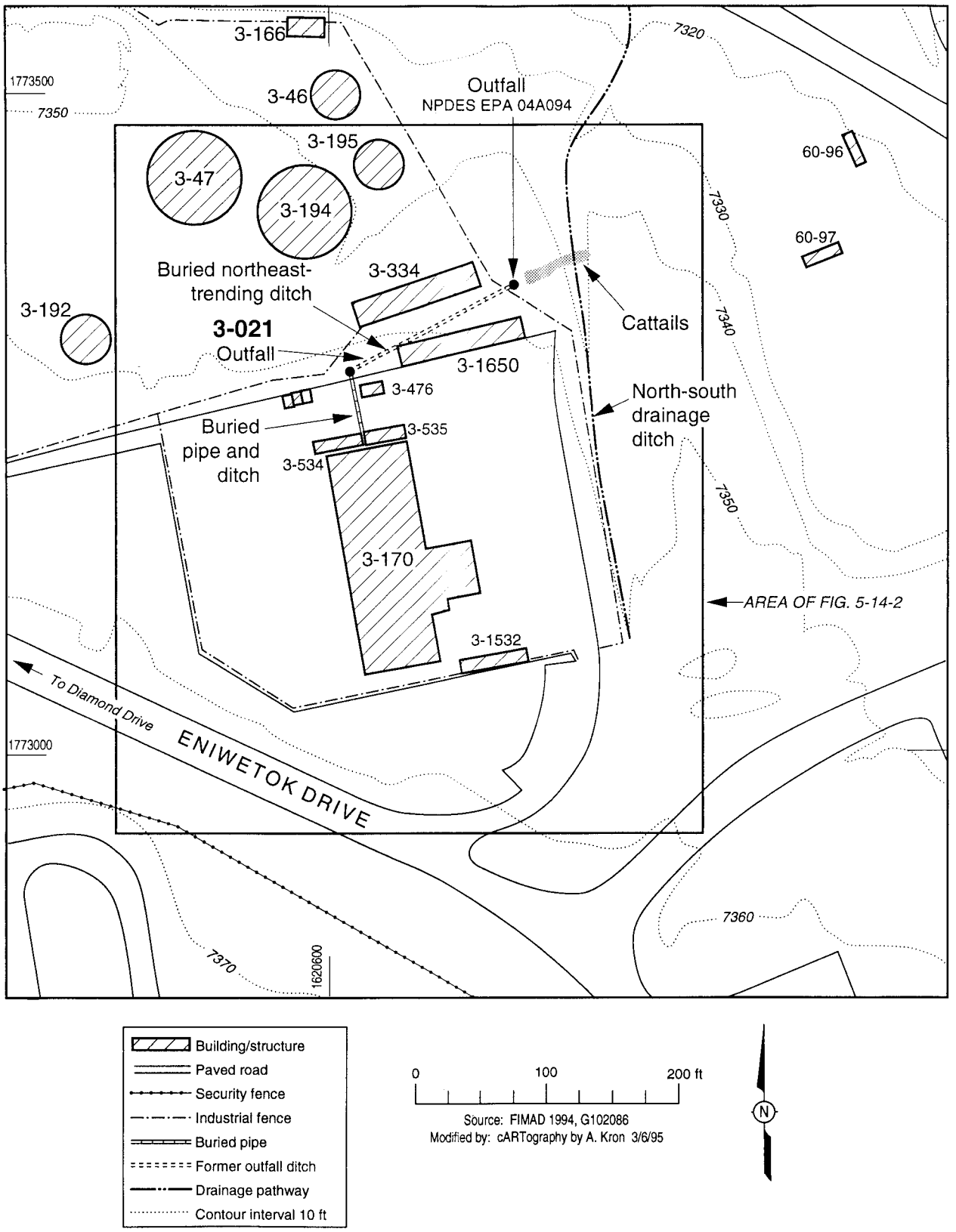

Fig. 5-14-1. Site location map of SWMU 3-021.

due north (LANL 1993, 17-905). Discharge from the end of the outfall pipe was then directed into a northeast-trending surface ditch that carried the wastewater approximately 180 ft to the main north-south drainage ditch. The discharge to the north-south drainage ditch is designated by the NPDES number EPA 04A094 (Fig. 5-14-2).

NPDES EPA 04A094 is permitted to discharge noncontact cooling water from TA-3-170 via the main north-south drainage. Review of aerial photographs indicates the presence of the shallow northeast-trending ditch constructed in Bandelier Tuff (LANL 1977, ER 17859). This area is presently covered with an estimated 5 to 10 ft thickness of fill material, based on past and present topography. A significant amount of runoff from paved areas drains northward and enters this fill area approximately 40 ft east of the SWMU 3-021 outfall ditch.

5.14.2 Investigation Approach and Objectives

The objectives of this investigation is to provide information regarding the nature and extent of contamination associated with SWMU 3-021. Heavy metal precipitates from paint chips suspended in the wastewater are likely contaminants. It is possible that the caustic nature of the wastewater caused metals, such as lead and chromium, to precipitate as oxides and hydroxides. Therefore, the primary COPCs are Appendix VIII metals. Additionally, SVOCs are COPCs because they are constituents of enamel-based paints that may have been removed from the compressed gas cylinders. VOCs are not COPCs, because volatilization during transport makes it unlikely that any volatile constituents would accumulate in soils. However, samples will be field screened and collected if necessary for VOCs as described in Subsection 5.0.5.1 of Addendum 1.

Soils that may be contaminated are now buried by the fill material and/or asphalt that were placed during construction of TA-3-1650. Potential contamination from washing compressed gas cylinders is most likely contained in the soil surrounding the SWMU 3-021 outfall pipe and ditch and the northeast-trending ditch. The pipe fittings on the north wall of TA-3-170 and the NPDES outfall bound the area to be investigated. Therefore, the

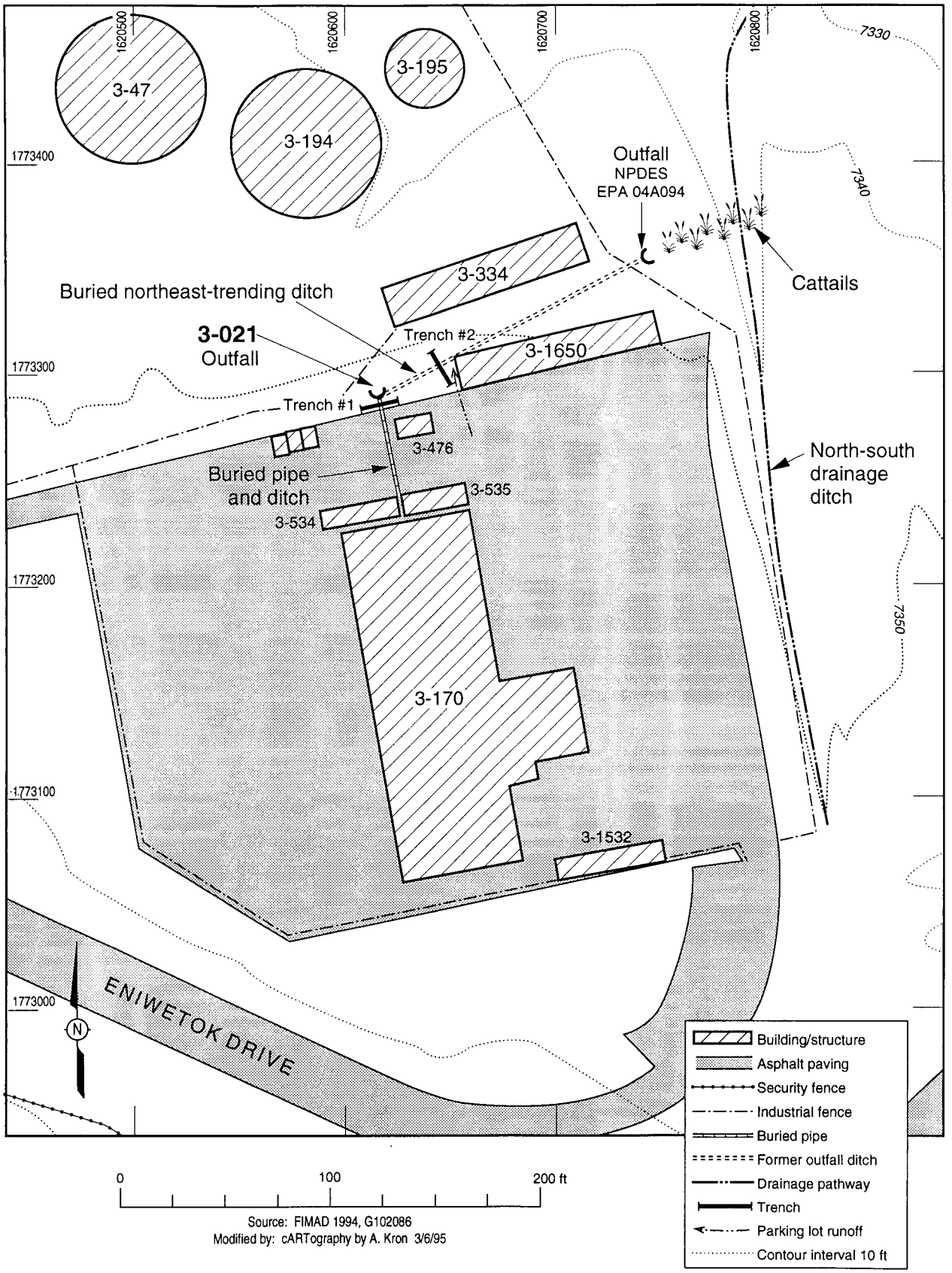

Fig. 5-14-2. Location of sample sites for SWMU 3-021.

investigation approach for SWMU 3-021 is to first locate the former SWMU 3-021 outfall ditch and northeast-trending ditch, and then conduct subsurface sampling and analysis of these former ditches to assess the presence and nature of contamination.

A biased sampling approach will be used to investigate SWMU 3-021 and will target areas most likely to be contaminated based on historical information and transport processes in the outfall area. Sample locations were selected along the drainage to bound the lateral extent of contamination. The COPCs identified for this site are most likely to have accumulated in sediments or at the soil-tuff interface, assuming that the drainage ditches were not dug into the tuff. Therefore, biased samples will target these media and depths.

5.14.3 Sample Locations and Methods

The exact location of the former SWMU 3-021 ditch is not precisely known because it is now buried beneath 5 to 10 ft of fill and several layers of asphalt. However, as previously stated, the outfall ditch extended to the north, perpendicular to the north wall of TA-3-170 where there are pipe fittings that were associated with the two-inch diameter iron outfall pipe. It is not known if the outfall pipe itself was removed or left in place. These pipe fittings were sealed when the system was decommissioned. Six samples will be collected from the two trenches. Trench 1 will be excavated near the northern edge of the asphalted fill area perpendicular to the probable location of the outfall ditch (Fig. 5-14-2). Once the pipe has been located, biased samples will be collected from three locations immediately beneath and spaced uniformly across the trench. Sample biasing will be based on evidence of soil staining and the presence of paint chips or other anomalies. If the pipe is no longer present, three biased samples will be collected across the drainage ditch, which may be discerned from field observations such as differences between native soil and fill material. Samples will be collected from the one-foot interval below the fill-soil interface. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for laboratory analysis of SVOCs. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals.

After approximating the location of the former SWMU 3-021 outfall, the location of the former northeast-trending ditch leading to the NPDES discharge area can be extrapolated. The second trench (trench 2) will be located along the northeast-trending ditch approximately 5 to 10 ft upgradient of the point at which parking lot runoff enters the current drainage. As described above for the SWMU 3-021 outfall ditch, biased samples will be collected from three locations in the trench based on field observations. Site history indicates that this ditch was excavated into Bandelier Tuff and subsequently filled with fill material during construction of building TA-3-1650. Therefore, samples will be collected from the one-foot interval below the fill-tuff interface. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for laboratory analysis of SVOCs. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals.

All samples will be field screened and collected for VOCs described in Subsection 5.0.5.1. In the absence of field-detected VOCs, a confirmatory sample will be collected at random from each trench as described in Subsection 5.0.5.1. All samples will also be field screened for radiological constituents as described in Subsection 5.0.5.1.

Trenches will be excavated using LANL-ER-SOP-03.10, R0, Trenching and Logging. Soil and tuff samples will collected using LANL-ER-SOP-06.10, R0 Hand Auger and Thin-Wall Tube Sampler. Split-tubes will be used to facilitate sample removal. If necessary, adjacent samples for VOC analysis will be collected using a hand auger fitted with a brass sleeve. Specific procedures to be followed in the field for sample collection are discussed in Appendix D of Addendum 1.

5.14.4 Laboratory Analyses

All soil and tuff samples will be laboratory analyzed for Appendix VIII metals and SVOCs using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-14-1. One field duplicate will be submitted for analyses as a maximum number of QC samples as determined using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-14-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-021, COMPRESSED GAS FACILITY OUTFALL

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LAB ANALYSIS		
								Organics		Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	VOCs (SW 8240)	SVOCs (SW 8270)	Appendix VIII metals (SW 6010,7000)
Outfall pipe trench										
Trench 1	3	12-in. below f/s[c]	3		3	3	3		3	3
Northeast-trending ditch										
Trench 2	3	12-in. below f/t[d]	3		3	3	3		3	3
QC samples[e]										
Field duplicate	1	TBD[f]	1		1	1	1		1	1
Confirmatory samples	2	TBD	2		2	2	2	2[g]		
TOTALS	9		9		9	9	9	2	7	7

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]f/s = fill/soil interface.
[d]f/t = fill/tuff interface.
[e]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[f]TBD = To be determined in the field.
[g]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

5.15 SWMUs 3-056(k) and 3-052(b): Storm Drains and Drum Storage North of TA-3-66

5.15.1. Description and History

The PRSs included in this aggregate are SWMU 3-056(k) and SWMU 3-052(b). These SWMUs can be evaluated using one sampling and analysis plan because SWMU 3-056(k), the outside storage area located on the north side of TA-3-66 (Sigma Building), is a potential upgradient source to the storm drain system designated SWMU 3-052(b) (Fig. 5-15-1).

SWMU 3-052(b). Surface runoff flows across the surrounding area into the storm drain system at two locations. This storm drain system, identified as SWMU 3-052(b), is located approximately 20 ft north and west of TA-3-66. The storm drain system is three sections of pipe (two sections are corrugated metal and one is vitrified clay), which can be accessed at five locations shown on Fig. 5-15-1. The single storm drain located on the northwest side of TA-3-66 discharges to a low-lying grassy area. The storm drain system on the northeast side of TA-3-66 discharges to a storm drain outlet located just north of Eniwetok Drive (Fig. 5-15-1).

SWMU 3-056(k) is identified in the SWMU Report as a drum storage area on the north side of TA-3-66 containing oil, solvents, and radioactively contaminated graphite (LANL 1990, 0145). Items in the storage area east of the dock are drummed, spent graphite molds that were used to form depleted uranium components (Heskett 1995, 17-1205). A 1989 site visit by Roy F. Weston, Inc., personnel also noted drums containing oil mixed with vermiculite. Staining was observed on the asphalt where the oil/vermiculite drums were stored (LANL 1992, 17-582). A 1994 and 1995 interview with TA-3-66 site health and safety personnel revealed the oil was vacuum pump oil suspected of contamination from depleted uranium. The drums were staged outside the center doors on the east leg of the loading dock prior to transport to TA-54. There were no releases from the drums to the concrete dock according to site personnel and no staining on the dock.

The outside storage area also includes the loading dock located at the northwest corner of TA-3-66. During a 1993 site visit to SWMU 3-056(k), the following items were noted on the loading dock; a 55-gal. drum containing

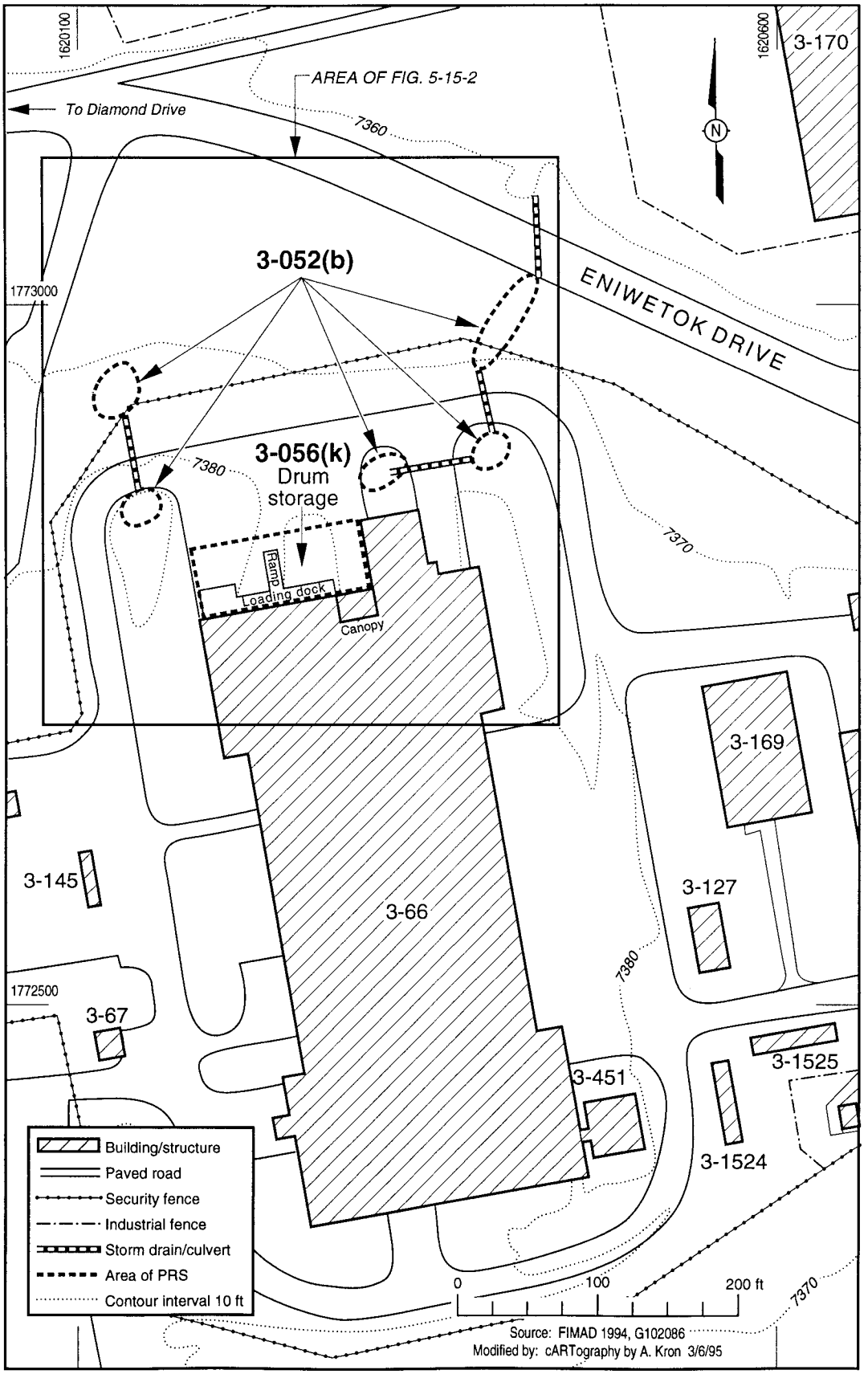

Fig. 5-15-1. Site location map of SWMUs 3-056(k) and 3-052(b).

depleted uranium chips in diesel fuel covered by a tarp within secondary containment and two centrifugal separators and a bag separator system used to collect graphite and depleted uranium oxide dust into 30-gal. drums. One drum was sited under each shaker; however, the gate valve from the shaker was wrapped with plastic and taped shut.

Four documented radiological material releases may have contributed contamination to SWMU 3-056(k) and may have impacted SWMU 3-052(b). The first two of these releases are associated with the TA-3-66 foundry crucible-cleaning operation. In past years, this operation utilized the centrifugal separator and tubular bag separator system. One documented release occurred in 1989 after changeout of the drums used to collect dust from the separator/shaker system. After changeout, the gate valves to the drums was not reopened. This caused dust to accumulate in the separator housings and leak to the surrounding environment. Over time, rain spread contamination [0 to 1 042 disintegrations per minute (dpm) alpha] to a localized area of the dock surface, 9-10 ft diameter from the separator drum (LANL 1991, 17-1202). A second release occurred in 1991 when the filter bag in the graphite shaker failed and graphite dust escaped the shaker system. A radiological survey of the impacted area was performed; however, no detectable contamination was found (LANL 1991, 17-1202). A third release that may have affected SWMU 3-056(k) occurred when janitors dumped wastewater from floor cleaning in the foundry off the dock. As a result of this practice being noticed, a radiological survey was performed on and around the dock were the water was disposed. Elevated levels of radioactivity were observed using hand-held beta/gamma detectors. The user group performed a voluntary cleanup of the dock area by removing a two foot strip of asphalt and underlying soil and replaced the section with new asphalt. Contamination on the concrete dock was fixed in place by applying a fixative paint. The user group maintains the painted surface and monitors the centrifugal separator, dictated by ESH personnel.

The fourth reported incident occurred June 29, 1992, when a water leak from a broken steam pipe was discovered in the TA-3-66 foundry. This leak caused water to spill through a radiological controlled area and out the back loading dock of SWMU 3-056(k). Three water samples were taken at the time of the spill. Only one sample, from a controlled area, revealed radiation

levels above SALs (Clements 1992, 17-1201). This release is believed to be the cause of above-background radiation levels detected on the dock during a radiation survey conducted in 1994 (LANL 1994, 17-1208).

5.15.2. Investigation Approach and Objectives

Based on known releases from the TA-3-66 area, COPCs for these SWMUs include Appendix VIII metals and depleted uranium. Sampling activities for SWMU 3-052(b) will focus on detecting the presence and nature of potential contamination in soils associated with the storm drain. Biased sampling strategies will be used for SWMU 3-052(b) to select five locations where access to the storm drain system allows for collection of soil samples. For SWMU 3-056(k); sampling will focus on detecting the presence and nature of potential contamination in the soil and asphalt around the drum storage area. No obvious spill areas exist at SWMU 3-056(k); therefore, random sampling will be used to provide coverage of the entire drum storage area, increasing the likelihood that contaminated areas will be identified.

Areas most likely to be contaminated, based on historical information, current observations of site use, physical and chemical characteristics of the soil, and the COPC migration potential as described in Subsection 5.0.3 of this work plan will be selected as biased sampling sites.

5.15.3. Sample Locations and Methods

One biased soil sample will be collected at each of the five access points to the SWMU 3-052(b) storm drain shown on Fig. 5-15-2. Sampling points will be selected based on soil deposition at the access points. Two biased soil samples will also be collected in the grassy area on the west side of the loading dock.

Random samples at SWMU 3-056(k) will be selected from a 10-ft by 10-ft sampling grid on a 50-ft wide by 125-ft long sampling area that abuts the loading dock on the north side. A site reconnaissance will be conducted to verify sites selected, followed by a geodetic survey of those grid nodes selected for sampling. Based on the likely types and volume of spills and/or releases in the area, it will be assumed that 25% of the sample grid area may

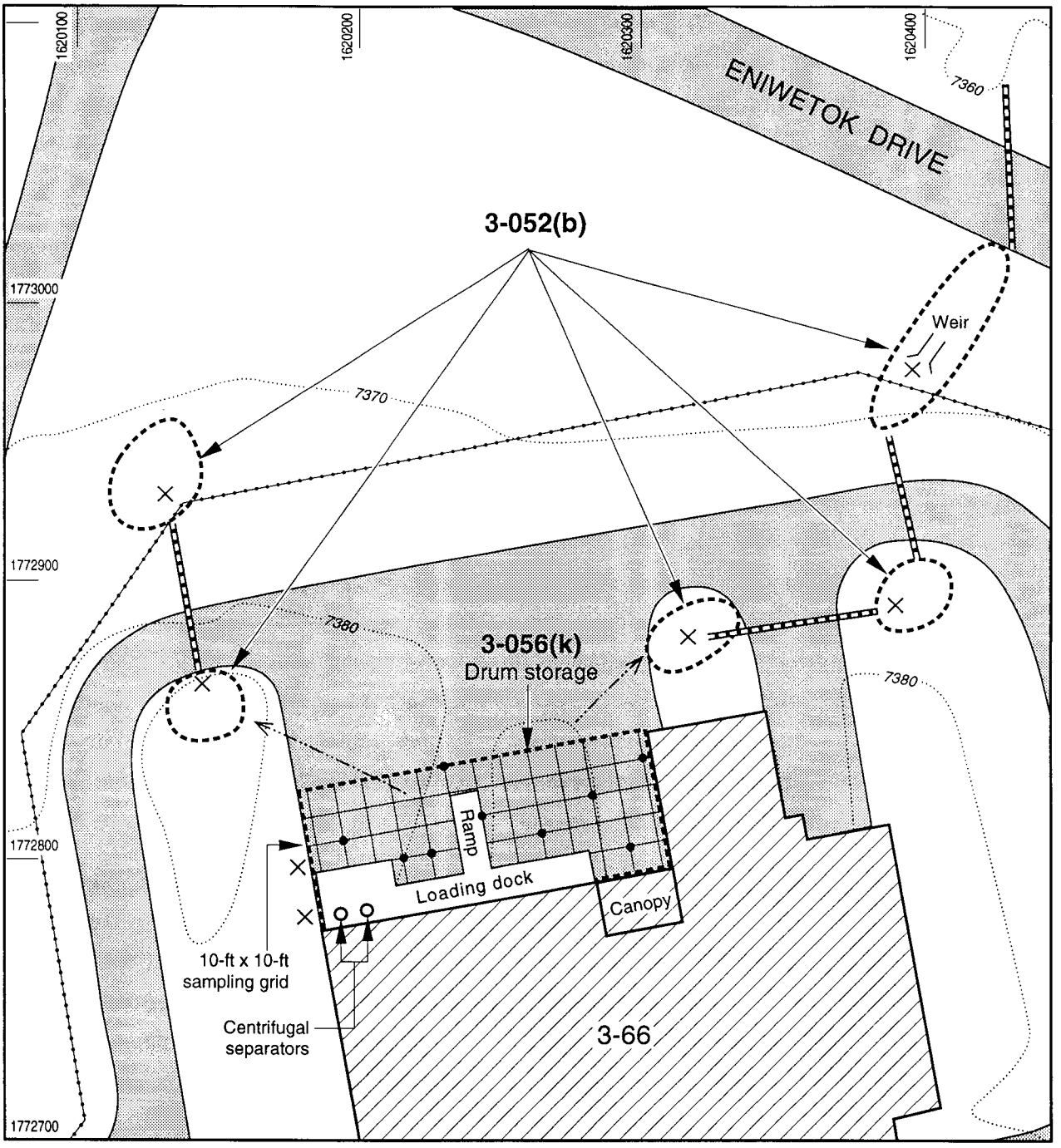

Fig. 5-15-2. Location of sample sites for SWMUs 3-056(k) and 3-052(b).

be contaminated. If 25% of the sample grid is assumed to be contaminated and a 90% level of confidence is desired for detection of contamination, 9 sample points will be randomly selected at grid nodes using the equation discussed in Subsection 5.0.4. All sampling sites are shown schematically on Fig. 5-15-2.

For both biased and random sample locations, soil samples will be screened continuously in 12-in. intervals from the surface down to the clay-rich horizon, or to the soil-tuff interface if no clay-rich horizon is found. Each sample interval will be screened and collected for VOCs as described in Subsection 5.0.5. Each sample will also be field screened for radionuclides as described in Subsection 5.0.5.

Because the drum storage area is covered with asphalt, the asphalt and the underlying base course will be removed prior to soil sample collection. Asphalt samples will not be submitted for isotopic uranium analysis only because it is unlikely that the metals would have adsorbed to the asphalt surface. Soil samples will be collected from the 0 to 12-in. interval and from the 12-in. interval immediately above the clay-rich horizon, or the soil-tuff interface if no clay-rich horizon is found. Soil samples from each depth will be homogenized and then submitted for laboratory analysis of Appendix VIII metals and isotopic uranium.

Asphalt will be sampled using the LANL-ER-SOP-06.28, R0, Chip Sampling of Porous Surfaces. Soil samples from the 0 to 12-in. depth interval and from the 12-in. interval immediately above the clay-rich horizon or the soil-tuff interface as described above will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples. Soil samples collected from the interval above the clay-rich horizon or the soil-tuff interface will use LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler and a split tube will be used to facilitate soil sample removal. If necessary, adjacent samples for VOC analysis will be collected using a hand auger fitted with a brass sleeve. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.15.4. Laboratory Analyses

Asphalt and soil samples will be analyzed in the laboratory for the constituents described above using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-15-1. One field duplicate and one field collocated sample will be submitted as the maximum number of QC samples determined using the guidelines in the site specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-15-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMUs 3-052(b) and 3-056(k), STORM DRAIN SYSTEM AND STORAGE AREA

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LAB ANALYSIS		
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Radio-nuc-lides: Isotopic uranium	Organics: VOCs (SW 8240)	Metals: Appendix VIII metals (SW 6010, 7000)
SWMU 3-052(b)										
Biased sampling	5	0–12	5		5	5	5	5		5
		s/t[c]	5		5	5	5	5		5
SWMU 3-056(k)										
Biased sampling	2	0–12 s/t[c]	2		2	2	2	2		2
		s/t[c]	2		2	2	2	2		2
Random sampling										
10-ft x 10-ft grid	9	Asphalt	9		9	9	9	9		
		0–12 (soil)	9		9	9	9	9		9
		s/t[c]	9		9	9	9	9		9
QC samples[d]										
Field collocated	1	TBD[e]	1		1	1	1	1		1
Rinsate duplicate	1	TBD	1		1	1	1	1	2	1
Confirmatory samples	2	TBD	2		2	2	2		2[f]	
TOTALS	20		45		45	45	45	43	4	34

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[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]s/t = soil/tuff interface (12-in. interval above interface).
[d]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[e]TBD = To be determined in the field.
[f]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

5.16 SWMUs 3-052(a,e) and 3-054(b): Shops Outfall

5.16.1 Description and History

The PRSs in this aggregate include two storm drains, SWMUs 3-052(a,e) that discharge to a TA-3 storm sewer and continue to the NPDES permitted outfall for cooling tower blow-down/effluent and noncontact cooling water at SWMU 3-054(b) (Fig. 5-16-1). Because the two storm drains are potential sources of contaminants for outfall SWMU 3-054(b), these SWMUs can be evaluated using one sampling and analysis plan.

SWMU 3-054(b) is the outfall area of a TA-3 storm sewer that eventually discharges to Twomile Canyon. The discharge area, located approximately 70 ft west of building TA-3-1538, is filled with 1.5 to 2 ft of sediment and is covered by vegetation consisting of grasses and cattails. Effluent from the outfall has formed a gently sloping drainage channel ranging from 10 to 15 ft wide that flows south for approximately 100 ft to a perimeter road. A 10-ft long weir is located approximately 25 ft downgradient of the outfall pipe. A drainage swale that collects runoff from both paved and unpaved areas surrounding TA-3-1538 enters the drainage channel from the east, approximately 25 ft downgradient of the outfall pipe. Storm water runoff from the perimeter road also enters the drainage area at this location. The water in the drainage area is routed under the perimeter road through a corrugated metal pipe and then falls steeply into Twomile Canyon. This description is illustrated on Figs. 5-16-1 and 5-16-2.

The outfall area is designated NPDES EPA 03A009 and is permitted to receive discharge water from cooling tower effluent blow-down. During an initial site investigation in July 1993 this outfall was reported to discharge water from equipment in building TA-3-102, cooling tower effluent, cooling tower blow-down, and noncontact cooling water from a furnace. All these sources used municipal water. The water from these sources was discharged to the permitted outfall via the storm sewer (LANL 1993, 17-935). Since the 1993 site visit, the noncontact cooling water from the furnace has been re-routed to the sanitary sewer; future plans include eliminating the need for the NPDES permit at the outfall by also rerouting the cooling tower effluent and blow-down to the sanitary sewer (LANL 1993, 17-935). Currently, the Laboratory monitors the outfall quarterly and reports flow rate, total suspended solids, chlorine, pH, and total phosphorus under the NPDES requirement.

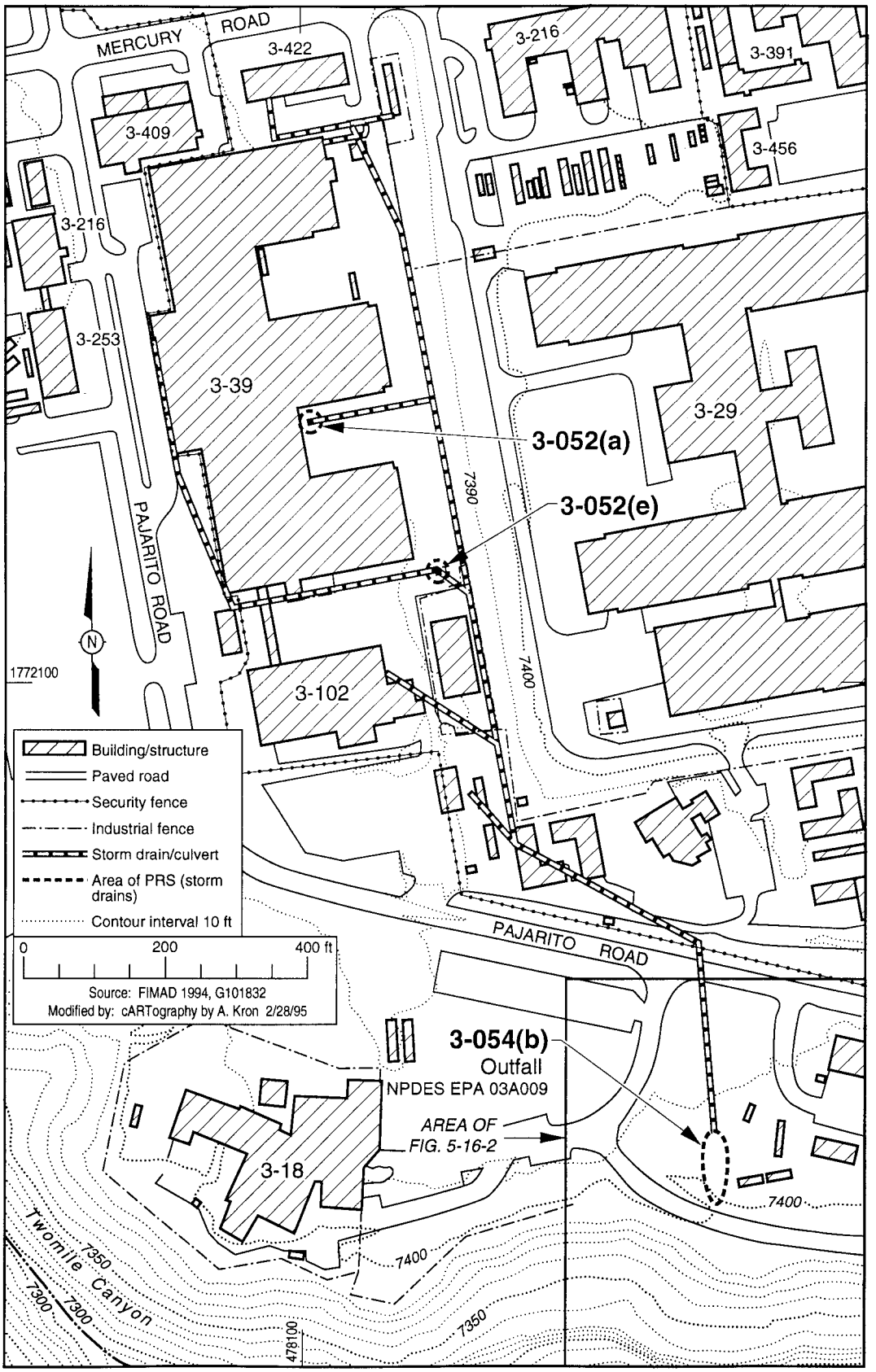
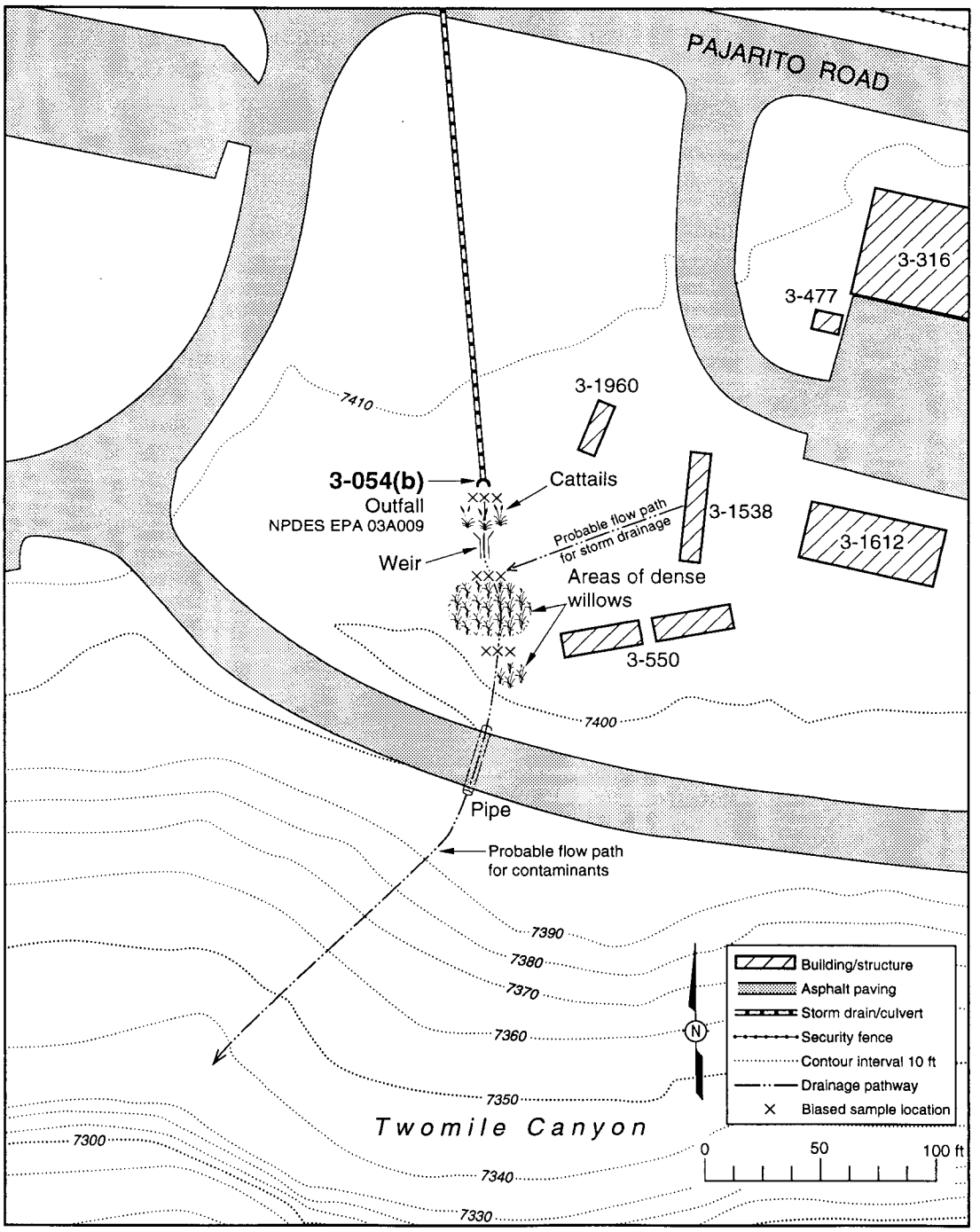


Fig. 5-16-1. Site location map of SWMUs 3-054(b) and 3-052(a,e).



Source: FIMAD 1994, G101832
Modified by: cARTography by A. Kron 3/9/95

Fig. 5-16-2. Location of sample sites for SWMUs 3-054(b), 3-052(a,e).

Additional discharges to this outfall area via the TA-3 storm sewer include storm water runoff from surface areas surrounding 26 buildings in TA-3. Runoff from a total of 94 roof drains from area buildings (86 from TA-3-39, 6 from TA-3-102, and 2 from TA-3-422) is also routed to the storm sewer, and eventually discharges to the outfall (LANL 1992, 17-863).

During a one-time sampling event in 1993, in preparation for the NPDES storm water program implementation, storm water runoff was sampled at outfall SWMU 3-054(b) and analyzed for wastewater parameters, radionuclides, metals, cyanide, total phenols, VOCs, SVOCs, pesticides, and herbicides (LANL 1993, 17-1114). Several constituents were identified above quantitation limits; however, none was above SAL. The constituents with levels greater than quantitation limits were chromium, lead, zinc, and heptachlor epoxide (pesticide). Results of the 1993 sampling event are compared to SALs in Table 5-16-1. The metals may be attributed to background levels and/or facility runoff; while the pesticide concentrations may have been the result of a recent application at an upgradient area. Soil and sediments at the outfall area or in the drainage below have not been sampled.

TABLE 5-16-1

SAMPLING RESULTS AT SWMUs 3-052(a,e) COMPARED TO SALs

COPC	SALS IN WATER (µg/L)	RESULTS OF 1993 SAMPLING EVENT (µg/L)
Chromium	100	<10
Lead	50	11
Zinc	10 000	11
Heptachlor epoxide	0.2	0.14

SWMU 3-052(a) is a storm drain located near the main storage dock area on the east side of TA-3-39 (Fig. 5-16-1). This SWMU consists of a 100 ft x 10 ft area used to store dumpsters that contained waste materials from machining operations in TA-3-39. Metal filings and oil stains were noted surrounding the dumpsters and in the storm drain during an initial site reconnaissance visit (Sobojinski 1993, 17-1099). From 1954 to 1991 materials from machining operations were disposed of in dumpsters and

included metal filings such as aluminum, stainless steel, copper, and brass; solvents such as trichloroethane (TCA) and trichlorethene (TCE) used for degreasing; and, ethylene glycol used as a coolant (LANL 1994, 17-1115). Material from the dumpsters may have leaked and been washed into the storm drain. Currently, only metal filings go to the dumpsters; all liquids are drummed, transported to TA-54, and eventually shipped offsite for disposal.

Since the 1993 site reconnaissance visit, a metal barrier consisting of angle irons and silastic material has been constructed around the dumpster area and the storm drain has been sealed using a metal plate to prevent runoff and discarded materials from entering the storm drain system (LANL 1994, 17-1115). Future plans include extending the roof over the dumpster area to prevent rainwater from entering the bermed dumpster area. Currently, rainwater must be pumped to a basement sump that utilizes an oil-water separator before draining to the sanitary sewer system.

SWMU 3-052(e) is a storm drain located approximately 50 ft southeast and downgradient of an indoor paint booth located in the southeast corner of TA-3-39. This storm drain may have received paint compounds and residual solvents used in painting operations. Paint stains were observed on the asphalt surface in a 50-ft square area just outside the rollup door to the indoor paint spray booth and in the vicinity of the inlet to the storm drain. Visual inspections of the site suggest that items too large for the paint booth were spray-painted outdoors on the asphalt surface adjacent to the building.

5.16.2 Investigation Approach and Objectives

Investigation activities for this aggregate will focus on detecting the presence and nature of potential contamination in soils at the outfall area SWMU 3-054(b). COPCs for this aggregate include Appendix VIII metals and SVOCs. Radioactive contaminants are possible, but unlikely, in the fluids disposed of from the machine shop. However, a minimum of two samples for radiological constituents will be collected as described in Subsection 5.16.3. Because metal filings, residual solvents, and paint-related compounds may have been transported via the storm sewer and discharged to the outfall area, it is unlikely that volatile constituents, including ethylene glycol, discharged via the outfall would accumulate in soils due to volatilization during transport. However, samples will be field screened and collected for

VOCs as described in Subsection 5.0.5.1. Confirmatory samples will be submitted for laboratory VOC analysis if VOCs are not detected in field screening.

It is important to note that even if sampling results of the outfall area do not indicate the presence of COPCs above SALs, that contaminants may have accumulated and may be present in the storm sewer pipe at concentrations above SALs. Potential contamination within all TA-3 storm and sanitary sewer pipes should be evaluated prior to any storm or sewer drain cleanout or any decontamination and decommissioning of the storm or sanitary drain system. Currently, Environmental Safety and Health (ESH) groups must evaluate each potential excavation prior to an excavation permit being granted. This includes a historical evaluation from the Environmental Restoration Project if the site was designated as a PRS.

Biased sampling will be conducted within the soils at the drainage area where contamination is most likely to exist. This biased approach is based on the known history of the PRSs and the COPC and soil migration potential described in Subsection 5.0.3 of Addendum 1.

Sampling for SWMUs 3-052(a), 3-052(e), and 3-054(b) will be performed in the drainage downstream of the outfall. In order to collect representative samples below the outfall, sample locations are selected along transects positioned perpendicular to flow direction. Transect spacing along the drainage was selected based on existing topography and soil deposition. Additionally, the transects were also spaced to provide information on the influence of other runoff sources entering the outfall (or drainage area) at approximately 25 ft and 75 ft downgradient of the discharge pipe to the SWMU; and various sources of contamination to the outfall. The number of samples and number of locations along each transect were selected based on drainage topography, drainage width, and soil deposition. The COPCs identified for this site are most likely to have accumulated in surface soil; however, episodes of deposition and migration may have distributed COPCs in subsurface soils. Therefore, samples will also be collected from the soil-tuff interface.

5.16.3. Sample Locations and Methods

The nine sampling locations that will be used to identify the presence and nature of the COPCs are shown on Fig. 5-16-2. Based on the rationale presented in Subsection 5.16.2, the area directly below the outfall discharge will be sampled at three transects perpendicular to the direction of the flow. Three distinct locations will be sampled along each transect. The first transect will be located within approximately two feet downgradient of the discharge pipe. One sample site along the transect will be located at the center of the discharge area, with the other two sample sites located on each side of the center site at a distance equal to the radius of the discharge pipe. A second transect will be located approximately 25 ft downgradient of the discharge pipe, beyond the south end of the weir, and 1 ft downgradient of the drainage swale which contributes runoff from surrounding areas. One sample site along the transect will be located in the approximate center of the weir discharge with the other two sites on either side, approximately one-quarter of the way up (vertically) from each channel bank incline. A third transect of three sites will be located approximately 75 ft downgradient of the discharge pipe between two distinct areas of dense willow growth. These sample locations will include the centers of two small, deeper-cut channels and a point midway between the two channels. All sample locations are subject to change based on field conditions at the time of sampling.

The depth from the soil surface to the soil-tuff interface is expected to be no greater than 12 in. along the length of the outfall. Prior to sample collection, the depth to the soil-tuff interface will be determined at each location by driving a blunt, stainless steel rod into the ground.

As previously noted, the soil intervals where COPCs have most likely accumulated are surface soil and the soil-tuff interface. Soil samples will be collected from the 0 to 12-in. interval or to depth if the depth to the soil-tuff interface is 18 in. or less. If the depth to the soil-tuff interface is greater than 18 in., an additional sample will be collected as described above from the interval immediately above the soil-tuff interface. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted

for laboratory analysis of SVOCs. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals.

Each 12-in. sample interval will be field-screened and collected for VOCs as described in Subsection 5.0.5.1 of Addendum 1. Samples will also be field screened for radiological constituents as described in Subsection 5.0.5.1 of Addendum 1. In the absence of field-detected radiological constituents, 10% of the sampling sites will be randomly selected for confirmatory sampling. In no case will fewer than two confirmatory samples be collected. These samples will be sent to a fixed laboratory for confirmatory gross alpha/beta analysis, gamma spectroscopy, and tritium analysis. In the absence of field-detected VOCs, one adjacent sample from each transect collected at the soil-tuff interface will be submitted for laboratory VOC analyses to validate field-screening data.

The continuous soil samples will be collected using LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler; a split-tube will be used to facilitate sample removal. The adjacent samples for VOC analysis will be collected using a hand auger fitted with a brass sleeve. If the depth to the tuff is less than 12 in. at a location, composite samples may be needed to ensure adequate sample volume for appropriate analyses as determined by the field team leader. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.16.4 Laboratory Analyses

Soil samples will be laboratory analyzed for Appendix VIII metals, SVOCs, and VOCs using appropriate EPA methodology. The number of anticipated samples, their locations and the types of analyses are summarized in Table 5-16-2. One rinsate blank and one field collocated sample will also be analyzed as a maximum number of QC samples, as determined using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-16-2

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMUs 3-054(b) and 3-052(a,e), TWOMILE CANYON OUTFALL

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LAB ANALYSIS			
									Organics		Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Gross alpha/beta, gamma spec., and tritium	VOCs (SW 8240)	SVOCs (SW 8270)	Appendix VIII metals (SW 6010, 7000)
Canyon outfall											
First transect	3	0–12	3		3	3	3			3	3
		s/t[c]	3		3	3	3			3	3
Second transect	3	0–12	3		3	3	3			3	3
		s/t[c]	3		3	3	3			3	3
Third transect	3	0–12	3		3	3	3			3	3
		s/t[c]	3		3	3	3			3	3
QC samples[d]											
Field collocated	1	TBD[e]	1		1	1	1			1	1
Rinsate blank	NA[f]	NA	1							1	1
Confirmatory samples	5	TBD	5		5	5	5	2[g]	3[g]		
TOTALS	15		25		24	24	24	2	3	20	20

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]s/t = soil/tuff interface (12-in. interval above interface).
[d]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[e]TBD = To be determined in the field.
[f]NA = Not applicable.
[g]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

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5.17 SWMU 3-001(e): Drum Storage West of TA-3-30

5.17.1 Description and History

SWMU 3-001(e) is the former waste oil storage area approximately 15-ft long x 4-ft wide. The area served the vacuum pump repair shop, located on the west side of TA-3-30, the main Laboratory warehouse (Fig. 5-17-1).

The vacuum pump repair shop was located in TA-3-30 between 1950 and 1992. From approximately 1950 to 1957 waste oil contaminated with radionuclides, rinse solvents, and waste mercury from vacuum pumps repaired at the shop was discharged via a pipe to an area immediately west of TA-3-30 identified as SWMU 3-010(a). After 1957 the vacuum pump waste oil was emptied into a stainless steel sink enclosed in a Plexiglas® hood, located within the vacuum pump repair shop. Discharge from the sink flowed outside into barrels located in an unpaved area on the west side of TA-3-30; this storage area is the former waste oil storage area, SWMU 3-001(e). Interviews with past site workers indicate that barrels often overflowed prior to being hauled off site for disposal (Sobojinski 1992, 17-720).

In the early 1960s the storage barrels were replaced by a 100- to 200-gal. holding tank within a concrete, secondary containment berm. Waste oil from the holding tank was periodically pumped into barrels for disposal at TA-54 (Sobojinski 1992, 17-720). A concrete sump was constructed in the former waste oil storage area and the surrounding area was paved in approximately 1984; however, it is not known whether the area was regraded prior to asphalt application. The concrete sump is 15 ft long x 4 ft wide, and is 6-in. deep in one section and 18-in. deep in the other section. Waste oil was piped from from inside the TA-3-30 shop directly into 55-gal. drums located outside on a grate above the sump. In 1988 and 1989 the disposal process was upgraded so that the vacuum pump oil was drained into four different barrels to separate the contaminants into hazardous waste categories. The entire vacuum pump repair operation was discontinued in late 1992 and the outdoor sump area is proposed for decommissioning.

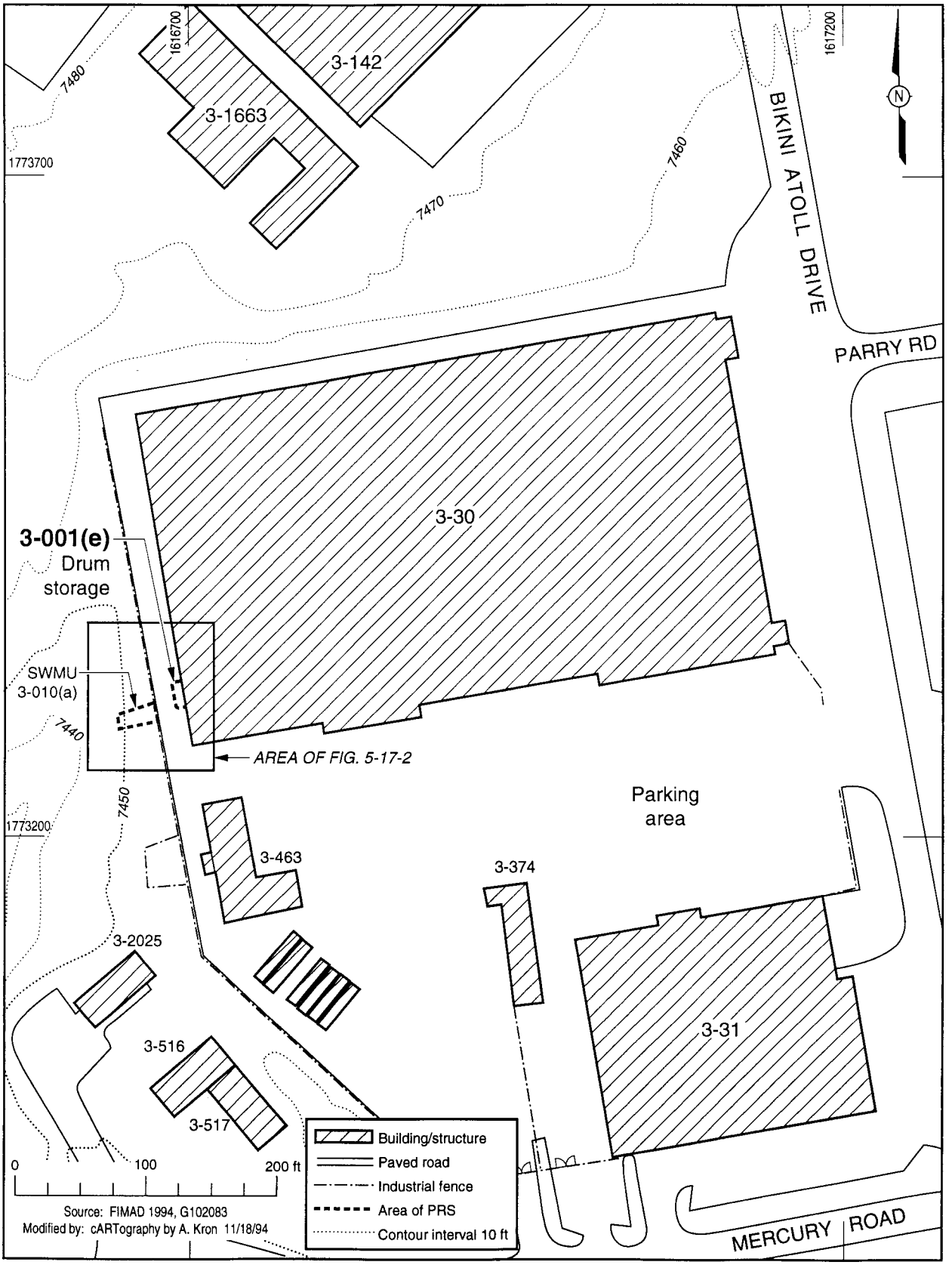


Fig. 5-17-1. Site location map of SWMU 3-001(e).

A 1993 Phase I investigation at SWMU 3-010(a) discovered elevated levels of TPH, mercury, lead, and tritium. Low levels of plutonium-238 and -239, uranium, and cesium-137 were also discovered. As a result of this investigation, a voluntary corrective action (VCA) was implemented in April 1994 to remove contaminated soil from the site. Verification analytical results from soil samples collected at the soil-tuff interface (approximately 12 ft below ground surface) indicated that remaining mercury concentrations were below SALs. However, halogenated organic compounds and TPH were detected, resulting in the need for additional site characterization. A Phase II investigation was implemented from September through October 1994 at SWMU 3-010(a) to determine the extent of the contamination. As part of this investigation, a borehole was drilled in the area between SWMUs 3-010(a) and 3-001(e) immediately west of and adjacent to the concrete sump. Surface and subsurface samples were collected and a monitor well was installed to monitor shallow subsurface water encountered at approximately 23 ft below ground surface. Analytical information collected from this borehole is probably associated with disposal practices at SWMU 3-010(a) and spills from drums that overflowed and waste oil transfer activities from SWMU 3-001(e). The waste oil contamination source identified for SWMU 3-010(a) is, therefore, the same potential contaminant source as for SWMU 3-001(e). The extent of contamination and the risk associated with contamination from previous disposal practices and spills associated with these SWMUs will primarily be addressed in association with investigations conducted for SWMU 3-010(a).

5.17.2 Investigation Objectives and Approach

The objective of the investigation activities for SWMU 3-001(e) is to determine the presence and nature of potential contamination associated specifically with SWMU 3-001(e). The objective will be achieved by evaluating if contamination exists within the soils immediately beneath the concrete sump.

Because the integrity of the concrete sump is unknown, a biased sampling approach will be used within the underlying soils. The COPCs for SWMU 3-001(e) include tritium, plutonium-238 and -239, uranium, cesium-137, TPH, VOCs, and Appendix VIII metals. These are the same COPCs as the

contaminants of concern for SWMU 3-010(a). However, data indicate that of the radiological contaminants, only tritium was above the SAL. Therefore, only a limited number of samples will be collected for the other radiological contaminants for waste characterization purposes.

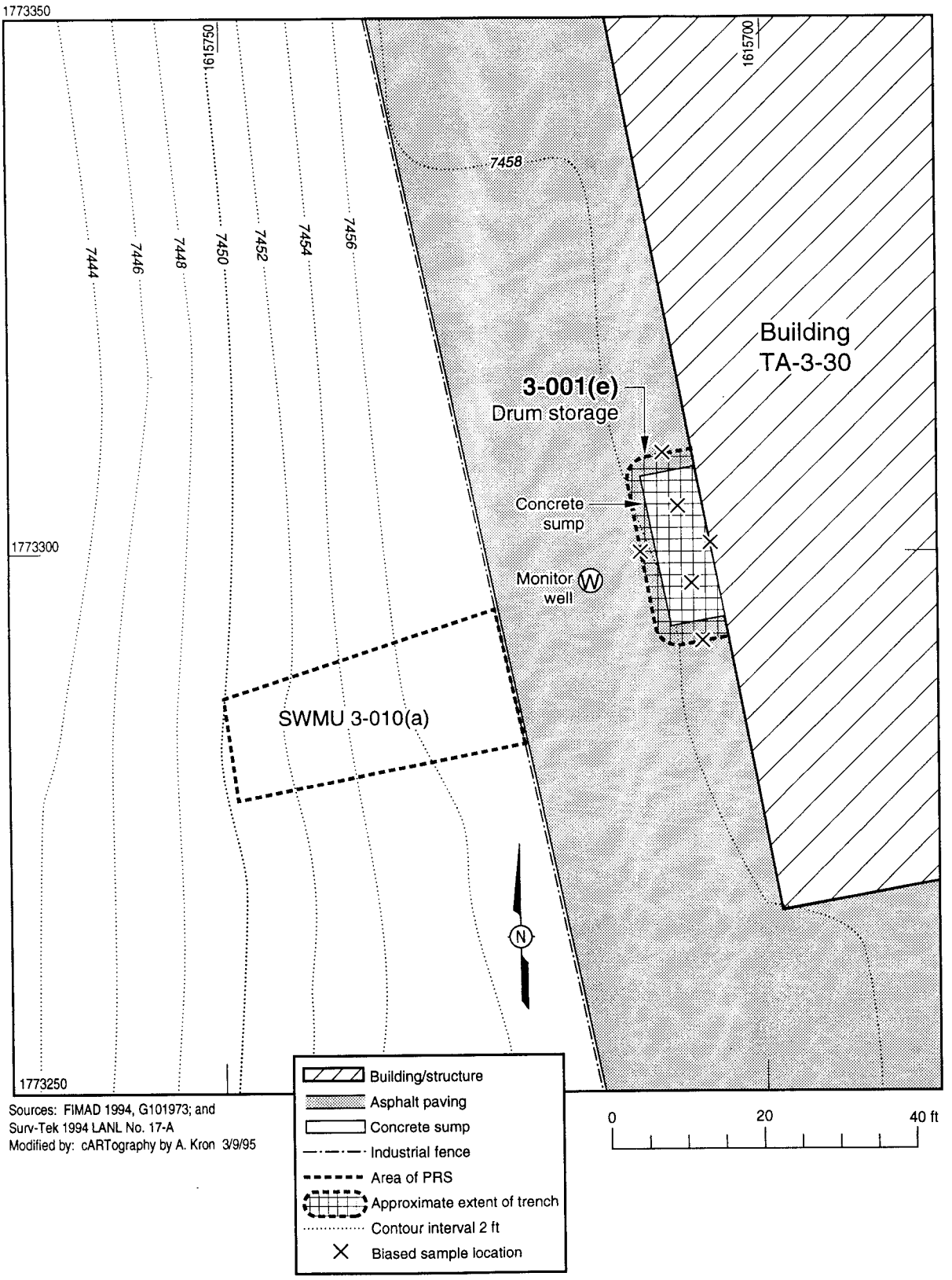
5.17.3 Sample Locations and Methods

The proposed sampling and analyses activities will be conducted concurrently with decontamination and decommissioning (D & D) activities for the sump. The corrugated steel roof and the concrete sump will be removed during D & D. After the sump is removed, six biased samples will be collected from exposed soil. One sample site will be located adjacent to the midpoint at each of the four sides of the area of exposed soil, and two sample sites will be located approximately five feet on either side of the midpoint along the north-south axis through the exposed soil (Fig. 5-17-2). If cracks are observed in the sump and/or stains exist in the surrounding soil, additional biased sample sites will be selected to include these areas.

All samples will be field screened for VOCs as described in Subsection 5.0.5.1 of Addendum 1. In addition, all samples will be field screened for radioactivity with a hand-held beta/gamma detector.

Soil samples will be collected from the 0 to 12-in. interval. An aliquot of soil will be collected from the sample intervals prior to homogenization and be submitted for mobile laboratory analysis of TPH. The remainder of the sample interval will be homogenized and then submitted for x-ray flouresence (XRF) analysis of Appendix VIII metals and rad van analysis of tritium. Ten percent of the samples collected from the first 24-in. interval will be sent to a fixed laboratory to validate mobile laboratory data.

Samples will also be collected from the 12 to 24-in. interval and submitted for mobile laboratory analysis of VOCs. Soil samples collected for VOC analyses will be immediately analyzed on site by the mobile chemical analysis van to determine extent of contamination real-time. Samples will continue to be collected in 12-in. intervals at each of the six locations and analyzed for the indicator VOCs. Excavation will cease when two successive intervals are reported as containing less than the appropriate SAL concentration of indicator VOCs or when the soil/tuff interface is



Sources: FIMAD 1994, G101973; and
Surv-Tek 1994 LANL No. 17-A
Modified by: cARTography by A. Kron 3/9/95

Fig. 5-17-2. Location of sample sites for SWMU 3-001(e).

encountered. The indicator VOCs were determined during the investigation of SWMU 3-010(a), they are 1,2-DCA, 1,2-DCE, and 1,1,1-TCA. As determined by the investigation of SWMU 3-010(a), 1,1,1-TCA is the most prevalent VOC indicator. This sampling strategy is designed to determine the extent of contamination at this site.

At the final sample interval, samples will be collected for all constituents that were analyzed for in the first 0- to 12-in. interval. For waste characterization purposes one sample will be collected for isotopic uranium, isotopic plutonium, and gamma spectroscopy for cesium at both the 0-to 12-in. surface soil interval and the final sample interval.

Soil samples will be collected using the LANL-ER-SOP-06.09, R0 Spade and Scoop Method for Collection of Soil Samples. Soil samples collected for VOCs and TPH analyses from the 12 to 24-in. interval will be collected using the LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler. A split tube will be used to facilitate sample removal. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.17.4 Laboratory Analyses

Soil samples will be analyzed in a fixed laboratory for tritium (in soil moisture and in TPH), isotopic plutonium, isotopic uranium, gamma spectroscopy for cesium, and Appendix VIII metals using appropriate EPA methodologies. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-17-1. One rinsate blank and one field collocated sample will be submitted for analyses as the maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-17-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-001(e), FORMER WASTE OIL STORAGE AREA

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LAB ANALYSIS	FIELD LAB ANALYSIS			
								Radio-nuclides	Radio-nuclide	Organics		Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic plutonium and uranium, gamma spectroscopy	Tritium[c]	VOCs (SW 8240)	TPH (SW 8015)	Appendix VIII metals (SW 6010, 7000)
Soil underlying removed												
sump	6	0–12	6		6	6	6	1	6		6	6
		12–24[d]	6		6	6	6			6		
Final interval samples	6	s/t[e]	6		6	6	6	1	6	6	6	6
QC samples[f]												
Field collocated	1	TBD[g]	1		1	1	1		1		1	1
Rinsate blank	NA[h]	NA	1						1	1		1
Confirmatory samples	2	TBD	2		2	2	2		2[i]	2[i]	2[i]	2[i]
TOTALS	15		22		21	21	21	2	16	15	15	16

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]Tritium will be analyzed in soil moisture and in TPH.
[d]Intervals below the 12–24-in. interval will only be collected if VOCs are found in either of the two overlying intervals. Sampling will be terminated when two successive intervals contain VOCs < SALs or when tuff is encountered.
[e]s/t = soil-tuff interface (12-in. interval above interface).
[f]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[g]NA = Not applicable.
[h]TBD = To be determined in the field.

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5.18 SWMU 3-049(b) and C-3-014: TA-3-35, Outdoor Storage Area

5.18.1 Description and History

The PRSs included in this aggregate are SWMU 3-049(b) and area of concern C-3-014. SWMU 3-049(b) is the exhaust outlet that discharged from the south wall of the Press Building, TA-3-35. C-3-014 is the equipment storage area located southwest of TA-3-35 (Fig. 5-18-1). These PRSs can be evaluated using a single sampling and analysis plan because surface water drainage from both sites collects in the same locations and regrading and paving operations may have redistributed contamination from one site to another.

SWMU 3-049(b) is a discharge area, approximately 50 ft long x 20 ft wide, associated with the exhaust outlet from an inactive vacuum pump that served the furnaces in TA-3-35 (Fig. 5-18-1). The vacuum pump evacuated oil from the furnaces used for experiments in TA-3-35. The vacuum pump exhaust outlet is located eight feet above the ground on the south wall of TA-3-35. No oil stains were observed on the exhaust outlet pipe, wall, or ground below the pipe during a 1993 site reconnaissance survey. Additionally, a sign on the vacuum pump indicated that the pump contained non-PCB oil (LANL 1993, 17-900). A 10-ft x 8-ft area under the exhaust outlet pipe, described in the SWMU Report as being stained with oil, is now paved with asphalt (LANL 1990, 0145). Paving of this area occurred at roughly the same time that the vacuum pump was deactivated (in the late 1980s). The pavement is graded away from the exhaust outlet in predominantly west and southwest directions. Runoff from this area drains toward low-lying areas and to the southwest. It is assumed that regrading did not alter the pre-existing drainage pattern significantly because the storm water collection system continues to collect area runoff as designed.

C-3-014 is an equipment storage area, approximately 125 ft x 100 ft, located southwest of TA-3-35 (Fig. 5-18-1). This area is bounded by security fences to the north, south, and west and by TA-3-35 to the east. Most of this area is currently paved, except for a 15-ft wide strip of grass along the southern security fence. The grassy area widens to approximately 30 ft southwest of TA-3-35. Runoff from this storage area drains to the same low-lying areas as SWMU 3-049(b) (Fig. 5-18-2).

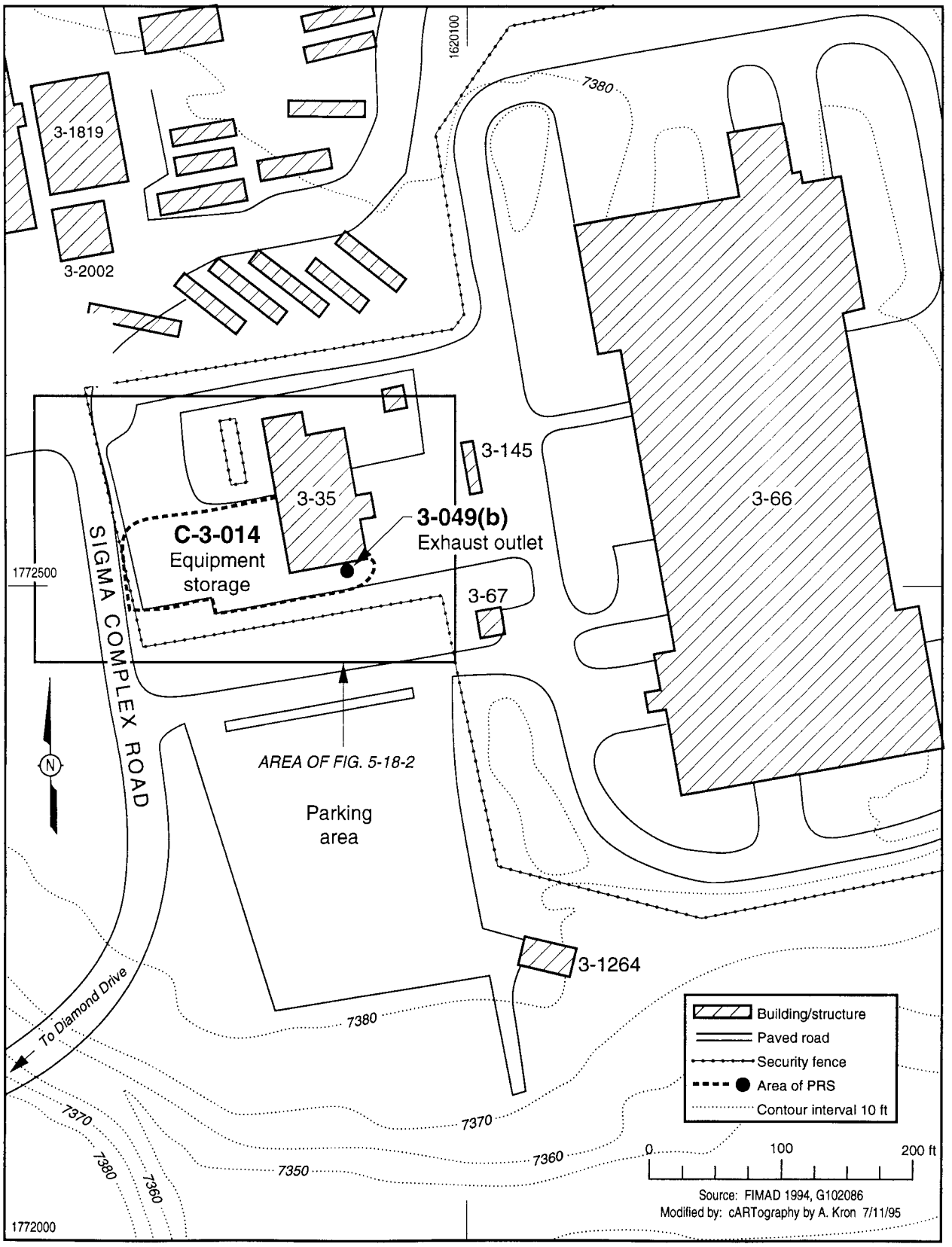

Fig. 5-18-1. Site location map of SWMU 3-049(b) and C-3-014.

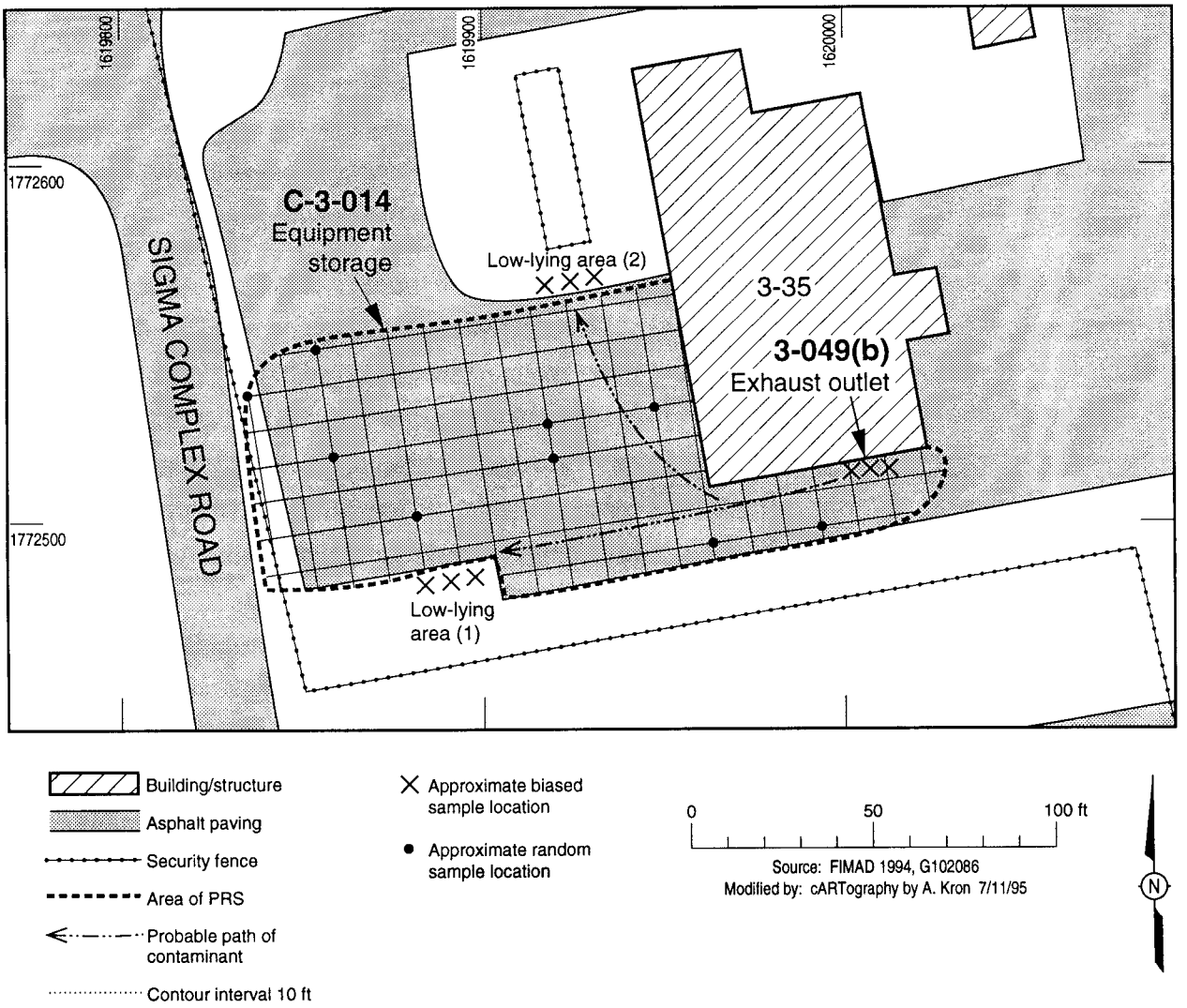

Fig. 5-18-2. Schematic representation of sample sites for SWMU 3-049(b) and C-3-014.

Constructed in 1953, TA-3-35 housed operations to fabricate enriched uranium-loaded graphite and carbide fuel elements. Additionally, enriched uranium (uranium-235) was processed in an area located in the northern portion of the first floor of the building. As a result of the processing operation and the obsolete ventilation/exhaust system, the northern portion of the first floor is contaminated with uranium-235 and does not comply with current environmental safety and health requirements (LANL 1991, 17-254). In November 1991 TA-3-35 was declared surplus or inactive due to lack of funding for facilities, equipment, and security upgrades (Mitchell 1991, 17-254). Because of new shop work orders, in 1995 the press has become operational again. However, there are no new operations taking place in the contaminated area of the building.

Various pieces of equipment and molds from TA-3-35 are stored outdoors, within the boundary of AOC C-3-014 for salvage or because of space limitations within the building. In 1994 some equipment for salvage was found contaminated with radioactivity (LANL 1994, 17-1208). As a result, the area was roped off and posted as a radiologically controlled area. The current standard procedure for removing equipment from the building consists of taking swipe samples to test for radioactivity followed by decontamination, if necessary. However, there is no documentation to support if this activity was completed when the equipment was removed from the building. Swipes of the equipment and surrounding paved surfaces showed levels of less than 200 dpm beta contamination with negligible alpha and gamma contamination. January 18, 1994, contamination on the equipment and pavement was identified and was scheduled to have been cleaned up by the user group by the user group to levels published in the Los Alamos National Laboratory and the Department of Energy Radiological Control Manual (LANL 1994, 17-1206) or equipment painted over to prevent spread of contaminants. These tasks have not been completed to date. Preliminary evaluation from the occurrence report showed that current handling and control procedures for depleted uranium had not been followed when the equipment was last used in the 1970s (LANL 1994, 17-1208).

5.18.2 Investigation Approach and Objectives

Investigation activities for this aggregate will focus on detecting the presence and nature of potential contamination within the soils at SWMU 3-049(b) and within the soils and asphalt at C-3-014. Because oil released from the vacuum pump exhaust outlet may have been contaminated with metals, and enriched uranium-contaminated equipment may have been stored outdoors for several years, COPCs for this aggregate include TPH, Appendix VIII metals, and enriched uranium. PCBs are also a COPC for this aggregate because even though the vacuum pump was tagged non-PCB oil at the time of the site visit, there is no documentation to determine what type of oil was used in the vacuum pump over its operational life. Therefore, verification sampling for PCBs will be conducted during this sampling effort.

Both biased and random sampling methods will be used to investigate SWMU 3-049(b) and C-3-014. Biased sampling will target areas most likely to be contaminated, based on historical information, current observations of site use and the COPC and soil migration potential described in Subsection 5.0.3 of Addendum 1.

Random sampling will supplement the biased sampling activities by providing greater coverage of the entire aggregate area, thus increasing the likelihood that all contaminated areas will be identified. These random sampling locations will address the uncertainties associated with past equipment storage practices and the regrading and paving operations. Additionally, it is unknown if clean fill was used to regrade the area or existing soil was rearranged across the site. If existing soil was rearranged, a more widespread distribution of contamination might be expected.

5.18.3 Sample Locations and Methods

Prior to sampling, a 10-ft x 10-ft sampling grid will be generated from which samples will be randomly selected. A site reconnaissance will be conducted to verify sites selected and then a geodetic survey will be conducted for those grid nodes selected for sampling (Fig. 5-18-2). Based on the potential contaminant redistribution from grading or drainage patterns, the contaminant distribution from wind and water at the unpaved areas along the southern boundary of TA-3-35, and the presence of low-lying areas downgradient of

the aggregate area where sediments may have accumulated, approximately 25% of the aggregate area may be contaminated. If 25% of the area is assumed to be contaminated and a 90% level of confidence is desired for detecting contamination present, 9 sample points will be randomly selected at grid nodes, using the equation discussed in Subsection 5.0.4 of Addendum 1.

Nine biased sample sites are located within areas where COPCs are most likely to accumulate based on site-specific conditions. These areas include the soils underlying asphalt below the exhaust outlet and within the two low-lying unpaved areas that collect runoff (Fig. 5-18-2). Three sample sites were selected in the 10-ft x 8-ft area near the exhaust outlet and three sample sites were selected within each of the low-lying areas. At the exhaust outlet, one sample is located three feet directly south of the outlet pipe with the other two samples located five feet on either side of the first sample. Within each of the unpaved, low-lying areas, 3 sample sites spaced 5 to 10 ft apart are located along the soil-asphalt perimeter 3 to 5 ft from the asphalt into the soil area (at least one sample site will be located at the lowest point within the area).

All samples will be field screened and collected for VOCs and field screened for radiological constituents as described in Subsection 5.0.5.1 of Addendum 1. Confirmatory samples for radiological constituents will be submitted for isotopic uranium analysis only.

Up to nine samples of asphalt material will be collected from the random sample locations and submitted for laboratory analysis of isotopic uranium only. Prior to surface soil sample collection where asphalt is present, base course underlying the asphalt will be removed from the sample locations using a stainless steel shovel.

For both random and biased locations, soil samples will be collected from the 0 to 12-in. soil depth interval. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for laboratory analysis of TPH. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals and PCBs.

Soil samples from the accessible surface and immediately beneath the asphalt and base course will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples. The TPH and adjacent VOC soil samples will be collected using LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler Method. A split tube will be used to facilitate soil sample removal. Adjacent samples for VOC analysis will be collected using a hand auger fitted with a brass sleeve. Asphalt will be sampled using LANL-ER-SOP-6.28, R0, Chip Sampling of Porous Surfaces. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.18.4 Laboratory Analyses

Asphalt and soil samples will be analyzed in the laboratory for the constituents described above using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-18-1. One field duplicate will be submitted as a maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-18-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-049(b) and C-3-014, PRESS BUILDING EXHAUST OUTLET AND EQUIPMENT STORAGE AREA

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LABORATORY ANALYSIS				
								Radio-nuc-lides	Organics			Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic uranium	VOCs (SW 8240)	PCBs (SW 8080)	TPH (SW 8270)	Appendix VIII metals (SW 6010, 7000)
Biased locations												
Exhaust outlet soils;	3	0–12 below base course	3		3	3	3			3	3	3
10-ft x 8-ft area												
Low area (1)	3	0–12 below base course	3		3	3	3			3	3	3
Low area (2)	3	0–12 below base course	3		3	3	3			3	3	3
Random locations												
Soil (10-ft x 10-ft area)	9	0–12 below base course	9		9	9	9			9	9	9
		Asphalt	9 max		9		9	9				
QC samples[c]												
Field duplicate	1	TBD[d]	1		1	1	1	1		1	1	1
Confirmatory samples	4	TBD	4		4	4	4	2[e]	2[e]			
TOTALS	23		32		32	23	32	12	2	19	19	19

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[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[d]TBD = To be determined in the field.
[e]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

5.19 SWMUs 3-059 and 3-003(n): Salvage Yard Adjacent to TA-3-271

5.19.1 Description and History

The PRSs included in this aggregate are SWMUs 3-059 and 3-003(n) located adjacent to TA-3-271 (Fig. 5-19-1). SWMU 3-059 is a former salvage yard and SWMU 3-003(n) is a one-time transformer spill from equipment stored in the salvage yard. TA-3-271 is now used by EES-5 as a drill core logging and storage facility, and the adjacent former salvage yard [SWMUs 3-059 and 3-003(n)] is used as a parking lot and a storage area for empty drums.

5.19.1.1 SWMUs 3-059 and 3-003(n)

SWMU 3-059, a former salvage yard, included an approximately 250 ft long x 115 ft wide area located adjacent to the south side of building TA-3-271 and an approximately 100 ft x 60 ft fenced, asphalted area north of the building (Fig. 5-19-1).

The perimeter of the south yard is fenced except for the northern portion that abuts TA-3-271. Most of the south yard is paved with asphalt except for an approximate 50-ft square area in the southwest corner and a small, 15 ft x 20 ft area approximately 50 ft from the southeast corner of TA-3-271 where the asphalt has degraded. Other areas where equipment was stored outside of the fenced yards include: 1) a 20-ft wide area along the western side of the fenced yard; 2) a 20-ft wide area north of the northwest corner of the fenced yard; and 3) a 50 ft x 50 ft unpaved area located along the west side of TA-3-271 [SWMU 3-003(n)], near the northwest corner of the building.

Runoff across the surface of the SWMU drains southeast toward Sandia Canyon. LANL support contractors (Zia, Pan Am, Johnson Controls) used the area of SWMU 3-059 as a salvage yard from the early 1960s through May 1993, when the salvage operation and materials were moved to TA-60-2. This SWMU was used for the storage of transformers, electrical equipment, batteries, and scrap metal pending sale or reuse. All salvage operations were conducted from offices inside TA-3-271. Small and weather-sensitive salvage items were kept inside TA-3-271. All other items were stored in and around the salvage yard adjacent to the south side of the

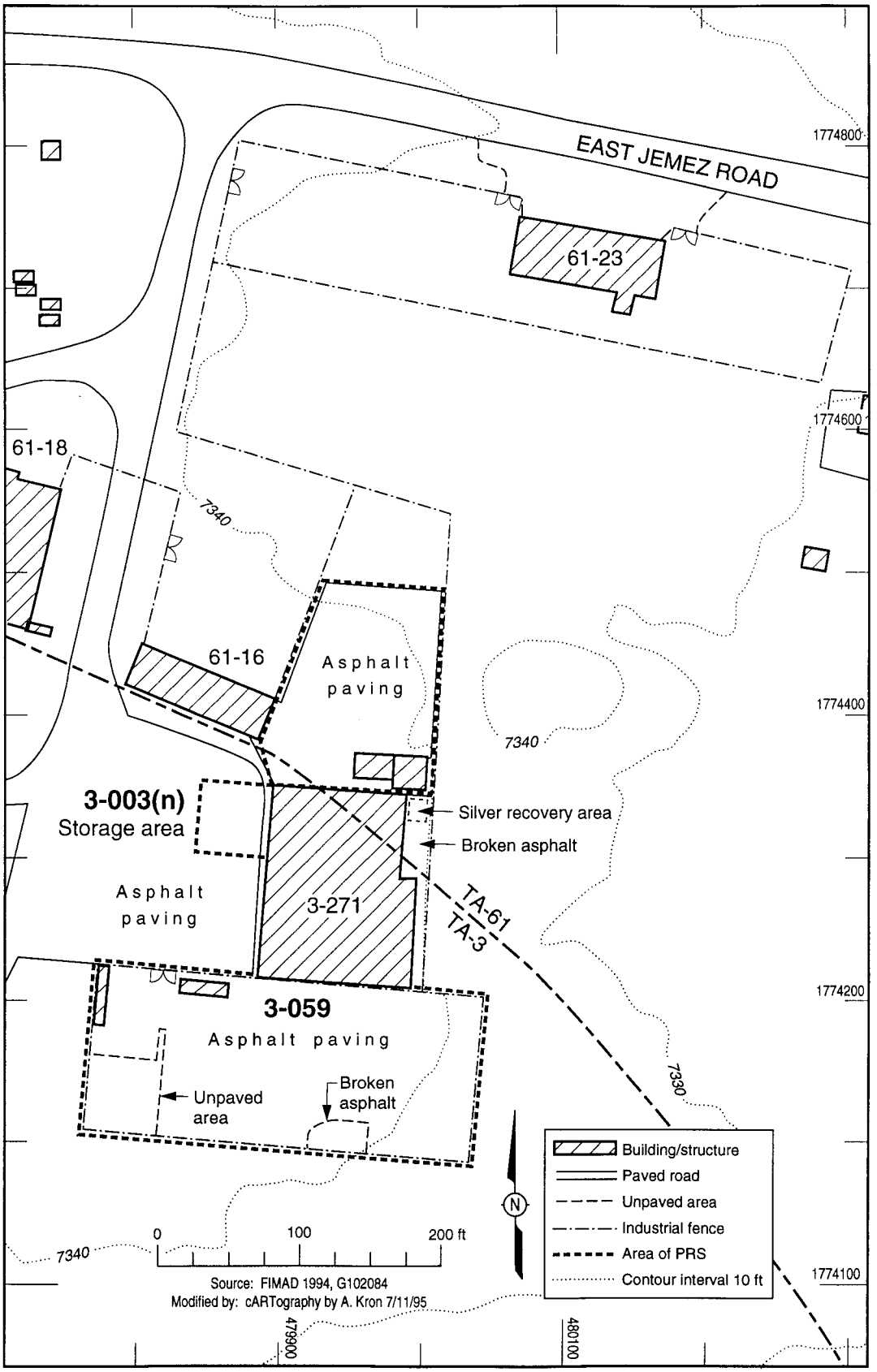

Fig. 5-19-1. Site location map of SWMUs 3-059 and 3-003(n).

building. Sections of the salvage yard were paved intermittently and some sections remained unpaved until the late 1980s. The exact dates of paving could not be determined from a review of aerial photographs or from interviews with site workers.

Review of a 1986 field observation report indicated a single, used car battery leaking acid onto the ground approximately five feet south of the salvage yard fence (LANL 1986, 17-223). Debris was also noted along the east and south sides of the fence. Review of aerial photographs showed soil staining near equipment stored along the inside fence and in other portions of the yard (LASL 1974, ER ID 0017267; LASL 1977, ER ID 0017860; LASL 1979, ER ID 0018923; LANL 1984, ER ID 0018929; LANL 1986, ER ID 0018010; LANL 1991, ER ID 0018135). The extent of hazardous and radioactive material releases from fluids draining from equipment to the soil is unknown.

Aerial photographs indicate that transformers were stored in the area that composes SWMU 3-003(n) from at least 1977 to 1986 (LASL 1977, ER ID 0017860; LANL 1986, ER ID 0018010). The area was affected by an oil spill from a transformer that occurred in 1977; the spill area is located approximately 20 ft south of the northwest corner of TA-3-271. The ruptured transformer had a yellow label indicating that it contained between 50 and 500 ppm PCBs. The dimensions of the transformer that ruptured were approximately 3 ft long x 4 ft wide x 8 ft high (LANL 1989, 17-582), so the spill was likely less than 10 gal. in volume. There are conflicting reports as to whether the spill was cleaned up, or if confirmatory sampling was conducted. During an ER Program site reconnaissance visit in 1988, stained soil was observed at the storage area and the 1977 spill location (LANL 1991, 17-323); this staining was not observed in the 1991 aerial photographs (LANL 1991, ER ID 0018135). In 1991 the drainage pattern west of TA-3-271 was altered by regrading the parking lot and applying base course. The entire area has received additional base course at least once since that time.

In 1993 storm water runoff samples were collected from two locations downslope and southeast of this SWMU and analyzed for radionuclides, metals, cyanide, total phenols, VOCs, and SVOCs (LANL 1993, 17-851).

Sample collection sites were located 100 ft northeast of TA-3-271 and 50 ft southeast of the southeast corner of the salvage yard. Review of analytical results shows all concentrations at or below background levels except for one constituent. Results from a sample collected in the runoff area showed one SVOC constituent, bis(2-ethylhexyl)phthalate, detected at concentrations above the SAL. This constituent is a common analytical laboratory contaminant resulting from the use of plastic sample bottles and/or latex gloves during sample collection or analysis. As a result, bis(2-ethylhexyl)phthalate is not considered a COPC.

5.19.2 Investigation Approach and Objectives

5.19.2.1 SWMUs 3-059 and 3-003(n)

The nature and extent of potential contamination at SWMU 3-059 is not known due to incomplete records and lack of knowledge about common work practices at TA-3-271. Electrical equipment that may have contained PCB-contaminated dielectric fluids, equipment containing hydraulic and lubricating oils, used and damaged batteries, and equipment that may have contained radioactive contaminated fluids possibly released potentially hazardous substances into the environment. COPCs for this SWMU include PCBs, TPH, SVOCs, and metals. Because radionuclides could have contaminated fluids in the equipment, samples will also be collected for these COPCs as described in Subsection 5.19.4.2. Although no contamination was found in runoff water samples collected downslope of this SWMU and December 1, 1994, results from soil and asphalt samples collected within the SWMU boundaries for PCBs did not reveal contamination in the immediate surrounding area, COPCs are still very probable at other locations within and around the salvage yard. Surface samples were collected in high foot traffic areas to ensure site workers that PCB surface contamination was not present, or if it was present, to close off the area to personnel.

Sampling activities for SWMU 3-003(n) will focus on detecting the presence and nature of potential contamination in soils where transformers were stored and in the 1977 reported spill area. Because oil potentially containing PCBs was spilled and regrading may have redistributed contamination throughout the unpaved area, COPCs for SWMU 3-003(n) include TPH, Appendix VIII metals, and PCBs.

Based on review of historical information and aerial photographs, soil contamination is likely to exist at this site. Therefore, the most cost-effective investigation approach for this site is a sampling strategy that satisfies both the purposes of the Phase I investigation (to identify COPCs and the presence or absence of contamination) and the Phase II investigation (to identify the nature and extent of contamination, if present). Although some additional investigation efforts may be required to further define contamination, this sampling strategy is designed to limit the level of effort that may be required at a later date.

Based on the known spill area of SWMU 3-003(n) and the uncertainty associated with the regrading of the driveway area, biased and random investigatory sampling methods will be used. Biased sampling will target areas most likely to be contaminated, based on historical information and the factors discussed in Subsection 5.0.3 of Addendum 1. Random sampling will provide greater coverage of the parking lot area, increasing the likelihood that contaminated areas not targeted for biased sampling will be identified.

In order to implement the combined Phase I/Phase II sampling strategy, both biased and random sampling methods will be used to investigate SWMU 3-059. Biased sampling will target areas most likely to be contaminated, based on historical information and the factors discussed in Subsection 5.0.3 of Addendum 1. Random sampling will provide greater coverage of the salvage yard, increasing the likelihood that contaminated areas not targeted for biased sampling will be identified. Realtime analytical techniques (i.e., use of an on-site mobile chemical analysis van) will be used to determine if contamination exists and to bound the outer extent of contamination.

5.19.3 Sample Locations and Methods

5.19.3.1 Random Locations

Before sampling at SWMUs 3-059 and 3-003(n), sampling grids will be generated from which sample sites will be randomly selected at grid nodes. A 25 ft x 25 ft sampling grid will be established within the north and south fenced areas at SWMU 3-059 (Fig. 5-19-2). At SWMU 3-003(n), a 5 ft x 5 ft sampling grid extending from the west wall of TA-3-271, 50 ft to the west and

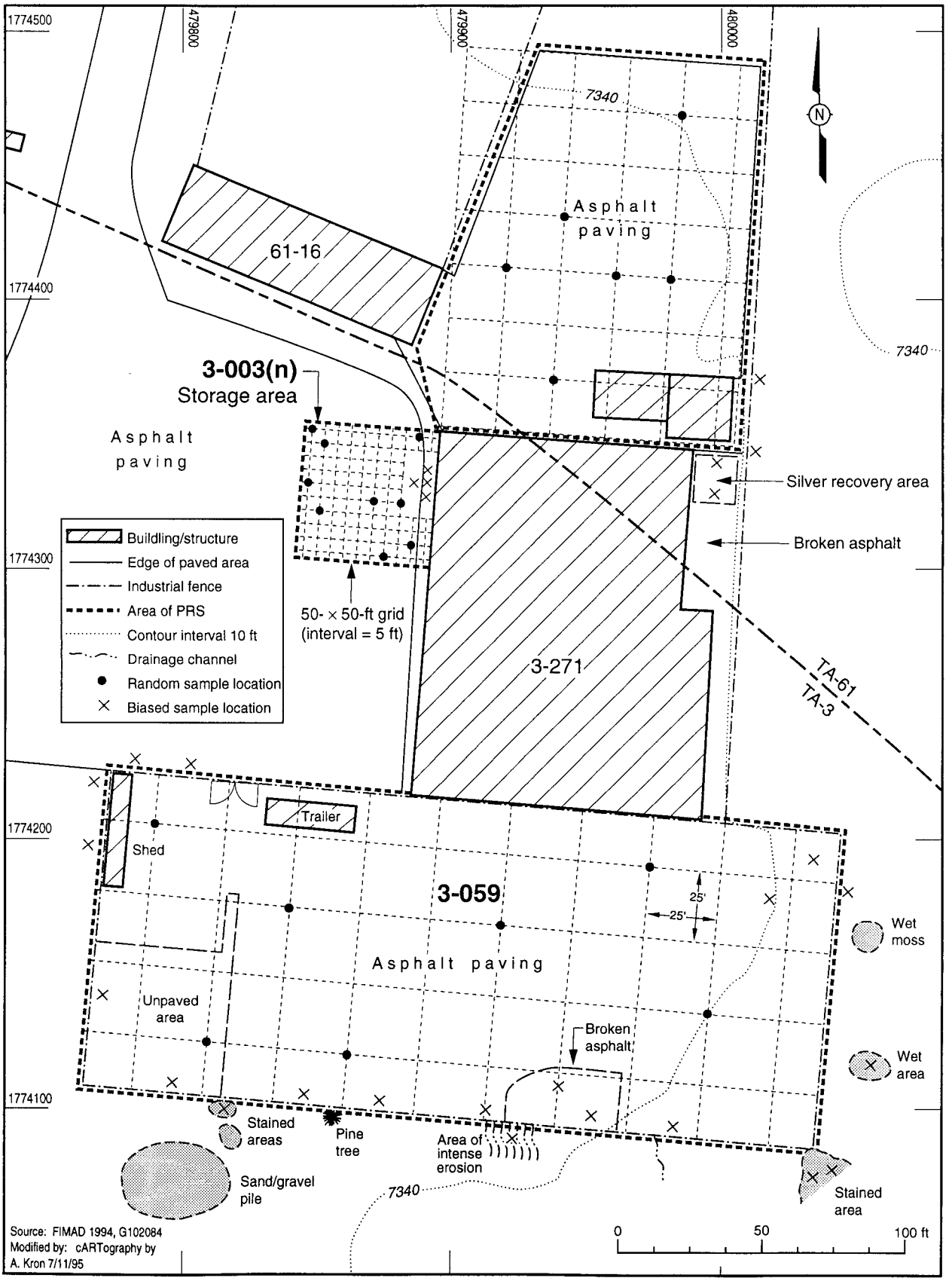

Fig. 5-19-2. Location of sample sites for SWMUs 3-059 and 3-003(n).

50 ft south of the northwest corner of TA-3-271 will be used (Fig. 5-19-2). Aerial photographs indicate that this area encompasses the former storage site and the area of the reported spill. The area included in the biased sampling for SWMU 3-003(n) will be excluded from the random sampling grid. A site reconnaissance will be conducted to verify sites selected at each SWMU, followed by a geodetic survey for those grid nodes selected for sampling. Based on review of aerial photographs that showed equipment storage and soil staining, approximately 30% of the south yard and 50% of the north yard of SWMU 3-059 may be contaminated. Approximately 25% of SWMU 3-003(n) may be contaminated based on review of aerial photographs, estimated volume of material spilled from the transformer, and extent of regrading in the area. If these percentages of the SWMU areas are assumed to be contaminated and a 90% level of confidence is desired to detect existing contamination, 13 and 9 sample points will be randomly selected at grid nodes at SWMU 3-059 and SWMU 3-003(n), respectively, using the equation discussed in Subsection 5.0.4 of Addendum 1.

5.19.3.2 Biased Locations

Biased sampling to determine the presence and extent of contamination will be conducted at SWMU 3-059, using the on-site mobile chemistry van. Twenty-four biased sample sites have been selected based on documented releases, evidence of soil staining at areas of equipment storage shown in aerial photographs, and area drainage patterns. These sampling locations include seven sample sites located along the southern boundary of the salvage yard inside the fence and four outside the fence, four sites at the east side of the yard (two inside the fence and two outside the fence), five sample sites at the west and northwest side of the yard (four outside the fence and one inside the fence), and four samples located north of TA-3-271 (two in the old silver recovery area and two outside the southeast corner of the fence) (Fig. 5-19-2). To increase the probability of detecting contaminants, additional biased samples may be collected at other locations based on field observations, such as field screening measurements and visual indicators.

Biased soil sampling at SWMU 3-003(n) will be conducted in areas where contamination is most likely to exist. Four biased sample locations have been selected based on documented releases, aerial photographs, and

COPC migration pathways. The biased sample locations include one at the approximate center of the reported spill area (20 ft south of the northwest corner of TA-3-271) and three additional biased samples located 5 ft to the north, south, and west of the central sample location (Fig. 5-19-2). The central north and south samples will be located approximately three feet west of the building, with the westernmost sample located five feet west of the central sample location.

5.19.4 Sample Collection Methods

5.19.4.1 Field Screening

All soil samples from SWMUs 3-059 and 3-003(n) will be field screened and collected for VOCs as described in Subsection 5.0.5.1 of Addendum 1. Because realtime data are required to implement the Phase II investigation at SWMU 3-059, the mobile chemistry van will be on site. Adjacent samples from areas with positive VOC screening readings from both SWMUs will be submitted to the on-site mobile chemistry van for VOC analysis. All soil samples collected at SWMU 3-003(n) will be field screened for radiological constituents as described in Subsection 5.0.5.1 of Addendum 1.

5.19.4.2 SWMU 3-059

All soil and asphalt samples from SWMU 3-059 will be field screened for radiological constituents as described in Subsection 5.0.5.1 of Addendum 1. If radiological constituents are not detected as described above, 10% of the sampling sites for each media will be randomly selected for confirmatory sampling. In no case will fewer than two confirmatory samples be collected. These samples will be sent to a fixed laboratory for confirmatory gross alpha/beta analysis, gamma spectroscopy, and tritium analysis.

If an asphalt cover exists at a sample location, the asphalt will also be sampled prior to sampling soil under the asphalt. Asphalt samples will be analyzed for PCBs only because it is likely that other constituents have washed from the asphalt surface. A maximum of 20 asphalt samples (12 random locations and 8 biased locations) will be collected. After the asphalt has been sampled, the base course underlying the asphalt will be removed using a stainless steel shovel. Soil sample collection will be performed as described below.

Soil samples from SWMU 3-059 will be collected from the 0 to 12-in. interval. Each sample interval will be homogenized and then submitted to the on-site mobile chemical analysis van for XRF metals in soil and PCB analyses in soil and asphalt. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for laboratory analysis of SVOCs and TPH. For samples collected under asphalt, SVOC and TPH analysis will only be conducted on soils below the 12-in. depth to decrease the potential for false positives obtained as a result of the asphalt cover.

If mobile chemistry van analyses identify PCBs, SVOCs, TPH, or metals in soils above SALs at a sample location, then additional soil samples will be collected in 12-in. intervals to the clay-rich horizon or the soil-tuff interface if no clay-rich horizon is found. If chemical van analyses identifies that PCBs, SVOCs, TPH, and metals are not present above SALs at the 0 to 12-in. depth, 10% of all sampling sites will be randomly selected for confirmatory sampling. In no case will fewer than two confirmatory samples be collected and they will be collected in the same manner as previously described. These samples will be submitted to a fixed laboratory for analysis of PCBs, SVOCs, TPH, and Appendix VIII metals. In addition, 10% of the metals samples found to be over SALs by the field laboratory will be submitted to a fixed lab for confirmatory analyses.

5.19.4.3 SWMU 3-003(n)

The 13 soil samples from SWMU 3-003(n) will be collected from the 0 to 12-in. soil depth interval beneath the base course, which will be removed prior to sample collection. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for field laboratory analysis of TPH. The remainder of each sample interval will be homogenized and then submitted for field laboratory analysis of Appendix VIII metals and PCBs.

If mobile chemistry van analyses identify PCBs, TPH, or metals in soils above SALs at a sample location, then additional soil samples will be collected from the interval immediately above the clay-rich horizon or the soil-tuff interface if no clay-rich horizon is found. If chemical van analyses show PCBs, TPH, and metals are below SALs at the 0 to 12-in. depth, 10% of all sampling sites will be randomly selected for confirmatory sampling. In

no case will fewer than two confirmatory samples be collected and they will be collected in the same manner as previously described. These samples will be submitted to a fixed laboratory for analysis of PCBs, TPH, and Appendix VIII metals. In addition, 10% of the metals samples found to be over SALs by the field laboratory will be submitted to a fixed laboratory for confirmatory analyses.

5.19.4.4 SOP Methods

For all sample locations at both SWMUs, soil samples from the accessible surface soil and from soil immediately beneath the asphalt at SWMU 3-059 and from immediately below the base course at SWMU 3-003(n) will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples. The subsurface soil samples (12-in. depth to clay-rich horizon or soil-tuff interface), TPH samples, and adjacent VOC samples will be collected using LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler. A split tube will be used to facilitate subsurface soil sample removal. Adjacent VOC samples will be collected using a hand auger fitted with a brass sleeve. Asphalt will be sampled using LANL-ER-SOP-06.28, R0, Chip Sampling of Porous Surfaces. Specific procedures to be followed in the field for sample collection are discussed in Appendix D of Addendum 1.

5.19.5 Laboratory Analyses

5.19.5.1 SWMU 3-059

At SWMU 3-059 asphalt chip samples will be submitted for field laboratory analysis of PCBs. Confirmatory soil samples will be submitted for fixed laboratory analysis of PCBs, SVOCs, TPH, VOCs, and Appendix VIII metals using appropriate EPA methodology. All other soil samples will be submitted to an on-site mobile chemical analysis van. Soils will be analyzed at the van for PCBs by SW-846 Method 8080, SVOCs by SW-846 Method 8270, TPH by SW-846 Method 418.1, or modifiedVOCs by 8015 SW-846 Method 8260, and metals by XRF. Samples identified for radioactivity analysis will be submitted to a fixed laboratory for confirmatory gross alpha/beta analysis, gamma spectroscopy, and tritium analysis.

The number of anticipated samples, associated locations, and the EPA method of analyses are summarized in Table 5-19-1. One field duplicate, one rinsate blank, and one collocated sample will be collected and submitted as a maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. One trip blank will be submitted for VOC analyses. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.19.5.2 SWMU 3-003(n)

Soil samples from SWMU 3-003(n) will be submitted to the field laboratory for analysis of TPH, Appendix VIII metals, and PCBs. In addition, 10% of the metals samples found to be over SALs by the field laboratory will be submitted to a fixed laboratory for confirmatory analysis. The number of anticipated samples, their locations, and the EPA methods of analyses are summarized in Table 5-19-1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-19-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMUs 3-059 and 3-003(n), FORMER JCI SALVAGE YARD

SAMPLE DESCRIPTION					FIELD SCREEN			FIELD LABORATORY ANALYSIS					FIXED LABORATORY ANALYSIS					
								Organics				Metals		Organics			Metals	
SAMPLING LOCATION DESCRIPTION	No. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	VOCs (SW 8240)	SVOCs (SW 8270)	PCBs (SW 8080)	TPH (SW 418.1)	Appendix VIII metals XRF or LIBS	Gross alpha/beta, gamma spec., tritium	VOCs (SW 8240)[c]	SVOCs (SW 8270)[c]	TPH (SW 418.1)[c]	PCBs (SW 8080)[c]	Appendix VIII metals (SW 6010, 7000)[c]
SWMU 3-059																		
Biased sampling	8	Asphalt	8		8	8	8			8								
	24	0–12	24		24	24	24		16	24	16	24						
		12–24[d]	24		24	24	24		24	24	24	24						
Random sampling	12	Asphalt	12		12	12	12			12								
	13	0–12	13		13	13	13		1	13	1	13						
		12–24[d]	13		13	13	13		13	13	13	13						
Confirmatory samples	3	TBD[e]	3		3	3	3	3					3	3	2	3	3	3
SWMU 3-003(n)																		
Biased sampling	4	0–12	4							4	4	4						
		s/t[d]	4							4	4	4						
Random sampling	9	0–12	9							9	9	9						
		s/t[d]	9							9	9	9						
Confirmatory samples	2	TBD	2		2	2	2	2						2		2	2	2
QC samples[f]																		
Trip blank	NA[g]	NA	1											1				
Field duplicate	1	TBD	1		1	1	1		1	1		1						
Field collocated	1	TBD	1		1	1	1		1	1		1						
Rinsate blank	NA	NA	1											2	2			2
TOTALS	77		129		101	101	101	5	56	122	80	102	3	8	4	5	5	7

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]Confirmation samples will be collected and submitted to a fixed laboratory if no constituents are found in the first soil interval sampled for each PCOC.
[d]Samples between the 0–12-in. soil interval and the soil tuff (s/t) interface will only be collected if constituent sare found in the prior depth interval.
[e]TBD = To be determined in the field.
[f]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[g]NA = Not applicable.

5.20 SWMU 3-001(i): Salvage/Storage Yard East of the Asphalt Batch Plant

5.20.1 Description and History

The Asphalt Batch Plant was moved from a location near the airport to the complex southwest of the Physics Building in 1953, and then to its present location in the northeast corner of TA-3 southeast of the Diamond Drive and East Jemez Road intersection in 1954 (ENG-7 building records). An office building (TA-3-70) was built directly northeast of the batch plant in July 1954 to house Zia Company Roads and Grounds staff (Fig. 5-20-1). The plant is currently operated by Johnson Controls, Inc. (JCI). All but one PRS, SWMU 3-001(i), located within the roads and grounds area is proposed for NFA in Chapter 6 of Addendum 1. A more comprehensive explanation of how a batch plant operates is contained in Chapter 6, Subsection 6.4.1.1.1.

SWMU 3-001(i) consists of two former material and equipment storage areas located near TA-3-70, the JCI Roads and Grounds office building. Both areas remain inactive. Storage area #1 is proposed for NFA in Chapter 6. Storage area #2 located directly northeast of TA-3-70, requires investigation (Fig. 5-20-2). Storage area #2 measures approximately 50 ft x 150 ft on level, unpaved ground. It was used by LANL support contractors between the early 1970s and approximately 1989 as a staging area for old transformers, barrels of roofing compound, tars, and roofing adhesives (LANL 1994, 17-1172). Bagged and labeled asbestos materials were also stored in dumpsters before disposal at the Los Alamos County landfill (Sobojinski 1993, 17-964). There is no staining or documented releases for this area. However, workers from the adjacent salvage yard confirm that the salvaged transformers often contained PCBs, and workers from roads and grounds stated small spills or leaks from the loading and unloading process may not have been documented (Sobojinski 1995, 17-1269).

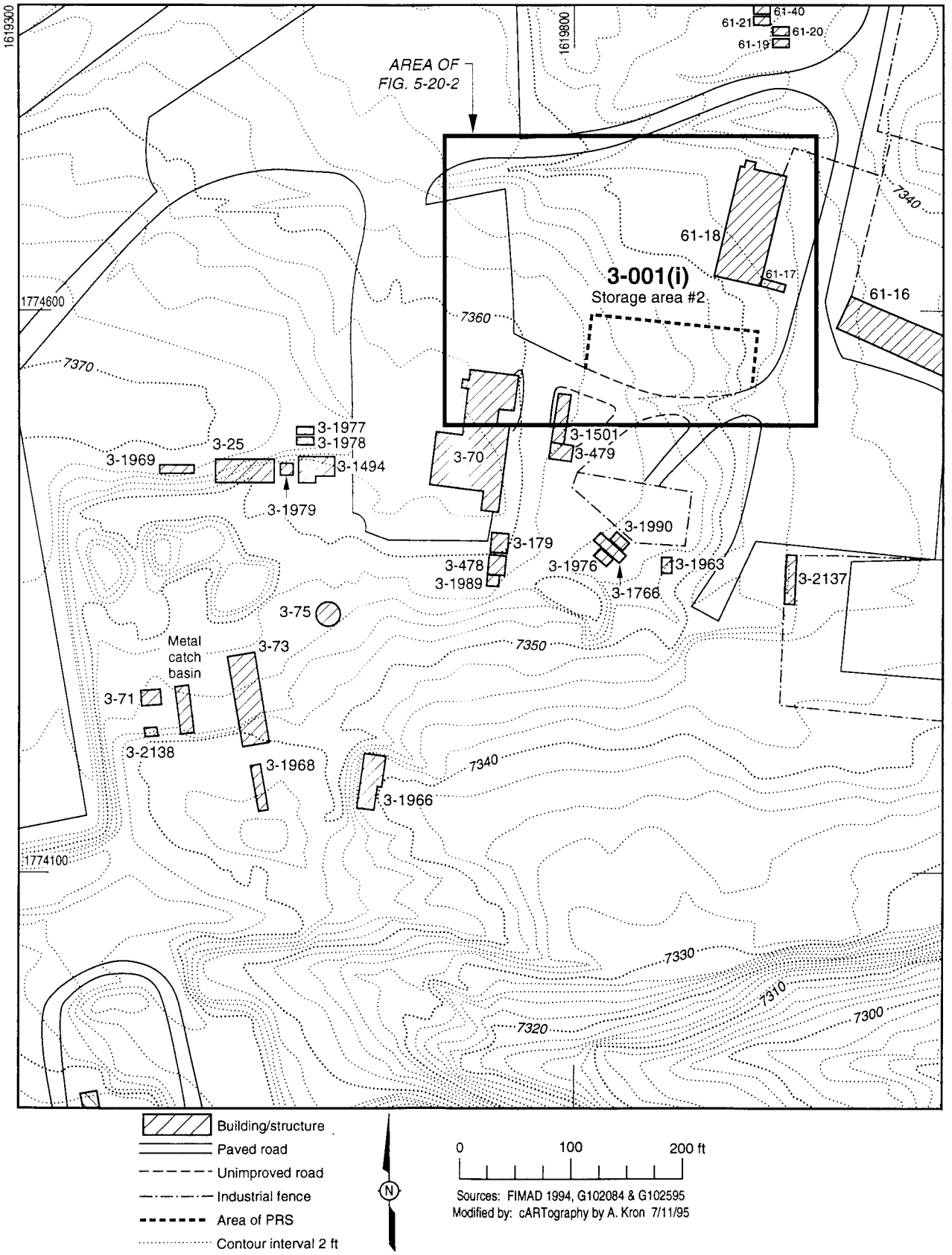

Fig. 5-20-1. Site location map of SWMU 3-001(i).

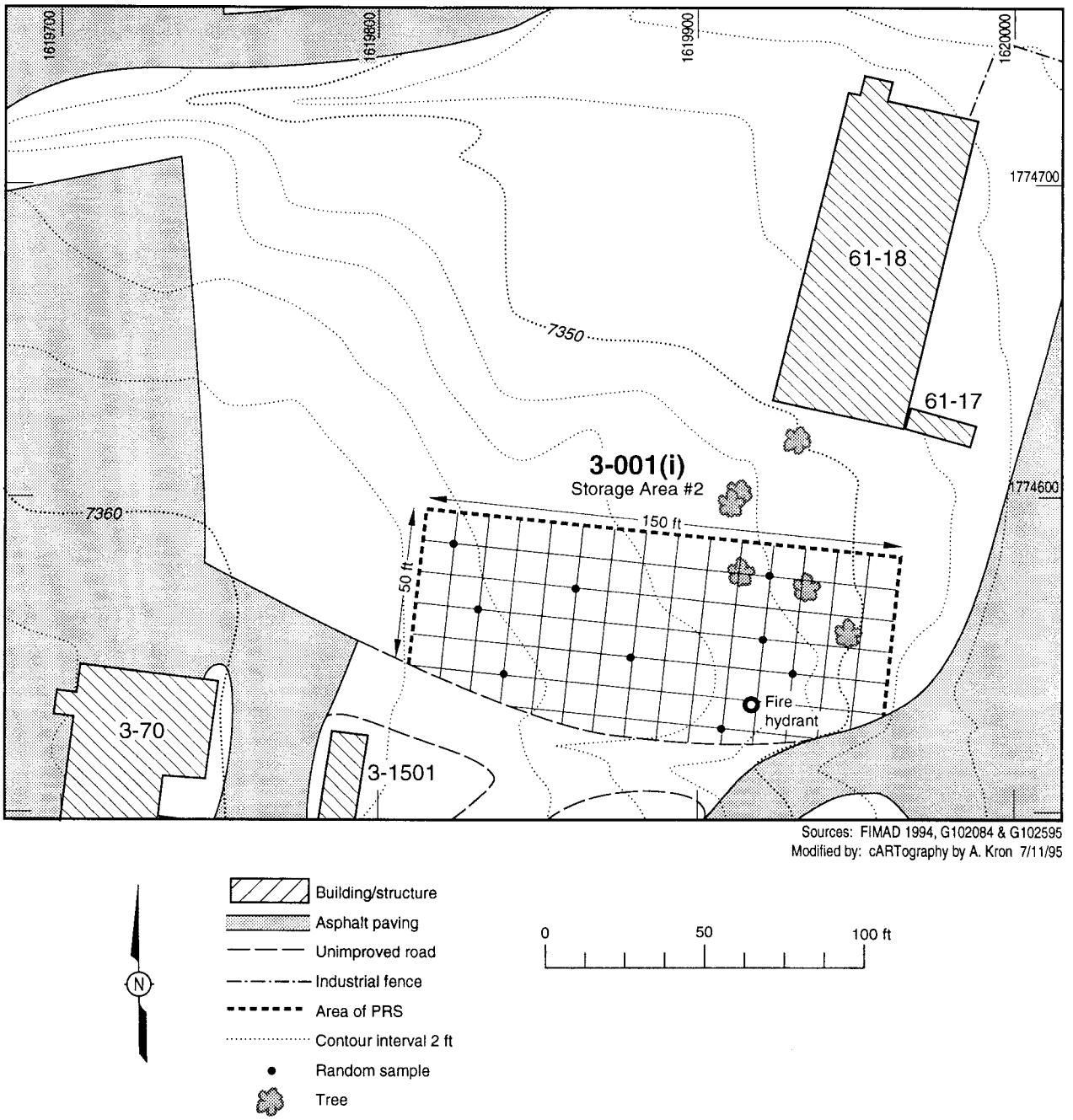

Fig. 5-20-2. Location of sample sites for SWMU 3-001(i).

5.20.2 Investigation Approach and Objectives

Investigation activities for this aggregate will focus on detecting the presence and nature of potential contamination in surface soils of SWMU 3-001(i).

Electrical equipment stored in storage area #2 of SWMU 3-001(i) may have released PCB-contaminated dielectric fluids and the drums of roofing materials may have leaked; however, the nature and extent of any potential contamination at storage area #2 is unknown. Random sampling methods will be used to provide coverage of the entire storage area, increasing the likelihood that contaminated areas will be identified. COPCs for storage area #2 of SWMU 3-001(i) are PCBs, TPH, and VOCs [specifically benzene, toluene, ethylbenzene, and xylene (BTEX) components] of petroleum products (found primarily in the naphtha in roofing adhesives and sealers). Asbestos is not a COPC because it was properly double-bagged and stored in dumpsters while in this area (Sobojinski 1993, 17-964).

5.20.3 Sample Locations and Methods

Samples at storage area #2 of SWMU 3-001(i) will be randomly selected from 10 ft x 10 ft sampling grid. Based on the potential quantity of dielectric fluid released from transformers temporarily stored in the area, it is assumed that no more than 25% of the area covered by the grid may be contaminated. If 25% of the area covered by the sample grid is assumed to be contaminated and a 90% confidence level is desired for detection of potential contaminants, 9 sample points will be randomly selected at grid nodes based on the equation discussed in Subsection 5.0.3 of Addendum 1. A site reconnaissance will be conducted to verify sites selected and a geodetic survey will be conducted for those grid nodes selected for sampling (Fig. 5-20-2).

The nine soil samples will be field screened for VOCs and field screened and collected for radiological constituents as described in Subsection 5.0.5.1 of Addendum 1. The random soil samples at SWMU 3-001(i) will be collected from the 0- to 12-in. depth interval. An aliquot of soil will be collected from the sample intervals prior to homogenization and submitted for laboratory analysis of TPH. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of PCBs. An adjacent sample will be collected from the 6- to 12-in. interval and submitted for VOC analysis.

Soil samples will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples and LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler. A split tube will be used to facilitate sample removal.

5.20.4 Laboratory Analyses

Soil samples collected from storage area #2 of SWMU 3-001(i) will be analyzed in the laboratory for PCBs, TPH, and VOCs using appropriate EPA methodology. The number of anticipated samples, their locations and types of analyses are summarized in Table 5-20-1. QC samples will be submitted from SWMU 3-001(i) as determined by the Field Team Leader (FTL), the total number submitted for this SWMU are as follows: one rinsate blank, one field duplicate and one collocated sample will be submitted for analyses as a maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. One trip blank will be submitted for VOC analyses. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-20-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-001(i) ASPHALT BATCH PLANT AGGREGATE

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LAB ANALYSIS			
								Organics			
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	VOCs (SW 8240) (BTEX)	SVOCs (SW 8270)	PCBs (SW 8080)	TPH (SW 8015)
SWMU 3-001(i)											
Random grid 10 x 10 ft	9	0–12	9		9	9	9	9[c]		9	9
QC samples[d]											
Trip blank	NA[e]	NA	1					1			
Rinsate blank	NA	NA	1					2			2
Field duplicate	1	TBD[f]	1		2	2	2	2		2	2
Field collocated	1	TBD	1		2	2	2	2		2	2
TOTALS	11		13		13	13	13	16		13	15

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]VOCs collected from the 6-12 in. interval.
[d]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[e]NA = Not applicable.
[f]TBD = To be determined in the field.

5.21 SWMU 3-034(a): Liquid Waste Underground Storage Tanks West of the CMR Building

5.21.1 Description and History

SWMU 3-034(a) has been identified as building TA-3-154 and the associated underground radioactive liquid waste storage tanks (two stainless steel tanks and two concrete tanks) located partially beneath the building. TA-3-154 was constructed in 1961 to house operating equipment of the four underground storage tanks (USTs) that received radioactive waste from wing 9 of the CMR Building, TA-3-29. SWMU 3-034(a) is located approximately 75 ft west of wing 9 (Fig. 5-21-1).

From 1961 to 1983 the USTs received radioactive liquid waste (fission products from the destructive testing of reactor fuel rods) from the hot cell of wing 9 at TA-3-29. The radioactive liquid waste was originally routed to the stainless steel tanks and stored to allow decay of short-lived radionuclides. The radioactive liquid waste was then pumped through a series of stainless steel transfer lines into the concrete storage tanks. Prior to the radioactive liquid waste transfer into the concrete tanks, it was processed through ion exchange columns which resulted in lower activity radioactive liquid waste (LANL 1994, 17-1120).

The two cylindrical stainless steel USTs are located below grade beneath the northern part of TA-3-154 and are accessible from individual manholes outside the building. Each stainless steel tank is 7 ft long and 5 ft in diameter with a maximum capacity of approximately 1 000 gal. and is located inside a concrete vault. In the early 1980s an acid-proof coating was applied to upgrade each concrete vault, which provides secondary containment for each stainless steel tank. The concrete vaults share a common wall and each concrete vault also contains pumps and stainless steel piping associated with the tanks.

Two rectangular concrete USTs are located below grade beneath the southern part of TA-3-154 and are accessible from outside the building via separate manholes. Each concrete tank is approximately 17 ft long x 9 ft wide x 6 ft high, with a maximum capacity of 4 900 gal. The concrete walls

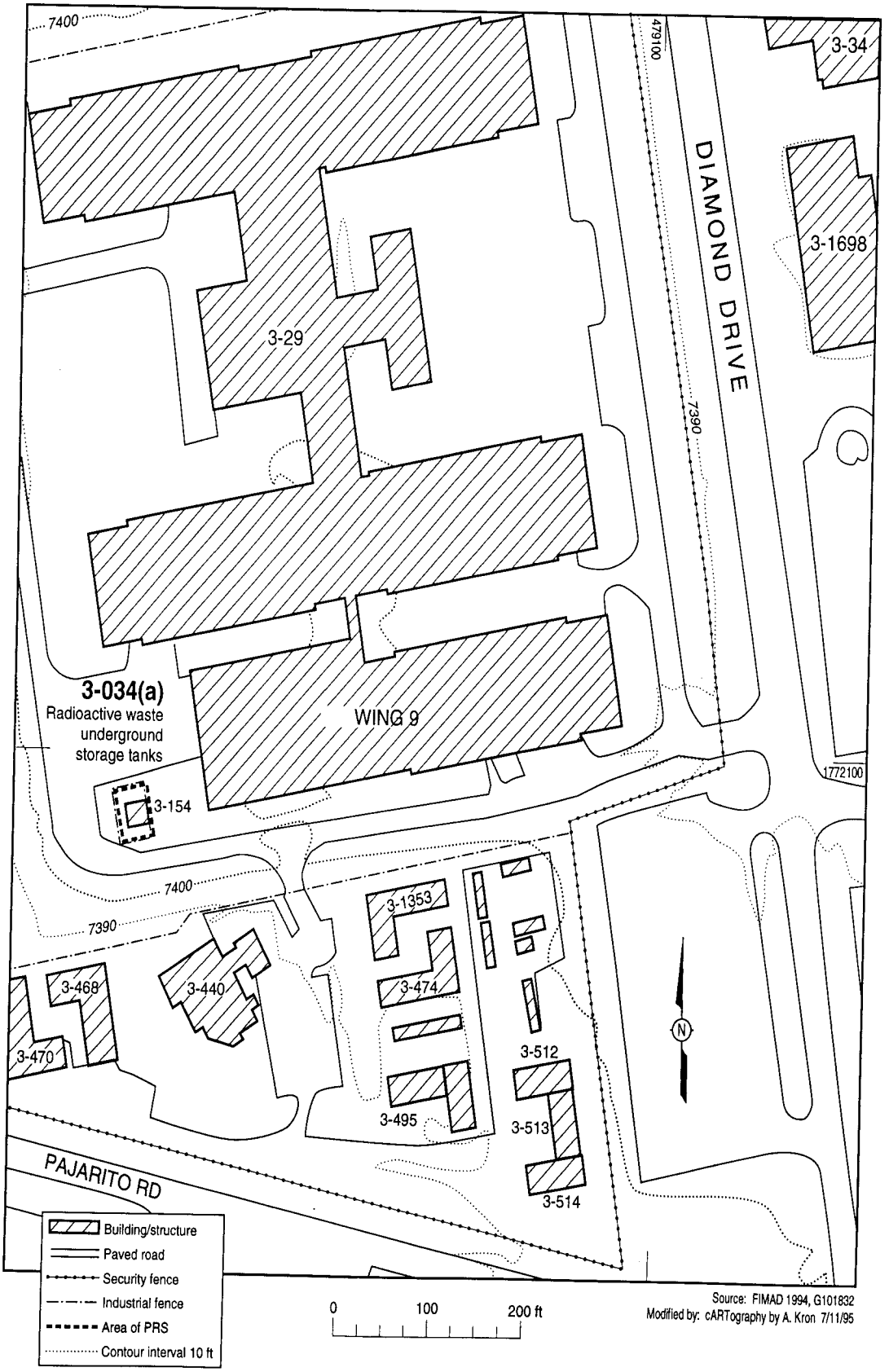

Fig. 5-21-1. Site location map of SWMU 3-034(a).

of the tanks are 8-in. to 12-in. thick and have an acid-proof coating (also applied in the early 1980s to upgrade the concrete tanks). A single gravity outflow sump pit, which served both concrete tanks, is located on the south side of the tanks and was used to drain liquid waste to the industrial waste line. The liquid waste was then pumped to TA-50 (LANL 1994, 17-1117).

After 1983 the stainless steel and concrete USTs were no longer used (LANL 1994, 17-1118). Both sets of tanks were taken off-line in 1985 when the former industrial waste line was removed (Elder et al. 1986, 17-001). The tanks were not reconnected to the new waste line that was installed at that time (LANL 1994, 17-1117).

All four tanks are currently on standby status; it is not known whether they will be reconnected and used in the future. One stainless steel tank and one concrete tank contain radioactive liquid waste (LANL 1994, 17-1120). There were no reported releases from the SWMU 3-034(a) tanks and no unexplained changes in fluid levels that may have indicated leaks (LANL 1994, 17-1120). It is believed that only liquid radioactive waste passed through the SWMU 3-034(a) system; there were no known RCRA waste constituents in the stream (LANL 1994, 17-1120; LANL 1994, 17-1125). The Laboratory's Waste Management Group, CST-13, is planning to sample the liquid waste in the tanks in fiscal year 1995 for analyses of TAL metals, VOCs, and radioisotopes. The results of these analyses may modify the COPCs identified for this site.

5.21.2 Investigation Approach and Objectives

There is no evidence or documentation that the tanks have leaked in the past; therefore, the nature and extent of any contamination associated with SWMU 3-034(a) is unknown. If radioactive liquid was released from the stainless steel tanks into the surrounding concrete vault, it is likely that the concrete vault would have contained the release and evidence of this release would be present on the interior of the concrete vault in the form of detectable radioactivity. Therefore, the investigation on the stainless steel tanks will focus on a radiological survey of the concrete vault interior. If detectable radioactive contamination is found within the concrete vault, it will be assumed that the concrete vault may not have contained all of the released liquids and a sampling strategy similar to that discussed in the

following subsection for the concrete USTs will be followed, including the same list of COPCs. Until the results from the Laboratory's Waste Management Group (CST-13), are available, COPCs are radionuclides, including isotopic plutonium, isotopic uranium, strontium-90, and cesium.

Any release from the concrete USTs would also consist of radionuclide contamination. No known RCRA waste constituents were in the liquid waste stream that entered the tanks; however, metals may have been present as part of other activities in TA-3-29. As discussed previously, a full suite of hazardous constituent analyses will be conducted on the liquid waste by the Laboratory's Waste Management Group, CST-13. These analytical results will assist in refining the list of COPCs.

Biased sampling will be conducted by hollow stem augering and sampling within the soil surrounding the concrete tanks at the depth where contamination is most likely to exist. When the tanks were filled to capacity, the tops of the tanks would represent the minimum depth at which contamination would be detected. From this depth, contamination would move laterally and vertically as a result of gravity and preferential flow paths. Spatial distribution of contamination is a function of COPCs and the physical and chemical characteristics of the surrounding media. This biased approach is based on the known history of the SWMUs and the COPC migration potential factors discussed in Subsection 5.0.5 of Addendum 1.

5.21.3 Sample Locations and Methods

A total of four biased sample locations were selected for sampling at this PRS. Results of the radiological survey to be conducted in the concrete vaults may result in four additional sample locations. The sampling locations which will be used to identify the presence and nature of COPCs are presented in Fig. 5-21-2. Description of sample locations in this subsection use a five-foot distance from the exterior of all tank walls. In the field the boreholes will be placed as close to the tanks as possible but no further away than five feet. If contamination is detected, additional boreholes may be drilled to try to further determine the lateral extent of contamination. One biased sampling site will be located along each of the exterior east and west walls of the concrete USTs. Two of these sample sites are located

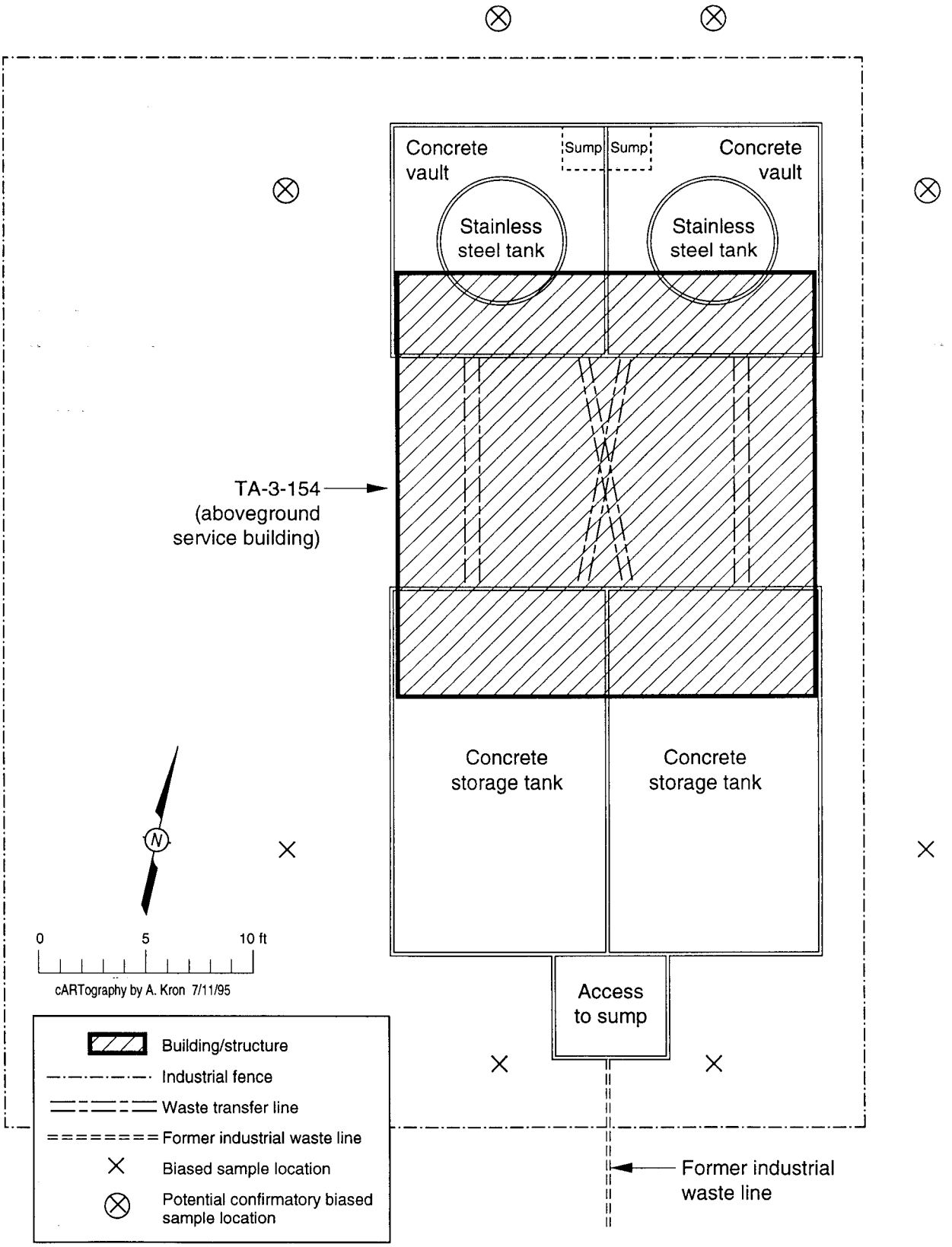

Fig. 5-21-2. Location of sample sites for SWMU 3-034(a).

approximately six feet south of TA-3-154 and five feet out from the walls of the concrete USTs. The two remaining samples will be collected from approximately five feet south of the southern wall of the USTs. The north side of the tanks is actually located under TA-3-154 and, therefore, will not be sampled (Fig. 5-21-2).

Samples will not be collected from soil surrounding the concrete vaults that contain the stainless steel tanks unless the radiological survey conducted in either concrete vault with a hand-held gross gamma survey instrument indicates that a release occurred. If a release is indicated, the structural integrity of the concrete vaults will be investigated to determine if material may have escaped the vaults. If such a release is indicated, sampling activities will be expanded to include these concrete vaults. In that event, one biased sample site will be located along each of the exterior east and west walls of the concrete vaults. These sample sites are located approximately five feet from the respective walls of the concrete vaults and three feet south along the walls of each concrete vault. Two additional samples will be collected along the northern wall. Again, the fourth wall is inaccessible and, therefore, will not be sampled (Fig. 5-21-2) (LASL 1962, ENG-C 31111).

All subsurface materials (soil and tuff) within each core barrel will be continuously screened with a PID/FID for VOCs in 2.5-ft intervals from the top of the tank to approximately 2-ft below the base of the tank or to the fill/tuff interface. If VOC field screening of samples indicates a concentration greater than background readings, VOC sampling will commence with subsequent core barrels (brass sleeves will be used within core barrels). Samples will be collected from the portion of the core barrel with the highest VOC reading and submitted for laboratory analysis. If VOC field screening does not indicate the presence of volatile constituents within each borehole, a VOC sample will be collected from the final core barrel to confirm field screening results.

In addition, all soil samples will be field screened for radiological constituents using a hand-held gross gamma survey instrument. Field screening will be performed from 8 ft (the approximate top of the concrete USTs) to 16 ft (approximately two ft below the bottom of the concrete USTs or the fill/tuff

interface) (LASL 1962, ENG-C 31111). If the radioactivity field screening results are three standard deviations or more above background, samples will be collected from the section of the core barrel with the highest radioactivity reading and submitted to a fixed laboratory for isotopic plutonium, isotopic uranium, gamma spectroscopy for isotopic cesium, and strontium-90 analyses. If radioactivity is not detected as described above within each borehole, a sample will be collected from the final core barrel (preferably below the bottom of the tanks at the fill-tuff interface) and submitted to a fixed laboratory for confirmatory analysis of isotopic plutonium, isotopic uranium, gamma spectroscopy for cesium, and strontium-90 to validate field-screening data.

Three 12-in. soil sample intervals will be collected at each sample location and submitted for laboratory analysis. The first sample will be collected from soil depth corresponding with the top of the concrete USTs (8- to 9-ft depth). The second sample location will be from above the bottom of the tanks (13 to 14-ft depth), and the third sample location will be from below the bottom of the tanks (15 to 16-ft depth). From each of these depth intervals the sample will be collected and homogenized prior to submittal for analysis of those hazardous constituents identified by the Laboratory's Waste Management Group, CST-13. If sampling is required, similar depth intervals would be used for the stainless steel tanks inside the concrete vaults.

Before drilling and sampling begins, a review of engineering and utilities drawings will be performed to locate all underground structures; this review may slightly modify these specific borehole locations. Hollow-stem drilling and sampling techniques will follow the procedures outlined in LANL-ER-SOP-04.01, R0, Drilling Methods and Drill Site Management and LANL-ER-SOP-06.26, R0, Core Barrel Sampling for Subsurface Earth Materials. All cores will be visually inspected and logged according to LANL-ER-SOP-04.04, R0, General Borehole Logging.

5.21.4 Laboratory Analyses

Soil and tuff samples listed above may be analyzed in the mobile radiation detection van to guide drilling activities, with confirmatory samples listed in Table 5-21-1 analyzed in a fixed laboratory using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-21-1. Assuming that the soil surrounding the concrete vault will not be sampled, the maximum number of samples anticipated include four sample sites at the top of the concrete USTs, four sample sites above the bottom of the tanks, and four sample sites below the bottom of the tanks. One rinsate blank and one field duplicate will be submitted for analyses as a maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-21-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-034(a), RADIOACTIVE LIQUID WASTE UNDERGROUND STORAGE TANKS

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LAB ANALYSIS			FIELD LAB
								Radio-nuc-lides	Organics		Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic plutonium and uranium, gamma spec., SR-90	VOCs (SW 8240)	LANL parameters[c]	Gross alpha/beta, gamma spectroscopy
Concrete USTs											
Top of concrete USTs	4	8–9	4		4	4	4			4	4[d]
Above bottom of USTs	4	13–14	4		4	4	4			4	4[d]
Below bottom of USTs	4	15–16	4		4	4	4			4	4[d]
QC samples[e]											
Field duplicate	1	TBD[f]	1		1	1	1	1		1	
Rinsate blank	NA[g]	NA	1								
Confirmatory samples	4	TBD	4		4	4	4	4[h]	4[h]		
TOTALS	17		18		17	17	17	5	4	13	12

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]The Laboratory's Waste Management Group will identify hazardous constituents to be tested prior to initiating field activities.
[d]Potential number of samples collected to guide additional drilling activies (number may vary).
[f]TBD = To be determined in the field.
[g]NA = Not applicable.
[h]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

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5.22 SWMU 3-007: Decommissioned Firing Site

5.22.1 Description and History

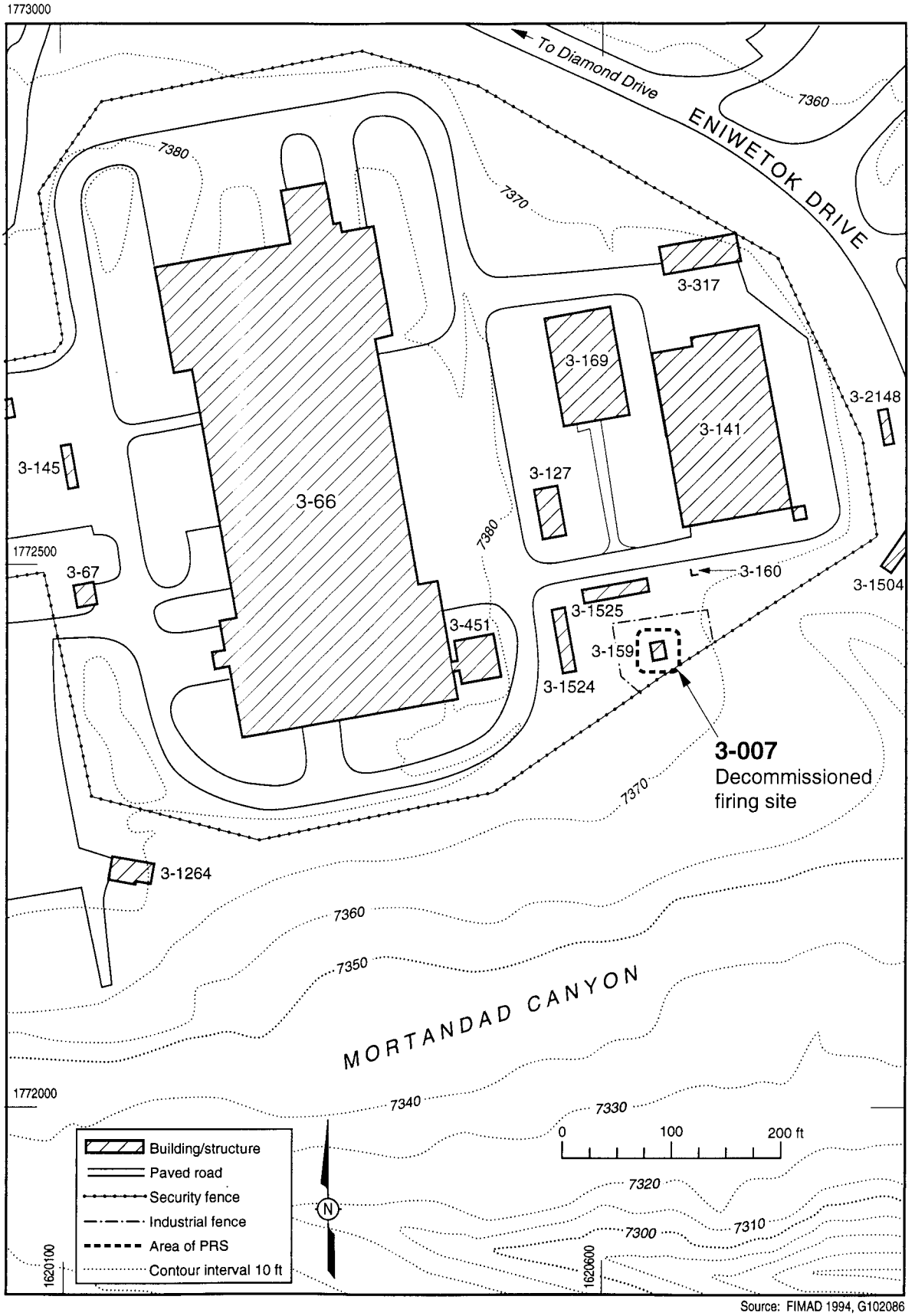
SWMU 3-007 is a decommissioned firing site, located southwest of TA-3-141 (Rolling Mill Building), and includes structures TA-3-159, a containment building for explosive experiments, and TA-3-160, a personnel safety barrier (Fig. 5-22-1). Both structures were constructed using prefabricated concrete slabs. TA-3-159 is situated on an 8-ft-square slab and has 6-in.-thick by 8-ft-high walls and an opening on one side serving as an entrance. TA-3-160 is situated on a slab and has two 8-ft-high by 4-ft-wide by 6-in.-thick walls that are set at a 90-degree angle (Mitchell 1993, 17-947).

From 1970 to 1975, approximately 50 to 75 explosive shot experiments were detonated within TA-3-159 to bond or form metals (copper, silver, iron, etc.). During the experiments, the energy of the detonation forced the metal into a concrete mold. Plastic blasting caps were used to initiate/detonate explosive shots consisting of approximately two pounds of high explosive (HE) mixtures such as Composition C (TNT and RDX) or Torpex (TNT, aluminum, and RDX). After an explosive shot, TA-3-159 was often rinsed with water that was allowed to drain outside the building through a gap between the floor and wall.

The firing site was cleaned up in the late 1970s with no HE contamination detected in the area. No formal documentation of past usage, cleanup criteria, or modifications to TA-3-160 or TA-3-159 has been found (Mitchell 1993, 17-947). By 1983 TA-3-159 was no longer used as the containment building for explosive experiments and was modified to serve as a storage building; a fiberglass roof and a doorway were installed. From the late 1980s to the present, TA-3-159 has been used to store thoria (oxide) and thorium (metal) (Mitchell 1993, 17-947).

5.22.2 Investigation Approach and Objectives

Since washdown practices may have resulted in contamination of adjacent soil, investigation activities for this SWMU will focus on detecting the presence and nature of potential contamination in the soils surrounding the containment building, TA-3-159. COPCs for this site include thorium, Appendix VIII metals, and HE. Because SVOCs are formed from the breakdown of HE, they are also considered COPCs for this site.



Source: FIMAD 1994, G102086
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Fig. 5-22-1. Site location map of SWMU 3-007.

Biased sampling will be conducted from the soil along the north and east walls of structure TA-3-159, targeting areas most likely to have been contaminated by wash water exiting the structure through the gap between the floor and the walls. Sampling locations are based on the known history of the SWMU and the soil and COPC migration potential as described in Subsection 5.0.3 of Addendum 1.

The number of samples and locations were selected based on the size of the building and the likely area where wash water would have ponded and drained. Based on the factors listed above, the COPCs identified for this site are most likely to have accumulated in surface soil. Therefore, biased samples will target the surface soil interval.

5.22.3 Sample Locations and Methods

A total of six sample locations were selected along the north and east sides of TA-3-159 as identified in Fig. 5-22-2. These sites were selected to identify the presence and nature of COPCs based on site-specific factors listed in Subsection 5.22.2. Along the length of both the north and east walls, one biased soil sample will be collected at the center and one approximately two feet on either side of center, with all samples collected at a distance of one foot from the wall.

Before field sampling begins, the Health Physics Operations Group (ESH-1) will be contacted to conduct a radiation survey around structure TA-3-159 to determine if any time limitations must be set for fieldwork based on the potential radiation dose from the storage of thorium. Fieldwork will be tailored to time constraints established by this survey. In addition, all samples will be field screened and collected for VOCs and field screened for radiological constituents as described in Subsection 5.0.5.1, of Addendum 1.

As previously noted, COPCs would most likely accumulate in the surface soil interval. Therefore, soil samples will be collected at the 0 to 12-in. depth. Prior to homogenization of the collected sample, an aliquot of soil will be collected for laboratory analysis of SVOCs. The remainder of the collected sample will be homogenized prior to submittal for analysis of isotopic thorium, HE, and Appendix VIII metals.

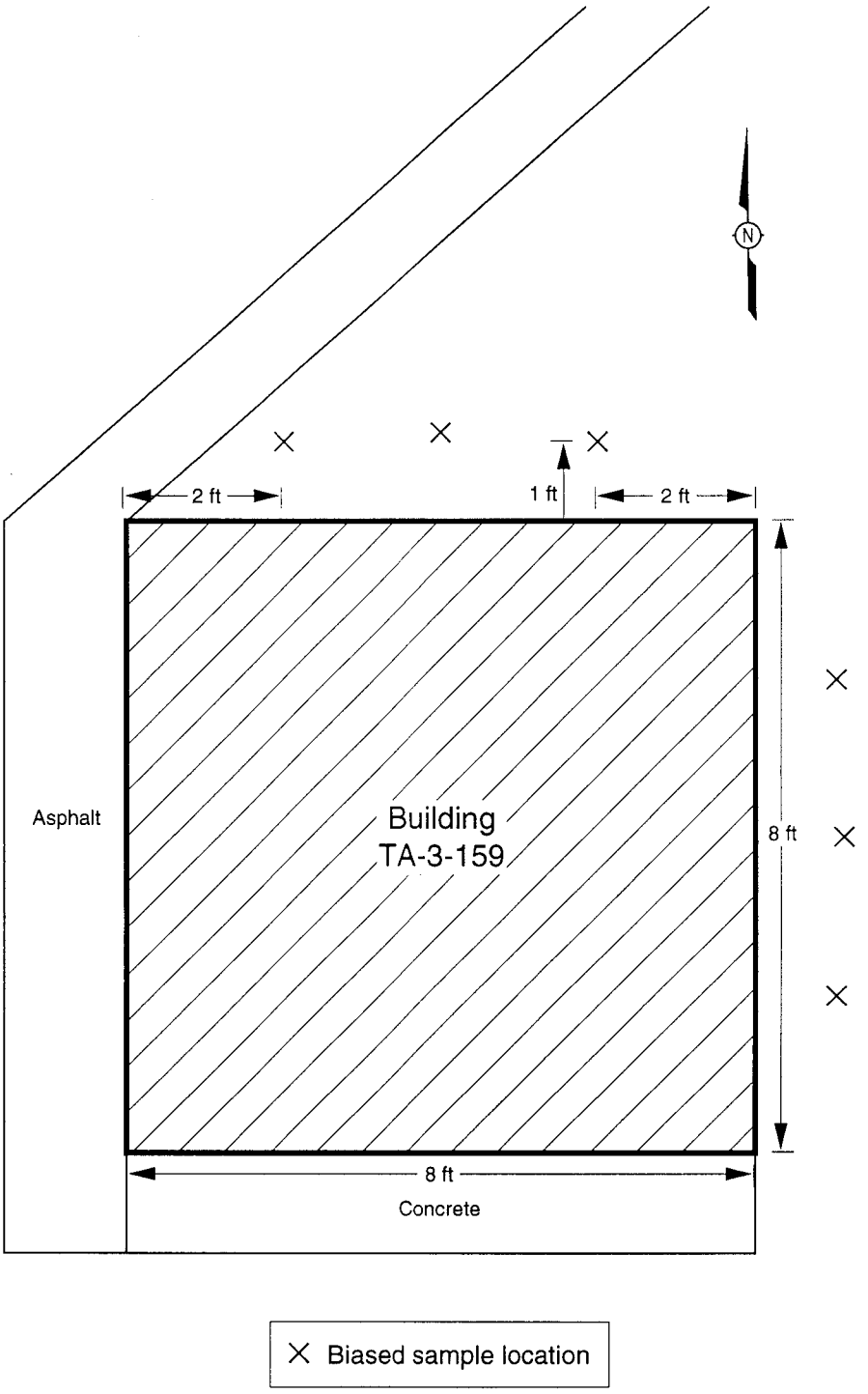

Fig. 5-22-2. Location of sample sites for SWMU 3-007.

The soil samples will be collected at the 0- to 12-in. depth using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples or LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler. A split-tube fitted with a brass sleeve will be used during sample collection to facilitate sample removal. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.22.4 Laboratory Analyses

Soil samples will be analyzed for isotopic thorium, Appendix VIII metals, HE, SVOCs, and VOCs using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-22-1. One field collocated sample will be submitted for analysis as the maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-22-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMU 3-007, DECOMMISSIONED FIRING SITE

SAMPLE DESCRIPTION					FIELD SCREEN			FIXED LABORATORY ANALYSIS				
								Radio-nuc-lides	Organics		Metals	Misc
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic thorium	VOCs (SW 8240)	SVOCs (SW 8270)	Appendix VIII metals (SW 6010, 7000)	High explosives (USATHAMA)
Biased sampling												
Outside of exterior walls	6	0–12	6		6	6	6	6		6	6	6
on the north and east side												
QC samples[c]												
Field collocated	1	TBD[d]	1		1	1	1	1		1	1	1
Confirmatory samples	2	6–12	4		2	2	2		2[e]			
TOTALS	9		11		9	9	9	7	2	7	7	7

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[d]TBD = To be determined in the field.
[e]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

5.23 SWMUs 3-004(c,d): Dumpsters West of the CMR Building

5.23.1 Description and History

The PRSs included in this aggregate are SWMUs 3-004(c,d). These SWMUs can be sampled together because they share similar COPCs and physical settings; therefore, the sampling strategy at both SWMUs is similar. SWMU 3-004(c) is a dumpster area located at the main loading dock of TA-3-29, the CMR Building. SWMU 3-004(d) is a former dumpster area located west of wing 9, TA-3-29 (Fig. 5-23-1).

SWMU 3-004(c) is a level, asphalted area approximately 85 ft long x 50 ft wide, occupied by two dumpsters; this loading dock area has been an active site since TA-3-29 opened in 1952. Both dumpsters receive boxed waste measured by the multiple energy gamma assay system (MEGAS). MEGAS has an assay range from 0 to 100 nCi/g; waste within this range is referred to as low-level waste (LLW). Only boxed waste assayed between 0 to 99 nCi/g, a dose rate below 0.5 mR/hr per box, and weighing no more than 15 kilograms is allowed into these dumpsters. A majority of the waste is below 50 nCi/g; 90% of the boxes are below 10 nCi/g. Boxes of waste assayed at or above 100 nCi/g, transuranic (TRU), and/or exceeding the 15 kilogram weight limit are returned to the originator for sorting and repackaging. One dumpster receives compactable waste and the other receives non-compactable waste. These dumpsters typically receive waste from offices within all wings of TA-3-29 (wing 9 waste is also accepted if it meets the above criteria) and waste from radioactive material handling areas. The waste material consists of gloves, paper products, glass, plastic, and metal. Runoff from this dumpster area drains to a storm drain inlet grate located approximately 50 ft southwest of SWMU 3-004(c). The storm drain eventually discharges at an outfall in upper Mortandad Canyon (Fig. 5-23-1). This outfall site, designated NPDES permit number EPA 03A021, is also identified as SWMU 3-054(e), addressed by a sampling plan in Subsection 5.12 of Addendum 1.

SWMU 3-004(d) is a level, gravel-covered area, approximately 75 ft long x 20 ft wide, that is located south of the steps at the west end of wing 9 of TA-3-29. One dumpster formerly occupied this area, but it is now housed within wing 9. This dumpster has always been considered part of a

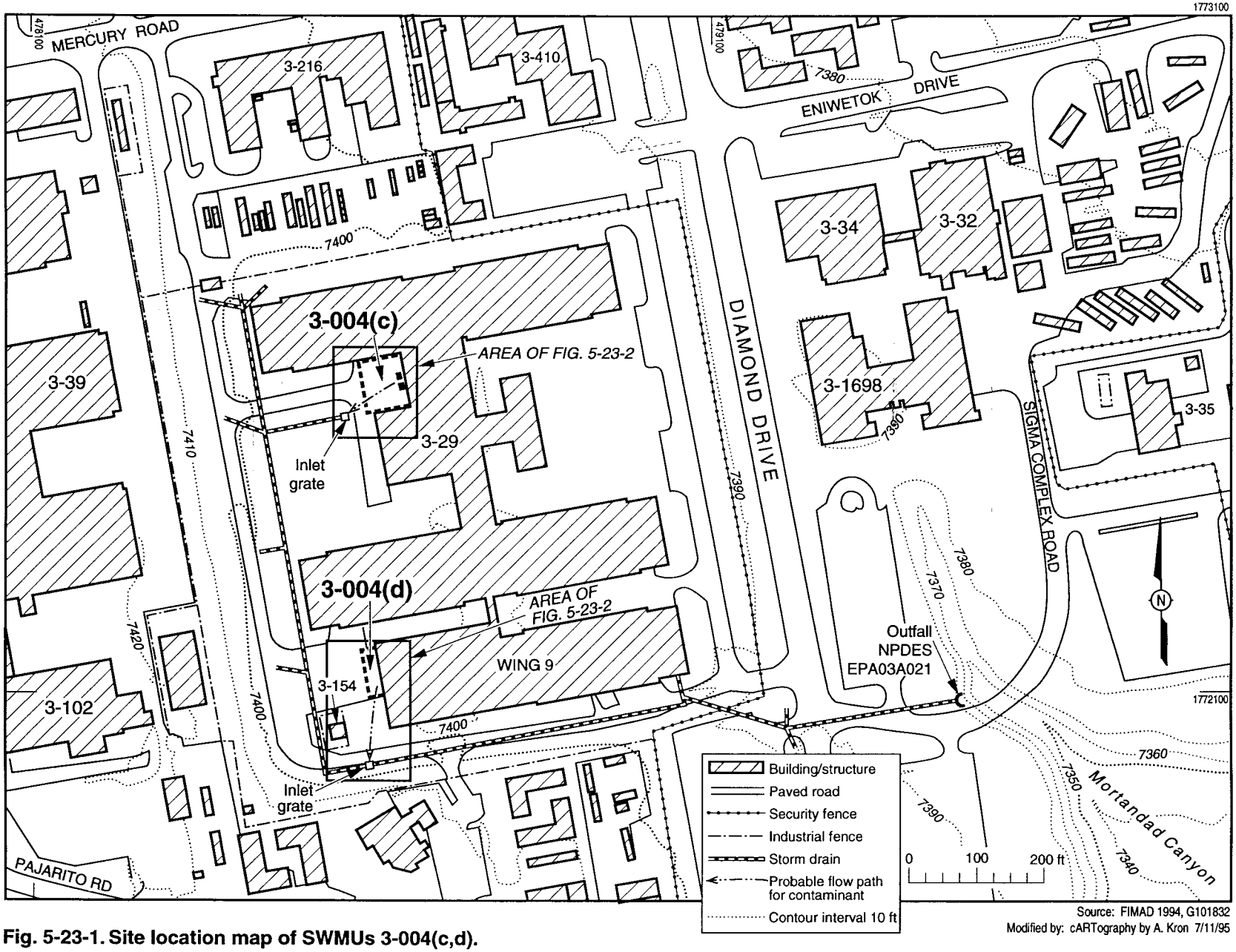

Fig. 5-23-1. Site location map of SWMUs 3-004(c,d).

contaminated facility used to accumulate contact-handled waste from the operations of wing 9 hot cells. When the dumpster was located at SWMU 3-004(d), it typically received waste that consisted of rags, small hardware, paper, machine shop waste, and cleaning materials, with an occasional decontaminated hot cell item. All waste was bagged and boxed prior to being placed into the dumpster. Runoff from this area flows to a storm drain inlet grate located approximately 100 ft west of SWMU 3-004(d). The storm drain eventually discharges into upper Mortandad Canyon at outfall location SWMU 3-054(e) (Figs. 5-23-1 and 5-23-2).

5.23.2 Investigation Approach and Objectives

Investigation activities for this SWMU aggregate will focus on detecting the presence and nature of potential contamination in the asphalt and underlying soil surrounding SWMU 3-004(c) and in soil underlying gravel at SWMU 3-004(d). Liquids may have occasionally been part of the waste stream disposed in dumpsters at these SWMUs, and rainwater may have entered the dumpsters. Liquids draining from the dumpsters may have carried contaminants from waste material in the dumpsters outside to the surrounding area. The primary COPCs for SWMU 3-004(c) and SWMU 3-004(d) are radionuclides, specifically plutonium, uranium, and cesium. However, other COPCs which may have been part of waste materials, including SVOCs and Appendix VIII metals, may also have been carried outside the dumpsters.

Biased sampling methods will be used to investigate SWMU 3-004(c) and SWMU 3-004(d). Biased sampling will target the areas most likely to have been contaminated by liquid drainage from the dumpsters, if such an event occurred. The biased approach is based on the known history of the SWMUs and the soil and COPC migration potential described in Subsection 5.0.3 of Addendum 1.

5.23.3 Sample Locations and Methods

Biased sampling within the dumpster areas will be conducted in soil and asphalt at SWMU 3-004(c) and in soil at SWMU 3-004(d). Samples will be collected from nine locations at SWMU 3-004(c) and from ten locations at SWMU 3-004(d). Asphalt samples for SWMU 3-004(c) will first be removed from each sample location using LANL-ER-SOP-06.28, R0, Chip Sampling

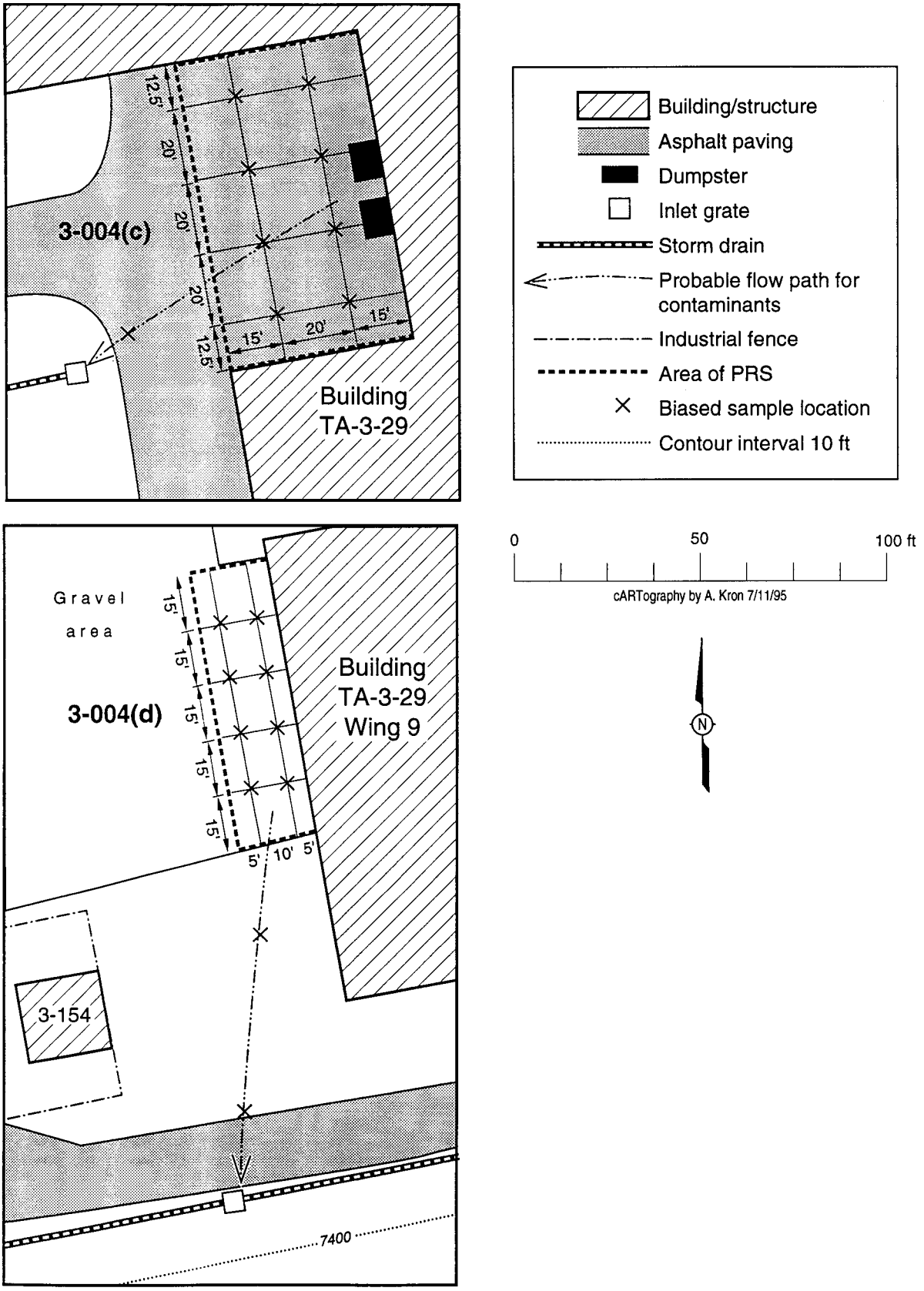

Fig. 5-23-2. Location of sample sites for SWMUs 3-004(c,d).

of Porous Surfaces and then collected for isotopic plutonium, isotopic uranium, and gamma spectroscopy for cesium analyses. Prior to surface soil sample collection at each PRS where gravel is present, gravel underlying the asphalt will be removed from the sample locations using a stainless steel shovel. It is likely that the dumpster locations varied within each area as a result of being lifted and emptied and replaced for waste disposal. In order to include these slight location variations, four transects will be established perpendicular to the long axis of SWMU 3-004(c). These transects will be located approximately 20 ft apart with samples collected every 20 ft along each transect. An additional sample site will be located approximately midpoint between SWMU 3-004(c) and the storm drain that collects area runoff. The midpoint is approximately 25 ft downgradient of SWMU 3-004(c); the specific location will be determined based on field observations. For SWMU 3-004(d), 4 transects will be established perpendicular to the long axis, approximately 15 ft apart with samples collected every 10 ft along each transect. At SWMU 3-004(d), 2 additional sample sites will be located approximately 25 ft and 75 ft from the southern boundary of SWMU 3-004(d) in a transect toward the storm drain that collects area runoff. Specific sampling locations will be determined based on field observations. Sampling sites for both SWMUs are shown in Fig. 5-23-2.

All soil samples will be field screened and collected for VOCs as described in Subsection 5.0.5.1 of Addendum 1. All soil and asphalt samples will also be field screened for radiological constituents as described in Subsection 5.0.5.1 of Addendum 1. These samples will be sent to a fixed laboratory for confirmatory analyses of isotopic plutonium, isotopic uranium, and gamma spectroscopy for cesium to validate field-screening data.

Soil samples at each PRS will be collected from the 0 to 12-in. depth interval. An aliquot of soil will be collected from each sample interval prior to homogenization and submitted for laboratory analysis of SVOCs. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals.

Soil samples will also be collected from the 12-in. interval immediately above the clay-rich horizon or the soil-tuff interface if no clay-rich horizon is found. An aliquot of soil will be collected from the sample intervals prior to

homogenization and submitted for laboratory analysis of SVOCs. The remainder of each sample interval will be homogenized and then submitted for laboratory analysis of Appendix VIII metals.

Soil samples from the accessible surface soil and from soil immediately beneath the asphalt and base course will be collected using LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples. Samples collected at depth and all adjacent VOC soil samples will be collected using LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler. A split tube will be used to facilitate soil sample removal. If necessary, adjacent samples for VOC analysis will be collected using a hand auger fitted with a brass sleeve. Specific sample collection procedures that must be followed are discussed in Appendix D of Addendum 1.

5.23.4 Laboratory Analyses

Asphalt and soil samples will be analyzed in the laboratory for the constituents described above using appropriate EPA methodology. The number of anticipated samples, their locations, and the types of analyses are summarized in Table 5-23-1. One rinsate blank, one field duplicate, and one collocated sample will be submitted for analyses as a maximum number of QC samples determined by using the guidelines in the site-specific QAPjP, Annex II, Note 2A of Addendum 1. All samples will be prepared and shipped in accordance with LANL ER standard operating procedures for chain-of-custody and transportation as listed in Appendix D of Addendum 1.

TABLE 5-23-1

SCREENING AND ANALYSIS FOR OU 1114 PHASE I SAMPLING PLAN SUMMARY OF SWMUs 3-004(c,d), DUMPSTER AREAS BEHIND THE CMR BUILDING

SAMPLE DESCRIPTION					FIELD SCREEN			LABORATORY ANALYSIS			
								Radio-nuc-lides	Organics		Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	ISO-PU, ISO-U, gamma spec.	VOCs (SW 8240)	SVOCs (SW 8270)	Appendix VIII metals (SW 6010, 7000)
SWMU 3-004(c)											
Dumpster area transects	8	Asphalt	8		8	8	8	8[c]			
		0–12	8		8	8	8			8	8
		s/t[d]	8		8	8	8			8	8
Drainage area	1	Asphalt	1		1	1	1	1[c]			
		0–12	1		1	1	1			1	1
		s/t[d]	1		1	1	1			1	1
SWMU 3-004(d)											
Dumpster area transects	8	0–12	8		8	8	8			8	8
		s/t[d]	8		8	8	8			8	8
Drainage area	2	0–12	2		2	2	2			2	2
		s/t[d]	2		2	2	2			2	2
QC samples[e]											
Field duplicate	1	TBD[f]	1		1	1	1			1	1
Field collocated	1	TBD	1		1	1	1			1	1
Rinsate blank	NA[g]	NA	1							1	1
Confirmatory samples	4	TBD	4		4	4	4	2[h]	2[h]		
TOTALS	25		54		53	53	53	11	2	41	41

rev. 7/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]Asphalt samples will be analyzed for gross alpha/beta and gamma spectroscopy, and the listed isotopes if results deem necessary.
[d]s/t = soil/tuff interface (12-in. interval above interface).
[e]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[f]TBD = To be determined in the field.
[g]NA = Not applicable.
[h]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

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5.24 SWMU 3-053: Basement of the Rolling Mill Building, TA-3-141

5.24.1 Description and History

SWMU 3-053 is designated as the basement area of the Rolling Mill Building, TA-3-141. From 1962 to 1990, TA-3-141 housed electrochemical and depleted uranium processing facilities (Keenan 1977, 17-199). Currently, powder characterization, plasma flame spray processing, beryllium processing, and depleted uranium processing are ongoing operations. The solid waste generated at TA-3-141 is classified as low-level radioactive waste. The Weston Task Report states that materials used in TA-3-141 included uranium-238, uranium-235, thorium-232, lead, nickel, tungsten, cadmium, antimony, bismuth, copper, zirconium, barium, and infrequently tritium (LANL 1989, 17-017). TA-3-141 is listed as a "contaminated facility currently in use" (i.e., a controlled facility) due to ongoing uranium usage, and is also listed as a moderate hazard category due to work with uranium metallurgy (LASL 1975, 17-190). It is unknown if releases occurred through the basement floor drains that were formerly connected to the storm water system.

A number of drains at TA-3-141 were previously routed to an outfall (SWMU 3-015) located approximately 10 ft outside of TA-3-141 and east of the Sigma Complex security fence. Discharge from the outfall flowed into the ditch adjacent to Eniwetok Drive. This drainage originated from the beryllium facility, the mezzanine floor drains, and all of the building roof drains. During heavy rains water would back up through the floor drains located in some work areas. Water draining from the work area floors could potentially carry loose material to the floor drains and eventually to the outfall. No contamination was detected during occasional radiological surveys of the outfall area while there was high usage of powdered, depleted uranium compounds.

The floor drains have been rerouted into the TA-50 radioactive liquid waste line, and in 1992 the roof drains were rerouted to an existing outfall in Mortandad Canyon. The lines draining to the outfall were decommissioned in February 1993. During decommissioning, one water sample was collected from the outfall area and analyzed for radioactivity. Alpha (plutonium and uranium) and beta radiation analyses resulted in less than detectable counts (less than 14 counts per minute) (Sundby 1993, 17-811).

5.24.2 Investigation Summary

SWMU 3-053 was evaluated during the summer 1994 investigation of SWMU 3-015. SWMU 3-053 corresponds to the basement floor drains TA-3-141 that previously discharged to the outfall designated as SWMU 3-015. The sampling and analysis plan presented in Subsection 5.3 of the July 1993 RFI Work Plan for OU 1114 describes the investigation rationale, sampling approach, and laboratory analyses for SWMU 3-053 and SWMU 3-015 (LANL 1992, 17-1090). The investigation involved characterization of the outfall (SWMU 3-015) through the collection and analysis of five surface soil samples for Appendix VIII metals, SVOCs, PCBs, radionuclides, and VOCs. These samples were collected from the 0- to 12-in. interval in the drainage channel associated with the outfall. Data from these samples will be used to characterize SWMU 3-053, and results will be documented in future RFI reports for OU 1114.

5.25 SWMU 3-052(f): Outfall Northeast of TA-3-207

5.25.1 Description and History

SWMU 3-052(f) is an outfall located northeast of building TA-3-207 that discharges to Sandia Canyon. This outfall received flow from floor drains, sumps, sinks, and water fountains associated with several buildings at TA-3, as well as effluent from three reported spills within TA-3. Information from the Sherwood Building (TA-3-105) indicates that dielectric insulating oil, hydraulic oil, and possibly other PCB-containing oil may have been discharged to the storm drain. The drains in TA-3-105 were rerouted to the sanitary sewer system in 1991 (ENG-C 20763). The floor drains [SWMUs 3-013 (a,b)], sinks, and water fountains from the Johnson Controls shop building (TA-3-38) drained to this outfall until 1987 when the drains were rerouted to the TA-3 sanitary sewer system (LANL 1987, 17-763). During 1968, Stoddard® solvent (xylene - petroleum naphtha product) from the maintenance shop and dry acid and caustic materials from the pipefitter operations were discarded through sinks and floor drains (Schulte 1968, 17-145). In addition, floor drains, sinks, and water fountains of the Nevada Test Site (NTS) shop TA-3-38 originally discharged wastewater directly to the storm drain system. During the 1960s and 1970s, spent paint solvents and cutting oils contaminated with machined beryllium particles may have been released to the floor drains (LANL 1990, 0145). In addition, cooling water for welding torches was also discharged directly to the storm drain (LANL 1987, 17-763). Wastewater discharging into the storm drain may also have contained lead, chromium, nickel, and other metals.

Three reported spills may have also affected SWMU 3-052(f); two occurred in building TA-3-287 and one in a utility trench excavated between buildings TA-3-1793 and TA-3-1794. The first spill consisted of approximately 200 gal. of a water/waste oil mixture that was discharged following the failure of an automatic compressor blow-down mechanism (LANL 1989, 17-952). The second spill consisted of a ruptured air compressor oil line in the basement of TA-3-287 resulting in an approximately one quart spill of compressor oil into the floor drain (LANL 1989, 17-951). This spill resulted in an oily sheen on the surface of the water at the outfall. The third spill consisted of approximately 15 gal. of diesel fuel that was released from a

ruptured truck fuel line into the utilities construction trench between buildings TA-3-1793 and TA-3-1794. On the same day, a clay sewer pipe in the utility trench broke, releasing approximately 2 000 gal. of wastewater into the excavation (LANL 1989, 17-950). A sump pump was used to remove the wastewater from the excavation and discharge it to the SWMU 3-013(a) storm drain. The diesel-contaminated asphalt and soil was removed and disposed at Sigma Mesa for land farming (LANL 1989, 17-950). The possibility exists that some diesel fuel may have been mixed with the wastewater and may have been discharged at SWMU 3-052(f).

The outfall is categorized by the NPDES permit as industrial and receives waters from noncontact cooling water, non-destructive testing discharge, and production facilities. All industrial outfalls throughout the Laboratory are sampled weekly on a sequential, rotating basis. The sample monitoring parameters include flow rate, total suspended solids, chlorine, pH, and total phosphorus. The application for NPDES permits began in the mid-1970s. Reapplication for NPDES permits every five years requires analyses of over 120 analytes, including some RCRA-regulated constituents. Analytical reports from these water analyses are not included in this work plan, which is concerned with COPCs that may have accumulated in soil from discharges in the early 1960s.

The only sections of the storm drain considered as potential direct sources of exposure to the public are two open concrete and rock-lined ditches east of TA-3-261 and north of TA-3-207, the natural channel between the designated outfall [SWMUs 3-013(a,b) and 3-052(f)], and the channel running south of TA-3-443. The remainder of the storm drain is underground. The outfall and associated drainage also receive a significant amount of runoff from parking lots and the surrounding areas.

5.25.2 Investigation Summary

SWMU 3-052(f) was characterized during the summer 1994 investigation of SWMUs 3-013(a,b). SWMU 3-052(f) is the outfall that received discharges from several sources, including the drains identified as SWMUs 3-013(a,b). The sampling and analysis plan presented in Subsection 5.9 of the July 1993 RFI Work Plan for OU 1114 describes the investigation rationale, sampling approach, and laboratory analyses implemented to characterize SWMUs 3-013(a,b) (LANL 1993, 1090). The investigation involved characterization of outfall SWMU 3-052(f) through the collection and analysis of five sediment samples for Appendix VIII metals, PCBs, SVOCs, and VOCs. The sediment samples were collected in sediment catchment basins from 10 to 50 ft downstream of the outfall pipe. Data from these samples will be used to characterize this SWMU and results will be documented in future RFI reports for OU 1114.

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5.26 SWMU 3-042: Former Containment Sump West of TA-3-218

5.26.1 Description and History

SWMU 3-042 is a former containment sump located west of TA-3-218 used for secondary containment of a wooden surge tank that contained dielectric mineral oil used as insulation in experiments. The containment sump consisted of a 43 ft long x 27 ft wide concrete pad surrounded by an 18-in. to 20-in. high cement curb. The wooden surge tank was erected on the containment sump in approximately 1965. When heavy rains occurred, water filled the containment area. At times, the water had an oily film (possibly from leaks in the pumps and or piping) that would occasionally overflow to surrounding soil and gravel (Sobojinski 1992, 17-688).

The area surrounding the containment sump was enclosed by a chainlink fence and served as a storage yard for old electrical equipment for approximately 20 years. Most stored capacitors were labeled as non-PCB; i.e., equipment containing PCBs in quantities less than 50 ppm. In 1985 the surge tank, chainlink fence, and curbing around the cement pad were removed (Sobojinski 1992, 17-688). The curb of the containment sump, the concrete pad, and many of the transformers and capacitors were removed in 1988. While there were no known releases other than occasional overflow from the containment sump, sampling was not done to determine if hazardous constituents were present.

5.26.2 Investigation Summary

SWMU 3-042 was characterized during the summer 1992 investigation of the waste oil storage areas aggregate [SWMU 3-003(a)]. The sampling and analysis plan presented in Subsection 5.10 of the July 1993 RFI Work Plan for OU 1114 describes the investigation rationale, sampling approach, and laboratory analyses implemented to characterize SWMU 3-003(a) (LANL 1993, 1090). The investigation involved the collection and analysis of 17 surface soil samples and 2 asphalt chip samples for PCBs. Two random confirmatory samples were also submitted for analysis of SVOCs, VOCs, and Appendix VIII metals. Data from these samples will be used to characterize SWMU 3-042 and results will be documented in future RFI reports for OU 1114.

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5.27 SWMU 3-045(b,c): Outfalls from Cooling Towers

5.27.1 Description and History

The PRSs included in this aggregate are SWMUs 3-045(b,c). Both SWMUs are located in the upper portion of Sandia Canyon directly south of the steam plant (LANL 1993, 17-926).

SWMU 3-045(b) is identified as the outfall from cooling towers TA-3-25 and TA-3-58 which serve the power plant TA-3-22 (LANL 1993, 17-926). This discharge point is identified as NPDES permitted outfall EPA 01A001 and is identical to SWMU 3-012(b) from the 1993 RFI Work Plan for OU 1114 (LANL 1993, 1090). Cooling tower TA-3-25 was demolished in 1990, and only the concrete basin remains. Cooling tower TA-3-58 remains in operation (LANL 1993, 17-926).

The outfall receives effluent from the neutralization tank, the chlorine building, and cooling tower TA-3-58 effluent. The neutralization tank receives blowdown from the boilers and wastewater from the water treatment area. The pH of the wastewater in the neutralization tank is adjusted by adding either sulfuric acid or sodium hydroxide, as appropriate, before it is released to the outfall. This adjustment ensures that the pH is maintained between six and nine (Monaghan 1990, 17-824).

Storm water that collects in the concrete foundation basin from TA-3-25 also flows to this outfall from leaking pipe valves that were previously connected to the cooling system. May 20, 1990, a one-time release of sulfuric acid was discharged to this outfall. During this release, excess sulfuric acid was released into the neutralization tank used for treatment of boiler blowdown and demineralizer discharge. Overflow from the neutralization tank combined with cooling water and was discharged to the outfall. Low pH values were observed in a 2.5-mile section of the watercourse below the outfall. Soda ash was manually added to the entire 2.5-mile watercourse after the release. On May 23, 1990, a subsequent pH survey conducted along this section of watercourse detected no pH measurements below 6.9 (Monaghan 1990, 17-824).

In accordance with the NPDES permit, water samples are collected at the outfall based on standard parameters for industrial wastewater systems, and analyzed for total suspended solids, pH, and chlorine (EPA 001, pp. V1 - V9, 1986, 17-719).

SWMU 3-045(c) is an outfall identified by NPDES permit number EPA 03A027 and is located approximately 110 ft east of SWMU 3-012(b) (outfall EPA 01A001). This outfall only receives effluent from cooling tower TA-3-285 which serves the generators powering the Laboratory computer system (LANL 1993, 17-926). Currently the Laboratory monitors and reports flow rate, total suspended solids, chlorine, pH, and total phosphorus for this outfall.

Both outfalls SWMU 3-045(b) and SWMU 3-045(c) may have received intentionally applied chemicals prior to being NPDES permitted. These chemicals were used to inhibit corrosion and algae growth in the cooling towers, as well as for cleaning purposes. Chromium-based water treatment chemicals were used from June 1956 until approximately 1970. At the time of the initial site visit, there was no evidence of damaged vegetation or staining in the vicinity of either outfall (LANL 1993, 17-926).

5.27.2 Investigation Summary

SWMUs 3-045(b) and 3-045(c) were evaluated during the summer 1994 investigation of the sanitary treatment system aggregate. The sampling and analysis plan presented in Subsection 5.5 of the July 1993 RFI Work Plan for OU 1114 described the investigation rationale, sampling approach, and laboratory analyses implemented to characterize SWMUs 3-012(b), and 3-045(b,c) (LANL 1993, 1090). The investigation involved characterization of the power plant outfall through the collection and analysis of five sediment samples for PCBs, Appendix VIII metals, SVOCs, VOCs, pesticides, herbicides, and radionuclides. The RFI work plan originally called for two samples to be collected from SWMU 3-012(b) at the outfall; however, an additional three samples were collected approximately 25 ft to 50 ft downstream from the outfall. Data from these samples will be used to characterize these SWMUs and results will be documented in future RFI reports for OU 1114.

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Executive Summary

Chapter 1
Introduction

Chapter 2
Background Information

Chapter 3
Environmental Setting

Chapter 4
Technical Approach

Chapter 5
Evaluation of PRS Aggregates

Chapter 6
PRSs Recommended for No Further Action or Deferred Action

Annexes

Appendixes

Chapter 6

RFI Work Plan (1993)

- Potential Release Sites Recommended for No Further Action or Deferred Action
- Module VIII-listed PRSs Recommended for No Further Action or Current RCRA Facility Investigation
- Non-listed Module VIII PRSs Recommended for No Further Action or Deferred Action

Addendum 1

- The PRS Has Never Been Used for the Management of RCRA Solid or Hazardous Wastes or Hazardous Substances
- No Release Has Occurred From the Unit to the Environment
- The Site is Regulated or Closed Under a Different Authority That Addresses Corrective Action
- The PRS Has Been Characterized or Remediated in Accordance with Current Applicable State or Federal Regulations, and Available Data Indicate That Contaminants of Concern Are Not Present or Present In Concentrations That Pose An Acceptable Level of Risk

6.0 PRSs RECOMMENDED FOR NO FURTHER ACTION OR DEFERRED ACTION

According to proposed Subpart S of 40 CFR 264, a potential release site (PRS) can be recommended for no further action (NFA) if it can be demonstrated that the unit poses no threat to human health or the environment (EPA 1990, 0432). The Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan for Operable Unit (OU) 1114 contained 77 PRSs that were proposed for NFA (LANL 1993, 1090). A PRS is either a solid waste management unit (SWMU) or an area of concern (AOC). Addendum I to that work plan contains 167 PRSs proposed for NFA based on the new Los Alamos National Laboratory (LANL) criteria (Table 6-1) (Environmental Restoration Project 1995, 1173). One PRS is proposed for deferred action (DA). Rationale for the following NFA recommendations is based on archival information and field investigations and is included following each PRS history unless a common rationale can be used. The PRSs are aggregated according to type of unit and include both active and inactive units. Figures in Appendix E are location maps of PRSs described in Chapter 6.

TABLE 6-1

NFA CRITERIA[a]

CRITERION	SUBSECTION	DESCRIPTION
1	6.4.1	The PRS has never been used for the management of RCRA solid or hazardous wastes or hazardous substances.
2	6.4.2	No release has occurred from the PRS to the environment.
3	6.4.3	The site is regulated or closed under a different authority that addresses corrective action.
4	6.4.4	The PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and available data indicate that contaminants of concern are either not present or are present in concentrations that pose an acceptable level of risk.
Deferred action	6.4.5	PRS is active with no credible off-site pathways.

[a]"Los Alamos National Laboratory - No Further Action Criteria," Environmental Restoration Project 1995, 1173.

Subsection heading numbers are continued from the RFI Work Plan for OU 1114 (LANL 1993, 1090). Table 6-11 contains summary information for each PRS including Hazardous and Solid Waste Amendments (HSWA) status, the subsection in which it is discussed, the criterion used for evaluating candidacy for NFA or deferred action (DA), and the rationale within that step.

6.4.1 PRSs Recommended for NFA Under Criterion 1

PRSs that have never been used for the management of RCRA solid or hazardous wastes or hazardous substances are recommended for NFA under Criterion 1. Also included in this criterion are duplicate PRSs addressed elsewhere in Addendum 1 or in the 1993 RFI Work Plan for OU 1114, and PRSs that cannot be located or are nonexistent. The aggregates addressed in this subsection are listed in Table 6-2.

TABLE 6-2

CRITERION 1 AGGREGATES

SUBSECTION	SUBSECTION HEADING
6.4.1.1	**Non-RCRA Hazardous Wastes/Substances**
6.4.1.1.1	Asphalt Batch Plant
6.4.1.1.1.1	Asphalt Emulsion (85-100 oil) Storage Tanks
6.4.1.1.1.2	Gasoline Tanks
6.4.1.1.1.3	Outdoor Storage Areas
6.4.1.1.1.4	Storage Sheds
6.4.1.1.1.5	Asphalt Emulsion and Road Construction Debris as Landfill
6.4.1.1.1.6	NPDES Permitted Outfall
6.4.1.1.1.7	Deferred Action: Active PRSs with No Credible, Off-Site Pathways
6.4.1.2	**Radioactive only**
6.4.1.3	**Incorrectly identified or nonexistent**
6.4.1.4	**Duplicate PRSs**

6.4.1.1 PRSs Never Used for the Management of RCRA Hazardous Wastes or Hazardous Substances

The PRSs listed in this subsection have never been used for the management of RCRA solid or hazardous wastes or hazardous substances.

C-3-001 consists of two gas trap manholes. One manhole is located at the southeast corner of building Technical Area (TA) 3-1498, the Data Communications Center. It was installed in 1987 and consists of a manhole and two 8-in.-diameter vent pipes which protrude from either side of the manhole (Griggs 1993, 17-850). The other gas trap manhole is designated structure TA-3-1872. It is at the southwest corner of TA-3-28, an office building. There is an inverted U-pipe welded to the vent pipes so that it points toward the ground and prevents rainwater and airborne debris from entering. The pipes are connected to the communication cables duct banks that enter the building below surface grade and serve as a fresh air supply to personnel working in the duct banks.

Rationale for Recommendation: The gas trap manholes were used to provide ventilation for personnel in the duct banks. This site has never managed RCRA hazardous waste.

C-3-004 is identified as a construction debris pile 15 ft x 15 ft located northwest of TA-3-66, the Sigma Building (LANL 1990, 0145). The pile accumulated in this area in 1987 when a machine shop was added to the building. The materials noted were scrap metal, wood, an old battery, and an empty one- or two-gallon kerosene can. The debris was removed by the contractor when construction of the machine shop was completed in 1988 (Lab Job #7910-03).

Rationale for Recommendation: The debris pile designated C-3-004 did not involve the management of RCRA hazardous waste or constituents. The area containing the construction debris was cleaned and all materials were removed in 1988 when the addition to the building was completed. A visual inspection of the area indicates no stains or other signs of release.

SWMU 3-009(i) is a debris area located east of the Liquid and Compressed Gas Facility, TA-3-170. The SWMU Report states that the area contains concrete, asphalt, electrical cable, metal, vitrified clay pipe, and a large

mound of soil (LANL 1990, 0145). According to an official from Johnson Controls Environmental, the debris pile is residue from modifications and reconstruction of buildings in the immediate vicinity of TA-3-170, and contains only uncontaminated materials such as tuff, concrete, rock, and other construction-related items (Griggs 1993, 17-841). Use of this debris site discontinued in 1980 (Chacon 1995, 17-1258).

SWMU 3-009(j) is described in the SWMU Report as a soil fill area located west of TA-3-142, a warehouse (LANL 1990, 0145). The fill area is located under the parking lot for the Wellness Center, TA-3-1663. The soil fill area is documented to contain only uncontaminated construction debris such as tuff, concrete, rock, and other construction-related items (Griggs 1993, 17-841; Air Force photograph 1958, AF58-25-5).

Rationale for Recommendation: SWMU 3-009(i), a debris area and SWMU 3-009(j), a soil fill area, are recommended for NFA because they have never been used for the management of RCRA hazardous waste or constituents. Additionally, interviews with site workers clearly indicate that the units managed only construction debris (Griggs 1993, 17-841).

SWMU 3-011 was a rinsing station consisting of a spigot and a reinforced concrete pad, structure TA-3-101. The station was used to wash and rinse empty carboys with water from a nearby spigot and fire hydrant. The carboys had once contained toluene, nitric acid, or sulfuric acid (LANL 1993, 17-921; LANL 1993, 17-931). The washing platform was built in 1956 and is located 100 ft southwest of TA-3-31, a chemical warehouse. The drainage pattern from structure TA-3-101 trended southward under Mercury Road then behind the security fence where it joins a prominent storm water drainage that discharges into Twomile Canyon. The carboy washing practice ceased in 1980.

Rationale for Recommendation: Because the carboys were empty before being washed and rinsed, it would be highly unlikely that any appreciable amounts of toluene, nitric, or sulfuric acids would be found associated with the concrete pad or the drainage channel. Furthermore, there is no visual evidence of staining.

SWMU 3-016(a) includes a 1 000-gal. precast fiberglass septic tank, TA-3-1484, and associated seepage pit, TA-3-1667. The tank was installed in 1984 and served TA-3-130, the calibration building. TA-3-130 has always been used to calibrate instruments for the detection of radioactive contamination. The seepage pit is located northeast of the building. According to the Weston Report performed during the RCRA Facility Assessment (RFA), the septic tank received only sanitary waste from the lavatory (LANL 1992, 17-582). The building manager confirmed that no radioactive waste entered the sewage system, only domestic waste (Eisele 1995, 17-1257). The seepage pit, TA-3-1667, was installed in 1986 and was connected to the septic tank by an overflow pipe. Prior to the installation of the pit, the overflow was discharged to a leach field or was pumped out regularly (LANL 1989, 17-018). According to engineering records, in 1992 the septic tank and seepage pit were abandoned in place when the sanitary sewer became routed to the sanitary waste system consolidation pipeline (SWSC). See rationale for PRSs 3-016 (a-d).

SWMU 3-016(b) is a 1 000-gal. precast fiberglass septic tank, structure TA-3-272, located 60 ft from the southeast corner of TA-3-271. This building stored equipment to be salvaged. According to resident employees, no chemicals were stored in TA-3-271 (Buksa 1994, 17-1104). The tank was installed in 1966 and served the lavatory in the building. In 1971 a lift station was installed, structure TA-3-693, approximately 360 ft south of the building. The plumbing changes consisted of abandoning in place the line from the building to the tank and then connecting a sewer line directly from the building to the lift station (Engineering drawing ENG-C 41463). Given the date of installation for the lift station, it is assumed the septic tank was abandoned in place in 1971. See rationale PRSs 3-016 (a-d).

SWMU 3-016(c) is a 500-gal. septic tank, structure TA-3-79, that served only the lavatory in TA-3-70, the parks and refuse office. This building was used as the Roads and Grounds scale house and office building operated by The Zia Company from 1954 to 1971. The tank discharged to a small drain field directly south of the building (LANL 1994, 17-1172). Engineering drawing ENG-C 41486 shows a sanitary sewer cleanout at the approximate location of septic tank TA-3-79, and an eight-inch concrete sanitary waste line extending from the cleanout toward the southeast to a pump/lift station.

Available records do not confirm that the septic tank was removed after TA-3-70 was connected to the sanitary sewer system in 1971. See rationale PRSs 3-016 (a-d).

SWMU 3-016(d) is listed as a septic pit in the SWMU Report (LANL 1990, 0145). The SWMU is actually a sanitary lift station, TA-3-1638, that serves the university house, TA-3-443 (Engineering drawing ENG-C 44762). The building is used to welcome foreign visitors and dignitaries. The sewer line from this lift station leads to the TA-3 wastewater treatment plant.

Rationale for Recommendation: SWMUs 3-016(a,b,c,d) have all been exclusively used for domestic sewage. The septic systems described above are not associated with structures that contained, stored, or used RCRA hazardous waste or constituents and are, therefore, recommended for NFA.

SWMU 3-019 is a septic tank, TA-3-15, that measured 4 ft x 9 ft x 5 ft and is listed in the SWMU Report as having once served the Van de Graaff Facility, TA-3-18 (LANL 1990, 0145). The tank is listed in engineering records as follows: "Not used approximately in January 1951 at the time the sewer line was completed." According to engineering records, construction of the three buildings that compose the Van de Graaff Facility (TA-3-16,-17,-18), were completed between 1951 and 1952. In 1952 the sanitary sewer lines from the building were connected with the main sewer line; which indicates that the septic tank was only used during the first year of construction and not used once the facility began operations (ENG R 115, 5103). In 1964 building addition activities included removal of septic tank TA-3-15 and renumbering the three buildings as one facility, TA-3-16 (Engineering drawings ENG-C 7384, 7389, 7398, and 4700).

Rationale for Recommendation: Records indicate that the tank was abandoned before construction was completed on the building. In addition, sanitary lines were installed from the building to the main sewer line, which is routed to the wastewater treatment plant. Therefore, it is concluded that the tank did not receive hazardous waste or constituents prior to its removal.

SWMU 3-038(e) is a drain line from a sink at TA-3-65, the radiological materials storage building, that connects the sink to the industrial waste line running to TA-50. In 1987 to 1988, approximately one gallon of potassium

hydroxide (KOH) and one gallon of sodium hydroxide (NaOH) mixed with hundreds of gallons of water were discharged into the drain (Watanabe 1994, 17-1162). During this time, experiments in TA-3-65 involved bombardment of neutrons in polymer plastic. Potassium hydroxide and sodium hydroxide were applied to the plastic in order to visually track the neutrons. Approximately 50 to 100 ml (2 to 3 oz) of KOH or NaOH were used in each experiment (Watanabe 1994, 17-1162). Currently, the sink is active and is also used as an emergency eyewash station.

Rationale for Recommendation: This SWMU is recommended for NFA because the small, dilute quantities of potassium hydroxide and sodium hydroxide do not exhibit the corrosive characteristics of RCRA hazardous waste as described in 40 CFR 261.20, Subpart C. The sink that transported the liquid waste was discharged to the industrial waste line and was then routed to TA-50.

SWMU 3-040(a) is a vault located in TA-3-30 used for staging shipments. The vault is designated as room 124 and is part of the main receiving bay, room 131. TA-3-30 was built in 1952 and the vault was constructed at that time. There is no history of chemical storage. According to an employee of the building since 1976, the vault has always been used for the purpose of staging shipments which at one time included rolls of used film in plastic bags. The bags of film were placed in wooden crates pending shipment to Albuquerque for silver recovery . The frequency of shipments was approximately four times per year (Buksa 1995, 17-1254).

What else?

Rationale for Recommendation: SWMU 3-040(a) is recommended for NFA because no hazardous waste or constituents were stored in the vault. There have been no known releases inside the vault. There are no floor drains in room 124; therefore, no pathway to the environment exists.

SWMU 3-045(e) is an inactive outfall from a floor drain in an oil pump house, TA-3-57, located at the Steam Plant, TA-3-22. One line from each diesel storage tank, TA-3-26 and TA-3-27, pass through the pump house to TA-3-22. The pump house contained valves to operate each line and allow the flow of diesel fuel from either one or both of the storage tanks. The drain was in place to prevent the pump house from filling with diesel fuel should a rupture or leak occur at the valve junction. A site worker, who has worked

at the plant for 14 years, stated that there have been no known releases of oil going down the drain and that there have been no ruptures at the valve junction (Sobojinski 1995, 17-1266). He also noted that the drain had been plugged in 1989. The drain line outfall area has a concrete apron where the drainpipe discharges. This drainpipe was also plugged in 1989. During a site visit in August 1993, the concrete apron had minimal staining; however, it is believed to be from organic matter (LANL 1993, 17-927).

Rationale for Recommendation: SWMU 3-045(e) is recommended for NFA because there is no history of releases from the valve junctions inside the pump house. In addition, during the 1993 site visit no staining was observed near the floor drain, inside TA-3-57, that would suggest historical releases.

SWMU 3-045(f) is an inactive outfall from a sink drain that served TA-3-223, the Utilities Control Center, from 1950 through the late 1980s. The sink was used as a quench tank for welding and cutting operations. Because the sink only contained water to cool the welded piece of metal, no leaching of metals is possible. The outfall was located on the north side of the building and emptied into Sandia Canyon. The area is flat and shows no signs of erosion from the discharge. There were no known releases of hazardous waste or constituents to the sink and its outfall (LANL 1993, 17-903).

Rationale for Recommendation: Building TA-3-223 did not handle or manage hazardous waste or constituents. No known contaminants were associated with use of the sink; therefore, there is no reasonable basis to suspect contamination of the outfall area.

SWMU 3-045(h) is the outfall area at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of cooling tower TA-3-187. The outfall area is designated National Pollutant Discharge Elimination System (NPDES) Environmental Protection Agency (EPA) 03A024 and is permitted to discharge treated cooling water from the 6 000 gal. cooling tower, TA-3-187. TA-3-187 serviced operations in the northern portion of TA-3-35. Constructed in 1953 TA-3-187 was inactive from the late 1980s and was reactivated in early 1995.

Water in the cooling tower basin is circulated through two water-to-water heat exchangers in series. The high quality chilled water is used to cool high temperature furnaces. Routine treatment of the water began in 1968 to keep the tower, basin, and slats operating successfully (LANL no date, 17-1259). The treatment involved biocides and fungicides to reduce algae growth and chelating agents, such as ethylene diaminetetraacetic acid (EDTA), to inhibit corrosion (Radzinski 1995, 17-1260).

The area at the outfall pipe consists of a small drainage approximately three feet wide and six feet long. Presently, both the treated cooling tower water and storm water runoff drains into a corrugated metal storm drainpipe that trends northeast. The storm drain emerges east of TA-3-187 within a small drainage. There the effluent combines with additional storm water runoff from the surrounding areas. The drainage continues southward and joins a large channel north of Eniwetok Drive that ultimately drains into Sandia Canyon (LANL 1993, 17-902).

Rationale for Recommendation: Only storm water runoff, addressed by ESH-8, and cooling water were ever released at this outfall; thus, no RCRA hazardous wastes were used. Because cooling tower TA-3-187 had no history of chromate use and the outfall is NPDES permitted, SWMU 3-045(h) is recommended for NFA (LANL 1993, 17-930).

SWMU 3-045(i) is described as an outfall from floor and sink drains at TA-3-34, the Cryogenics Building. Engineering drawings clearly show the drains discharging to the sanitary sewer system through manhole TA-3-66 (ENG-C 17676, 17679, 17618). The suspected outfall is a runoff pipe draining storm water from a parking lot into the ditch on the south side of Eniwetok Drive, north of building TA-3-34 (LANL 1993, 17-934).

Rationale for Recommendation: SWMU 3-045(i) is not associated with hazardous wastes or constituents and was incorrectly identified in the SWMU Report. The outfall was storm water runoff from a parking lot and is therefore recommended for NFA.

SWMUs 3-049(c and d) The active outfall from the steam condensate pits (the north and south tanks) is located on the east side of the Sigma Building, TA-3-66. The pits are open and collect rainwater. The steam lines have been active since 1959 and continue to discharge to the ground. The steam is completely contained within the pipes and presents no potential for contamination (LANL 1993, 17-897).

Rationale for Recommendation: The outfall only discharges steam condensate and collected rainwater or storm water runoff. Because there are no RCRA hazardous wastes or constituents associated with these condensate pits, SWMUs 3-049(c and d) are recommended for NFA.

SWMU 3-055(a) is an active outfall from roof and floor drains located approximately 50 ft south of TA-3-16 and has been in operation since 1952. According to engineering drawings, the outfall pipe is a six- to eight- inch pipe with a filter screen that discharges to Twomile Canyon. The Wastewater Characterization Report indicates that the pipe collects water from roof drains and one floor drain in generator room 68 (LANL 1992, 17-861).

Rationale for Recommendation: There is no evidence of staining in the outfall area. Because no RCRA constituents are located in the generator room, there is no source of contamination to this outfall.

SWMU 3-056(j) is listed in the SWMU Report as an outdoor storage area containing compressors and gasoline for the compressors west of TA-3-473, a transportable office building, south of the Physics Building, TA-3-40 (LANL 1990, 0145). During a site visit in May 1994 there was no visible sign or documentation that compressors or drums of gasoline had ever been stored or spilled or leaked at this location. According to the Geoengineering (EES-4) Group Leader responsible for the area, the storage was used approximately four years during the late 1980s for satellite dishes and scaffolding. Other items stored in the area included a rack with pipes, conduit, electrical cable, and fuse boxes (Watanabe 1994, 17-1156).

Rationale for Recommendation: This SWMU is recommended for NFA because the storage area was not used to manage RCRA hazardous waste.

SWMU 3-056(l) is an outside storage facility described in the 1990 SWMU Report as a drum storage area on the east side of TA-3 in SM 141 (LANL 1990, 0145). It is immediately adjacent along the northeast side of the building. According to 1988 site inspection by Roy F. Weston Inc. personnel, drums containing Beryllium trash were staged on the east side of TA-3-141 prior to disposal. According to the HSE representative for the Sigma Complex, the actual contents of drums were disposable clothing contaminated with Beryllium powder. At times, there also may have been carboys for Beryllium powder in water. The carboys were usually in a tray for secondary containment even though the waste was nonregulated and nonhazardous. (Sobojinski 1995, 17-1270)

Rationale for Recommendation: This SWMU is recommended for NFA because it never handled or managed RCRA hazardous wastes or constituents. Beryllium powder from this process is nonregulated and is a nonhazardous waste. In addition, there is no history of releases from the drums or carboys in to the environment.

SWMU 3-056(m) is an area outside TA-3-322 once used for drum storage. TA-3-322 is a supply building located southeast of the Physics Building, TA-3-40. The entire area is surrounded by concrete sidewalk and asphalt. According to the assistant building manager for TA-3-40, there was only one drum stored in the vicinity of TA-3-322. He stated that the area contained one open-topped drum and a pressed-board box on the northwest corner of the facility; both were used to collect general trash from the surrounding area. While it is unknown exactly how long the drums were located near TA-3-322, it has been estimated to be since the early 1970s (Griggs 1993, 17-866). The leakage from the drum noted during the site reconnaissance visit was from rainwater that collected in the open containers and drained through holes in the base of the drum. The containers were removed in 1989 (Griggs 1993, 17-866).

Rationale for Recommendation: The drum storage area contained only general trash with no source of contamination. SWMU 3-056(m) is being recommended for NFA because no hazardous wastes or substances were associated with the area.

SWMU 3-057 is an inactive grease trap located 10 ft southeast of TA-3-100, a former cafeteria. The grease trap was installed in 1956 and is 2 ft wide by 3 ft long by 2.5 ft deep and constructed of 6-in. rebar-reinforced concrete walls. Contrary to the SWMU Report, the grease trap has no structure number. Water containing grease from the kitchen drained into the grease trap. There the grease was separated from the water through three grease filters, which were removed and replaced periodically to prevent clogging; the remaining liquid went to the sanitary sewer. Manhole TA-3-688 was constructed in 1968 as more structures required sanitary sewer drain service. This structure number was incorrectly identified in the SWMU Report as the grease trap (LANL 1990, 0145). The grease trap has been inactive since 1981 when the new cafeteria became active in the Otowi Building, TA-3-261.

Rationale for Recommendation: The grease trap that served the cafeteria was not used for hazardous waste and is therefore recommended for NFA.

6.4.1.1.1 Asphalt Batch Plant

The Asphalt Batch Plant aggregate consists of many PRSs all located in the immediate vicinity of the plant. All but one PRS is proposed for NFA, SWMU 3-001(i) described in Chapter 5, Subsection 5.20 of Addendum 1. The PRSs are in close proximity to the Asphalt Batch Plant and fall into all four criteria outlined in Subsection 6.0. There is one PRS associated with the asphalt batch plant described in another subsection of Chapter 6 because the rationale for NFA was more appropriate for that PRS (e.g., a sanitary septic tank). The other 23 PRS locations, descriptions, and functions are more clearly pictured when presented as part of the day-to-day operations of an asphalt (and decommissioned concrete) batch plant, and are therefore described below, subdivided by the same criteria outlined in Subsection 6.0.

The Asphalt Batch Plant, TA-3-73, was moved from a location near the airport to the complex southwest of the Physics Building in 1953, and then to its present location in the northeast corner of TA-3, at the southeast corner of East Jemez Road and Diamond Drive (ENG-7 building records). The plant began operations at this new location in May 1961. An office building, TA-3-70, was built directly northeast of the batch plant in July 1954 to house Zia Company Roads and Grounds maintenance staff. Zia Company

was the Laboratory's maintenance contractor from 1946 through 1986. Currently, Johnson Controls World Services, Inc. (JCI) is the maintenance contractor in charge of this operation.

Operations associated with the maintenance of the Laboratory's roads and grounds includes the following: (see Fig. 6-1 for operation and SWMU location).

- Operation of the Asphalt Plant
- Operation of the Concrete Plant (decommissioned in 1979; removed in 1987)
- Fuel and sealer loading area
- Sand and gravel storage and distribution
- Temporary storage of pesticides (moved in 1988 to Sigma Mesa; old storage site addressed in 1993 RFI Work Plan)
- Maintenance of small gasoline-powered motors

The roads and grounds maintenance is a large task. The area for storage of maintenance equipment such as snowplows, backhoes, and trenching equipment alone encompasses about a 200 sq ft parking lot. Other assorted sheds are filled with smaller equipment for cutting grass and weeds, preparing signs, or patching potholes. In addition to all the items needed to keep up the grounds, repair of roads and parking lots is ongoing. JCI runs a small batch plant to produce asphalt on site for road and parking lot repairs.

A typical scenario for asphalt batch production and usage begins with bulk aggregate, including various sizes and grades of gravel and sand stored on site, passed through a dryer to remove moisture, and then placed into the pugmill. Liquid 85-100 asphalt emulsion stored in a heated aboveground tank [SWMUs 3-036(a,c,d,e) and 3-043(a,b,d,f,g,h)] adjacent to the batch plant is then pumped into the pugmill and mixed with the aggregate. Before loading the asphalt into trucks, dump trucks are sprayed with a thin coating of diesel fuel #2 (kerosene was used until 1989) to prevent sticking [SWMU 3-036(b)], and then transported to the job site.

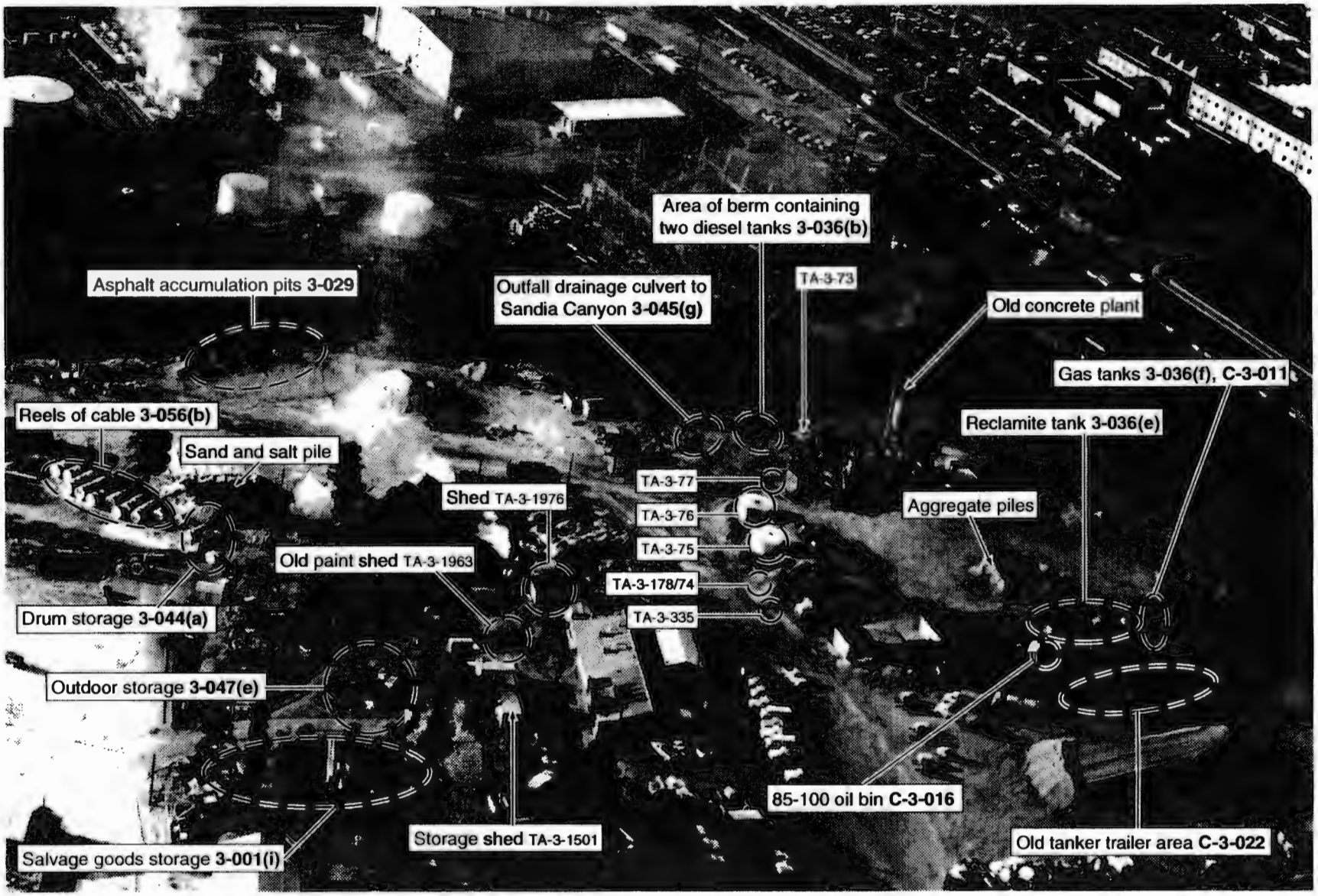

Photo: Asphalt Batch Plant 1983, RN83-124-50

Fig. 6-1. Asphalt Batch Plant operations and PRS locations.

While the asphalt batch is being prepared, the oil distributor truck is filled with heated asphalt emulsion (85-100 oil). This oil is applied to the paving surface to ensure that the asphalt adheres to the surface before the asphalt is applied. After the dump truck has delivered the asphalt, it is again sprayed with a small quantity of diesel fuel #2 to remove residual asphalt. Diesel fuel (kerosene was used prior to 1989) is also used to clean the applicator on the oil distributor truck. Residual oil from the distributor and diesel fuel are also collected in a small, partially buried metal bin at the batch plant (AOC C-3-016).

Materials known to have been used in asphalt batch operations include: aggregate, asphalt, asphalt emulsion, asphalt cement, asphalt rubber, diesel fuel #2, and asphalt crack sealer. In 1989, diesel fuel #2 replaced kerosene, which had been used to coat asphalt dump trucks and clean the oil distributor truck from the mid-1970s. Components of these materials include asphalt, petroleum hydrocarbons, water, and light distillates (kerosene), which make up the majority of the PRSs at this site and are not considered hazardous. Most of the PRSs in this aggregate are being proposed for NFA under Criterion 1, the PRSs were not used for the management of hazardous wastes or substances. In addition, many of the sites have never had a release to the environment. Each grouping of PRSs by criterion, has a rationale for NFA following the write-up, as listed in Table 6-3.

TABLE 6-3

PRS NUMBER AND DESCRIPTION

PRS NO.	DUPLICATE PRS NO.	STRUCTURE NO.	DESCRIPTION	CRITERION
3-029	3-029(b)	NA[a]	Landfill	1
3-036(a)	3-043(d,h)	TA-3-75 TA-3-76	20 000-gal. asphalt emulsion tank	1
3-036(b)		None	(2) 25-50-gal aboveground diesel tanks	DA
3-036(c)	3-043(f)	TA-3-178	30 000-gal. asphalt emulsion tank	1
3-036(d)	3-043(g)	TA-3-335	10 000-gal. asphalt emulsion tank	1
3-036(e)	Add from 1993	None	Asphalt storage tank	1
3-036(f)		None	500-gal. gasoline tank	1 and 2
3-043(a)		TA-3-74	20 000 -gal. asphalt emulsion storage	1
3-043(b)		TA-3-77	10 000-gal. asphalt storage tank	1
3-043(d)	3-036(a)	TA-3-75 TA-3-76	20 000-gal. asphalt emulsion tank	1
3-043(f)	3-036(c)	TA-3-178	30 000-gal. asphalt emulsion tank	1
3-043(g)	3-036(d)	TA-3-335	10 000-gal. asphalt emulsion tank	1
3-043(h)	3-036(a)	TA-3-75 TA-3-76	20 000-gal. asphalt emulsion tank	1
3-044(a)		NA	Drum storage	1
3-045(g)		EPA 04A109	NPDES outfall	3
3-047(b)		TA-3-1501	Metal storage shed for road repair materials	1
3-047(c)		NA	Outdoor storage area for form oil and small lawn care equipment	1
3-047(e)		TA-3-1963	Decommissioned storage shed for paints	1
3-047(f)		TA-3-1976	Storage shed for small engine replacement parts	1
3-056(b)		NA	Drum and wire cable storage	1
C-3-005		NA	85-100 oil spill	3
C-3-011		None	250-gal. gasoline storage tank	2
C-3-016		None	(2) used 85-100 oil metal bins	DA
C-3-022		None	Kerosene tanker trailer	1

[a]NA = Not applicable.

Criterion 1: The PRS has never been used for the management of hazardous wastes or hazardous substances.

6.4.1.1.1.1 Asphalt Emulsion (85-100 oil) Storage Tanks

C-3-022 is the former location of a tanker trailer used to store and distribute kerosene for Asphalt Batch Plant operations. The tanker trailer was located in a bermed materials storage area on a hill directly north of the Asphalt Batch Plant. The tanker was in service for approximately 15 years and supplied kerosene through a gravity feed line that had a valve near the oil distributor tank, C-3-016, located about 12 ft south (directly below the hill) of the tanker. The tanker was maintained by the Roads and Grounds crews. JCI removed the tanker and gravity feed line in 1989 when kerosene was replaced with diesel fuel #2. There is no record of release or source of contamination associated with this storage tanker. However, the area downslope where the kerosene was dispensed is adjacent to C-3-016 an oil distributor cleanout bin, addressed in Subsection 6.4.1.1.1.7 (LANL 1994, 17-1172).

SWMU 3-036(e) is soil containing small spills from a 5 000-gal. aboveground tank in the work area near the asphalt batch plant, TA-3-70. The tank, TA-3-1969, was used for reclamite storage. During the May 1989 inspection, the tank showed no evidence of leaks, nor were there any reports of spills (LANL 1992, 17-582). The tank was emptied and removed from service in 1986 or 1987 and remains on site approximately 225 ft west of TA-3-70. The 1990 SWMU Report also noted that the reclamite storage tank had ruptured and spilled 1 500 gal. of oil emulsion in 1987 but, as discussed above, that spill was actually from tank TA-3-75 [SWMU 3-036(a)].

The reclamite storage tank was used to store heavy oil for reconditioning asphalt. Reclamite is not a TCL material, as it is solely petroleum based. The tank is currently empty and inactive. There is no visual evidence, either on the tank or on the ground around the tank, that there were ever any spills from this tank. This is corroborated by a 1989 inspection (LANL 1992, 17-582).

SWMU 3-043(a) was a 20 000-gal. underground tank, TA-3-74, installed in 1948 for the storage of asphalt emulsion (85-100 oil). In accordance with Zia Company work order #903180, the tank was removed in May 1963, cut apart, and taken to the Los Alamos municipal sanitary landfill for disposal. The tank was subsequently replaced by another storage tank, TA-3-178 [SWMU 3-043(f) of this aggregate], in 1963. The area is currently used for aggregate (sand and gravel) storage and mixing for feed to the asphalt plant. According to JCI employees interviewed, there is no record of release or source of contamination associated with the tank, and review of historic aerial photographs revealed no staining in this area (LANL 1994, 17-1172; LASL 1955, ER ID 0017011; LASL 1974, ER ID 0017267; LASL 1977, ER ID 0017869; LASL 1979, ER ID 0018923; LANL 1983, ER ID 0018925; and LANL 1986, ER ID 0018010).

SWMU 3-043(b) was a 10 000-gal. storage tank, TA-3-77, installed in 1948 and was partially buried with sand and gravel packed around the tank. In 1980 the tank was cleaned out, removed, cut apart, and taken to the Los Alamos municipal sanitary landfill for disposal. Any stained soils beneath and around the tank from routine spills were also excavated and taken to the landfill (LANL 1992, 17-582). The area is still actively used for aggregate storage and mixing for feed to the asphalt plant (LASL 1955, ER ID 0017011; LASL 1974, ER ID 0017267; LASL 1977, ER ID 0017869; LASL 1979, ER ID 0018923; LANL 1983, ER ID 0018925; and LANL 1986, ER ID 0018010).

SWMUs 3-043(f,g) are duplicates of SWMUs 3-036 (c,d) addressed in the 1993 RFI Work Plan for OU 1114 in Subsection 6.1.4.1.3.4 and reiterated here. They are described in the 1990 SWMU Report as two tanks for cooled asphalt and two tanks for hot asphalt emulsion storage (LANL 1990 0145). However, the 1987 CEARP Phase I Draft Report, Vol. 1 (DOE 1987, 0264) lists only one tank for each function, as does the report of an inspection by Roy F. Weston, Inc. personnel in 1989.

SWMUs 3-043(f) and its duplicate, SWMU 3-036(c) was a 30 000-gal. tank, TA-3-178, installed in 1963 to replace the underground asphalt emulsion storage tank TA-3-74 [SWMU 3-043(a)]. TA-3-178 was relocated from TA-49. This tank was partially buried with sand and gravel packed around it. The tank was removed in 1989, cut apart, and removed to the Los Alamos municipal sanitary landfill. Inspection revealed that they had never leaked (LANL 1992, 17-582). The area is still actively used for aggregate storage and mixing for feed to the asphalt plant.

SWMUs 3-043(g) and its duplicate, SWMU 3-036(d) were a 10 000-gal. underground steel tank, TA-3-335, installed in 1967 for the storage of asphalt emulsion (85-100 oil). The 8-ft diameter and 28-ft-long tank was located approximately 12 ft north of the asphalt emulsion tank, TA-3-178. In 1989 the tank was cleaned out, removed, cut apart, and taken to the Los Alamos municipal sanitary landfill for disposal (LANL 1992, 17-582). Inspection revealed that they had never leaked (LANL 1992, 17-582) In addition, interviews with JCI employees revealed that there is no record of release or source of contamination associated with the tank (LANL 1994, 17-1172), and no staining was observed in the vicinity of the tank in historic aerial photographs of the site (LASL 1955, ER ID 0017011; LASL 1974, ER ID 0017267; LASL 1977, ER ID 0017869; LASL 1979, ER ID 0018923; LANL 1983, ER ID 0018925; and LANL 1986, ER ID 0018010). The area is still actively used for aggregate storage and mixing for feed to the asphalt plant.

SWMUs 3-043(d,h) and its duplicate, SWMU 3-036(a) are decommissioned product tanks, structure TA-3-75, and TA-3-76 located at the Asphalt Batch Plant, TA-3-70. These SWMUs are a duplicate of SWMU 3-036(a) addressed in the 1993 RFI Work Plan for OU 1114, Subsection 6.1.4.1.3.4 (LANL 1993, 1090) and reiterated here. TA-3-75 and TA-3-76 were formerly two large, circular storage tanks located within a soil-bermed secondary containment area about 225 ft southwest of TA-3-70. The tanks were used to store asphalt emulsion. From examination of an aerial photograph (34-155) taken in 1974 and a photograph (RN 84-18839), taken in 1984, it appears that each tank was 25-30 ft in diameter and 8 to 12 ft high. Engineering records cite a capacity of 20 000 gal. Each tank was within a separate bermed containment area approximately 50 ft in diameter. The tanks were in place

as early as 1974. Operations resulted in some small spills from these tanks; however, these spills were contained within the berms. One large spill of 1 500 gal. was attributed to the reclamite tanks, SWMU 3-036(e), but was actually the result of a rupture near the base of tank TA-3-75. The spill was contained within the bermed area, mixed with sand, and deposited in the Los Alamos municipal landfill (Barnett 1987, 17-346). Between October 1988 and April 1989 both tanks were removed, cut up, and deposited in the Los Alamos municipal landfill. All soil around and under the two tanks was removed, mixed with sand, hardened, and also deposited at the Los Alamos municipal landfill (LANL 1992, 17-582). The area is currently used for storage and preparation of crack-sealing machines.

Rationale for Recommendation: The PRSs in this aggregate are proposed for NFA for the following reasons: the tanks stored product rather than waste; the tanks and contaminated soil (if any) have been removed; the area is an active site, performing the same functions as when the tanks were in use; and, the entire area will be subject to a cleanup plan when the asphalt plant is decommissioned.

Criterion 2: No Releases to the Environment

6.4.1.1.1.2 Gasoline Tanks

C-3-011 is the former location of a decommissioned 250-gal. aboveground (approximately one ft in the air) leaded gasoline storage tank on metal legs. The tank was located in a bermed materials storage area on a hill directly north of the Asphalt Batch Plant. The tank was in service for approximately ten years to fuel small equipment used by the Roads and Grounds crews. The tank was removed in 1989. According to JCI employees, there is no record of release from this storage tank (LANL 1994, 17-1172).

SWMU 3-036(f) is the location of a decommissioned 500-gal. aboveground (approximately 8 to 10 ft in the air) unleaded gasoline storage tank on metal legs. The tank was located in a bermed materials storage area on a hill directly north of the Asphalt Batch Plant. The tank was in service for approximately 10 years to fuel small equipment used by the Roads and Grounds crews. JCI removed the tank in approximately 1990. No release has occurred from the tank to the environment (LANL 1994, 17-1172).

Rationale for Recommendation: SWMU 3-036(f) and C-3-011 are proposed for NFA because these gasoline tanks did not leak and there were no releases to the environment.

6.4.1.1.1.3 Outdoor Storage Areas

SWMUs 3-056(b) and 3-044(a) are located on a 30 ft x 100 ft concrete pad approximately 75 ft southeast of TA-3-70, the parks and refuse office. The concrete pad is surrounded by sand piles varying from 6 to 15 ft in height. Through 1993 heavy equipment, such as forklifts, operated throughout the storage area constantly removing and adding reels of cable for storage and drums both empty (for storage) and filled, as described below.

SWMU 3-056(b) is located on the east half of the existing concrete pad and includes the surrounding area. It was used for the storage of large wooden cable spools for the Nevada Test Site testing facility (NTS) facility from the mid-1970s through 1989. In addition, drums containing sand and asphalt mixtures were stored on pallets in an unpaved, 20 sq. ft area (DOE 1987, 0264). Drums of oil saturated sand from a catch tray in a steam cleaning pit (for steaming oil and grease off equipment) were also stored here. New drums of roofing compound were also periodically stored in this area. The steam cleaning pit was decommissioned in 1990 and HSE-7 removed the drums at that time (Sobojinski 1992, 17-643).

The west portion of the pad SWMU 3-044(a), was used by the Roads and Grounds Crew for the storage of drums of waste diesel fuel, kerosene, and oil emulsion prior to pickup for recycling by Mesa Oil, Inc. of Albuquerque. The only drum that remained after 1993 was one 55 gal. drum used as a satellite storage area (an asphalt berm was placed around a 6 ft square area on the concrete), and now even that is gone.

No staining was observed during site visits or from historical aerial photographs of the area where the pad is located (LASL 1955, ER ID 0017011; LASL 1974, ER ID 0017267; LASL 1977, ER ID 0017869; LASL 1979, ER ID 0018923; LASL 1979, ER ID 0018923; LANL 1983, ER ID 0018925; LANL 1986, ER ID 0018010; LANL 1994, 17-1173).

SWMU 3-047(c) is an outdoor fenced yard used since the mid-1970s to store concrete forms and small pieces of equipment, e.g., lawnmowers. Form oil (a light lubricating oil used to prevent concrete from adhering to the metal forms) was stored in 55-gal. drums in this yard until 1990. The yard is not paved and small oil stains were visible under some of the small pieces of equipment stored in the yard during several site visits conducted by ER Project personnel in 1993 and 1994. According to JCI employees interviewed, there is no record of any spill or source of contamination associated with the storage yard other than the small drips from the lawn care equipment (LANL 1994, 17-1172).

Rationale for Recommendation: SWMUs 3-047(c), 3-044(a) and 3-056(b), are proposed for NFA because there are no known releases from the drum storage and the small amount of 10W-30 motor oil released into the environment from forklifts and lawn mowing equipment is not considered a hazardous wastes, or a threat to the environment (Unocal 1992, 17-1253).

6.4.1.1.1.4 Storage Sheds

SWMU 3-047(b) is a corrugated metal storage shed, TA-3-1501, with a plywood floor. The shed was constructed in the 1970s and is used for nonhazardous materials storage including patching compound for filling potholes, crack sealant for asphalt roads, stucco for patching exterior walls, and de-icer. According to the JCI Roads and Grounds employees interviewed, there is no record of any release to the environment or source of contamination associated with the shed (LANL 1994, 17-1172).

SWMU 3-047(e) is the former location of a small storage shed, TA-3-1963, with a plywood floor located directly east of TA-3-70, the parks and refuse office, and TA-3-1501, a storage trailer. The shed was constructed in the 1970s and removed in the late 1980s. It was used by Roads and Grounds crews to store small quantities of paints and related materials. The site is a flat grass-covered area with no evidence of staining or vegetation stress (LANL 1994, 17-1172).

SWMU 3-047(f) is a mobile metal storage shed, TA-3-1976, with a plywood floor also known as a Morgan™ shed. In 1987 the shed was placed approximately 100 ft south of TA-3-70, the parks and refuse office, and is actively being used for storing engine and replacement parts for equipment used by JCI. No hazardous materials were observed in the shed during site visits conducted by ER Project personnel in 1993 and 1994. JCI employees interviewed stated that hazardous materials have not been stored in the shed (LANL 1994, 17-1172).

Rationale for Recommendation: SWMUs 3-047(b,e,f) are proposed for NFA because the sheds were never used for the management of hazardous waste or constituents.

6.4.1.1.1.5 Asphalt Emulsion and Road Construction Debris as Landfill

SWMU 3-029 was incorrectly listed as SWMU 3-029(b) in the 1993 RFI OU 1114 Work Plan. It is a 30 x 70 ft, inactive landfill located about 300 ft south of TA-3-271 near the rim of Sandia Canyon. The 1986 CEARP survey team noted several inches of liquid in an unlined pit marked "asphalt and sealer accumulation point" (DOE 1987, 0264). Pits of this type received excess asphalt and clean-out from the asphalt plant and were later covered with sand. This disposal practice continued for some time; similar pits line the edge of Sandia Canyon. When one pit was full, a new pit was constructed (LANL 1990, 0145). These fills raised and leveled the surface areas at the rim of the mesa. Debris at the PRS appears to be pieces of asphalt, each piece less than 1 ft square (Griggs 1992, 17-753).

November 2, 1990, the New Mexico Environmental Improvement Division (NMEID) issued LANL a Notice of Violation concerning pieces of asphalt and an oily sheen found in the Sandia Canyon watercourse below TA-3-73. These items meet the definition of refuse and the New Mexico Water Quality Control Commissions Regulations prohibit disposal of refuse in a watercourse. The pieces of asphalt and oily sheen resulted from disposal of residual asphalt, oil emulsion, and kerosene in small depressions as described above (NMEID 1990, 17-1195).

November 27, 1990, LANL submitted a corrective action plan to NMEID that was subsequently approved December 12, 1990. Cleanup of the drainage and outfall, and stabilization of the landfill area was initiated in early 1991 and continued through early 1993. The corrective action included removing old pieces of asphalt within the drainage and on the associated slope, regrading the entire watercourse and slope to support vegetation, extending the culvert from the storm drain [SWMU 3-045(g)] approximately 50 ft down the drainage, constructing a concrete berm to prevent additional exposure of asphalt buried in the fill, and seeding and maintaining dense grass cover on all fill slopes and disturbed areas.

June 12, 1992, the New Mexico Environmental Department (NMED) (previously NMEID) issued LANL a letter stating that the corrective actions taken by the Laboratory for the cleanup of the asphalt in the Sandia Canyon outfall was unsatisfactory (LANL 1992, 17-1196). LANL further discussed the general concept for the cleanup, re-engineering, and construction of the outfall and downstream area with NMED, and the time schedule to complete the task. The tasks were completed in 1993. The re-engineered slope has been seeded, however new growth (an integral part of the plan) is slowly taking root. (Williams 1992, 17-1198; Tiedman 1992; Tiedman 1992, 17-1199).

Additionally, water samples were collected from the storm drain and the results indicate that oil, grease, or other compounds typically associated with asphalt plant operations were not present (Nielsen 1991, 17-968).

On September 18, 1992 a memorandum from David Vackar, NMED Director of Environmental Protection Division, was sent to the NMED Solid Waste Bureau stating the division's policy on the use of clean concrete and asphalt for fill. NMED has taken the position that concrete and asphalt used for fill constitute beneficial reuse of the materials and can, under certain conditions, be exempted from the definition of a solid waste facility and not subject to solid waste permitting and operational requirements. It appears more beneficial to allow the use of concrete and asphalt for fill purposes rather than requiring disposal at a landfill. Such material can have a significant

adverse impact on a landfill's capacity (NMED 1992, 17-836). See reference in Attachment A, Chapter 6 .

Because excess asphalt and asphalt emulsion from road resurfacing operations are what has been placed in the pits, along with other road construction/demolition debris, such as concrete, concrete with rebar, and culvert pieces, and the corrective action required by NMED has been completed, this PRS is being proposed for NFA. NMED closed out this site on October 20, 1993 with a conditional approval for water monitoring if erosion or tar reappear in the outfall (NMED 1993, 17-1234). See reference in Attachment A, Chapter 6.

Criterion 3: The site is regulated or closed under a different authority that addresses corrective action.

6.4.1.1.1.6 NPDES Permitted Outfall and One Time Release to the Outfall

SWMU 3-045(g) is storm drain and an NPDES-permitted outfall (EPA 04A109) which discharges to Sandia Canyon directly south of the Asphalt Batch Plant, TA-3-73. The storm drain noted in the 1990 SWMU Report has been closed and locked since late 1990 (LANL 1990, 0145); this was confirmed during site visits conducted by ER Project personnel in 1993 and 1994 (LANL 1994, 17-924). Until 1960, kerosene was liberally applied to the truck beds prior to loading them with asphalt. Excess kerosene and asphalt residue were washed to the storm drain. Presently, small amounts of diesel fuel are misted on the trucks with a one gallon Hudson™ sprayer to clean them. The diesel is then collected in a tank (AOC-C-3-016) and recycled. Since 1987 the only intentional discharge from the asphalt plant to the outfall is from two filter ponds used to collect dust from batching operations. Storm water from parking lots, roadways, and roof drains west of the batch plant is also discharged to the outfall.

Other releases to Sandia Canyon just below this outfall are the one-time release which was reported as an area of concern, AOC C-3-005, and erosion of asphalt into the canyon from surface disposal practices addressed as SWMU 3-029 above.

C-3-005 is an oil emulsion spill associated with SWMU 3-045(g) that occurred in August 1986 when cleaning an asphalt oil distributor truck with kerosene to remove excess asphalt and oil. The tank valve on the truck was accidentally opened resulting in a discharge of oil emulsion and residual kerosene that flowed through the storm drain [SWMU 3-045(g)] and into Sandia Canyon. After the spill occurred, oil was noted in the stream and absorbent booms were placed across the stream to prevent the spread of oil. An earthen berm was then constructed across the drainage channel and the oil was removed using absorbent pillows, vermiculite, and skimmers. Approximately 30 drums of the oil /water mixture were filled. The cleanup was stopped when it was determined that the channel below the pooled oil area was oil-free. Drums of oily water, vermiculite and adsorbent pillows were taken to a disposal site at the Los Alamos airport (LANL 1986, 17-394).

Immediate corrective actions were taken by Pan Am World Services, Inc., the maintenance contractor at the time of the spill, (contractor from 1986-1991) to prevent a similar release (LANL 1986, 17-394)

Rationale for Recommendations: C-3-005 and SWMU 3-045(g) are recommended for NFA due to the extensive cleanup (1986 and 1991-1994) and re-engineering (1993-1994) that has taken place near the storm drain and down the entire outfall drainage area (cleanup associated with SWMU 3-029)(LANL 1992, 17-1196; LANL 1992, 17-1197; Williams 1992, 17-1198; Tiedman 1992, 17-1199). In addition, C-3-005 was the result of a one-time release that was cleaned up immediately after it occurred. Furthermore, 1991 sample results from water collected from the storm drain after remediation/cleanup of asphalt in the storm drain, were less than the minimum detection limit of 2 mg/L for total petroleum hydrocarbons in water (Nielsen 1991, 17-968).

6.4.1.1.1.7 Deferred Action: Active PRSs With No Credible, Off-Site Pathways

C-3-016 is an oil distributor cleanout bin with a hinged lid. The metal bin measures approximately 4 ft wide x 16 ft long x 3 ft deep, and is buried so that the top is flush with the ground surface. According to JCI Roads and Grounds staff, the tank was installed in the mid-1970s (LANL 1994, 17-1172). It contained used asphalt emulsion (85-100) oil, the oil applied to

roads before application of asphalt. Aerial photographs from the 1970s and early 1980s and subsequent site visits by ER Project personnel show extensive stains in the immediate vicinity of the oil distributor cleanout bin (LASL 1974, ER ID 0017267; LASL 1977, ER ID 0017860; LASL 1979; ER ID 1128923; LANL 1983, ER ID 0018925; LANL 1984, ER ID 0018929; LANL 1986, ER ID 0018010; LANL 1991, ER ID 0018135). This resulted from splashing of oil emulsion, kerosene, and diesel fuel #2 during cleaning of the oil applicator equipment, and the re-depositing of residual oil from asphalt paving operations into this bin for recycling. Within the last eight years (late 1980s) the area around the oil distributor tank was dug up and new fill, (sand and gravel) was put in around the bin; however, staining still occurs because the asphalt distributor machine rollers, when sprayed off, drip residue onto the gravel surrounding the tank as well as into the tank.

SWMU 3-036(b) consists of two, small #2 diesel fuel aboveground storage tanks (25- to 50- gal. capacity) surrounded by a 3-ft soil berm located 100 ft west of TA -3-73. Diesel fuel from the small tanks is applied to dump truck beds prior to asphalt loading to prevent sticking. An aboveground metal catch basin located adjacent to the east side of the berm collects residual diesel fuel from the truck beds. Before 1989, kerosene was stored in theses tanks and applied in the same fashion to truck beds to prevent asphalt from sticking. Historical aerial photographs reveal no visible staining in the area. Minor, periodic drips and splashes from the tanks create dark stains just under the top layer of loose gravel, however; JCI Roads and Grounds staff stated there is no record of release from these tanks (LANL 1994, 17-1209).

Rationale for Recommendation: Deferred action is recommended for SWMU 3-036(b) and AOC C-3-016 because they are active sites used in the day-to-day operations of road maintenance. Further action will be taken when the roads and grounds operations are decommissioned or moved to another area.

6.4.1.2 PRSs with only a Radionuclide Component

The PRSs described in this subsection do not involve hazardous wastes as defined by RCRA. This aggregate contains areas that are/were for radioactive material storage and are not subject to RCRA regulations and are, therefore, recommended for NFA.

C-3-007 is an area of concern inside the Press Building, TA-3-35. This building, constructed in 1953, is located on Sigma Road east of Diamond Drive, across from the CMR Building, TA-3-29. According to the SWMU Report the building contains approximately 10 000 ft^2 of space, of which 3 625 ft^2 in the northern part of the building are designated as a material access area for processing uranium-235 (LANL 1990, 0145). From 1975 until 1985, this part of the building was used for fuel element production, where uranium-238, uranium-239, and graphite are used in the process. The rest of the building was used for the fabrication of cable assemblies in support of the weapons program, rack mechanics, the Meson Physics Facility, and service programs (LANL 1985, 17-1038). Storage areas for radioactive materials, mostly uranium-235, were located throughout the building. There is no record of releases from the storage areas to the environment.

Rationale for Recommendation: C-3-007 is recommended for NFA because the fuel element production area never stored RCRA materials.

C-3-008 was a storage building for nuclear materials, TA-3-164. The building is located 90 ft east of TA-3-102, the tech shops addition, and southwest of TA-3-29. TA-3-164 was constructed in 1963 for storing sealed canisters of radioactive material, mostly uranium, in 55-gal. drums. In 1993 TA-3-164 was emptied of all material and is now being decontrolled. Decontrolling the building consists of surveying the entire building, identifying areas of contamination, and cleaning. All contamination identified during surveying will be cleaned to acceptable levels (Buksa 1994, 17-1109).

Rationale for Recommendation: TA-3-164 has never contained RCRA waste or constituents and has no history of radioactive releases. There is no floor drain in the building and no liquids were stored that could have caused a potential release.

Storage Areas For Radioactive Contaminated Materials

The storage areas listed in Table 6-4 involve items that are radioactively contaminated. The storage areas are located in the CMR Building, TA-3-29, and have always been under administrative control with no history of releases. The PRSs in this aggregate are all contained within an active building with restricted access and no potential pathway to the environment. Furthermore, no RCRA hazardous waste has been managed at these units.

TABLE 6-4

RADIOACTIVE STORAGE AREAS IN TA-3-29

PRS NO.	LOCATION	DESCRIPTION	STATUS
3-004(a)	TA-3-29	Temporary drum storage located outside room 4041	Inactive
3-004(b)	TA-3-29	Drums stored on concrete pad inside room 2005	Inactive
3-004(e)	TA-3-29, basement of wing 4; room 4062	Drum storage for glove box waste	Active; under administrative control
3-004(f)	TA-3-29	Vault used to store calcium fluoride slag	Inactive
3-048	TA-3-29, wing 9	TRU waste canisters	Active; under administrative control
3-058	TA-3-29, wings 2, 3, 5, and 7	TRU container storage area	Active; under administrative control

SWMU 3-004(a) is an inactive temporary storage area in a basement hallway of TA-3-29. The drums were located outside room 4041 and contained radioactively contaminated paper and glass. At the time of the RFA inspection, eighteen 55-gal. steel drums were stored on a concrete pad. The waste was scheduled to go to TA-54, MDA-G once the 18 drum capacity was reached (generally 30 to 45 days). There were no known releases from the storage area (LANL 1990, 0145).

SWMU 3-004(b) is an inactive drum storage area on a concrete pad in room 2005. The drums contained radioactively contaminated paper and glass and included solids, flammable material, inorganics, and metals. No drums remain in the area (LANL 1990, 0145).

Rationale for Recommendation: The storage areas inside TA-3-29 are administratively controlled and there are no indications or documentation to support past releases from the drums.

SWMU 3-004(e) is one 55-gal. drum in wing 4 for the storage of enriched-uranium processing operation wastes. The wing 4 waste consists of glove box wastes, such as rags, paper, rubber gloves, and similar items. All potentially radioactively contaminated material is drummed as low-level waste. Drums are under the administrative control of the operating group and are picked up routinely by the Laboratory's Waste Management Group (CST-7) for disposal at TA-54 (Buksa 1994, 17-1169).

Rationale for Recommendation: The drum storage is active and consists only of solid radioactive waste with no history of containment incidents.

SWMU 3-004(f) is listed in the SWMU Report as a room in the basement of TA-3-29 where calcium fluoride slag is stored (LANL 1990, 0145). The slag was originally stored in a vault in the late 1980s, not the basement. In 1991, the slag was moved to room 4064 in the basement. Slag cylinders, 3 in. high and 6 to 8 in. in diameter are stored in paint cans inside 55-gal. drums used for secondary containment. The slag is generated by reducing uranium fluoride with calcium metal using an iodine booster. The slag is stored in the basement for future use (Buksa 1994, 17-1169).

Rationale for Recommendation: The slag is securely stored with proper secondary containment and is actively monitored. There has been no historical release (Buksa 1994, 17-1169).

SWMU 3-048 consists of twenty-five 55-gal. transuranic (TRU) waste canisters inside a remote-handled hot cell in wing 9, located in the south wing of the building. The waste contains primarily metal TRU waste and plastic pending shipment to TA-54 and eventually the Waste Isolation Pilot Plant (WIPP) (Buksa 1994, 17-1169).

Rationale for Recommendation: The hot cells in wing 9 are completely contained units with no pathway to the environment. There has been no release of hazardous or radioactive waste (Buksa 1994, 17-1169).

SWMU 3-058 is described in the SWMU Report as TRU container storage areas within TA-3-29 (LANL 1990, 0145). Approximately two or three 55-gal. drums are located in the utility corridors between the laboratories in wings 2, 3, 5, and 7. Typically, the temporary accumulation areas store combustible and noncombustible waste such as gloves, tissues, rags, laboratory plastic ware, and broken laboratory equipment (Buksa 1994, 17-1169). The container storage areas are under administrative control with no history of releases. The waste is placed in separate plastic bags inside each drum. Full drums are moved to the basement rooms 5070 and 5072 and accounted for daily. Prior to being removed from the building enroute to TA-54, radiation levels of the drums are measured (Buksa 1994, 17-1169).

Rationale for Recommendation: The site did not manage or store RCRA hazardous waste. No release to the environment has occurred.

Radioactive Air Emissions

This aggregate consists of six PRSs associated with the stack emissions from the following buildings: the CMR Building, TA-3-29; the Cryogenics Building, TA-3-34; the Press Building, TA-3-35; the Technical Machine Shop, TA-3-39; the Physics Building, TA-3-40; and the Van de Graaff Facility, TA-3-16. These PRSs are aggregated because they are associated with potential soil contamination resulting from exhaust emissions at TA-3. The chemicals of potential concern (COPCs) for this aggregate include tritium, plutonium, uranium, mixed fission products, iodine, and beryllium.

The EPA requires use of CAP-88 (Clean Air Act Assessment Package-1988) or AIRDOS-PC computer models for determining compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for emissions of radionuclides at DOE facilities (40 CFR 61.93, Subpart H).

Comparisons made between the CAP-88 predictions of annual average ground-level concentration to actual environmental measurements taken by the Office of Radiation Programs indicate agreement between these two approaches. CAP-88 has been used by the LANL Radionuclide Air Emission Management (RAEM) group to determine the effective dose equivalents for NESHAPS compliance for airborne radionuclide emissions. Meteorological

data and most of the radioactive air emission data are obtained from the LANL RAEM group, and those parameters are input to the CAP88-PC model to calculate the radionuclide ground deposition from TA-3 stack releases. CAP-88 tends to overestimate radiation doses in the complex terrain around Los Alamos because it does not take into account dilution of airborne radionuclides by terrain-induced turbulence.

CAP88-PC uses a modified Gaussian plume equation of Pasquill to estimate the average dispersion of stack-released radionuclides. In the CAP88-PC calculation, all the stacks from SWMUs 3-050 (a,b,c,d,e,f,g) are considered as one point source of radioactive air emissions due to their geographic locations. Additionally, all radioactive air emissions are assumed in the form of particulates. Heavier annual precipitation, slower stack gas exit velocity, lower mixing height, and lower stack height of one meter were used instead of the actual parameters in the CAP88-PC calculation to ensure conservative results. The release height of the stack is the sum of the stack height and the plume rise. The plume rise is calculated based on momentum of the exit gas at ambient temperature. Meteorological data collected at TA-6 (the nearest meteorological station) and Los Alamos population data were used for the CAP88-PC calculation.

Air concentration, dry deposition rate, wet deposition rate, and ground deposition rate of radionuclides in 16 directions at various distances around the stack were computed. The ground deposition rate is the highest deposition rate, and therefore represents the most conservative radionuclide deposition scenario. For this reason, it is used to calculate the emission necessary to cause the radioactivity concentration in soil to exceed screening action level (SAL). Soil density of 1.8 g/cm^3, and 0.1 cm of soil mixing depth were employed to estimate the total emission necessary to cause the radioactivity concentrations in soil to exceed current SALs.

Available annual data on the total known radioactive releases from the associated stacks range from 2 to 40 years. To ensure conservative results, the actual data were normalized in the calculation to show the potential radioactive air emission within 40 years of operation. These values are shown below in Table 6-5.

TABLE 6-5

RADIOACTIVE AIR EMISSION SUMMARY

RADIONUCLIDES	RADIOACTIVE AIR MISSION WITHIN 40 YEARS OF OPERATION (Ci)	ESTIMATED VALUE TO TRIGGER SOIL SALS[a] (Ci)
Tritium	360 000	4.8×10^9
Plutonium-238 and -239	0.081	7.6×10^3
Uranium-235 and -238	0.0081	5.7×10^3
Mixed fission products	0.0067	2.8×10^3
Iodine-129/-131	0.025	8.7×10^2
Beryllium	---[b]	---[b]

[a] Based on 0.1 cm of soil mixing depth.
[b] No report on TA-3-40 is available; no beryllium data were found; however, in 1955 2 air samples and 14 swipe tests showed negligible amounts of beryllium.

These radioactive releases are at least four orders of magnitude lower than the minimum radioactivity necessary to cause soil contamination exceeding SALs (Radian 1993, 17-1192).

In addition, actual data from preliminary soil screening results in locations surrounding TA-3 from 1991 through 1993 show alpha, beta, and gamma activities at background levels (Fresquez 1993, 17-787; Fresquez 1991, 17-498; Fresquez 1991, 17-259; Fresquez 1992, 17-241; Fresquez 1992, 17-1026).

The individual PRSs are described below.

SWMU 3-050(a) is the PRS attributed to emissions from 24 active exhaust stacks located at TA-3-29. TA-3-29 was built in 1952 as a multi-story laboratory building consisting of six interconnected wings. Wing 9, an addition to TA-3-29 in 1961, houses an irradiated-fuel examination facility. The other wings house various research and development and analytical chemistry operations. These operations involve handling radioactive materials containing uranium, plutonium, iodine, mixed fission products, and tritium. High efficiency particulate air (HEPA), Aerosolve 95™ fabric, and charcoal filters have been used to remove radioactive particulates from the stack effluent (Balo 1982, 17-435). TA-3-29 is currently undergoing a complete ventilation systems upgrade of all wings.

Radioactive air emissions from the stacks at TA-3-29 are monitored and documented (Stafford 1980, 17-969; LANL 1994, 17-1008). Available radioactive air emissions data show that approximately 0.081 Ci of plutonium-238 and -239, 0.0032 Ci of uranium-235 and -238, 0.0032 Ci of mixed fission products, 0.008 Ci of iodine-131, and 11 000 Ci of tritium were released from TA-3-29 between 1953 and 1992 (LANL 1994, 17-1028).

A Technetium-99 stack release in 1991 contaminated two laboratory rooms and the associated ductwork for the exhaust system in wing 1 (LANL 1994, 17-1135). Soil samples under and outside the wing 1 first floor vent were surveyed immediately after this release and the results showed no detectable activity (LANL 1994, 17-1137).

SWMU 3-050(b) is the PRS attributed to emissions from exhaust stacks located at TA-3-34. Construction of TA-3-34 was completed in April 1955. Active tritium work was carried out in this building until 1984. In July 1986, the tritium effluent stack was shut down because all tritium and tritium handling systems were removed. Radioactive air releases have been documented and the available data show 28 000 Ci of tritium were released from TA-3-34 from 1976 through 1985 (Goosney 1986, 17-918).

SWMU 3-050(c) is the PRS attributed to emissions from exhaust stacks located at TA-3-35. TA-3-35 was constructed in 1954 as part of the Sigma Complex and was used to manufacture enriched uranium-loaded graphite and carbide fuel elements. In November 1991, TA-3-35 was declared surplus or inactive due to lack of funds for facilities, equipment, and security upgrades (Mitchell 1991, 17-254). Small amounts of tritium were also handled in this facility (Enders 1973, 17-177). Available radioactive air emissions data show 260 μCi of uranium-235 were released from TA-3-35 from the 1960s through 1992 (LANL 1994, 17-1028).

SWMU 3-050(d) is the PRS where soil contamination may have occurred as a result of emissions from the exhaust system (specifically the air pollution control device, a shaker type baghouse) located at the south side of TA-3-102. TA-3-102 is fenced off to maintain security, and radiation signs are posted to indicate that the building is a facility contaminated with radioactivity, specifically low-level concentrations of uranium (LANL no date, 17-424).

TA-3-102 was built in 1957 specifically for machining radioactive materials, namely uranium-235 and -238. Machining of lithium hydride started in the 1970s and was associated with the uranium work for the Rover Program reactor fuel rods.

Because of the pyrophoric characteristics of uranium, it has been machined while submerged in oil (LANL 1993, 17-999; LANL 1986, 17-003). The oil not only prevents uranium from causing a fire when exposed to the atmosphere but also acts as a primary air pollution control device to minimize uranium graphite particulates from entering the exhaust system. The baghouse was used as a secondary air pollution control device to remove uranium graphite particulates in the gas stream to the stack (Enders 1973, 17-177). However, lithium hydride, also pyrophoric and explosive, has been machined dry. The baghouse was the primary air pollution control device to remove lithium hydride particulates in the gas stream to the stack. In addition, small amounts of metals have also been machined in this building on occasion (LANL 1993, 17-999). However, no routine machining of these other metals occurred.

The baghouse (also known as the lithium hydride exhaust system) was installed when TA-3-102 was built, and it is situated on a concrete pad south of TA-3-102. The operation of the baghouse ceased in 1992 due to a failure in the dioctyl phthalate penetration test which measures the efficiency of the collection system. All ventilation ducts associated with machining operations were then diverted to a high flow rate ventilation system connected to an operational baghouse located east of the inactive baghouse. The inactive baghouse is scheduled to be decommissioned, possibly in FY95. HEPA filter banks are planned to be installed in TA-3-102 for air pollution control measures (LANL 1993, 17-999).

Radionuclide air emissions at the currently inactive baghouse stack were monitored from the beginning of its use, and available data showed a total release of 580 µCi of uranium-235 and -238 (LANL 1994, 17-1028). Normalizing the available data to 37 years of building operations, the total release of uranium-235 and -238 is calculated to be 890 µCi. The EPA-approved CAP88-PC Gaussian model was then used to determine the ground deposition of radionuclides, and results indicate a minimum of

5.7×10^3 Ci of uranium-235 and -238 would be necessary to cause soil contamination exceeding SALs (LANL 1994, 17-1031). Therefore, no contamination from routine radioactive air emissions from the baghouse is in excess of SALs.

Release of radioactive uranium particulates to the concrete pad through the inactive baghouse fabric filter has also been documented. These releases include a uranium spill due to a leak at a weld joint of the ventilation system (LASL 1966, 17-122). Accumulation of lithium hydride particulates on the fabric filter may have caused spontaneous combustion and burned a hole on the fabric filter, thus allowing particulates to escape (LANL 1992, 17-625 and LANL 1993, 17-999). The concrete pad underlying the inactive baghouse was later painted to immobilize any existing uranium particulates (LANL 1991, 17-292). Radiological survey results showed no detectable activity on the concrete pad or on the soil around it (LANL 1994, 17-1129).

Rationale for Recommendation: NFA is proposed for SWMU 3-050(d) because no potential pathway for migration of uranium has been identified based on existing data. In addition, due to the high reactivity with water to form lithium hydroxide and the pyrophoric characteristic of lithium hydride, any spill of lithium hydride to the ground would no longer be present.

SWMU 3-050(e) is the inactive filter unit located on the east side of the machine shop, TA-3-39. This filter unit was used from 1953 until 1993 and was used to remove grinding particulates containing tool steels, carbide, and carborundom grinding wheel residue. The grinding residue, which was not hazardous, was collected in a 55-gal. barrel located at the exhaust end of the collector (Buksa 1995, 17-1255).

SWMU 3-050(f) is emissions from exhaust stacks located at TA-3-40. Beryllium foil was made in room S-118 in the mid-1950s. Air samples and wipe tests were taken during the operation period. The results showed negligible amounts of beryllium (Shipman 1955, 17-062). In the 1960s beryllium windows were cleaned with acetone or other solvents in room E-116. The cleaning solvents were then allowed to evaporate in the hood. Beryllium residue was put into a special container, and then removed by the janitor (Toca 1969, 17-155). Tritium work in the calibration laboratory in room W-10 has caused 0.67 Ci of tritium to be released from the stack since

1986 (LANL 1994, 17-1028). Laser experiments employing inert gases, e.g., argon, nitrogen, and helium-neon, as lasting media have also been conducted. High molecular weight, nonvolatile laser dyes are used in the laser experiments, but no airborne chemicals are released from the experiments.

SWMU 3-050(g) is the PRS attributed to tritium emissions from exhaust stacks located at the Van de Graaff Accelerator Laboratory, TA-3-16. Tritium work has been carried out in TA-3-16 since 1951. Tritium was used in ion sources to accelerate the beam and was sometimes used as aiming targets (Buksa 1995, 17-1256). The available radioactive air emissions data show 14 000 Ci of tritium gas were released from the laboratory from the 1960s through 1992 (LANL 1994, 17-1028).

Rationale for Recommendation: No further action is proposed for this SWMU aggregate based on the following reasons: preliminary soil screening results show no contamination exceeding SALs; CAP88-PC calculation for these emissions indicates that the emissions were not sufficient to cause radioactive deposition in excess of SALs; these areas of suspected soil contamination from the stack emissions were not the sites of hazardous waste management; and these areas were incorrectly designated as SWMUs based solely on the potential presence of radioactivity.

6.4.1.3 PRSs Incorrectly Identified or No Longer Exist

The PRSs described in this aggregate were either incorrectly identified as SWMUs or nonexistent during investigation.

C-3-019 is identified as an underground storage tank (UST) for petroleum product located north of the Van de Graaff Facility, TA-3-16. No UST was found during the 1989 or 1993 ER Program site reconnaissance visits. There is no indication of a vent or fill pipe that would suggest a UST on engineering drawings (ENG-R 8005, 8008, 8010) or aerial photographs (LASL photo RN84-188103). The only structure located in the area of concern is a steam manhole.

SWMU 3-001(l) is reported to be a less-than-90-day storage area southeast of TA-3-316, the Relativis Electronic Beam Facility. According to the satellite accumulation records and a former ENG-5 waste coordinator employed

during the 1980s, no such storage area existed (Buksa 1994, 17-1181). TA-3-65 is located directly east of TA-3-316. During the 1989 Weston site reconnaissance a storage area was noted west of building TA-3-65, the source storage building, and labeled as an "HSE drum storage area" (LANL 1992, 17-582). It is believed the area found during the Weston investigation in June 1989 was, in fact, the temporary drum storage area for the Relativis Electronic Beam Facility. Three 55-gal. drums were found, yet the contents are unknown. In October 1989 the approximate location of the storage area was graded and paved with concrete. Presently, there are five transportable buildings TA-3-2006, -2007, -2008, -2009, -2010 that sit on the concreted area (Lab Job 10262-3).

Rationale for Recommendation: The exact location of SWMU 3-001(l) was never identified and cannot be found; however, even if there were releases from the drums, the contaminated soil would have been removed or redistributed during construction (Buksa 1994, 17-1181).

SWMU 3-008(a) is listed in the SWMU Report as a decommissioned firing site located at the original South Mesa Site (LANL 1990, 0145). The area once housed a production shop, storage building, hutments, and magazines and was used to manufacture and test detonators. Memoranda document what appears to be several firing areas on South Mesa that were in use in 1943 (DOE 1987, 0264). After reviewing engineering drawings and aerial photographs, the old South Mesa Site would have been located near the current intersection of Diamond Drive and Jemez Road (Engineering drawing A5-R38). The site is no longer discernible.

Rationale for Recommendation: With the development of TA-3, in addition to several construction projects in the area, no high explosives (HE) contamination would be expected.

SWMU 3-025(a) is described in the SWMU Report as an oil trap sump connecting a steam cleaning drain from the shops in TA-3-34 to the industrial waste line (LANL 1990, 0145). The SWMU Report incorrectly identifies this PRS as an oil trap sump. There is, in fact, no such sump between the drain lines in the only shop at TA-3-34 and its drains to the industrial waste line (Bohn 1989, 17-883; Engineering drawing ENG-C 17680).

Rationale for Recommendation: SWMU 3-025(a) is recommended for NFA because it is nonexistent.

SWMU 3-055(c) is identified as an outfall located north of the fire station, TA-3-41. During a site visit, no outfall was observed, only a storm water drainage channel. Engineering drawings do not indicate any type of drain or outfall northeast of the building. The drainage channel had previously been sampled by EM-8 personnel as an interim action associated with the Industrial Partnership Center at TA-3. Samples were screened for gross alpha, beta and gamma radioactivity, VOCs, SVOCs, polychlorinated biphenyls (PCBs), and heavy metals; only a SVOC and heavy metals were detected and were below EPA action levels. There were no RCRA hazardous waste constituents in levels high enough to be considered a health and safety problems (Fresquez 1993, 17-787).

Rationale for Recommendation: No outfall exists in the location identified in the SWMU Report.

SWMU 3-055(d) is described as an outfall pipe directly north of TA-3-59, a large sanitary waste lift station west of the fire station, TA-3-41. The pipe was initially thought to be an overflow from the lift station, but after inspection, no such pipe exists. Furthermore, lift stations do not have associated outfall piping (LANL 1993, 17-898).

Rationale for Recommendation: No outfall pipe exists at the location identified in the SWMU Report.

6.4.1.4 Duplicate PRSs

This subsection consists of PRSs that are duplicates of other units addressed elsewhere in Addendum 1 or in the RFI Work Plan for OU 1114 (LANL 1993, 1090).

C-60-004 is listed as a decommissioned tank located near TA-60-1. This tank is being addressed as C-60-001 under Subsection 6.4.3.1.

C-61-001 is listed as an active PCB storage area at TA-61-23 (LANL 1990, 0145). This AOC is actually a duplicate of 61-001, an inactive PCB storage area at TA-61-23 that was addressed in the RFI Work Plan for OU 1114, Subsection 5.10 (LANL 1993, 1090).

SWMU 3-001(u) consists of two satellite accumulation areas located inside buildings on Sigma Mesa. The storage areas were addressed in the RFI Work Plan for OU 1114 SWMU 60-001(c) in Subsection 6.2.2.1 (LANL 1993, 1090).

SWMU 3-005 is described in the SWMU Report as a container storage area on Sigma Mesa (LANL 1990, 0145). This SWMU was renumbered during the update of the 1988 SWMU Report and is now listed as SWMUs 60-004(a,b,c). These PRSs were addressed in the RFI Work Plan for OU 1114 in Subsection 6.1 and Subsections 5.8 and 5.9, respectively (LANL 1993, 1090).

SWMU 3-006(a) Is identified as a burning area, TA-3-12, built in 1945 and removed in 1949. This SWMU has been renumbered to SWMU 61-003 and was addressed in the RFI Work Plan for OU 1114 in Subsection 6.2.1.2 (LANL 1993, 1090).

SWMUs 3-016(e,f) are listed as septic pits located northwest of TA-3-1616 and TA-3-1617, transportable office buildings. Engineering drawing ENG-C 44762 shows that the pits are actually a single lift station, structure TA-3-1639. The lift station was addressed as SWMU 3-014(s) in the RFI Work Plan for OU 1114 in Subsection 5.5.1.1.6 (LANL 1993, 1090).

SWMU 3-030 was a temporary earthen pit used to contain water flushed from the chilled water system of TA-3-66, the Sigma Building. This SWMU is a duplicate of SWMU 3-012(a) addressed in the RFI Work Plan for OU 1114 in Subsection 6.1.4.1.3.2 (LANL 1993, 1090).

SWMU 3-045(d) is an aboveground storage tank located at the Power Plant, TA-3-22. This SWMU was addressed as SWMUs 3-014(q) and 3-012(b) in the RFI Work Plan for OU 1114, Subsection 5.5.1.1.2 (LANL 1993, 1090).

SWMU 3-049(e) is identified in the SWMU Report as possible soil contamination from an outfall pipe of unknown origin located south of the Sigma Building, TA-3-66 (LANL 1990, 0145). During a site visit in 1992, an outfall was located approximately 100 ft southeast of TA-3-66. This outfall was addressed in Subsection 6.1.4.1.3.2 as SWMU 3-012(a) of the RFI Work Plan for OU 1114 (LANL 1993, 1090). SWMU 3-049(e) is a duplicate of SWMU 3-012(a).

SWMU 3-056(e) is generically described as waste storage facilities at the Cryogenics Buildings, TA-3-32 and TA-3-34. This SWMU is a duplicate of both SWMU 3-001(j) and SWMU 3-001(n) addressed below in Subsection 6.4.3.5.

SWMU 3-056(f) is described in the SWMU Report as a waste storage facility located at TA-3-316, the high voltage test facility (LANL 1990, 0145). SWMU 3-056(f) is listed as drum storage west of the building. This SWMU was formerly SWMU 3-001(n). SWMU 3-001(n) was then renumbered to SWMU 3-001(l) addressed below in Subsection 6.4.1.3.

6.4.2 PRSs Recommended for NFA Under Criterion 2

Criteria 2 includes PRSs that have no history of releases to the environment. This criterion also includes PRSs completely contained in a building with no route to the environment. The aggregates addressed in this subsection are listed in Table 6-6

TABLE 6-6

CRITERION 2 AGGREGATES

SUBSECTION	AGGREGATE
6.4.2.1	Industrial Waste Line
6.4.2.2	Storage Units
6.4.2.3	Tanks/pits/sumps
6.4.2.4	Miscellaneous PRSs

6.4.2.1 Industrial Waste Line Aggregate

The following PRSs are associated with the industrial and radioactive liquid waste line system and have no pathway to the environment.

SWMU 3-025(b) is described as two oil traps (sumps), one active and one inactive, in the basement of the tech shops addition, TA-3-102. Water with low-level radioactive oils from the TA-3-39 steam cleaning room is first discharged to an oil/water separator located outside the south side of the room [see SWMU 3-025(c)]. After the water and oil are separated, it is passed through the active, above-floor sump allowing the oil to collect in the trap while water is discharged to the radioactive liquid waste line via piping that goes through the old, below-floor sump.

One of the sumps sits below-floor in a concrete pit, and one is a metal tank sitting at floor level in a concrete berm. The sump below floor level is 36 in. long x 24 in. wide x 30 in. deep and consists of a 0.25-in.-thick welded steel container in a concrete pit. The new, active floor-level sump is a welded steel container approximately 40 in. long x 24 in. wide x 30 in. deep with a detachable steel cover sitting in an 8-in. deep concrete berm secondary container. The nonradioactive liquid wastes from an oil/water separator serving the steam-cleaning room in the tech shops, TA-3-39, flow into the oil trap(s) in TA-3-102. A white steel pipe ties into the pipe that goes from the floor-level sump to the below-floor-level sump.

Rationale for Recommendation: SWMU 3-025(b) is being recommended for NFA because the sumps are contained within an active, restricted access building with no pathways to the environment. All connecting lines associated with the sumps go to the industrial waste treatment plant at TA-50. Administrative Requirement (AR) 10-1, Radioactive Liquid Waste, states that the flow through all industrial waste lines can be measured and leaks anywhere in the lines can be detected from TA-50 (LANL 1992, 0333). There have been no known releases from SWMU 3-025(b).

SWMU 3-025(c) is identified as a concrete oil/water separator installed in 1963 outside the south side of the steam cleaning room at the TA-3-39 tech shops. Liquid waste from steam cleaning oil, grease, and solvents from newly machined pieces drained directly to the radioactive liquid waste collection system before the oil/water separator was installed. Steam cleaning liquids have not been discharged for the last three to four years; however, the operation could be utilized at any time in the future. The SWMU Report states that this oil/water separator overflowed in the past; this statement is incorrect (LANL 1990, 0145). The oil/water separator has a bypass pipe that goes directly to the radioactive liquid waste collection system installed in 1989, Lab Job 10050-03, (Drawing # C45667). If oil in the separator is at capacity, an alarm light is activated. Then, if the oil is not manually suctioned off into barrels, the wastewater goes directly into the radioactive liquid waste collection system. This has never been known to happen. The oil is collected by CST-7. There were no observable leaks in the piping inside the separator. Even if there were leaks, the concrete separator would act as secondary containment.

Rationale for Recommendation: This is a standard civil plan for a liquid waste collection system. Sample analysis of the liquid in the separator showed no detectable alpha or beta contamination. In addition, there were no releases to the environment (Sobojinski 1995, 17-1261).

SWMU 3-026(c) is identified in the SWMU Report as 11 sumps located at the base of cooling towers in TA-3-29 that received blow-down from the cooling towers (LANL 1990, 0145). The SWMU Report is incorrect in identifying these structures as sumps. SWMU 3-026(c) is actually aboveground holding tanks in the basement of TA-3-29 that are associated with chilled water systems in wings 2, 3, 4, 5, and 7. The water chillers are on the first floor. Chilled water is piped to each laboratory for circulation in equipment. Returning water is piped to the basement where it empties into an aboveground holding tank. There are five holding tanks in each wing approximately 16 ft long and 4 ft in diameter. Adjacent to each holding tank are two pumps that recirculate the water to the chillers. There is a pipe from the tank to a floor drain connected to the industrial waste line. The tanks are designed to discharge to the industrial waste line via the floor drain if both recirculating pumps fail.

Rationale for Recommendation: SWMU 3-026(c) is being recommended for NFA because the entire chilled water system does not involve hazardous waste and there is no pathway to the environment from the basement of TA-3-29. The holding tanks are currently active and have no history of leaks.

SWMU 3-031 This radioactive liquid waste system within TA-3-29 consists of double-encased stainless steel vaults, tanks, sumps, and drain lines that discharge to the industrial waste line for treatment at TA-50 (LANL 1990, 0145).

From 1953 to 1982, operations at TA-3-29 drained liquid radioactive waste through sumps and tanks. Floor drains, air duct washwater, and, in some cases, the perchloric acid scrubber, drained into two 10 800-gal. concrete tanks and associated sumps in the basement. Engineering drawings illustrating the construction of TA-3-29 show two 10 800-gal. capacity tanks sited in the basement of each wing. These tanks are adjacent to each other and made of 6-in.-thick concrete walls. The dimensions of the tanks are 10 ft long x 6 ft wide x 6 ft high (Engineering drawing ENG-C 8006). Although

the tanks were designed as holding tanks, they were used more as a pass-through system. The valve at the bottom of each tank was always in the open position; therefore, all liquids drained directly to the radioactive liquid waste line. The tanks served as holding tanks if the inflow to the tank was a greater rate than the outflow. Liquid waste from TA-3-29 was carried through the radioactive liquid waste line to pumping station TA-3-700 and then pumped to the Radioactive Liquid Waste Treatment Facility TA-50 (LANL 1990, 0145).

The present TA-3-29 system has been in operation since 1982. Waste discharged to the sumps and tanks contains radioactive and mixed waste constituents. The tanks are expected to handle solids, liquids, gases, and sludges containing corrosives, flammables, reactives, toxics, inorganics, and metals (AR 10-1 Radioactive Liquid Waste). The liquid is directly transferred to TA-50 via the radioactive liquid waste line. According to AR 10-1, a computerized leak detection and valve control system at TA-50 monitors the lines for leaks (LANL 1992, 0333). No releases from the vaults were observed during the visual inspection in 1987 or have been reported in the past (LANL 1990, 0145).

Rationale for Recommendation: NFA is recommended for SWMU 3-031 because no releases from the vaults were observed during the inspection and none have been reported. In addition, the industrial waste system is completely contained in the building with no pathway to the environment.

SWMU 3-034(b) is an active industrial waste sump 10 ft square by 11 ft deep located on the west side of TA-3-141, the Rolling Mill Building. The concrete sump is an underground pit serving as a secondary containment for a 50-gal. tank through which process water and liquid waste flow. The liquids may contain small quantities of radionuclides, specifically uranium-238, and acid wastes which are pumped into the radioactive liquid waste line from the tank. The tank and sump secondary containment have been active since installation in the 1960s (Griggs 1993, 17-845).

Rationale for Recommendation: SWMU 3-034(b) is recommended for NFA because it is an active industrial waste line system with no history of releases. Furthermore, the sump serves as secondary containment for the 50-gal. process water tank used to transfer liquid waste to the industrial waste line.

SWMU 3-038(d) is an industrial waste line that is associated with the liquid waste treatment system. Between the 1950s and 1970s, the industrial drains from TA-3-32 and TA-3-34 connected the two buildings to the old industrial waste line, which was replaced with the new line in 1986. The new line connected TA-3-34 to TA-3-50, while the drains in TA-3-32 were connected to the sanitary sewer.

Rationale for Recommendation: This SWMU is recommended for NFA because the industrial waste line was completely removed during the LANL Industrial Waste Line Removal Project, from 1981 to 1986, and no releases were found (Watanabe 1994, 17-1097).

SWMU 3-041 is an unloading station, TA-3-1264, and is designed as a holding tank for industrial low-level radioactive wastewater. It is located in a below-grade concrete-lined vault approximately 140 ft southwest of the Sigma Building, TA-3-66. The tank itself is 15 ft long x 20 ft wide x 15 ft high, double-walled fiberglass, and has a capacity of 2 000 gal. It is corrosion-proof and has a leak detection system. The holding tank connects to the industrial waste line. The tank was installed in 1982 to serve as a holding chamber for liquid waste collected from sites that were not connected to the industrial waste line. While the unloading station is currently on active status, it has never been used. If used, TA-3-1264 would act as an introduction point for waste into the industrial waste line (Moss 1993, 17-940). The Laboratory's AR 10-1 Radioactive Liquid Waste, gives the limits of what is allowed in the collection system (LANL 1992, 0333).

Rationale for Recommendation: SWMU 3-041, holding tank TA-3-1264, is recommended for NFA because it has never been used for liquid waste of any kind. In the event it is used in the future, releases from the holding tank are unlikely because it is a completely contained system with no pathway to the environment.

6.4.2.2 Storage Units

The storage units in this aggregate were used as product storage areas with no history of systematic releases to the environment.

SWMU 3-002(d) is a drum storage area in the parking lot southeast of TA-3-40, the Physics Building. The entire parking lot, including the corner

where the drums were reported to have been stored, is completely asphalted. Discussions with the former facility manager revealed that the drums contained waste dielectric mineral oil used inside electrical power supply units (Watanabe 1994, 17-1152). The power supplies contained non-PCB mineral oil. The site worker does not recall any leakage or spills of mineral oil from the drums (Watanabe 1994, 17-1152). The drums were located in the area between 1982 and 1986. In 1986 when the experimental requirements of the associated laboratories changed, the drums were removed (LANL 1992, 17-582).

Rationale for Recommendation: There is no history of releases from the drums and no obvious stains on the asphalt to suggest historical releases. In addition, mineral oil is not a RCRA regulated substance and does not exhibit any hazardous characteristics (Penreco 1992, 17-1262).

SWMU 3-047(g) was identified by Weston as a product drum storage area consisting of three drums of acetone, one drum of vacuum pump oil, and one five-gallon can of ethylene glycol located under a canopy on the north side of TA-3-141. During the 1989 site reconnaissance survey, staining was found on the cement (LANL 1992, 17-582). During a site visit in September 1993, the building manager stated that the storage area has been used for approximately 20 years for product oil and occasionally for solvents. The 1993 site visit revealed only one drum of mineral oil stored on the pad. The mineral oil, used for vacuum pumps, is stored in drums with a hand pump inserted into the drum bung hole. As oil is dispensed, spills have been known to occur. The stains are evident on the concrete around the barrel; however, the staining does not continue off the concrete suggesting that the small oil spills had not migrated off the concrete pad (Sobojinski 1993, 17-1153).

Rationale for Recommendation: The stains present on the concrete pad are believed to be from dispensing mineral oil. Because the stains indicate that the oil did not migrate from the concrete pad, NFA is recommended.

SWMU 3-047(h) is potentially contaminated soil from a product storage area located northeast of TA-3-170, the Liquid and Compressed Gas Facility. The RFA report noted a drum storage area consisting of two 55-gal. drums, one containing trichloroethane (TCE) and the other containing vacuum

pump oil. The storage area was covered by a roof and was surrounded by an approximate 75 ft length of asphalt to the north and 100 ft of asphalt to the east. Both drums were grounded and were placed over a secondary containment drip pan most of the time (Chacon 1995, 17-1258). These drums were stored in this area from the early 1980s until 1989 (Buksa 1994, 17-1183).

Rationale for Recommendation: Because the storage area was covered by a roof, the likelihood of the any runoff entering the environment is minimal, even if a spill did occur. Secondary containment would also eliminate any potential pathways to the environment. This SWMU is recommended for NFA because no release to the environment occurred (Buksa 1994, 17-1183).

SWMU 3-047(k) is listed as potentially contaminated soil from a product storage area located at TA-3-374, the drum storage shed, west of TA-3-31, the chemical warehouse. The shed was constructed in the early 1970s and is a 90 ft long x 20 ft wide x 12 ft high structure. The area around the shed is completely covered with asphalt and serves as a parking lot. The nearest area containing soil is greater than 200 ft southwest of the parking lot. TA-3-374 housed an oil dispensing unit for new vacuum pump oil and sealed drums that contained new cleaning solvents for Laboratory-wide use.

The oil dispenser was removed, date unknown, and presently the shed contains only empty drums and equipment such as a forklift. There were no reported or documented spills, yet stains were noted on the pavement during the Weston site reconnaissance visit in 1989. Weston listed some contaminants of concern that were stored there, including a oil, trichloroethene, toluene, 2-butanone, freon, ethylene glycol, and chloroethene (LANL 1992, 17-582). The structure has no drains or any source of water (LANL 1992, 17-855).

During a site visit in April 1994, stains were present on the concrete floor of the shed; however, because no documentation exists regarding past spills, the stains are most likely from vehicular traffic or the equipment that is now stored in TA-3-374 (Buksa 1994, 17-1184).

The waste coordinator for TA-3-30, the general warehouse, and TA-3-31, the chemical warehouse, reviewed available records concerning the shed and found no spill occurrence related to TA-3-374.

Rationale for Recommendation: The area of concern did not handle or manage waste, only sealed drums of product solvent and product oil. All solvent containers were not opened and remained completely sealed while on site. TA-3-374 has no credible off-site pathways and has no history of releases to the environment.

SWMU 3-056(d) is an active drum storage area located northeast of the trickling filter, TA-3-47, at the TA-3 wastewater treatment plant and has been in use for the past 30 years. Presently there are two adjoining asphalt bermed areas measuring 25 ft long x 5 ft wide x 10 in. deep. In 1989 Weston reported six 55-gal. drums stored in the bermed area. The drums contained Regal oil, Kemzine solvent, Mulsirex solvent, 10 and 30 weight oil, and kerosene. Prior to 1989 when the berms were constructed, only barrels of lubricating oil were stored at this drum storage. The barrels were stored on pallets on the bare ground and active barrels were mounted in individual racks, with drip pans underneath (Glasco 1995, 17-1264). A site visit in 1993 revealed that only Regal oil, used for lubricating pumps for the water wells at LANL, and a partially full 55-gal. drum of 10 weight motor oil were being stored at the site. Stains were noted within the bermed area during the ER Project site visit in 1993 but none were observed on the exterior of the berm. The asphalt floor of the bermed area is covered with oil-absorbing material (Griggs 1993, 17-842).

Rationale for Recommendation: SWMU 3-056(d) is recommended for NFA because there is no evidence of staining outside the bermed area to indicate a release to the environment. In addition, if there were any spills or stains detected underneath the asphalt, they would be considered nonhazardous because only lubricating oils were stored there prior to 1989 (Penreco 1992, 17-1262).

SWMU 3-056(i) is an area used for drum storage on the east dock of TA-3-38, the JCI shops building. Weston identified a blue plastic 55-gal. drum with oil stains on the concrete dock just outside the electrical shop. According to the electrical shop supervisor who has worked at TA-3-38 for 20 years, oil stored in the drum is waste turbine oil. He stated that turbines are used in the shop to circulate water through the building. When the oil in the turbines is changed, it is temporarily stored in a drum until full and then taken to be recycled. He also stated that the waste turbine oil is very clean because it is changed frequently (Watanabe 1994, 17-1154). Small spills on the dock occurred when the drum was filled with the waste oil. The 1989 Weston site reconnaissance photograph shows staining; however, no stains had migrated more than two feet away from the drum. The drum storage is now located inside the electrical shop and the dock has been cleaned of all oil stains.

Rationale for Recommendation: The material safety data sheet for turbine oil states that it is a very inert, nontoxic/noncarcinogenic type of oil. There is no historical evidence of a release to the environment, and the amount of oil spilled during transfer was very small. The dock was thoroughly cleaned when the storage area was removed and currently poses no risk.

SWMU 3-056(n) was an outside storage area for lead waste located southwest of TA-3-379, the JCI lead shop. Lead cuttings that were too small to be useful for making lead products were put into 55-gal. drums and placed outside the shop to be picked up for recycling. The drums were staged at the storage dock only a few days before each pickup. According to the JCI shop supervisor and foreman, the storage area was active from the mid-1970s to spring of 1993. The lead shop is totally surrounded with asphalt and has been since its construction in 1972 (Griggs 1993, 17-847).

Rationale for Recommendation: The drums contained solid lead waste, kept dry and covered at all times. There is no historical record of release to the surrounding asphalt. The drum storage was well maintained and kept clean by the frequency of removal (Griggs 1993, 17-847).

6.4.2.3 Tanks/Pits/Sumps

This aggregate contains structures that were used as secondary containment systems or operated with secondary systems. These units have no history of systematic releases to the environment.

C-3-018 is a 100-gal. diesel fuel tank associated with generator house, TA-3-157, built in 1961 and removed in 1984. The tank is listed as an underground fuel tank but was actually suspended from the ceiling in TA-3-157. The generator served as backup power for the office building, TA-3-28, and was located north of the building. Prior to demolition of the generator house, the diesel tank was emptied into a fuel truck; the remaining diesel fuel was then transported to TA-3-22, where it was added to diesel storage tanks. The discarded tank was taken to the Los Alamos Municipal landfill for disposal (Sobojinski 1994, 17-1171).

Rationale for Recommendation: There is no history of releases from the tank inside TA-3-157. Because the size of the tank was only 100 gal. and it was located inside a building with no pathway to the environment, NFA is recommended.

SWMU 3-023 is an active duplex concrete sump consisting of two motors and two pumps located in the lowest level of the Sherwood Building, TA-3-105, room 10, pit "level C." Fusion experiments that used dielectric oil were performed in TA-3-105. The sump was installed in 1959 and collected water from floor drains and sinks in the basement of TA-3-105 and discharged contents to an outfall north of TA-3-207 (Engineering drawing ENG-C 20763). In 1991 the piping was rerouted to drain the sump to the sanitary sewer.

Rationale for Recommendation: The sump is completely contained inside TA-3-105 with no pathway to the environment. In addition, there is no history of leaks from the sump structure. Prior to 1991, the sump discharged water from floor drains and sinks to the storm drain located north of TA-3-207. This area was sampled in 1994 as SWMUs 3-013(a,b) see Subsection 5.9.1.1 in the RFI Work Plan for OU 1114 (LANL 1993, 1090).

SWMU 3-024 is a pump pit built of reinforced concrete with a steel and concrete cover. The pit is 19.6 ft long x 13.6 ft wide x 11.8 ft deep. The system is a closed-circuit pump unit for TA-3-141. The noncontact cooling water flows through a roof-mounted water chiller, through operating equipment in the building, and back through the pump. The unit has been active since 1962. There have been no known releases from the system (Griggs 1993, 17-844).

Rationale for Recommendation: No contaminants are associated with the pump pit because it handles only noncontact cooling water for electric furnaces. There have been no known releases from the system and because it contains a large volume of water, more than 3 200 ft^3 would have to accumulate in order for the tank to overflow (Griggs 1993, 17-844).

SWMU 3-026(b) consists of five active sump pumps in the basement of the computer building, TA-3-132. The sumps receive waste from toilets, sink drains, and floor drains. The sumps have been active since 1953 and are connected to the sanitary sewer line, which feeds to the TA-3 Wastewater Treatment Plant (WWTP). The WWTP was sampled in 1994 as SWMUs 3-014 (a-z). There are two photo processing laboratories in the building that previously emptied spent processing solutions into the drains. Wastewater was collected in the sumps and pumped to the sanitary sewer line. The spent solution contained small quantities of silver and cyanide. The amount of spent solution discharged to the sanitary sewer was 1 038 gal. per month and a total of 44 000 gal. of rinse water per month (Trezona 1991, 17-870). Currently, spill pads cover the floor drains in the rooms, and the spent solution is captured in carboys and disposed of properly.

Rationale for Recommendation: Because there is no historical documentation or evidence to suggest a release has occurred from the sumps to the environment, SWMU 3-026(b) is recommended for NFA.

SWMU 3-032 is an aboveground recirculation tank used to store water for an air scrubber system located in a paint spray booth at TA-3-38. A vacuum pulls air contaminated with paint particulate through a curtain of water. The water removes the airborne paint particulate, then recirculates through the tank. The tank is approximately 3 ft long x 2 ft wide x 3 ft deep and was used from 1953 to 1987. Periodically, the liquid in the tank was discharged to the

floor drain and into the sanitary sewer. In 1987 the practice of discharging paint spray booth wastes into the floor drains was discontinued and liquid wastes were emptied into drums and removed to TA-54 for disposal. Presently, the water is run through a filtration system that removes all the paint particulate; the filtered water is then returned to the recirculation tank.

Rationale for Recommendation: The aboveground tank designated as SWMU 3-032 periodically discharged liquid containing paint particulates into the sanitary sewer system until 1987. The filtrate was sampled in 1991 and the analyses detected compounds mainly of aliphatic hydrocarbons, oxygenated aliphatic hydrocarbons, and alkyl substituted benzenes (Nielsen 1991, 17-878).

This tank has no history of leaking; furthermore, the only pathway to the environment is through the sanitary wastewater treatment plant. The outfall from the plant has been sampled under SWMU 3-014(c2) in the RFI Work Plan for OU 1114 (LANL 1993, 1090).

SWMU 3-036(h) consists of two 4 000-gal. storage tanks for cooling water corrosion inhibitors located 50 ft east of TA-3-22, the Steam Plant. The tanks have secondary containment and have been active since 1973. The tanks contain an organic copper compound and an organic phosphate compound used as corrosion inhibitors to protect equipment (Sobojinski 1993, 17-890). The chemicals are gravity fed to water treatment house, TA-3-24, where they are mixed with the treated effluent from the TA-3 wastewater treatment plant. The effluent water is mixed with the inhibitors prior to circulation through the cooling tower.

Rationale for Recommendation: There have been no uncontrolled releases to the environment from either storage tank, nor have the tanks managed hazardous waste (Sobojinski 1993, 17-890).

6.4.2.4 Miscellaneous PRSs

C-3-009 is an active warehouse, TA-3-169, used for storing equipment, product oil, and chemicals (cyanide, stored in locked cage) for use in TA-3-66, the Sigma Building. The structure was built in 1963 and contained a staging area for equipment to be sent to salvage and a container storage area for waste oil to be picked up by CST-7. The waste oil drums have

secondary containment consisting of a polyurethane catchment basin with a grate on which the drums of waste oil are placed. There is no history of releases from the storage areas inside of TA-3-169 (Sobojinski 1995, 17-1168).

Rationale for Recommendation: The warehouse contains items for use in TA-3-66. The only RCRA concern is used vacuum pump oil and possibly cyanide if it leaked. There is no history of releases from the secondary containment or storage cage (Sobojinski 1995, 17-1168).

C-3-010 is possible remnant contamination from a decommissioned cooling tower, TA-3-19, once located 30 ft north of TA-3-16, the Van de Graaff Facility. The cooling tower was installed in 1952 and removed in 1966; a concrete slab formerly occupied by transformers is all that remains. There is no history of chromate usage or evidence of staining on the concrete slab or surrounding soil (LANL 1993, 17-930).

Rationale for Recommendation: No visible contamination can be found around the former location of the cooling tower. No further action is being proposed because this unit did not manage hazardous waste or cause a release of hazardous substances into the environment.

C-3-012 was a storage cabinet located outdoors at the southeast entrance to the filter tower for wing 3 of TA-3-29. At the time of inspection in 1989, the cabinet contained photo processing supplies, organic chemicals, and a plastic bag labeled "hot material inside" (LANL 1992, 17-582). The SWMU Report incorrectly reports the location on the south side of wing 5 (LANL 1990, 0145). The cabinet was used for temporary storage of unwanted chemicals from wing 3 prior to removal and disposal by HSE-5. The cabinet was used for only a few years and has been removed (Hoard 1993, 17-913).

Rationale for Recommendation: The storage cabinet was not used for chemical waste. Only unused chemicals from laboratories were temporarily stored in the cabinet and were picked up routinely for use elsewhere in the Laboratory. There is no evidence of past spills and no documentation exists to suggest a release had occurred. In addition, no information could be found concerning the "hot material" that was identified during the site reconnaissance survey.

SWMU 3-008(b) is listed in the SWMU Report as a decommissioned firing site in a small, indoor, high-pressure firing chamber once located in room A-3J of the Administration Building, TA-3-43, during the 1960s (LANL 1990, 0145). The room was used for hydrostatic testing of electro-explosive devices. Small-scale studies were performed in the room to check timing delays and firing characteristics. Approximately 10 explosive cartridges (squibs) were fired during the testing from 1964 to the early 1970s (Buksa 1994, 17-1160). Explosive charges consisted of squibs that contained 120 mg of diazodinitrophenol. Single devices contained a maximum 2.5 g of explosives. The high-pressure firing chamber in room A-3J is now an internal room to A-3L and is used as an office and storage (Foley 1965, 17-1102).

Rationale for Recommendation: The firing chamber was completely contained and experiments involved only small amounts of high explosives. The chamber was used during a 10-year period with no history of releases to the environment (Buksa 1994, 17-1160).

SWMU 3-027 is described as a vehicle maintenance sump at the service station, TA-3-36. Inside the building are two concrete block-lined lift wells in the floor beneath the hydraulic lifts. The lift wells collect wash water and residual oil from the floor of the vehicle maintenance bays. These lift wells do not drain directly to a sanitary system or an outfall, but are manually pumped to 55-gal. drums that are taken to the motor pool and emptied into the oil/water separator before the water is discharged to the sanitary sewer. The operation has been active since 1952 (Morris 1993, 17-956).

The SWMU Report also cites a bottle-washing operation that was conducted from 1976 to 1980 and involved cleaning new sample vials in support of the National Uranium Resource Evaluation Program (LANL 1990, 0145). The vials were immersed in a 35% concentration nitric acid bath, then triple rinsed in deionized water (Gonzales 1993, 17-911). The rinse water, which was greatly diluted because it contained only the wash water from the surface of the vials, was discharged into floor drains. The acid bath wash water was reused many times before it was discharged into the drain system. Consequently, a small volume of acidic wastewater was produced (Morris 1993, 17-956). The bottle-washing operation was active until 1980.

Rationale for Recommendation: There is no direct drainage from the lift wells in the motor vehicle shop. Wastewater and oil collected in the pits are manually pumped into 55-gal. drums, taken to the motor pool, and run through an oil/water separator before being discharged into the sanitary sewer.

Wash water and rinse water from the bottle washing operation were released through floor drains in the vehicle maintenance bay between 1976 and 1980. The floor drains discharge to storm drains. However, the volume of acidic wash water that was produced is estimated to have been very low and the rinse water, although greater in volume, was extremely dilute (Morris 1993, 17-956).

SWMU 3-040(b) was a film disintegrator once located in room A-3B in the basement of the Administration Building, TA-3-43. The disintegrator, a completely enclosed system for shredding classified film, operated from 1988 until 1991. The film pieces exited the disintegrator via a hose and were deposited into plastic bags inside a 55-gal. drum. When a certain volume was reached, the bags were sent to Phoenix, Arizona for silver recovery (Buksa 1994, 17-1182).

Rationale for Recommendation: SWMU 3-040(b) is recommended for NFA because the disintegrator was a completely enclosed system with no possibility of contamination outside the system. In addition, there was no pathway to the environment from the basement room.

SWMU 3-047(a) is listed as soil contamination from a product storage area located at the iron workers supply shed, TA-3-236 (now designated TA-61-16). The shed, donated to the Zia Company in 1965 and condemned in 1991, housed scrap iron, sheet metal, tools, and lead pigs used in the lead pouring shop, and heavy equipment repair in the 1960's. Although no liquids were stored in the building, it was noted in the SWMU Report that the wooden floor was stained, indicating a past spill that could have contaminated the soil beneath the floor. This statement is erroneous because the floor of building TA-61-16 is concrete.

Rationale for Recommendation: NFA is recommended for SWMU 3-047(a) because a wooden floor does not exist in TA-61-16 and only motor vehicle type stains were visible on the concrete floor during a site inspection.

SWMU 3-047(i) is identified in the SWMU Report as potentially contaminated soil from a product drum storage area located on the south side loading dock of TA-3-216, the Weapons Test Support Facility (LANL 1990, 0145). According to the RFA (Weston) report, stains were noted on the cement immediately around the drums but did not extend to the edge of the loading dock (LANL 1992, 17-582). At the time of the investigation, trays were under the spigot to contain any minor leaks from dispensing. The area surrounding the loading dock is completely asphalted. During a site visit in 1994, no obvious contamination was found. There were only rust rings from metal stands that held the drums.

Rationale for Recommendation: The dock area of TA-3-216 is very clean and orderly. There is no evidence of a release to the environment from the product storage area. Therefore, NFA is recommended.

SWMU 3-047(j) is identified in the SWMU Report as an inactive drum storage area located adjacent to the east dock of the Van de Graaff Facility, TA-3-16 (LANL 1990, 0145). The area is an asphalt pad approximately 8 ft long x 4 ft wide that contained two 55-gal. drums. According to a former site worker employed at the Van de Graaff Facility since the early 1980s, the drums were used to store waste mineral spirits and cutting oil from the machine shop. Nothing known to be radioactively contaminated was allowed to be machined in the shop. Apparently, the area was active for only a few years in the early 1980s. Machining operations ceased in 1987 (Buksa 1994, 17-1142).

Rationale for Recommendation: According to the machine shop supervisor, the drums of mineral spirits and cutting oil were only stored temporarily with no history of releases. While there is a small stain on the asphalt pad, it is contained in the immediate area and would not have been the result of a substantial release.

SWMU 3-051(d) is an active air compressor inside a metal shed located on the south side of the east wing of TA-3-40, the Physics Building. The shed sits on a concrete pad that abuts the asphalt parking lot. The compressor has been in operation since the building was constructed in 1953 and is only used as a power backup when the main compressor is serviced. Stains are visible directly below the compressor on the concrete pad due to small

gasket leaks inherent in the equipment. The oil has not migrated off the pad. The stain is contained with Sorb-all™ which is changed by building personnel (Watanabe 1994, 17-1163).

Rationale for Recommendation: This PRS is recommended for NFA because the oil leaks never migrated off the pad to any surrounding soil or vegetation located at greater than 200 ft. There is no documented PCB release from the compressor and no records indicating that there is reason to suspect the compressor contained PCBs at any concentration (Wechsler 1995, 17-1235).

SWMU 3-054(a) is a decommissioned outfall once associated with cooling tower TA-3-19 that was operational from 1952 through 1966. The piping was then rerouted and currently collects water from floor drains in an equipment building, TA-3-208, and blow-down from the cooling tower in TA-3-16 [SWMU 3-054(d)]. The outfall pipe could not be located but the discharge would have entered Twomile Canyon [SWMU 3-054(d)].

SWMU 3-054(d) is an active permitted outfall (NPDES permit number EPA 03A025) that releases blow-down and effluent from the cooling tower on the roof of TA-3-16 and wash water from three floor drains in the equipment room of TA-3-208. In the past, this outfall site likely received cooling tower effluent and blow-down from TA-3-19 [SWMU 3-054(a) and C-3-010]. The equipment in TA-3-208 supports the cooling system that serves TA-3-16.

Rationale for Recommendation: SWMUs 3-054(a and d) are in the same area south of TA-3-16 and are both recommended for NFA because there is no history of chromate use in the cooling towers. In addition, the facility manager who has worked at the facility since 1979, reported that there had been no chemical spills of oil, grease, or solvents in TA-3-208 and confirmed that the floor drains received only water and dirt when the floor was washed down (LANL 1993, 17-932).

6.4.3 PRSs Recommended for NFA Under Criterion 3

PRSs that are regulated, managed, or closed by Laboratory programs according to Federal and State regulations are recommended for NFA under Criterion 3. PRSs qualifying for NFA under Criterion 3 are listed in Table 6-7.

TABLE 6-7

CRITERION 3 AGGREGATES

SUBSECTION	AGGREGATE
6.4.3.1	Underground Storage Tanks
6.4.3.2	Aboveground Storage Tanks
6.4.3.3	PCB Transformers and Capacitors
6.4.3.4	National Pollution Discharge Elimination System (NPDES) Permitted Outfalls
6.4.3.5	Temporary Storage Areas

6.4.3.1 Underground Storage Tanks

In 1990, the State of New Mexico was given authority to regulate underground storage tanks (USTs). The Code of Federal Regulations, 40 CFR 281.11, provides general requirements that include corrective actions for the state's UST program implemented by the Laboratory UST Program. USTs discussed in this aggregate are subject to current state UST regulations or were covered by federal regulations prior to 1990.

C-3-015 is an active 15-year-old unleaded gasoline storage tank located 100 ft northeast of the service station, TA-3-36. The 5 038-gal. tank has not been upgraded since installation in 1980. The tank undergoes a pressurized tightness test each year, and will continue to do so until 1998, when it must either be upgraded or permanently closed under State of New Mexico Underground Storage Tank Regulations section 401: Upgrading of Existing Systems; 40 CFR 280.21; State of New Mexico Environmental Improvement Board Underground Storage Tank Regulations 801: Permanent Closure and Changes-In-Service (New Mexico Environmental Improvement Board 1990, 644); and 40 CFR 280.71. The most recent tightness test, administered in July 1994, confirmed that the tank is free of leaks (Benchmark 1994, 17-1191).

Rationale for Recommendation: C-3-015 is recommended for NFA because the tank has no history of leaks and is addressed under the State of New Mexico UST Regulations.

C-3-017 is a 55-gal. underground fuel storage tank located north of an office building, TA-3-28. Since the 1950s the tank was used to supply fuel to a backup generator. During removal in 1989, the tank was found to be empty and dry and was taken to the Los Alamos county landfill for disposal (per instructions on Engineering drawing ENG-C 45550 under Lab job 9593).

Rationale for Recommendation: This SWMU is recommended for NFA because there was no evidence of historical releases during removal.

C-3-020 consists of three decommissioned underground transformer oil storage tanks, structures TA-3-107, 3-108, and 3-109. The tanks were associated with the Sherwood Building, TA-3-105. The oil stored in these tanks was used to provide electrical insulation in various high voltage arrangements for magnetic fusion energy experiments including power supplies, spark gap switches, experimental transformers, and cable junction containers (Quinn 1994, 17-1044).

The three steel tanks were installed underground in 1957 just west of the equipment room, 161B. Tank 3-107 has a 2 000-gal. capacity and tanks TA-3-108 and TA-3-109 a 560-gal. capacity. The oil stored in these tanks may have contained PCBs because at that time nearly all insulating oil contained some quantity of PCBs. In the late 1960s and the early 1970s, non-PCB mineral oil was probably mixed in and stored in these tanks (Quinn 1994, 17-1044).

Rationale for Recommendation: The tanks have no history of leaks and were abandoned in place and filled with sand in 1978 in preparation of a building addition located over the tanks (Quinn 1994, 17-1044). Because the tanks were properly closed and pose no current threat to the environment, NFA is recommended in accordance with New Mexico UST Regulations, section 803.

C-3-021 is the location of a former 200-gal. underground fuel storage tank, structure TA-3-191, located 40 ft southeast of TA-3-18. The tank was installed in 1964 and removed in 1991. Upon removal of the tank, visual evidence and field screening analysis for total aromatic hydrocarbons (TAH) revealed that soil beneath the tank was contaminated with petroleum. Further investigation determined that the source of the petroleum release

was the associated piping. After soil excavation July 2, 1991, two soil samples (191-1, and 191-2) were collected in accordance with Appendix C, Part XII, of the New Mexico UST Regulations, and analyzed by LANL's Environmental Chemistry Group. The soil samples were analyzed using EPA SW-846, Analytical Method 8260. The soil sample analyses revealed benzene soil concentration of less than 0.005 ppm for both samples. TAH concentrations ranged from 0.099 to 2.1 ppm. State soil cleanup levels, as specified in Part XII, Section 1209 (D), are 10 ppm for benzene and 50 ppm for TAH.

Additional soil was excavated to remove remaining contamination. The final depth of the excavation was approximately eight feet below land surface. Approximately 11 yd^3 of soil were excavated and transported to LANL's TA-54 land farm for treatment. Six more samples revealed that soil contamination was below State soil cleanup levels listed above. A new diesel fuel tank was placed inside a cement vault in the former location of tank TA-3-191. The final closure report to NMED/Underground Storage Tank Bureau was submitted on February 21, 1992 (Tiedman 1992, 17-872).

Rationale for Recommendation: C-3-021 is recommended for NFA because the site underwent official cleanup and closure in 1992 (NMED 1992, 17-1244). Furthermore, no environmental threat exists to the groundwater or drinking water. See reference in Attachment A, Chapter 6 .

SWMU 3-043(i) is a 35-gal. fuel oil tank, TA-3-93, that was located east of the south wing of the Physics Building, TA-3-40 (Engineering drawing ENG-C 11340). The tank was installed in 1953 and removed in 1966. There were no reports of historical releases during removal (Goodrich 1966, 17-982). In 1966 a natural gas generator was installed, then removed in 1988. Currently, there is a new diesel generator along with a 560-gal. UST inside a cement vault.

Rationale for Recommendation: There is no documentation that suggests the original 35-gal. tank, or the other tanks subsequently placed in the same location, have leaked. Presently, the tank in the location of SWMU 3-043(i) is covered under current state UST regulations.

C-60-001 is a 10 152-gal. UST for diesel fuel formerly designated TA-3-382, now designated TA-60-1. The tank, TA-3-Motor Pool-2, was installed in 1978 and removed in 1989. In 1986 an improperly conducted tightness test resulted in the assumption the tank was leaking, as reported in the Site Reconnaissance Report performed by Weston (DOE 1989, 17-018); however, no visible signs of contamination were present during the tank removal. This area of concern has undergone closure under the New Mexico UST Regulations (Tiedman 1989, 17-619). See reference in Attachment A, Chapter 6 .

C-60-002 is a 4 000-gal. decommissioned diesel fuel UST, TA-3-318. The tank was located on Sigma Mesa near the decommissioned communications bunker, TA-3-219. The date the tank was installed is unknown. In 1987 the tank was excavated and removed as part of a Laboratory-wide UST removal program. After removal, the manufacturer's original chalk markings inside the tank showed that it never held product fuel. The tank was cut up and the metal scrap transported to the salvage yard (McInroy 1993, 17-962).

6.4.3.2 Aboveground Storage Tanks

Any releases that may occur from aboveground storage tanks are addressed under the Spill Prevention Control and Countermeasures (SPCC) Plan (LANL 1990, 17-820). This contingency plan is under the authority of the Clean Water Act (CWA) and is regulated under 40 CFR 112 and 125, Subpart K. The SPCC Plan is managed by the Laboratory's Environmental Protection Group (ESH-8) and must be in compliance with NMED regulations.

SWMU 3-036(g) is an active 5 000-gal. aboveground tank located south of TA-3-22. The tank, installed in 1951, holds sulfuric acid used to neutralize cooling water from TA-3-22. Secondary containment was added around the tank after a noncompliance violation in 1990 resulting in a release to NPDES Outfall 01A001.

SWMU 3-046 is a 10 000-gal. treatment tank inside a concrete containment area located 60 ft southeast of TA-3-22. The tank receives continuous blow-down from the TA-3-22 boilers, softeners, and demineralizer tanks. The function of the tank is to adjust the pH of the aforementioned wastewaters prior to discharge to the NPDES permitted outfall. The tank is filled with

wastewater and neutralized with either sulfuric acid or sodium hydroxide. After the waste is neutralized, it is discharged to Sandia Canyon. Three uncontrolled releases have occurred from the neutralization tank resulting in noncompliance violations from NMED These releases are described below.

The first violation involved excess sulfuric acid introduced into the neutralization tank. The neutralization tank is used to treat boiler blow-down. An open valve on the underground line from the acid tank to the neutralization tank caused the neutralization tank to overflow. The excess sulfuric acid combined with cooling water and discharged to the outfall. Immediate action resulted in closing the valve and adding soda ash to the effluent in the arroyo.

The second and third violations involved discharges consisting of excess sulfuric acid, boiler blow-down, demineralizer discharge, and cooling water. The total amount of acid released from the three incidents was approximately 1 000 to 1 400 gal. (LANL 1990, 17-825). Soda ash was added to the effluent in the arroyo for neutralization.

Laboratory group HSE-8 conducted a wetlands study to assess the impact of the spill on the downstream wetlands maintained by effluent from both the steam plant and the sewage treatment plant. The study showed that immediately after the incident, the entire stream was devoid of aquatic organisms. Additionally, within 10 days the vegetation within 3 ft of the stream was yellowed and appeared dead. Within a month, ESH-8 reported that there was a recovery of aquatic organisms in the stream below the cattail marsh but not within or above the marsh (Tiedman 1990, 17-828). The wetlands were continually monitored for the next year and a wetlands study in 1992 stated that the communities had reestablished themselves back to normal (Monaghan 1990, 17-824; LANL 1992, 17-1263).

Rationale for Recommendation: SWMUs 3-036(g) and 3-046 have never managed hazardous waste and have excellent integrity and secondary containment. Additionally, the NMED approved the spill report on the acid release conditionally, based upon completion of corrective actions listed in the report to the EPA (Tiedman 1991, 17-829). Investigation indicated that the release was caused primarily by operational problems and communication

deficiencies. Operational and administrative changes were initiated to correct these problems and interim physical plant modifications of the neutralization system were completed. These modifications included new pH monitoring equipment and a lock on the discharge valve from the environmental tank (Sneesby 1994, 17-1159). The NMED closed out this incident after the Laboratory paid a $12 500 fine (NMED 1992, 17-832). See reference in Attachment A, Chapter 6 .

6.4.3.3 PCB Transformers and Capacitors

The following PCB capacitors and transformers were removed in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (DOE 1991, 17-949). In each case, if no stains were visible after the transformer was removed, the area was considered free of contamination and no swipes were taken for PCB analysis. If there was any evidence of leaks from PCB-containing equipment, the stained areas were sampled after removal of the equipment. If the stained areas were swiped and found to be above levels mandated by 40 CFR 761, immediate action was taken to clean the area to PCB levels deemed acceptable under specific scenarios in 40 CFR 761.125. Measures taken for cleanup included one or more of the following: double wash/double rinse, excavation of concrete pads and contaminated soil, encapsulation or labeling, or any combination of the above. Post-cleanup sampling, as specified in 40 CFR 761.130, was done to verify completion of cleanup. The transformers and capacitors described in this aggregate are listed in Table 6-8.

SWMU 3-003(d) is described as an area of potential soil contamination from two PCB-containing transformers, TA-3-146 and TA-3-176, that were located on a concrete pad east of the Rolling Mill Building, TA-3-141. The transformers, PCB ID#s 5008 and 5009, contained PCB concentrations greater than 500 ppm and were removed in 1992 and 1991, respectively (Buksa 1994, 17-1185). Because no stains were present on the concrete pad when the transformers were removed, no cleanup action was taken prior to siting the new, non-PCB transformers on the same pad. Additional concrete was added to extend the existing pad in 1993 (Nunes 1992, 17-996; Morales 1992, 17-997).

TABLE 6-8

PCB CAPACITOR/TRANSFORMER AGGREGATE

PRS	STRUCTURE # OR PCB ID #	LOCATION	INSTALLED	STATUS
3-003(d)	TA-3-146 TA-3-176 Transformers	East of TA-3-141	1959 1962	Replaced with non-PCB in 1991 Replaced in 1992
3-003(e)	13 transformers (PCB ID #s 85.5567-5579)	Basement of TA-3-29	1951	Removed in 1989 and 1990
3-003(g)	Transformer	Basement of TA-3-35	Unknown	Replaced in 1984
3-003(h)	3 transformers	Mezzanine of TA-3-39	1952	Replaced in 1984
3-003(f)	9 transformers (PCB ID #s 85.5585-5593)	Basement of TA-3-66	1958	Removed in 1991
3-003(i)	Transformer in indoor vault (PCB ID # 85.5551)	South loading dock of TA-3-32	1951	Removed in 1992
3-003(j)	4 transformers (PCB ID #s 85.5552-5555)	Basement of TA-3-40 in rooms E-6, N-8, S-18	1952	Removed in 1991
3-003(m)	2 capacitor banks	TA-3-1188	1973	Replaced in 1988
C-59-001	Transformer	Room B-1 of TA-59-1	Unknown	1991
3-056(h)	Transformer/ capacitor	TA-3-105	1950s	Inactive
3-003(k)	Transformer	East side of TA-3-316	Unknown	Active
3-003(o)	Capacitor bank	TA-3-287	Unknown	Removed in 1990
3-052(d)	Non-PCB capacitors and transformers	Basement and southeast side of TA-3-287	Unknown	Removed in 1993
3-051(a)	Compressor	Metal shed southeast of TA-3-39	1985	Active
3-051(b)	2 air compressors	Metal shed outside TA-3-102	1987	Active

SWMU 3-003(e) is listed in the SWMU Report as an area of potential contamination from 10 transformers that were located in the basement of TA-3-29 (LANL 1990, 0145). The transformers were removed in 1989 and 1990 and contained PCB concentrations greater than 500 000 ppm. Inspection revealed no oil stains on the concrete in the former location of the transformers. Archival research indicates no record of releases (Buksa 1994, 17-1185).

SWMU 3-003(g) is a PCB-containing transformer in the basement of the Press Building, TA-3-35. The transformer contained a PCB concentration greater than 500 ppm and was replaced with a non-PCB transformer in 1984 (LANL 1986, 17-1003). No stains on the concrete were present upon removal of the transformer. Archival research revealed no record of releases (LANL 1992, 17-1002).

SWMU 3-003(h) The transformers in the mezzanine of the shops, TA-3-39, were replaced in 1984 without incident. The transformers contained a PCB concentration greater than 500 000 ppm (Buksa 1994, 17-1185). No stains were noted upon removal of the transformers (LANL 1986, 17-1003). Archival research revealed no history of releases and the mezzanine area had no pathway to the environment.

Rationale for Recommendation: Each of the above PCB-containing transformers has either been removed or replaced with a non-PCB transformer. In all cases, no stains were found to indicate any releases of PCB-containing oil. Archival research reveals no record of releases at any of these SWMUs.

SWMU 3-003(f) consists of areas of potential soil contamination from nine greater than 500 000 ppm PCB-containing transformers that were removed from the basement of the Sigma Building, TA-3-66, in 1991 (Buksa 1994, 17-1185). For all but one of the PCB-containing transformers, sample results indicate that the PCB contamination was remediated to levels acceptable under 40 CFR 761 after one cleanup operation. Stained concrete slabs for all of the transformers were removed in 1992 and taken to TA-54, Area G (Bailey 1992, 17-991). Soil and gravel sampling from beneath the excavated concrete pads in TA-3-66 indicated PCB concentrations less than 1.6 ppm, below the 10 ppm cleanup standards required by TSCA under

40 CFR 761 (Morales 1992, 17-989). New concrete pads were poured at these sites and non-PCB transformers were installed in 1992.

The one area of particular concern is contamination from a spill of PCB-containing oil that occurred September 3, 1991. Approximately 3 gal. of PCB-containing dielectric fluid were spilled during efforts to remove a 1 500 kV transformer from Area J of the TA-3-66 basement (Nunes 1991, 17-988). When the transformer was placed on its side for removal from the building, dielectric fluid leaked onto the plastic liner inside a containment basin placed on the floor by Unison (PCB subcontractor), and approximately one quart of fluid leaked from the containment basin onto the basement floor. The most recent samples on record of the J-3 wing basement floor, yielded three grid points above the prescribed 10 µg/100cm2. Because it is possible subsequent post-cleanup sampling results were never filed. ESH-19 conducted a site visit on March 17, 1995, to take confirmatory samples and noted that the floor had been encapsulated with plasite, a pigmented epoxy. Swipes were taken for PCBs from four areas on the floor of the basement. The concentrations of all four samples were found to be below 2.5 µg/100 cm^2; therefore, no further action is required because the concentrations are below the TSCA requirement of 10 µg/100 cm^2 (LANL 1995, 17-1265). See reference in Attachment A, Chapter 6 .

SWMU 3-003(i) A greater than 500 000 ppm PCB-containing transformer was removed from a vault beneath the Cryogenics Building, TA-3-32, September 12 and 19, 1992. October 19, 1992, three large concrete slabs and three 55-gal. drums of soil and debris were also removed from the vault at TA-3-32 and taken to TA-54, Area G (Bailey 1992, 17-1039; Bailey 1992, 17-1043). EM-8 swipes of the concrete revealed PCB concentrations of 94 µg/100 cm^2 but a soil sample prior to removal of the concrete revealed PCB concentrations of 0.27 ppm PCBs by volume (LANL 1993, 17-942). Because the concrete was removed and the soil beneath the concrete falls below TSCA-mandated cleanup levels, this SWMU warrants no further action.

SWMU 3-003(m) includes two capacitor banks located at TA-3-1188 in a limited access, fenced area. The two banks were installed in 1973 and consisted of 55 PCB capacitors placed on wooden poles. The capacitor banks are on minimal topsoil over welded tuff. Over a four-year period

during the 1980s, numerous capacitors ruptured. In 1987 three capacitors on one rack ruptured, releasing oil onto the rack and the surrounding soil. The capacitor bank was shut down. A thorough cleanup of the area began May 12, 1988. During cleanup, 55 capacitors from the two racks were removed and both racks were washed using the double wash/double rinse method. Concrete footings were removed and disposed, and the soil beneath the capacitor banks was excavated until sampling revealed PCB contamination levels below 25 ppm (LANL 1989, 17-980). The area was backfilled with clean soil, new concrete footings were installed, and the clean capacitor racks were reinstalled along with 55 non-PCB capacitors. A total of 357 yd^3 of soil was removed from the site (LANL 1989, 17-980).

C-59-001 is an area of potential contamination from a 1 000 kVA transformer once located in room B-1 of TA-59-184, now designated TA-59-1. The transformer had a PCB concentration in excess of 500 ppm and was removed in 1991. Four 55-gal. drums were filled with the oil from the transformer and removed from the area (LANL 1991, 17-1110). The transformer was taken out of the building. The SWMU Report states there were no active leaks, but there were old stains around the bushings and gaskets (LANL 1990, 0145). No staining was visible during a site visit in 1994. According to the building manager for TA-59-1, there were never any oil spills or stains from the transformers in the area (LANL 1991, 17-1110).

SWMU 3-056(h) is listed in the SWMU Report as a container storage area near TA-3-105 and TA-3-287 (LANL 1990, 0145). Several areas of potential contamination have been identified. The areas near TA-3-287 have been addressed under SWMUs 3-003(o) and 3-052(d) in this subsection.

TA-3-105 housed magnetic fusion energy experiments beginning in the mid-1950s. Prior to the 1992 cleanout by a salvage contractor, a number of swipes were taken on various surfaces throughout the building. Results revealed no PCB contamination. During the salvage cleanout of TA-3-105, some non-PCB oil was spilled north of the building. Swipes taken in this area at the time of the spill revealed no PCB contamination (Quinn 1993, 17-963). A cable shed, TA-3-252, located west of TA-3-105 was also removed during the 1992 decommissioning. Swipe tests done on oil stains on the plywood

floor, as well as soil samples taken underneath the floor, yielded no PCBs (Quinn 1993, 17-963). Another area of potential contamination is on the southeast side of TA-3-105 in a driveway area outside the large roll-up door. During the site reconnaissance visit in 1989 two transformers were observed inside a fenced area at this location. No oil stains were present on the asphalt around the transformers (LANL 1992, 17-582).

On the west side of TA-3-105, PCB spills were reported in September 1991 and March 1993. In the September 1991 leak, a double wash/double rinse cleanup with Viking™ Electric R-30 degreasing solvent was conducted and soil beneath a leaking spigot was excavated until non-stained soil was reached (LANL 1991, 17-1149). In the March 1993 incident, an oil stain under a transformer was double washed/double rinsed with Chemsearch ND-165™ (LANL 1993, 17-1193). On a site visit in 1994 only one stain was noted in the vicinity. Swipe tests at the location revealed no PCB concentrations above 2.8 $\mu g/100cm^2$ (Wechsler 1994, 17-1134).

Rationale for Recommendation: The PCB-containing transformers and capacitors described above have all been removed or replaced with non-PCB equipment. The documented releases of PCBs were remediated in accordance with the TSCA requirements found in 40 CFR 761.

SWMU 3-003(j) consists of four transformers located in three equipment rooms in the basement of TA-3-40, the Physics Building. Each transformer had a PCB concentration in excess of 500 000 ppm. In 1991 the dielectric fluid was drained from the transformers into 55-gal. drums, the transformers were removed, and the concrete pads were cut and removed. Soil beneath the concrete pads was sampled and found to have a PCB concentration of 49 ppm (Heskett 1994, 17-1210). Following this analysis, concrete was placed over the soil with no further samples having been taken. See reference in Attachment A, Chapter 6.

Rationale for Recommendation: The area containing 49 ppm is completely sealed under concrete in a utility closet, inside TA-3-40. Because of the immobility of PCBs in soil under concrete, no threat to the environment or human health exists.

SWMU 3-003(k) is an area of potential soil contamination from a transformer stored on the east side of TA-3-316. According to the Pan Am (the laboratory maintenance contractor from July 1986 to May 1991) Non-PCB Transformer Inventory List, the transformer contained less than 50 ppm PCBs (LANL 1989, 17-018). As a non-PCB transformer, it is not regulated by TSCA, 40 CFR 761.120(a). In addition, a leak from a stored transformer with less then 50 ppm PCBs could not have involved a significant amount of contamination, and the soil has been graded and asphalted since the leak was discovered.

SWMU 3-003(o) was a 60 kV capacitor bank used as part of an experiment for the magnetic fusion energy project, Scyllac. The capacitor bank was housed in TA-3-287 and contained approximately 3 300 capacitors, each with a 60 kV spark-gap switch. The sealed capacitor units contained a non-PCB castor oil and the spark-gap switches each used approximately two quarts of non-PCB mineral oil for electrical insulation. The mineral oil was also used in power supplies and in high voltage junction containers (Quinn 1993, 17-963). Prior to decommissioning the Scyllac experiment in the mid-1980s, oil samples from spark-gap switches and swipes from surfaces within the room were analyzed and found to have a PCB concentration less than 2 ppm (Fresquez 1992, 17-241). During the decommissioning phase, the capacitors were temporarily stored south of TA-3-287. Swipes from the pavement were tested and found free of PCB contamination (Morales 1990, 17-615).

SWMU 3-052(d) is an area of possible contamination in the basement and on the southeast side of TA-3-287. Both areas were storage for a number of non-PCB capacitors and transformers that were scheduled to be removed in the 1993 building renovation (Morales 1990, 17-615). Sampling done before building renovation revealed gross alpha, beta, and gamma activity at background levels, total chromium below upper limit background levels (less than 75 ppm), no toxicity characteristic leaching procedure (TCLP) metals above RCRA hazardous waste limits, and no PCBs in soil or on the pavement on the south side of TA-3-287 (Fresquez 1992, 17-588).

Rationale for Recommendation: The transformers and capacitors in this aggregate contained only non-PCB mineral oil as defined in 40 CFR 761. There are no other COPCs for the PRSs in this aggregate.

SWMU 3-051(a) is a compressor dated 1985 that is housed in a metal shed southeast of TA-3-39. The compressor was noted to be leaking during the RFA investigation in 1987 (LANL 1989, 0445). Oil stains were observed inside the shed and on the asphalt two feet from the shed. PCB tests on the compressor in 1994 revealed a PCB concentration of less than 2.5 $\mu g/100cm^2$ (Heskett 1995, 17-1213; Wechsler 1995, 17-1014).

Rationale for Recommendation: While the compressor has leaked in the past, the stains do not pose a threat to the environment given the nature of the oil used in the compressors and the absence of PCB contamination. SWMU 3-051(a) is being recommended for NFA because it was never used for the management of hazardous waste or hazardous substances.

SWMU 3-051(b) is possible contamination from two active air compressors used to pump air into TA-3-102. The air compressors currently in use were installed in 1987 and are housed in two metal sheds. Weston reported that the compressors were leaking oil at the time of the RFA investigation (LANL 1989, 0445). Stains from the oil extended 15 ft south of the shed. The oil currently used in these air compressors is a synthetic oil, Mobil-926 (Heskett 1995, 17-1213).

The lightweight mineral oil historically used in the compressors escaped by leaching through gaskets, making the leaking oil relatively clean because the gasket acts as a filter. The possibility of PCB contamination from the old mineral oil was investigated by ESH-19. Swipes taken in August 1994 from one shed yielded PCB levels of 9.4 $\mu g/100cm^2$; samples from the other shed yielded 17 $\mu g/100cm^2$ (Heskett 1994, 17-1210). See reference in Attachment A, Chapter 6 .

The area that revealed contamination was double washed and double rinsed. EPA Region 6 TSCA Unit will be contacted and presented with the above information for concurrence with a no further action decision from ESH-19 (Radian 1992, 17-1192). According to the building manager of TA-3-102, Sorb-all™ is periodically applied to the oil leaks and removed when it becomes saturated.

Rationale for Recommendation: SWMU 3-051(b) does not pose a threat to the environment given the nature of the oil currently used in the compressors. Further, the compressors are in a restricted access area and are under administrative control by the user group.

6.4.3.4 NPDES Permitted Outfalls

SWMU 3-045(a) is an inactive outfall from the Steam Plant, TA-3-22, that was operational from the 1950s through May 1993. The outfall was NPDES permitted EPA A01A001 and received water from floor drains in the basement, first floor, mezzanine, heater floor, platform, and roof drains. Also routed to the outfall were steam condensate and floor wash water (LANL 1991, 17-867). In general, the major flow into the outfall came from steam condensate. In 1989, an oil/water separator was installed near the outfall to prevent possible oil spills from reaching the outfall. The separator was removed in 1993 and the discharge pipe was capped (LANL 1993, 17-925).

Rationale for Recommendation: The entire outfall area was graded with clean fill as part of a corrective action following a diesel fuel release in 1991 associated with two diesel tanks at TA-3-22. Any potentially contaminated soil from SWMU 3-045(a) was removed as a result of this corrective action (LANL 1992, 17-834) [see SWMU 3-036(j), Subsection 6.4.4.2].

SWMU 3-054(c) is an inactive outfall from cooling tower TA-3-156, designated NPDES permit number EPA 03A023. The cooling tower is located northwest of TA-3-287 and was used to cool an electromagnet in TA-3-105 (LANL 1993, 17-970). The outfall, which contained effluent and blow-down from cooling tower TA-3-156, discharged directly into the storm water sewer approximately 25 ft east of the cooling tower. The ground surface in the area between the buildings is asphalt and concrete.

Rationale for Recommendation: In February 1992 the Environmental Protection Group collected two composite surface soil samples from the north side of TA-3-287. In 1993 the Environmental Protection Group collected two samples from the cooling tower to evaluate characteristics of the structure for D&D. The samples were screened for gross alpha, beta, and gamma radiation before being submitted for total chromium and TCLP metals. This screening detected background concentrations.

The analysis detected a total chromium of less than 70 ppm, which is below the SAL level at 400 ppm. Chromium-VI is typically reduced to the chromium-III valence state by organic matter in the environment and is less toxic than chromium-VI, with a SAL of 80 000 ppm (Clement Assoc., 17-1167). Because the chromium is released to the environment by the cooling tower water, most of it will deposit into sediment, and only chromium-III will be found absorbed onto organics and clayish materials (Syracuse Research Corporation 1991, 17-1166).

No TCLP metals, including chromium, were detected above EPA action levels, and is therefore recommended for NFA (Fresquez 1993, 17-981).

SWMU 3-038(c) is the two-inch, cast iron drain line that piped rinse solution from a copper electroplating bath in TA-3-28, room 46, to the industrial waste line. The electroplating bath initially operated on contract in the 1960s. It was used to plate very small parts of printed circuit boards. E-2, Electronic Manufacturing and Technician Resource Group, took over the operation in June 1971, and by September of that year the operation was terminated and moved to TA-3-40 (Watanabe 1994, 17-1157). According to the former group leader of E-2, water was sprayed through rows of holes in a manifold on either side of the rinse sink. Minuscule amounts of plating and acid solutions were washed off the circuit boards and down the drain (Watanabe 1994, 17-1130). The Laboratory's Waste Management Group transported spent plating baths and the spent acid strip solutions to TA-50 for treatment. These solutions contained cyanide, chromic sulfuric acid, and hydrochloric acid (Watanabe 1994, 17-1130).

The rinse solution was of varying dilution depending on the amount of water used in the process. Amounts and concentrations of contaminants are not known (Voelz 1974, 17-181). Additionally, the electroplating bath was subject to regulation under EPA Effluent Guidelines and Standards– Electroplating Point source Category, Section 413.12 (c) (Federal Register, Vol. 39, No. 61, March 28, 1974, pp. 11510-11514). The electroplating bath met the standards in effect until it ceased to operate in the early 1970s (Voelz 1974, 17-181).

In the early 1970s room 46 was completely renovated and remodeled into an office and is now the Computing, Information, and Communications (CIC-1) group office. The drainpipe was cut and capped inside the wall to make it inaccessible and there is no basement from which to access the drainpipe. According to the building manager, there have never been any problems with the drainpipe (Watanabe 1994, 17-1161).

Rationale for Recommendation: The drainpipe from a rinse sink in room 46 of TA-3-28 to the industrial waste line is recommended for NFA because it was covered by EPA regulations during its active lifetime. Additionally, acid solutions released to the drain were dilute due to the large quantities of water used in the rinse system (Voelz 1974, 17-181).

6.4.3.5 Temporary Storage Areas

Satellite storage areas and less-than-ninety day accumulation areas were established at OU 1114 in conformance with 40 CFR 262, Standards Applicable to Generators of Hazardous Waste and managed under the Laboratory Spill Prevention Control and Countermeasure Plan (LANL 1990, 17-820). Because any releases from storage areas will be addressed under the SPCC, there is no potential for considering these units as historical release sites. The EPA and the Laboratory have agreed that accumulation areas are not PRSs provided that they have no history of release and have no credible pathways to the environment (Twombly 1992, 17-681). PRSs listed in Table 6-9 meet these criteria. They were either indoors with no potential for leaks beyond the building or they were extensively cleaned for the Department of Energy Tiger Team inspection in 1991. These PRSs are listed on the Laboratory registry of satellite and less-than-ninety-day accumulation areas (McInroy 1992, 17-748; (LANL 1995, 17-1236). See reference in Attachment A, Chapter 6.

TABLE 6-9

APPROVED SATELLITE AND LESS-THAN-90-DAY ACCUMULATION AREAS

PRS	LOCATION	AREA	DESCRIPTION	STATUS
3-001(d)	TA-3-170	Outside, NW of building	Satellite accumulation	Removed
3-001(f)	TA-3-38	Rm. 103, paint shop	<90 day accumulation	Active
		Rm. 122, NTS shops	Satellite accumulation	Active
		Rm. 125, NTS shops	Satellite accumulation	Active
		Rm. 132, NTS shops	Satellite accumulation	Active
3-001(g)	TA-3-473	Located inside transportable	Satellite accumulation	Removed
3-001(h)	TA-3-66	Rm. 105C	Satellite accumulation	Removed
		Rm. 107	Satellite accumulation	Removed
		Rm. B100, foundry	Satellite accumulation	Active
		Rm. B100, foundry (mezzanine)	Satellite accumulation	Active
		Rm. B104	Satellite accumulation	Removed
		Rm. B107	Satellite accumulation	Removed
		Rm. B3	Satellite accumulation	Removed
		Rm. C100	Satellite accumulation	Active
		Rm. C100 (south wall)	Satellite accumulation	Removed
		Rm. C100	Satellite accumulation	Removed
		Rm. D106	Satellite accumulation	Active
		Rm. D108	Satellite accumulation	Active
		Rm. D2	Satellite accumulation	Active
		Rm. G103	Satellite accumulation	Active
		Rm. G105	Satellite accumulation	Active
		Rm. G3	Satellite accumulation	Active
		Rm. G4	Satellite accumulation	Active
		Rm. H105	Satellite accumulation	Active
		Rm. J1	Satellite accumulation	Active
		Rm. J104	Satellite accumulation	Removed
		Rm. J105	Satellite accumulation	Removed
		Rm. K2	Satellite accumulation	Active
		Rm. K104	Satellite accumulation	Active

TABLE 6-9 (continued)

APPROVED SATELLITE AND LESS-THAN-90-DAY ACCUMULATION AREAS

PRS	LOCATION	AREA	DESCRIPTION	STATUS
		Rm. P1	Satellite accumulation	Active
		Rm. P103	Satellite accumulation	Active
		Rm. R108	Satellite accumulation	Active
		Rm. R100	Satellite accumulation	Active
		Rm. R11	Satellite accumulation	Active
		Rm. R4	Satellite accumulation	Active
		Rm. R3	Satellite accumulation	Removed
3-001(j)	TA-3-34	South loading dock	Satellite accumulation	Removed
3-001(n)	TA-3-32	Rm. 104 and on south loading dock	Satellite accumulation	Active
3-001(o)	TA-3-35	Rm. 100	Red can waste container[a]	Removed
3-001(q)	TA-3-43	Rm. 108A	Satellite accumulation	Removed
		Rm. A326	Satellite accumulation	Removed
3-001(s)	TA-3-494	Rm. 101	Satellite accumulation	Active
		Rm. 107	Satellite accumulation	Active
3-001(t)	TA-3-502	Rm. N111	Satellite accumulation	Removed
3-001(v)	TA-60-29	Pesticide storage shed	Satellite accumulation	Active
3-001(w)	TA-3-1888	Rm. 110	Satellite accumulation	Removed
3-001(x)	TA-3-22	Inside, SW corner	Satellite accumulation	Active
3-001(y)	TA-3-29	Wing 7, rm. 7148	Satellite accumulation	Active
		Wing 5, rm. 5123	Satellite accumulation	Active
		Wing 3, rm. 3118	Satellite accumulation	Active
		Machine shop	Satellite accumulation	Active
3-002(a)	TA-3-66	Outside of rm. P100	<90 day accumulation	Active
3-056(g)	TA-3-16	Rm. 65	Satellite accumulation	Removed

[a] Red metal can used for short term accumulation while work is in progress.

6.4.4 PRSs Recommended for NFA Under Criterion 4

These PRSs have been characterized or remediated in accordance with current applicable state or federal regulations. This subsection also includes one-time releases.

This subsection includes PRSs that have available data to indicate contaminants of concern are either not present or are present in concentrations near background levels. In addition, sites that have undergone remediation in accordance with current applicable state or federal regulations will also be addressed in this subsection and are listed in Table 6-10.

TABLE 6-10

CRITERION 4 AGGREGATES

SUBSECTION	AGGREGATE
6.4.4.1	One-time Spills
6.4.4.2	Characterized or remediated PRSs
6.4.4.3	Voluntary Corrective Action/Expedited Clean-Up

6.4.4.1 One-time Spills

C-3-002 consists of an oil leak from an asphalt laydown machine located at TA-3-187. The leak occurred while the machine was being serviced and consisted of 15-40 weight motor oil and C-4 hydraulic oil (Texaco, Inc. 1993, 17-987). There is no evidence that the oil migrated off the asphalt surface. Sorb-all™ was added to the spill and was disposed (LANL 1992, 17-582).

Rationale for Recommendation: C-3-002 is a one-time spill of hydraulic oil. The MSDS for the oil states that it is not a hazardous substance (Texaco, Inc. 1993, 17-987). Because the spill was not significant and did not migrate from the immediate area, C-3-002 is proposed for NFA.

C-3-003 is an oil stain located a few feet east of the northeast dock at the main tech shops, TA-3-39. The stain measures 10 x 10 ft and is entirely on asphalt; no staining was noted in the grass area to the east. According to a site worker who was in charge of machining operations adjacent to the dock from 1978 to 1991, only pure mineral oil was stored on the dock (usually indoors) in quantities of 100 gal. for machining operations. The food-grade mineral oil, Carnation™ white mineral oil, was stored as product on the dock from 1978 to 1991. During the DOE Tiger Team investigation, the loading dock area was re-asphalted (Sobojinski 1994, 17-1098).

Rationale for Recommendation: A 1988 photograph shows the oil stain was completely contained on the asphalt. The oil was Carnation™ white mineral oil which is not hazardous and, therefore does not present a threat to the environment (Witco 1994, 17-1187).

C-60-003 is a one-time release from the Pesticide Storage Shed, TA-60-29. The only documented incident at the shed involved a ruptured 2-in. potable water line that was discovered January 3, 1989. According to the filed spill report (LANL 1989, 17-662), a furnace air pressure switch failed which subsequently caused a potable water line to the safety shower in the shed to freeze and rupture. Between 2 000 and 10 000 gal. of water were estimated to have been released from the ruptured pipe. The water flooded the mesa top north to the rim of Sandia Canyon and south to the rim of Mortandad Canyon. A stream of water ran into Mortandad Canyon extending about 150 ft down the canyon floor, approximately 60 yards from an intermittent stream. At the time of the discovery, the water had frozen into linear tongues of ice on top of the mesa.

Responding personnel constructed earthen berms around the spill boundary and pumped approximately 1 500 gallons of water out of the shed into two Hydroseeder tanks adjacent to the building. Most of the pesticide and herbicide products stored in the shed were in sealed metal or plastic-lined cardboard boxes. Several product containers came into contact with the water; however, the containers remained intact. Pesticides may have been dissolved in the water that was released into the surrounding soil, yet samples were taken. Analytical results indicate that no pesticides were

detected, and only the herbicide 2,4-D was detected in concentrations of 1 189 and 11 890 µg/l, respectively. No additional correction action was taken and the spill was reported to NMEID on January 4, 1989. This area of concern is a duplicate of SWMU 60-001(d) addressed in the RFI Work Plan for OU 1114 in Subsection 6.2.4.1.1 (LANL 1993, 1090).

SWMU 3-052(c) is a hydraulic oil release of unknown quantity in the underground storm drain near office building TA-3-422. The spill occurred in 1986 when a hydraulic line was flushed while repairs were made on the Mercury Road security gate (LANL 1986, 17-356). The oil flowed down the drainpipe and daylighted southwest of TA-3-22.

Rationale for Recommendation: SWMU 3-052(c) is a one-time release of hydraulic oil in a storm drain. The amount of hydraulic oil released did not result in severe contamination of the outfall area southwest of TA-3-22. Furthermore, the entire outfall area was remediated as a result of a corrective action in 1991 [see SWMU 3-036(j)].

6.4.4.2 Characterized or Remediated PRSs

SWMU 3-036(i) is a 250-gal. emergency diesel fuel tank. Installed in 1970, the tank is located approximately 20 ft east of TA-3-22. Because of past spills and leaks, an asphalt berm was constructed around the tank in 1989 to contain any future releases. In 1990 the tank was moved to a concrete secondary containment area 50 ft north of its original location. There are no drains from the secondary containment structure. The contaminated soil and the asphalt berm from the previous tank location were removed in the summer of 1990 and taken to the TA-54 landfill. The former location of the fuel tank is now covered with a 6-in.-thick concrete pad measuring 20 ft long by 20 ft wide that supports new transformers for TA-3-22 (Paxton 1983, 17-240).

Rationale for Recommendation: The emergency diesel fuel tank was small and never managed hazardous waste. Stained soil and the asphalt berm were completely removed and the entire area is now capped with cement; therefore, NFA is recommended because no threat to the environment exists.

SWMU 3-036(j) consists of two 150 000-gal. diesel fuel tanks installed in 1954 as backup power for TA-3-22. The two tanks are connected to a pump house, TA-3-57, which then connects to TA-3-22. The only release to the environment from these tanks occurred in 1991. An odor of natural gas was detected and analysis indicated that a fitting on a gas line needed to be replaced. The backup fuel system was brought on-line and pressurized. JCI personnel immediately discovered a leak in the underground line connecting TA-3-57 to TA-3-22 [see SWMU 3-045(e)]. Diesel fuel from one of the tanks was discharged onto the ground and entered a storm water channel where it drained into a watercourse. The spill was discovered immediately by JCI operators, the fuel line was shut off, and the discharge ceased. The fuel discharged to a small drainage to Sandia Canyon, which is an ephemeral tributary to the Rio Grande. The total amount discharged was estimated to be 100 to 200 gal. (LANL 1992, 17-834). The Laboratory's Emergency Management Office was notified of the diesel spill and subsequently notified DOE, NMED, and EPA (LANL 1992, 17-834; Bellows 1991, 17-835).

The diesel spill was contained in the watercourse within minutes of the spill using absorbent booms and pillows. Pools of diesel fuel were removed using a wet/dry vacuum and absorbents. The removed fuel and absorbents were placed in drums and were properly disposed. Contaminated soil was removed, sampled, and properly disposed. Contaminated rocks were cleaned with low-pressure water and any discharge associated with the cleanup was contained and properly disposed. NPDES outfalls located downstream of the of the spill were controlled by re-routing or stopping their discharges to ensure that the spill was contained (NMED 1992, 17-832). The corrective action was to install a temporary fuel line until JCI Engineering designed and installed a permanent replacement (LANL 1992, 17-834). In addition, there was continuous monitoring of water flow in the canyon for a period of one year and annual leak testing for the backup fuel systems at all three steam plants. The site was inspected in February 1992, by NMED and found that the corrective actions taken were satisfactory (NMED 1992, 17-832).

Rationale for Recommendation: The two tanks are structurally sound and have automatic leak detection systems. In addition, no hazardous waste has been managed in either tank. The only historical release on record is the 1991 spill from the pump house line which was addressed above as SWMU 3-045(e).

SWMU 3-043(c) is listed in the SWMU Report as a decommissioned tank for storage of mixed, corrosive waste (LANL 1990, 0145). The SWMU is actually a former manhole, TA-3-718, that was part of the LANL liquid industrial waste line system that transported wastes from TA-3-40 to TA-45, and then to TA-50 (Elder et al. 1986, 17-001). The manhole was 3 ft long x 4 ft wide x 4 ft deep and located below grade on the northeast side of TA-3-40. TA-3-718 was constructed of steel-reinforced concrete with walls 8-in. thick (Engineering drawing ENG-C 11340). The 6-in.-diameter industrial waste line passed directly through the bottom of the manhole. Upon removal in 1984, the manhole was found to be intact with no signs of cracking. In addition, no fluid was observed within the manhole.

Rationale for Recommendation: SWMU 3-043(c) is being proposed for NFA for two reasons: TA-3-718 was inaccurately identified in the SWMU Report as an underground storage tank and because no threat exists from TA-3-718. TA-3-718 was part of the industrial waste line system and was remediated after removal in 1984 (LANL 1994, 17-1170; Elder et al. 1986, 17-001). The general soil cleanup guidelines for the removal project consisted of collecting soil samples at appropriate intervals from representative locations along the bottom and walls of the trench and analyzing for gross alpha, gross beta, tritium, or gamma spectroscopy. Because there is no record of a soil cleanup at this site, sampling results fell below the minimum levels specified in the soil cleanup guidelines for the removal project. Minimum gross alpha and gross beta levels were 75 pCi/g, tritium was 250 pCi/mL, and gamma spectroscopy was 20 μR/h.

6.4.4.3 Voluntary Corrective Action/Expedited Cleanup

The following SWMUs are recommended for NFA because they will be undergoing a voluntary corrective action (VCA) between the months of July and September 1995. The VCA process addresses small-scale sites with no controversial issues or which merely involve good facility management practices. Described below is the common rationale for recommendation for NFA for all SWMUs undergoing VCA.

Rationale for Recommendation: SWMUs 3-003(l), 3-003(p), 3-022, 3-047(d), and 3-051(c) are recommended for NFA because they are in the process of a VCA. These sites are being remediated because they have an obvious remedy that can be rapidly implemented , previous sampling data and/or archival data are available to adequately identify chemicals of potential concern (COPCs), and the VCA will be the final solution of the PRS. These processes will allow for the quick removal of contamination, reducing health and environmental risks associated with past Laboratory operations. Any contaminated soil will be contained and disposed off site to a permitted disposal facility in accordance with the waste management plan (WMP).

SWMU 3-003(l) is listed in the SWMU Report as an area of potential contamination from two transformers (PCB ID #s 5557 and 5558) previously located in the basement of the Van de Graaff Building, TA-3-16 (LANL 1990, 0145). Both transformers became inactive in 1988. The transformers were removed in 1989 without incident and taken to TA-21-61 where they were drained (LANL 1989, 17-449; Bailey 1991, 17-1033). While Weston reported that the transformers had a history of leaks, all were contained within the building. No oil could have entered the floor drains located 30 ft from the transformers; furthermore, no stains were noted on the floor at the time of removal (LANL 1989, 17-018). Staining was subsequently noted in a 1994 visit. Confirmatory swipes revealed PCB levels between 2 870 $\mu g/100\ cm^2$ and 3 065 $\mu g/100\ cm^2$. ESH-19 immediately initiated a double wash/double rinse cleanup and conducted post-cleanup sampling which yielded PCB concentrations between 3 760 $\mu g/100\ cm^2$ and 352 $\mu g/100\ cm^2$ (Heskett 1994, 17-1210). Based on these results, additional cleanup work at TA-3-16 is required. A VCA plan will be submitted to DOE to remove the affected concrete and underlying soil (if any), or to fix the contamination in place. EPA Region 6 will be contacted to establish cleanup requirements specific to this site if remediation is required.

SWMU 3-003(p) was a storage area east of the warehouse building TA-3-142, which was built in 1960. From the 1960s to 1994, SWMU 3-003(p) was used for storage of drums and miscellaneous equipment, including

electrical capacitors and transformers that may have contained insulating oils containing PCBs. Site visits document unlabeled drums and apparent stains on the soil from spills and/or leaks from the drums or equipment. The storage area is currently covered with asphalt and slopes gently southward from the warehouse. The VCA area is unpaved and is transected by a drainage channel that was rerouted when the area was paved. Two large trees are located within the VCA area; these trees will be protected during remediation activities.

In 1994 asphalt and soil samples were collected prior to resurfacing activities at this PRS site and analyzed for antimony and lead . Analytical results from the fixed laboratory indicated that antimony concentrations were below the SAL for antimony and the levels of lead were just over the lead SAL. Based on these results, a 20-square-ft area has been identified as containing elevated lead concentrations within surface soils. There is potential spread of contamination to the south by wind and rain runoff.

The proposed remedy for this site is to excavate and remove the soil until site-specific preliminary remediation goals (PRGs) are met. Upon confirmation that the PRG has been met, the area will be backfilled, recontoured, and reseeded. Soil that is removed in the remediation will be considered hazardous waste until confirmed otherwise.

SWMU 3-022 includes a concrete sump and a steel beam support structure that were part of an aboveground mineral oil storage and pumping system. The system supported the operation of a generator in TA-3-316. Two aboveground steel storage tanks that were part of the storage system were removed in early 1995. The electrical supply, pumps and aboveground piping associated with the tanks have been removed. The mineral oil was Shell Diala AX, which is described in the material safety data sheet as a mixture of refined hydrotreated middle distillates (30-40%) and severely hydrotreated light napthenic distillates (60-70%). The product does not contain detectable levels (<1 ppm) of PCBs. The product is reportedly classified as an oil under Section 311 of the Clean Water Act. Based upon data available to Shell, the product is not regulated by the Superfund Amendments and Reauthorization Act (SARA)Title III.

The potential release site is not listed in the Laboratory's HSWA permit. The site has been proposed for VCA because the remedy is obvious and the contaminants involve only nonhazardous chemicals. A sample of the mineral oil taken on July 23, 1991, failed to detect PCBs above 5 ppm (west tank), and 10 ppm (east tank). There has not been a report of any spills or leaks from the tanks. A waste profile form completed on January 21, 1993, states that the water in the sump was analyzed for toxic metals, PCBs, reactivity, ignitability and corrosivity and did not detect any of these parameters.

Clean backfill will be placed in the sump after confirmatory sample data are available. The fill material will be compacted and the finished surface at the former sump will be graded as needed for drainage and erosion control .

SWMU 3-047(d) is a former drum storage area for TA-3-22. TA-3-22, the steam plant, consisted of an area occupied by a 6-ft x 15-ft asphalt pad located adjacent to the east side of TA-3-22. Various materials such as 30-weight motor oil, Stoddard solvent, and waste oil were stored in drums at SWMU 3-047(d) from approximately 1954 to 1989.

In 1987, a six-inch asphalt berm was added to the asphalt pad to provide secondary containment. The drums within the storage area were stored horizontally on metal stands. Spigots, with collection pans underneath, were used to dispense the contents. There were no documented spills or releases of product in this area. However, accidental spills may have discharged unknown quantities of drum contents to the environment over the years.

In 1989, a new location was selected for an upgraded materials storage area. The original drum storage area's asphalt pad was removed and disposed of at the Los Alamos County landfill. The potential contaminated area is on the eastern edge of the former storage pad. The soils which lay under the pad also may be contaminated if product penetrated the asphalt. Although this is not a high use area, contaminates could have been spread to the east by foot traffic or rain runoff.

All excavated areas will be backfilled with clean soil/tuff and seeded with appropriate materials. Removed soil will be considered hazardous waste until confirmed otherwise (LANL 1995, 17-1267).

SWMU 3-051(c) represents three distinct three to five-foot diameter stains of vacuum pump oil and/or exhaust, located on the east side of TA-3-141. Vacuum pump oil may contain contaminants associated with the processes the vacuum pump was used for, including small amounts of heavy metals from equipment wear. The potential contaminated area is not a high use area but contamination could be spread by foot traffic and rain runoff to the east. As excavation proceeds soil/tuff material will be analyzed at a mobile field laboratory for organic and inorganic constituents to determine final extent of contamination.

Following confirmatory sampling, all excavated areas will be backfilled with clean soil/tuff and seeded or covered with appropriate materials. Engineering controls are proposed for installation beneath the vacuum pump exhausts to prevent future contamination. Removed soil will be considered hazardous waste until confirmed otherwise (LANL 1995, 17-1267).

6.4.5 PRSs Recommended for Deferred Action

6.4.5.1 PRS Is Active With No Credible, Off-Site Pathways

SWMU 3-038(f) TA-3-1502 was a transportable used as a hot change house for the industrial waste line removal workers. The transportable was hooked into the old industrial waste line via a manhole, TA-3-728. When the removal project reached the lines that serviced TA-3-1502, new lines were installed to connect the transportables to the new industrial waste line via manhole TA-3-759. Manhole TA-3-728 was removed along with the old lines. The industrial waste line removal project ended in 1986 and TA-3-1502 was vacated by the workers. In 1987 the transportable was removed leaving the lines connecting it to manhole TA-3-759 in the ground (LANL 1994, 17-1045).

Weston reported that the trailer was monitored by HSE-1 and removed to TA-54. They also stated that the main drain line that connected the shower, sink, and toilet drains to the industrial waste line is still present, but no unusually high readings were detected from it during the ER Project site reconnaissance visit (LANL 1989, 17-018).

Rationale for Recommendation: A former site worker was interviewed concerning the removal project. Apparently the waste line for transportable office building TA-3-2009 is connected to the abandoned waste line of TA-3-1502 (Watanabe 1994, 17-1155). Because SWMU 3-038(f) remains active, further characterization would cause greater risk to workers than characterizing the line when it is decommissioned.

TABLE 6-11

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-001(d)	TA-3-170	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(f)	TA-3-038	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(g)	TA-3-473	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(h)	TA-3-066	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(j)	TA-3-034	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(l)	TA-3-316	Storage area	6.4.1.3	1	Not RCRA hazardous wastes/substances
NO	3-001(n)	TA-3-032	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(o)	TA-3-035	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(q)	TA-3-043	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(s)	TA-3-494	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(t)	TA-3-502	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(u)	TA-3-1485 TA-60-19	Satellite accumulation	6.4.1.4	1	Not RCRA hazardous wastes/substances

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-001(v)	TA-3-1486 TA-60-29	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(w)	TA-3-1888	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(x)	TA-3-022	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-001(y)	TA-3-029	Satellite accumulation	6.4.3.5	3	Approved accumulation area
YES	3-002(a)	TA-3-066	Satellite accumulation	6.4.3.5	3	Approved accumulation area
YES	3-002(d)	TA-3-040	Drum storage	6.4.2.2	2	No release to environment
NO	3-003(d)	TA-3-141	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(e)	TA-3-029	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(f)	TA-3-066	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(g)	TA-3-035	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(h)	TA-3-039	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(i)	TA-3-032	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(j)	TA-3-040	PCB-containing capacitors, transformers, drums	6.4.3.3	3	Regulated or closed under different authority

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-003(k)	TA-3-316	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(l)	TA-3-016	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(m)	TA-3-022	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(o)	TA-3-287	PCB-containing capacitors and transformers	6.4.3.3	3	Regulated or closed under different authority
NO	3-003(p)	TA-3-142	Storage of electrical capacitors and transformers	6.4.4.3	4	Voluntary Corrective Action
NO	3-004(a)	TA-3-029	Drum storage/ temporary	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-004(b)	TA-3-029	Drum storage	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-004(e)	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-004(f)	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA hazardous wastes/substances
NO	3-005		Renumbered; addressed in 1993 RFI Work Plan	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-006(a)	TA-3-012	HE-associated	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-008(a)	Old TA-3	HE-associated	6.4.1.3	1	Not RCRA hazardous wastes/substances
NO	3-008(b)	TA-3-43	HE-associated	6.4.2.4	2	No release to environment
YES	3-009(i)	TA-3-170	Debris pile	6.4.1.1	1	Not RCRA hazardous wastes/substances

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
YES	3-009(j)	TA-3-142	Debris pile	6.4.1.1	1	Not RCRA hazardous wastes/substances
YES	3-011	TA-3-031 TA-3-101	Outfall	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(a)	TA-3-130 TA-3-1484	Septic tank & seepage pit	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(b)	TA-3-272	Septic tank	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(c)	TA-3-079	Septic tank	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	3-016(d)	TA-3-443	Septic pit	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-016(e)	TA-3-1639	Lift station	6.4.1.4	1	Not RCRA hazardous wastes/substances
NO	3-016(f)	TA-3-1617	Septic pit	6.4.1.4	1	Not RCRA hazardous wastes/substances
YES	3-019	TA-3-018 TA-3-015	Septic tank	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-022	TA-3-316	Sump	6.4.4.3	4	Voluntary Corrective Action
NO	3-023	TA-3-105 TA-3-148	Sump pit	6.4.2.3	2	No release to environment
YES	3-024	TA-3-141 TA-3-174	Pump pit	6.4.2.3	2	No release to environment
YES	3-025(a)	TA-3-034	Oil trap sump	6.4.1.3	1	Not RCRA hazardous wastes/substances
YES	3-025(b)	TA-3-102	Oil trap	6.4.2.1	2	No release to environment
NO	3-025(c)	TA-3-039	Sump	6.4.2.1	2	No release to environment
YES	3-026(b)	TA-3-132	Sump	6.4.2.3	2	No release to environment
YES	3-026(c)	TA-3-029	Sump	6.4.2.1	2	No release to environment
NO	3-027	TA-3-036	Sump/lift wells	6.4.2.4	2	No release to environment
NO	3-029	TA-3-73 TA-2-271	Asphalt waste/ oil spill	6.4.1.1.1.5	1	Not RCRA hazardous wastes/substances
NO	3-030	TA-3-066	Temporary pit; addressed as SWMU 3-012(a) in 1993 Work Plan	6.4.1.4	1	Not RCRA hazardous wastes/substances
YES	3-031	TA-3-029	Industrial Waste Line	6.4.2.1	2	No release to environment

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
YES	3-032	TA-3-038	Aboveground storage tank	6.4.2.4	2	No release to environment
YES	3-034(b)	TA-3-141	Contaminated soil	6.4.2.1	2	No release to environment
	3-036(a)	TA-3-75 TA-3-76	Asphalt emulsion tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
	3-036(b)	none	Above ground storage tank	6.4.1.1.1.7	1	Not RCRA hazardous wastes/substances
	3-036(c)	TA-3-178	Asphalt emulsion tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
	3-036(d)	TA-3-335	Asphalt emulsion tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
NO	3-036(e)		Asphalt storage tank	6.4.1.1.1.1	1	Not RCRA hazardous wastes/substances
NO	3-036(f)	none	Aboveground storage tank	6.4.1.1.1.2	1	Not RCRA hazardous wastes/substances
NO	3-036(g)	TA-3-022	Aboveground storage tank	6.4.3.2	3	Site regulated or closed under different authority
NO	3-036(h)	TA-3-022	Aboveground storage tank	6.4.2.3	2	No release to environment
NO	3-036(i)	TA-3-022	Aboveground storage tank	6.4.4.2	4	No threat-characterized/ remediated
NO	3-036(j)	TA-3-022	Aboveground storage tank	6.4.4.2	4	Site regulated or closed by different authority
NO	3-038(c)	TA-3-028	Industrial waste line left in place	6.4.3.4	3	Site regulated or closed by different authority
NO	3-038(d)	TA-3-034 TA-3-50	Removed industrial waste line	6.4.2.1	2	No releases to environment
NO	3-038(e)	TA-3-065	Sink drains	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-038(f)	TA-3-2009	Industrial waste line left in place	6.4.5	DA	Active; no pathway to environment
NO	3-040(a)	TA-3-030	Photographic film	6.4.1.1	1	Not RCRA hazardous wastes/substances
NO	3-040(b)	TA-3-043	Photographic film	6.4.2.4	2	No release to environment
NO	3-041	TA-3-1264	Holding tank	6.4.2.1	2	No release to environment
NO	3-043(a)	TA-3-70 TA-3-74	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous waste/substance

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-043(b)	TA-3-70 TA-3-77	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substance
YES	3-043(c)	TA-3-040 TA-3-718	Storage tank	6.4.4.2	4	No threat-characterized/ remediated
NO	3-043(d)	TA-3-70 TA-3-76	Aboveground storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(f)	TA-3-070 TA-3-178	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(g)	TA-3-070 TA-3-335	Storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(h)	TA-3-070 TA-3-75	Aboveground storage tank	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	3-043(i)	TA-3-040 TA-3-93	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	3-044(a)	TA-3-70	Storage area	6.4.1.1.1.3	1	Non RCRA hazardous wastes/substances
YES	3-045(a)	TA-3-022	Outfall	6.4.3.4	3	Site regulated or closed under different authority
YES	3-045(d)	TA-3-022	Aboveground storage tank	6.4.1.4	1	Not RCRA or hazardous wastes/substances
YES	3-045(e)	TA-3-057	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-045(f)	TA-3-223	Outfall from drain	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-045(g)	TA-3-073	Outfall	6.4.1.1.1.6	1	Non RCRA hazardous wastes/substances
YES	3-045(h)	TA-3-066 TA-3-187	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-045(i)	TA-3-034	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-046	TA-3-022	Aboveground storage tank	6.4.3.2	3	Site regulated or closed under different authority
NO	3-047(a)	TA-3-236	Storage	6.4.2.4	2	No release to environment
NO	3-047(b)	TA-3-1501	Storage	6.4.1.1.1.4	1	Non RCRA hazardous wastes/substances
NO	3-047(c)	TA-3-070	Drum storage	6.4.1.1.1.3	1	Not RCRA hazardous wastes/substances
NO	3-047(d)	TA-3-22	Storage	6.4.4.3	4	Voluntary Corrective Action

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-047(e)	TA-3-1963	Storage	6.4.1.1.1.4	1	Non RCRA hazardous wastes/substances
NO	3-047(f)	TA-3-1976	Storage	6.4.1.1.1.4	1	Not RCRA hazardous wastes/substances
NO	3-047(g)	TA-3-141	Drum storage	6.4.2.2	2	No release to environment
NO	3-047(h)	TA-3-170	Waste oil leaks, spills	6.4.2.2	2	No release to environment
NO	3-047(k)	TA-3-374	Drum Storage	6.4.2.2	2	No releases to environment
NO	3-047(i)	TA-3-216	Satellite accumulation	6.4.2.4	2	No release to environment
NO	3-047(j)	TA-3-016	Drum storage	6.4.2.4	2	No release to environment
NO	3-048	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-049(c)	TA-3-066	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-049(d)	TA-3-066	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-049(e)	TA-3-066	Outfall	6.4.1.4	1	Not RCRA or hazardous wastes/substances
YES	3-050(a)	TA-3-029	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(b)	TA-3-034	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(c)	TA-3-35	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(d)	TA-3-102	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(e)	TA-3-39	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(f)	TA-3-40	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
YES	3-050(g)	TA-3-16	Exhaust emissions	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	3-051(a)	TA-3-039	Oil from leaking compressor	6.4.3.3	3	Site regulated or closed by different authority
NO	3-051(b)	TA-3-102	Oil/leaking compressor	6.4.3.3	3	Site regulated or closed by different authority
YES	3-051(c)	TA-3-141	Vacuum pump leaking	6.4.4.3	4	Voluntary Corrective Action

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-051(d)	TA-3-040	Oil/leaking compressor	6.4.2.4	2	No release to environment
YES	3-052(c)	TA-3-422	Storm drains	6.4.4.1	4	One-time release
NO	3-052(d)	TA-3-287	Storm drains	6.4.3.3	3	Site regulated or closed by different authority
YES	3-054(a)	TA-3-016 TA-3-019	Outfall	6.4.2.4	2	No release to environment
YES	3-054(c)	TA-3-105 TA-3-156	Outfall	6.4.3.4	3	Site regulated or closed by different authority
YES	3-054(d)	TA-3-016 TA-3-208	Outfall	6.4.2.4	2	No release to environment
YES	3-055(a)	TA-3-016	Outfall	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-055(c)	TA-3-041	Outfall	6.4.1.3	1	Not RCRA or hazardous wastes/substances
YES	3-055(d)	TA-3-059	Outfall	6.4.1.3	1	Not RCRA or hazardous wastes/substances
NO	3-056(b)	TA-3-70	Storage area	6.4.1.1.1.3	1	Non RCRA hazardous wastes/substances
YES	3-056(d)	TA-3-047	Drum storage	6.4.2.2	2	No release to environment
NO	3-056(e)	TA-3-34	Satellite storage	6.4.1.4	1	Not RCRA or hazardous wastes/substances
NO	3-056(f)	TA-3-316	Drum storage	6.4.1.4	1	Not RCRA or hazardous wastes/substances
NO	3-056(g)	TA-3-016	Satellite accumulation	6.4.3.5	3	Approved accumulation area
NO	3-056(h)	TA-3-105 TA-3-287	PCB-containing capacitors and transformers	6.4.3.3	4	No threat-characterized / remediated
NO	3-056(i)	TA-3-038	Drum storage	6.4.2.2	2	No release to environment
NO	3-056(j)	TA-3-473	Storage	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	3-056(l)	TA-3-141	Drum Storage	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-056(m)	TA-3-322	Drum storage	6.4.1.1	1	Not RCRA or hazardous wastes/substances
YES	3-056(n)	TA-3-379	Drum storage	6.4.2.2	2	No release to environment

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	3-057	TA-3-100 TA-3-688	Grease trap	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	3-058	TA-3-029	Satellite accumulation	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	C-3-001	TA-3-28 TA-3-1872 TA-3-1498	Gas trap	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	C-3-002	TA-3-035	Leak from asphalt machine	6.4.4.1	4	One-time release
NO	C-3-003	TA-3-039	Stained asphalt	6.4.4.1	4	One-time release
NO	C-3-004	TA-3-066	Misc. debris	6.4.1.1	1	Not RCRA or hazardous wastes/substances
NO	C-3-005	TA-3-073	Storm drains	6.4.1.1.1.6	1	Non RCRA hazardous wastes/substances
NO	C-3-007	TA-3-035	Storage	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	C-3-008	TA-3-164	Storage/rad contaminated	6.4.1.2	1	Not RCRA or hazardous wastes/substances
NO	C-3-009	TA-3-169	Storage	6.4.2.4	2	No release to environment
NO	C-3-010	TA-3-019	Outfall	6.4.2.4	2	No release to environment
NO	C-3-011	TA-3-070	Storage tank	6.4.1.1.1.2	1	Non RCRA hazardous wastes/substances
NO	C-3-012	TA-3-029	Satellite accumulation	6.4.2.4	1	Not RCRA or hazardous wastes/substances
NO	C-3-015	TA-3-036	Underground storage tank	6.4.3.1	3	Site regulated or closed under different authority
	C-3-016		Oil metal bin	6.4.1.1.1.7	1	Non RCRA hazardous wastes/substances
NO	C-3-017	TA-3-028	Underground storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-3-018	TA-3-028 TA-3-157	Underground storage tank	6.4.2.3	2	No release to environment
NO	C-3-019	TA-3-016	Underground storage tank	6.4.1.3	1	Not RCRA or hazardous wastes/substances
	C-3-020	TA-3-105	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-3-021	TA-3-016 TA-3-191	Underground storage tank	6.4.3.1	3	Site regulated or closed under different authority

TABLE 6-11 (continued)

PRSs PROPOSED FOR NO FURTHER ACTION OR DEFERRED ACTION IN CHAPTER 6, ADDENDUM 1

HSWA LISTED	PRS	LOCATION	DESCRIPTION	SUB-SECTION	CRITERION	RATIONALE
NO	C-3-022	TA-3-070	Kerosene tanker trailer	6.4.1.1.1.1	1	Non RCRA hazardous wastes/substances
NO	C-59-001	TA-59-184	PCB-containing capacitors and transformers	6.4.3.3	3	Site regulated or closed under different authority
NO	C-60-001	TA-60-1 TA-3-382	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-60-002	TA-60-45	Storage tank	6.4.3.1	3	Site regulated or closed under different authority
NO	C-60-003	TA-60-29	One-time release at pest shed	6.4.4.1	4	No threat-characterized / remediated
NO	C-60-004	TA-60-1	Storage tank	6.4.1.4	1	Not RCRA or hazardous wastes/substances
NO	C-61-001	TA-61-23	PCB oil leak	6.4.1.4	1	Not RCRA or hazardous wastes/substances

6.4.6 REFERENCES

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Reference # 17-619

DOE Removal Letter to NMEID Concerning Underground Storage Tank TA-3-Motor Pool-2 for C-60-001

3-000619

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE: September 6, 1989
IN REPLY REFER TO: ADO-89-745
MAIL STOP: A120
TELEPHONE: (505) 667-9390
(FTS) 843-9390

Mr. James R. Anderson
Area Manager
US Department of Energy
Los Alamos Area Office
Los Alamos, New Mexico 87544

Dear Mr. Anderson:

Enclosed for your concurrence and signature is a self explanatory letter to the New Mexico Environmental Improvement Division (NMEID) transmitting documentation concerning the removal of two Underground Storage Tanks (USTs).

As required under section 207 B. of the New Mexico UST regulations, this letter is to be accompanied by one revised Environmental Protection Agency (EPA) registration form and two pre-signed NMEID closure worksheets.

If you have any questions regarding any upgrades, removals or these regulatory requirements, please contact Dave McInroy of my staff at 667-0819.

Sincerely,

Allen J. Tiedman
Associate Director
for Operations

AJT:DM:skj

Enclosures: a/s

Cy: T. Gunderson, HSE-DO, MS K491
K. Hargis, (HSE8-89-489), HSE-8, MS K490
D. McInroy, HSE-8, MS K490
CRM-4 (2), MS A150

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

SEP. 15 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Bonney Hughes
Environmental Supervisor
Underground Storage Tank Bureau
Environmental Improvement Division
1190 St. Francis Drive
Harold Runnels Building
Santa Fe, New Mexico 87503

Dear Ms. Hughes:

Pan American World Services was tasked by Los Alamos National Laboratory to remove two underground storage tanks in July of this year. The tank numbers were TA-3-36-1 and TA-3-Motor Pool-2. Tank No. TA-3-36-1 was replaced and considered an upgrade by your staff. The notification for upgrade and closure was received by your office on June 19. 1989. Your office was notified of our work schedule, and work began on the removals on the 11th of July. The tanks were removed from the ground on July 13th and 14th, 1989, respectively. All work performed complied with section 801 of the New Mexico Underground Storage Tank Regulations (NMUSTR) and API Publication 1604. There was no visual evidence that the tanks had ever leaked.

As required under section 207 B. of the NMUSTR, we are submitting a revised Environmental Protection Agency (EPA) registration form 7530-1 to reflect the removal of Tank No. TA-3-Motor Pool-2. The revised registration form notifying you of the intended upgrade of Tank No. TA-3-36-1 was sent to you on June 9, 1989. Also enclosed are the closure worksheets (checklists) for the two tanks.

If you have any questions, please call Jim Phoenix of my staff at 667-5288.

Sincerely,

James R. Anderson
Acting Area Manager

Enclosures

cc:
A. J. Tiedman, LANL, MS A120
T. Gunderson, LANL, MS K491
D. McInroy, LANL, MS K490

TANK CLOSURE WORKSHEET

Tank Owner US DOE Phone (505) 667-5288
Address 528 35th Street, Los Alamos, NM 87544

Contractor Name LANL Phone (505) 667-0819
Address Box 1663, Los Alamos, NM 87455
Contractor Name _____ Phone _____
Address _____

Tank Closure Date July 13, 1989 Tank # TA-3-36-1

****

I. **Tank Closure Initial Procedures** (check measures complied with):

- X Obtain recommended safety equipment for all personnel
- X Contact Fire Marshall or other fire officials
- X Bond or ground equipment
- X Drain product from piping and tank
- X Disconnect, then cap or remove piping
- X Remove all residual product from tank
- X Excavate to tank top
- X Remove all tank fixtures
- X Properly purge or inert tank of all flammable vapors using approved method
- X Continually monitor for explosive vapors while tank is being removed

II. **Tank Removal**

- X Create vent hole
- X Excavate tank using all safety precautions
- X Clean and inspect tank
- X Check excavation for evidence of leaks and notify EID and other proper authorities if leak is found
- X Check vapor levels in tank before transporting
- X Dispose of tank in approved manner

Tank disposal location Cleaned, holes cut in the ends and salvaged for scrap.
How did you assess site for leakage? Visual
Closure report kept at The office of David McInroy, LANL
NOTE: Immediately report any evidence of leakage to EID at 827-0188

I hereby state that the above information is correct

David McInroy HSE-8, LANL
Signature of owner or contractor performing work

****

FOR EID USE ONLY
Notification Received _____ Approved By _____
Inspection Date _____ Inspector _____

Notification for Underground Storage Tanks

FOR TANKS IN **NM**

RETURN COMPLETED FORM TO

New Mexico Environmental Improvement Division
Ground Water/Hazardous Waste Bureau
P.O. Box 968 (505) 827-2933
Santa Fe, NM 87504 (505) 827-2918

I.D. Number

STATE USE ONLY

Date Received

GENERAL INFORMATION

Notification is required by Federal law for all underground tanks that have been used to store regulated substances since January 1, 1974, that are in the ground as of May 8, 1986, or that are brought into use after May 8, 1986. The information requested is required by Section 9002 of the Resource Conservation and Recovery Act, (RCRA), as amended.

The primary purpose of this notification program is to locate and evaluate underground tanks that store or have stored petroleum or hazardous substances. It is expected that the information you provide will be based on reasonably available records, or, in the absence of such records, your knowledge, belief, or recollection.

Who Must Notify? Section 9002 of RCRA, as amended, requires that, unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks. Owner means—

(a) in the case of an underground storage tank in use on November 8, 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage, use, or dispensing of regulated substances, and

(b) in the case of any underground storage tank in use before November 8, 1984, but no longer in use on that date, any person who owned such tank immediately before the discontinuation of its use.

What Tanks Are Included? Underground storage tank is defined as any one or combination of tanks that (1) is used to contain an accumulation of "regulated substances," and (2) whose volume (including connected underground piping) is 10% or more beneath the ground. Some examples are underground tanks storing: 1. gasoline, used oil, or diesel fuel, and 2. industrial solvents, pesticides, herbicides or fumigants.

What Tanks Are Excluded? Tanks removed from the ground are not subject to notification. Other tanks excluded from notification are:

1. farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
2. tanks used for storing heating oil for consumptive use on the premises where stored;
3. septic tanks;
4. pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968, or the Hazardous Liquid Pipeline Safety Act of 1979, or which is an intrastate pipeline facility regulated under State laws;
5. surface impoundments, pits, ponds, or lagoons;
6. storm water or waste water collection systems;
7. flow-through process tanks;
8. liquid traps or associated gathering lines directly related to oil or gas production and gathering operations;
9. storage tanks situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

What Substances Are Covered? The notification requirements apply to underground storage tanks that contain regulated substances. This includes any substance defined as hazardous in section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), with the exception of those substances regulated as hazardous waste under Subtitle C of RCRA. It also includes petroleum, e.g., crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

Where To Notify? Completed notification forms should be sent to the address given at the top of this page.

When To Notify? 1. Owners of underground storage tanks in use or that have been taken out of operation after January 1, 1974, but still in the ground, must notify by May 8, 1986. 2. Owners who bring underground storage tanks into use after May 8, 1986, must notify within 30 days of bringing the tanks into use.

Penalties: Any owner who knowingly fails to notify or submits false information shall be subject to a civil penalty not to exceed $10,000 for each tank for which notification is not given or for which false information is submitted.

INSTRUCTIONS

Please type or print in ink all items except "signature" in Section V. This form must by completed for each location containing underground storage tanks. If more than 5 tanks are owned at this location, photocopy the reverse side, and staple continuation sheets to this form.

Indicate number of continuation sheets attached: 1

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual, Public Agency, or Other Entity)
U.S. Department of Energy, LAAO

Street Address
528 35th Street

County
Los Alamos

City: Los Alamos State: NM ZIP Code: 87544

Area Code: (505) Phone Number: 667-5105

Type of Owner (Mark all that apply ☒)

- ☐ Current
- ☐ Former
- ☐ State or Local Gov't
- ☒ Federal Gov't (GSA facility I.D. no. _____)
- ☐ Private or Corporate
- ☐ Ownership uncertain

II. LOCATION OF TANK(S)

(If same as Section 1, mark box here ☐)

Facility Name or Company Site Identifier, as applicable
Los Alamos National Laboratory

Street Address or State Road, as applicable
Box 1663

County
Los Alamos

City (nearest): Los Alamos State: NM ZIP Code: 87544

Indicate number of tanks at this location: 1

Mark box here if tank(s) are located on land within an Indian reservation or on other Indian trust lands ☐

III. CONTACT PERSON AT TANK LOCATION

Name (If same as Section I, mark box here ☐)

Job Title: James A. Phoenix, Chief, Technical Programs Branch

Area Code: (505) Phone Number: 667-5288

IV. TYPE OF NOTIFICATION

☐ Mark box here only if this is an amended or subsequent notification for this location.

V. CERTIFICATION (Read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete.

Name and official title of owner or owner's authorized representative	Signature	Date Signed

CONTINUE ON REVERSE SIDE

Owner Name (from Section I) _____ Location (from Section II) LANL _____ Page No. 2 of 2 Pag

VI DESCRIPTION OF UNDERGROUND STORAGE TANKS (Complete for each tank at this location)

Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential Number (e.g., 1,2,3...)	TA-3	Tank No. 2 Motor Pool	Tank No.	Tank No.	Tank No.	Tank No
1. Status of Tank (Mark all that apply ☒)						
Currently in Use		☐	☐	☐	☐	☐
Temporarily Out of Use		☐	☐	☐	☐	☐
Permanently Out of Use		X	☐	☐	☐	☐
Brought into Use after 5/8/86		☐	☐	☐	☐	☐
2. Estimated Age (Years)		10				
3. Estimated Total Capacity (Gallons)		10,152				
4. Material of Construction (Mark one ☒)						
Steel		X	☐	☐	☐	☐
Concrete		☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic		☐	☐	☐	☐	☐
Unknown		☐	☐	☐	☐	☐
Other, Please Specify						
5. Internal Protection (Mark all that apply ☒)						
Cathodic Protection		☐	☐	☐	☐	☐
Interior Lining (e.g., epoxy resins)		☐	☐	☐	☐	☐
None		☐	☐	☐	☐	☐
Unknown		X	☐	☐	☐	☐
Other, Please Specify						
6. External Protection (Mark all that apply ☒)						
Cathodic Protection		X	☐	☐	☐	☐
Painted (e.g., asphaltic)		☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic Coated		☐	☐	☐	☐	☐
None		☐	☐	☐	☐	☐
Unknown		☐	☐	☐	☐	☐
Other, Please Specify						
7. Piping (Mark all that apply ☒)						
Bare Steel		☐	☐	☐	☐	☐
Galvanized Steel		☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic		☐	☐	☐	☐	☐
Cathodically Protected		☐	☐	☐	☐	☐
Unknown		☐	☐	☐	☐	☐
Other, Please Specify		Wrapped				
8. Substance Currently or Last Stored in Greatest Quantity by Volume (Mark all that apply ☒)						
a. Empty		☐	☐	☐	☐	☐
b. Petroleum						
Diesel		☐	☐	☐	☐	☐
Kerosene		☐	☐	☐	☐	☐
Gasoline (including alcohol blends)		☐	☐	☐	☐	☐
Used Oil		☐	☐	☐	☐	☐
Other, Please Specify						
c. Hazardous Substance		☐	☐	☐	☐	☐
Please Indicate Name of Principal CERCLA Substance						
OR Chemical Abstract Service (CAS) No.						
Mark box ☒ if tank stores a mixture of substances		☐	☐	☐	☐	☐
d. Unknown		☐	☐	☐	☐	☐
9. Additional Information (for tanks permanently taken out of service)						
a. Estimated date last used (mo/yr)		7 / 89	/	/	/	/
b. Estimated quantity of substance remaining (gal.)		-0-				
c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)		☐	☐	☐	☐	☐

REMOVED DATE 7-14-89

☆ U.S. Government Printing Office: 1986—486-738

Reference # 17-832

NMED Closure Letter for SWMU 3-036(g), 3-046

3-000832

State of New Mexico

ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

June 10, 1992

Mr. Jerry L. Bellows
Area Manager
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Mr. Allen J. Tiedman
Associate Dir. of Support
University of California
P.O. Box 1663, MS A-120
Los Alamos, NM 87545

RE: Spill report pursuant to 1-203 A.3. and 1-203 A.6. of the New Mexico Water Quality Control Commission (WQCC) Regulations

Dear Sirs:

The Surface Water Quality Bureau of the New Mexico Environment Department (NMED), is in receipt of the spill reports submitted by DOE/UC-LANL. A list of the spill reports are as follows;

Spill Date	Type of Release	Location User Group
8/29/91	foam	TA-3 WWTP
9/10/91	foam	TA-3 WWTP
10/26/91	sewage overflow	TA-3 WWTP
12/18/91	sewage overflow	TA-3 WWTP
2/11/92	hydraulic fluid	TA-3 Bldg. 2011 ACI
8/1/91	oily sheen	TA-3 outfall 023
8/28/91	foam	TA-3 outfall 023
9/25/91	diesel spill	TA-3 Power Plant
9/4/91	white effluent	TA-3 cooling tower 1837
10/10/91	environmental tank effluent	disposed in TA-18 lagoon
1/27/92	manhole overflow	TA-41 Bldg. 50
2/9/92	steam condensate	TA-21 BLdg. 286
9/27/91	treated effluent	TA-21 outfall 050
2/27/92	discharge from clean out	TA-60

Each site was inspected on February 28, 1992. The corrective actions taken were satisfactory.

Spill reports are required by Section 1-203 of the New Mexico Water Quality Control Commission (WQCC) Regulations. The reports have been reviewed by technical staff of the NMED Surface Water Quality Bureau and they appear to be **administratively complete.** The NMED considers this letter as documentation for closing the files on these spills. NMED appreciates your voluntary cooperation in this matter.

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(505) 827-2850 FAX (505) 827-2836

If you have any questions regarding this matter do not hesitate to call Peter Monahan of my staff at 827-2794.

Sincerely,

Jim Piatt

Jim Piatt
Chief
Surface Water Quality Bureau

xc: NMED, Office of General Counsel
Courte Voorhees, NMED District II Office
Steve Rae, UC-LANL/HSE-8, MS K490

Reference # 17-836

Policy on the Use of Clean Concrete and Asphalt for Fill

ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2850

3-000030

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

September 18, 1992

M E M O R A N D U M

To: Solid Waste Bureau

From: David M. Vackar, Director, Environmental Protection Division

Re: Policy on the Use of Clean Concrete and Asphalt for Fill

Concrete and asphalt have been utilized for fill purposes statewide. These materials by themselves do not pose environmental problems with disposal because of their stability and inertness. They are widely applied in all types of situations including road pavements and water drainage systems. Breakup of the material does not increase the potential to leach contaminants.

In management of solid wastes, it appears more beneficial to allow the use of concrete and asphalt for fill purposes rather than require they go to a landfill for disposal. Such material can have a significant impact on a landfill's capacity. Moreover, the use of such material for fill purposes should not require a solid waste permit.

Section 105.HHH of the Solid Waste Management Regulations exempts from the definition of solid waste facility, "any facility accepting concrete and asphalt material for reuse." The Department has taken the position that concrete and asphalt used for fill constitute beneficial reuse of the materials and can under certain conditions be exempted from the definition of solid waste facility and not subject to solid waste permitting and operational requirements. Other similar materials such as pumice block and bricks may be exempted on a case by case basis.

In making determinations whether certain fill operations qualify for an exemption, the following will be applied:

1. The exemption shall be limited to the use of clean asphalt and concrete and similar materials approved by the Department for fill purposes. Clean is defined as being free of other solid waste or contaminants which have a potential to migrate into surface water and groundwater. Reinforcement materials which are an integral part such as rebar are included.

2. The material shall be covered with 2 feet of clean earth immediately after deposition or within a reasonable time as determined by the Department;

3. Filling of any portions of a watercourse shall not be allowed unless a permit for dredge and fill has been obtained from the Corps of Engineers under the Federal Clean Water Act;

4. Exemptions are intended for individual applications and not for establishment of an on going disposal site. On going disposal of such materials would be classified as Class C landfill, subject to the permitting and operating requirements of the regulations.

Reference # 17-1210

PCB Information Regarding SWMUs 3-003(j), 3-003(l), 3-051(b)

to Becky Wechsler
FROM Danny Bryant

re; pcb information

1. a. samples that were submitted on 10-24-91 showed there were contaminated areas on the floor in "J" wing HSE-9 REQUEST # 12201. THE FOLLOWING ARE GRID POINTS (#) WITH THE RESULTS FOLLOWING IN ug/100~~in~~cm2.
#2;26, #3;130, #4;13, #6;19, #7;18, #10;472, #11;387, #12;66, #13;16, #14;11, #15,190, #16;21, #18;21, #19;25, #21;16, #23;16. the rest of the points (1 thru 24) in this request were less than 10 ug/100~~in~~cm2.

in the sample book, labeled with request # 12536 called second clean-up by JCI submitted on 2-21-92 the results over 10 ug/100in2 are as follows by grid point # and results #3A;11, #10;15, #11;56, #15;37, #16;70.

on 4-20-92, results are in the sample book for a third clean-up at t.a.-3 sm-66 "J-3" basement. results are as follows by grid point (#) followed by result in ug/100~~in~~cm2.
#3A;11.5, #10;16.5, #11;239.

this is the last entry in the sample book for any clean-ups that were done in this area.

1. D. as of 10-27-94 still waiting for results for 2 swipe samples taken from in front of the new dry type transformers that sit where the two pcb units used to sit.

3. a. there were 13 transformers in the basement of t.a.-3 sm-29 that were removed in 1989 and 1990. PCB id #'s are as follows; 85.5567, 5568, 5569, 5570, 5571, 5572, 5573, 5574, 5575, 5576, 5577, 5578, 5579. Jci engineering has an installation date of 1-1-51. these transformers were filled with Inerteen, a brand name for pcb dielectric fluid, which is up to 70% PCB.

3. b. these 9 transformers in the basement of t.a.-3 sm-66 had pcb id #'s as follows, 85.5585, 5586, 5587, 5588, 5589, 5590, 5591, 5592, 5593. they were installed 1-1-58 and had askarel pcb fluid which is up to 90% pcb.

3. c. ????????????????

3. d. ?????????????????????

3. e. this transformer had a pcb id # of 85.5551 and also had an installation date of 1-1-51. this unit was filled with Inerteen dielectric fluid, which is up to 70% pcb.

3. f. these four transformers were installed in 1952. there pcb id #'s are as follows 85.5552, 5553, 5554, 5555. these transformers contained Inerteen pcb fluid.

All I need is info on 3 up to 70% c, d, and G.

to Becky
FROM Danny

re; pcb information

1. a. samples that were submitted on 10-24-91 showed there were contaminated areas on the floor in "J" wing HSE-9 REQUEST # 12201. the following are grid points (#) with the results following in ug/100in2.
#2;26, #3;130, #4;13, #6;19, #7;18, #10;472, #11;387, #12;66, #13;16, #14;11, #15,190, #16;21, #18;21, #19;25, #21;16, #23;16. the rest of the points (1 thru 24) in this request were less than 10 ug/100in2.

in the sample book, labeled with request # 12536 called second clean-up by JCI submitted on 2-21-92 the results over 10 ug/100in2 are as follows by grid point # and results #3A;11, #10;15, #11;56, #15;37, #16;70.

on 4-20-92, results are in the sample book for a third clean-up at t.a.-3 sm-66 "J-3" basement. results are as follows by grid point (#) followed by result in ug/100in2. #3A;11.5, #10;16.5, #11;239.

this is the last entry in the sample book for any clean-ups that were done in this area.

1. b. soil and swipe samples taken on 9-12-92 at ta-3 sm-32 xfmr vault under the cement pad and perimeter on floor. em-9 request # 13601. soil sample location and results are as follows; A,nw=140 ppb, B,ne=240 ppb, C,sw=190 ppb, D,se= "ND" <50 ppb. swipes taken in the same area and same request # with results are as follows. 1,nw=57ug/100cm2, 2,sw=46ug/100cm2. parking lot* 94 ug/100cm2. *note; pcb drops spilled by westinghouse personal gary hyatt ,driver of truck in the parking lot. the following are swipe samples taken from the perimeter of the floor in the vault. sample location # and results are as follows. #1; 40ug/100cm2, #2; >94ug/100cm2, #3; 17ug/100cm2, #4; 82ug/100cm2, #5; 16ug/100cm2, #6; 23ug/100cm2. there were other samples taken in this area.

1. c. post cleanup soil samples from t.a. 3 sm 40 are as follows, soil samples taken from under concrete pads on 7-25-91 hse-9 request # 11793 room s-18 sample location; "soil close to room center" result; 49 ppm. sample from room n-8, sample location "soil SW corner of xfmr" result; 20 ppm. a note in the sample log book says that cement was poured after the results were determined and no other samples were taken.

1. d. area sampled on 8-31-94 at ta 3 sm 16 in rm 70 by the new dry type transformers. locations and results are as follows. cst-9 request # 18804 by switch 1582 result; 3065 ug/100 cm2. sample by switch 1583, result; 2870 ug/100 cm2.

after a clean-up done by m. bailey of jenv the area was resampled on 11-1-94 cst-3 request # 19838 location and results are as follows; by switch 1582; 3760 ug/100cm2, between switch 1582 and 1583; 5420 ug/100cm2, by switch 1583; 352 ug/100cm2. no other samples have been taken.

1. e.

2.

3. a. there were 13 transformers in the basement of t.a.-3 sm-29 that were removed in 1989 and 1990. PCB id #'s are as follows; 85.5567, 5568, 5569, 5570, 5571, 5572, 5573, 5574, 5575, 5576, 5577, 5578, 5579. Jci engineering has an installation date of 1-1-51. these transformers were filled with Inerteen, a brand name for pcb dielectric fluid, which is up to 70% PCB.

3. b. these 9 transformers in the basement of t.a.-3 sm-66 had pcb id #'s as follows, 85.5585, 5586, 5587, 5588, 5589, 5590, 5591, 5592, 5593. they were installed 1-1-58 and had askarel pcb fluid which is up to 90% pcb.

3. c. can't find any replacement info on this xfmr.

3. d. the transformers were manufactured by stockwell and installed in 1952. not sure what type of pcb fluid they contained.

3. e. this transformer had a pcb id # of 85.5551 and also had an installation date of 1-1-51. this unit was filled with Inerteen dielectric fluid, which is up to 70% pcb.

3. f. these four transformers were installed in 1952. there pcb id #'s are as follows 85.5552, 5553, 5554, 5555. these transformers contained Inerteen pcb fluid.

3. g.

Reference # 17-1234

NMED Closure Letter for SWMU 3-029, 3-045(g)

3-001734

State of New Mexico

ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

Certified Mail: Return Receipt Requested

ap 10/20/93

October 20, 1993

Joseph Vozella, Chief
Environment, Safety, and Health Branch
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Dear Mr. Vozella:

Thank you for your letter dated September 21, 1993 regarding LANL's spills and discharges to the surface. I am aware of the time it has been taking this Bureau to send out approval/disapproval letters according to paragraph 7 Section 1-203 of the New Mexico Water Quality Control Commission (WQCC) Regulations.

The Surface Water Quality Bureau (SWQB) has had problems in staffing personnel at Los Alamos under the DOE/AIP program. As discussed in my July 14, 1993, letter to Mr. Bellows and Mr. Tiedman, we intend to utilize the AIP staff person to review corrective actions. Now that we are staffed in that position we expect faster reviews.

Prior to your letter, the SWQB AIP staff met with LANL EM-8 staff on September 15, 1993, to: address this issue, establish routine meetings, and inspect corrective actions implemented at a number of spill locations.

As you are aware LANL reports most of their spills to the SWQB according to WQCC regulation and since January of 1990, LANL has reported 119 spills. The SWQB has closed out all but 15 of these spills, 13 will be closed out in this letter and 3 will remain open pending corrective actions taken by LANL.

The following is a list of the 13 spills that are administratively complete. A conditional approval was placed on TA-3, Sandia Canyon, asphalt for continuous monitoring after runoff events.

Spill Date	Type of Release	Location User Group
10/5/90	Asphalt	TA-3, Sandia Canyon
12/1/91	oil/water	Pajarito Well #4
11/23/92	sewage overflow	TA-61

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Spill Date	Type of Release	Location User Group
11/23/92	gas/fire water	TA-3, SM-29
2/19/93	oil/water	TA-9, 05A066
5/22/93	sewage overflow	TA-18, lift station
5/27/93	sewage overflow	TA-35, lift station
5/28/93	sewage overflow	TA-35, lift station
6/17/93	water treatment chemicals	TA-3-22, power plant
6/18/93	ethylene glycol	TA-53, near bldgs. 28,7
6/22/93	ethylene glycol	TA-3-34
7/6/93	ethylene glycol	TA-53
7/20/93	sanitary sewage	TA-3-1702

Spill reports are required by Section 1-203 of the New Mexico Water Quality Control Commission (WQCC) Regulations. The reports have been reviewed by technical staff of the NMED Surface Water Quality Bureau and they appear to be administratively complete. The NMED considers this letter as documentation for closing the files on these spills. NMED appreciates your voluntary cooperation in this matter.

If you have any questions regarding this matter do not hesitate to call Glenn Saums of my staff at 827-2827.

Sincerely,

Jim Piatt

Jim Piatt
Chief
Surface Water Quality Bureau

cc: NMED, Office of General Counsel
Nina Wells, SWQB-NPS
Tito Madrid, NMED District II Office
Steve Rae, UC-LANL/HSE-8, MS K490

Reference # 17-1236

Computer Database for Satellite and Less-Than-90-Day Storage Areas with ESH-18

SITE_ID	TA	BLDG	ROOM	STATUS	DATE_UPDA	CONTACT	C_GROUP	FACILITY_TYPE
119	3	16	119	REMOVED	28-MAY-93	JEFFREY E. SCHINKEL	P-6	SATELLITE
1040	3	16	120	ACTIVE		GREGG CHAPARRO	P-15	SATELLITE
108	3	16	147B	ACTIVE	31-JAN-95	BARRY WILLARDSON	P-21	SATELLITE
299	3	16	65	REMOVED	19-JUL-95	GREGG CHAPARRO	P-23	SATELLITE — SWMU 3-056(
298	3	16	SHED	ACTIVE	31-JAN-95	GREGG CHAPARRO	P-23	SATELLITE
813	3	22	N/A	ACTIVE	29-JUL-94	RALPH GARCIA	JCI	SATELLITE — SWMU 3-001(X
1179	3	28	41	ACTIVE	10-MAY-95	DENNIS OLIVE	CIC-1	SATELLITE
1255	3	29	1007	ACTIVE		JOE DAHLBY	CST-8	SATELLITE
400	3	29	1117	REMOVED	18-AUG-92	DARRYL C GARCIA	MST-5	SATELLITE
401	3	29	2000	ACTIVE	17-JUN-93	MIKE F. LOPEZ	MST-5	SATELLITE
402	3	29	2048	ACTIVE	17-JUN-93	MIKE F. LOPEZ	MST-5	SATELLITE
403	3	29	2057	ACTIVE	17-JUN-93	MANUEL L. LOVATO	MST-5	SATELLITE
312	3	29	2066	REMOVED	12-APR-95	DAN PAVONE	NMT-9	SATELLITE
946	3	29	2074	REMOVED	01-DEC-94	DARRYL GARCIA	MST-5	SATELLITE
961	3	29	2074	ACTIVE		DARRYL GARCIA	MST-5	SATELLITE
404	3	29	2115	ACTIVE	17-JUN-93	KIMBERLY A. MARTIN	MST-5	SATELLITE
405	3	29	2121	ACTIVE	17-JUN-93	KIMBERLY A. MARTIN	MST-5	SATELLITE
406	3	29	2123	ACTIVE	17-JUN-93	DARRYL C GARCIA	MST-5	SATELLITE
407	3	29	2128	REMOVED	12-NOV-92	DARRYL C GARCIA	MST-5	SATELLITE
923	3	29	2130	REMOVED	15-MAR-94	DARRYL GARCIA	MST-5	SATELLITE
408	3	29	2136	ACTIVE	17-JUN-93	JOSE I. ARCHULETA	MST-5	SATELLITE
960	3	29	2137	ACTIVE		JOSE ARCHULETA	NMT-5	SATELLITE
1285	3	29	2156	ACTIVE	25-MAY-95	PHILLIP KLEINSCHMIDT	NMT-5	SATELLITE
870	3	29	3000	ACTIVE	06-FEB-95	JOEL DAHLBY	CST-8	SATELLITE
131	3	29	3118	REMOVED	06-FEB-95	BARBARA F. SMITH	CST-10	SAFETY KLEEN — SWMU
861	3	29	3127	ACTIVE	06-FEB-95	NELSON STALNAKER	CST-8	SATELLITE 3-001(y)
1273	3	29	3135	REMOVED	25-MAY-95	NELSON STALNAKER	CST-8	SATELLITE
161	3	29	3162	ACTIVE	06-FEB-95	BARBARA SMITH	CST-10	SATELLITE
81	3	29	4125	ACTIVE	06-FEB-95	LEON SONNTAG	CST-1	SATELLITE
1132	3	29	4153	ACTIVE		PETE DEL MAR	MST-5	SATELLITE
1233	3	29	4166	ACTIVE	26-JAN-95	RICK STAROSKI	CST-17	SATELLITE
1309	3	29	5061	ACTIVE		LARRY VAUGHAN	ESA/EPE	SATELLITE
502	3	29	5110	ACTIVE	06-FEB-95	SCOTT EKBERG	CST-4	SATELLITE
133	3	29	5121	ACTIVE	06-FEB-95	TOM MARSHALL	CST-8	SATELLITE — SWMU
959	3	29	5125	ACTIVE	06-FEB-95	JOEL DAHLBY	CST-8	SATELLITE 3-001(y)
958	3	29	5127	ACTIVE	06-FEB-95	TOM MARSHALL	CST-8	SATELLITE
952	3	29	5128	ACTIVE	06-FEB-95	LARRY CALLIS	CST-8	SATELLITE
863	3	29	7051	REMOVED	06-FEB-95	NELSON D. STALNAKER	CST-8	SATELLITE
869	3	29	7051	ACTIVE	06-FEB-95	NELSON STALNAKER	CST-8	SATELLITE

56	3	29	7112	ACTIVE	06-FEB-95	RA HUCKETT	CST-9	SATELLIT
957	3	29	7115	ACTIVE	01-DEC-94	JON SCHOONOVER	CST-4	SATELLITE
1263	3	29	7116	ACTIVE		CONCHA COLLIER	CST-9	SATELLITE
954	3	29	7127	REMOVED	06-FEB-95	LARRY CALLIS	CST-8	SATELLITE
953	3	29	7129	ACTIVE	06-FEB-95	LARRY CALLIS	CST-8	SATELLITE
955	3	29	7134	ACTIVE	06-FEB-95	SARA HUCKETT	CST-9	SATELLITE
132	3	29	7135	ACTIVE	06-FEB-95	SUSAN PACHECO	CST-9	SATELLITE
1302	3	29	7150	ACTIVE	12-JUN-95	CONCHA COLLIER	CST-9	SATELLITE
454	3	29	9010	ACTIVE	14-NOV-94	LARRY FIELD	MST-5	INTERIM
849	3	29	9030	ACTIVE	08-NOV-94	DARRYL GARCIA	MST-5	INTERIM
149	3	29	9115	REMOVED	12-NOV-92	HORACE MARTINEZ	MST-5	SATELLITE
844	3	29	9133	REMOVED	01-DEC-94	JIM LEDBETTER	MST-5	SATELLITE
148	3	29	9165	ACTIVE	17-JUN-93	HORACE MARTINEZ	MST-5	SATELLITE
768	3	29	S012	ACTIVE	13-DEC-94	RICK STAROSKI	CST-17	LESS 90 DAY
1251	3	29	S019	ACTIVE	06-FEB-95	JOEL DAHLBY	CST-8	SATELLITE
301	3	30	131A	ACTIVE	18-NOV-92	JEAN P. RUHE	FSS-DO	SATELLITE
16	3	30	N/A	REMOVED	21-JUN-93	BEN MARTINEZ	ESA-10	LESS 90 DAY
1212	3	30	N/A	REMOVED	11-APR-95	LYNDA SOBOJINSKI	CST-18	LESS 90 DAY
1140	3	30	N/A	REMOVED	21-APR-95	KEN KISIEL	ER/EM	LESS 90 DAY
284	3	30	W113	REMOVED	06-NOV-92	RALPH LASKIE	ESA-10	SATELLITE
282	3	30	W113	REMOVED	06-NOV-92	RALPH LASKIE	ESA-10	SATELLITE
396	3	30	W113	REMOVED	18-NOV-92	BEN MARTINEZ	ESA-10	SATELLITE
283	3	30	W113	REMOVED	06-NOV-92	RALPH LASKIE	ESA-10	SATELLITE
495	3	30	W126	ACTIVE	05-JUL-94	RICK RIVERA	CIC-2	SATELLITE
375	3	30	W131	REMOVED	09-SEP-93	JEAN RUHE	FSS-DO	SATELLITE
914	3	31	DOCK	REMOVED	05-JAN-93	STEVE VANDENBUSCH	VWR	LESS 90 DAY
860	3	31	N/A	REMOVED	24-AUG-92	ALEENE R. JENKINS	BUS-5	LESS 90 DAY
333	3	32	102F	ACTIVE		TERRY MITCHELL/JAMES F. SMITH	CMS	SATELLITE
705	3	32	104	ACTIVE	17-NOV-92	CHRIS ESPINOZA	MST-10	SATELLITE—SWMU 3-001(n)
1297	3	32	111	ACTIVE		STEPHEN FOLTYN	MST-STC	SATELLITE
1300	3	32	111	ACTIVE	01-JUN-95	STEPHEN FOLTYN	MST-STC	SATELLITE
182	3	32	N/A	REMOVED		** HARVEY HAAGENSTAD	MST-10	SATELLITE—SWMU 3-001(j)
323	3	34	0124	REMOVED	12-NOV-92	JACK DYSON	ESA-10	SATELLITE
696	3	34	103	ACTIVE		JOE THOMPSON	MST-10	SATELLITE
697	3	34	104	ACTIVE	17-NOV-92	R. DEAN TAYLOR	MST-10	SATELLITE
695	3	34	107	ACTIVE		JOE D. THOMPSON	MST-10	SATELLITE
698	3	34	108	ACTIVE	30-MAY-95	AL MIQLIORI	MST-10	SATELLITE
699	3	34	116	ACTIVE	17-NOV-92	MICHAEL HUNDLEY	MST-10	SATELLITE
702	3	34	119	ACTIVE		J. HOFFER	MST-10	SATELLITE
701	3	34	122	ACTIVE	21-JUN-93	THOMAS BELL	MST-10	SATELLITE
703	3	34	123	ACTIVE	17-NOV-92	CHRIS HAMMELL	MST-10	SATELLITE

852	3	34	124	ACTIVE	07-JUL-92	ROY ROCKAGE	MST-10	SATELLITE
795	3	34	124	REMOVED	12-NOV-92	ROY ROCKAGE	ESA-10	SATELLITE
845	3	34	124	REMOVED	12-NOV-92	ROY ROCKAGE	ESA-10	SATELLITE
315	3	34	126	REMOVED	15-MAR-94	KENNETH V. SALAZAR	STC	SATELLITE
700	3	34	128	ACTIVE	28-APR-93	R. MOVSHOVICH	MST-10	SATELLITE
704	3	34	129	ACTIVE	17-NOV-92	A.J. ARKO	MST-10	SATELLITE
706	3	34	B1	ACTIVE		MARK HOLLANDER	CMS	SATELLITE
339	3	34	B12	REMOVED	15-MAR-94	KENNETH V. SALAZAR	STC	SATELLITE
718	3	34	B14	ACTIVE	15-MAR-94	NICHOLAS COPPA	STC	SATELLITE
1024	3	34	B14	ACTIVE	15-MAR-94	IAN CAMPBELL	STC	SATELLITE
994	3	34	B1A	ACTIVE	15-MAR-94	KENNETH SALAZAR	STC	SATELLITE
367	3	34	B7	ACTIVE		CHARLES D. KISE	MST-4	SATELLITE
88	3	35	100	REMOVED	28-JUL-92	KEITH BINGHAM	JCI	SATELLITE—SWMU 3-001(c
351	3	35	103	ACTIVE	08-JUL-92	ANTHONY ROLLETT	MST-6	SATELLITE
639	3	36	N/A	REMOVED	02-AUG-93	GEORGE LUJAN	JCI	LESS 90 DAY
115	3	37	N/A	REMOVED	28-JUL-92	DAVE MAESTAS	JCI	SATELLITE
63	3	38	103	ACTIVE	26-JUN-95	ALEX GARCIA	JCI	LESS 90 DAY—SWMU.
1037	3	38	103E	ACTIVE		EARL BOOKWALTER	JCI	SATELLITE 3-001(f)
86	3	38	105	REMOVED	28-JUL-92	VICTOR ROMERO	JCI	SATELLITE
85	3	38	122	ACTIVE	29-JUL-94	FRED THRONAS	JCI	SATELLITE—SWMU
864	3	38	122	REMOVED	14-DEC-93	FRED THRONAS	JCI	SATELLITE 3-001(f)
64	3	38	125	REMOVED	10-AUG-93	CHARLIE BARNETT	JCI	SAFETY KLEEN
865	3	38	125	ACTIVE	29-JUL-94	FRED THRONAS	JCI	SATELLITE—
87	3	38	132	ACTIVE	29-JUL-94	FRED THRONAS	JCI	SATELLITE— } SWMU 3-001(f)
1082	3	38	133A	REMOVED	16-FEB-95	REX CROOK	JCI	SATELLITE
519	3	39	10	ACTIVE	14-OCT-92	RAMON SERRANO	ESH-9	SATELLITE
742	3	39	11	ACTIVE	06-NOV-92	RAMON SERRANO	ESH-9	SATELLITE
584	3	39	15	REMOVED	18-NOV-92	RICHARD LOGSDON	MST-7	SATELLITE
754	3	39	15	REMOVED	14-JAN-93	RICHARD LOGSDON	MST-7	SATELLITE
905	3	39	15	ACTIVE	26-OCT-92	RICHARD LOGSDON	MST-7	SATELLITE
986	3	39	16	ACTIVE	17-MAY-95	RAUL BRUNNER	ESA-10	SATELLITE
496	3	39	22	REMOVED	09-AUG-93	ANTONIO GONZALES	ESA-10	SATELLITE
606	3	39	23CA	REMOVED	09-AUG-93	ANTONIO MARTINEZ	ESA-10	SATELLITE
521	3	39	23P	REMOVED	09-AUG-93	JOHN EDWARDS	ESA-10	SATELLITE
302	3	39	28G	REMOVED	09-AUG-93	ORLANDO SMITH	ESA-10	SATELLITE
515	3	39	28G	REMOVED	09-AUG-93	ORLANDO SMITH	ESA-10	SATELLITE
444	3	39	6	REMOVED	11-JUL-94	JACOB BARTOS	MST-7	SATELLITE
667	3	39	7	REMOVED	09-AUG-93	FERNANDO ALGARRA	ESA-10	SATELLITE
784	3	39	N/A	REMOVED	12-NOV-92	PHILLIP DURAN	ESA-10	LESS 90 DAY
5	3	39	N/A	ACTIVE	31-JAN-95	DAVID A. MONTOYA	ESA/MF	LESS 90 DAY
603	3	39	N/A	REMOVED	09-AUG-93	ROBERT HAYES	ESA-10	SATELLITE

520	3	39	N/A	ACTIVE	14-OCT-92	MON SERRANO	ESH-9	SATELLI
414	3	39	SH12	REMOVED	09-AUG-93	RON HAGGART	ESA-10	SATELLITE
922	3	39	SH8	ACTIVE	31-JAN-95	P. DURAN	ESA/MF	SATELLITE
516	3	39	SHP4	REMOVED	18-NOV-92	RON HAGGART	ESA-10	SATELLITE
415	3	39	SHP6	REMOVED	09-AUG-93	ORLANDO SMITH	ESA-10	SATELLITE
1234	3	40	0000	REMOVED	01-MAR-95	STALEY HADDEN	P-DO	LESS 90 DAY
126	3	40	106	REMOVED	14-JAN-93	E.R. SHUNK	EES-8	SATELLITE
1052	3	40	E116	ACTIVE		MARK PETERS	P-6	SATELLITE
1051	3	40	E137	ACTIVE	25-JAN-95	RICK MONTOYA	P-22	SATELLITE
1044	3	40	E146	ACTIVE	14-NOV-94	ABEL CASTILLO	P-23	SATELLITE
1046	3	40	E28A	ACTIVE	10-FEB-94	WILLIAM MARTINEZ	ESH-4	LESS 90 DAY
632	3	40	E34B	REMOVED	21-APR-95	EDWARD ROBINSON	P-3	SATELLITE
634	3	40	E38	ACTIVE	17-NOV-92	MEL ANAYA	P-3	SATELLITE
851	3	40	E39	ACTIVE	17-NOV-92	JUDY GUBSKY	P-3	SATELLITE
112	3	40	N/A	REMOVED	04-JUN-93	ALFRED HERNANDEZ	NIS-1	SATELLITE
823	3	40	N/A	REMOVED	05-NOV-92	TOMAS VIGIL	JCI	SATELLITE
916	3	40	N/A	REMOVED	09-JUN-93	STALEY HADDEN	P-DO	SATELLITE
862	3	40	N/A	ACTIVE		STALEY E. HADDEN	P-DO	SATELLITE
6	3	40	N/A	REMOVED	08-OCT-93	JACK CHASE	ESA-10	LESS 90 DAY
382	3	40	N100	REMOVED	20-JAN-94	CATHERINE MOMBOURQUETTE	MST-11	SATELLITE
381	3	40	N100	REMOVED	06-NOV-92	CATHERINE MOMBOURQUETTE	MST-11	SATELLITE
383	3	40	N102	ACTIVE	06-NOV-92	CATHERINE MOMBOURQUETTE	MST-11	SATELLITE
100	3	40	N102	REMOVED	07-JUL-92	CATHERINE MOMBOURQUETTE	MST-11	SATELLITE
581	3	40	N105	ACTIVE	06-NOV-92	JUDITH VALERIO	MST-11	SATELLITE
399	3	40	N114	REMOVED	06-JUL-93	STEPHEN BLAIR	NIS-3	SATELLITE
129	3	40	N120	REMOVED	31-AUG-92	J. BALDONADO	SST-8	SATELLITE
8	3	40	N121	REMOVED	31-AUG-92	JUAN ROBERT BALDONADO	SST-8	SATELLITE
371	3	40	N142	ACTIVE	06-NOV-92	JOHN JOSEPH	MST-11	SATELLITE
1209	3	40	N161	ACTIVE	13-FEB-95	JOHN DAVEY	MST-11	SATELLITE
580	3	40	N170	REMOVED	20-JAN-94	JUDITH VALERIO	MST-11	SATELLITE
1004	3	40	N170	ACTIVE	20-JAN-94	ERIC BOSHA	MST-11	SATELLITE
583	3	40	N174	REMOVED	07-JUL-92	MARK PAFFET	CST-1	SATELLITE
928	3	40	N176	ACTIVE	20-JAN-94	FERNANDO GARZON	MST-11	SATELLITE
582	3	40	N183	ACTIVE	06-NOV-92	TOM ZARWODZINSKI	MST-11	SATELLITE
592	3	40	N185	ACTIVE	06-NOV-92	CHUCK DEROUIN	MST-11	SATELLITE
125	3	40	S104	REMOVED	31-AUG-92	J. BALDANADO	SST-8	SATELLITE
285	3	40	S106	REMOVED	31-AUG-92	WARREN BUXTON	SST-8	SATELLITE
127	3	40	S116	REMOVED	31-AUG-92	BOB REEDY	SST-8	SATELLITE
128	3	40	S12	REMOVED	31-AUG-92	JOE BOROVSKY	SST-8	SATELLITE
153	3	40	S123	ACTIVE	09-NOV-92	BRUCE ROBINSON	EES-4	SATELLITE
164	3	40	S2	REMOVED		ED FENIMORE	NIS-2	SATELLITE

124	3	40	S2	REMOVED		ED FENIMORE		NIS-2	SATELLITE
790	3	40	W112	ACTIVE	11-JUL-94	JUAN BALDONADO		NIS-1	SATELLITE
9	3	40	W122	REMOVED	23-NOV-92	JOHN VALENCIA		NIS-2	SATELLITE
260	3	40	W124	REMOVED		BILL VERZINO		NIS-2	SATELLITE
10	3	40	W124	ACTIVE	22-JUL-93	FRANK AMEDURI		NIS-2	SATELLITE
261	3	40	W124	REMOVED	23-NOV-92	FRANK AMEDURI		NIS-2	SATELLITE
272	3	40	W126	REMOVED	23-NOV-92	FRANK AMEDURI		NIS-2	SATELLITE
104	3	40	W128	REMOVED	23-NOV-92	AL GIBBS		NIS-2	SATELLITE
497	3	40	W131	REMOVED	06-JUL-93	STEPHEN BLAIR		NIS-3	SATELLITE
111	3	40	W40	ACTIVE	23-NOV-92	HAROLD DEHAVEN		NIS-1	SATELLITE
12	3	43	A326	REMOVED	07-JUL-92	LYNN TREASE		EES-5	SATELLITE-SWMU 3-001(q)
542	3	43	A432	REMOVED	04-NOV-92	RICHARD G. WARREN		EES-1	SATELLITE
360	3	43	B202	ACTIVE	08-JUN-93	PAM PAINE		X-DO	SATELLITE
336	3	43	B6	REMOVED	09-NOV-92	JIMMY ROYBAL		IS-9	SATELLITE
494	3	43	C2	ACTIVE	05-JUL-94	ALTON MCNEIL		CIC-17	LESS 90 DAY
335	3	43	C22A	REMOVED		Presley Salaz		IS-9	LESS 90 DAY
397	3	43	C255	ACTIVE	09-NOV-92	ANNE K. BREW		NIS-11	SATELLITE
19	3	66	105C	REMOVED		JOE MITCHELL	(RM H101A)	MST-6	SATELLITE- } SWMU 3-001(b)
379	3	66	107	REMOVED	12-NOV-92	CHARLIE BACA		ESA-10	SATELLITE-
384	3	66	B100	REMOVED	24-FEB-94	PAUL DUNN		MST-6	SATELLITE
743	3	66	B100	ACTIVE	24-FEB-94	PAUL DUNN		MST-6	SATELLITE-
352	3	66	B104	REMOVED	09-MAR-93	PAUL DUNN		MST-6	SATELLITE-
253	3	66	B107	REMOVED	09-MAR-93	P. DUNN		MST-6	SATELLITE-
254	3	66	B3	REMOVED	09-MAR-93	P. DUNN		MST-6	SATELLITE-
359	3	66	C100	ACTIVE	24-FEB-94	PAUL DUNN		MST-6	SATELLITE-
378	3	66	C100	REMOVED	12-NOV-92	CHARLIE BACA		ESA-10	SATELLITE-
362	3	66	C100	REMOVED	12-NOV-92	CHARLIE BACA		ESA-10	SATELLITE-
880	3	66	D106	ACTIVE	09-MAR-93	P. MOMBOURQUETTE		MST-6	SATELLITE-
244	3	66	D108	ACTIVE	22-JUN-94	CAROLYNN SCHEREN		MST-4	SATELLITE-
276	3	66	D2	ACTIVE	12-NOV-92	DAVID PHILLIPS		MST-4	SATELLITE-
349	3	66	G103	ACTIVE	12-NOV-92	ERALIO TRUJILLO		MST-4	SATELLITE- } SWMU 3-001(h)
292	3	66	G105	ACTIVE	08-JUL-92	J. PETROVIC		MST-4	SATELLITE-
308	3	66	G3	ACTIVE	12-NOV-92	DAVE PHILLIPS		MST-4	SATELLITE-
353	3	66	G4	ACTIVE	06-MAY-93	CHARLES KISE		MST-4	SATELLITE-
1164	3	66	G6	ACTIVE		JEFF HULING		MST-4	SATELLITE-
162	3	66	H105	ACTIVE	09-MAR-93	ANN KELLY		MST-6	SATELLITE-
968	3	66	J1	ACTIVE		PAUL MOMBOURQUETTE		MST-6	SATELLITE-
350	3	66	J104	REMOVED	07-JUL-92	CHARLES HOSFORD		MST-7	SATELLITE-
741	3	66	J105	REMOVED	09-MAR-93	GARY CARTER		MST-6	SATELLITE-
834	3	66	K-2	ACTIVE	09-MAR-93	W.S. GIBBS		MST-6	SATELLITE-
354	3	66	K104	ACTIVE	24-FEB-94	MANNY PACHECO		MST-6	SATELLITE-

158	3	66	N/A	REMOVED	05-JUL-95	TONY MAYER	MST-6	LESS 90 DAY	
321	3	66	P1	ACTIVE	09-MAR-93	RICHARD BRAMLETT	MST-6	SATELLITE	
740	3	66	P103	ACTIVE	09-MAR-93	RICHARD BRAMLETT	MST-6	SATELLITE	
361	3	66	R100	ACTIVE	09-MAR-93	SAM ATENCIO	MST-6	SATELLITE	
255	3	66	R108	ACTIVE	24-FEB-94	MIKE BARBE	MST-6	SATELLITE	SWMU 3-001(h)
293	3	66	R11	ACTIVE	09-MAR-93	BARRY BINGHAM	MST-6	SATELLITE	
364	3	66	R3	REMOVED	12-NOV-92	RICHARD BRYANT	ESA-10	SATELLITE	
274	3	66	R4	ACTIVE	09-MAR-93	BARRY L. BINGHAM	MST-6	SATELLITE	
65	3	70	8	REMOVED	09-APR-93	CHARLIE BARNETT	JCI	SAFETY KLEEN	
82	3	70	N/A	REMOVED	03-JUN-93	BENITO MARTINEZ	JCI	SATELLITE	
816	3	70	N/A	REMOVED	15-OCT-92	LLOYD COLE	JCI	SATELLITE	
555	3	102	112	REMOVED	09-AUG-93	ANTONIO MARTINEZ	ESA-10	SATELLITE	
665	3	102	118	REMOVED	12-NOV-92	ROBERT W. HAYES	ESA-10	SATELLITE	
755	3	102	118	ACTIVE	31-JAN-95	RICHARD BRYANT	ESA/MF	SATELLITE	
7	3	102	118	ACTIVE	31-JAN-95	KIM LLOYD	ESA/MF	LESS 90 DAY	
641	3	102	118A	CLOSED	22-NOV-94	ROBERT HAYES	ESA-10	INTERIM	
666	3	102	125	REMOVED	12-NOV-92	MARTIN MARTINEZ	ESA-10	SATELLITE	
498	3	102	129	REMOVED	09-AUG-93	ROBERT HAYES	ESA-10	SATELLITE	
753	3	105	10	REMOVED	17-JUN-93	BOB KASICK	P-1	SATELLITE	
707	3	105	N/A	REMOVED		NICK SALAZAR	CTR-DO	LESS 90 DAY	
278	3	132	180S	REMOVED	08-JUL-92	STEPHEN B. DUNAGAN	C-1	SATELLITE	
1062	3	132	187	ACTIVE	05-JUL-94	STEPHEN DUNAGAN	CIC-18	LESS 90 DAY	
594	3	132	202B	REMOVED	26-SEP-94	STEPHEN B. DUNAGAN	CIC-18	LESS 90 DAY	
279	3	132	202B	REMOVED	08-JUL-92	STEPHEN B. DUNAGAN	C-1	SATELLITE	
1205	3	132	260	REMOVED	14-NOV-94	STEVE DUNAGAN	CIC-17	SATELLITE	
1201	3	132	260A	REMOVED	14-NOV-94	STEVE DUNAGAN	CIC-18	SATELLITE	
1206	3	132	260A	ACTIVE	14-NOV-94	STEVE DUNAGAN	CIC-17	SATELLITE	
1200	3	132	280	ACTIVE	26-JAN-95	STEVE DUNAGAN	CIC-18	SATELLITE	
275	3	141	102A	ACTIVE	12-NOV-92	GERALD J. VOGT	MST-4	SATELLITE	
998	3	141	130	ACTIVE		JULIE BREMSER	MST-4	SATELLITE	
739	3	141	136A	ACTIVE	09-MAR-93	VICTOR VARGAS	MST-6	SATELLITE	
307	3	141	144	ACTIVE	03-MAY-93	VICTOR VARGAS	MST-6	SATELLITE	
1311	3	141	144	ACTIVE		PAUL MOMBOURQUETTE	MST-6	SATELLITE	
738	3	141	N/A	REMOVED	03-MAY-93	HAROLD DAVID	MST-6	SATELLITE	
18	3	170	N/A	REMOVED	06-NOV-92	JOHNNY LOVATO	BUS-4	SATELLITE	SWMU 3-001(d)
291	3	215	259	ACTIVE	20-APR-95	MARCIA JONES	EES-5	SATELLITE	
137	3	216	106	REMOVED	05-NOV-92	LARRY MITCHELL	DX-17	SATELLITE	
1074	3	216	166	ACTIVE		JEFFREY BRADLEY	P-14	SATELLITE	
1048	3	216	36	ACTIVE		BILL COULTER	P-14	SATELLITE	
747	3	216	6A	ACTIVE	18-NOV-92	JERFFREY M. BRADLEY	P-14	SATELLITE	
1049	3	216	6A	ACTIVE	23-FEB-95	JEFFREY BRADLEY	P-22	SATELLITE	

1073	3	216	8	ACTIVE		JEFFREY BRADLEY	P-14	SATELLITE
1050	3	216	9	ACTIVE	25-JAN-95	BILL COULTER	P-22	SATELLITE
116	3	223	N/A	REMOVED	22-DEC-93	JERRY LYNCH	JCI	SATELLITE
1308	3	271	0000	ACTIVE		GREG BAYHURST	EES-4	LESS 90 DAY
1168	3	271	N/A	ACTIVE	08-NOV-94	KEN KISIEL	ER/EM	LESS 90 DAY
332	3	287	0101	REMOVED	12-NOV-92	PETE PAZUCHANICS	ESA-10	SATELLITE
1139	3	287	16	ACTIVE		MIKE KELLY	NIS-2	SATELLITE
640	3	287	N/A	REMOVED	28-JUL-92	MIKE HARVEY	JCI	LESS 90 DAY
114	3	322	101	ACTIVE	03-MAY-93	DAVE ANDERSON	EES-4	SATELLITE
908	3	334	N/A	REMOVED	15-MAR-93	GLENN BRYANT	JCI	SATELLITE
814	3	379	0000	ACTIVE	19-MAY-95	FRED THRONAS	JCI	LESS 90 DAY
90	3	382	N/A	REMOVED	28-JUL-92	ORLANDO LOPEZ	JCI	SATELLITE
92	3	382	N/A	REMOVED	28-JUL-92	TONY GUTIERREZ	JCI	SATELLITE
67	3	382	N/A	REMOVED	28-JUL-92	ROBERT ATENCIO	JCI	SATELLITE
93	3	382	N/A	REMOVED	28-JUL-92	CHARLIE BARNETT	JCI	SAFETY KLEEN
66	3	382	N/A	REMOVED	28-JUL-92	CHARLIE BARNETT	JCI	SAFETY KLEEN
912	3	391	100C	ACTIVE	26-SEP-94	JAMES MORK	JCI	SATELLITE
983	3	391	100C	REMOVED	28-JUN-93	JAMES MORK	JCI	SATELLITE
166	3	409	101	REMOVED	14-NOV-94	HUGH N. SMITH	ESH-2	SATELLITE
617	3	409	113F	REMOVED	25-JUN-93	JOSEFITA GONZALES	ESH-2	SATELLITE
554	3	409	133	ACTIVE	14-NOV-94	TERESA J. JONES	ESH-2	SATELLITE
553	3	409	N/A	REMOVED	17-AUG-94	TERESA J. JONES	ESH-2	SATELLITE
1017	3	409	N/A	REMOVED	22-DEC-93	JOESFITA GONZALES	ESH-2	LESS 90 DAY
1186	3	410	128	ACTIVE	26-JAN-95	STEVE JOHNSON	FSS-3	SATELLITE
1036	3	422	116	ACTIVE	22-JUN-93	GERALD MARTINEZ	P-15	SATELLITE
931	3	447	N/A	REMOVED	09-APR-93	GARY MARTIN	JCI	SAFETY KLEEN
1245	3	462	0000	REMOVED	22-JUN-95	MICHAEL WILLIAMS	ESH/TS	SATELLITE
123	3	494	101	ACTIVE	09-NOV-92	PAT TRUJILLO	EES-1	SATELLITE
122	3	494	101	ACTIVE	26-SEP-94	DALE COUNCE	EES-1	SATELLITE
121	3	494	107	ACTIVE	09-NOV-92	PEGGY SNOW	EES-1	SATELLITE
120	3	502	N111	REMOVED	07-JUL-92	LOUIS R. BACA	EES-1	SATELLITE - SWMU 3-001(S)
879	3	510	203	ACTIVE	05-JUL-94	PRESELY SALAZ	NIS-4	SATELLITE - SWMU 3-001(t)
717	3	539	N/A	ACTIVE	18-NOV-92	BILL WAGEANARR	CIC-9	SATELLITE
1275	3	562	109	ACTIVE		CLIFF UNKEFER	P-1	SATELLITE
89	3	1485	N/A	REMOVED	28-JUL-92	FRED TRONASINEZ	CST-4	SATELLITE
1077	3	1526	N/A	ACTIVE		CHUCK THIEL	JCI	SATELLITE
811	3	1568	N/A	REMOVED	23-AUG-93	GEORGE LUJAN	JCI	SATELLITE
1129	3	1663	112	ACTIVE		DAVID APEL	JCI	SATELLITE
1293	3	1698	B122	ACTIVE		MIKE LOPEZ	ESH-2	SATELLITE
1278	3	1698	C116	ACTIVE		DEQUAN LI	MST-5	SATELLITE
1310	3	1698	C135	ACTIVE		TERENCE MITCHELL	CST-4	SATELLITE
							CM	SATELLITE

94	3	1698	C143	ACTIVE		N DI WU	MST-STC	SATELLITE
1270	3	1698	C208	ACTIVE		ROGER RAY	STC	SATELLITE
1143	3	1698	C222	ACTIVE		MARK WELKER	MST-7	SATELLITE
1264	3	1698	C239	ACTIVE		THOMAS TAYLOR	CST-10	SATELLITE
1296	3	1698	C243	ACTIVE		DARRYL BUTTS	MST-6	SATELLITE
1258	3	1698	C245	ACTIVE		KENNETH MCCLELLAN	MST-4	SATELLITE
1295	3	1698	C247	ACTIVE		DARRYL BUTTS	MST-6	SATELLITE
273	3	1819	0103	ACTIVE	15-MAR-94	DONALD E. NYE	CMS	SATELLITE
245	3	1819	0105	REMOVED	26-OCT-92	ROBERT E. HERMES	MST-7	SATELLITE
1242	3	1819	102	ACTIVE	26-JAN-95	YATES COULTER	STC	SATELLITE
338	3	1819	104	REMOVED	15-MAR-94	KENNETH V. SALAZAR	STC	SATELLITE
600	3	1819	105	ACTIVE	17-FEB-94	DEQUAN LI	CST-14	SATELLITE
337	3	1819	115	REMOVED	15-MAR-94	KENNETH V. SALAZAR	STC	SATELLITE
113	3	1888	110	REMOVED	05-MAR-93	MELVIN BUCHWALD	NIS-4	SATELLITE-SWMU
139	3	2009	131	ACTIVE	22-DEC-92	JOSEPH R. CORTEZ	ESH-4	SATELLITE 3-001(W)
1101	3	2009	132	ACTIVE		RICH MCKEEVER	ESH-4	SATELLITE
808	3	2039	SHED	REMOVED	26-JAN-93	MICHAEL BAILEY	JCI	SATELLITE
805	3	2056	N/A	REMOVED	09-MAY-94	William Coulter	P-14	LESS 90 DAY
524	3	2133	N/A	ACTIVE	08-JUL-92	BOB BOLLMAN	NIS-4	LESS 90 DAY
1283	59	1	0000	REMOVED	21-JUN-95	GEORGE BROOKS	CST-9	LESS 90 DAY
532	59	1	101	REMOVED	21-JUN-94	STEVE GOLDSTEIN	CST-9	SATELLITE
533	59	1	103	REMOVED	21-JUN-94	EDWARD GONZALES	CST-9	SATELLITE
540	59	1	104	REMOVED	21-JUN-94	GLORIA MARTINEZ	CST-9	SATELLITE
551	59	1	106	REMOVED	27-MAR-95	ALICE SLEMMONS	CST-9	SATELLITE
539	59	1	107	ACTIVE	03-FEB-95	JEFF ROBERTS	CST-12	SATELLITE
534	59	1	108	ACTIVE	03-FEB-95	JEFF ROBERTS	CST-12	SATELLITE
535	59	1	113	ACTIVE	03-FEB-95	ANTHONY LOMBARDO	CST-12	SATELLITE
537	59	1	115	ACTIVE	26-JUN-95	JUDY TRAYLOR	CST-12	SATELLITE
536	59	1	116	ACTIVE	03-FEB-95	KELLY HAKONSON	CST-12	SATELLITE
538	59	1	117	ACTIVE	03-FEB-95	MATTHEW MONAGLE	CST-12	SATELLITE
868	59	1	119	REMOVED	03-FEB-95	CHRIS LEIBMAN	CST-12	SATELLITE
970	59	1	119	ACTIVE	03-FEB-95	CHRIS LEIBMAN	CST-12	SATELLITE
933	59	1	120	ACTIVE	19-APR-93	CARROL THOMAS	ESH-5	LESS 90 DAY
1214	59	1	123	ACTIVE		TANYA LEWIS	CST-12	SATELLITE
599	59	1	129	ACTIVE	10-FEB-93	DAVID RAMSEY	ESH-5	SATELLITE
843	59	1	130	REMOVED	01-MAY-95	RICHARD KISSANE	ESH-5	SATELLITE
1007	59	1	134	REMOVED	01-MAY-95	RICHARD BAGLEY	ESH-5	SATELLITE
1008	59	1	148	REMOVED	01-MAY-95	LARRY ORTIZ	ESH-5	SATELLITE
593	59	1	172	REMOVED	24-AUG-92	SANDRA CISNEROS-FLORES	CST-9	SATELLITE
531	59	1	184	ACTIVE	22-JUN-94	CATHERINE HENSLEY	CST-9	SATELLITE
395	59	1	190	ACTIVE	20-JUN-95	W. RICK VELASQUEZ	CST-17	LESS 90 DAY

487	59	1	B1B	REMOVED	07-JUL-92	DOUGLAS BARNEY	ESH-5	SATELLITE
541	59	1	B4	ACTIVE	03-FEB-95	NANCY L. KOSKI	CST-3	SATELLITE
841	59	1	B8H	REMOVED	01-MAY-95	GERRY WOOD	ESH-5	SATELLITE
14	59	1	N/A	REMOVED	18-DEC-92	JOHN MIGLIO	CST-9	SATELLITE
985	59	1	N/A	ACTIVE	03-FEB-95	CHRIS LEIBMAN	CST-12	SATELLITE
1038	59	1	N/A	ACTIVE	03-FEB-95	KELLY HAKONSON	CST-12	LESS 90 DAY
842	59	2	108	REMOVED	30-SEP-92	RICHARD KISSANE	ESH-5	SATELLITE
687	59	3	204	REMOVED	17-MAR-95	CAROL A. COX-DEVORE	ESH-2	SATELLITE
1175	60	0	0	REMOVED	30-MAY-95	GARRY ALLEN	CST-18	LESS 90 DAY
1199	60	1	0000	REMOVED	21-OCT-94	DAN ARCHULETA	JCI	LESS 90 DAY
815	60	1	N/A	ACTIVE	29-JUL-94	ED MONTOYA	JCI	SATELLITE
942	60	1	N/A	REMOVED	09-APR-93	JOE RICHARDSON	JCI	SAFETY KLEEN
941	60	1	N/A	REMOVED	09-APR-93	JOE RICHARDSON	JCI	SAFETY KLEEN
940	60	1	N/A	REMOVED	09-APR-93	JOE RICHARDSON	JCI	SAFETY KLEEN
1196	60	2	0000	REMOVED	20-JAN-95	SCOTT ALEXANDER	JCI	SATELLITE
948	60	2	N/A	REMOVED	15-MAR-93	LOUIE R. ROYBAL	JCI	LESS 90 DAY
1130	60	9	N/A	REMOVED	07-JUN-94	EARL BOOKWALTER	JCI	LESS 90 DAY
1208	60	17	0000	REMOVED	30-JAN-95	ALFONSO MARTINEZ	FSS-9	LESS 90 DAY
822	60	17	EAST	ACTIVE	29-JUL-94	JOE GARCIA	JCI	SATELLITE
866	60	17	N/A	REMOVED	25-MAR-93	KELSIE DOSHIER	JCI	SATELLITE
819	60	19	N/A	REMOVED	07-JUN-94	JOE GARCIA	JCI	SATELLITE
91	60	29	N/A	ACTIVE	29-JUL-94	MANUEL L'ESPERANCE	JCI	SATELLITE -SWMU
878	60	381	YARD	REMOVED	04-NOV-92	RUDY VIGIL	JCI	SATELLITE 3-001(V)
759	61	23	102	ACTIVE	05-JUL-94	JOHN FLAMMING JR.	CIC-4	SATELLITE

350 rows selected.

SQL>

Reference # 17-1244

NMED Closure Letter for C-3-021

3-001244

State of New Mexico

ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

March 25, 1992

U. S. Department of Energy
Los Alamos Area Office
Environmental Safety & Health Branch
Attn: Karl J. Twombly
528 35th Street
Los Alamos, NM 87544

RE: TECHNICAL AREA TA-3-191

Dear Mr. Twombly:

The New Mexico Environment Department (NMED) has recieved the final report on the above-referenced site. The NMED has determined that this site does not pose an immediate public health or environmental threat for the following reasons:

1. The horizontal and vertical extent of soil contamination has been adequately defined. No contaminated soils above the state cleanup levels remains on site. Contaminated soils have been properly disposed.

2. Depth to groundwater at this site is greater than 900 feet below ground surface.

Therefore, NMED is not requiring additional work at this time. However, NMED reserves the right to require additional work in the future if data become available that indicate the presence of petroleum hydrocarbon contamination emanating from or in the vicinity of this site that results in a threat to public health or the environment.

Again, thank you for your cooperation in this matter.

Sincerely,

Anthony Moreland
Remedial Action Program
Underground Storage Tank Bureau

cc: NMED Espanola Field Office
Jeff Carmichael, Environmental Safety & Health Branch, DOE

Reference # 17-1265

PCB Analysis Results Summary for SWMU 3-003(f)

LINDA SORATENSKI WK PG. COC
CC GEZO PC MA 11-3004
3/17/95 ~~[illegible]~~ - SIGMA WING J3

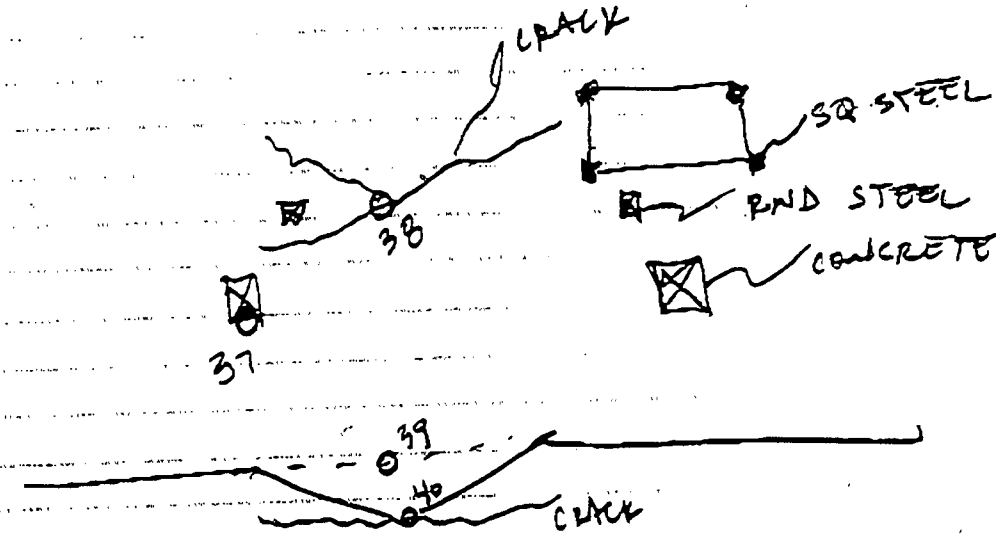
3-001265

95.0037 < 2.5 µg/g

95.0038 < 2.5 µg/g

95.0039 < 2.5 µg/g

95.0040 < 2.5 µg/g



CLEANED BY MIKE BAILEY
COVERED (PAINTED W/ PLASITE) - PIGMENTE EPOX

Sample #	Request #	Date	Comments	Type
95.0026		2/21/95	TA-9 Rm 135	Vac-Pump Oi
95.0027		2/21/95	TA-9 Rm 135	" " " ; used
95.0028		2/21/95	TA-9 Rm 127	" " " "
95.0029		2/17/95	TA-3 SM-38 Rm 108	PCB Ballast
95.0030	21419	2/25/95 9:10am	TA-53 PCB Transformer 855034	Under Subfloor of 2° S
95.0031	21419	2/25/95	TA-53 (#71) 855034	" " "
95.0032	21419	2/25/95 9:40am	TA-53 PCB Transformer 855035	Under Subfloor of 2° S
95.0033	21419	2/25/95	TA-53 (#1135) 855035	" " " "
95.0034	21532	3/9/95 4:00	TA-33 Sangamo Cap.	Capacitor ~~mod#CP~~
95.0035 RW	21558	3/14/95 5:00	TA-21 SM 210 Rm 128-B	Grinder
95.0036 RW	21558	" "	" " "	Intensifier
95.0037 RW		3/16/95	TA-3 SM 66 Wing J-3 ?	Swipes of Floor
95.0038 RW		"	" " "	"
95.0039 RW		"	" " "	"
95.0040 RW		"	" " "	"
95.0041 VOID				
95.0042 RW		3/13/95	TA-53 - 172 T8	XFMR G853264A
95.0043 RW		3/13/95	TA-53 - 174 T3	XFMR G853263B
95.0044 RW		3/13/95	TA-53 - Sub 181	XFMR G854272
95.0045 RW		3/13/95	TA-53 - 179 T10	XFMR G853264B
~~855032-P~~ 855032-P(2)				
~~55.51 RW~~		3/30/95	TA-53-51 Pad; PRIORITY 2	XFMR # 855032
855052-P		3/30/95	TA53-182 Scabbled Pad	XFMR# 855052 PCB ID
855051-P		3/30/95	TA53-1132 Scabbled Pad	XFMR PCB ID # 855
855051-S		3/31/95	TA53-1132 Switch Gear Panel	" " " "

Matrix	Result ug/g (sw, ...)	Comments	Contact
oil	<1.0117 ug/g	Gordon Jio 7-5318	Scott Cohen 7-5085
oil	<1.1644 ug/g	"	Scott Cohen
oil	<0.8945 ug/g	"	Scott Cohen
Swipe	<2.5 ug/sample	Verification swipe after cleanup	Mike Bailey 7-0104
Swipe	38± 7.6 ug/sample	Testing to see if transformer leaked under switchgear; no apparent stain	B. Wechsler (Scott Cohen collected the samples)
"	62± 12.4 " "		
Swipe	16± 3.2 " "	Appearance of limited (<10 drops) on subfloor inside switchgear; near bus; not oily though; inconclusive - unable to swipe - out of reach	
swipe	3.2± 0.64 " "		
swipe	<2.5 ug/100 cm²	model # CP70B1EH106K; swipe of stain on side of capacitor	S. Cohen; B. Wechsler
oil	2.2 ± 0.44 ug	Equip. scheduled for transfer Skotrowski	Lanni 7-8464
oil	<0.9921		EES-3 C335
swipe	<2.5 ug/sample	Follow up on old spill site	S. Cohen
"	<2.5		
	<2.5		
	<2.5		
Perchlorethylene	65±13 ug/g	System 50 Retrofill fluids	C. Trujillo
"	109± 21.8	" " " "	"
"	13± 26	" " " "	"
"	95± 19 ug/g	" " " "	"
Swipe	61± 12.2 ug/sample	Post-scabbling	
Swipe	2171± 434.2 ug/sample	Post-scabbling	
Swipe	7108± 1421.6 ug/sample	"	
Swipe	2949± 589.8 ug/sample	Inside switchgear (2°) below bus ~8", center	

CST-12 PCB ANALYSIS LABORATORY

Results Summary

To: Rebecca Wechsler

Thru: Matthew Monagle, PCB Task Area Leader

From: Kelly Hakonson

Date: 21 March 1995

Subject: Summary of Analytical Results

Request : 21581

Matrix: Swipes

☑ No PCBs were found in the sample(s) submitted.

☑ No PCBs were found in the blank submitted with these samples.

☐ PCBs were found in the following sample(s) at the noted concentrations:

Sample Number	Aroclor Detected	Amount (ug/sample)	Level of Quantitation

CST-12 PCB ANALYSIS LABORATORY

Results Summary

Sample Information:

Samples **95.05506 and 95.05509** were received and analyzed.

Sample Collection Date: **17 March 1995**

Sample Extraction Date: **20 March 1995**

Sample Analysis Date: **21 March 1995**

Additional samples associated with this request were analyzed:

1 Blank

1 Blind QC

1 BS/BSD

HOLDING TIMES:

Both extraction and analytical holding times were met for these samples.

Surrogate Recoveries:

See attached; Surrogates were within CST-12 fourth quarter control limits.

Matrix Spike Recoveries:

Recoveries for the matrix spike and matrix spike duplicate were calculated to be 98% and 98% respectively, with a Relative Standard Deviation (RSD) of 0. Control limits have not yet been established.

Method Summary:

The method used to analyze these samples was CST-12 Analytical Method EO-420. The gauze swipe was sonicated with 10.0 ml hexane. A Varian Gas Chromatograph with an Electron Capture Detector and a J&W Scientific DB-5 (30M X 0.25 MICRON FILM X 0.32 ID) column was used to obtain the data.

Additional Comments:

These samples were subject to Florisil cleanup, which resulted in a 1:5 dilution.

If you have questions or concerns about these samples or their analysis, please feel free to call me @ 7-6934.

LOS ALAMOS NATIONAL LABORATORY
HEALTH, SAFETY AND ENVIRONMENT DIVISION
HSE-9
SURROGATE RECOVERIES FOR VOLATILES
SOIL

REQUEST #: 21581
SET LETTER: A < ---------IF THERE IS MORE THAN
NUMBER OF SAMPLES: 8 ONE SET OF SAMPLES
MATRIX F IN THIS REQUEST THEN INCREMENT THIS LETTER.
ANALYST: KMH
Date: 03/21/95

SURROGATE RECOVERIES

SURROGATE
RECOVERIES IN PERCENT (%)

3/21/95

	SAMPLE NUMBERS	TYPE	gcaq
1	B95.05511	BLANK	101
2	E95.05511	BLANK SPIKE	101
3	F95.05511	BLANK SP-DU	103
4	S95.05510	SAMPLE	108
5	S95.05506	SAMPLE	98
6	S95.05507	SAMPLE	93
7	S95.05508	SAMPLE	96
8	S95.05509	SAMPLE	94
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			

Average % Surrogate Recovery... 99
Defined Lower QC Limits (%).... 0
Defined Upper QC Limits (%).... 176

Observed Lower QC Limits (%)... 93
Observed Upper QC Limits (%)... 108

KMH 3/21/95

"*" If % Surrogate Recovery is followed by a "*", it is out of QC Limits.

Reviewed By:

REPORT NUMBER: 33054

********** CST ANALYTICAL REPORT **********

Prepared by: KMH on 22-Mar-1995

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 21581 MATRIX: FS ANALYST: KELLY HAKONSON PROGRAM CODE: NA11 NOTEBOOK: 0 PAGE:

OWNER: Rebecca J. Wechsler GROUP: ESH-19 MAIL-STOP: K498 PHONE: 7-0814 TECHNIQUE: GCEC ANALYTICAL PROCEDURE: EO-420

SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
95.0037RW	95.05506	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)
95.0038RW	95.05507	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)
95.0039RW	95.05508	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)
95.0040RW	95.05509	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)

DETAILED PCB DATA for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
95.0037RW	95.05506	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)
95.0037RW	95.05506	53469219	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1242
95.0037RW	95.05506	11097691	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1254
95.0037RW	95.05506	11096825	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1260
95.0038RW	95.05507	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)
95.0038RW	95.05507	53469219	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1242
95.0038RW	95.05507	11097691	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1254
95.0038RW	95.05507	11096825	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1260
95.0039RW	95.05508	1336363	< 2.5		UG/SAMPLE	3/21/95		Aroclor (Mixed)
95.[illegible]RW	95.05508	53469219	< 2.5		UG/SAMPLE	3/21/95		Aroclor 1242
95[illegible]	95.05508	11097691	< 2.5		UG/SAM[illegible]	3/21/95		Aroclor 1254

95.0039RW	95.05508	11096825	< 2.5	UG/SAMPLE	21/95	Aroclor 1260
95.0040RW	95.05509	1336363	< 2.5	UG/SAMPLE	3/21/95	Aroclor (Mixed)
95.0040RW	95.05509	53469219	< 2.5	UG/SAMPLE	3/21/95	Aroclor 1242
95.0040RW	95.05509	11097691	< 2.5	UG/SAMPLE	3/21/95	Aroclor 1254
95.0040RW	95.05509	11096825	< 2.5	UG/SAMPLE	3/21/95	Aroclor 1260

REPORT NUMBER: 33054

********** EM-9 QUALITY ASSURANCE REPORT **********

POLYCHLORINATED BIPHENYLS Prepared by: KMH on 22-Mar-1995

REQUEST NUMBER: 21581 MATRIX: FS ANALYST: KELLY HAKONSON PROGRAM CODE: MA11 NOTEBOOK: 0 PAGE:

OWNER: Rebecca J. Wechsler GROUP: ESH-19 MAIL-STOP: K498 PHONE: 7-0814 TECHNIQUE: GCEC ANALYTICAL PROCEDURE: EO-420

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QA SAMPLES RUN WITH THIS BATCH

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

___ Only qualitative data requested

___ Only Blind QC samples run with this batch.

___ No QC samples run with this sample batch.

___ No QC samples for this constituent and matrix type available within CST

REPORT NUMBER: 33054

********** EM-9 QUALITY ASSURANCE REPORT **********

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	QC VALUE	QC UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
95.05510	1336363	10.	2.	UG/SAMPLE	12.5	1.3	3/21/95	UNDER CONTROL	Aroclor (Mixed)
95.05510	53469219	< 2.5		UG/SAMPLE	0.0		3/21/95	UNDER CONTROL	Aroclor 1242
95.05510	11097691	< 2.5		UG/SAMPLE	0.0		3/21/95	UNDER CONTROL	Aroclor 1254
95.05510	11096825	10.	3.	UG/SAMPLE	12.5	1.3	3/21/95	UNDER CONTROL	Aroclor 1260

REPORT NUMBER: 33054

Analyst	Reviewer	Team Leader	QA Officer
K Hakinson	Matt Monaf		Laura Kelly for mag
3/22/95	3/22/95		3/23/95
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1992,' LA-12790-MS, Vol. I, pp. 19-20

****

Executive Summary

Chapter 1
Introduction

Chapter 2
Background Information

Chapter 3
Environmental Setting

Chapter 4
Technical Approach

Chapter 5
Evaluation of Potential Release Site Aggregates

Chapter 6
Units Proposed for No Current RCRA Facility Investigation

Annexes

Appendices

Annex II

Quality Assurance Project Plan

RFI Work Plan (1993)

- Approval for Implementation
- Project Organization and Responsibility
- Quality Control Samples
- Sample Representativeness
- Field Quality Assurance Reports to Management

Addendum 1

- Note 2A: Supplement to Quality Control Samples

NOTE 2A: SUPPLEMENT TO QUALITY CONTROL SAMPLES

1.0 INTRODUCTION TO QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Note 2A is a supplement to Annex II, Note 2 of the RFI Work Plan for Operable Unit (OU) 1114 (LANL 1993, 1090). It uses available quality assurance/quality control (QA/QC) sample data from the 1994 summer sampling season, extracted from the Facility for Information Management and Display (FIMAD) between February 13 and February 17, 1995, to determine which QA/QC samples give the most value-added information. Those data were analyzed to determine: what QA/QC samples would yield the most useful information for OU 1114 and how many QA/QC samples should be proposed in Addendum 1 to the RFI Work Plan for OU 1114.

Note that the recommendations in this supplement were followed in the Addendum 1, Chapter 5 sampling plans. In one case, the Field Unit One (OU 1114 is now part of Field Unit One) technical team recommended that no spiked samples be submitted as described in Section 4.0. However, the recommendation does not preclude any contractual agreements between the contract laboratories and Los Alamos National Laboratory's (LANL's) Analytical Services Group, CST-3, for supplying spiked samples if required.

2.0 BLANK SAMPLES

Blank samples are used to detect and estimate positive analyte biases incurred through sample collection, handling, and analyses. To determine the number of blank samples that should be taken to maintain adequate quality control and assessment over field activities, data for the 1994 summer sampling season were reviewed. Of 2 933 analyte determinations performed on 25 blanks at OU 1114, the 5 analytes listed in Table 1 were detected. These five analytes are chloroform, copper, iron, lead, and zinc.

Eight instances of detection occurred for the four metals in five samples. Chloroform was detected in seven other blank samples, but in none of the field samples. All totaled, 15 analyte detections were registered out of 2 933 determinations, or a 0.5% analyte detection rate. All analytes detected in

the blanks were detected at concentrations within a factor of approximately three times their respective estimated quantitation limits (EQLs) or estimated detection limits (EDLs) (EPA 1992, 1207).

TABLE 1

ANALYTES DETECTED IN TWENTY-FIVE BLANK SAMPLES

ANALYTE	NUMBER OF DETECTS	DETECTION RANGE	EQL[a] OR EDL[b]	SAL[c]
Chloroform	7	6 to 9 µg/L	5 µg/L (EQL)	210 µg/kg
Copper	2	30 to 34 µg/L	25 µg/L (EDL)	3 000 mg/kg
Iron	2	125 to 227 µg/L	100 µg/L (EDL)	NA[d]
Lead	2	4.4 to 5.8 µg/L	3 µg/L (EDL)	500 mg/kg
Zinc	2	26 to 68.3 µg/L	20 µg/L (EDL)	24 000 mg/kg

[a] EQL = Estimated quantitation limit.
[b] EDL = Estimated detection limit.
[c] SAL = Screening action level.
[d] NA = Not applicable.

An EQL is the limit representing the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operations. The EQL is generally 5 to 10 times the method detection limit but, to simplify data reporting, it may be a nominal value chosen within these guidelines. The EQL may be the concentration that is the lowest non-zero concentration standard used to generate the analytical calibration curve. EQLs may not always be achievable.

An EDL is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte. The contaminant detection rate in the blanks is low and the respective contaminant concentrations are very low relative to screening action levels (SALs). Given this, the following approach for computing the number of field QC blanks to be collected in the future is recommended.

Assume that a 10% analyte detection rate can be tolerated because historically, when an analyte is detected, its concentration is such that it is much less than its SAL. Also assume that the detection of one analyte is not

correlated with detection of another analyte and that the distribution of detection rates in the contaminated blanks is Gaussian. With a 95% confidence level of detecting contamination, this equates to a mean value of a 5% detection rate with a standard error of the mean equal to 2.5%. Thus, 0.05 represents *P*, the mean proportion of analytes detected and 0.025 represents the standard error of the mean. Barnett's equation relating the distribution of analyte detection rate to the number of samples required to detect *P* with a given level of confidence is:

$$SE(P) = \sqrt{\frac{P(1-P)}{n}}$$

Where *P* is defined above, *SE(P)* is the standard error of *P*, and *n* = the number of samples required to yield the desired confidence in detecting contamination at the accepted rate (Barnett 1974, 17-1218). This equation rearranges to:

$$n = \frac{P(1-P)}{[SE(P)]^2}$$

and allows for easily computing *n*.

With *P* = 0.05 and *SE(P)* = 0.025 a value of *n* = 76 is computed. Because each volatile organic analysis includes the determination of 60 analytes, *n* = 76 translates to two trip blank samples (*n* = 76/60 => 2 samples) for detecting volatile organic contamination. Using similar logic, and an assumption of 23 analytes included in a typical metals analysis suite, a total of four equipment rinsate blanks is computed (*n* = 76/23 => 4 samples) for detecting metals contamination.

The Field Unit One technical team recommended that field reagent blanks be eliminated from the QA/QC sample scheme. Although two field reagent blanks showed chloroform contamination, the chloroform detected could be due to laboratory contamination (no chloroform was detected in actual field samples) and the detected contamination is within a factor of 1.5 of the EQL. In addition, no volatile organics were detected in the duplicate and collocated

samples. This, in conjunction with the fact that equipment rinsate blanks should include any contaminants likely to show up in field reagent blanks, is the rationale for eliminating field reagent blanks from the QA sample scheme.

No radioactive contaminants were detected in the blank samples at activities statistically greater than zero. Because radionuclides were detected in the environmental samples but not the blank samples, implementation of field sampling and decontamination protocol is assumed to be adequate. This is corroborated by the fact that metals and organic contaminants are present at concentrations approximately two to three orders of magnitude less than concentrations of interest for screening, i.e., SALs. Such low contaminant concentrations are dwarfed by the imprecision associated with sampling and analyses.

Radionuclide contaminants have not been a problem in the blanks, so there is probably no need to monitor blanks for radionuclide contamination. This field season there is a greater expectation than in the 1994 field season that organic contaminants will be present in potential release sites (PRSs); therefore, monitoring should be done for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) concentrations. Also, as metals have been the most frequently observed constituents of concern (COCs), they too should be monitored. Audits of field personnel compliance with sample collection and equipment decontamination procedures, together with the following QC sample schedule in Table 2, is also recommended.

TABLE 2

RECOMMENDED NUMBER OF BLANK SAMPLES

QC SAMPLE	NUMBER TO BE COLLECTED (ADDENDUM 1)	ANALYSES PERFORMED
Equipment rinsate blank	4	Metals, VOAs
Trip blank	2	Metals, VOAs

If metal contamination is detected in blanks, one should suspect that if radionuclides are present in the environmental samples, radionuclides are also possible contaminants. Judicious use of the chemistry van for monitoring metals contaminants using, for example, laser-induced breakdown spectroscopy (LIBS) might provide near screening for metals contaminants. A possible alternative is to have CST-9 dedicate a particular instrument in their laboratory (either wholly or partially) to rapid turnaround of such samples for metals analyses. This would require advance coordination with CST-3 prior to sending the quick turnaround samples to them. Hand-held screening or use of the radiochemistry van for real time or near real time screening of samples for radioactivity might also be an option. The chemistry van should be considered for use in near real time analysis of blanks and environmental samples for organic contaminants.

3.0 Estimation of Sampling Error and Population Variability

Collocated samples provide information on the repeatability of sampling (sampling error) and on very small-scale COC concentration distributions (population variability); duplicate samples provide information on larger scale distribution of COC concentrations. The component of sampling error obtained through the use of field splits is contained within collocated and duplicate field samples. Therefore, it is recommended that field splits not be taken, but that a series of collocated samples be taken to estimate small-scale population variance and field duplicates be taken to gain an estimate of population variance on a wider scale.

Total variability for all sample data for inorganic analyses was 82% risk-specific dose (RSD) (OU 1114 data extracted from FIMAD between February 13 and February 17, 1995). This is marginally greater than 73% RSD, which is the maximum observed for collocated and field split samples from the same data set. However, from available data, only five pairs of field splits and three pairs of collocated samples were analyzed for metals. Two pairs of collocated samples were analyzed for radionuclides. These low numbers of samples provide little statistical power in the estimate of variances. More statistical power can be obtained by taking more samples. The means of determining an appropriate number of samples to be collected is described below.

Assuming a desired 95% confidence level in the estimate of small-scale and large-scale variances, the number of sample pairs required to yield a range of values containing the true variance can be obtained from Table 3 of A Rationale for the Assessment *of Errors in the Sampling of Soils* (van Ee and Starks 1990, 17-1219). Van Ee's Table 3 shows that, with 10 sample pairs (10 degrees of freedom), the estimated variance has a 95% probability of lying within the range of 0.49 to 3.08 of the true variance. Because the variance is the square of the standard deviation, this can be converted to an estimate of the precision of the standard deviation by taking square roots. Doing so reveals that the estimated standard deviation would have 95% probability of falling within the range of 0.70 to 1.75 times the true standard deviation. Using similar calculations, 20 samples would provide an estimate of sampling standard deviation ranging from 0.76 to 1.44 of the true standard deviation. Thus, doubling the sample size (i.e., a doubling of sampling/analysis cost) provides only about a 30% decrease in the range of values associated with the estimate of sampling error standard deviation. For this reason, it is recommended that the numbers of the indicated samples (Table 3) be collected and analyzed to gain estimates of sampling and population variability.

TABLE 3

RECOMMENDED NUMBER OF COLLOCATED AND FIELD DUPLICATE SAMPLES

QC SAMPLE	NUMBER TO BE COLLECTED (ADDENDUM 1)	ANALYSES PERFORMED
Collocated sample	10	Metals, VOAs, SVOAs
Field duplicate	10	Metals, VOAs, SVOAs

If radionuclides are of concern at a particular PRS, they may be added to the analyte list so that an estimated variability for radionuclide concentrations can be obtained.

4.0 SPIKED SAMPLES

Spiked samples may be used to obtain estimates of variability and bias for analytes that have been spiked (added) into a sample, as well as those that appear naturally in the sample. The variability and bias represent the errors associated with sample handling, storage, and analysis, as well as matrix-specific effects. Thus, ideally, the sample that is spiked has a matrix identical to that of the environmental samples of interest. This cannot be commonly achieved and a sample matrix that approximates the environmental sample matrix is actually spiked.

Data available to date indicate that a single, spiked water sample was analyzed at OU 1114 during the 1994 summer sampling season. However, field spikes of water do not represent soil sample collection and analyses because of the great differences between soil and water matrices. Therefore, it is recommended that field spikes be eliminated from the QA sample scheme. In addition, the surrogate standard addition to and matrix spiking of soil samples that are part of existing laboratory protocol, provide better indicators of analyte recovery in soils than spiked water samples.

5.0 REFERENCES

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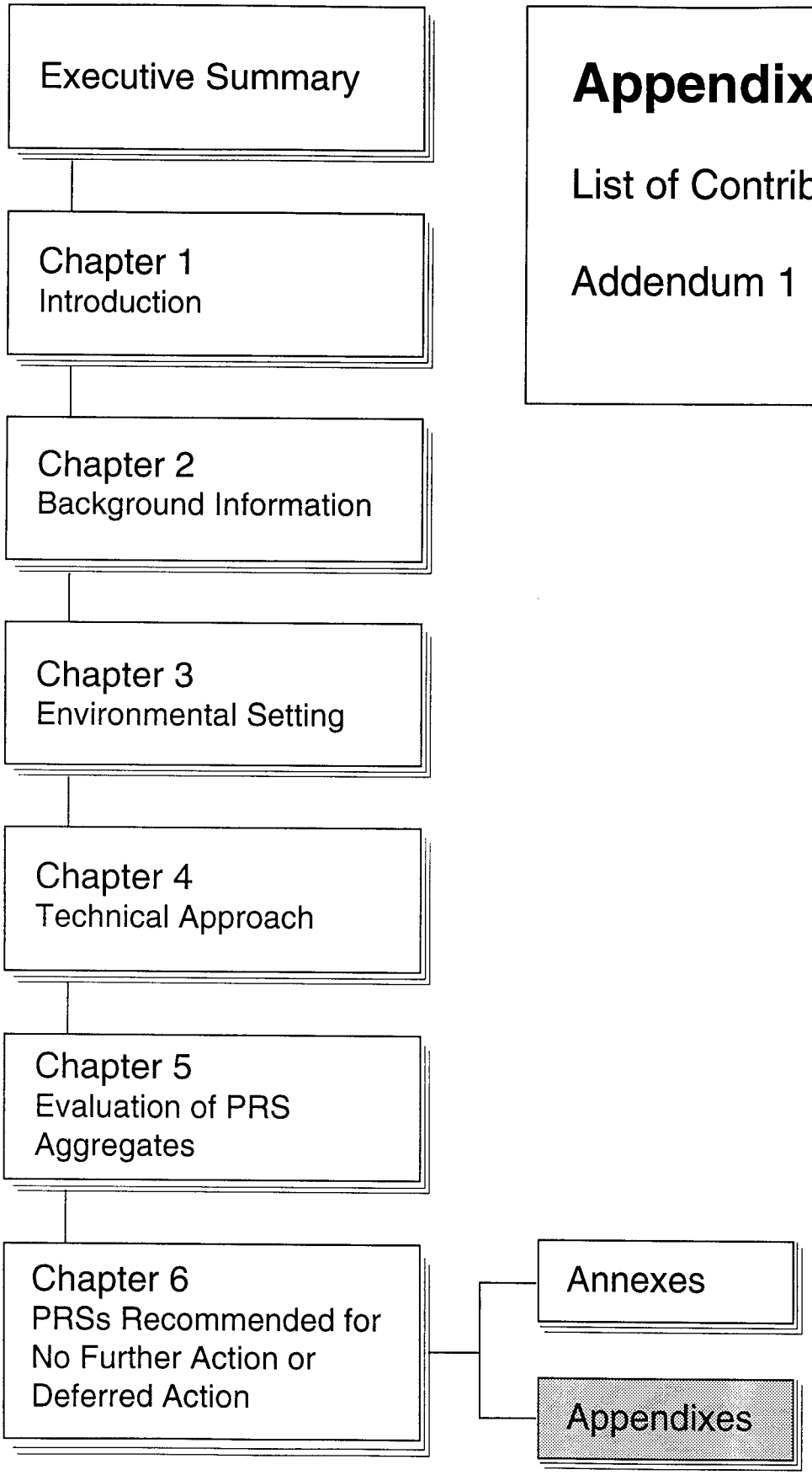
van Ee, J. J., and T. H. Starks, May 1990. *A Rationale for the Assessment of Errors in the Sampling of Soils*, US Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Office of Research and Development, EPA/600/4-90/013, Las Vegas, Nevada. **(van Ee and Starks 1990, 17-1219)**



Appendix C

List of Contributors

Addendum 1

LIST OF CONTRIBUTORS

NAME AND AFFILIATION	EDUCATION/EXPERTISE	ER PROGRAM ASSIGNMENT
Garry Allen (CST-18/ER)	M.B.A., B.S. Electrical Engineering 23 years experience in engineering design, 18 years experience in technical project management, 10 years experience in technical line management	Field Project Leader, Field Unit 1
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Randall Ryti (Neptune and Co.)	Ph.D. Biology, B.A. Biology 15 years experience in data analysis and statistical design to support ecological sampling, CERCLA, and RCRA investigations	Work plan support
Lynda Sobojinski (Ray Rashkin and Associates)	A.S. Environmental Pollution and Control 3 years experience performing environmental site investigation and assessments, 6 years experience in fire restoration management	Archival research, technical review
Julie Wilson (ERM/Golder)	Ph.D. Environmental Medicine, M.S. Health Physics, B.S. Biology 14 years experience in human health risk assessment for chemical and radiological constituents, site investigation planning and oversight	Work plan support

Executive Summary

Chapter 1
Introduction

Chapter 2
Background Information

Chapter 3
Environmental Setting

Chapter 4
Technical Approach

Chapter 5
Evaluation of PRS Aggregates

Chapter 6
PRSs Recommended for No Further Action or Deferred Action

Annexes

Appendixes

Appendix D

Field Investigation Approach and Methods

RFI Work Plan (1993)

- General
- Field Operations
- Standard Screening Methods
- Field Surveys and Screening
- Field Analyses
- Laboratory Analyses
- Sampling Methods

Addendum 1

- Introduction
- General Field Operations
- Standard Screening Methods
- Field Surveys and Screening
- Field Analyses
- Laboratory Analyses
- Sampling Methods

1.0 INTRODUCTION

This appendix limits the repetition of information related to field investigations by describing elements that are common to field investigations at all Operable Unit (OU) 1114 potential release sites (PRSs). Those elements include:

- releases of radioactive materials without simultaneous release of hazardous constituents;
- the release of hazardous constituents at some PRSs may not have been associated with the release of radioactive materials, but human activities and action by physical forces would have diluted this isolation effect;
- the potential use of field surveys and field screening to identify gross contamination and assist in sample selection for laboratory analyses;
- the potential use of field laboratory analyses to guide field operations; and,
- the use of analytical laboratory analyses to complete the sampling/analyses planned at each phase of site investigation.

The primary focus of this appendix is on field investigation methods. It is based on the field sampling methods subsection of the Laboratory's Installation Work Plan (IWP), Subsection 4.4 (LANL 1993, 1017). The methods described (see Sections 4.0 to 7.0 of this appendix) include:

- field survey methods to identify contaminants *in situ* and field sample screening methods to be used at the point of sample collection;
- field analytical methods;
- analytical laboratory methods; and,
- sampling methods.

This appendix also identifies several aspects of the Laboratory's implementation of the field sampling process that are not mentioned in the PRS-specific field sampling plans. Standard activities that will be used to support field operations (see Section 2.0, General Field Operations) include:

- Laboratory-required preliminary activities and support procedures;
- identification and documentation of locations that have been sampled;
- sample handling and laboratory coordination procedures;
- equipment decontamination procedures; and,
- management of wastes generated by sampling activities.

Specific information such as sampling locations or target depths of boreholes is provided by the individual field sampling plan. The method descriptions presented here are intended to complement the site-specific Quality Assurance Project Plan (QAPjP), Annex II and the governing standard operating procedures (SOPs).

Where reference is made to work conducted in accordance with a particular procedure, it is understood that the most current revision of the procedure will be used.

2.0 GENERAL FIELD OPERATIONS

Activities not associated with physical, radiological, or chemical analyses of environmental samples are described in this section.

2.1 Archaeological, Cultural, and Ecological Evaluations

Prior to initiating fieldwork and as part of the Laboratory's environment, safety, and health (ES&H) questionnaire process, archaeological and ecological evaluations shall be performed in all areas where the surface is to be disturbed, vegetation is to be removed, or invasive sampling is to be performed. Depending on the results of the archaeological and ecological

evaluations, a Department of Energy (DOE) environmental checklist for either categorical exclusion or environmental assessment will be completed.

2.2 Excavation Permits

As part of the ES&H questionnaire process, excavation permits are required by the Laboratory prior to any excavation, drilling, or other invasive activity. Acquisition of the permits will be coordinated with the Laboratory's Facility Risk Management Group (ESH-3) and Johnson Controls World Services, Inc. Acquisition of excavation permits must be scheduled as appropriate for each phase of fieldwork. All areas intended for excavation, drilling, or sampling deeper than 18 in. must be marked in the field for formal clearance prior to the work.

2.3 Health and Safety

Annex III of the RFI Work Plan for OU 1114 presents the Health and Safety Project Plan for all field activities within OU 1114 (LANL 1993, 1090). The plan presents PRS-specific information regarding known or suspected contaminants and the personal protection required for performing various field activities.

Samples acquired as part of this RFI work plan shall be screened at the point of collection to identify the presence of gross contamination or conditions that may pose a threat to the health and safety of field personnel. The field screening techniques listed in Subsection 4.2 of this appendix will be used.

2.4 Support Services

Physical support services during the field investigation will be provided by the Laboratory's Facility Project Delivery Group (FSS-6), Operations and Maintenance Services Group (FSS-9), Johnson Controls, or other contractors/subcontractors. Existing job ticket procedures will be used. The services these groups will provide include, but are not limited to: excavating using backhoes and front-end loaders, moving pallets of drummed auger cuttings and decontamination solutions, and setting up signs and other warning notices around the perimeter of work areas.

2.5 Environmental and QC Sample Coordination

The Sample Coordination Facility (SCF) has been established by the Environmental Restoration (ER) Project to provide consistency for all investigations with regard to sample handling and tracking. The SCF is to be notified at least 30 days prior to implementing the sampling operation. The notification will serve to alert the SCF to the numbers and types of environmental samples and quality control (QC) samples to be collected and shipped. With the assistance of the SCF the numbers and types of sample bottles required to support the field effort, and the laboratories to which the samples will be shipped, can be determined. SOPs governing field quality control samples and environmental sample collection, identification, shipping, etc. are identified in the ER Project's Quality Assurance Project Plan (QAPP), Chapter 4 in the IWP (LANL 1995, 1164) and Subsection 2.9 of this appendix. The Records Processing Facility (RPF) or a well maintained set of controlled procedures should also be consulted to identify changes to existing procedures or additional procedures that govern sampling operations.

A description of the use and intended purpose of each kind of QC sample is provided in the ER Project's QAPP (LANL 1995, 1164). The frequency with which each type of field QA sample is to be collected is detailed in the sampling plans in Chapter 5 of Addendum 1.

2.6 Site Control

Access, staging, and sample storage areas will be designated by the field team leader (FTL). To maintain sample integrity and adequate sample documentation, all sampling sites will be included in one or several exclusion zones. Exclusion zones will be delineated by the FTL with the concurrence of the site safety officer (SSO). The boundary of an exclusion zone will be defined based on the nature, magnitude, and extent of confirmed or possible contamination; the potential for contaminant migration; hazards at the site, for example, use of mechanical equipment; the presence of electrical lines or other utilities, structures, tanks, pits, or trenches; and the presence of steep banks or cliffs.

Boundaries of exclusion zones may be changed as operations progress. All changes shall be designated by the FTL or designee with the concurrence of the SSO.

2.7 Site Monitoring

The OU 1114 Health and Safety Plan details procedures required to ensure the health and safety of field personnel during fieldwork (LANL 1993, 1090). Ingress and egress at sites will be controlled for monitoring purposes. All personnel entering the sites must use appropriate radiation monitoring badges, e.g., thermoluminescent dosimeters (TLDs), and other monitoring devices as specified by the SSO. Locations for drinking water, restroom facilities, etc., will be identified by the SSO prior to the start of site activities. Protective clothing requirements will be determined by the SSO.

Field measurements for wind-borne contaminants shall be made and documented before, during, and after surface sampling activities. Qualified health and safety personnel (or designees) are responsible for this monitoring. Results of monitoring will be used to evaluate possible existing hazards at the site in order to determine current conditions and specify personal protective equipment. All personnel are required to visually monitor for extreme weather conditions, lightning, or other physical or environmental hazards that may develop. Personnel are required to notify the SSO when unanticipated physical or environmental hazards develop. Potential site hazards are discussed in detail in Annex III of the RFI Work Plan for OU 1114 (LANL 1993, 1090).

2.8 Contamination Control

To ensure sample integrity, to maintain control over sampling waste, and to avoid contamination of the site office, decontamination may be required for personnel, equipment, and vehicles moving from one zone to another. Therefore, a contamination reduction zone (CRZ) surrounding the exclusion zone(s) shall be established. Contamination reduction corridors, one for personnel and one for equipment, shall be established in the CRZs. The size

of the corridor will depend on the number of stations required for decontamination activities. The corridors should be located in a direction that is generally upwind from the exclusion zone.

If required, decontamination stations will be set up to reduce contamination as personnel move toward the end of the contamination reduction corridor. A sequential doffing of protective equipment shall be conducted, starting with the most heavily contaminated items at the first station and progressing to the least contaminated items at the final station. The stations shall be far enough apart to minimize cross-contamination. The spacing will be based on best professional judgment of the FTL.

Decontamination and waste management shall be controlled through proper implementation of the site-specific waste management plan. All decontamination materials must be stored in drums with proper labels and identifying information. Efforts shall be made to keep the volume of decontamination materials to a minimum. Persons involved in performing the actual decontamination will generally be dressed in protective clothing one level below what the exclusion zone workers are required to wear. Prior to leaving an exclusion zone or central decontamination area, all personnel and equipment shall be monitored by a radiation control technician for radioactive contamination. The choice of monitoring technique is to be decided by the FTL (or FTL designee) and the SSO.

Personnel entering an exclusion zone in which personnel decontamination is required must follow the specified decontamination procedures. Personnel who are not required to wear the maximum level of protective clothing may bypass the decontamination stations for protective clothing that they are not wearing.

2.9 Sample Control and Documentation

Sample packaging, handling, chain-of-custody, documentation, and shipping procedures are provided in the following ER Project SOPs:

- LANL-ER-SOP-01.01, R0, General Instructions for Field Investigations;

- LANL-ER-SOP-01.02, R0, Sample Containers and Preservation;
- LANL-ER-SOP-01.03, R1, Handling, Packaging, and Shipping of Samples; and,
- LANL-ER-SOP-01.04, R2, Sample Control and Field Documentation.

2.10 Equipment Decontamination

Decontamination is performed as a quality assurance measure and a safety precaution. All equipment decontamination practices shall conform to the requirements of the approved site-specific waste management plan and in LANL-ER-SOP-1.08, R0, Field Decontamination of Drilling and Sampling Equipment. Decontamination prevents cross-contamination among samples and helps maintain a clean working environment for the safety of personnel. Sampling tools are decontaminated by washing, rinsing, and drying. Disposable sample collection devices will be used as deemed necessary to eliminate costly decontamination procedures in the field.

Steam cleaning is used for large machinery, vehicles, auger flights, and coring tools used in borehole sampling. Decontamination fluids, including steam-cleaning fluids, are considered wastes and must be collected and contained for proper disposal. The effectiveness of the decontamination process may be documented by rinsate blanks submitted for laboratory analysis. This equipment rinsate blank collection/analysis is no longer required unless poor decontamination effectiveness is anticipated.

2.11 Waste Management

Wastes produced during sampling activities may include borehole auger cuttings, excess samples, excavated soil from trenching, decontamination and steam-cleaning fluids, and disposable materials such as wipes, protective clothing, and sample bottles. Hazardous waste, low-level radioactive waste, transuranic waste, and mixed waste (either low-level or transuranic) may be encountered in OU 1114. Requirements for segregating, containing, characterizing, treating, and disposing of each type and category of waste are provided in an administrative procedure (AP), LANL-ER-AP-05.3, R0, Management of Environmental Restoration Program Waste.

3.0 STANDARD SCREENING METHODS

In all Addendum 1 sampling plans, a screening and analysis table has been used to identify certain field operations, plus requirements for sampling and analysis. The use of such tables is described below using Table D-1 as an example. Methods have been selected in accordance with requirements delineated in the ER Project's Quality Assurance Project Plan (LANL 1995, 1164).

3.1 Samples and Sampling Methods

The two columns on the left side of Table D-1 identify the sampling location and description and the number of sample locations. The next three columns identify the following: depth interval (as appropriate), total number of samples to be taken, and space for recording each sample identification number. Below the sampling location and description are the types and number of quality assurance (QA)/QC samples to be analyzed. The sampling methods or activities identified in the first column are specifically defined below. Sampling methods are described in detail in Section 7.0 of this appendix.

3.1.1 Use of the Standard Screening and Analysis Tables

The screening and analysis tables serve two major purposes. First, they clearly and concisely summarize the details of a sampling plan. They:

- identify sampling locations,
- indicate sampling methods and spatial sampling intervals,
- identify the screening and analysis measurements for each sample detailed in Chapter 5 of Addendum 1,
- explicitly identify the collection and analysis of field quality assurance samples, and
- give a representation of certain options and uncertainties in the plan.

The tables also provide the detail needed to estimate costs associated with the investigation.

TABLE D-1

EXAMPLE OF SCREENING AND ANALYTICAL REQUIREMENTS FOR SAMPLING PLAN

SAMPLE DESCRIPTION					FIELD SCREEN			LABORATORY ANALYSIS				
								Radio-nuc-lides	Organics			Metals
SAMPLING LOCATION DESCRIPTION	NO. OF SAMPLE LOCATIONS	SAMPLE DEPTH (in.)	TOTAL NO. OF SAMPLES	SAMPLE I.D. NUMBER	Radiation screening[a]	Organic vapor screening (PID/FID)	Rad van analysis[b]	Isotopic plutonium and uranium, gamma spec., tritium	VOCs (SW 8240)	PCBs (SW 8080)	SVOCs (SW 8270)	Appendix VIII metals (SW 6010, 7000)
Mortandad Canyon												
Depositional area 1	2	0–12	2		2	2	2	2		2	2	2
		s/t[c]	2		2	2	2	2		2	2	2
Depositional area 2	2	0–12	2		2	2	2	2		2	2	2
		s/t[c]	2		2	2	2	2		2	2	2
Depositional area 3	2	0–12	2		2	2	2	2		2	2	2
		s/t[c]	2		2	2	2	2		2	2	2
QC samples[d]												
Field duplicate	1	TBD[e]	1		1	1	1	1	1		1	1
Field collocated	1	TBD	1		1	1	1	1	1		1	1
Rinsate blank	NA[f]	NA	1					1			1	1
Confirmatory samples	2	TBD	2		2	2	2		2[g]			
TOTALS	10		17		16	16	16	15	4	12	15	15

rev. 5/13/95

[a]Gross alpha, beta, and gamma using field instrumentation.
[b]Gross alpha, beta, and gamma using mobile laboratory instrumentation.
[c]s/t = soil/tuff interface (12-in. interval above interface).
[d]QC samples are determined using guidelines outlined in the site-specific QAPjP, Annex II, Note 2A of this work plan. Location is determined by the Field Team Leader.
[e]TBD = To be determined in the field.
[f] NA = Not applicable.
[g]Represents minimum number of confirmatory samples to be submitted for VOCs based on field screening results. Actual number may vary.

3.2 Screening, Surveying, and Analysis Methods

Very precise language, as described below, has been adopted in Addendum 1 to refer to categories of measurements. Table D-2 summarizes instrumentation and methods to be used or designated analytical approaches.

TABLE D-2

INSTRUMENTATION AND METHODS FOR PROPOSED ANALYTICAL LEVELS

FIELD SURVEY AND SCREENING
Portable instruments:
Phoswich meter
Field instrument for the detection of low-energy radiation (FIDLER) meter
Geiger-Mueller counter ESP-1 beta/gamma meter ESP-1 alpha meter
MicroR meter
Organic vapor analyzer (OVA)
Photoionization detector
Explosimeter
Oxygen level indicator
Field test/methods/kits:
OVA headspace test
HNU headspace test
Ensys™ PCB immunoassay kits
FIELD ANALYSIS/INSTRUMENTATION
Radiological screening laboratory
Field gas chromatography (GC)/flame ionization detector (FID)
X-ray fluorescence
LABORATORY ANALYSIS/INSTRUMENTATION
EPA protocol for soil, air, and water analysis for semivolatile organic compounds and metals using Los Alamos, off-site, or mobile laboratories typically includes the following instrumentation (EPA 1994, 1222):
Gas chromatography (GC)
Gas chromatography/mass spectrometry (GC/MS)
Inductively coupled plasma-atomic emission spectroscopy (ICP-AES)
Atomic absorption (AA)

1. **Field Surveys** (or surveys). Direct reading or recording instruments are used to scan the land surface to make measurements of *in situ* conditions. Commonly, surveys provide data of lesser precision than more definitive test methods but they can provide results very quickly. The minimal sample preparation involved generally limits surveys to collecting information related to visual observation and surficial contamination, or to contaminants emitting high energy radiation that can pass through the sample matrix to the detector. It also limits radiological and chemical information to gross categories rather than the identification and quantitation of specific contaminants. Gamma radioactivity is a common target of field surveys. Land surveys and borehole logging are also included in this category.

2. **Field Screening** (field sample screening or screening). This is the process by which instruments or observations are applied to samples at the point of collection to measure the presence of contaminants or to determine other properties of the sample. The quality of data provided by screening and the associated level of data review is comparable to survey data, but the ability to identify and quantify specific contaminants or more focused groups of contaminants is improved in some cases. Gross radioactivity (beta/gamma) and organic vapors are common targets of field screening. Lithologic logging of core samples is included in this category. By averaging data from replicate screens, precision comparable to laboratory analyses may be obtained.

3. **Field Analysis** (or field laboratory analysis). This category represents the initial analyses conducted on samples in the field prior to selecting samples for submission to the analytical laboratory. These analyses are conducted to provide information to direct voluntary corrective actions (VCAs) or to direct which samples are submitted for further analysis at the analytical laboratory. Sample preparation is more rigorous than that used for screening analyses, but not as rigorous as that used for laboratory analyses. This allows for collecting information beyond that which can be collected by screening or surveys alone. Field analyses may provide a quality of data that is more stringent than screening or survey data. The level of data review is generally more detailed than the reviews imposed on screening data. Analyses conducted in field radiological trailers and with the field gas chromatography (GC)/flame ionization detector (FID) are included in this category.

4. **Laboratory Analysis** (or analytical laboratory analyses). This category represents the primary analysis for which samples are collected. Because the data are generated in a highly controlled environment, the opportunity for generating data of incontestable quality is generally considered to be greater than screening, survey, or field analytical data. Of all data types, the level of quality control and data scrutiny is typically greatest for laboratory analyses. Laboratory analyses are commonly provided by off-site analytical laboratories but may be provided by Los Alamos National Laboratory (LANL) analytical groups, especially in the case of highly radioactive samples and samples requiring very rapid turnaround.

For each of the sampling categories in Table D-1, several measurement techniques are identified by vertical columns. The individual measurement techniques represented by each vertical column are identified in the following sections of this appendix: Section 4.0, Field Surveys and Screening; Section 5.0, Field Analyses; and Section 6.0, Laboratory Analyses.

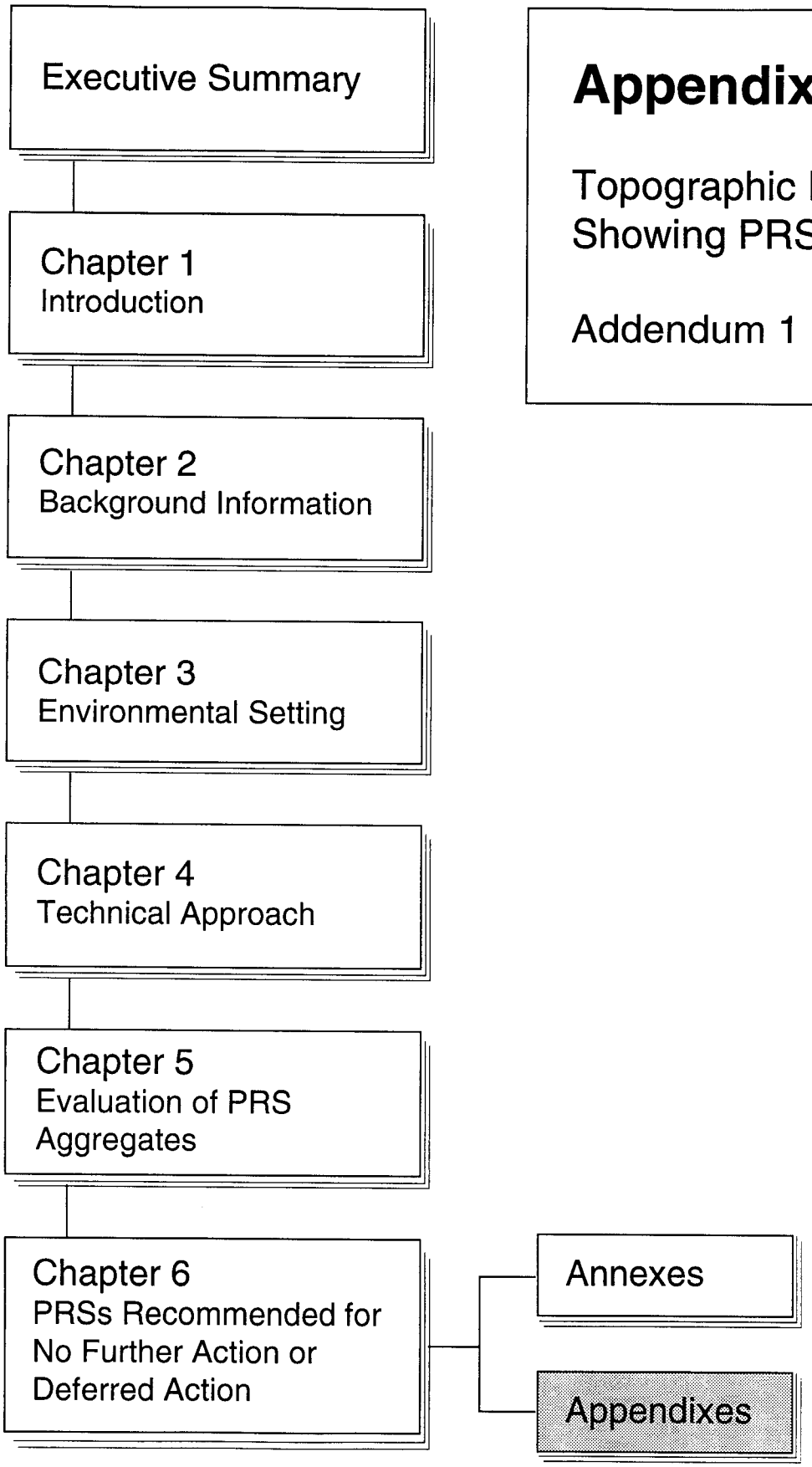
4.0 FIELD SURVEYS AND SCREENING

Field surveys are primarily walking scans of the land surface using direct reading or recording instruments. Field survey data and screening data (for example, radioactivity or organic vapor measurements) are used to identify the presence of contaminants or structures in the field. While negative results from field surveys are not conclusive evidence of COPCs below trigger levels, positive results obtained at an early stage can allow timely redirection of a sampling plan. For convenience, land surveys to identify and mark locations from old drawings are included in this category.

4.1 Field Surveys

4.1.1 Radiological Surveys

Radiological surveys are conducted to identify the presence of radioactive contamination at a site. Several instruments are suitable for these surveys: microR meters, sodium iodide (NaI) detectors of various sizes with ratemeters and scalers, Geiger-Mueller detectors (such as the ESP-1 beta/gamma meter), field instrument for detection of low-energy radiation (FIDLER), and Phoswich. The specific uses of each meter are discussed in the following subsections.



Appendix E

Topographic Maps Showing PRS Locations

Addendum 1

4.1.1.1 Gross Gamma Surveys

Several instruments are suitable for gross gamma surveys, including microR meters, NaI detectors of various sizes with ratemeters or scalers, and Geiger-Mueller detectors. The preferred instruments are microR meters with the ability to measure to 5 μR/hr, 2-in.-by-2-in. NaI detectors with a ratemeter capable of displaying 100 counts per minute (cpm), and the ESP-1 beta/gamma meter. Some discrete- or continuous-measurement recording instruments are also available using the same detectors. Surveys are conducted by carrying the instrument at waist height, walking at a slow pace, and observing and recording the ratemeter response. Measurements may also be made at the ground surface to aid in verifying the presence of localized radioactive contamination.

4.1.1.2 Low-Energy Gamma Surveys

Either the FIDLER or the Phoswich detector may be used for low-energy gamma surveys. Both are optimized for the detection of low-energy gamma photons, such as the 60 keV gamma emission from americium-241 or x-rays that accompany the decay of heavy radionuclides such as uranium, thorium, plutonium, and other transuranic radionuclides. Discrete- or continuous-measurement recording options are available. Surveys are conducted by carrying the instrument close to (i.e., within 12 inches of) the ground surface and observing the ratemeter or scaler. Measurements may also be made at the ground surface to aid in verifying the presence of localized contamination.

4.1.2 Organic Vapor Surveys

Organic vapor detectors will be used to monitor breathing zones for personnel safety in sample collection and handling areas at OU 1114 sites. Two types of detectors, a photoionization detector (PID) and a flame ionization detector, will be used to survey a wide range of organic vapors as described below.

4.1.2.1 Photoionization Detectors

A Model PI 101 PID or its equivalent will be used. This is a general survey instrument capable of detecting real-time concentrations of many complex organic compounds and some inorganic compounds in air. The instrument can be calibrated to a particular compound; however, it cannot distinguish among detectable compounds in a mixture of detectable gases.

4.1.2.2 Flame Ionization Detectors

A Foxboro Model OVA-128 FID or its equivalent will be used. An FID can be used as a general screening instrument to detect the presence of many organic vapors. Its response to an unknown sample is relative to its response to a gas of known composition to which the instrument has been calibrated. Its quantitative usefulness is, therefore, limited by the comparability of the sample gas to the calibration gas.

4.1.3 Combustible Gas/Oxygen Detector

A Gastech Model 1314 or its equivalent will be used to determine the potential for combustion or explosion of unknown atmospheres during drilling and intrusive activities. A typical combustible gas indicator (CGI) determines the level of organic vapors and gases present in an atmosphere as a percentage of the lower explosive limit or lower flammability limit. The Gastech Model 1314 also contains an oxygen detector to identify atmospheres that are deficient or enriched in oxygen. For health and safety purposes, the CGI will be used (if appropriate) to monitor atmospheres during some intrusive activities.

4.1.4 Land Surveys

Land surveys will be used both to document all sampling locations and, if needed, to locate former or buried structures. In all cases, the documentation requirements for the surveys are plus or minus 1 ft horizontal and plus or minus 0.1 ft vertical. The survey procedure used is LANL-ER-SOP-03.01, R1, Land Surveying Procedures.

4.1.5 Geomorphic Mapping

Field or geomorphic mapping is required to assist in locating certain sampling points. To sample drainages judged most likely to contain potential contamination, some individual sampling plans in Chapter 5 require the identification of watercourses or drainages. Preliminary fieldwork at OU 1114 indicates that an expert field geologist is required to map current-day precipitation runoff channels. The geologist will correlate current-day drainage channels to the historic channels that would have carried effluent from OU 1114 outfall locations into the lower gradient area at the floor of the canyon. To assist in correlating current drainage channels

to historic drainage channels, the geologist will use field mapping, aerial photographs, topographic maps, and other archival information. The ER Project's QAPP contains requirements concerning the use of archived data (LANL 1995, 1164).

Several PRS aggregate drainages and channels are well defined from the rim to the floor of the canyon. Other aggregates will require mapping as described above. Professional judgment allows placing representative sampling locations or establishing placement of a systematic sampling grid on field maps. Representative sampling locations must provide adequate coverage to assess dissemination of potential contaminants in the drainages. Correct use of well-documented judgmental sampling points will allow less reliance on nonjudgmental or random sampling regimens.

4.2 Field Screening

Screening measurements are applied at the point of sample collection, in borehole headspace, and in excavations to identify gross contamination and to assess conditions affecting the health or safety of field personnel. Field screening for personnel health and safety is detailed in Annex III of this work plan and the Health and Safety Plan, Chapter 6 in the IWP (LANL 1993, 1090; 1995, 1164). Individual sampling plans may not explicitly identify the use or role of sample screening measurements; however, the standard analytical table for each investigation shall show the methods to be used.

4.2.1 Radiological Screening

Radiological screening is conducted to identify the presence of gross radioactive contamination of samples and personnel. Several instruments are suitable for these surveys including microR meters, NaI detectors of various sizes with ratemeters and scalers, Geiger-Mueller detectors, and alpha scintillation detectors. The specific uses of each meter are discussed in the following subsections.

4.2.1.1 Gross-Gamma Radiological Screening

Field screening samples for gross-gamma radioactivity will be done using a hand-held NaI detector probe and ratemeter or the ESP-1 beta/gamma meter. The NaI detector is held close to the sample or core and is capable

of identifying elevated concentrations of certain radionuclides as an increased reading above instrument background levels. The response is best interpreted as a gross indicator of potential contamination.

4.2.1.2 Gross-Alpha Radiological Screening

Field screening samples for gross-alpha radioactivity is conducted using a hand-held alpha scintillation detector and a ratemeter. The detector is held close to contact with the sample or core and is capable of detecting alpha radioactivity on the order of 100 to 200 pCi/g for a damp soil sample. However, detecting alpha activity can be difficult in moist samples because of shielding by the water. The instrument cannot identify specific radionuclides.

4.2.1.3 Gross-Beta Radiological Screening

Field screening of samples for gross-beta radioactivity is accomplished using a hand-held detector. A typical beta detector consists of a Geiger-Mueller tube with a thin mica window protected by a sturdy wire screen. When held close to contact with the sample, the detector (with window thickness between 1.4 to 2 mg/cm^2) is capable of detecting gross beta activity down to energies of 40 keV. The gamma sensitivity of such a detector is approximately 3 600 cpm/mR/h. The beta efficiency (determined as percentage of 2π emission rate, from a 1-in.-diameter source) with screen in place is nominally 45% for strontium-90 and 10% for carbon-14. Screen removal increases efficiency by 45%. This beta detector is alpha sensitive above 3 MeV.

4.2.2 Organic Vapor Detectors

Organic vapor detectors will be used to screen borehole cores and soil samples at the point of collection to identify grossly contaminated samples. PIDs and FIDs (described in Subsection 4.1.2 of this appendix) will be used to improve the probability of detecting a wide range of vapors.

4.2.3 Polychlorinated Biphenyls

Portable enzyme-linked immunosorbent assay kits such as PCB-RISc kits will be used to identify areas of polychlorinated biphenyl (PCB) contamination in the field. Manufacturer's instructions and the draft SW-846 Method 4020

will be followed in using these kits (EPA 1994, 1222). The method is designed to provide indication of PCB contamination above 5 ppm. When necessary, selected confirmation samples for laboratory analysis will be collected from areas to confirm the results of the PCB screening kits.

4.2.4 Lithologic Logging

Lithologic logging of drill cores to describe the physical nature of borehole cores will be performed by a geologist capable of describing subsurface lithologies and differentiating the various strata of Bandelier Tuff.

5.0 FIELD ANALYSES

Section 3.0 of this appendix defines field analyses used in this work plan. These analyses will be used to identify areas of contamination, to select samples for confirmation by laboratory analysis, and to provide preliminary and final radiological and chemical analyses of samples. The radiological analyses will be conducted using the mobile radiological analysis laboratory in accordance with Inorganic Trace Analysis Group (CST-9) procedures series MRL100 through MRL400. In addition, the mobile chemistry van will be used to provide chemical analyses. Mobile radiochemical and chemical analyses will be conducted either onsite or at an easily accessible location, following the analyses described in Subsections 5.1 and 5.3. At the discretion of the field project leader (FPL) and mobile laboratory personnel, experimental conditions may be adjusted to provide the necessary analytical sensitivity, selectivity, precision, and bias. For example, counting times for radiological analyses may be adjusted to provide required sensitivities while maintaining acceptable turnaround times. The field analyses will be conducted using field GC/FID, as described in Subsection 5.2 and x-ray fluorescence, described in Subsection 5.3.

5.1 Field Radiological Analyses

For areas with suspected radiological contamination, an accurate estimate of sample radioactivity is required before the samples can be submitted to the SCF. The CST-9 radiological analysis van will be used to conduct preliminary radiological analyses to ensure samples fall within Department of Transportation (DOT) shipping limits. Results of these analyses will also

be used to identify areas of radiological contamination, indicate which radioelements are likely present, and provide definitive analyses where appropriate. Use of the mobile radiological analyses van will minimize sample turnaround times that may contribute to sampling decisions in the field and ultimately translate to reduced costs. The decision to use the mobile radiological analysis van or to send samples to fixed laboratories rests with the FPL but may be delegated as necessary. Field radiological analyses are discussed in the following subsections.

5.1.1 Gross-Alpha and Gross-Beta Radioactivity

Measurements of gross-alpha and gross-beta radioactivity can be used to assess the presence of plutonium, uranium, and americium in samples; although individual radionuclides cannot be identified by this method. Despite limitations regarding analyte selectivity, these measurements can be used to guide field operations, bias sample selection, or provide an initial assessment of the sample radioactivity for health and safety purposes.

The method uses dried soil samples in a fixed geometry with measurement times of 15 to 20 minutes. Detection limits are approximately 60 pCi/g for alpha emitters and 20 pCi/g for beta emitters.

5.1.2 Gamma Spectrometry

Gamma spectrometry can be used to quantify gamma-emitting radionuclides in soil samples by determining the intensities of gamma photons emitted over a range of energies. Dried soil samples are counted in a fixed geometry using computer-based multichannel analyzers equipped with NaI or germanium detectors. Detection limits are isotope specific.

5.2 Field GC/FID

Field GC/FID analyses will be used to identify areas with hydrocarbon contamination; for example, to identify the extent of areas to be excavated during VCAs. An adaptation of SW-846 Method 8015 or Method 418.1 for total petroleum hydrocarbons (TPH) will be used and confirmatory samples will be sent for fixed laboratory analysis to verify that petroleum contamination has been remediated. The field method, sensitive below the proposed 100 ppm cleanup levels, can be standardized against various petroleum

products (for example, Stoddard solvent or diesel fuel) or site-specific materials (for example, spilled petroleum products that have weathered).

5.3 Mobile Chemistry Analyses

To the extent practicable, the mobile chemistry van will be used for polychlorinated biphenyls, TPH, semivolatile organics, and volatile organics analyses. The Organic Analysis Group's (CST-12) procedures series MLO274 through MLO720 will be used for these analyses. The intent is to minimize turnaround times, sample handling, and analyses costs; yet provide data at a level of analyses appropriate for making future sampling and cleanup decisions. The mobile chemistry analytical procedures are based on standard Environmental Protection Agency (EPA) analytical protocols.

5.3.1 X-ray Fluorescence Probe for Metals

Metal concentrations in solid matrices may be determined using x-ray fluorescence (XRF) spectroscopy. Instrumentation consists of a source for sample excitation (x-ray tube or radioisotope), a solid-state proportional counter or detector, a sample chamber, and an energy analyzer. Dried soil or crushed debris samples are placed in a sample chamber, excited, and counted for finite time periods (e.g., 400 seconds).

Metal action-level detection limits may not be achieved in field instruments, but gross concentrations of metals may be detected. Even gross concentrations of metals will provide valuable information for soil or debris assessment. An ER SOP for XRF analyses is currently in technical review. The field team will follow guidance from the XRF SOP if it is approved before sampling begins. Otherwise, calibration and field procedures recommended by the instrument manufacturer will be followed.

6.0 LABORATORY ANALYSES

Subsection 3.2 of this appendix provides the definition of laboratory analyses as it is used in Addendum 1. Data generated in fixed laboratories are intended to be of the highest quality. Samples submitted to an analytical laboratory will be packaged, shipped, and tracked by the ER Project's Sample Coordination Facility.

Table D-3 summarizes analytical methods used for sample analyses. The following list clarifies a few of the analytical methods that appear in Table D-3.

TABLE D-3

SUMMARY OF ANALYTICAL METHODS USED FOR ANALYSES OF SAMPLES COLLECTED AT OU 1114

SAMPLE TYPE	METHOD USED	METHOD DETECTION/ QUANTITATION LIMIT IN SOILS
Radionuclides		
Gross alpha	Gas flow proportional counter	4.0-10.0 pCi/g[a]
Gross beta	Gas flow proportional counter	5.0-12.0 pCi/g[a]
Gamma spectrometry	High-purity germanium gamma-ray spectrometry	0.1-2.0 pCi/g[a]
Isotopic plutonium (plutonium-238, -239, -240)	Ion exchange and alpha spectrometry	0.02 pCi/sample[b]
Isotopic uranium (uranium-234, -235, -238)	Ion exchange and alpha spectrometry	3.00 pCi/g[b]
Strontium-90	Solvent extraction and beta counting	0.50 pCi/g[b]
Tritium	Distillation and liquid scintillation	2.50 pCi/total activity, or 500 pCi/L per 5 ml sample[b]
Organics		
Herbicides	EPA SW-846 Method 8150	0.05-167.0 ppm[c]
Organochlorine pesticides	EPA SW-846 Method 8080	0.0014-0.16 ppm[c]
Organophosphorus pesticides	EPA SW-846 Method 8140	0.02-3.35 ppm[c]
Polychlorinated biphenyls	EPA SW-846 Method 8080	0.045 ppm[c]
PCB/immunoassay	EPA SW-846 Method 4020[c]	5.0 ppm[c]
Semivolatile organic compounds	EPA SW-846 Method 8270	0.10-3.30 ppm[c]
Total petroleum hydrocarbons	EPA Method 418.1[c]	10 ppm[c]
Volatile organic compounds	EPA SW-846 Method 8240	0.005-0.10 ppm[c]
Metals		
Mercury	EPA SW-846 Method 7471	0.2 ppm[d]
OU 1114 and Subpart S metals suite (arsenic, barium, beryllium, cadmium, chromium, lead, nickel, selenium, silver), Appendix VIII or TAL metals suite	EPA SW-846 Method 6010[c]	See Table D-4
Appendix VIII or TAL metals suite	EPA SW-846 Method 7000[c]	See Table D-4
Miscellaneous		
Cyanide	EPA SW-846 Methods 9010 and 9012[a]	1.0 ppm[e]

[a] DOE 1983, 0516.
[b] LANL 1992, 0520.
[c] EPA 1994, 1222.
[d] A dilution factor of 100 was applied to the detection limit reported.
[e] EPA 1991, 0814.

- **Gross alpha/beta/gamma.** This refers to the laboratory analysis for the total activity of the sample for each of these types of radiation.

- **Isotopic analyses.** The following isotopic analyses may be selected based on the gross alpha/beta/gamma analyses done in the radiological van.

- **Gamma spectroscopy.** This refers to quantification of individual radionuclides by measurement of photon emissions over a range of energies.

- **Isotopic plutonium**. Radiochemical separation of plutonium from soil is followed by alpha spectrometry to quantify each isotope of plutonium.

- **Isotopic uranium**. Radiochemical separation of uranium from soil is followed by alpha spectrometry to quantify each isotope of uranium.

- **Strontium-90**. This refers to radiochemical separation using multiple selective precipitation and counting beta activity by gas proportional detectors.

- **Tritium**. This refers to measurement of tritium in soil moisture. Soil moisture is distilled from soil, and the low-energy beta emission from tritium is measured by liquid scintillation techniques.

- **Appendix VIII Metals Suite.** The 40 CFR Appendix VIII metals suite or the target analyte list (TAL) metals will be used as the default list of metals where no subset has been specified for analysis. At OU 1114 there is no documented use of several metals on the Appendix VIII or TAL metals list (including antimony, arsenic, barium, selenium, thallium, and vanadium). For several metals on the Appendix VIII list (including aluminum, cobalt, iron, manganese, and zinc), the screening action levels

(SALs) are far higher than any waste concentrations expected at the site, or are such common constituents in the environment that no SALs have been defined for soil. Table D-4 compares the TAL metals list and the OU 1114 Appendix VIII default suite to the SAL in soil.

TABLE D-4

ANALYTE LISTS COMPARED

TARGET ANALYTE LIST (TAL)	OU 1114 ANALYTE LIST (APPENDIX VIII LIST)	SAL IN SOIL[a] (mg/kg)
Aluminum		b
Antimony	Antimony	32.00
Arsenic	Arsenic	b
Barium	Barium	5 600.00
Beryllium	Beryllium[c]	b
Cadmium	Cadmium[c]	80.00
Calcium	Calcium	b
Chromium III	Chromium III	80 000.00
Chromium VI	Chromium VI[c]	400.00
Cobalt		b
Copper		3 000.00
Cyanide		1 600.00
Iron		b
Lead	Lead[c]	400.00[d]
Magnesium		b
Manganese		11 000.00
Mercury	Mercury[c]	24.00
Nickel	Nickel[c]	1 600.00
Potassium		b
Selenium	Selenium	400.00
Silver	Silver[c]	400.00
Sodium		b
Thallium	Thallium	6.40
Uranium		240.00
Vanadium	Vanadium	560.00
Zinc		24 000.00

[a] Soil SALs (except SAL for lead) are from the 1993 IWP (LANL 1993, 1017)
[b] Background comparison should be performed for this compound to determine if further action is required.
[c] These metals constitute the OU 1114 metals suite. Analysis for the remaining metals will only occur at the wastewater treatment system aggregate and the Sigma Mesa solar pond.
[d] Soil SAL based on EPA OSWER Directive 9355.4-12 (EPA 1994, 1209).

- **Mercury** (SW-846 Methods 7470, 7471). Method 7470 is the standard EPA method for quantification of mercury in aqueous waste and groundwater. Method 7471 is the EPA method for quantification of mercury in solid and sludge-type waste.

- **Cyanide** (SW-846 Methods 9010, 9012). Methods 9010 and 9012 are the standard EPA methods for quantification of cyanide in an aqueous waste or leachate.

7.0 SAMPLING METHODS

7.1 Introduction

For the field sampling plans in Addendum 1, specific sampling methods have been selected and the details of their uses and applications in the field have been carefully defined below. In addition to consistency of operations and minimization of repeated information, this standardization provides comparability of sample analysis results from location to location in OU 1114.

For each method identified below the specifically defined portion is detailed; however, complete specification of the method requires additional information that is referenced to the applicable SOP or provided in the field sampling plan (e.g., nominal or target depth for a borehole).

7.2 Soil Sampling Methods

7.2.1 Surface Soil Samples

Surface soil samples are defined as samples taken from the upper 12 in. of soil. This type of soil sample shall be gathered using a stainless steel or Teflon™ scoop. Care must be used to take the sample to a full 12-in. depth and to cut the sides of the hole vertically so that equal volumes of soil are taken from sample to sample over the full 12-in. depth. The applicable SOPs are LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples and LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler.

7.2.2 Undisturbed Surface Soil Samples

Undisturbed soil samples shall be gathered from the first six inches of soil using the ring sampler method. This method involves driving a four-inch-diameter stainless steel tube (ring sampler) vertically into the area to be sampled. The soil around the ring sampler is then excavated so that the tube can be removed. An undisturbed core sample is obtained by pushing the soil from the ring sampler. The applicable SOP is LANL-ER-SOP-06.11, R0, Stainless Steel Surface Soil Sampler.

7.2.3 Deposition-Layer Soil Samples

Deposition-layer soil samples are collected from the first one inch of soil. Samples collected using this method represent wind- or air-deposited contaminants on the soil surface (e.g., contaminants dispersed and deposited from stack emissions). They shall be collected by using a stainless steel or Teflon™ trowel to scrape off the upper one inch of soil. The applicable SOP is LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples.

7.2.4 Manual Shallow-Core Samples

Small volume soil samples can be recovered from depths approaching 10 ft with a hand auger or with a thin-wall tube sampler. The thin-wall tube sampler provides a less disturbed sample than that obtained with a hand auger. However, it may not be possible to force the thin-wall tube sampler through some soil or tuff, and sampling with the hand auger may be the more viable alternative. The applicable SOP is LANL-ER-SOP-06.10, R0, Hand Auger and Thin-Wall Tube Sampler.

7.3 Chip Samples

Chip samples are destructive samples collected to be representative of porous surfaces such as asphalt, concrete, wood, brick, unglazed clay pipe, and tuff. Destructive porous surface techniques are used for any porous

object considered too large for collection, such as a discrete sample. Examples include intact structures such as a roadbed or wall, chunks of debris too large for transport, boulders or bedrock surfaces, and surfaces of functioning structures. Chip sampling requires a chisel, drill, hole saw, or similar tool to collect a minimum of 100 grams of sample to a maximum depth of 1 in. The applicable SOP is LANL-ER-SOP-06.28, R0, Chip Sampling of Porous Surfaces.

Trenches may be used to evaluate geologic features such as soils or stratigraphy. The minimum trench dimensions sufficient to expose significant geologic materials and relationships on the trench wall are generally 5 to 12 ft deep by 3 ft wide. The actual dimensions may vary depending on site and geologic conditions and available equipment. Trenching will also vary considerably depending on topography, ease of excavation, and available equipment. Soil samples will be collected from the backhoe bucket using the LANL-ER-SOP-06.09, R0, Spade and Scoop Method for Collection of Soil Samples to preclude the need for a confined space entry permit.

7.4 Liquid Samples

The Coliwasa sampler is designed for collecting liquid hazardous wastes. It permits the representative sampling of multiphase wastes with a wide range of viscosity, corrosivity, volatility, and solids content. The main parts of the Coliwasa consist of a sampling tube, stop-cock, and closure system. The sampling tube is a 5-ft by 1.625-in.-diameter translucent plastic pipe (usually polyvinyl chloride), or a borosilicate glass plumbing tube. The plastic Coliwasa is used to sample most containerized liquid wastes except wastes that contain ketones, nitrobenzene, dimethylforamide, mesityl oxide, and tetrahydrofuran. The glass Coliwasa is used to sample all other containerized liquid wastes except for strong alkali and hydrofluoric acid solutions. The applicable SOP is LANL-ER-SOP-06.15, R0, Coliwasa Sampler for Liquids and Slurries.

8.0 REFERENCES

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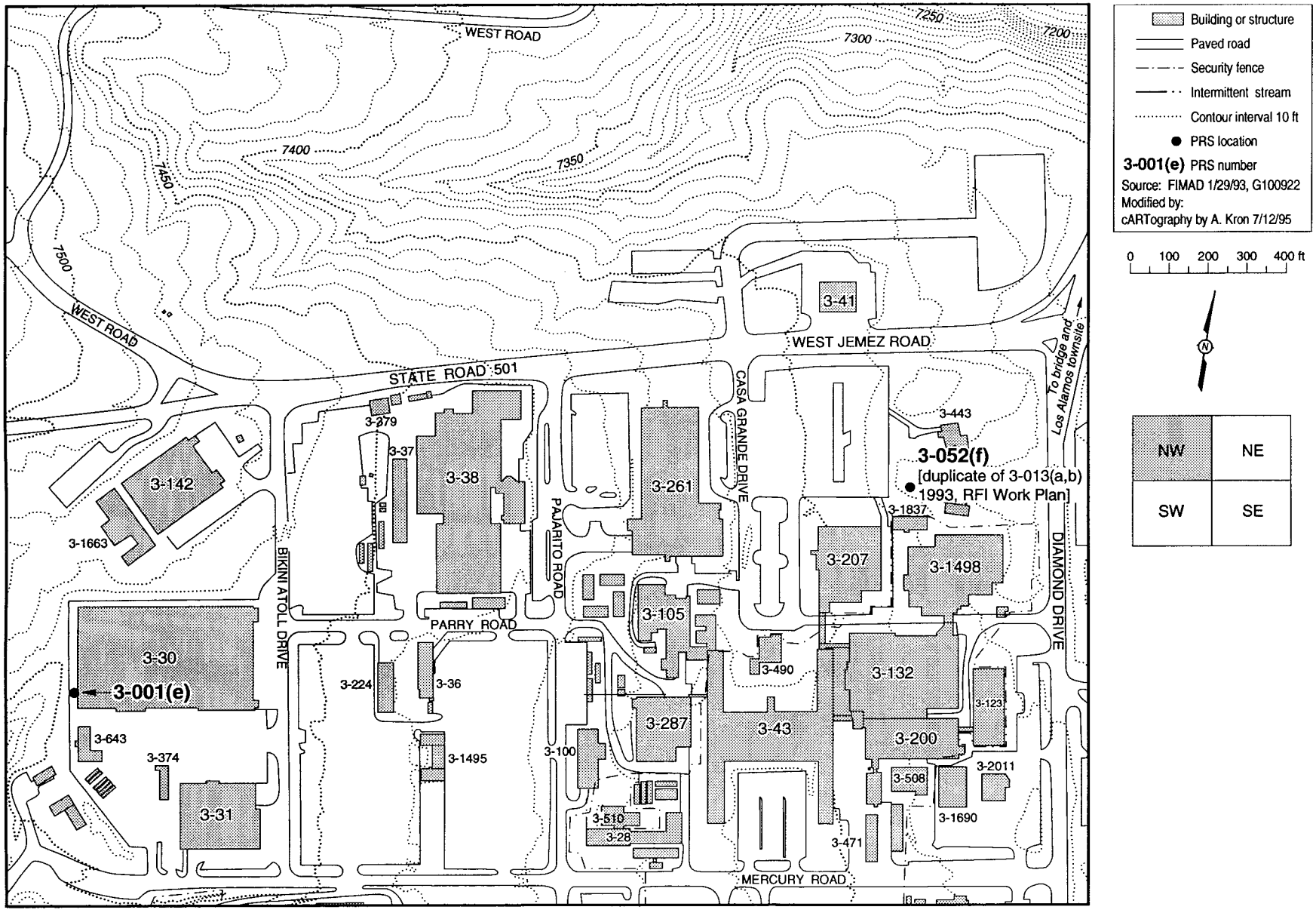

Fig. E-12. Topographic map of TA-3 (NW quadrant) showing sampling locations of PRSs.

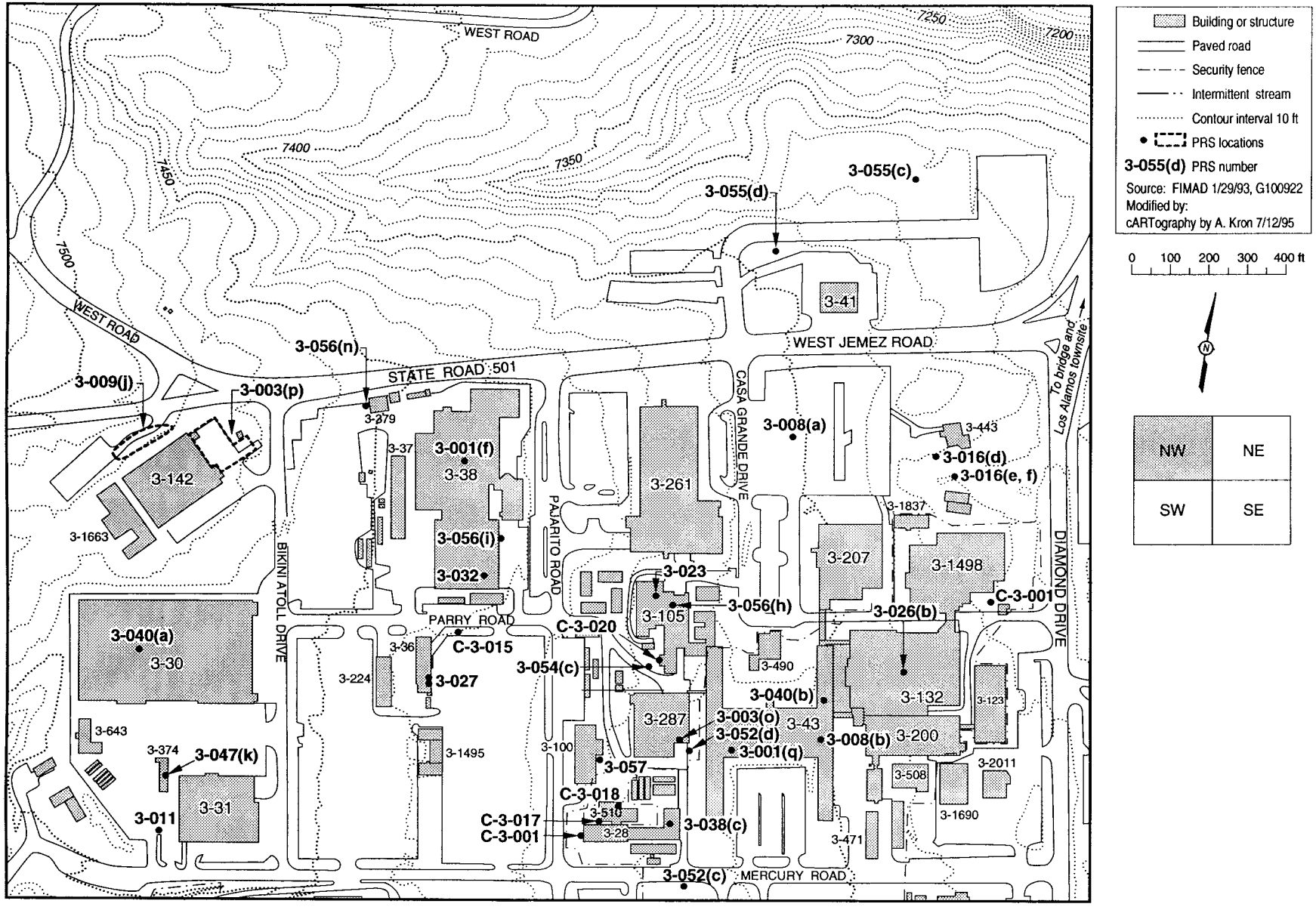

Fig. E-12-NFA. Topographic map of TA-3 (NW quadrant) showing locations of PRSs proposed for NFA.

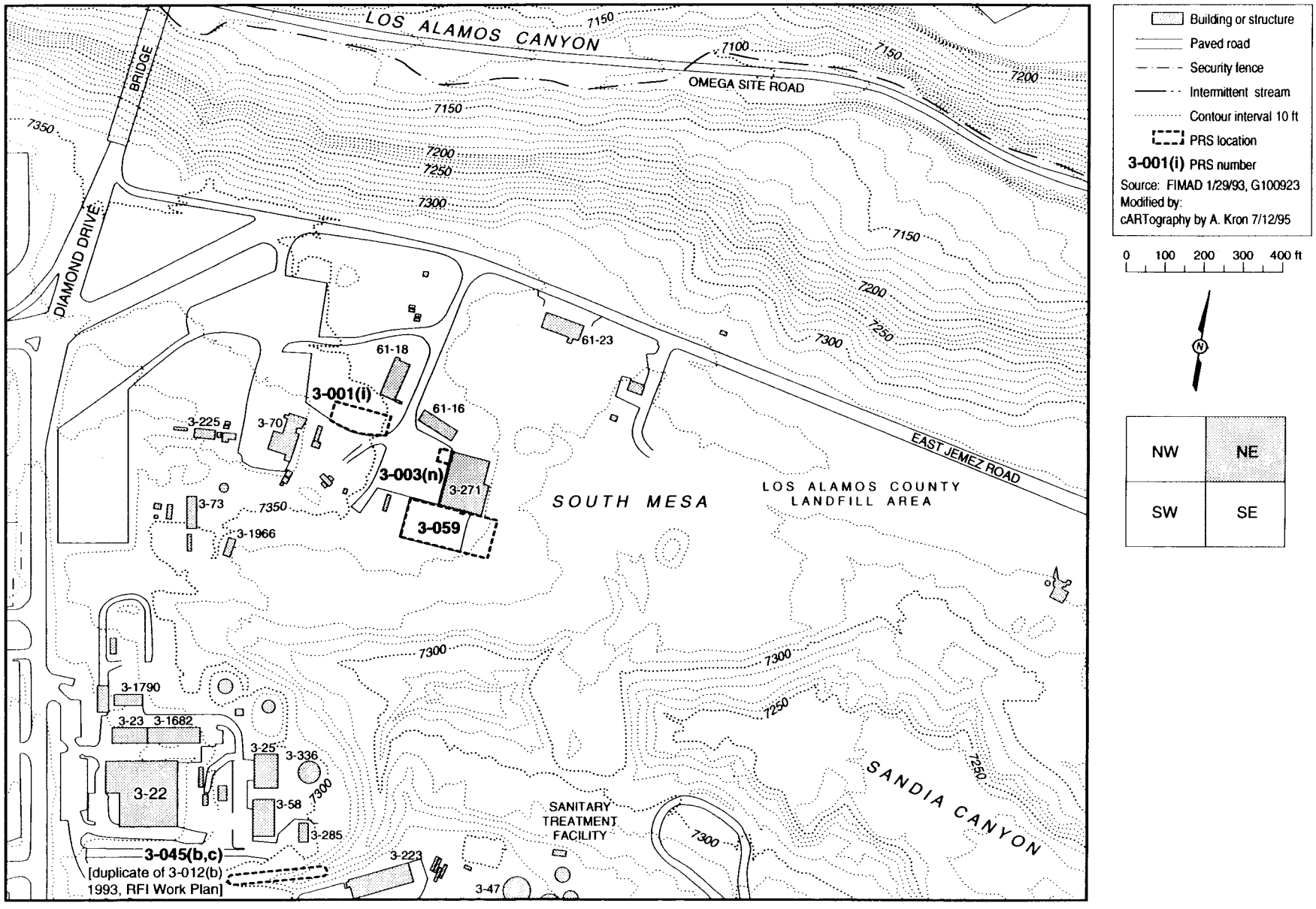

Fig. E-13. Topographic map of TA-3 (NE quadrant) showing sampling locations of PRSs.

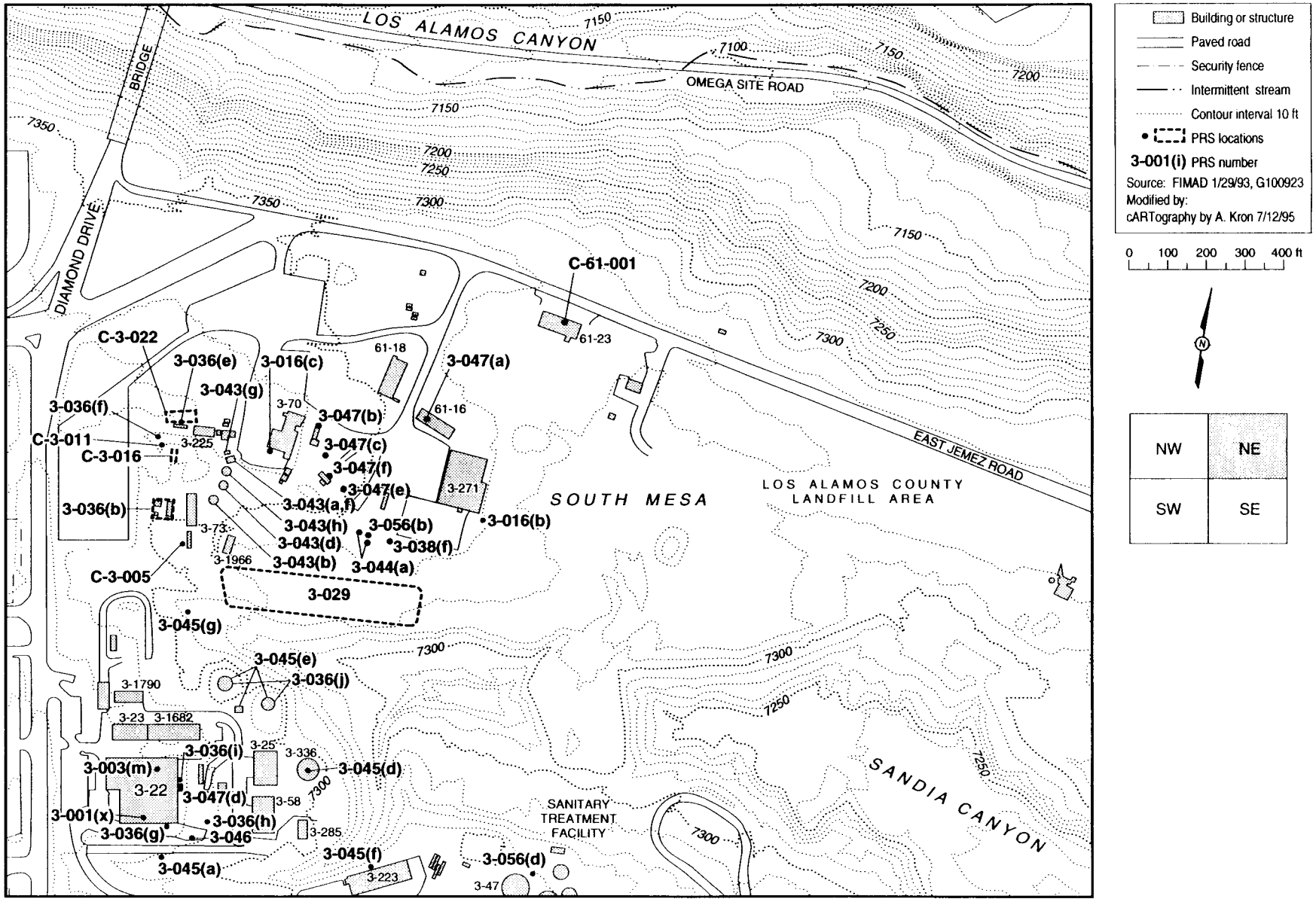

Fig. E-13-NFA. Topographic map of TA-3 (NE quadrant) showing locations of PRSs proposed for NFA.

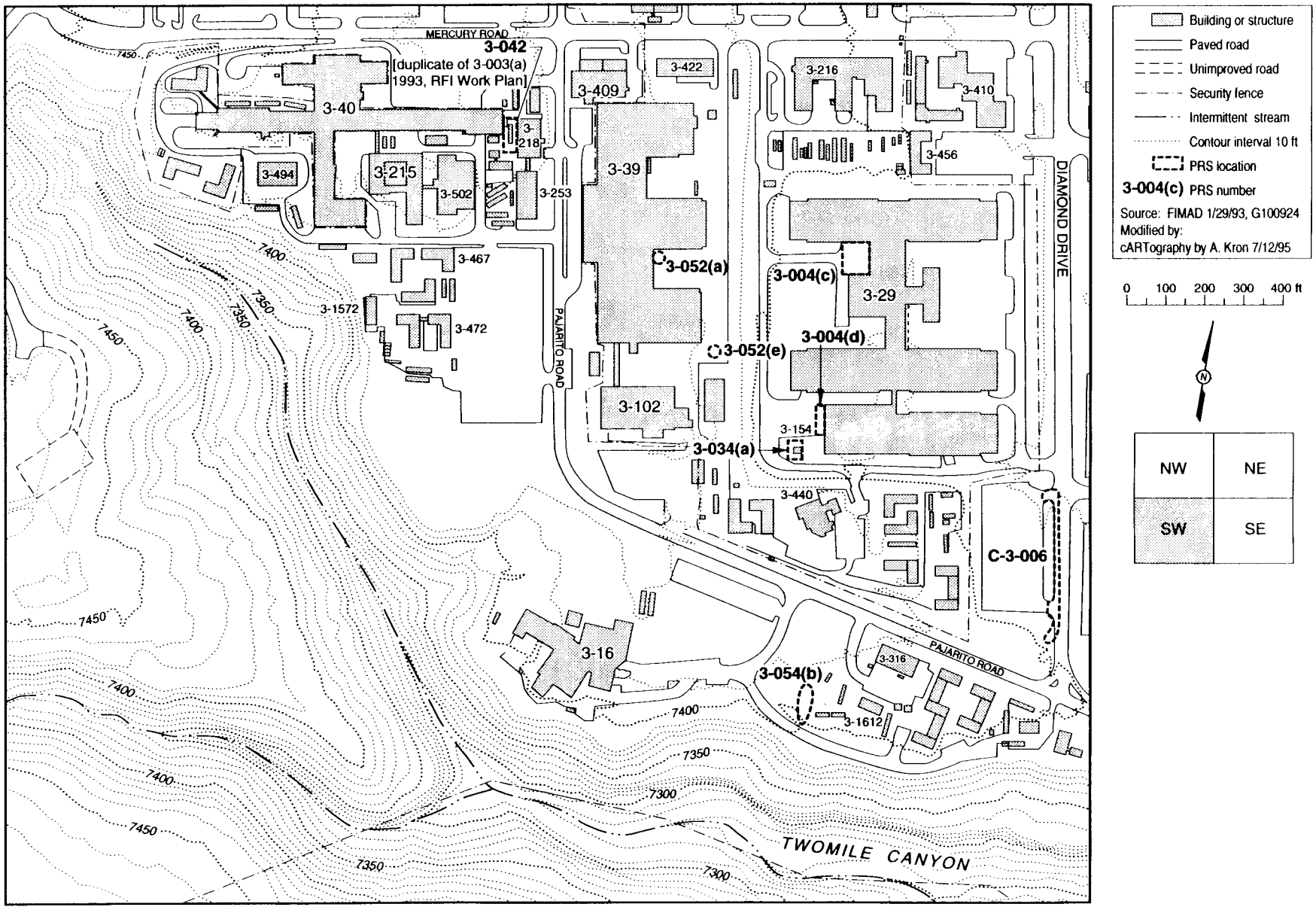

Fig. E-14. Topographic map of TA-3 (SW quadrant) showing sampling locations of PRSs.

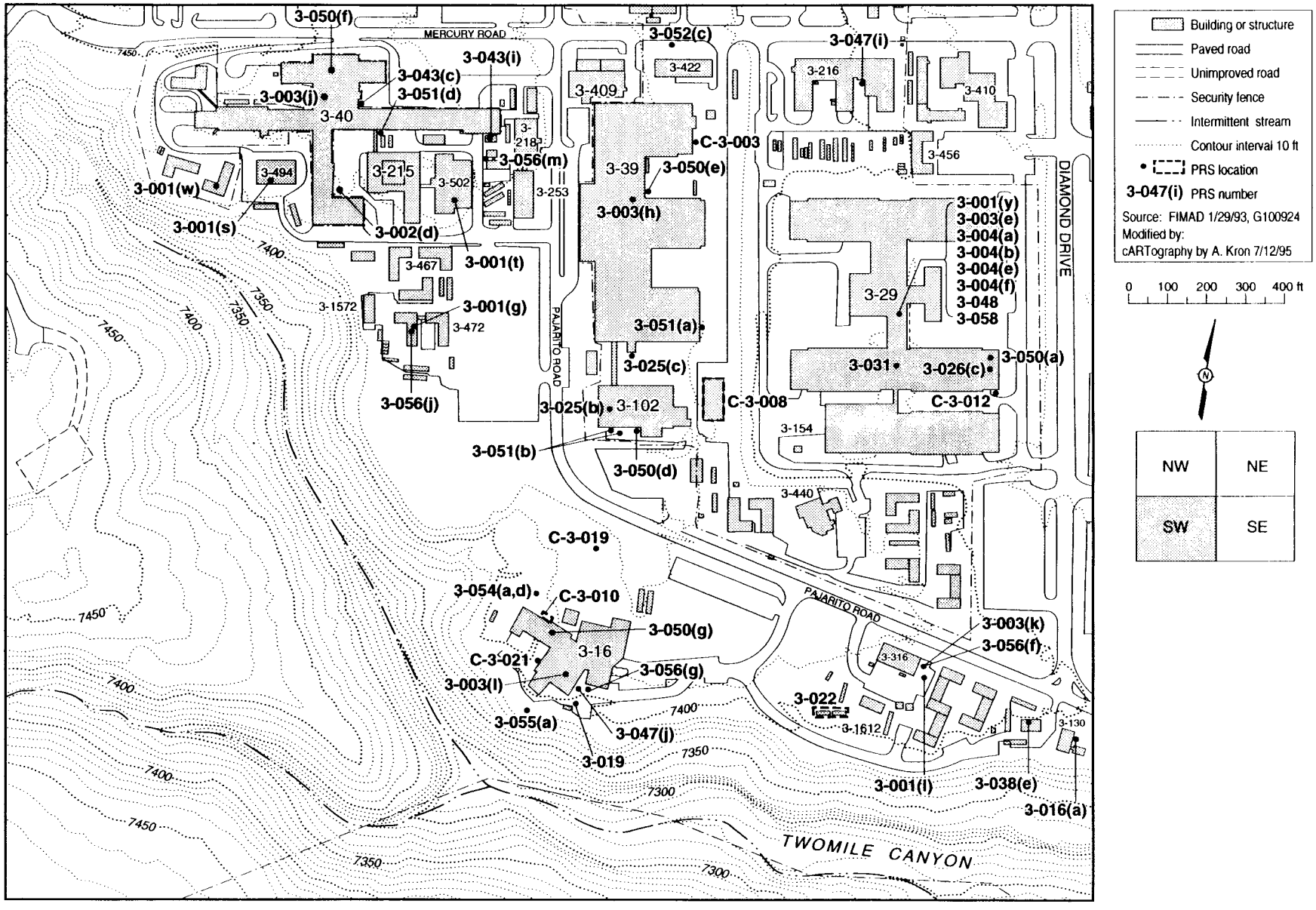

Fig. E-14-NFA. Topographic map of TA-3 (SW quadrant) showing locations of PRSs proposed for NFA.

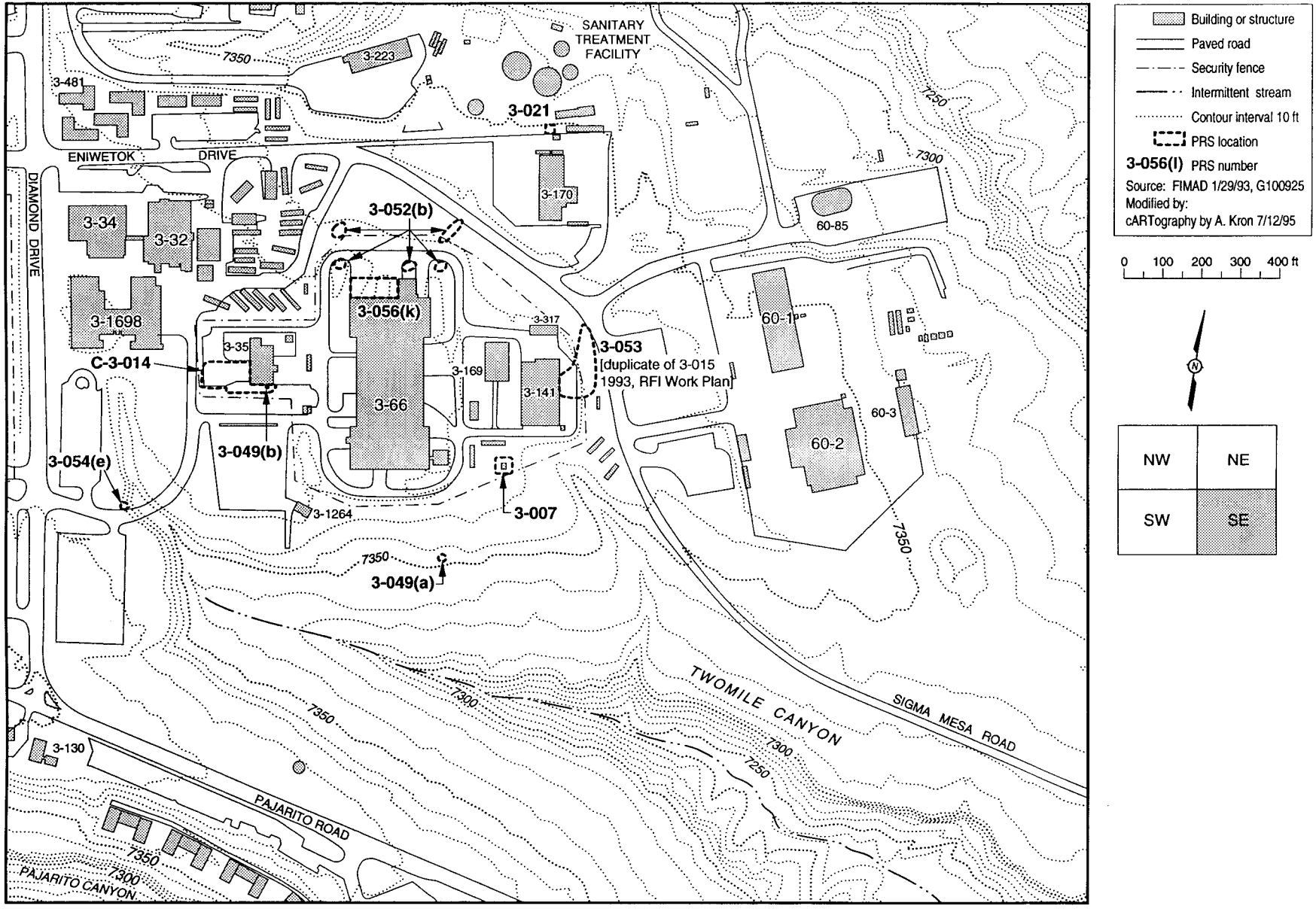

Fig. E-15. Topographic map of TA-3 (SE quadrant) showing sampling locations of PRSs.

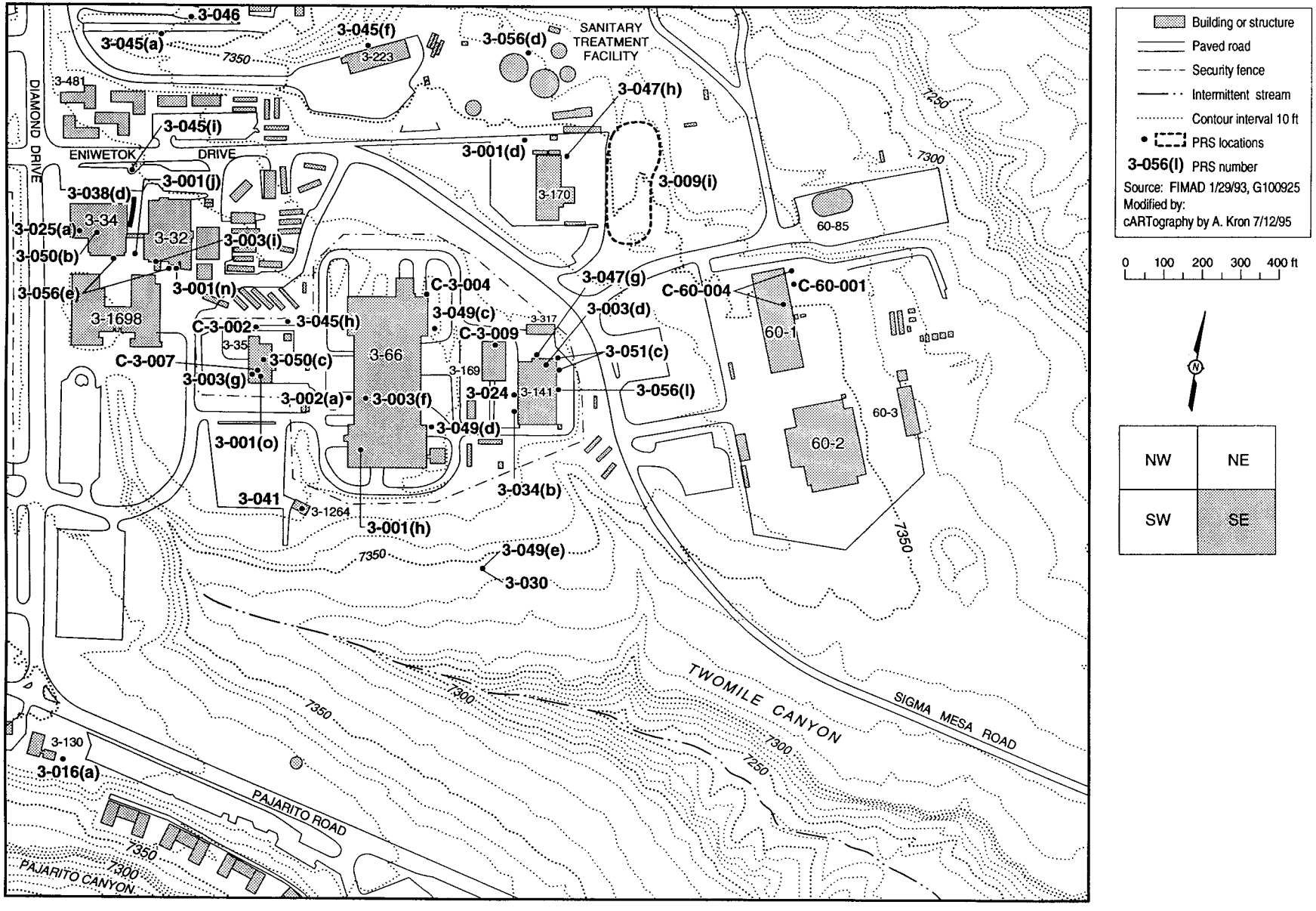

Fig. E-15-NFA. Topographic map of TA-3 (SE quadrant) showing locations of PRSs proposed for NFA.

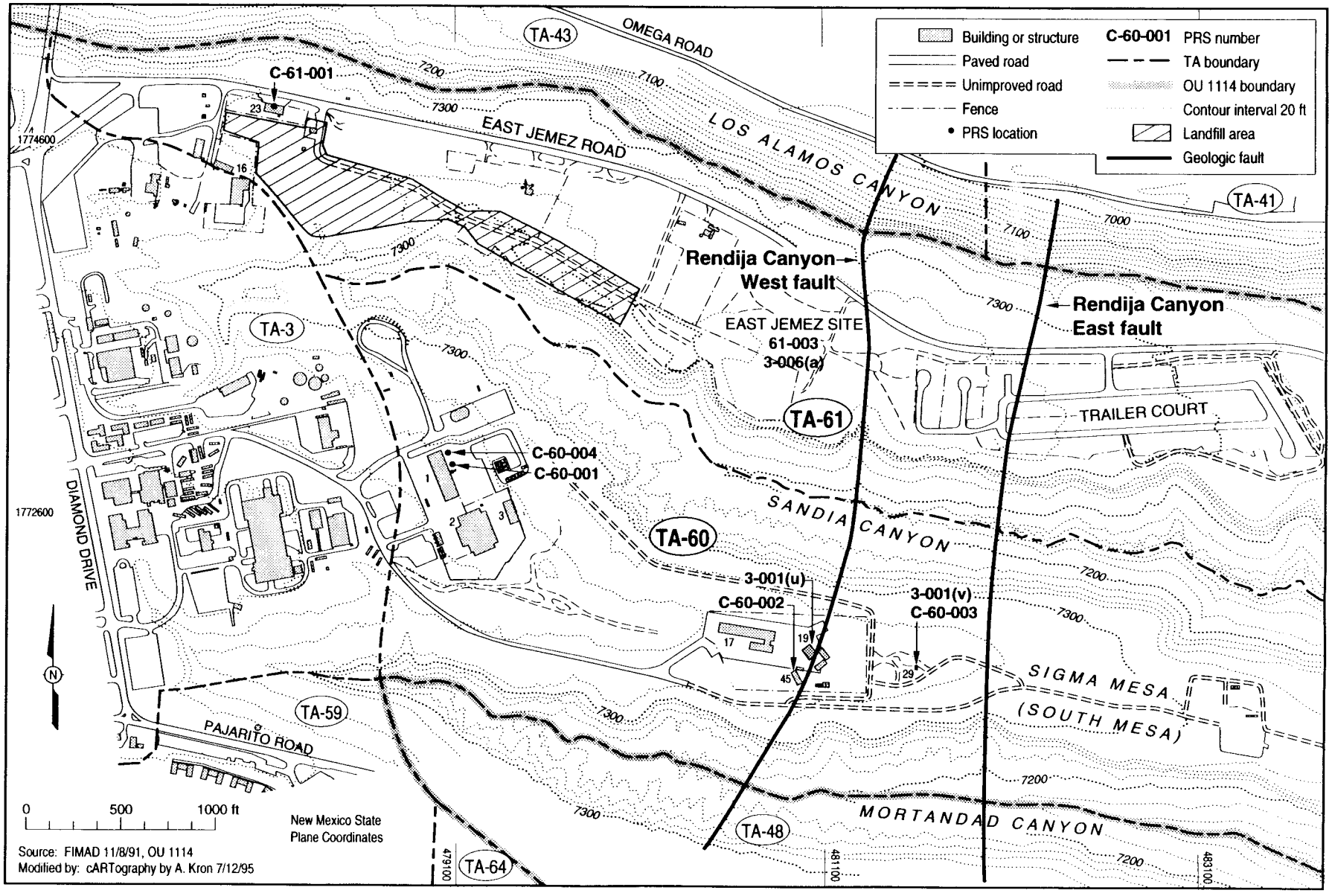

Fig. E-17-TA-60 NFA. Topographic map of TA-60 (western half) showing locations of PRSs proposed for NFA.

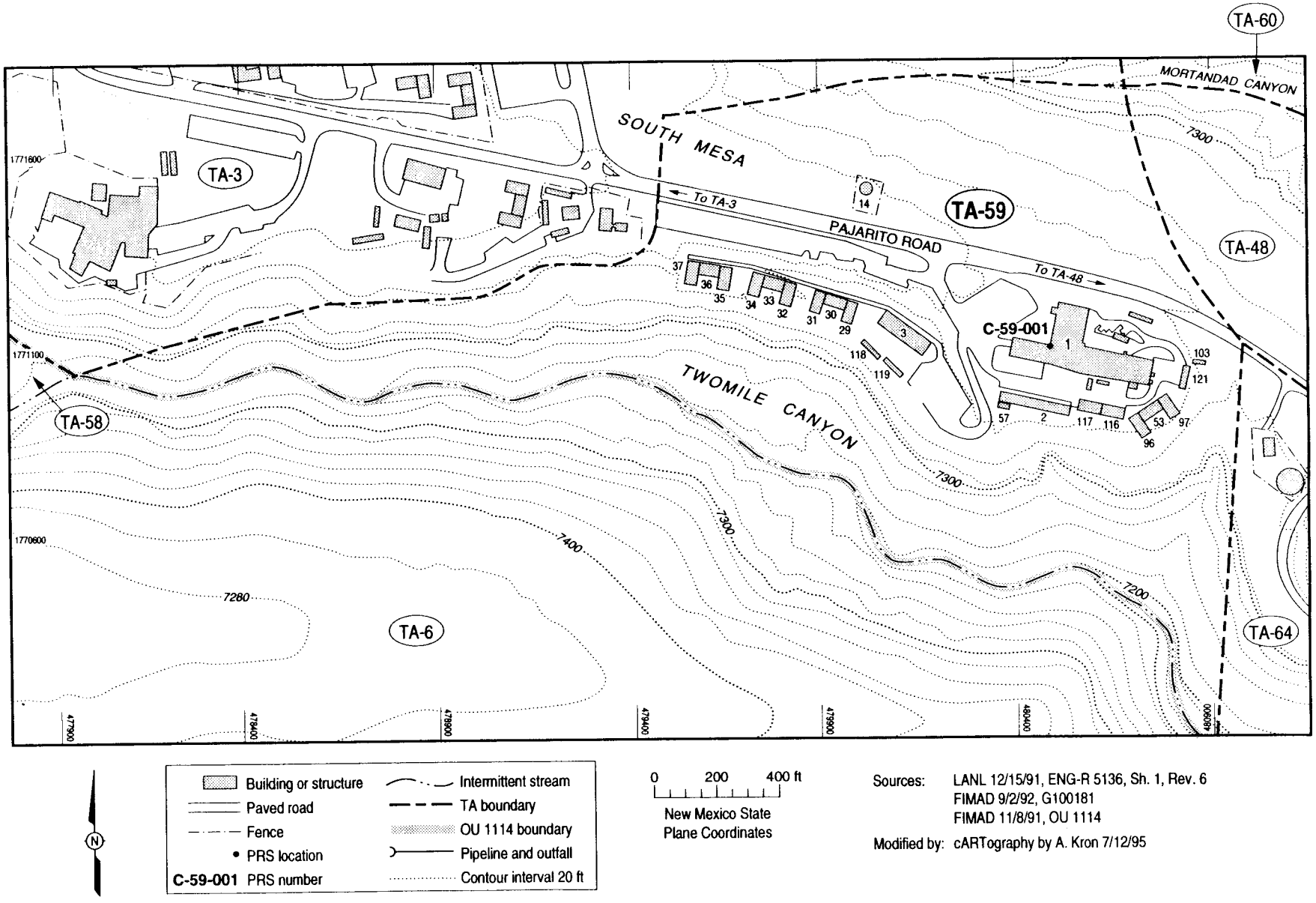

Fig. E-16-TA-59 NFA. Topographic map of TA-59 showing PRS proposed for NFA.