198

RFI Work Plan for Operable Unit 1082

Environmental Restoration Project

Addendum 2

July 1995

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-95-1038

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

Executive Summary

EXECUTIVE SUMMARY

Purpose

The primary purposes of this Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan are to determine if a release has occurred, and/or the nature and extent of releases of hazardous waste or hazardous constituents from solid waste management units (SWMUs) in Operable Unit (OU) 1082, and to determine the need for corrective measures studies (CMSs). Secondly, this document satisfies part of the regulatory requirements contained in Los Alamos National Laboratory's (the Laboratory's) permit to operate under RCRA.

OU 1082 includes active Technical Areas (TAs) 11, 16, 28, and 37. These TAs are located in Los Alamos County. There are 425 potential release sites (PRSs) in OU 1082, which are located on land owned by the Department of Energy (DOE).

Because of the large number of PRSs in OU 1082, this work plan is written in three parts. The first part is the complete work plan delivered in 1993. The second part is Addendum 1 delivered in 1994 and the third part is Addendum 2 delivered in 1995. Addendum 1 consists of updated versions of the Executive Summary, Chapters 1, 2, 3, 4, and Appendix E.

Addendum 2 consists of selected updated sections and tables of the Executive Summary, Chapter 1 and Chapter 4. Chapters 5 and 6 contain the additional PRSs to the 1993 and 1994 editions of these chapters. Chapter 6 has Attachment A that contains cleanup documentation for some SWMUs. Attachment A is available at the Records Processing Facility and The Environmental Restoration Project Public Reading Room. Appendix E, Maps, contains only new maps produced for Addendum 2. The table of contents and list of figures and tables pertain only to Addendum 2.

Section 5.0 of Chapter 5 and the notes at the beginning of Chapter 6 show new text marked with an underline. Changed or deleted text is marked with a strike through. New tables or figures are distinguished by the addition of the letter "B" to the table or figure number.

Table of Contents

EXECUTIVE SUMMARY
Purpose ES-1

TABLE OF CONTENTS
Tables vi
Figures viii

Chapter 1 INTRODUCTION

Chapter 4 TECHNICAL APPROACH

Chapter 5 EVALUATION OF POTENTIAL RELEASE SITE AGGREGATES

5.0	Evaluation of Potential Release Site Aggregates	5-0-1
5.0.1	Index to PRSs Described in Chapter 5	5-0-1
5.0.2	DQOs for Reconnaissance Sampling - Generic Logic	5-0-10
5.0.2.1	Problem Statement (DQO Step 1)	5-0-15
5.0.2.2	Decision Process (DQO Step 2)	5-0-15
5.0.2.3	Decision Inputs (DQO Step 3)	5-0-16
5.0.2.4	Investigation Boundary (DQO Step 4)	5-0-16
5.0.2.5	Decision Logic (DQO Step 5)	5-0-16
5.0.2.6	Design Criteria (DQO Step 6)	5-0-17
5.26	Surface Contamination Aggregate	5-26-1
5.26.1	Background	5-26-1
5.26.1.1	Description and History	5-26-1
5.26.2	Decision and Investigation Objectives	5-26-13
5.26.2.1	Problem Statement	5-26-13
5.26.2.2	Design Criteria	5-26-15
5.26.3	Sampling and Analysis Plan	5-26-17
5.26.3.1	Sampling	5-26-19
5.27	Underground Storage Tanks Aggregate	5-27-1
5.27.1	Background	5-27-1
5.27.1.1	Description and History	5-27-1
5.27.1.2	Nature and Extent of Contamination	5-27-3
5.27.2	Remediation Decision and Investigation Objectives	5-27-5
5.27.2.1	Problem Statement	5-27-5
5.27.2.2	Investigation Boundries	5-27-5
5.27.2.3	Design Criteria	5-27-8
5.27.3	Sampling and Analysis Plan	5-27-8
5.28	Outfalls Aggregate	5-28-1
5.28.1	Background	5-28-1
5.28.1.1	Description and History	5-28-1
5.28.1.1.1	Chemical Storage Building Outfalls	5-28-2
5.28.1.1.2	Oil Overflow Drain Outfalls	5-28-5
5.28.1.1.3	TA-16-202 Machine Shop Outfall	5-28-8
5.28.1.1.4	Radiography Building Outfalls	5-28-9
5.28.1.1.5	TA-16-370 Outfall	5-28-13
5.28.1.1.6	Cooling Tower Outfalls and Associated Debris	5-28-15
5.28.1.1.7	TA-16-260 Outfalls	5-28-17
5.28.1.2	Nature and Extent of Contamination	5-28-19

5.28.2	Remediation Decision and Investigation Objectives	5-28-22
5.28.2.1	Problem Statement	5-28-22
5.28.2.2	Design Criteria	5-28-23
5.28.3	Sampling and Analysis Plan	5-28-25
5.28.3.1	Sampling	5-28-26
5.29	TA-16-478 Aggregate	5-29-1
5.29.1	Background	5-29-1
5.29.1.1	Description and History	5-29-1
5.29.1.2	Conceptual Exposure Model	5-29-4
5.29.1.2.1	Nature And Extent Of Contamination	5-29-4
5.29.1.2.2	Potential Pathways And Exposure Routes	5-29-5
5.29.2	Remediation Decisions and Investigation Objectives	5-29-6
5.29.2.1	Problem Statement	5-29-6
5.29.2.2	Decision Process	5-29-6
5.29.2.3	Inputs	5-29-7
5.29.2.4	Boundaries	5-29-7
5.29.2.5	Decision Logic	5-29-8
5.29.2.6	Design Criteria	5-29-9
5.29.3	Sampling and Analysis Plan	5-29-9
5.29.3.1	Surface Scraping and Trenching Surveys	5-29-10
5.29.3.2	Sampling	5-29-13

Chapter 6 EVALUATION OF POTENTIAL RELEASE SITE AGGREGATES

6.6	Solid Waste Management Units Listed in the Hazardous and Solid Waste Amendments (HSWA) Module VIII Recommended for No Further Action	6-2
6.6.1	Solid Waste Management Units Recommended for No Further Action Under Step One of the Four-Step Criteria	6-2
6.6.1.1	Outfall, SWMU 16-028(e); Active Sump, SWMU 16-029(i)	6-3
6.6.1.1.1	Background	6-3
6.6.1.1.2	Recommendation	6-3
6.6.1.1.3	Rationale for Recommendation	6-3
6.6.1.2	Surface Disposal, SWMUs 16-016(d,e,g)	6-4
6.6.1.2.1	Background	6-4
6.6.1.2.2	Recommendation	6-5
6.6.1.2.3	Rationale for Recommendation	6-6
6.6.1.3	Outfalls, SWMUs 16-026(a,l,t,z) and 16-030(c)	6-6
6.6.1.3.1	Background	6-6
6.6.1.3.2	Recommendation	6-8
6.6.1.3.3	Rationale for Recommendation	6-8
6.6.1.4	Outfall, SWMU 16-026(a2)	6-9
6.6.1.4.1	Background	6-9
6.6.1.4.2	Recommendation	6-9
6.6.1.4.3	Rationale for Recommendation	6-9
6.6.1.5	Outfall, SWMU 16-026(y)	6-9
6.6.1.5.1	Background	6-9
6.6.1.5.2	Recommendation	6-10
6.6.1.5.3	Rationale for Recommendation	6-10
6.6.1.6	Outfall, SWMU 16-031(h)	6-10
6.6.1.6.1	Background	6-10
6.6.1.6.2	Recommendation	6-11
6.6.1.6.3	Rationale for Recommendation	6-11
6.6.1.7	Active Outfall Cooling Tower, SWMU 16-031(e); Inactive Outfall Cooling Tower, SWMU 16-031(f)	6-11

6.6.1.7.1	Background	6-11
6.6.1.7.2	Recommendation	6-12
6.6.1.7.3	Rationale for Recommendation	6-12
6.6.2	SWMUs Recommended for No Further Action Under Step Two of the Four-Step Criteria	6-13
6.6.2.1	Outfalls, SWMUs 16-026(d2,e2,f2,g2,h,k,x) and 16-030(b,e,f)	6-13
6.6.2.1.1	Background	6-13
6.6.2.1.2	Recommendation	6-14
6.6.2.1.3	Rationale for Recommendation	6-14
6.6.2.2	Outfall, SWMU 16-026(f)	6-14
6.6.2.2.1	Background	6-14
6.6.2.2.2	Recommendation	6-15
6.6.2.2.3	Rationale for Recommendation	6-15
6.6.2.3	Outfall, SWMU 16-026(g)	6-15
6.6.2.3.1	Background	6-15
6.6.2.3.2	Recommendation	6-16
6.6.2.3.3	Rationale for Recommendation	6-16
6.6.2.4	Soil Contamination at Decommissioned Buildings, SWMUs 16-034(i,k)	6-16
6.6.2.4.1	Background	6-16
6.6.2.4.2	Recommendation	6-17
6.6.2.4.3	Rationale for Recommendation	6-17
6.6.3	SWMUs Recommended for No Further Action Under Step Four of the Four-Step Criteria	6-17
6.6.3.1	Soil Contamination at Decommissioned Storage Buildings, SWMUs 16-025(e2,f2,h2)	6-18
6.6.3.1.1	Background	6-18
6.6.3.1.2	Recommendation	6-18
6.6.3.1.3	Rationale for Recommendation	6-18
6.7	SWMUs and AOCs Not Listed in the HSWA Module That Are Recommended for No Further Action	6-19
6.7.1	SWMUs Recommended for No Further Action Under Step One of the Four-Step Criteria	6-19
6.7.1.1	Fuel Tank, C-16-072	6-19
6.7.1.1.1	Background	6-19
6.7.1.1.2	Recommendation	6-19
6.7.1.1.3	Rationale for Recommendation	6-19
6.7.1.2	Active HE Sump, SWMU 16-003(q); Hydraulic Oil Spill, C-16-071	6-20
6.7.1.2.1	Background	6-20
6.7.1.2.2	Recommendation	6-20
6.7.1.2.3	Rationale for Recommendation	6-20
6.7.1.3	Decommissioned Office and Shop, C-16-049	6-21
6.7.1.3.1	Background	6-21
6.7.1.3.2	Recommendation	6-21
6.7.1.3.3	Rationale for Recommendation	6-21
6.7.1.4	Decommissioned Electrical Manholes, C-16-062 and C-16-063	6-22
6.7.1.4.1	Background	6-22
6.7.1.4.2	Recommendation	6-22
6.7.1.4.3	Rationale for Recommendation	6-22
6.7.1.5	Decommissioned Water Storage Tank, C-16-018	6-22
6.7.1.5.1	Background	6-22

6.7.1.5.2 Recommendation 6-22
6.7.1.5.3 Rationale for Recommendation 6-22
6.7.1.6 Decommissioned Office Building, C-16-020 6-23
6.7.1.6.1 Background 6-23
6.7.1.6.2 Recommendation 6-23
6.7.1.6.3 Rationale for Recommendation 6-23
6.7.1.7 Decommissioned Water Tanks, C-16-034 and C-16-035 6-23
6.7.1.7.1 Background 6-23
6.7.1.7.2 Recommendation 6-23
6.7.1.7.3 Rationale for Recommendation 6-24
6.7.1.8 Decommissioned Latrine, C-16-061 6-24
6.7.1.8.1 Background 6-24
6.7.1.8.2 Recommendation 6-24
6.7.1.8.3 Rationale for Recommendation 6-24
6.7.1.9 Decommissioned Hose House, C-16-041 6-24
6.7.1.9.1 Background 6-24
6.7.1.9.2 Recommendation 6-25
6.7.1.9.3 Rationale for Recommendation 6-25
6.7.1.10 Decommissioned Steam Manholes, C-16-044 and C-16-046 6-25
6.7.1.10.1 Background 6-25
6.7.1.10.2 Recommendation 6-26
6.7.1.10.3 Rationale for Recommendation 6-26
6.7.1.11 Decommissioned Storage Building, C-16-050 6-26
6.7.1.11.1 Background 6-26
6.7.1.11.2 Recommendation 6-26
6.7.1.11.3 Rationale for Recommendation 6-26
6.7.1.12 Industrial Waste Tank, SWMU 16-037 6-26
6.7.1.12.1 Background 6-26
6.7.1.12.2 Recommendation 6-27
6.7.1.12.3 Rationale for Recommendation 6-27
6.7.1.13 Crossover Platform 6-27
6.7.1.13.1 Background 6-27
6.7.1.13.2 Recommendation 6-28
6.7.1.13.3 Rationale for Recommendation 6-28
6.7.2 SWMUs and AOCs Recommended for No Further Action Under Step Two of the Four-Step Criteria 6-28
6.7.2.1 Decommissioned Aboveground Fuel Tanks, SWMUs 16-033(c,d) 6-28
6.7.2.1.1 Background 6-28
6.7.2.1.2 Recommendation 6-29
6.7.2.1.3 Rationale for Recommendation 6-29
6.7.2.2 Implement Shed, C-16-008; Mess Hall, C-16-009; Storage Building, C-16-010; Decommissioned Blacksmith Shop, C-16-012; Decommissioned Lumber Storage Area, C-16-013; Decommissioned Equipment Room, C-16-014; Decommissioned Hose House, C-16-015; Decommissioned Fire House, C-16-016; Decommissioned Latrine, C-16-036 6-29
6.7.2.2.1 Background 6-29
6.7.2.2.2 Recommendation 6-30

6.7.2.2.3 Rationale for Recommendation 6-31
6.7.2.3 Decommissioned Oil Switches, C-16-047, C-16-051, and C-16-058 6-31
6.7.2.3.1 Background 6-31
6.7.2.3.2 Recommendation 6-31
6.7.2.3.3 Rationale for Recommendation 6-32
6.7.2.4 Transformer 6-32
6.7.2.4.1 Background 6-32
6.7.2.4.2 Recommendation 6-32
6.7.2.4.3 Rationale for Recommendation 6-33
6.7.2.5 Decommissioned Pump House, C-16-019 6-33
6.7.2.5.1 Background 6-33
6.7.2.5.2 Recommendation 6-33
6.7.2.5.3 Rationale for Recommendation 6-33
6.7.2.6 Underground Fuel Tank, C-16-070 6-34
6.7.2.6.1 Background 6-34
6.7.2.6.2 Recommendation 6-35
6.7.2.6.3 Rationale for Recommendation 6-35
6.7.3 SWMUs Recommended for No Further Action Under Step Three of the Four-Step Criteria 6-35
6.7.3.1 Soil Contamination, SWMU 16-022(a) 6-35
6.7.3.1.1 Background 6-35
6.7.3.1.2 Recommendation 6-37
6.7.3.1.3 Rationale for Recommendation 6-37
6.7.3.2 Underground Storage Tanks, SWMUs 16-033(a,b,f-j), and 16-022(b) 6-37
6.7.3.2.1 Background 6-37
6.7.3.2.2 Recommendation 6-43
6.7.3.2.3 Rationale for Recommendation 6-43
6.7.4 SWMUs and AOCs Recommended for No Further Action Under Step Four of the Four-Step Criteria 6-44
6.7.4.1 Transformers, SWMUs 16-027(a-c) 6-44
6.7.4.1.1 Background 6-44
6.7.4.1.2 Recommendation 6-46
6.7.4.1.3 Rationale for Recommendation 6-46
6.7.4.2 Operational Release, SWMU 16-021(b) 6-46
6.7.4.2.1 Background 6-46
6.7.4.2.2 Recommendation 6-46
6.7.4.2.3 Rationale for Recommendation 6-46
6.8 SWMU Recommended for Voluntary Corrective Action 6-47
6.8.1 SWMU Recommended for No Further Action due to Voluntary Corrective Action Under Step Four of the Four-Step Criteria 6-47
6.8.1.1 Surface Disposal, SWMU 16-016(f) 6-47
6.8.1.1.1 Background 6-47
6.8.1.1.2 Recommendation 6-47
6.8.1.1.3 Rationale for Recommendation 6-47
References 6-48

Appendix E OU 1082 PLATES

Tables

Table 1-3B	Addendum 2 SWMU Cross Reference List	1-1
Table 1-4B	PRSs, PRS Aggregates, and Location in Chapter 5	1-5
Table 1-5B	PRSs Recommended for No Current RCRA Facility Investigation in Addendum2	1-6
Table 1-6B	SWMUs Proposed for Deletion from Table C of the HSWA Module	1-9
Table 4-1B	Chemicals of Potential Concern at OU 1082 for Aggregates 5.26 Through 5.30	4-1
Table 4-6B	Potential Response Actions for Each PRS Aggregate	4-8
Table 5-0-1	Index to PRSs	5-0-2
Table 5-0-2	Field Screening Sampling Numbers	5-0-19
Table 5-0-3	Laboratory Sampling Numbers	5-0-21
Table 5-26-1	Surface Soil Contamination PRSs at S-Site	5-26-2
Table 5-26-2	Potential Release Sites and Chemicals of Potential Concern Contained in OU 1082, Surface Aggregate	5-26-14
Table 5-26-3	Grouping of Surface PRSs into Severity and Heterogeneity Categories	5-26-16
Table 5-26-4	Standard Operating Procedures for Field Activities	5-26-17
Table 5-26-5	Summary of Site Surveys, Sampling, and Analysis for Surface Aggregate	5-26-18
Table 5-27-1	Underground Storage Tanks at TA-16	5-27-1
Table 5-27-2	Summary of Remediation or Screening Action Levels for USTs During Removal or Upgrading	5-27-3
Table 5-28-1	Outfall and Drainage Aggregate PRSs	5-28-1
Table 5-28-2	Potential Release Sites and Chemicals of Potential Concern Contained in OU 1082, Outfalls Aggregate	5-28-20
Table 5-28-3	Analysis of Soil Samples for Barium Content	5-28-21
Table 5-28-4	Barium Concentration in Soil Samples Measured With XRF	5-28-22
Table 5-28-5	Grouping of Outfall PRSs Into Severity and Heterogeneity Categories	5-28-24
Table 5-28-6	Standard Operating Procedures for Field Activities	5-28-26
Table 5-28-7	Summary of Site Surveys, Sampling, and Analysis for Surface Aggregate	5-28-27
Table 5-29-1	High Explosives in Drainage Ditches at Sump Effluent Outlet Baytos' Studies of 1970 - 1986 at TA-16-478	5-29-5
Table 5-29-2	Standard Operating Procedures for Field Activities	5-29-10
Table 5-29-3	Summary of Site Surveys, Sampling, and Analysis for Surface Aggregate	5-29-27

Table 6-11	PRSs Recommended for No Current RCRA Facility Investigation in Addendum 2	6-1
Table 6-12	XRF and Background Values for Soil Near TA-16-370	6-5
Table 6-13	Rest Houses and Rest House Utility Room Drains	6-13
Table 6-14	Decommisioned Zia Maintenance Facility Structures	6-30
Table 6-15	Oil Switches	6-31
Table 6-16	Analytical Results from Borehole Samples at TA-16-205	6-36
Table 6-17	Underground Storage Tanks Removed from TA-16	6-38
Table 6-18	Headspace Teat Results	6-42
Table 6-19	Results of Laboratory Analyses	6-42

Figures

Fig. 5-0-1(a). Index to PRS location and sampling maps for OU 1082 (1993 RFI Work Plan) 5-0-11

Fig. 5-0-1(b). Index to PRS location and sampling maps for OU 1082 (1993 RFI Work Plan). 5-0-12

Fig. 5-0-2. Index to detailed sampling and PRS location figures for Subsections 5.18 through 5.25 (Addendum 1). 5-0-13

Fig. 5-0-3. Index map to PRS locations and sampling maps for Subsections 5.26 through 5.29 (Addendum 2). 5-0-13

Fig. 5-0-4. Schematic diagram showing typical groups of SWMUs covered in Subsections 5.18 through 5.25. 5-0-22

Fig. 5-26-1. Locations of SWMUs 16-024(i and j) in the administration area 5-26-3

Fig. 5-26-2. Location of SWMU 16-024(v) near TA-16-540. 5-26-4

Fig. 5-26-3. Location of SWMU 16-024(s) near TA-16-430. 5-26-5

Fig. 5-26-4. Locations of SWMUs 16-024(a and u) at P-Site. 5-26-7

Fig. 5-26-5. Locations of PRSs 16-025(d2) and C-16-060 near TA-16-340. 5-26-8

Fig. 5-26-6. Location of SWMU 16-024(t) near TA-16-460. 5-26-10

Fig. 5-26-7. Locations of PRSs 16-034(j), C-16-034(h), and C-16-011 in the Zia maintenance area. 5-26-12

Fig. 5-26-8. Sampling locations for SWMU 16-034(j), 16-034(h), and 16-011 in the Zia maintenance area. 5-26-21

Fig. 5-26-9. Sampling locations for SWMUs 16-024(a and u), decommissioned magazines at P-Site. 5-26-22

Fig. 5-26-10. Sampling locations for SWMU 16-024(t), decommissioned magazine near TA-16-460. 5-26-24

Fig. 5-26-11. Sampling locations for PRSs 16-025(d2) and C-16-060, decommissioned buildings near TA-16-340. 5-26-25

Fig. 5-26-12. Sampling locations for SWMUs 16-024(i and j), decommissioned magazines in the administration area. 5-26-26

Fig. 5-26-13. Sampling locations for SWMU 16-024(s) near TA-16-430. 5-26-27

Fig. 5-26-14. Sampling locations for SWMU 16-024(v) near TA-16-540. 5-26-28

Fig. 5-27-1. Possible location of decommissioned fuel tanks, SWMU 16-033(e). 5-27-2

Fig. 5-27-2. Possible location of C-16-073, a decommissioned fuel tank associated with building TA-16-200. 5-27-4

Fig. 5-27-3. UST decision logic flow chart. 5-27-6

Fig. 5-27-4. Geophysical survey location southwest of building TA-16-200. 5-27-7

Fig. 5-27-5. Geophysical survey location northwest of building TA-16-10. 5-27-9
Fig. 5-28-1. Location of SWMU 16-026(c2) near TA-16-462. 5-28-3
Fig. 5-28-2. Location of SWMU 16-030(a) at TA-16-344. 5-28-4
Fig. 5-28-3. Location of SWMU 16-026(r) at TA-16-180. 5-28-6
Fig. 5-28-4. Locations of SWMUs 16-026(u and b2) and 16-028(d) in the administration area. 5-28-7
Fig. 5-28-5. Location of SWMU 16-026(i) at TA-16-224 in the radiography area. 5-28-10
Fig. 5-28-6. Location of SWMU 16-026(j) at TA-16-226 in the radiography area. 5-28-11
Fig. 5-28-7. Location of SWMU 16-028(c) at TA-16-220 in the radiography area. 5-28-12
Fig. 5-28-8. Locations of SWMUs 16-028(b) and 16-031(a) near TA-16-370. 5-28-14
Fig. 5-28-9. Locations of PRSs 16-031(b) and C-16-002 associated with TA-16-262. 5-28-16
Fig. 5-28-10. Locations of SWMUs 16-026(k2) and 16-029(j) at TA-16-260. 5-28-18
Fig. 5-28-11. Sampling locations for SWMU 16-028(c), outfall at TA-16-220 in the radiography area. 5-28-29
Fig. 5-28-12. Sampling locations for SWMU 16-026(i), outfall at TA-16-224 in the radiography area. 5-28-31
Fig. 5-28-13. Sampling locations for SWMU 16-026(j), outfall at TA-16-226 in the radiography area. 5-28-32
Fig. 5-28-14. Sampling locations for SWMUs 16-028(b) and 16-031(a), outfalls near TA-16-370, the barium nitrate grinding facility. 5-28-33
Fig. 5-28-15. Sampling locations for PRSs 16-031(b) and C-16-002, outfalls associated with TA-16-262, a decommissioned cooling tower. 5-28-35
Fig. 5-28-16. Sampling locations for SWMUs 16-026(k2) and 16-029(j), outfalls at TA-16-260, an HE machining building. 5-28-36
Fig. 5-28-17. Sampling location for SWMU 16-026(r), outfall at TA-16-180, a fire station. 5-28-38
Fig. 5-28-18. Sampling locations for SWMUs 16-026(u and b2) and 16-028(d), outfalls in the administration area. 5-28-39
Fig. 5-28-19. Sampling locations for SWMU 16-026(c2), outfall near chemical storage building TA-16-462. 5-28-41
Fig. 5-28-20. Sampling locations for SWMU 16-030(a) outfall at TA-16-344. 5-28-42
Fig. 5-29-1. SWMUs 16-003(p) and 16-029(h) at TA-16-478. 5-29-2
Fig. 5-29-2. Likely trench pattern for SWMU 16-029(h). 5-29-12
Fig. 5-29-3. TA-16-478 outfall aggregate sampling decision flow. 5-29-15

Fig. 5-29-4. Sampling plan scenario one. 5-29-17
Fig. 5-29-5. Sampling plan scenario two. 5-29-18
Fig. 6-1. Borehole locations for sampling near TA-16-1465. 6-41

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

Chapter 1 (1993 and 1994)

- Statutory and Regulatory Background
- Installation Work Plan
- Description of OU 1082
- Organization of Work Plan

Addendum 2 (1995)

- Table 1-3B
- Table 1-4B
- Table 1-5B
- Table 1-6B

TABLE 1-3B
ADDENDUM 2 SWMU CROSS-REFERENCE LIST

OLD NUMBER (1988)	NEW NUMBER (1990)	CURRENT SWMU 1990 SWMU REPORT	INCLUDED IN THE PENDING PERMIT MODIFICATION
	16-003(p)	16-003(p)	no
	16-003(q)	16-003(q)	no
	16-016(d)	16-016(d)	yes
	16-016(e)	16-016(e)	yes
	16-016(f)	16-016(f)	no
	16-016(g)	16-016(g)	yes
16-022	16-022(a)	16-022(a)	no
	16-022(b)	16-022(b)	no
	16-024(a)	16-024(a)	no
	16-024(i)	16-024(i)	no
	16-024(j)	16-024(j)	no
	16-024(s)	16-024(s)	no
	16-024(t)	16-024(t)	no
	16-024(u)	16-024(u)	no
	16-024(v)	16-024(v)	no
	16-025(d2)	16-025(d2)	yes
	16-025(e)	16-025(e)	no
	16-025(e2)	16-025(e2)	yes
	16-025(f2)	16-025(f2)	yes
	16-025(h2)	16-025(h2)	yes
	16-026(a)	16-026(a)	yes
	16-026(a2)	16-026(a2)	yes
	16-026(b2)	16-026(b2)	yes
	16-026(c2)	16-026(c2)	yes
	16-026(d2)	16-026(d2)	yes
	16-026(e2)	16-026(e2)	yes
	16-026(f)	16-026(f)	yes
	16-026(f2)	16-026(f2)	yes
	16-026(g)	16-026(g)	yes
	16-026(g2)	16-026(g2)	yes
	16-026(h)	16-026(h)	yes

TABLE 1-3B (continued)
ADDENDUM 2 SWMU CROSS-REFERENCE LIST

OLD NUMBER (1988)	NEW NUMBER (1990)	CURRENT SWMU 1990 SWMU REPORT	INCLUDED IN THE PENDING PERMIT MODIFICATION
	16-026(i)	16-026(i)	yes
	16-026(j)	16-026(j)	yes
	16-026(k)	16-026(k)	yes
	16-026(k2)	16-026(k2)	yes
	16-026(l)	16-026(l)	yes
	16-026(r)	16-026(r)	yes
	16-026(t)	16-026(t)	yes
	16-026(u)	16-026(u)	yes
	16-026(x)	16-026(x)	yes
	16-026(y)	16-026(y)	yes
	16-026(z)	16-026(z)	yes
	16-027(a)	16-027(a)	no
	16-027(b)	16-027(b)	no
	16-027(c)	16-027(c)	no
	16-027(d)	16-027(d)	no
	16-028(b)	16-028(b)	yes
	16-028(c)	16-028(c)	yes
	16-028(d)	16-028(d)	yes
	16-028(e)	16-028(e)	yes
	16-029(h)	16-029(h)	yes
	16-029(i)	16-029(i)	yes
	16-029(j)	16-029(j)	yes
	16-030(a)	16-030(a)	yes
	16-030(b)	16-030(b)	yes
	16-030(c)	16-030(c)	yes
	16-030(e)	16-030(e)	yes
	16-030(f)	16-030(f)	yes
	16-031(a)	16-031(a)	yes
	16-031(b)	16-031(b)	yes
	16-031(e)	16-031(e)	yes
	16-031(f)	16-031(f)	yes

TABLE 1-3B (continued)
ADDENDUM 2 SWMU CROSS-REFERENCE LIST

OLD NUMBER (1988)	NEW NUMBER (1990)	CURRENT SWMU 1990 SWMU REPORT	INCLUDED IN THE PENDING PERMIT MODIFICATION
	16-031(h)	16-031(h)	yes
	16-033(a)	16-033(a)	yes
	16-033(b)	16-033(b)	yes
	16-033(c)	16-033(c)	no
	16-033(d)	16-033(d)	no
	16-033(e)	16-033(e)	no
	16-033(f)	16-033(f)	no
	16-033(g)	16-033(g)	no
	16-033(h)	16-033(h)	no
	16-033(i)	16-033(i)	no
	16-033(j)	16-033(j)	no
	16-034(h)	16-034(h)	yes
	16-034(i)	16-034(i)	yes
	16-034(j)	16-034(j)	yes
	16-034(k)	16-034(k)	yes
	16-037	16-037	no
	C-16-001	C-16-001	yes
	C-16-002	C-16-002	no
	C-16-008	C-16-008	no
	C-16-009,	C-16-009,	no
	C-16-010	C-16-010	no
	C-16-011	C-16-011	no
	C-16-012	C-16-012	no
	C-16-013	C-16-013	no
	C-16-014	C-16-014	no
	C-16-015	C-16-015	no
	C-16-016	C-16-016	no
	C-16-018	C-16-018	no
	C-16-019	C-16-019	no
	C-16-020	C-16-020	no

TABLE 1-3B (continued)
ADDENDUM 2 SWMU CROSS-REFERENCE LIST

OLD NUMBER (1988)	NEW NUMBER (1990)	CURRENT SWMU 1990 SWMU REPORT	INCLUDED IN THE PENDING PERMIT MODIFICATION
	C-16-034	C-16-034	no
	C-16-035	C-16-035	no
	C-16-036	C-16-036	no
	C-16-041	C-16-041	no
	C-16-044	C-16-044	no
	C-16-046	C-16-046	no
	C-16-047	C-16-047	no
	C-16-049	C-16-049	no
	C-16-050	C-16-050	no
	C-16-051	C-16-051	no
	C-16-058	C-16-058	no
	C-16-060	C-16-060	no
	C-16-061	C-16-061	no
	C-16-062	C-16-062	no
	C-16-063	C-16-063	no
	C-16-070	C-16-070	no
	C-16-072	C-16-072	no
	C-16-073	C-16-073	no

TABLE 1-4B

PRSs, PRS AGGREGATES, AND LOCATION IN CHAPTER 5

PRS, DESCRIPTION	PRS AGGREGATE	SUB-SECTION
16-024(a,i,j,s,t,u,v), soil contamination from decommissioned magazines 16-025(d2), soil contamination at decommissioned HE facilities 16-034(h,j), soil contamination at miscellaneous buildings C-16-011, decommissioned paint shop C-16-060, decommissioned storage	Surface contamination	5.26
16-033(e), decommissioned fuel tanks C-16-073, underground fuel tank	Underground storage tanks	5.27
16-026(i,j,r,u,b2,c2,k2), inactive outfalls from building drains 16-028(b,c,d), active outfalls from cooling towers and tanks 16-029(j), inactive HE sumps 16-030(a), active outfalls from building drains 16-031(a,b), inactive outfalls: cooling towers/industrial lines C-16-002, cooling tower rubble	Outfalls	5.28
16-029(h), inactive HE sump 16-003(p), active HE sump	TA-16-478	5.29

TABLE 1-5B
PRSs RECOMMENDED FOR NO CURRENT RCRA FACILITY INVESTIGATION IN ADDENDUM 2

PRS AGGREGATE(S), DESCRIPTION(S)	SUBSECTION
16-028(e), outfall	6.6.1.1
16-029(i), active sump	6.6.1.1
16-016(d), surface disposal	6.6.1.2
16-016(e), surface disposal	6.6.1.2
16-016(g), surface disposal	6.6.1.2
16-026(a), outfalls	6.6.1.3
16-026(l), outfalls	6.6.1.3
16-026(t), outfall	6.6.1.3
16-026(z), outfall	6.6.1.3
16-030(c), outfall	6.6.1.3
16-026(a2), outfall	6.6.1.4
16-026(y), outfall	6.6.1.5
16-031(h), outfall	6.6.1.6
16-031(e), active outfall cooling tower	6.6.1.7
16-031(f), inactive outfall cooling tower	6.6.1.7
16-026(d2), outfall	6.6.2.1
16-026(e2), outfall	6.6.2.1
16-026(f2), outfall	6.6.2.1
16-026(g2), outfall	6.6.2.1
16-026(h), outfall	6.6.2.1
16-026(k), outfall	6.6.2.1
16-026(x), outfall	6.6.2.1
16-030(b), outfall	6.6.2.1
16-030(e), outfall	6.6.2.1
16-030(f), outfall	6.6.2.1
16-026(f), outfalls	6.6.2.2
16-026(g), outfall	6.6.2.3
16-034(i), soil contamination at decommissioned HE facility	6.6.2.4
16-034(k), soil contamination at decommissioned HE facility	6.6.2.4
16-025(e2), soil contamination at decommissioned storage building	6.6.3.1
16-025(f2), soil contamination at decommissioned storage building	6.6.3.1

TABLE 1-5B (continued)
PRSs RECOMMENDED FOR NO CURRENT RCRA FACILITY INVESTIGATION IN ADDENDUM 2

PRS AGGREGATE(S), DESCRIPTION(S)	SUBSECTION
16-025(h2), soil contamination at decommissioned storage building	6.6.3.1
C-16-072, fuel tank	6.7.1.1
16-003(q), active HE sump	6.7.1.2
C-16-071, hydraulic oil spill	6.7.1.2
C-16-049, decommissioned office and shop	6.7.1.3
C-16-062, decommissioned electrical manhole	6.7.1.4
C-16-063, decommissioned electrical manhole	6.7.1.4
C-16-018, decommissioned water storage tank	6.7.1.5
C-16-020, decommissioned office building	6.7.1.6
C-16-034, decommissioned water tank	6.7.1.7
C-16-035, decommissioned water tank	6.7.1.7
C-16-061, decommissioned latrine	6.7.1.8
C-16-041, decommissioned hose house	6.7.1.9
C-16-044, decommissioned steam manhole	6.7.1.10
C-16-046, decommissioned steam manhole	6.7.1.10
C-16-050, decommissioned storage building	6.7.1.11
16-037, industrial waste tank	6.7.1.12
C-16-001, crossover platform	6.7.1.13
16-033(c), decommissioned aboveground fuel tank	6.7.2.1
16-033(d), decommissioned aboveground fuel tank	6.7.2.1
C-16-008, implement shed	6.7.2.2
C-16-009, mess hall	6.7.2.2
C-16-010, storage building	6.7.2.2
C-16-012, decommissioned blacksmith shop	6.7.2.2
C-16-013, decommissioned lumber storage area	6.7.2.2
C-16-014, decommissioned equipment room	6.7.2.2
C-16-015, decommissioned hose house	6.7.2.2
C-16-016, decommissioned fire house	6.7.2.2
C-16-036, decommissioned latrine	6.7.2.2
C-16-047, decommissioned oil switch	6.7.2.3
C-16-051, decommissioned oil switch	6.7.2.3

TABLE 1-5B (continued)
PRSs RECOMMENDED FOR NO CURRENT RCRA FACILITY INVESTIGATION IN ADDENDUM 2

PRS AGGREGATE(S), DESCRIPTION(S)	SUBSECTION
C-16-058, decommissioned oil switch	6.7.2.3
16-027(d), transformer	6.7.2.4
C-16-019, decommissioned pump house	6.7.2.5
C-16-070, underground fuel tank	6.7.2.6
16-022(a), soil contamination	6.7.3.1
16-022(b), underground storage tank	6.7.3.2
16-033(a), underground storage tank	6.7.3.2
16-033(b), underground storage tank	6.7.3.2
16-033(f), underground storage tank	6.7.3.2
16-033(g), underground storage tank	6.7.3.2
16-033(h), underground storage tank	6.7.3.2
16-033(i), underground storage tank	6.7.3.2
16-033(j), underground storage tank	6.7.3.2
16-027(a), transformer	6.7.4.1
16-027(b), transformer	6.7.4.1
16-027(c), transformer	6.7.4.1
16-021(b), operational release	6.7.4.2
16-016(f), surface disposal area	6.8.1.1

TABLE 1-6B
SWMUs PROPOSED FOR DELETION FROM TABLE C OF THE HSWA MODULE

SWMU, DESCRIPTION	SUBSECTION
16-028(e), outfall; and 16-029(i), active sump	6.6.1.1
16-016(d,e,g), surface disposal	6.6.1.2
16-026(a,l,t,z) and 16-030(c), outfalls	6.6.1.3
16-026(a2), outfall	6.6.1.4
16-026(y), outfall	6.6.1.5
16-031(h), outfall	6.6.1.6
16-031(e,f), cooling tower outfalls	6.6.1.7
16-026(d2,e2,f2,g2,h,k,x) and 16-030(b,e,f), outfalls	6.6.2.1
16-026(f), outfall	6.6.2.2
16-026(g), outfall	6.6.2.3
16-034(i,k), soil contamination at decommissioned HE facilities	6.6.2.4
16-025(e2,f2,h2), soil contamination at decommissioned storage buildings	6.6.3.1

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

Chapter 4 (1993 and 1994)

- Aggregation of PRSs
- Approaches to Site Characterization
- Conceptual Exposure Models
- Potential Response Actions
- Sampling Strategies and Sampling Methods
- Field Surveys
- Analytical Methods
- Quality Assessment
- Record Keeping

Addendum 2 (1995)

- Table 4-1B
- Table 4-6B

TABLE 4-1B

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30*

CHEMICALS OF POTENTIAL CONCERN (1)	PRS AGGREGATE (2)	LAB METH. (3)	LAB PQL (WATER/ SOIL) (ug/L/ppm) (4)	MOBILE LAB METH.	MOBILE LAB PQL IN SOIL (5)	FIELD SCREEN METH.	FIELD SCREEN PQL IN SOIL (ppm) (6)	LANL BACK-GROUND IN SOIL (ppm) (7)	SAL IN WATER (ug/L) (8)	SAL IN SOIL (ppm) (8)
Acetone	5.28	8240	100/100 ppb	GC/PID	50 ppb	PID	0.2	0	3 500	8 000
1-Acetylhexahydro-3,5-dinitro-1,3,5-triazine (e)										
1-Acetyloctahydro-3,5,7-trinitro-1,3,5,7 tetra-zocine (e)										
ADNT (g)								0		
Amines (a)								0		
2-Amino-4,6-DNT (a)								0		
4-Amino-2,6-DNT (a)								0		
Ammonium nitrate (d)								0		
Anthranils (i.e., 2,6 dinitroanthranil) (e)								0		
Barium	5.26, 5.28, 5.29, 5.30	6010	2.0/0.2	XRF	10 ppm	LIBS	<100	125-829	2 000	5 600
BDNPA (d)								0		
BDNPF (d)								0		
Benzene	5.27, 5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	5	0.67
Beryllium	5.29	6010	0.3/0.03			LIBS	0.1	1.0-4.4	4	0.16

TABLE 4-1B (continued)

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30

CHEMICALS OF POTENTIAL CONCERN (1)	PRS AGGREGATE (2)	LAB METH. (3)	LAB PQL (WATER/ SOIL) (ug/L/ppm) (4)	MOBILE LAB METH.	MOBILE LAB PQL IN SOIL (5)	FIELD SCREEN METH.	FIELD SCREEN PQL IN SOIL (ppm) (6)	LANL BACK-GROUND IN SOIL (ppm) (7)	SAL IN WATER (ug/L) (8)	SAL IN SOIL (ppm) (8)
BTX (f)								0		
Butyl acetate	5.28							0		
Cadmium	5.28	6010	4.0/0.4	XRF	2 ppm			1.2-1.7	5	80
Carbon tetrachloride	5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	5	0.21
Chlorobenzene	5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	100	67
Chloroform	5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	100	0.21
Chromium	5.28	6010	7.0/0.7	XRF	8 ppm	LIBS	2	2.03-71.07	100	400 (VI)
Copper	5.28	6010	6.0/0.6	XRF	3 ppm			2-18	1 300	3 000
Cyanuric acid (c)								0		
DATB (c)								0		
Decyclgallophenone (f)								0		
1,2-Dichloroethane	5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	5	0.2
Di(2-ethyl) sebacate (f)								0		
Di-n-butyl phthalate	5.28	8330							3 500	8 000
Dimethylformamide	5.28	8330						0	3 500	8 000
3,5-Dinitrocresol (e,f)										
Dinitroethylbenzene (f)								0		
Dinitroglycoluril (e)								0		
3,5-Dinitrophenol (d)								0		
Dipentaerythritol hexanitrate (e)								0		
1,3-DNB (a)	5.26, 5.28, 5.29, 5.30	8330	4.0/0.25					0	3.5	8

TABLE 4-1B (continued)

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30

CHEMICALS OF POTENTIAL CONCERN (1)	PRS AGGREGATE (2)	LAB METH. (3)	LAB PQL (WATER/ SOIL) (ug/L/ppm) (4)	MOBILE LAB METH.	MOBILE LAB PQL IN SOIL (5)	FIELD SCREEN METH.	FIELD SCREEN PQL IN SOIL (ppm) (6)	LANL BACK-GROUND IN SOIL (ppm) (7)	SAL IN WATER (ug/L) (8)	SAL IN SOIL (ppm) (8)
2,4-DNT (e,f)	5.26, 5.28, 5.29, 5.30	8330	5.7/0.25	GC/FID	1 ppm			0	0.5	1
2,6-DNT (a)	5.26, 5.28, 5.29, 5.30	8330	9.4/0.26	GC/FID	1 ppm			0	0.05	1
EDD (d)								0		
Ethyl acetate	5.28	8330						0	32 000	72 000
Ethylbenzene	5.27, 5.28	8240	5/5ppb					0	700	3 100
Formaldehyde (a)								0		
Hexane	5.28	8240						0	2 100	4 800
HMX	5.28, 5.29, 5.30	8330	13.0/2.2			HE spot	100	0	1 800	4 000
Hydrazines (e)								0		
Lead	5.27, 5.28	6010	42.0/4.2	XRF	10 ppm	LIBS	2	18–56	50	500
MAN (e)		8270						0		
Mercury	5.26	7470		XRF	30 ppm			0.007-0.029	2	24
Methanol (a)	5.28	8240						0	18 000	40 000
2-Methylaniline (e)								0		
Methyl ethyl ketone	5.28	8240	100/ 100 ppb	GC/PID	50 ppb	PID	0.2	0	1 700	4 000
Methylene chloride	5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	5	5.6

TABLE 4-1B (continued)

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30

CHEMICALS OF POTENTIAL CONCERN (1)	PRS AGGREGATE (2)	LAB METH. (3)	LAB PQL (WATER/ SOIL) (ug/L/ppm) (4)	MOBILE LAB METH.	MOBILE LAB PQL IN SOIL (5)	FIELD SCREEN METH.	FIELD SCREEN PQL IN SOIL (ppm) (6)	LANL BACK-GROUND IN SOIL (ppm) (7)	SAL IN WATER (ug/L) (8)	SAL IN SOIL (ppm) (8)
Methylnitramine (a)								0		
N-methylpicramide (a)								0		
Naphthalene	5.28	8330						0	1 400	3 200
Nickel	5.28	6010	15.0/1.5	XRF	4 ppm			1.6-19	100	1 600
Nitrate (a,f)	5.28	9200	1 mg/L / 1 ppm					0	10 000	130 000
Nitriles (i.e., 2,4,6 trinitrobenzonitrile) (a)								0		
Nitrite (a)			0.02 mg/L/NA					0	1 000	8 000
2-Nitro-4-amino toluene (e,f)								0		
3-Nitroaniline (e)								0		
Nitrobenzene (d)	5.28	8330	NA/0.26					0	18	5.3
Nitrocellulose (c)						HE spot	100	0		
2 Nitro-m-cresol (e,f)								0		
Nitroguanadine (c)								0		
Nitromethane (c)								0		

TABLE 4-1B (continued)

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30

CHEMICALS OF POTENTIAL CONCERN (1)	PRS AGGREGATE (2)	LAB METH. (3)	LAB PQL (WATER/ SOIL) (ug/L/ppm) (4)	MOBILE LAB METH.	MOBILE LAB PQL IN SOIL (5)	FIELD SCREEN METH.	FIELD SCREEN PQL IN SOIL (ppm) (6)	LANL BACK-GROUND IN SOIL (ppm) (7)	SAL IN WATER (ug/L) (8)	SAL IN SOIL (ppm) (8)
2-NT (a)		8330	12.0/0.25					0	350	800
3-NT (a)		8330	7.9/0.25					0	350	800
4-NT (a)		8330	8.5/0.25					0	350	800
NTO (e)								0		
PAHs (h)	5.28, 5.30							0		
Pentaerythritol	5.28							0		
PETN (c)						HE spot	100	0	700	1 600
Picric acid (e)								0		
Polonium-210	5.29							—		
PYX (e)								0		
RDX (a)	5.26, 5.28, 5.29, 5.30	8330	14.0/1.0			HE spot	100	0	3.2	64
TAGN (f)								0		
TATB (c)	5.29					HE spot	100	0		
TCP (f)								0		
1,1,2,2-Tetrachloroethane	5.28	8240	5/5ppb	GC/PID		PID		0	1.8	3.9
Tetrachloroethene	5.28	8240		GC/PID		PID		0	5	5.9

TABLE 4-1B (continued)

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30

CHEMICALS OF POTENTIAL CONCERN (1)	PRS AGGREGATE (2)	LAB METH. (3)	LAB PQL (WATER/ SOIL) (ug/L/ppm) (4)	MOBILE LAB METH.	MOBILE LAB PQL IN SOIL (5)	FIELD SCREEN METH.	FIELD SCREEN PQL IN SOIL (ppm) (6)	LANL BACK-GROUND IN SOIL (ppm) (7)	SAL IN WATER (ug/L) (8)	SAL IN SOIL (ppm) (8)
Tetryl (d)		8330	44.0/0.65					0	350	800
1,3,5-TNB (a)	5.26, 5.28, 5.29, 5.30	8330	7.3/0.25					0	1.8	4
2,4,6-TNT	5.26, 5.28, 5.29, 5.30	8330	6.9/0.25			HE spot	100	0	12	40
Toluene	5.27, 5.28	8240	5/5 ppb	GC/PID	10 ppb	PID	0.2	0	1 000	890
Toluene diisocyanate	5.28							0		
Total petroleum hydrocarbons (TPH)	5.27, 5.28					immuno-assay		0		100
1,1,1-Trichloroethane	5.28	8240	5/5 ppb	GC/PID	10 ppm	PID	0.2	0	200	1 000
Trichloroethene	5.28	8240	5/5 ppb					0	5	3.2
Trinitroethylbenzene (f)								0		
Trinitrostilbene (f)								0		
Tripentaerythritol acetonitrate (a)								0		
Tripicrylmelamine (e)								0		
Uranium (natural)	5.29			XRF	10 ppm			1.54-6.73	NA	66 pCi/g
Uranium-238	5.26, 5.29	a spec	0.2 pCi/L / 0.05 pCi/g	Gross a/b	25 pCi/g	Phoswich	35 pCi/g	—	6.7 pCi/L	59 pCi/g
Xylene	5.27, 5.28	8240	5/5 ppb	GC/PID		PID		0	10 000	160 000
Zinc	5.28	6010	2.0/0.2	XRF	34 ppm			38-71	10 000	24 000

TABLE 4-1B (continued)

CHEMICALS OF POTENTIAL CONCERN AT OU 1082 FOR AGGREGATES 5.26 THROUGH 5.30

* Aggregate 5.30 is PRSs deleted from Chapter 6 of the 1993 Work Plan based on EPA Review, submitted to EPA October 16, 1994.
Additional entries will be made in this table as they become available.
Note: All MDLs are extremely case-specific because of varying sample matrices and geometries and count times.

NA Not available
(1) Potential contaminants of concern (PCOCs) or chemicals of potential concern (COPCs) in Addendum 2 include all chemicals specifically listed in Chapter 5, potentially hazardous HE components (see Appendix D), and HE co-contaminants (see Appendix D).
(2) Potential release sites in which the PCOC is of concern based on archival research.
(3) SW-846 method unless otherwise indicated.
(4) Method detection limits for EPA methods are taken directly from those listed in the appropriate SW-846 method or from the QAPjP. ICP metals detection limits in soils estimated as 100x water MDLs.
(5) Estimated by CST-9.
(6) Beryllium, lead, and chromium from Han and Cremers 1990 (15-16-470). PID from manufacturers' specifications. Uranium and plutonium equal ESH-4 estimate. TNT from Baytos 1991, 0741. HMX, RDX, TATB, and PETN estimated by ESA-12.
(7) Copper, mercury, nickel, and zinc are from Ferenbaugh et al. 1990, 0099; radionuclides from Purtymun et al. 1987, 0211; and other metals from Duffy and Longmire 1993, 15-16-480.
(8) SALs are based on methodology presented in Subsection 4.2.2 and Appendix J of the IWP (LANL 1993, 1017).
(a) HE component used at TA-16 (est. > 500 000 lbs.; all estimated for 50-year time frame 1944-1993 by L. Hatler of WX-3).
(b) HE component used at TA-16 (est. 10 000 to 100 000 lbs).
(c) HE component used at TA-16 (est. 1 000 to 10 000 lbs).
(d) HE burn product.
(e) HE impurity or environmental breakdown product. These are COPCs at all PRSs in which HE is a COPC.
(f) For these compounds other isomers are also COPCs.

Abbreviations
ADNT - 3,5-dinitiro-1,2,4-triazole
BDNPA - Bis(dinitroproponyl) acetal
BDNPF - Bis(dinitroproponyl) formal
BTX - 5,7-Dinitro-1-picrylbenzotriazole
DNB - Dinitrobenzene
DNPA - 2,2-Dinitropropyl acrylate polymer
DNT - Dinitrotoluene
EDD - Ethylenediamine dinitrate
HMX - Cyclotetramethylenetetranitramine
NT - Nitrotoluene
NTO - 1,2,4-Nitro-triazole-5-one
PCB - polychlorinated biphenyl
PETN - Pentaerythritol tetranitrate
PYX - 2,6-Bis(picylamino)-3,5-dinitropyridine
TAGN - Triaminoguanidine nitrate
TATB - Triaminoguanidine nitrate
TCP - Tricresylphosphate
TNB - Trinitrobenzene
TNT - Trinitrotoluene

TABLE 4-6B

POTENTIAL RESPONSE ACTIONS FOR EACH PRS AGGREGATE[a]

SUB-SECTION	DESCRIPTION	NO FURTHER ACTION OR DEFERRED ACTION	REMOVAL/ TREATMENT		MIXED WASTE	INCIN-ERATION/ REMOVAL	DECON/ REMOVAL	CONDI-TIONAL CAP/ MONITOR	IN-STREAM BARRIERS	ACCESS RESTRIC-TION	*IN SITU* BIOREME-DIATION
			HAZ-ARDOUS ONLY	RADIO-ACTIVE ONLY							
5.26	Surface contamination	x	x		x		x				
5.27	Underground storage tanks	x	x				x				
5.28	Outfalls	x	x				x				
5.29	TA-16-478	x	x		x	x	x				
5.30[b]	PRSs deleted from Chapter 6		x			x	x				

[a] Note that this table is not meant to be all-inclusive.

[b] Subsection 5.30 is PRSs deleted from Chapter 6 of the 1993 Work Plan based on EPA Review, submitted to EPA October 16, 1994.

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

Chapter 5

RFI Work Plan (1993)

- Blowdown Tanks and Dry Wells
- HE Sumps and Outfalls
- HE Sumps and Active Outfall at TA-16-260
- TA-11 and TA-16 Septic Systems
- Materials Testing Laboratory
- Photoprocessing Facility
- Sanitary Waste Treatment Plant
- Active/Inactive Burn and Treatment Areas
- Cañon de Valle
- MDA R
- Surface Waste Disposal Areas
- Waste Water Ponds
- TA-13, P-Site
- TA-11, Firing Site
- TA-11, Outfalls
- TA-11, Potential Surface Contamination
- Decommissioned Waste Storage Area

Addendum 1 (1994)

- GMX-3—With Sumps
- GMX-3—Without Sumps
- GMX-2 Area
- World War II Administration Area
- Septic Systems
- 90s-Line
- TA-24, T-Site
- TA-25, V-Site

Addendum 2 (1995)

- Surface Contamination
- Underground Storage Tanks
- Outfalls
- TA-16-478

5.0 EVALUATION OF POTENTIAL RELEASE SITE AGGREGATES

Chapter 5 describes the history, data quality objectives, and sampling plans for the Operable Unit (OU) 1082 potential release sites (PRSs) for which sampling is deemed appropriate at this time. The solid waste management units (SWMUs) that are covered ~~here~~ in aggregates 5.1 through 5.17 are from Tables A and B of the Hazardous and Solid Waste Amendments (HSWA) Module and other PRSs that fit systematically into this work plan activity. The remaining OU 1082 PRSs ~~will be~~ are addressed in subsequent Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan addenda. Subsections 5.18 through 5.25 are in Chapter 5 of Addendum 1 (LANL 1994, 1160). Subsections 5.26 through 5.29 are in Chapter 5 of Addendum 2. Subsection 5.30 is part of a response to the Notice of Deficiency on the RFI Work Plan for OU 1082 (LANL 1993, 1094).

The framework for sample collection strategies and use of data as applied in Chapter 5 is found in Chapter 4, Subsections 4.5.1.1 and 4.5.1.2. Annex II, Quality Assurance Project Plan, describes the quality control issues pertinent to this work plan. Occupational Safety and Health Administration (OSHA) requirements for current site workers are the responsibility of the operating groups and are not addressed in this work plan. Site-specific information on potential release sources, chemicals of concern, migration pathways, and potential receptors is included in each aggregate. Current human receptors are limited to on-site workers. Future receptors could include recreational users. Chapter 4 of the RFI Work Plan for OU 1082 and Addendum 1 contain a detailed discussion of the migration pathways, conversion mechanisms, human receptors, and exposure routes.

5.0.1 Index to PRSs Described in Chapter 5

The OU 1082 RFI work plan describes potential release site (PRS) histories, ~~potential contaminants of concern (PCOCs),~~ chemicals of potential concern (COPCs), data quality objectives (DQOs), and sampling plans for a large number of PRSs (87 in 1993, ~~and~~ 164 in 1994, and 31 in 1995). In order to locate information for individual PRSs, an index table (Table 5-0-1) and index maps [Figs. 5-0-1(a), 5-0-1(b), ~~and~~ 5-0-2, and 5-0-3] for all PRSs and PRS sampling maps in the work plan, ~~and~~ Addendum 1, and Addendum 2 are provided below. ~~PRSs not listed in this table either will be described in~~

TABLE 5-0-1

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
11-001(a)	14/DA	5.14.1.1	5-245	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-001(b)	14/DA	5.14.1.1	5-245	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-001(c)	16	5.16.1.1	5-274	5-73	5-272	5-75	5-279	5.16.4.2	5-280
11-002	14/DA	5.14.1.1	5-248	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-003(a)	NFA	6.2.3.1	6-24	NA	NA	NA	NA	NA	NA
11-003(b)	14/DA	5.14.1.1	5-246	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-004(a)	14/DA	5.14.1.1	5-247	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-004(b)	14/DA	5.14.1.1	5-247	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-004(c)	14/DA	5.14.1.1	5-247	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-004(d)	14/DA	5.14.1.1	5-247	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-004(e)	14/DA	5.14.1.1	5-247	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-004(f)	14/DA	5.14.1.1	5-247	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-005(a)	4	5.4.1.1	5-97	5-28	5-102	5-30	5-108	5.4.4.3	5-110
11-005(b)	4	5.4.1.1	5-98	5-28	5-102	5-30	5-108	5.4.4.3	5-110
11-005(c)	15	5.15.1.1	5-260	5-70	5-261	5-72	5-267	5.15.4.2	5-268
11-006(a)	14/DA	5.14.1.1	5-248	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-006(b)	14/DA	5.14.1.1	5-248	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-006(c)	14/DA	5.14.1.1	5-248	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-006(d)	14/DA	5.14.1.1	5-248	5-67	5-244	5-69	5-257	5.14.4.2	5-258
11-007	NFA	6.1.5.1	6-13	NA	NA	NA	NA	NA	NA
11-008	NFA	6.2.3.2	6-25	NA	NA	NA	NA	NA	NA
11-009	NFA	6.1.5.2	6-14	NA	NA	NA	NA	NA	NA
11-010(a)	NFA	6.1.5.7	6-22	NA	NA	NA	NA	NA	NA
11-010(b)	DA	6.2.1.1	6-22	NA	NA	NA	NA	NA	NA
11-011(a)	15	5.15.1.1	5-260	5-70	5-261	5-72	5-267	5.15.4.2	5-268
11-011(b)	15	5.15.1.1	5-263	5-70	5-261	5-72	5-267	5.15.4.2	5-268
11-011(c)	DA	6.2.1.2	6-23	NA	NA	NA	NA	NA	NA
11-011(d)	15	5.15.1.1	5-263	5-70	5-261	5-72	5-267	5.15.4.2	5-268
11-012(a)	16	5.16.1.1	5-271	5-73	5-272	5-75	5-279	5.16.4.2	5-280
11-012(b)	16	5.16.1.1	5-271	5-73	5-272	5-75	5-279	5.16.4.2	5-280
11-012(c)	16	5.16.1.1	5-271	5-73	5-272	5-75	5-279	5.16.4.2	5-280
11-012(d)	16	5.16.1.1	5-271	5-73	5-272	5-75	5-279	5.16.4.2	5-280
13-001	13	5.13.1.1	5-226	5-64	5-227	5-66	5-236	5.13.4.3	5-239
13-002	13	5.13.1.1	5-226	5-64	5-227	5-66	5-236	5.13.4.3	5-239
13-003(a)	4	5.4.1.1	5-98	5-28	5-102	5-30	5-108	5.4.4.3	5-109
13-003(b)	4	5.4.1.1	5-98	5-28	5-102	5-30	5-108	5.4.4.3	5-109
13-004	13	5.13.1.1	5-226	5-64	5-227	5-66	5-236	5.13.4.3	5-240
16-001(a)	1	5.1.1.1	5-4	5-1	5-2	5-3	5-12	5.1.4.3	5-13
16-001(b)	1	5.1.1.1	5-4	5-1	5-2	5-3	5-12	5.1.4.3	5-13
16-001(c)	1	5.1.1.1	5-4	5-1	5-2	5-3	5-12	5.1.4.3	5-13
16-001(d)	1	5.1.1.1	5-4	5-1	5-2	5-3	5-12	5.1.4.3	5-13
16-001(e)	2	5.2.1.1	5-26	5-7	5-40	5-20	5-65	5.2.4.2	5-80
16-003(a)	2	5.2.1.1	5-19	5-7	5-40	5-20	5-65	5.2.4.2	5-80
16-003(b)	2	5.2.1.1	5-20	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(c)	2	5.2.1.1	5-32	5-7.	5-40	5-20	5-66	5.2.4.2	5-79
16-003(d)	2	5.2.1.1	5-24	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(e)	2	5.2.1.1	5-25	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(f)	2	5.2.1.1	5-25	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(g)	2	5.2.1.1	5-26	5-7	5-40	5-20	5-65	5.2.4.2	5-79

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-003(h)	2	5.2.1.1	5-28	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(i)	2	5.2.1.1	5-31	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(j)	2	5.2.1.1	5-31	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-003(k)	3	5.3.1.1	5-81	5-21	5-82	5-27	5-93	5.3.4.2	5-94
16-003(l)	2	5.2.1.1	5-31	5-7	5-40	5-20	5-65	5.2.4.2	5-72
16-003(m)	2	5.2.1.1	5-32	5-7	5-40	5-20	5-65	5.2.4.2	5-73
16-003(n)	2	5.2.1.1	5-35	5-7	5-40	5-20	5-66	5.2.4.2	5-79
16-003(o)	2	5.2.1.1	5-37	5-7	5-40	5-20	5-66	5.2.4.2	5-79
16-003(p)	29	5.29.1.1	5-29-1	NA	NA	5-29-3	5-29-11	5.29.3.2	5-29-13
16-003(q)	NFA	6.7.1.2	6-20	NA	NA	NA	NA	NA	NA
16-004(a)	7	5.7.1.1	5-133	5-38	5-136	5-42	5-144	5.7.4.2	5-145
16-004(b)	7	5.7.1.1	5-133	5-38	5-136	5-42	5-144	5.7.4.2	5-145
16-004(c)	7	5.7.1.1	5-133	5-38	5-136	5-42	5-144	5.7.4.2	5-145
16-004(d)	7	5.7.1.1	5-133	5-38	5-136	5-42	5-144	5.7.4.2	5-145
16-004(e)	7	5.7.1.1	5-133	5-38	5-136	5-42	5-144	5.7.4.2	5-145
16-004(f)	7	5.7.1.1	5-133	5-38	5-136	5-42	5-144	5.7.4.2	5-145
16-005(a)	22	5.22.1.1	5-139	5-110	5-445	5-114	5-451	5.22.4.2	5-452
16-005(b)	NFA	6.4.3.1	6-36	NA	NA	NA	NA	NA	NA
16-005(c)	18	5.18.1.1	5-313	5-80	5-325	5-87	5-339	5.18.4.2	5-346
16-005(d)	18	5.18.1.1	5-313	5-80	5-325	5-87	5-339	5.18.4.2	5-346
16-005(e)	20	5.20.1.1	5-387	5-95	5-398	5-102	5-409	5.20.4.2	5-418
16-005(f)	NFA	6.4.3.4	6-39	NA	NA	NA	NA	NA	NA
16-005(g)	30	5.30.1.1	5-30-1	5-30-2	5-30-6	5-30-4	5-30-8	5.30.4.2	5-30-7
16-005(h)	22	5.22.1.1	5-442	5-110	5-445	5-114	5-451	5.22.4.2	5-456
16-005(i)	NFA	6.4.2.5	6-35	NA	NA	NA	NA	NA	NA
16-005(j)	24	5.24.1.1	5-481	5-124	5-486	5-128	5-493	5.24.4.2	5-497
16-005(k)	22	5.22.1.1	5-442	5-110	5-445	5-114	5-451	5.22.4.2	5-456
16-005(l)	22	5.22.1.1	5-444	5-110	5-445	5-114	5-451	5.22.4.2	5-456
16-005(m)	24	5.24.1.1	5-481	5-124	5-486	5-128	5-493	5.24.4.2	5-498
16-005(n)	30	5.30.1.1	5-30-3	5-30-2	5-30-6	5-30-4	5-30-8	5.30.4.2	5-30-11
16-005(o)	NFA	6.1.5.4	6-17	NA	NA	NA	NA	NA	NA
16-006(a)	4	5.4.1.1	5-99	5-28	5-102	5-30	5-108	5.4.4.3	5-109
16-006(b)	NFA	6.1.5.5	6-18	NA	NA	NA	NA	NA	NA
16-006(c)	4	5.4.1.1	5-99	5-28	5-102	5-30	5-108	5.4.4.3	5-110
16-006(d)	4	5.4.1.1	5-100	5-28	5-102	5-30	5-108	5.4.4.3	5-110
16-006(e)	4	5.4.1.1	5-100	5-28	5-102	5-30	5-108	5.4.4.3	5-110
16-006(f)	NFA	6.1.5.6	6-18	NA	NA	NA	NA	NA	NA
16-006(g)	25	5.25.1.1	5-503	5-131	5-512	5-134	5-515	5.25.4.2	5-519
16-006(h)	DA	6.4.1.1	6-31	NA	NA	NA	NA	NA	NA
16-006(i)	NFA	6.4.2.1	6-33	NA	NA	NA	NA	NA	NA
16-007(a)	12	5.12.1.1	5-214	5-59	5-215	5-63	5-223	5.12.4.2	5-222
16-007(b)	NFA	6.2.2.1	6-23	NA	NA	NA	NA	NA	NA
16-008(a)	12	5.12.1.1	5-214	5-59	5-217	5-63	5-223	5.12.4.2	5-224
16-008(b)	NFA	6.1.2.1	6-6	NA	NA	NA	NA	NA	NA
16-009	11	5.11.1.1	5-200	5-56	5-203	5-58	5-209	5.11.4.3	5-210
16-010(a)	8	5.8.1.1	5-152	5-44	5-155	5-46	5-166	5.8.4.2	5-167
16-010(b)	DA	6.1.1.1	6-4	NA	NA	NA	NA	NA	NA
16-010(c)	DA	6.1.1.1	6-4	NA	NA	NA	NA	NA	NA

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-010(d)	DA	6.1.1.1	6-4	NA	NA	NA	NA	NA	NA
16-010(e)	DA	6.1.1.1	6-4	NA	NA	NA	NA	NA	NA
16-010(f)	DA	6.1.1.1	6-5	NA	NA	NA	NA	NA	NA
16-010(g)	DA	6.1.3.1	6-7	NA	NA	NA	NA	NA	NA
16-010(h)	8	5.8.1.1	5-152	5-44	5-155	5-46	5-166	5.8.4.2	5-168
16-010(i)	8	5.8.1.1	5-152	5-44	5-155	5-46	5-166	5.8.4.2	5-168
16-010(j)	DA	6.1.1.1	6-5	NA	NA	NA	NA	NA	NA
16-010(k)	8	5.8.1.1	5-152	5-44	5-155	5-46	5-166	5.8.4.2	5-170
16-010(l)	8	5.8.1.1	5-153	5-44	5-155	5-46	5-166	5.8.4.2	5-170
16-010(m)	8	5.8.1.1	5-153	5-44	5-155	5-46	5-166	5.8.4.2	5-170
16-010(n)	8	5.8.1.1	5-153	5-44	5-155	5-46	5-166	5.8.4.2	5-170
16-011	19	5.19.1.1	5-354	5-89	5-365	5-93	5-371	5.19.4.2	5-373
16-012(a)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(a2)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(b)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(c)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(d)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(e)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(f)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(g)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(h)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(i)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(j)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(k)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(l)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(m)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(n)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(o)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(p)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(q)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(r)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(s)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(t)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(u)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(v)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(w)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(x)	NFA	6.1.3.2	6-8	NA	NA	NA	NA	NA	NA
16-012(y)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-012(z)	NFA	6.1.5.7	6-19	NA	NA	NA	NA	NA	NA
16-013	17	5.17.1.1	5-283	5-76	5-285	5-78	5-290	5.17.4.2	5-289
16-015(a)	21	5.21.1.1	5-423	5-104	5-426	5-108	5-432	5.21.4.2	5-434
16-015(b)	21	5.21.1.1	5-424	5-104	5-426	5-108	5-432	5.21.4.2	5-434
16-015(c)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-412
16-015(d)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-412
16-016(a)	11	5.11.1.1	5-200	5-56	5-203	5-58	5-209	5.11.4.3	5-213
16-016(b)	11	5.11.1.1	5-200	5-56	5-203	5-58	5-209	5.11.4.3	5-213
16-016(c)	8	5.8.1.1	5-153	5-44	5-155	5-46	5-166	5.8.4.2	5-167
16-016(d)	NFA	6.6.1.2	6-4	NA	NA	NA	NA	NA	NA

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-016(e)	NFA	6.6.1.2	6-4	NA	NA	NA	NA	NA	NA
16-016(f)	NFA	6.8.1.1	6-47	NA	NA	NA	NA	NA	NA
16-016(g)	NFA	6.6.1.2	6-4	NA	NA	NA	NA	NA	NA
16-017	DA	6.4.1.1	6-31	NA	NA	NA	NA	NA	NA
16-018	DA	6.1.4.1	6-9	NA	NA	NA	NA	NA	NA
16-019	10	5.10.1.1	5-186	5-53	5-188	5-55	5-195	5.10.4.2	5-197
16-020	6	5.6.1.1	5-119	5-34	5-121	5-36	5-129	5.6.4.2	5-130
16-021(a)	5	5.5.1.1	5-111	5-31	5-113	5-33	5-116	5.5.4.2	5-117
16-021(b)	NFA	6.7.4.2	6-46	NA	NA	NA	NA	NA	NA
16-021(c)	3	5.3.1.1	5-81	5-21	5-82	5-27	5-93	5.3.4.2	5-94
16-022(a)	NFA	6.7.3.1	6-35	NA	NA	NA	NA	NA	NA
16-022(b)	NFA	6.7.3.2	6-39	NA	NA	NA	NA	NA	NA
16-023(a)	NFA	6.5.1.1	6-42	NA	NA	NA	NA	NA	NA
16-023(b)	19	5.19.1.1	5-354	5-89	5-365	5-93	5-371	5.19.4.2	5-377
16-024(a)	26	5.26.1.1	5-26-6	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-20
16-024(b)	19	5.19.1.1	5-356	5-89	5-365	5-93	5-371	5.19.4.2	5-377
16-024(c)	19	5.19.1.1	5-356	5-89	5-365	5-93	5-371	5.19.4.2	5-377
16-024(d)	19	5.19.1.1	5-356	5-89	5-365	5-93	5-371	5.19.4.2	5-377
16-024(e)	18	5.18.1.1	5-318	5-80	5-325	5-87	5-339	5.18.4.2	5-348
16-024(f)	24	5.24.1.1	5-481	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-024(g)	24	5.24.1.1	5-481	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-024(h)	24	5.24.1.1	5-482	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-024(i)	26	5.26.1.1	5-26-1	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
16-024(j)	26	5.26.1.1	5-26-1	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
16-024(k)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(l)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(m)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(n)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(o)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(p)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(q)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(r)	20	5.20.1.1	5-388	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-024(s)	26	5.26.1.1	5-26-1	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
16-024(t)	26	5.26.1.1	5-26-9	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
16-024(u)	26	5.26.1.1	5-26-6	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-20
16-024(v)	26	5.26.1.1	5-26-1	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
16-025(a)	19	5.19.1.1	5-358	5-89	5-365	5-93	5-371	5.19.4.2	5-373
16-025(a2)	20	5.20.1.1	5-392	5-95	5-398	5-102	5-409	5.20.4.2	5-412
16-025(b)	19	5.19.1.1	5-358	5-89	5-365	5-93	5-371	5.19.4.2	5-373
16-025(b2)	20	5.20.1.1	5-393	5-95	5-398	5-102	5-409	5.20.4.2	5-412
16-025(c)	NFA	6.4.3.2	6-37	NA	NA	NA	NA	NA	NA
16-025(c2)	20	5.20.1.1	5-394	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-025(d)	19	5.19.1.1	5-360	5-89	5-365	5-93	5-371	5.19.4.2	5-377
16-025(d2)	26	5.26.1.1	5-26-6	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
16-025(e)	18	5.18.1.1	5-318	5-80	5-325	5-87	5-339	5.18.4.2	5-348
16-025(e2)	NFA	6.6.3.1	6-18	NA	NA	NA	NA	NA	NA
16-025(f)	18	5.18.1.1	5-318	5-80	5-325	5-87	5-339	5.18.4.2	5-348
16-025(f2)	NFA	6.6.3.1	6-18	NA	NA	NA	NA	NA	NA

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-025(g)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(g2)	NFA	6.4.3.5	6-40	NA	NA	NA	NA	NA	NA
16-025(h)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(h2)	NFA	6.6.3.1	6-18	NA	NA	NA	NA	NA	NA
16-025(i)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(j)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(k)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(l)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-345
16-025(m)	24	5.24.1.1	5-482	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-025(n)	24	5.24.1.1	5-482	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-025(o)	24	5.24.1.1	5-482	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-025(p)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(q)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-025(r)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-346
16-025(s)	19	5.19.1.1	5-358	5-89	5-365	5-93	5-371	5.19.4.2	5-373
16-025(t)	20	5.20.1.1	5-389	5-95	5-398	5-102	5-409	5.20.4.2	5-412
16-025(u)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-345
16-025(v)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-345
16-025(w)	20	5.20.1.1	5-390	5-95	5-398	5-102	5-409	5.20.4.2	5-419
16-025(x)	25	5.25.1.1	5-504	5-131	5-512	5-134	5-515	5.25.4.2	5-516
16-025(y)	20	5.20.1.1	5-390	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-025(z)	20	5.20.1.1	5-391	5-95	5-398	5-102	5-409	5.20.4.2	5-412
16-026(a)	NFA.	6.6.1.3	6-6	NA	NA	NA	NA	NA	NA
16-026(a2)	NFA	6.6.1.4	6-9	NA	NA	NA	NA	NA	NA
16-026(b)	2	5.2.1.1	5-27	5-7	5-40	5-20	5-65	5.2.4.2	5-75
16-026(b2)	28	5.28.1.1.2	5-28-5	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-37
16-026(c)	2	5.2.1.1	5-27	5-7	5-41	5-20	5-65	5.2.4.2	5-75
16-026(c2)	28	5.28.1.1.1	5-28-2	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-40
16-026(d)	2	5.2.1.1	5-28	5-7	5-41	5-20	5-65	5.2.4.2	5-75
16-026(d2)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(e)	2	5.2.1.1	5-28	5-7	5-41	5-20	5-65	5.2.4.2	5-75
16-026(e2)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(f)	NFA	6.6.2.2	6-14	NA	NA	NA	NA	NA	NA
16-026(f2)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(g)	NFA	6.6.2.3	6-15	NA	NA	NA	NA	NA	NA
16-026(g2)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(h)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(h2)	2	5.2.1.1	5-32	5-7	5-41	5-20	5-65	5.2.4.2	5-76
16-026(i)	28	5.28.1.1.4	5-28-9	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-30
16-026(i2)	NFA	6.4.2.3	6-34	NA	NA	NA	NA	NA	NA
16-026(j)	28	5.28.1.1.4	5-28-9	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-30
16-026(j2)	2	5.2.1.1	5-38	5-7	5-41	5-20	5-65	5.2.4.2	5-77
16-026(k)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(k2)	28	5.28.1.1.7	5-28-17	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-34
16-026(l)	NFA	6.6.1.3	6-7	NA	NA	NA	NA	NA	NA
16-026(m)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-026(n)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-026(o)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-026(p)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-026(q)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-350
16-026(r)	28	5.28.1.1.2	5-28-5	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-37
16-026(s)	21	5.21.1.1	5-424	5-104	5-426	5-108	5-432	5.21.4.2	5-436
16-026(t)	NFA	6.6.1.3	6-7	NA	NA	NA	NA	NA	NA
16-026(u)	28	5.28.1.1.2	5-28-5	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-37
16-026(v)	2	5.2.1.1	5-32	5-7	5-40	5-20	5-66	5.2.4.2	5-69
16-026(w)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	347
16-026(x)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-026(y)	NFA	6.6.1.5	6-9	NA	NA	NA	NA	NA	NA
16-026(z)	NFA	6.6.1.3	6-7	NA	NA	NA	NA	NA	NA
16-027(a)	NFA	6.7.4.1	6-44	NA	NA	NA	NA	NA	NA
16-027(b)	NFA	6.7.4.1	6-45	NA	NA	NA	NA	NA	NA
16-027(c)	NFA	6.7.4.1	6-45	NA	NA	NA	NA	NA	NA
16-027(d)	NFA	6.7.2.4	6-32	NA	NA	NA	NA	NA	NA
16-028(a)	NFA	6.4.2.6	6-36	NA	NA	NA	NA	NA	NA
16-028(b)	28	5.28.1.1.5	5-28-13	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-30
16-028(c)	28	5.28.1.1.4	5-28-9	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-28
16-028(d)	28	5.28.1.1.3	5-28-8	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-37
16-028(e)	NFA	6.6.1.1	6-3	NA	NA	NA	NA	NA	NA
16-029(a)	2	5.2.1.1	5-29	5-7	5-40	5-20	5-66	5.2.4.2	5-69
16-029(a2)	20	5.20.1.1	5-390	5-95	5-398	5-102	5-409	5.20.4.2	5-418
16-029(b)	2	5.2.1.1	5-27	5-7	5-41	5-20	5-65	5.2.4.2	5-75
16-029(b2)	20	5.20.1.1	5-395	5-95	5-398	5-102	5-409	5.20.4.2	5-417
16-029(c)	2	5.2.1.1	5-28	5-7	5-41	5-20	5-65	5.2.4.2	5-75
16-029(c2)	20	5.20.1.1	5-391	5-95	5-398	5-102	5-409	5.20.4.2	5-417
16-029(d)	2	5.2.1.1	5-28	5-7	5-41	5.20	5-65	5.2.4.2	5-75
16-029(d2)	20	5.20.1.1	5-392	5-95	5-398	5-102	5-409	5.2.4.2	5-417
16-029(e)	2	5.2.1.1	5-32	5-7	5-41	5-20	5-65	5.2.4.2	5-76
16-029(e2)	20	5.20.1.1	5-393	5-95	5-398	5-102	5-409	5.20.4.2	5-417
16-029(f)	2	5.2.1.1	5-38	5-7	5-41	5-20	5-65	5.2.4.2	5-77
16-029(f2)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-347
16-029(g)	2	5.2.1.1	5-38	5-7	5-41	5-20	5-66	5.2.4.2	5-78
16-029(g2)	NFA	6.4.1.1	6-31	NA	NA	NA	NA	NA	NA
16-029(h)	29	5.29.1.1	5-29-1	NA	NA	5-29-3	5-29-11	5.29.3.2	5-29-13
16-029(h2)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-348
16-029(i)	NFA	6.6.1.1	6-3	NA	NA	NA	NA	NA	NA
16-029(j)	28	5.28.1.1.7	5-28-17	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-34
16-029(k)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-029(l)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-029(m)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-347
16-029(n)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-347
16-029(o)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-347
16-029(p)	18	5.18.1.1	5-322	5-80	5-325	5-87	5-339	5.18.4.2	5-347
16-029(q)	23	5.23.1.1	5-463	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-029(r)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-347
16-029(s)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-029(t)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-029(u)	23	5.23.1.1	5-462	5-117	5-464	5-122	5-472	5.23.4.2	5-475
16-029(v)	20	5.20.1.1	5-394	5-95	5-398	5-102	5-409	5.20.4.2	5-417
16-029(w)	25	5.25.1.1	5-504	5-131	5-512	5-134	5-515	5.25.4.2	5-519
16-029(x)	25	5.25.1.1	5-504	5-131	5-512	5-134	5-515	5.25.4.2	5-518
16-029(y)	20	5.20.1.1	5-389	5-95	5-398	5-102	5-409	5.20.4.2	5-417
16-029(z)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-349
16-030(a)	28	5.28.1.1.1	5-28-2	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-40
16-030(b)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-030(c)	NFA	6.6.1.3	6-7	NA	NA	NA	NA	NA	NA
16-030(d)	2	5.2.1.1	5-28	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-030(e)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-030(f)	NFA	6.6.2.1	6-13	NA	NA	NA	NA	NA	NA
16-030(g)	2	5.2.1.1	5-32	5-7	5-40	5-20	5-65	5.2.4.2	5-73
16-030(h)	2	5.2.1.1	5-31	5-7	5-40	5-20	5-65	5.2.4.2	5-79
16-031(a)	28	5.28.1.1.6	5-28-15	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-30
16-031(b)	28	5.28.1.1.6	5-28-15	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-34
16-031(c)	25	5.25.1.1	5-505	5-131	5-512	5-134	5-515	5.25.4.2	5-518
16-031(d)	19	5.19.1.1	5-359	5-89	5-365	5-93	5-371	5.19.4.2	5-378
16-031(e)	NFA	6.6.1.7	6-11	NA	NA	NA	NA	NA	NA
16-031(f)	NFA	6.6.1.7	6-12	NA	NA	NA	NA	NA	NA
16-031(g)	NFA	6.4.3.3	6-38	NA	NA	NA	NA	NA	NA
16-031(h)	NFA	6.6.1.6	6-10	NA	NA	NA	NA	NA	NA
16-032(a)	18	5.18.1.1	5-320	5-80	5-325	5-87	5-339	5.18.4.2	5-350
16-032(b)	NFA	6.5.1.3	6-43	NA	NA	NA	NA	NA	NA
16-032(c)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-349
16-032(d)	NFA	6.4.2.4	6-35	NA	NA	NA	NA	NA	NA
16-032(e)	NFA	6.4.3.6	6-41	NA	NA	NA	NA	NA	NA
16-033(a)	NFA	6.7.3.2	6-38	NA	NA	NA	NA	NA	NA
16-033(b)	NFA	6.7.3.2	6-39	NA	NA	NA	NA	NA	NA
16-033(c)	NFA	6.7.2.1	6-28	NA	NA	NA	NA	NA	NA
16-033(d)	NFA	6.7.2.1	6-29	NA	NA	NA	NA	NA	NA
16-033(e)	27	5.27.1.1	5-27-1	NA	NA	NA	NA	5.27.3	5-27-8
16-033(f)	NFA	6.7.3.2	6-38	NA	NA	NA	NA	NA	NA
16-033(g)	NFA	6.7.3.2	6-38	NA	NA	NA	NA	NA	NA
16-033(h)	NFA	6.7.3.2	6-38	NA	NA	NA	NA	NA	NA
16-033(i)	NFA	6.7.3.2	6-39	NA	NA	NA	NA	NA	NA
16-033(j)	NFA	6.7.3.2	6-39	NA	NA	NA	NA	NA	NA
16-034(a)	18	5.18.1.1	5-314	5-80	5-325	5-87	5-339	5.18.4.2	5-341
16-034(b)	24	5.24.1.1	5-483	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-034(c)	24	5.24.1.1	5-483	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-034(d)	24	5.24.1.1	5-484	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-034(e)	24	5.24.1.1	5-484	5-124	5-486	5-128	5-493	5.24.4.2	5-496
16-034(f)	24	5.24.1.1	5-484	5-124	5-486	5-128	5-493	5.24.4.2	5-497
16-034(g)	NFA	6.4.2.2	6-34	NA	NA	NA	NA	NA	NA
16-034(h)	26	5.26.1.1	5-26-11	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-20
16-034(i)	NFA	6.6.2.4	6-16	NA	NA	NA	NA	NA	NA
16-034(j)	26	5.26.1.1	5-26-11	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-19
16-034(k)	NFA	6.6.2.4	6-16	NA	NA	NA	NA	NA	NA

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
16-034(l)	19	5.19.1.1	5-362	5-89	5-365	5-93	5-371	5.19.4.2	5-377
16-034(m)	20	5.20.1.1	5-396	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-034(n)	20	5.20.1.1	5-396	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-034(o)	20	5.20.1.1	5-394	5-95	5-398	5-102	5-409	5.20.4.2	5-416
16-034(p)	19	5.19.1.1	5-354	5-89	5-365	5-93	5-371	5.19.4.2	5-373
16-035	13	5.13.1.1	5-226	5-64	5-227	5-66	5-236	5.13.4.3	5-241
16-036	13	5.13.1.1	5-226	5-64	5-227	5-66	5-236	5.13.4.3	5-241
16-037	NFA	6.7.1.12	6-26	NA	NA	NA	NA	NA	NA
25-001	NFA	6.5.1.2	6-42	NA	NA	NA	NA	NA	NA
37-001	NFA	6.2.3.3	6-26	NA	NA	NA	NA	NA	NA
C-11-001	14/DA	5.14.1.1	5-246	5-67	5-244	5-69	5-257	5.14.4.2	5-258
C-11-002	16	5.16.1.1	5-271	5-73	5-272	5-75	5-279	5.16.4.2	5-280
C-11-003	NFA	6.2.3.4	6-27	NA	NA	NA	NA	NA	NA
C-16-001	NFA	6.7.1.13	6-27	NA	NA	NA	NA	NA	NA
C-16-002	28	5.28.1.1.6	5-28-15	5-28-2	5-28-20	5-28-7	5-28-27	5.28.3.1	5-28-34
C-16-003	NFA	6.5.2.5	6-48	NA	NA	NA	NA	NA	NA
C-16-004	NFA	6.5.2.1	6-44	NA	NA	NA	NA	NA	NA
C-16-005	20	5.20.1.1	5-395	5-95	5-398	5-102	5-409	5.20.4.2	5-412
C-16-006	19	5.19.1.1	5-360	5-89	5-365	5-93	5-371	5.19.4.2	5-378
C-16-007	NFA	6.5.2.6	6-49	NA	NA	NA	NA	NA	NA
C-16-008	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-009	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-010	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-011	26	5.26.1.1	5-26-11	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-20
C-16-012	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-013	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-014	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-015	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-016	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-017	24	5.24.1.1	5-484	5-124	5-486	5-128	5-493	5.24.4.2	5-497
C-16-018	NFA	6.7.1.5	6-22	NA	NA	NA	NA	NA	NA
C-16-019	NFA	6.7.2.5	6-33	NA	NA	NA	NA	NA	NA
C-16-020	NFA	6.7.1.6	6-23	NA	NA	NA	NA	NA	NA
C-16-021	NFA	6.5.2.2	6-45	NA	NA	NA	NA	NA	NA
C-16-022	NFA	6.5.2.2	6-45	NA	NA	NA	NA	NA	NA
C-16-023	NFA	6.5.2.4	6-47	NA	NA	NA	NA	NA	NA
C-16-024	NFA	6.5.2.2	6-45	NA	NA	NA	NA	NA	NA
C-16-025	21	5.21.1.1	5-425	5-104	5-427	5-108	5-433	5.21.4.2	5-437
C-16-026	21	5.21.1.1	5-425	5-104	5-427	5-108	5-433	5.21.4.2	5-437
C-16-027	NFA	6.5.2.3	6-45	NA	NA	NA	NA	NA	NA
C-16-028	21	5.21.1.1	5-425	5-104	5-426	5-108	5-432	5.21.4.2	5-436
C-16-029	NFA	6.5.2.3	6-45	NA	NA	NA	NA	NA	NA
C-16-030	21	5.21.1.1	5-425	5-104	5-426	5-108	5-432	5.21.4.2	5-436
C-16-031	21	5.21.1.1	5-425	5-104	5-426	5-108	5-432	5.21.4.2	5-436
C-16-032	NFA	6.5.2.1	6-44	NA	NA	NA	NA	NA	NA
C-16-033	NFA	6.5.2.4	6-47	NA	NA	NA	NA	NA	NA
C-16-034	NFA	6.7.1.7	6-23	NA	NA	NA	NA	NA	NA
C-16-035	NFA	6.7.1.7	6-23	NA	NA	NA	NA	NA	NA

TABLE 5-0-1 (continued)

INDEX TO PRSs

PRS	AGGRE-GATE	HISTORY SUBSECTION	(PAGE)	PCOC OR COPC TABLE NO.	(PAGE)	SAMPLING TABLE NUMBER	(PAGE)	SAMPLING SUBSECTION	(PAGE)
C-16-036	NFA	6.7.2.2	6-29	NA	NA	NA	NA	NA	NA
C-16-037	NFA	6.5.2.4	6-47	NA	NA	NA	NA	NA	NA
C-16-038	NFA	6.5.2.4	6-47	NA	NA	NA	NA	NA	NA
C-16-039	NFA	6.5.2.1	6-44	NA	NA	NA	NA	NA	NA
C-16-040	NFA	6.5.2.1	6-44	NA	NA	NA	NA	NA	NA
C-16-041	NFA	6.7.1.9	6-24	NA	NA	NA	NA	NA	NA
C-16-042	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-043	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-044	NFA	6.7.1.10	6-25	NA	NA	NA	NA	NA	NA
C-16-045	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-046	NFA	6.7.1.10	6-25	NA	NA	NA	NA	NA	NA
C-16-047	NFA	6.7.2.3	6-31	NA	NA	NA	NA	NA	NA
C-16-048	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-049	NFA	6.7.1.3	6-21	NA	NA	NA	NA	NA	NA
C-16-050	NFA	6.7.1.11	6-26	NA	NA	NA	NA	NA	NA
C-16-051	NFA	6.7.2.3	6-31	NA	NA	NA	NA	NA	NA
C-16-052	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-053	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-054	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-055	NFA	6.5.2.6	6-49	NA	NA	NA	NA	NA	NA
C-16-056	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-057	NFA	6.5.2.8	6-50	NA	NA	NA	NA	NA	NA
C-16-058	NFA	6.7.2.3	6-31	NA	NA	NA	NA	NA	NA
C-16-059	NFA	6.5.2.7	6-50	NA	NA	NA	NA	NA	NA
C-16-060	26	5.26.1.1	5-26-6	5-26-2	5-26-14	5-26-5	5-26-18	5.26.3.1	5-26-23
C-16-061	NFA	6.7.1.8	6-24	NA	NA	NA	NA	NA	NA
C-16-062	NFA	6.7.1.4	6-22	NA	NA	NA	NA	NA	NA
C-16-063	NFA	6.7.1.4	6-22	NA	NA	NA	NA	NA	NA
C-16-064	19	5.19.1.1	5-362	5-89	5-365	5-93	5-371	5.19.4.2	5-378
C-16-065	19	5.19.1.1	5-362	5-89	5-365	5-93	5-371	5.19.4.2	5-378
C-16-066	NFA	6.5.2.4	6-47	NA	NA	NA	NA	NA	NA
C-16-067	19	5.19.1.1	5-362	5-89	5-365	5-93	5-371	5.19.4.2	5-378
C-16-068	25	5.25.1.1	5-506	5-131	5-512	5-134	5-515	5.25.4.2	5-518
C-16-069	20	5.20.1.1	5-389	5-95	5-398	5-102	5-409	5.20.4.2	5-417
C-16-070	NFA	6.7.2.6	6-34	NA	NA	NA	NA	NA	NA
C-16-072	NFA	6.7.1.1	6-19	NA	NA	NA	NA	NA	NA
C-16-073	27	5.27.1.1	5-27-3	NA	NA	NA	NA	5.27.3	5-27-8
C-16-074	25	5.25.1.1	5-506	5-131	5-512	5-134	5-515	5.25.4.2	5-518
C-25-001	NFA	6.5.1.2	6-42	NA	NA	NA	NA	NA	NA
Cañon de Valle	9	5.9.1.1	5-172	5-47	5-175	5-52	5-183	5.9.4.2	5-184

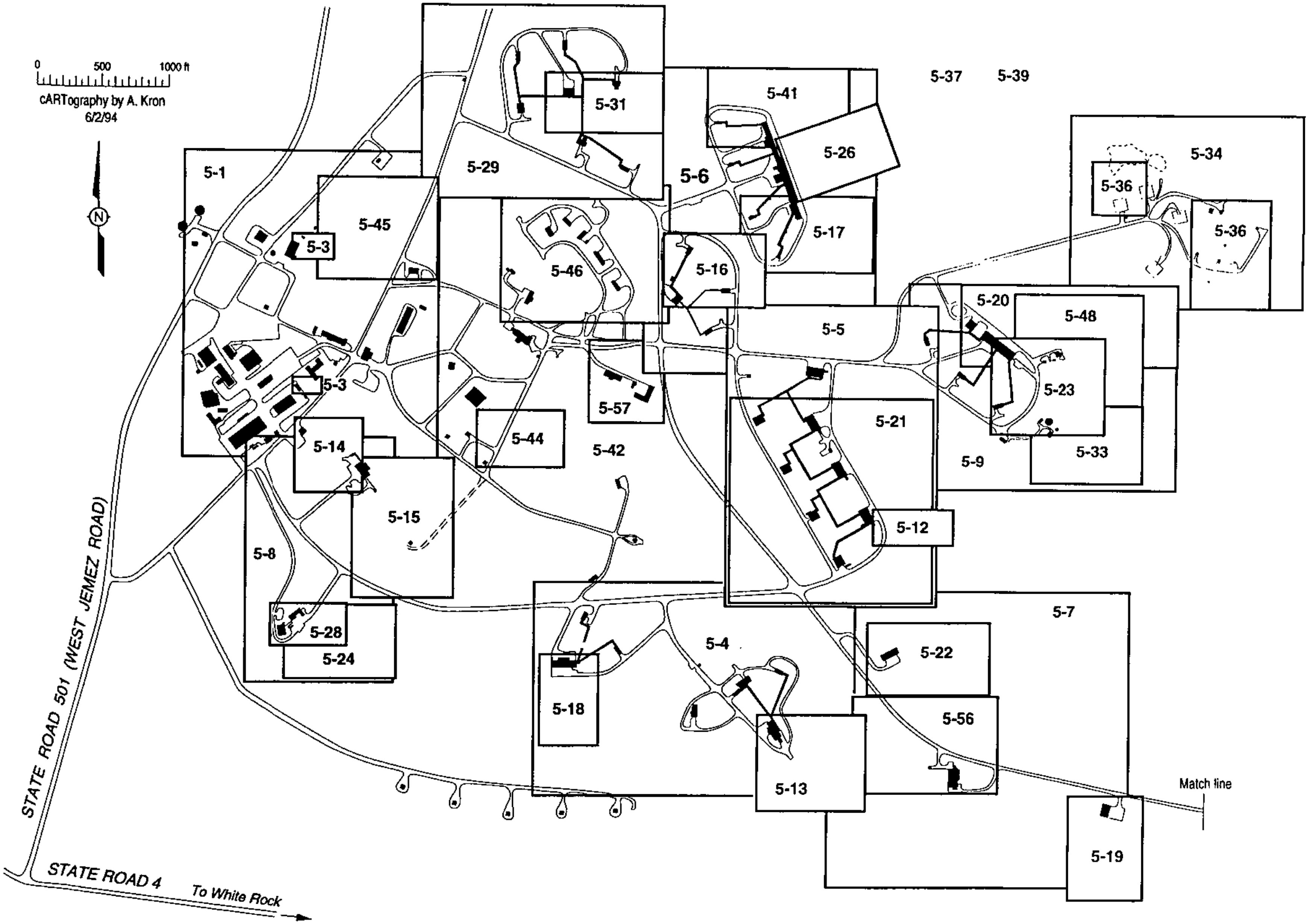


Fig. 5-0-1(a). Index to PRS location and sampling maps for OU 1082 (1993 RFI Work Plan).

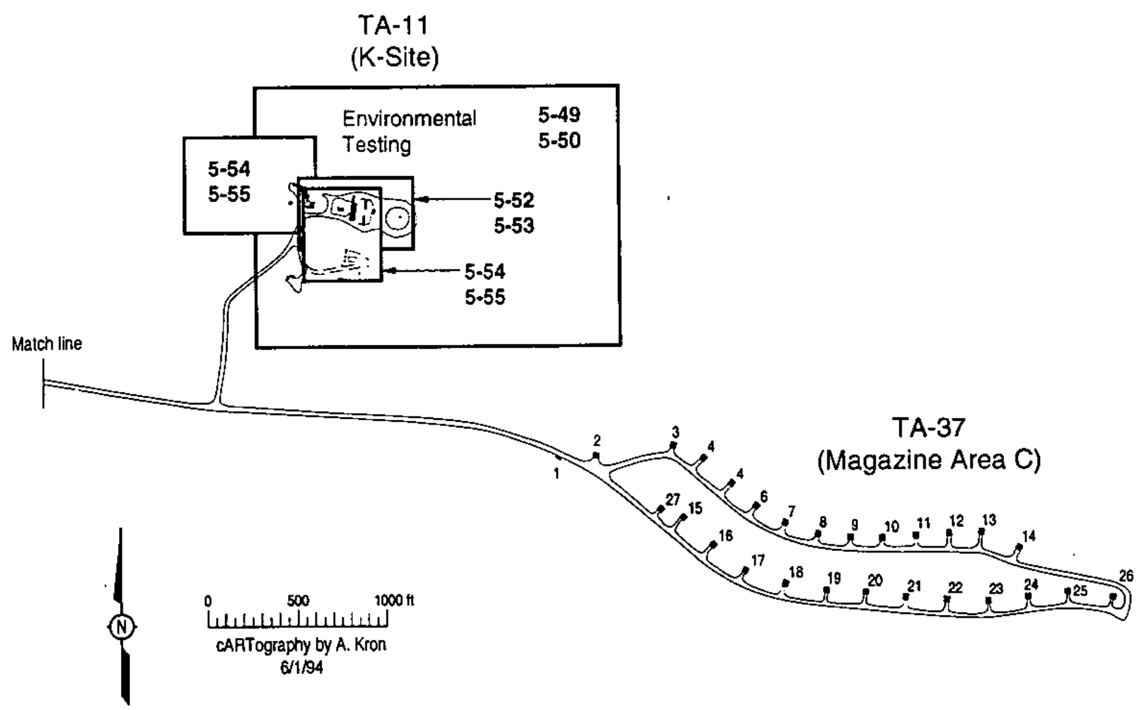


Fig. 5-0-1(b). Index to PRS location and sampling maps for OU 1082 (1993 RFI Work Plan).

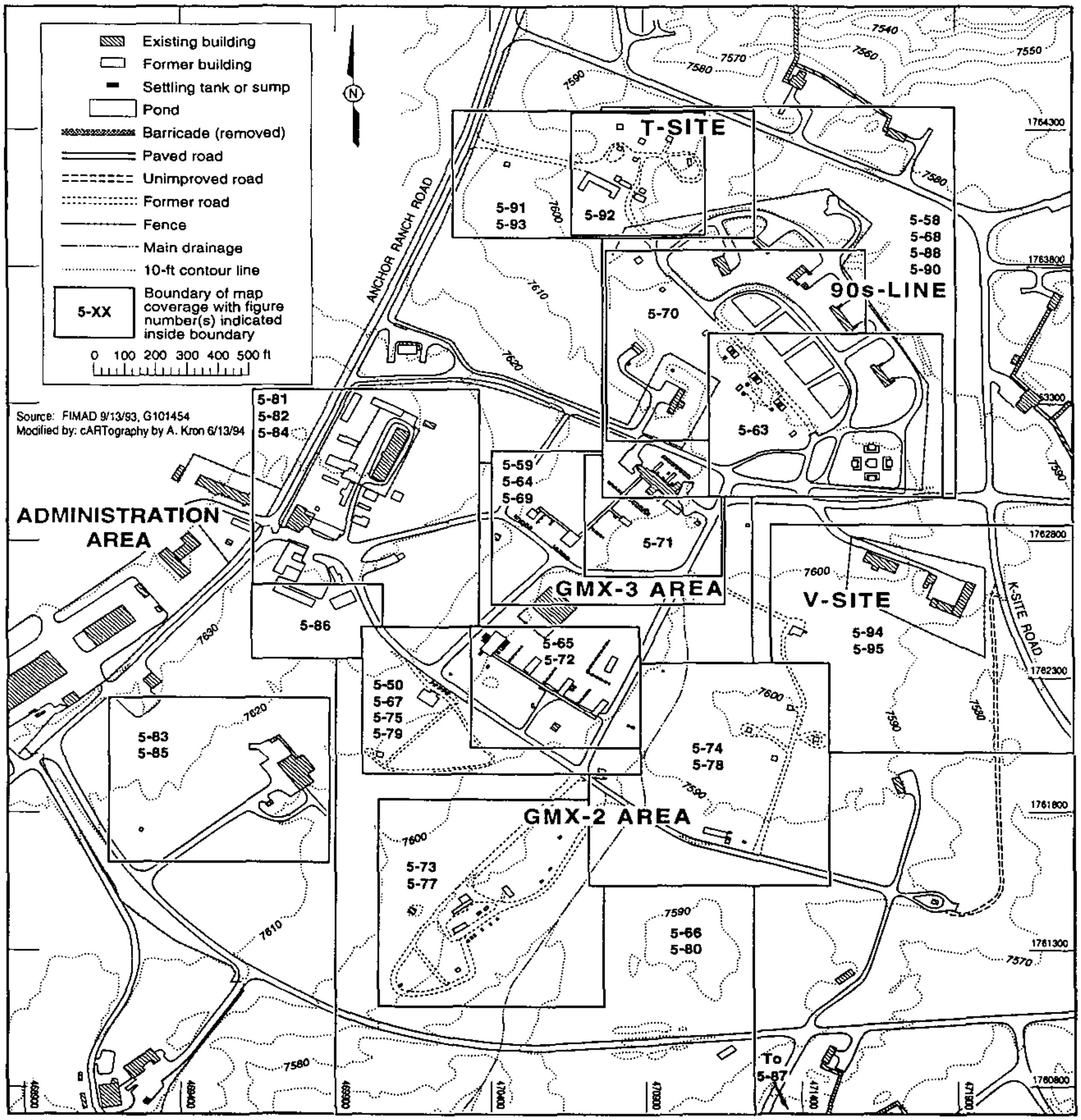


Fig. 5-0-2. Index to detailed sampling and PRS location figures for Subsections 5.18 through 5.25 (Addendum 1).

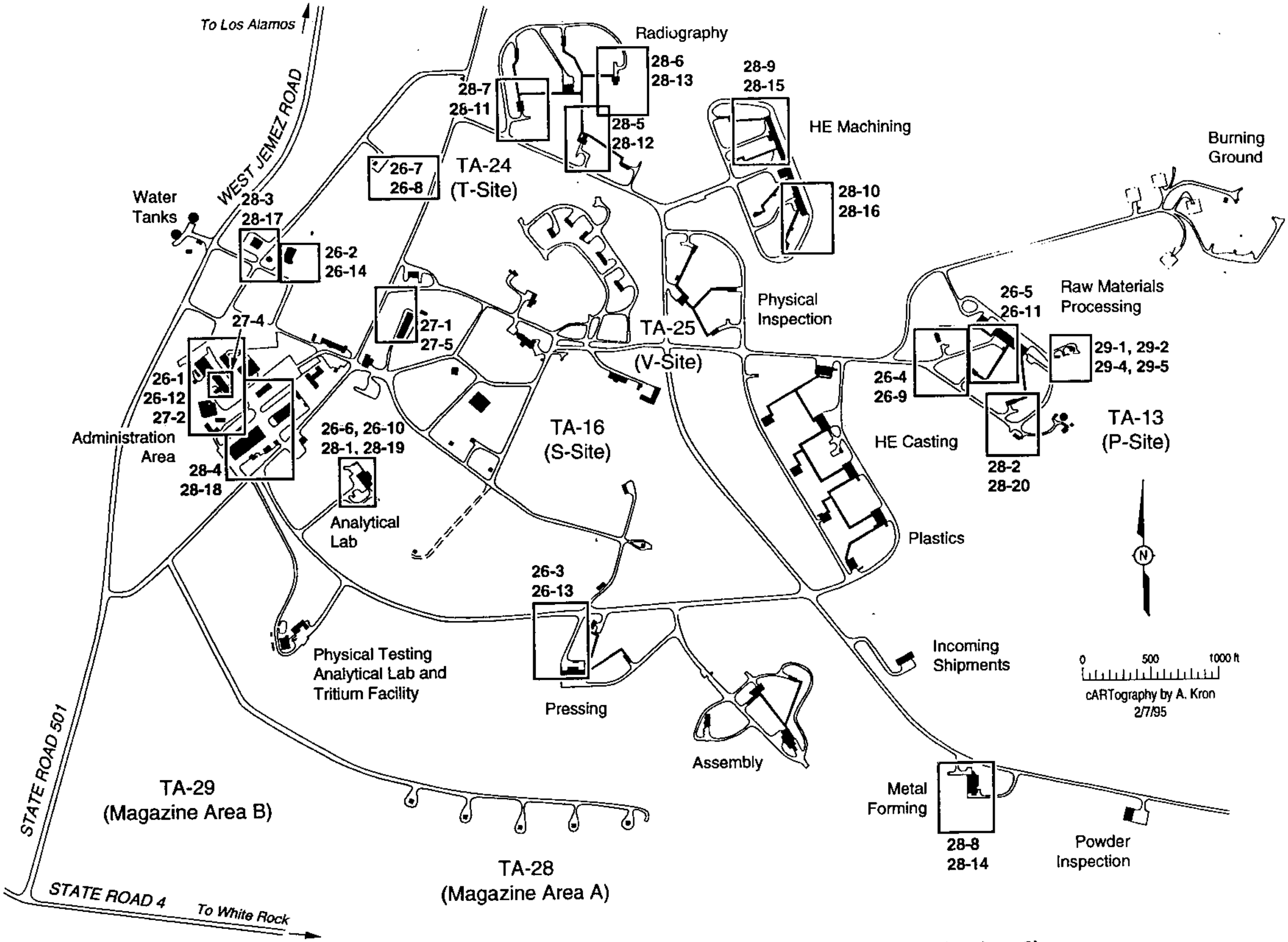


Fig. 5-0-3. Index map to PRS locations and sampling maps for Subsections 5.26 through 5.29 (Addendum 2).

~~the 1995 addendum to the OU 1082 RFI work plan or are proposed for no further action (NFA) or deferred action (DA) in Chapter 6.~~

5.0.2 DQOs for Reconnaissance Sampling - Generic Logic

Sampling designs in the RFI Work Plan for OU 1082 follow the general guidelines described in the Installation Work Plan (IWP). In particular, the streamlined approach and DQO process for sample design, as described in Subsections 4.1.2 and Appendix H of the IWP, were used to guide the development of sampling (LANL 1993, 1017). The aggregates described in Subsections 5.1 through 5.17 are a diverse group of PRS aggregates, with correspondingly diverse DQOs.

In contrast, because all of the aggregates in the 1994 work plan addendum address potential contamination associated with decommissioned World War II era S-Site structures, Subsections 5.18 through 5.25 are all reconnaissance sampling with similar DQOs (Throughout this document the term "World War II era" is used to refer to the period from roughly 1944 to 1950). In particular, portions of DQO Steps 1, Problem Statement; 2, Decision Process; 3, Decision Inputs; 4, Investigation Boundary; 5, Decision Logic; and 6, Design Criteria, are virtually identical for these aggregates. DQO Steps 1, 4, and 6 typically also include aggregate-specific information that is included in Subsections 5.X.2 and 5.X.3 where X extends from 18 to 25. Because of the similarities of the DQOs across aggregates 5.18 through 5.25, generic DQOs appropriate for reconnaissance sampling of the World War II era buildings are presented below. These generic DQOs are then cited in Subsections 5.18 through 5.25 in the interest of minimizing the repetitiveness of the aggregate descriptions. Similarly, generic DQOs are cited in Subsections 5.26 through 5.29 in the interest of minimizing repetitiveness.

5.0.2.1 Problem Statement (DQO Step 1)

For aggregates 5.18 through 5.29 the primary Phase I problem is typically to determine if contaminants are at levels of concern in any PRS in each aggregate and estimate nature and extent of contamination. Virtually every aggregate contains both surface contamination due to combustion of World War II era buildings and subsurface contamination due to leakage from sumps and drain lines. Typically, the indicator ~~PCOC~~ COPC ~~of concern~~ is high explosives (HE). The term HE refers to a broad range of compounds (see Appendix D) of varying toxicity. The two principal HE of concern in the World War II S-Site area are TNT (soil SAL = 40 ppm) and RDX (soil SAL = 64 ppm). The probability of contamination in PRSs within each aggregate varies, depending on the specific activities that occurred in the individual PRS in the aggregate.

5.0.2.2 Decision Process (DQO Step 2)

The objective of the Phase I investigations for aggregates 5.18 through 5.29 is reconnaissance sampling to determine if ~~PCOC~~ COPC concentrations are above screening action levels (SALs) in surface and subsurface soils. For each PRS if ~~PCOC~~ COPC concentrations are below SALs and there are no multiple constituent concerns, then a no further action (NFA) decision will be proposed for that PRS. If ~~PCOC~~ COPC concentrations are greater than SALs and background values, then a Phase II study will be initiated to determine the spatial extent and concentrations of contaminants of concern relative to an acceptable risk level.

For each aggregate, potential remediation options for PRSs that pose an unacceptable health and environmental risk include removal of contaminated surface or subsurface soils with treatment and disposal. The need for remedial action will be supported by data on contaminant levels gathered in a Phase II sampling plan.

5.0.2.3 Decision Inputs (DQO Step 3)

For PRSs in each of aggregates 5.18 through 5.29 the primary data needs are the confirmation of likely ~~PCOCs~~ COPCs, identification of additional ~~PCOCs~~ COPCs, and determination of the concentrations of all ~~PCOCs~~ COPCs in surface and subsurface soils and an estimate of the nature and extent of contamination. If SALs are not available for one or more ~~PCOCs~~ COPCs detected in a PRS, then these must be determined. Further, in order to locate the potentially contaminated areas of these PRSs for efficient and effective laboratory sampling, site information on facilities from visual indications, engineering drawings, field screening, and particularly

*Orthocorrected aerial photographs are corrected for local topography and the height and position of the airplane from which the photographs were taken.

orthocorrected aerial photographs* are needed to determine the location of former structures, subsurface plumbing, and drainages.

5.0.2.4 Investigation Boundary (DQO Step 4)

Boundaries are defined in each aggregate; 5.18 through 5.29. However, the PRS boundaries are typically used as investigation boundaries.

The depth boundary for undisturbed surface samples is 0 to 6 in. ~~For HE process building footprints~~, The depth boundary is extended to 0 to 24 in. for disturbed soil surfaces where bulldozing of soil has occurred and ~~HE is~~ contaminants are likely to have infiltrated into the subsurface. The depth boundary for subsurface samples, such as sumps, drain lines, and septic tanks is typically 0 in. to the soil-tuff interface.

5.0.2.5 Decision Logic (DQO Step 5)

For aggregates 5.18 through 5.29, if the maximum observed ~~PCOC~~ COPC concentrations in surface or subsurface soils for a PRS are above their SALs and well above any constituent background level, then a Phase II study will be performed. A baseline risk assessment will be completed at any time that adequate data exist for an exposure unit of interest. If SALs or background levels are not exceeded, then an NFA decision will be proposed for the PRS.

Some adjustments are made to this decision rule to account for ~~PCOCs~~ COPCs for which SALs are less than the normal range of background (e.g., beryllium), or if several ~~PCOCs~~ COPCs exhibit concentrations that are close to SALs without actually exceeding them. Chapter 4, Subsection 4.1.4 and Appendix J of the IWP (LANL 1993, 1017) provide details of the effect of these adjustments on the decision rule.

5.0.2.6 Design Criteria (DQO Step 6)

For aggregates 5.18 through 5.29 a reconnaissance sampling approach (IWP, Appendix H) is proposed for all PRSs in each aggregate (LANL 1992, 0768). Reconnaissance sampling is based on the assumption that biased samples can be taken at the likely points of highest ~~PCOC~~ COPC concentration. Biased laboratory sampling locations are chosen based on knowledge of process, geomorphologic mapping, and field screening. The term laboratory sample refers to samples selected for analysis in a fixed-base laboratory.

Each sampling design contains both field screening samples and laboratory samples. The field screening samples are used to increase the likelihood that laboratory samples are collected in regions of potential contamination. Positive field screening results will also be used to focus any Phase II investigations to exposure units known to contain contamination. The laboratory samples are designed to investigate the nature of ~~PCOCs~~ COPCs and to determine if the ~~PCOCs~~ COPCs are present at concentrations above SALs.

In order to design both the number and location of field screening and laboratory samples, each PRS was categorized into its likely heterogeneity and seriousness. These determinations were based on process knowledge, archival information, engineering drawings, and field visits. Rough definitions of the seriousness categories are: a very serious PRS is considered to have a 50% or better chance of containing ~~PCOCs~~ COPCs at a level an order of magnitude greater than SALs and background; a serious PRS is considered to have a greater than 10% chance of containing ~~PCOCs~~ COPCs at a level an order of magnitude greater than SALs and background; a not very serious PRS is considered to have a greater than 1% chance of containing ~~PCOCs~~ COPCs above SALs and background; and, a negligible PRS is considered to have much less than a 1% chance of containing ~~PCOCs~~ COPCs above SALs and background.

An indicator constituent or class of constituents was also designated for each PRS. Indicator constituents are ~~PCOCs~~ COPCs that: 1) are deemed to be likely to present the most serious health risks at a PRS, and 2) can easily be measured using field screening methods. It is important that the indicator constituents not have radically different initial dispersal mechanisms or environmental transport parameters from other potential constituents of serious concern. HE (TNT and RDX) are the indicator constituents for most PRSs considered in Subsections 5.18 through 5.25. HE and HE byproducts, including barium, are by far the most serious ~~PCOCs~~ COPCs based on both amounts used and toxicity at most PRSs in these aggregates. Large amounts (> 100 000 lb) of TNT and RDX were processed through the World

War II era S-Site complex, and both TNT and RDX have low SALs in soil (40 ppm for the former and 64 ppm for the latter). The HE spot test, which is described in Chapter 4, has 100 ppm detection limits for TNT, RDX, HMX, tetryl, and nitrocellulose. HE and HE byproducts are differentially mobilized in arid soil environments (for example, DNT is typically mobilized deeper into the subsurface than TNT and RDX). However, modeling of the relative transport of TNT, RDX, HMX, DNT, TNB, and DNB suggests that screening for TNT, RDX, and HMX would also identify regions in which DNB, DNT or TNB were ~~PCOCs~~ COPCs (Layton et al. 1987, 15-16-447). In World War II era S-Site, barium was discharged to the environment mixed with TNT (baratol), so screening for TNT should generally indicate the location of barium contamination. In addition, because of the high SAL for barium (5 600 ppm) it is of significantly lower concern than HE and organic HE byproducts.

The number of field screening samples for each PRS is determined using ~~the binary presence-absence diagram (Table 4-9) in concert with the~~ designations in the seriousness/heterogeneity tables. Knowledge of processes occurring in the facilities associated with the PRSs allowed identification of those PRSs most likely to contain hazardous constituents. Table 5-0-2 shows the ranges of field screening samples for PRSs in each of these categories. Heterogeneity categories are based on the relative area within a PRS that is likely to be contaminated. If it is assumed that a homogeneous PRS is affected over 50% of its area if it is affected at all, a

TABLE 5-0-2

FIELD SCREENING SAMPLING NUMBERS*

AMOUNT OF CONTAMINATION	VERY HETEROGENEOUS	NOT VERY HETEROGENEOUS	HOMOGENEOUS
Very serious	12 - 25	6 - 16	4-8
Serious	8 - 24	4 - 8	3 - 5
Not very serious	5 - 10	3 - 7	2 - 5
Negligible	3 - 6	1 - 5	1 - 4

* Note that the wide ranges in these categories reflect the significant differences within categories. For example, very heterogeneous sumps and drain lines can include up to nine decommissioned sumps.

not very heterogeneous PRS is affected over 30% of its area if it is affected at all, and a very heterogeneous PRS is affected over 15% of its area if it is affected at all. ~~then these sample numbers provide greater than an 84% chance of detecting the indicator constituents for very serious PRSs, greater than a 72% chance of detecting the indicator constituents for the serious PRSs, and greater than a 54% chance of detecting the indicator constituents in the not very serious PRSs.~~ It is important to note that although the HE spot test has detection limits for TNT (100 ppm) and RDX (100 ppm) that are larger than the SALs for these constituents, the likely mode of dispersal of HE in the World War II era S-Site (primarily through sump and drain line leaks and through cracks in building floors and doors) would lead to small, highly concentrated zones of HE contamination. These hot spots are unlikely to be missed by the HE spot test.

~~The number of laboratory samples for each PRS is designated based on professional judgment using guidance provided by a preliminary application of a Bayesian approach to sampling design (IWP, Appendix H) (LANL 1993, 1017). Based on knowledge of process, engineering drawings, and understanding of the 1960s World War II era S-Site cleanup, a Bayesian prior probability that a single sample taken in a stratified location would be below SALs for each PRS was estimated. This information is summarized for each PRS in Subsections 5.x.3.4. It also is estimated that the cost of a false negative result (HE chunk explosion) is two times greater than the cost of a false positive result (unneeded initiation of a Phase II study) for an HE-contaminated PRS.~~

Laboratory sample numbers ~~derived using this approach~~ are superimposed on Table 5-0-3, a seriousness/heterogeneity table. Typically within any category in this table, sump and drain line PRSs received more samples than building footprint PRSs. The PRSs deemed to be heterogeneous and seriously contaminated received the most samples (up to seven) because they had the largest degree of uncertainty concerning their likelihood of contamination and, thus, there was a large value in collecting additional data. Those PRSs deemed likely to be very seriously contaminated received up to four samples, because fewer samples are needed to locate samples with ~~PCOCs~~ COPCs above SALs in these PRSs than in PRSs with a larger degree of uncertainty. Other less serious and more homogeneous PRSs are assigned fewer samples (Table 5-0-3).

TABLE 5-0-3

LABORATORY SAMPLING NUMBERS

AMOUNT OF CONTAMINATION	VERY HETEROGENEOUS	NOT VERY HETEROGENEOUS	HOMOGENEOUS
Very serious	3 - 4	3 - 4	1 - 2
Serious	3 - 7	2 - 4	2 - 4
Not very serious	2 - 4	2 - 3	1 - 2
Negligible	0 - 3	0 - 2	0 - 1

Hypothetical Example of Application of Design Criteria to Typical PRSs

A simple example illustrates the application of these methods to typical World War II era S-Site PRSs.

Figure 5-0-4 shows PRSs associated with the site of a decommissioned HE processing building and its decommissioned sump and drain line. The soil beneath the decommissioned process building is estimated to be potentially heterogeneously contaminated because any HE within its footprint is likely to be derived from localized wastewater discharge through cracks in the building's floor and door. The building footprint is estimated to have serious potential for contamination because thousands of pounds of HE were processed in the building and the building was steam cleaned daily for ten years. The soil associated with the sump and drain line is likely to be heterogeneously contaminated because HE waste is likely to have leaked from drain line joints, particularly the joint between the sump and drain line (Martin and Hickmott 1993, 15-16-497). Any contamination of the sump and drain line is likely to be serious, because the 1960s World War II era S-Site cleanup only remediated HE in soils above a level of 3 wt %, which is nearly three orders of magnitude larger than the SALs for TNT and RDX.

Based on consideration of the seriousness/heterogeneity table (Table 5-0-2), ten field screening samples were designated in the process building PRS and twelve are designated in the sump/drain line PRS. Eight of those ten samples for the process building PRS are distributed randomly within the building footprint because the location of any floor leaks is unknown; hence, any soil contamination is likely to be heterogeneous and at a fairly

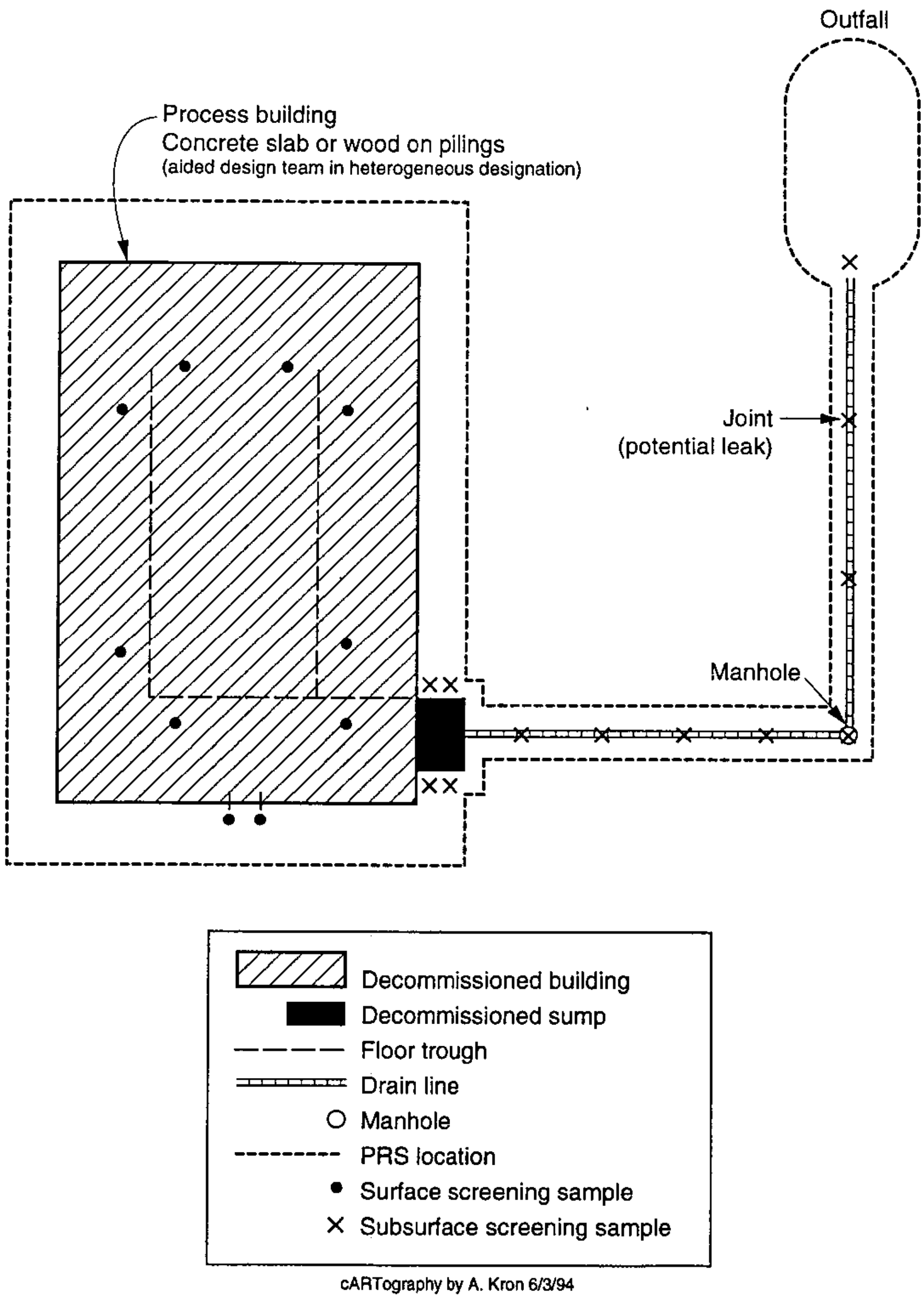


Fig. 5-0-4. Schematic diagram showing typical groups of SWMUs covered in Subsections 5.18 through 5.25.

high level (perhaps 1 wt %). Two samples are biased to the doorway area because steam washing likely would wash HE-rich wastewater through the doorway. For the sump/drain line PRS four biased screening samples will be taken in the sump area, as determined from orthocorrected 1965 aerial photographs; site workers report that the majority of HE found in soils during the 1960s cleanup was located within twenty feet of the sumps. The remaining eight samples are distributed at irregular intervals along the former location of the drain line; any leaks from the drain lines are likely to have been located near pipe joints and hence, heterogeneous and at a moderate level (perhaps 1 wt %).

For this hypothetical example, the OU 1082 Team estimates a 90% chance that a single stratified sample in either the footprint or sump/drain line would be below SALs for TNT or RDX. After consideration of a Bayesian statistical design based on this 90% prior probability, professional judgment is used to select five laboratory samples for the sump and drain line and three laboratory samples within the building footprint.

This simple example illustrates the processes used to arrive at the number of field and laboratory samples for each PRS considered in Subsections 5.18 through 5.29.

5.26 Surface Contamination Aggregate

5.26.1 Background

This aggregate contains PRSs related to small decommissioned structures. All of the structures have been decommissioned and removed. Their former locations were determined using aerial photographs, archival information, and site visits. With a few exceptions, the functions of these buildings have been confirmed by former employees. Seven of the ten structures in this aggregate were magazines used for HE storage; therefore, HE is a common CPOC. Although no PRS in this aggregate is known to be contaminated, all have a possibility of contamination due to possible spills or poor housekeeping practices.

Generally, HE-contaminated buildings were destroyed by burning. No building in this aggregate was regarded as sufficiently HE-contaminated to be burned. The method of decommissioning these structures is not known. This is probably because the HE stored in the magazines was tightly packaged and well contained, unlike HE in inspection and process facilities. No structure had a sump or outfall that would require sampling to extend significantly beyond the building footprint. The PRSs in this aggregate are listed in Table 5-26-1.

5.26.1.1 Description and History

The PRSs of this aggregate are distributed around the periphery of the decommissioned World War II era area that most of them once served. They are grouped by location and function.

SWMUs 16-024(j), 16-024(s), 16-024(i), and 16-024(v) contain potentially contaminated surface soil associated with HE magazines TA-16-65, TA-16-60, TA-16-64, and TA-16-62 (Figs. 5-26-1, 5-26-2, 5-26-3). All four magazines had concrete floors and each had soil piled against three sides of the building but not over the top.

TA-16-62 [SWMU 16-024(v)], TA-16-64 [SWMU 16-024(i)], and TA-16-65 [SWMU 16-024(j)] were built in 1944 outside the HE exclusion zone. S-Site was expanded between 1944 and 1946 to handle larger volumes of HE, which led to construction of larger receiving magazines inside the exclusion zone. As a result of the expansion, TA-16-62, TA-16-64, and TA-16-65 were retired as HE magazines after 12 to 18 months of service (Martin and Hickmott 1994, 15-16-549). The structures

TABLE 5-26-1

SURFACE SOIL CONTAMINATION PRSs AT S-SITE

PRS	HSWA STATUS	CURRENT STRUCTURE NUMBER	FORMER STRUCTURE NUMBER	DESCRIPTION	DIMENSIONS (FT)
16-024(a)	Non-HSWA	TA-16-488	P-14	Decommissioned HE magazine	Unknown
16-024(i)	Non-HSWA	TA-16-64	S-68	Decommissioned HE magazine	10 x 20
16-024(j)	Non-HSWA	TA-16-65	S-69	Decommissioned HE magazine	10 x 20 x 8.5
16-024(s)	Non-HSWA	TA-16-60	S-59	Decommissioned HE magazine	20 x 60 x 8.5
16-024(t)	Non-HSWA	TA-16-464	Unknown	Decommissioned HE magazine	Unknown
16-024(u)	Non-HSWA	TA-16-481	P-7	Decommissioned HE magazine	7 x 7 x 8
16-024(v)	Non-HSWA	TA-16-62	S-66	Decommissioned HE magazine	6 x 6 x 7
16-025(d2)	HSWA	TA-16-480	P-6	Decommissioned mockup chamber	16 - octagonal
16-034(h)	HSWA	TA-16-137	S-142	Decommissioned plumbing and electrical shop	L-shaped, 29 x 32 and 30 x 46
16-034(j)	HSWA	TA-16-190	S-144	Decommissioned drum storage rack	9 x 33 x 3
C-16-011	Non-HSWA	TA-16-132	S-137	Decommissioned paint shop	17 x 40 x 9 with a 9 x 40 x 7 porch
C-16-060	Non-HSWA	TA-16-479	P-5	Storage building for TA-16-480	16 x 16 x 8

were removed in 1968, 1961, and 1951 respectively. Because they were not considered seriously contaminated, plumbers and carpenters were allowed to use them for storage (Martin and Hickmott 1994, 15-16-549).

The area these three magazines once occupied is outside the current HE exclusion zone. Administration building TA-16-204 currently covers a portion of the site of TA-16-65 [SWMU 16-024(j)], removed in 1951 (Fig. 5-26-1). There is public access to the regions once occupied by TA-16-62 [SWMU 16-024(v)], which is about 100 ft east of TA-16-540 in a grassy field that slopes east (Fig. 5-26-2), and TA-16-64 [SWMU 16-024(i)], which is about 80 ft north of the S-Site main gate and under the asphalt driveway that serves the gate and the parking lot (Fig. 5-26-1).

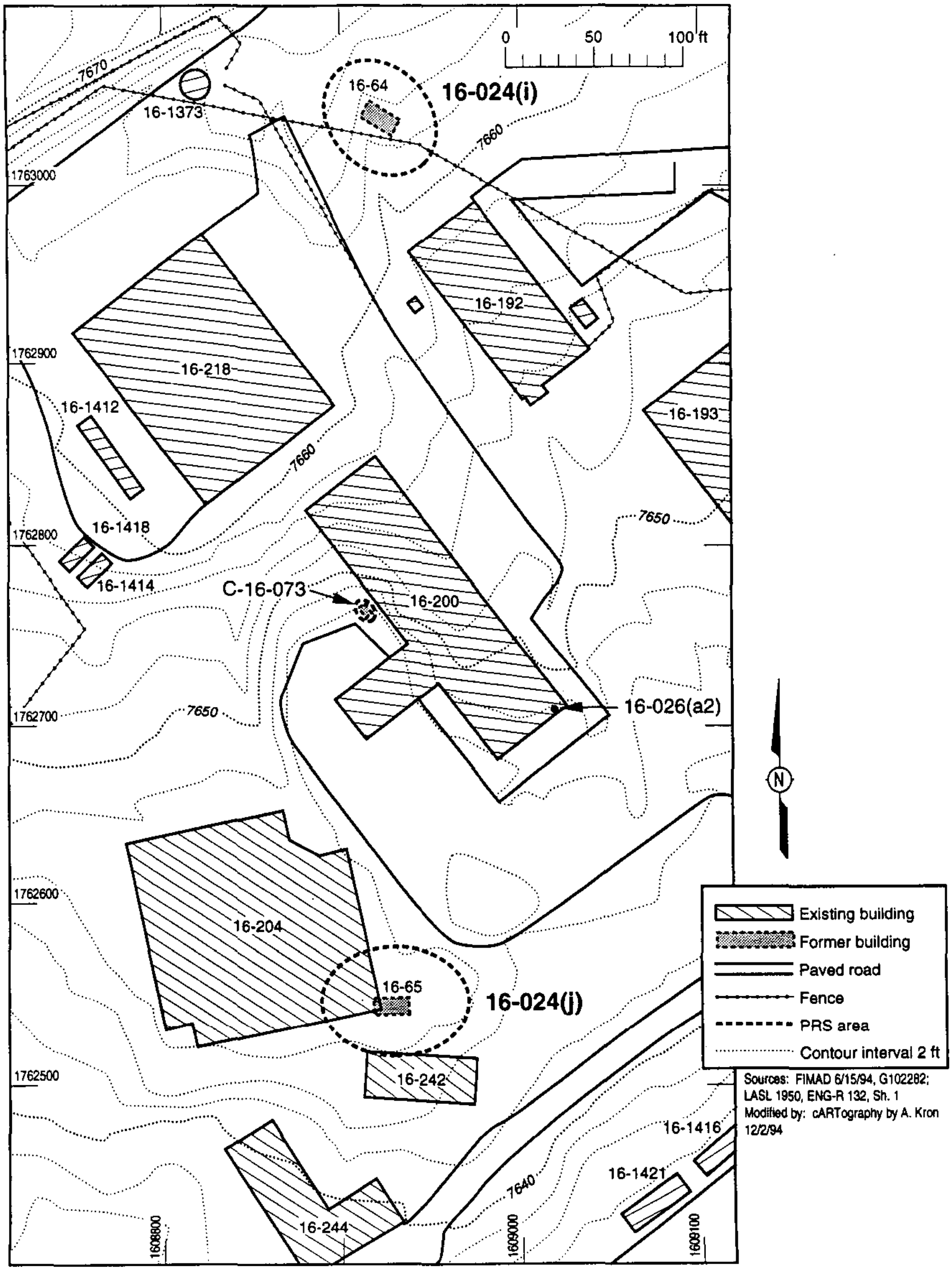


Fig. 5-26-1. Locations of SWMUs 16-024(i and j) in the administration area.

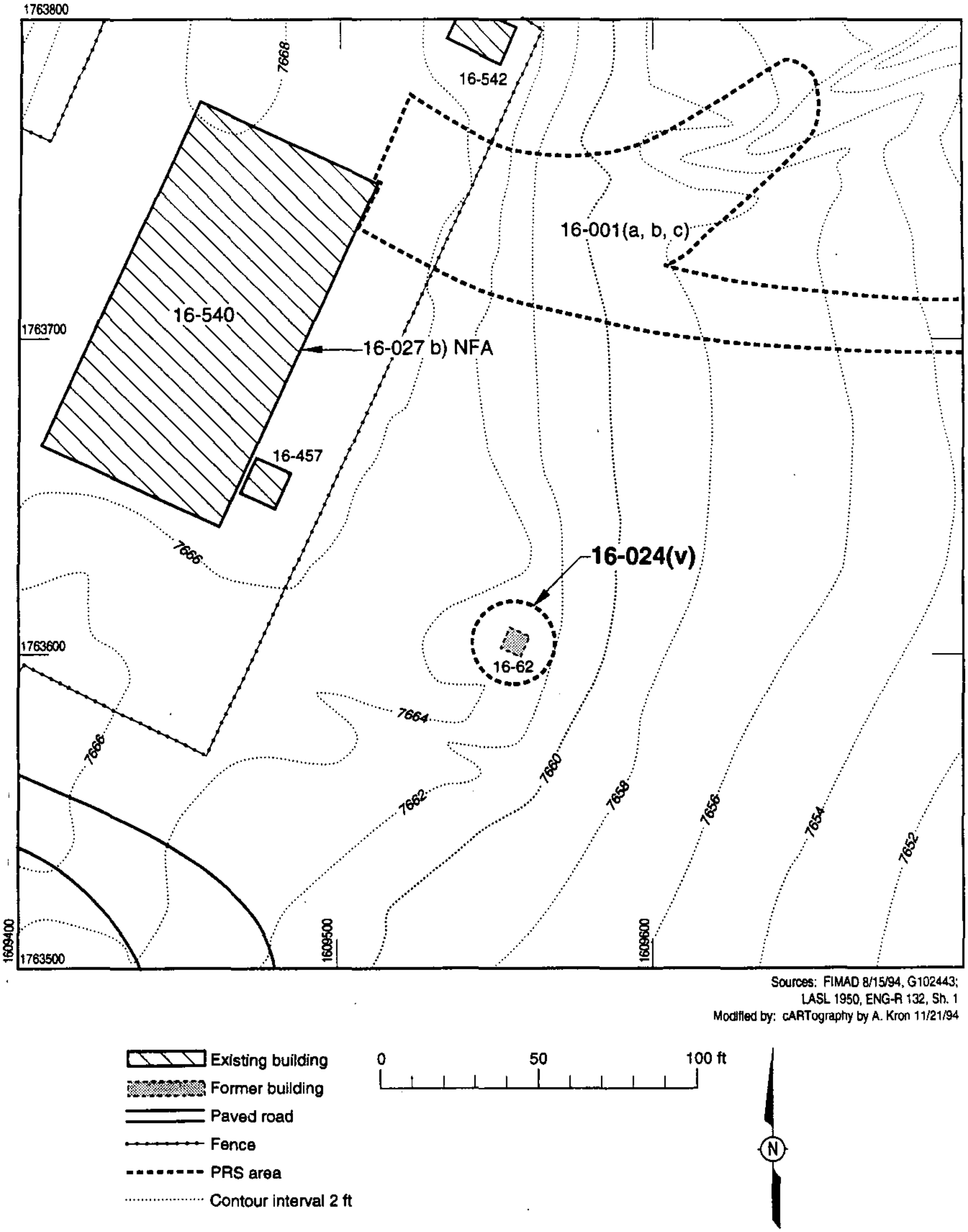
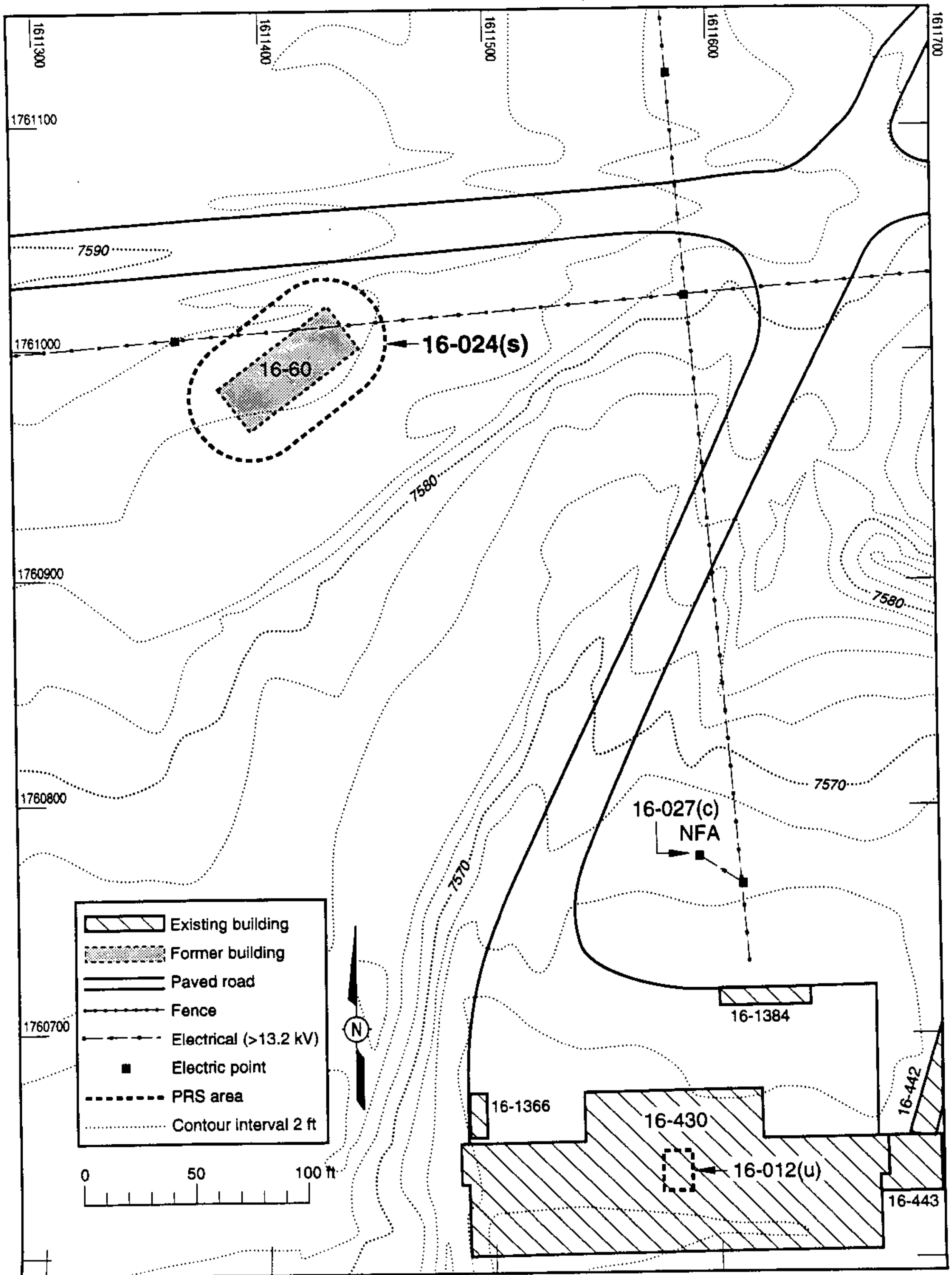


Fig. 5-26-2. Location of SWMU 16-024(v) near TA-16-540.



Sources: FIMAD 8/17/94, G102448; LASL 1950, ENG-R 132, Sh. 1
Modified by: cARTography by A. Kron 11/22/94

Fig. 5-26-3. Location of SWMU 16-024(s) near TA-16-430.

TA-16-60 [SWMU 16-024(s)] was a receiving magazine built in 1945 that was used for storage of finished HE product and packaged, raw HE. It is located inside the HE exclusion zone in a grass- and tree-covered field that slopes southeast. This magazine (Fig. 5-26-3) was removed in late 1950 due to its proximity to the TA-16-435 construction site.

SWMUs 16-024(a) and 16-024(u) contain potentially contaminated surface soil associated with HE magazines TA-16-488 and TA-16-481 (Fig. 5-26-4). These PRSs are located on the eastern edge of S-Site in a region originally called P-Site, TA-13. A detailed description of operations at P-Site is provided in Subsection 5.13. Both magazines were built in 1944 to store HE in support of x-ray diagnostics work on HE lenses (Bradbury 1947, 15-16-320). TA-16-481 [SWMU 16-024(u)] was retired from use in November 1950 (LASL no date, 15-13-016). The magazines were decommissioned and removed in 1951. The former locations of these magazines are approximately known (within 10 to 20 ft) and some evidence of the gravel driveways to the buildings are visible in the level, wooded sites. The construction material used for these magazines is not known. The dimensions of TA-16-488 [SWMU 16-024(a)] are not documented, but the structure appears in a 1947 aerial photograph to be similar in size to TA-16-481.

After mid-1945 P-Site was used for initiator testing. Initiators contained beryllium and polonium, the latter of which has decayed away due to its short (138 days) half-life. Toward the end of 1945, TA-13 was "...used for a variety of miscellaneous experiments for which no other site was quickly available" (Bradbury 1947, 15-16-320). These activities may have involved uranium, many forms of HE, beryllium, and other metals. TA-16-488 [SWMU 16-024(a)] and TA-16-481 [SWMU 16-024(u)] could have been exposed to those materials; however, a former site worker who worked at LANL from 1946 to 1982 listed HE as the sole contaminant of these structures (Blackwell 1983, 15-16-076; Paige 1995, 15-16-600). HE contamination of these magazines from all of these activities might have occurred, but it is likely to be at a low level because HE is not disrupted in magazines.

SWMU 16-025(d2) and C-16-060 contain potentially contaminated surface soil associated with structures TA-16-480 and TA-16-479. These structures were located southwest of the entrance to TA-16-340 (Fig. 5-26-5) in a sloped, grassy area between walkway TA-16-352 and the western access road to TA-16-340. This area is higher in elevation than the present roadbed. Drainage is generally east but local construction of berms, roads, and walkways directs drainage north and south as well.

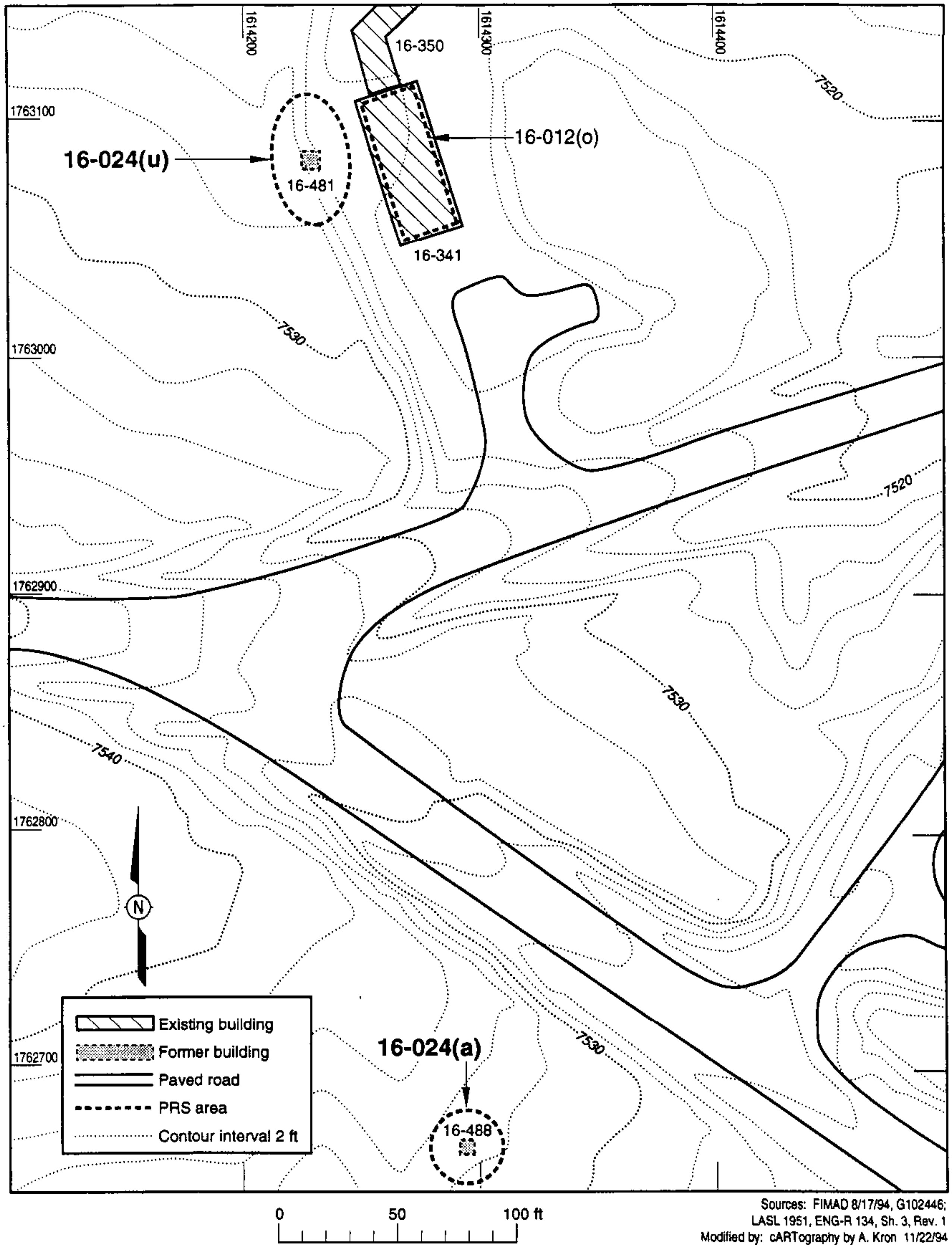


Fig. 5-26-4. Locations of SWMUs 16-024(a and u) at P-Site.

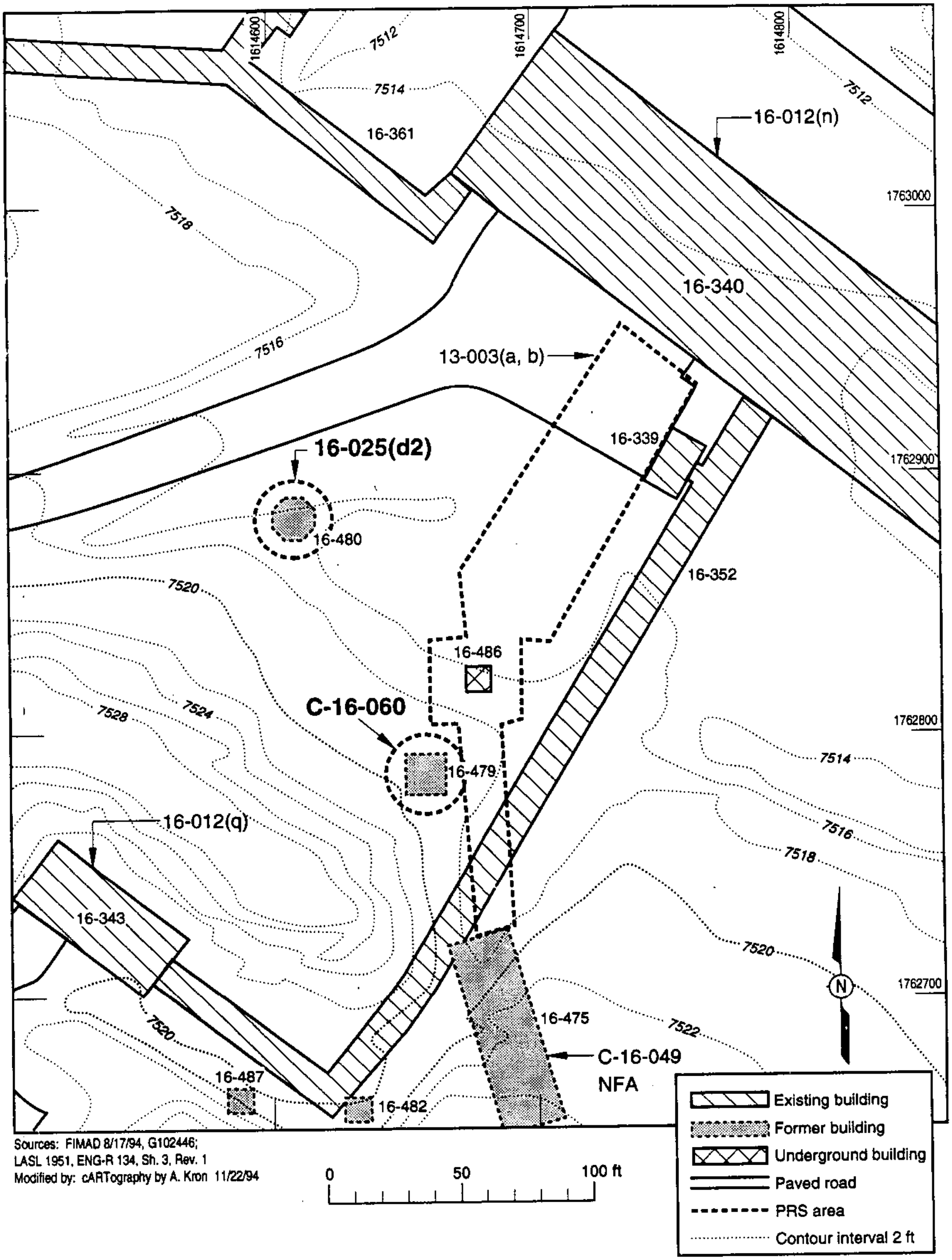


Fig. 5-26-5. Locations of PRSs 16-025(d2) and C-16-060 near TA-16-340.

TA-16-480 and TA-16-479 were originally within P-Site and can be located on a 1947 aerial photograph. The regions associated with SMWU 16-025(d2) and C-16-060 may have been disturbed by construction of TA-16-340 and its associated structures.

TA-16-480 [SWMU 16-025(d2)] was a temporary mockup chamber (ENG-7 drawing A5-C82) built in 1947 and removed in 1951. It was octagonal, approximately 16 ft across, built of logs on a concrete slab, and similar in size to concrete underground chambers used for initiator experiments at other sites. Based on its construction, detonation never occurred in this structure. Prior to 1947 three such chambers had been used at Trinity Site and similar, deeper structures were later built at TA-33 for the same purpose (ENG-C 426 and ENG-C 427). There is no direct documentation of the use of TA-16-480, but it probably was the building referred to in a 1947 memo as "...a hutment to be used for certain mockup arrangements of the experimental equipment required for experiments with highly radioactive sources which are actually to be performed at other locations" (Bradbury 1947, 15-16-320). In addition to radioactive components, the equipment used in these chambers probably contained mercury as well (Morgan 1994, 15-16-603). A former site worker lists TA-16-480 as a place where HE and uranium-238 may have been used (Blackwell 1983, 15-16-076; Paige 1995, 15-16-600). However, given that detonation did not occur in this structure, it seems unlikely that pieces of uranium and HE would be present at the site.

The second structure, TA-16-479 (C-16-060), was a small storage building with a wooden floor, used at P-Site from 1944 to 1949. TA-16-479 was about 50 ft south of TA-16-480 and may have been used to store materials used in the mockup chamber. A former site worker listed TA-16-479 as possibly having uranium-238 present (Blackwell 1983, 15-16-076; Paige 1995, 15-16-600). However, this building was considered clean enough to be moved to TA-33 for further use in August 1949 (ENG-7 structure list).

SWMU 16-024(t) contains potentially contaminated soil associated with decommissioned HE magazine TA-16-464, which was used to store HE brought to TA-16-460 for analysis. TA-16-464 was built in late 1952 and was heavily used until it was removed in 1966 to allow an access road to a replacement magazine, TA-16-463 (Fig. 5-26-6). There are no Engineering drawings of this magazine, so its size, shape, and composition are not known. Examination of an aerial photograph (USAF 1958, S-Site flyover negative ER ID# 0015915) suggests that TA-16-464

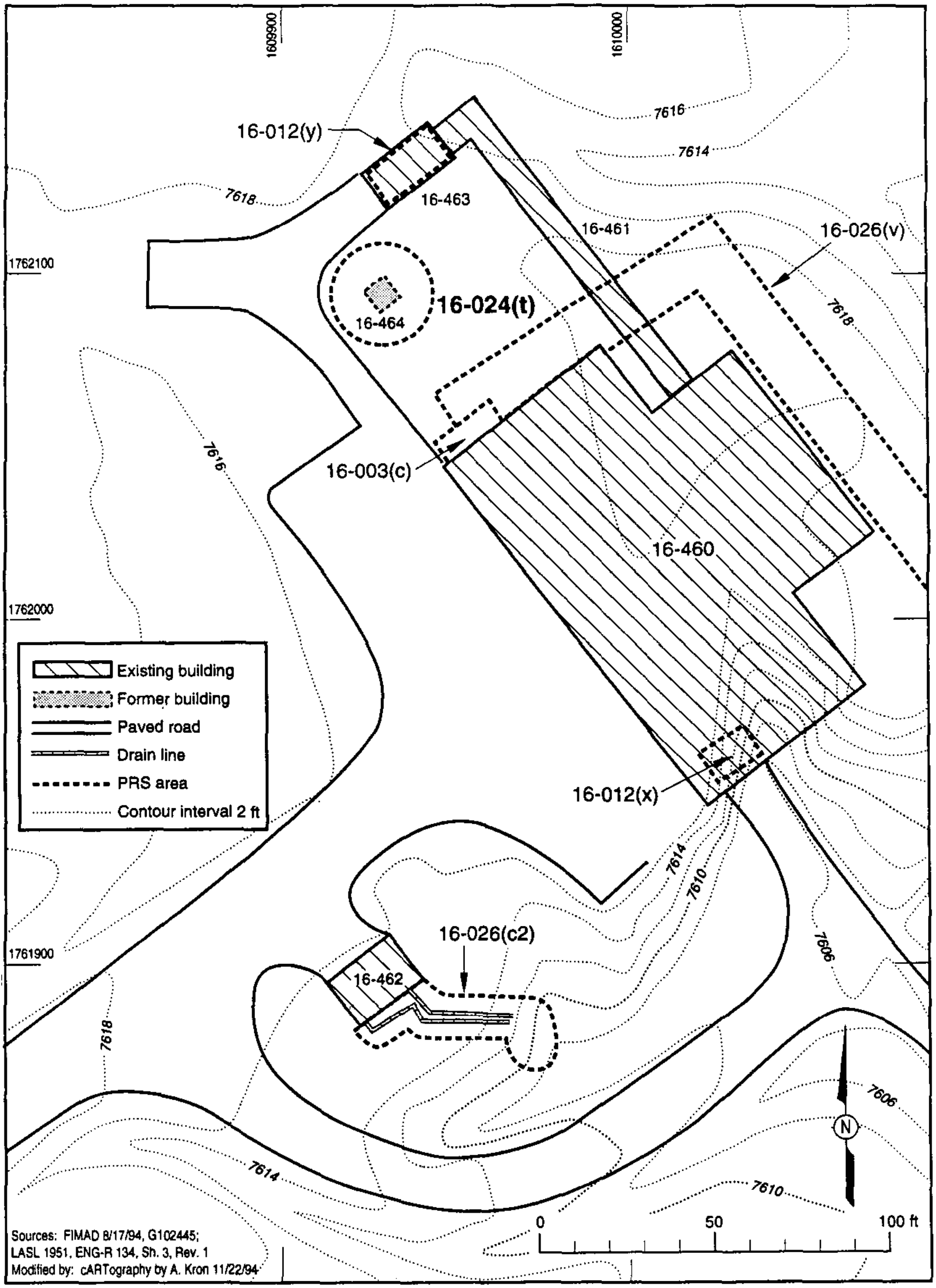


Fig. 5-26-6. Location of SWMU 16-024(t) near TA-16-460.

[SWMU 16-024(t)] was covered by an earthen mound with a half-domed shape. By comparing this with other earthen-covered magazines with known dimensions, building dimensions are estimated to be greater than 10 ft and less than 20 ft. It is located in an industrial, asphalt-covered area. Drainage is generally toward the southeast through culverts. The method of removal and subsequent cleanup of TA-16-464 is not known.

SWMUs 16-034(h,j) and C-16-011 contain potentially contaminated soil associated with a cluster of buildings that was part of a Zia satellite maintenance area used for the upkeep of S-Site buildings (Fig. 5-26-7). Information on other buildings in this cluster is located in Subsection 6.7.2.2. The maintenance area was built in 1944 and 1945 and was removed by 1955. The maintenance area included the decommissioned S-Site fire station; its foundation still exists. The area is west of West Road, the only entry to S-Site prior to 1951. This road was fenced on the east side and beyond this point no HE was allowed. That is, the road formed the boundary of the HE exclusion zone. The most likely source of contamination to any of these structures would have occurred as a result of personnel and equipment inadvertently introducing HE particles or chunks into the area. A site worker, who was familiar with the Zia maintenance area throughout its lifetime, believes that policies and practices of the time ensured that no HE contamination would be present in the Zia maintenance area (Miller 1994, 15-16-552). The maintenance area is located on a grassy area that slopes gradually east.

SWMU 16-034(j) is associated with a drum storage rack, TA-16-190, which was located north of TA-16-139, a small (16 ft long x 16 ft wide x 8 ft high) wooden storage building. The SWMU Report states that TA-16-139 was the structure associated with SWMU 16-034(j) (LANL 1990, 0145). TA-16-139 was determined not to pose a threat to health or the environment. It was a small building, involved in nondisruptive activities (storage), and administratively restricted from HE contamination. However, TA-16-190, which was located adjacent to TA-16-139, was deemed hazardous to the environment and will be addressed as SWMU 16-034(j).

TA-16-190 [SWMU 16-034(j)] was a storage rack for fifteen 55-gal. drums; drums that probably provided lubricants and solvents by gravity feed. This structure is cited in a memo as having stored "various chemicals" (Blackwell 1983, 15-16-076). The ENG-7 structure list claims TA-16-190 was built in 1945; however, the structure cannot be identified in a 1947 aerial photograph. In a 1950 aerial photograph (IS-9,

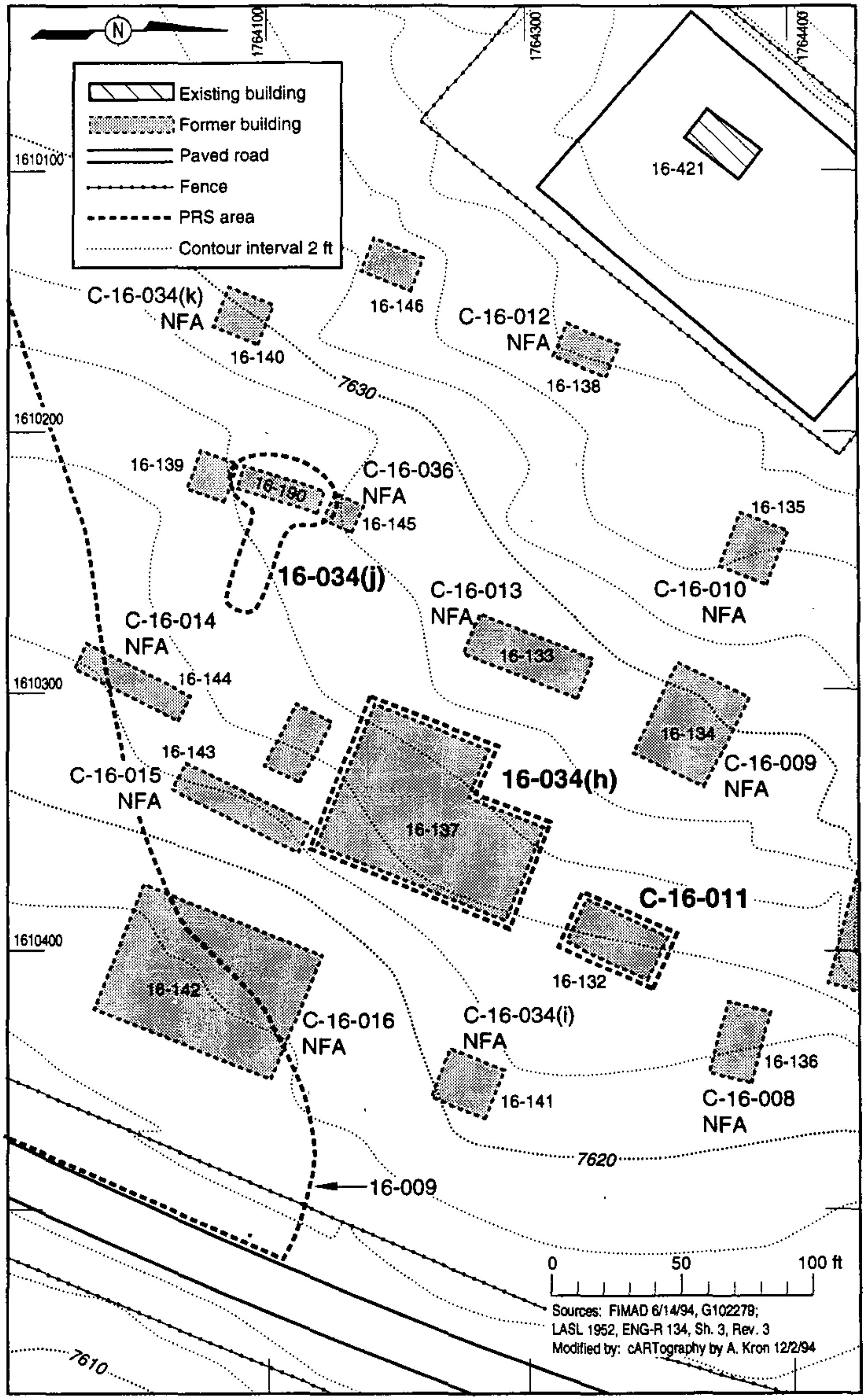


Fig. 5-26-7. Locations of PRSs 16-034(j), C-16-034(h), and C-16-011 in the Zia maintenance area.

September 12, 1950, negative 16339), the drum storage rack appears to rest on a concrete slab with no roof or walls to prevent contaminants from being washed downhill.

SWMU 16-034(h) was TA-16-137, a plumbing and electrical shop. A former site worker specifically states that TA-16-139 through TA-16-146 were not HE contaminated, supporting the argument that administrative controls limited HE contamination in this area (Martin and Hickmott 1994, 15-16-549).

C-16-011 was TA-16-132, a paint shop. A 1950 aerial photograph indicates that the 7 ft high porch is located along the west wall of the structure (IS-9, September 12, 1950, negative 16339).

There are no Engineering drawings of TA-16-132 or TA-16-137; therefore, their structural composition is not known. These structures are listed as having no association with hazardous materials (Blackwell 1983, 15-16-076).

5.26.2 Decision and Investigation Objectives

Generic decision criteria, decision logic, exposure pathways, and conceptual exposure models are located in Sections 4.3 and 5.0 of this document. Site-specific decision information is included in the following subsections.

5.26.2.1 Problem Statement

The Phase I problem is to determine if contaminants are at levels of concern in any PRS in this aggregate. This aggregate consists of miscellaneous potential surface soil contamination at S-Site. The structures include decommissioned magazines and building footprints. There is potential for near-surface (upper 6 in. of soil) and deep-surface contamination (upper 24 in. of soil) at most PRSs in this aggregate. COPCs include HE, radionuclides, metals, and semivolatile and volatile organics (Table 5-26-2). One decommissioned HE facility may have been used for experimental work on radioactive materials including uranium. The probability of contamination is moderate to low for most PRSs because the original source term is likely to be small.

For three PRSs the primary problem is not based on potential HE contamination. COPCs for the decommissioned P-Site building [SWMU 16-025(d2)] include HE, uranium, and other metals. Uranium is the most likely COPC for the decommissioned P-Site storage building (C-16-060). Semivolatile organic compounds are the principal COPCs for the electrical and plumbing shop [SWMU 16-034(h)], drum storage area [SWMU 16-034(j)], and the paint shop (C -16-011).

TABLE 5-26-2

POTENTIAL RELEASE SITES AND CHEMICALS OF POTENTIAL CONCERN CONTAINED IN OU 1082, SURFACE AGGREGATE

				HE			RAD	METALS				
PRS	DESCRIPTION	PRIMARY ACTIVITY LEADING TO A POTENTIAL PROBLEM	ACTIVE	UNDETONATED HE	HE DEGRADATION PRODUCTS	HE BURN PRODUCTS	URANIUM	METALS SUITE	BARIUM	MERCURY	VOLATILES	SEMIVOLATILES
16-024(a)	TA-16-488	HE magazine	N	X	X			X	X			X
16-024(i)	TA-16-64	HE magazine	N	X	X			X	X			X
16-024(j)	TA-16-65	HE magazine	N	X	X			X	X			X
16-024(s)	TA-16-60	HE magazine	N	X	X			X	X			X
16-024(t)	TA-16-464	HE magazine	N	X	X			X	X			X
16-024(u)	TA-16-481	HE magazine	N	X	X			X	X			X
16-024(v)	TA-16-62	HE magazine	N	X	X			X	X			X
16-025(d2)	TA-16-480	Mockup chamber	N	X	X		X	X	X	X		X
16-034(h)	TA-16-137	Plumbing/electrical shop	N					X			X	X
16-034(j)	TA-16-190	Drum storage rack	N					X			X	X
C-16-011	TA-16-132	Paint shop	N					X			X	X
C-16-060	TA-16-479	Storage	N	X	X		X	X	X	X		X

5.26.2.2 Design Criteria

The design criteria for the screening assessment include the perceived severity and heterogeneity of the primary COPC at each PRS. The severity of potential contamination was used to select the number of laboratory samples, and the heterogeneity of the constituents influenced the selection of field screening samples (see Section 5.0 for additional discussion of this approach). Heterogeneity is used here to describe variation in contaminant concentration.

Table 5-26-3 shows the severity and heterogeneity ranks for these PRSs. All of these PRSs were judged to either present a not very serious or negligible probability that contamination is above SALs. The drum storage area [SWMU 16-034(j)], the electrical and plumbing shop [SWMU 16-034(h)], and the paint shop [C-16-011] were judged to pose a not very serious threat of contamination due to a 10-year operational history (1945 to 1955) and, in the case of SWMU 16-034(j), a small potential source (15 drums). It is expected that minor spills would have been common during operations, but the decommissioning activities and subsequent weathering of the site would have reduced the possibility for contamination above SALs.

The P-Site magazines [SWMUs 16-024(a) and 16-024(u)] were judged to present a negligible probability of contamination, but contamination was judged more likely to be heterogeneous due to the uncertain location of these magazines. The mockup chamber [SWMU 16-025(d2)] and associated storage building [C-16-060] at P-Site were similarly judged to present a negligible probability of contamination, but with heterogeneous contamination due to the uncertain location of these structures. The inactive magazine [SWMU 16-024(t)] that was used as a rest house for HE samples to be analyzed was judged to be heterogeneous due to unknown decommissioning activities at that site. The PRSs with potential radioactive contamination were judged to have a negligible probability of contamination, but any potential contamination is expected to be heterogeneous due to the particulate nature of radioactive contamination. Thus, additional field screening samples are warranted for these PRSs. Decommissioned magazines with cement floors [SWMUs 16-024(i), 16-024(j), 16-024(s), 16-024(v)] that received unopened, packaged HE are expected to have a negligible probability of contamination. Decommissioning activities are expected to have mixed potential contamination. Therefore, these SWMUs are judged to be not very heterogeneous.

TABLE 5-26-3

GROUPING OF SURFACE PRSs INTO SEVERITY AND HETEROGENEITY CATEGORIES

AMOUNT OF CONTAMINATION	HETEROGENEITY OF POTENTIAL CONTAMINATION WITHIN PRS BOUNDARIES					
	VERY HETEROGENEOUS		NOT VERY HETEROGENEOUS		HOMOGENEOUS	
	PRS	DESCRIPTION	PRS	DESCRIPTION	PRS	DESCRIPTION
Very Serious						
Serious						
Not Very Serious			16-034(j) 16-034(h) C -16-011	Drum storage rack Plumbing and electrical shop Paint shop		
Negligible	16-024(t)	TA-16-464 magazine	16-024(i) 16-024(j)	Magazines with cement floors		
	16-024(a) 16-024(u)	P-Site magazines	16-024(s) 16-024(v)			
	16-025(d2)	Mockup chamber				
	C-16-060	P-Site storage building				

5.26.3 Sampling and Analysis Plan

Standard operating procedures (SOPs) that control field activities in this sampling plan are listed in Table 5-26-4. Appropriate health and safety precautions will be undertaken according to the ER Project SOPs (LANL 1993, 0875) and the site-specific health and safety plan. Sampling numbers and required analyses are shown in Table 5-26-5. Field quality assurance samples (QA) will be collected according to the guidance provided in the latest revision of the IWP (LANL 1995, 1164). Any QA/QC (quality control) duplicate samples planned to be collected during the course of the field investigations are included in Table 5-26-5.

Fixed-base laboratory analysis of samples will be at Level III for radionuclides (LANL or DOE method), metals (SW-846 Method 6010), semivolatile organic compounds(SVOCs) (SW-846 Method 8270), volatile organic compounds (VOCs)(SW-846 Method 8240), and HE and its byproducts (SW-846 Method 8330).

TABLE 5-26-4

STANDARD OPERATING PROCEDURES FOR FIELD ACTIVITIES

LANL-ER-SOP	TITLE	NOTES
01.02, R0	Sample Containers and Preservation	Applied to all laboratory samples
01.03, R1	Handling, Packaging, and Shipping of Samples	Applied to all laboratory samples
01.04, R2	Sample Control and Field Documentation	Applied to all laboratory samples
03.01, R1	Land Surveying Procedures	Applied to all engineering surveys
06.09, R0	Spade and Scoop Method for Collection of Soil Samples	Applied to all surface samples
06.10, R0	Hand Auger and Thin-Wall Tube Sampler	Applied to all augered samples
12.01, R1	Field Logging, Handling and Documentation of Borehole Materials	Applied to all cored samples

A later version of any SOP will be used if the cited version is superseded.

The principal radionuclide of concern is uranium. TNT and RDX were the types of HE most frequently used at these sites, and the principal HE byproducts of concern are DNT, TNB, and DNB.

TABLE 5-26-5

SUMMARY OF SITE SURVEYS, SAMPLING, AND ANALYSIS FOR SURFACE AGGREGATE

PRS	PRS TYPE	SAMPLED MEDIA	LABORATORY # NEAR-SURFACE	FIELD DUP	DEEP-SURFACE	FIELD DUP	SUBSURFACE	FIELD DUP	FIELD SCREENING # BTEX TEST KIT	GROSS GAMMA/BETA	ORGANIC VAPOR	HE SPOT TEST	GEOPHYSICS SURFACE	BARIUM - LIBS	A GEOLOGICAL CHARACTERIZATION	FIELD GROSS ALPHA	GROSS GAMMA/BETA	HIGH EXPLOSIVES	VOLATILE ORGANICS	B XRF	SOIL MOISTURE	LABORATORY ANALYSES # ALPHA SPECTROSCOPY	GAMMA SPECTROSCOPY	C BETA SPECTROSCOPY	TOTAL URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC URANIUM	D VOCs (SW 8240)	E SEMIVOLATILES (SW 8270)	F METALS (SW 6010)	G ASBESTOS	H HIGH EXPLOSIVES (SW 8330)	MERCURY
16-024(a)	Magazine	Soil			1					6		6		6				*											1	1		1	
16-024(i)	Magazine	Soil			1					5		5		5				*											1	1		1	
16-024(j)	Magazine	Soil			1					5		5		5				*											1	1		1	
16-024(s)	Magazine	Soil			1					5		5		5				*											1	1		1	
16-024(t)	Magazine	Soil			1					6		6		6				*											1	1		1	
16-024(u)	Magazine	Soil			1					6		6		6				*											1	1		1	
16-024(v)	Magazine	Soil			1	1				5		5		5				*											1	1		1	
16-025(d2)	Magazine	Soil			1					8		8		8				*							1				1	1		1	1
16-034(h)	Shop	Soil					2		6	6	6	6						*										2	2	2			
16-034(j)	Drum storage	Soil					4	1	6	6	6	6						*										4	4	4			
C-16-011	Paint shop	Soil					2		4	4	4	4						*										2	2	2			
C-16-060	Storage	Soil			1					8		8		8				*							1				1	1		1	1

= The actual number of samples will depend on the results of the field screening and the depth of the cores. These numbers are a minimum.

A, B, C, D = not applicable; E = full suite; F = 1082 suite; H = full suite.

* All samples with positive HE spot test results will be analyzed in the field for HE content in order to permit transportation of samples.

5.26.3.1 Sampling

All samples will be field screened for HE by spot test and radionuclides by gross beta-gamma. Each sample will be field screened at the midpoint of 12-in. intervals. The detection limits of the HE spot test are at a level such that a positive reading for TNT or RDX indicates a sample with contamination at a level above its SAL. All samples greater than a 6 in. depth will be field screened for volatile organic compounds with a photoionization detector (PID). SOPs for these procedures are currently in place. All samples that yield positive readings defined as a positive HE or PID reading or a metals or radiation reading (twice background or more) or are positive for other field screening tests will be sent for laboratory analysis. If multiple positive screenings are obtained on a core, the shallowest positive interval, the deepest positive interval, and the interval below the deepest interval will be submitted for laboratory analysis in order to bound the extent of contamination. If the deepest interval of a core section field screens positive, that interval and a sample collected two feet below that interval will be sent for laboratory analysis. In the absence of positive field screening readings, a hierarchy for selecting laboratory samples is included with each sampling plan.

All near-surface samples will be augered to six-inch depth. All deep-surface samples will be augered to a 24-in. maximum depth. Each subsurface core will be augered to a depth of three feet or the soil-tuff interface. The field team leader has the option to focus screening and select laboratory samples at a given depth for deep surface cores taken in a PRS.

The spatial boundaries of potential contamination for the surface aggregate include the PRS boundaries for the magazines or decommissioned buildings. Although the original location of COPCs at the building footprint was the soil surface (less than 6 in.), decommissioning activities likely redistributed or covered the COPCs. For each PRS, sampling points will be biased to areas believed most likely to contain the highest concentrations of COPCs based on field screening, orthocorrected aerial photographs, archival data, and the results of geomorphological surveys. Sample parameters, including complete lists of COPCs to be analyzed in the laboratory, are summarized in Table 5-26-5. Field-screening locations are shown in individual figures referenced in the sampling plans below.

SWMU 16-034(j) Sampling the drum storage rack footprint in the Zia maintenance area is designed to detect residual volatile and semivolatile organic compounds on the disturbed surface of this SWMU. Six subsurface cores will be field screened with an immunoassay test kit to detect BTEX (benzene, toluene, ethylbenzene, and xylene). Two cores will be taken within the structure footprint and four will be taken downgradient, for a total of six cores (Fig. 5-26-8). Sampling locations will be biased to stained locations; no such locations were observed during preliminary reconnaissance surveying of the site. At least four samples will be chosen for laboratory analysis from these six cores. In the event that no positive samples are identified with field screening, then the shallowest interval and the interval containing the soil-tuff interface will be selected from the two cores within the structure footprint.

SWMU 16-034(h) Sampling the plumbing and electrical shop footprint in the Zia maintenance area is designed to detect residual volatile and semivolatile organic compounds on the disturbed surface of SWMU 16-034(h). Six subsurface cores will be field screened with an immunoassay test kit to detect BTEX. The field screening locations will be near all six corners of the L-shaped structure, TA-16-137, which constitutes SWMU 16-034(h) (Fig. 5-26-8). Sampling locations will be biased to stained locations; no such locations were observed during preliminary reconnaissance surveying of the site. At least two laboratory samples will be chosen from these six cores. In the event that there are no positive field screening samples, the two samples will be collected from the shallowest increment and the increment containing the soil-tuff interface of a single core selected at random.

C-16-011 Sampling the paint shop footprint in the Zia maintenance area is designed to detect residual volatiles, semivolatiles, and lead on the disturbed surface of this PRS. Four subsurface cores will be field screened with an immunoassay test kit to detect BTEX. The field screening locations will be located in the four quadrants of the structure (Fig. 5-26-8). At least two laboratory samples will be chosen from these four cores. In the event that there are no positive field screening samples, the two samples will be collected from the shallowest increment and the increment containing the soil-tuff interface of the core from the west side of the structure, where the porch formerly stood.

SWMUs 16-024(a and u) Sampling the footprint of these two decommissioned magazines is designed to detect residual HE on the disturbed surfaces of these SWMUs. For each SWMU, six 0 to 24-in. depth samples will be field screened as described above in order to select at least one 12-in. core segment of the six cores for laboratory analysis. The six field screening points will be located in each quadrant of the building's footprint, in the center of the footprint, and one foot downgradient from the door (Fig. 5-26-9). In the absence of positive field screening readings, soil

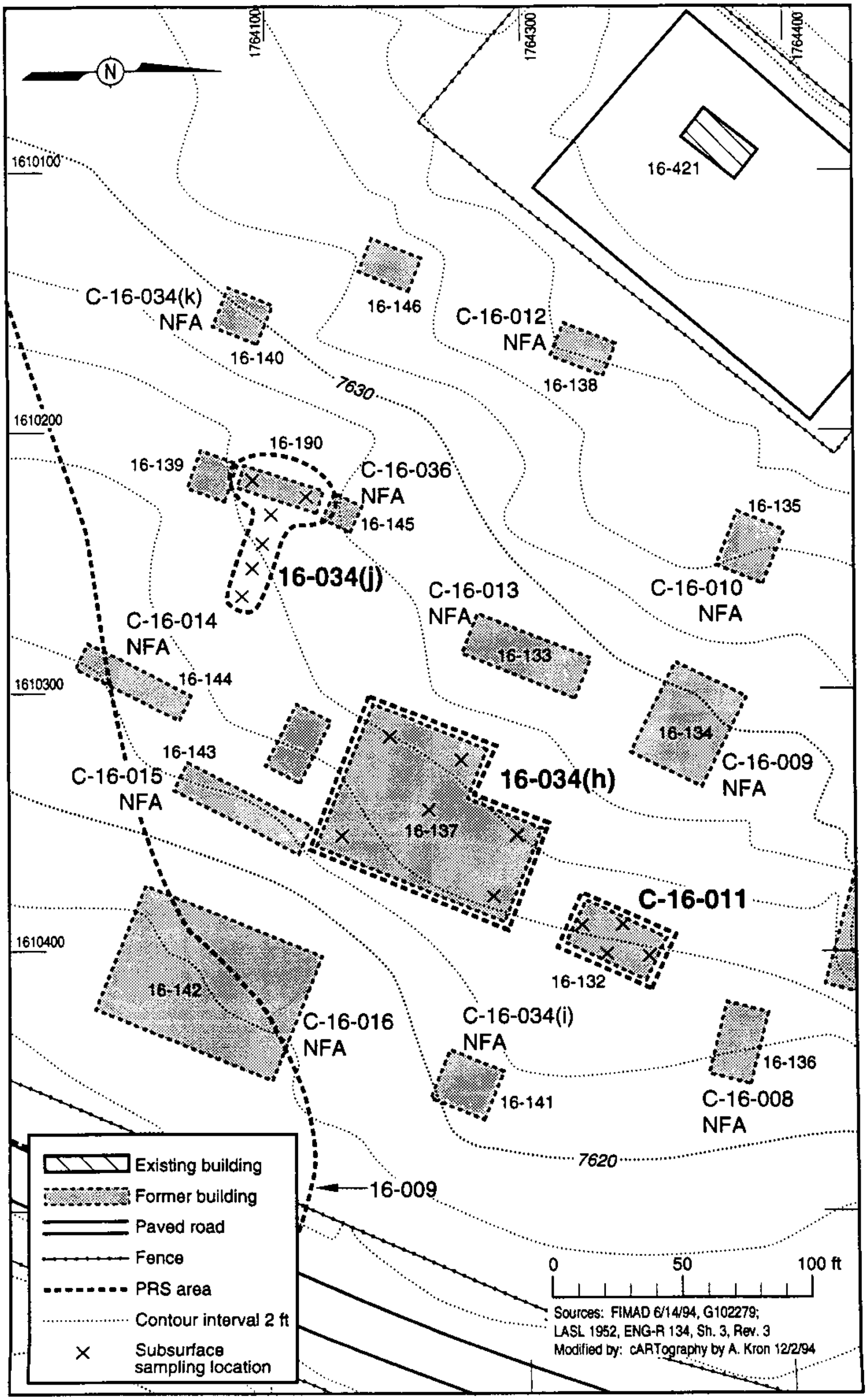


Fig. 5-26-8. Sampling locations for SWMU 16-034(j), 16-034(h), and 16-011 in the Zia maintenance area.

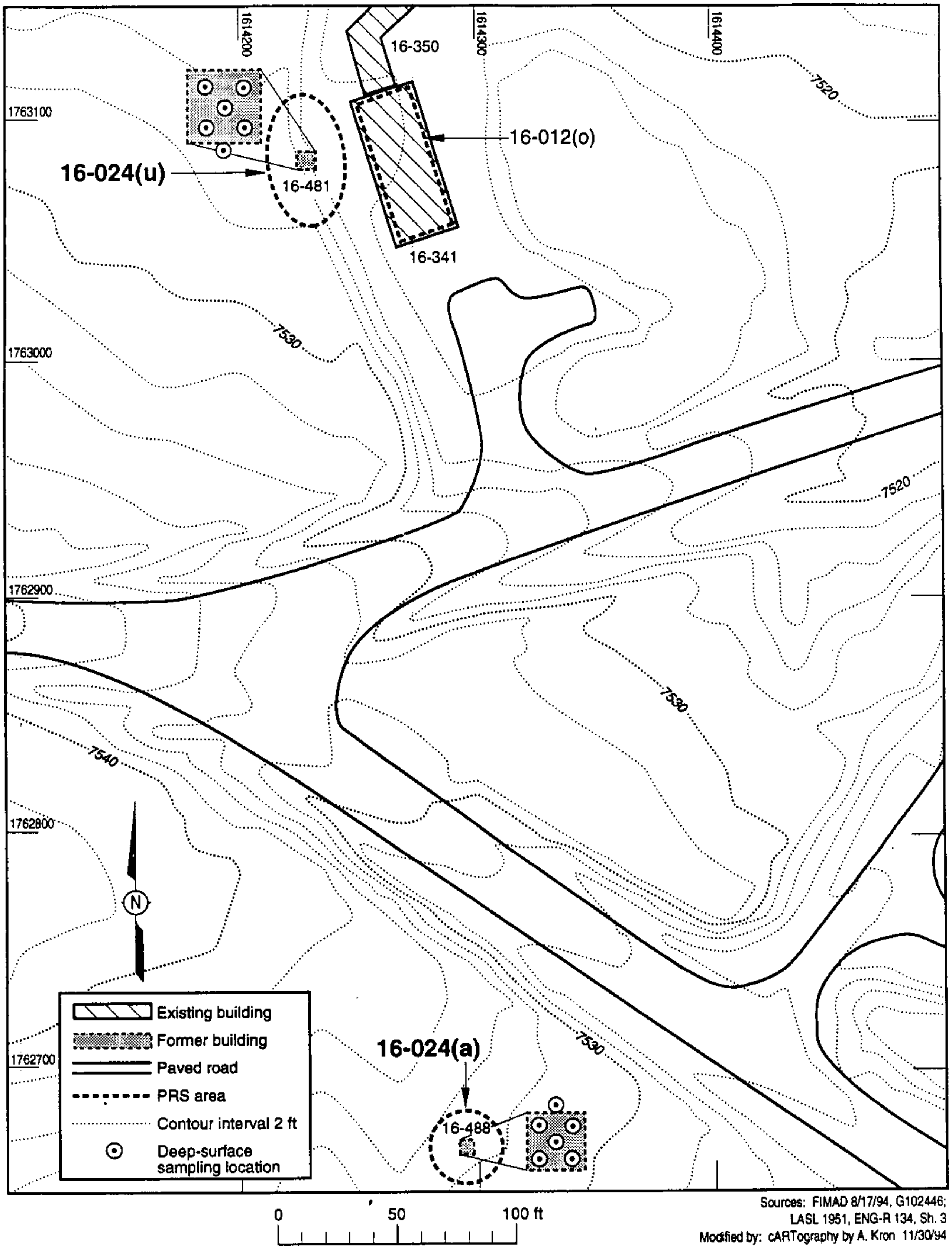


Fig. 5-26-9. Sampling locations for SWMUs 16-024(a and u), decommissioned magazines at P-Site.

samples for laboratory analysis will be collected from the deepest segment of the core augered near the former location of the door.

SWMU 16-024(t) Sampling the footprint of this magazine is designed to detect residual HE on the surface of this SWMU. Six 0 to 24-in. core samples will be field screened in order to select at least one 12-in. sample for laboratory analysis. The six field screening points will be located in each quadrant of the building's footprint, in the center of the footprint, and one foot downgradient from the door (Fig. 5-26-10). In the absence of positive field-screening readings, the soil sample for laboratory analysis will be collected from the deepest segment of the core augered near the former location of the door.

SWMU 16-025(d2) and C-16-060 Sampling the footprint of the temporary mockup chamber and the footprint of a small P-Site storage building is designed to detect residual radionuclides on the disturbed surfaces of these SWMUs. Within each SWMU, eight 0 to 24-in. samples will be field screened for HE and radionuclides in order to select at least one 12-in. sample for laboratory analysis. These field-screening locations are shown on Fig. 5-26-11 with two samples located in each quadrant of each footprint. In the absence of positive field screening readings, the two soil samples for laboratory analysis will be selected randomly from the deepest interval of the screened samples.

SWMUs 16-024(i,j,s,v) Sampling the footprint of these four decommissioned magazines is designed to detect residual HE on the disturbed ground surfaces. For each SWMU, five 0 to 24-in. samples will be field screened in order to select at least one 12-in. segment of the five cores for laboratory analysis. The five field screening samples will be located in each quadrant of the building's footprint and one foot downgradient from the door of each structure (Figs. 5-26-12, 5-26-13, 5-26-14). Because TA-16-204 may partially cover the former location of the northwest corner of TA-16-65 [SWMU 16-024(j)], the sample that would have been collected from that quadrant will be collected from the former center of the structure. Samples from TA-16-64 [SWMU 16-024(i)] will need to be cored through the asphalt parking lot which is currently located on top of the SWMU. In the absence of positive field screening readings, the one soil sample for laboratory analysis will be selected randomly from the deepest intervals of the screened samples.

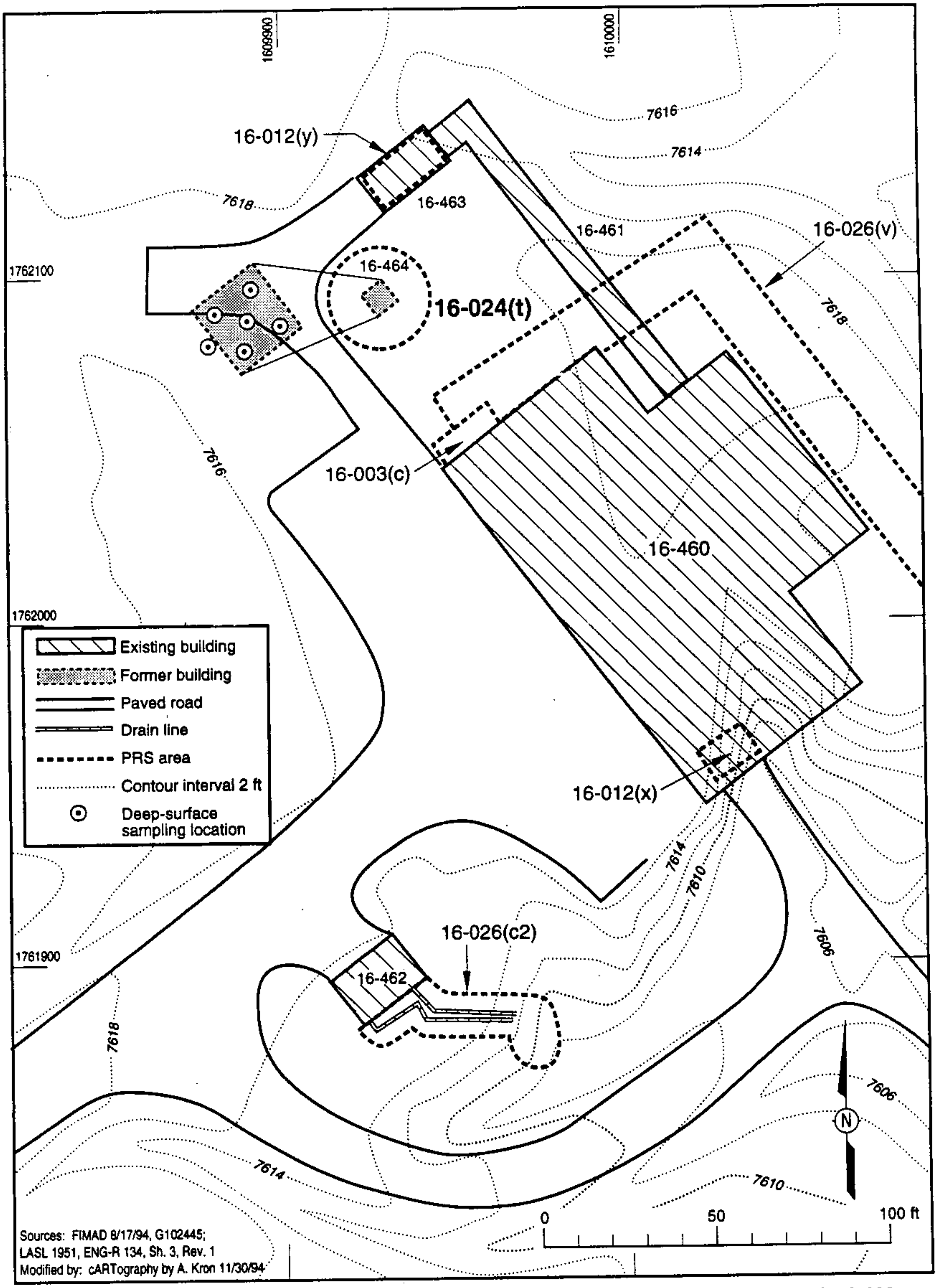


Fig. 5-26-10. Sampling locations for SWMU 16-024(t), decommissioned magazine near TA-16-460.

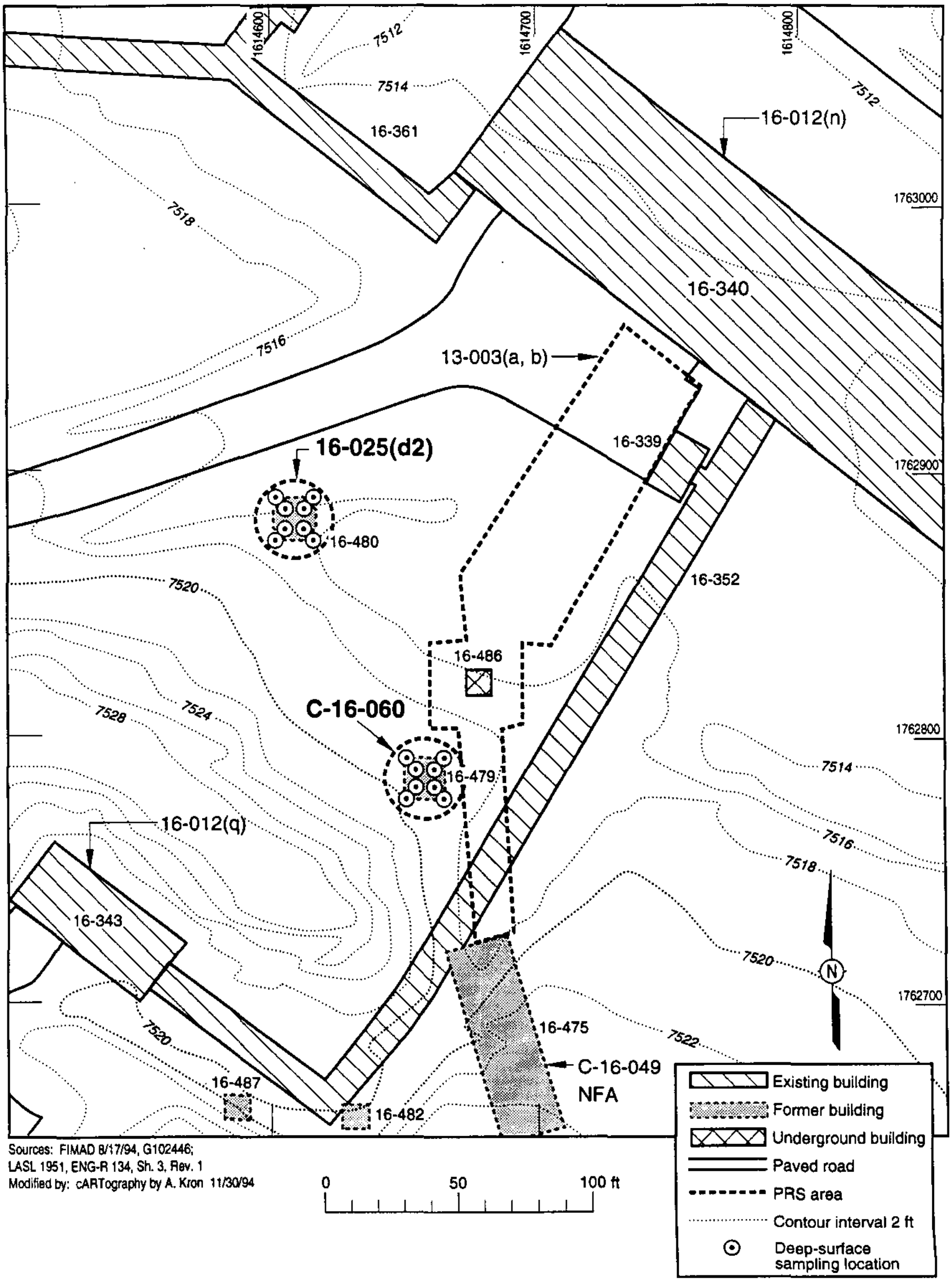


Fig. 5-26-11. Sampling locations for PRSs 16-025(d2) and C-16-060, decommissioned buildings near TA-16-340.

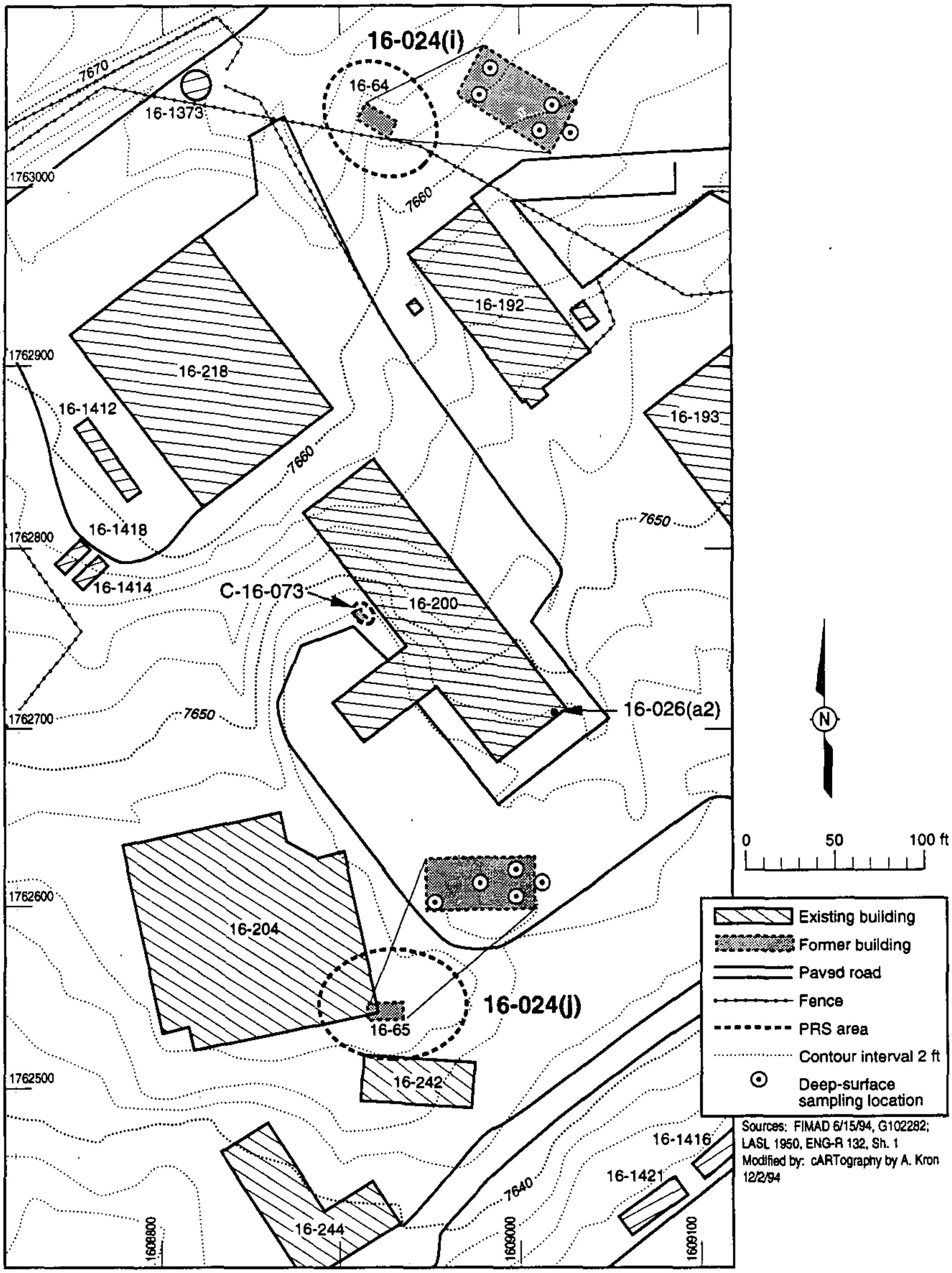
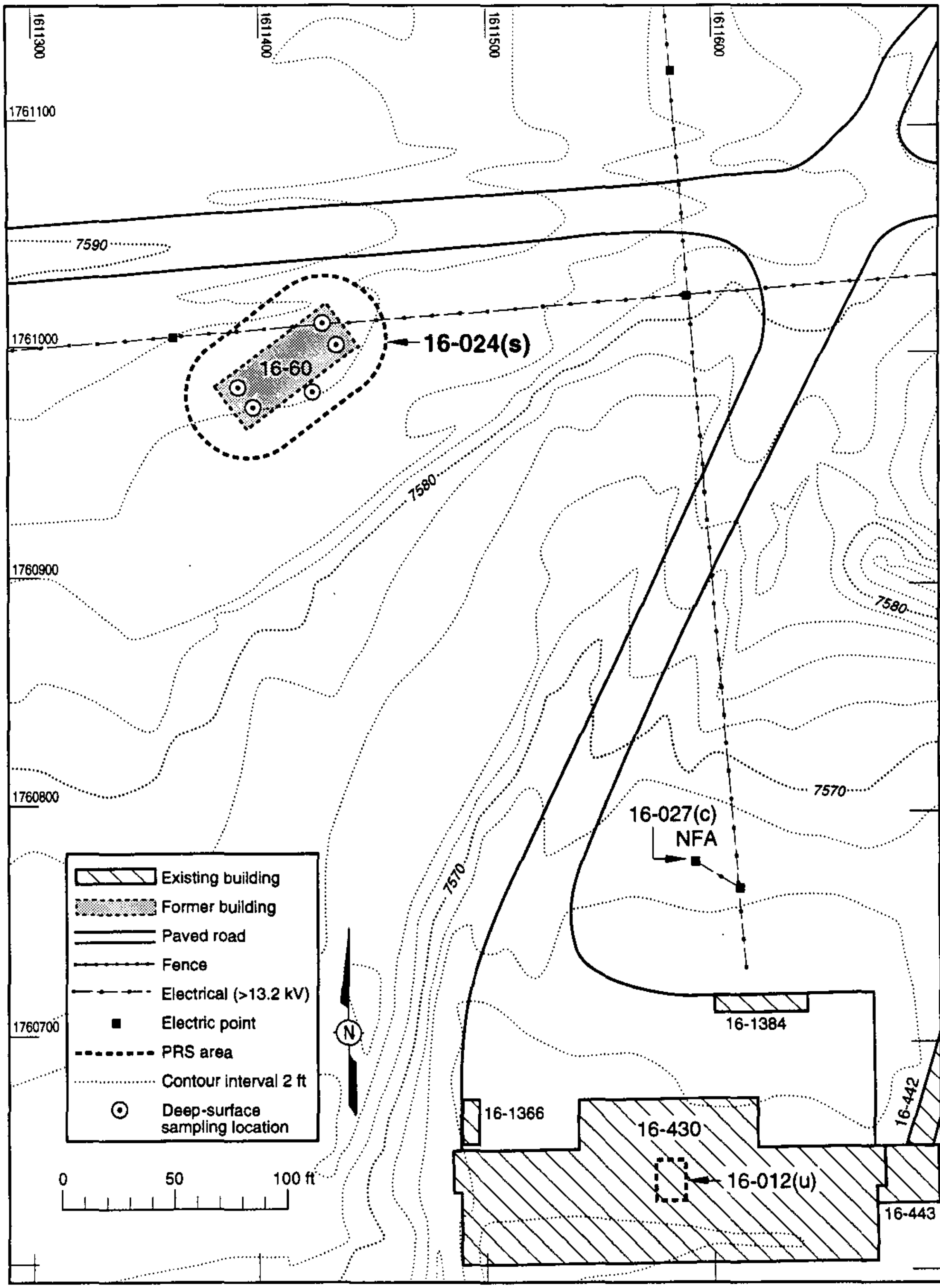


Fig. 5-26-12. Sampling locations for SWMUs 16-024(i and j), decommissioned magazines in the administration area.



Sources: FIMAD 8/17/94, G102448; LASL 1950, ENG-R 132, Sh. 1
Modified by: cARTography by A. Kron 11/28/94

Fig. 5-26-13. Sampling locations for SWMU 16-024(s) near TA-16-430.

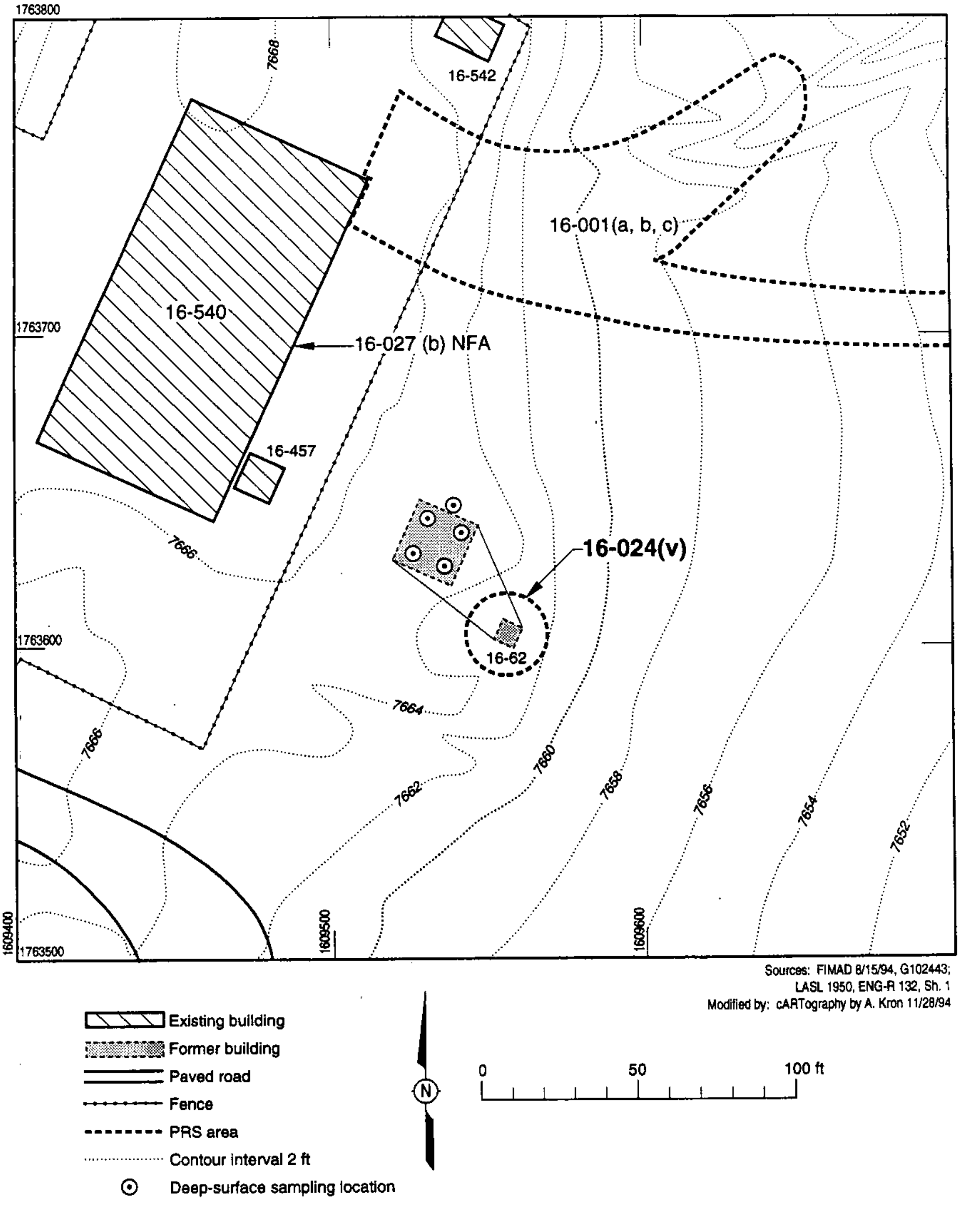


Fig. 5-26-14. Sampling locations for SWMU 16-024(v) near TA-16-540.

5.27 Underground Storage Tanks Aggregate

5.27.1 Background

This aggregate consists of two PRSs (Table 5-27-1). SWMU 16-033(e) and C-16-073 are underground storage tanks (USTs) that present possible subsurface soil contamination. Most of the contamination is expected to be under the former locations of the tanks and their associated piping.

TABLE 5-27-1

UNDERGROUND STORAGE TANKS AT TA-16

PRS	HSWA STATUS	STRUCTURE NUMBER	DESCRIPTION	COMMENTS
16-033(e)	Non-HSWA	Unknown	Two tanks located northwest of TA-16-10	No structure numbers; no information; no installation or removal dates
C-16-073	Non-HSWA	Unknown	Tank served an emergency generator in the basement of TA-16-200	No structure number; no installation or removal dates

5.27.1.1 Description and History

The USTs located at TA-16 contained fuel. Their use was in no way related to building activities or processes. The fuel tanks listed below will be sampled due to insufficient information concerning their abandonment and subsequent removal. They have not been accurately located, despite preliminary magnetic surveys.

SWMU 16-033(e) consists of two underground fuel tanks, associated fuel lines, and pump base located northwest of TA-16-10 in a level, industrialized area which drains to the east (Fig. 5-27-1). Because the tanks have no structure numbers, there is no existing information as to their capacity, dimensions, or installation and removal dates.

A 1967 memo regarding a radioactive contamination survey mentions monitoring two underground gasoline tanks northwest of TA-16-10; no additional information is given (Buckland 1967, 15-16-131). These are believed to be the tanks associated with SWMU 16-033(e). A number of former site workers were contacted concerning the monitoring survey but none recalls these tanks.

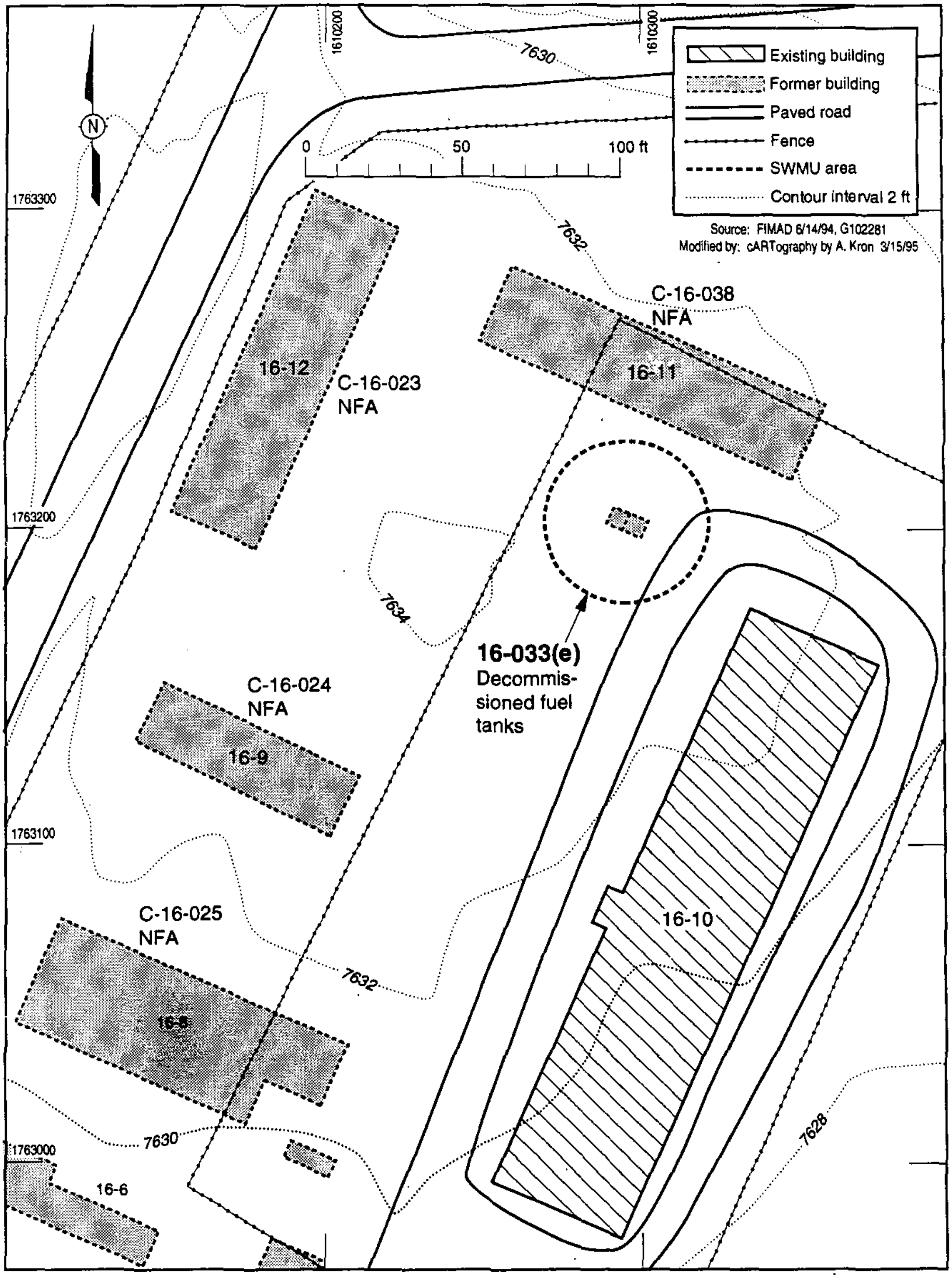


Fig. 5-27-1. Possible location of decommissioned fuel tanks, SWMU 16-033(e).

C-16-073 is an underground gasoline storage tank believed to be located six feet from the southwest wall of TA-16-200, an administrative building located outside the HE exclusion zone (Fig. 5-27-2). A 1967 memorandum indicates that the tank was located six feet south of TA-16-200 (Buckland 1967, 15-16-131). However, the tank had no structure number, making it difficult to document its installation or removal.

The gasoline storage tank served an emergency generator located inside the basement equipment room of TA-16-200 (Martin and Hickmott 1994, 15-16-549). It is assumed the tank was installed in 1952, the same year the main portion of TA-16-200 was built. The emergency generator is presently run by natural gas and it is likely the UST was decommissioned when this conversion took place or shortly after (date unknown). Given that it served the emergency generator in the equipment room and was located six feet south of the building, the tank is expected to be located near the basement entrance of TA-16-200, where the embankment starts with drainage to the south.

A memo documents monitoring the tank for radioactivity in 1967 with no detectable radioactive contamination found (Buckland 1967, 15-16-131).

5.27.1.2 Nature and Extent of Contamination

Constituents of fuels [benzene, toluene, ethylbenzene, xylene (BTEX), and possibly lead] are the primary COPCs for these underground storage tanks (Table 5-27-2). High explosives or radionuclides are not a concern because these USTs were not involved with building activities or processes.

TABLE 5-27-2

SUMMARY OF REMEDIATION OR SCREENING ACTION LEVELS FOR USTs DURING REMOVAL OR UPGRADING

UST CONSTITUENT	REMEDIATION OR SCREENING ACTION LEVELS (ppm)
TPH	100[a]
Total BTEX	50[a]
Benzene[b]	10[a]
Lead	400[c]

[a] Remediation level from State of New Mexico UST Regulations §1209
[b] The benzene component of BTEX
[c] SAL from (EPA 1994, 15-16-587)

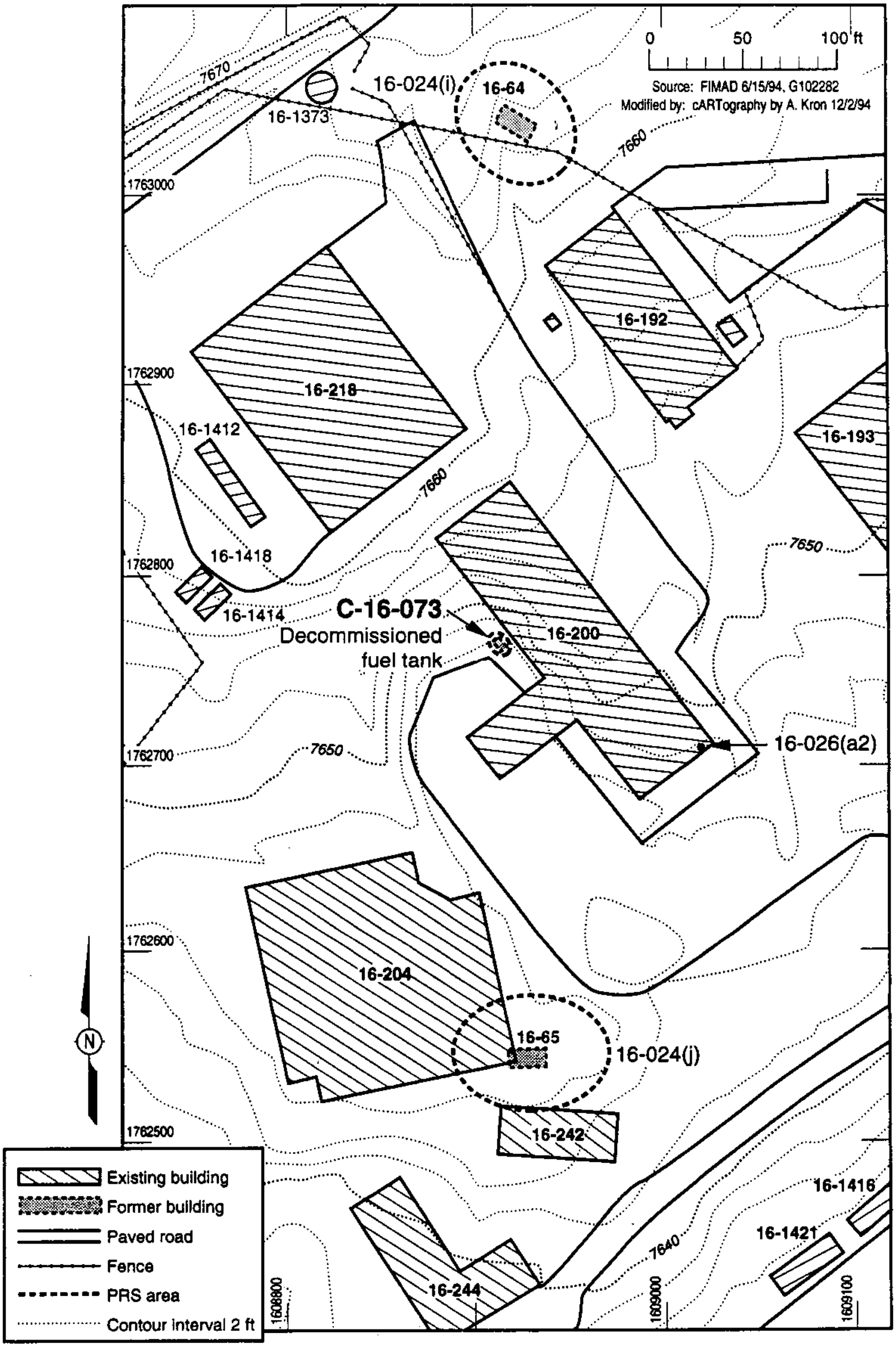


Fig. 5-27-2. Possible location of C-16-073, a decommissioned fuel tank associated with building TA-16-200.

5.27.2 Remediation Decision and Investigation Objectives

Generic decision criteria, decision logic, exposure pathways, and conceptual exposure models are located in Sections 4.3 and 5.0 of this document. Site-specific decision information is included in the following subsections.

5.27.2.1 Problem Statement

This aggregate consists of potential subsurface soil contamination from USTs. The problem is to determine if USTs in this aggregate have been removed (Fig. 5-27-3). If the USTs have not been removed, then removal will proceed according to New Mexico Environment Department (NMED) UST Regulations Part VIII §803.

November 15, 1990, the State of New Mexico was given authority to regulate USTs. The Code of Federal Regulations 40 CFR §281.11 provides general requirements for the state's UST program, specifically that "...the state must demonstrate that its requirements under each state program element for existing and new UST systems are no less stringent than the corresponding federal requirements." Code of Federal Regulations 40 CFR §280.73, which were adopted as NMED UST Regulations Part VIII §803, states that "...the owner and operator of an UST system closed before December 22, 1988 must assess the excavation zone and close the UST system in accordance with this Part VIII if releases from the UST may ... pose a current or potential threat to human health and the environment." This assessment of the decommissioned UST is based on the depth to groundwater of greater than 1 000 ft, absence of private wells within 1 000 ft or municipal water wells within 1 mile, and the absence of surface water courses within 500 ft of any of these PRSs (Environmental Protection Group 1990, 0497).

5.27.2.2 Investigation Boundaries

The spatial boundaries of potential contamination for the subsurface aggregate include the PRS boundaries for the UST and related fuel lines. It is expected that the USTs are excavated into the tuff, given the shallow soil at S-Site. Thus, the depth boundary for these PRSs is from the top of the tank or the fuel lines to the tuff.

For each UST geophysical survey points will be biased to areas believed to most likely contain the tank and fuel lines based on archival data and the results of land surveys. For C-16-073, the geophysical grid will center around a line 6 ft south of TA-16-200 and 3-ft grid intervals will be used for an area 9 ft wide and 21 ft long (Fig. 5-27-4). For SWMU 16-033(e), the grid spacing interval will be 5 ft.

UST Decision Logic Flow Chart

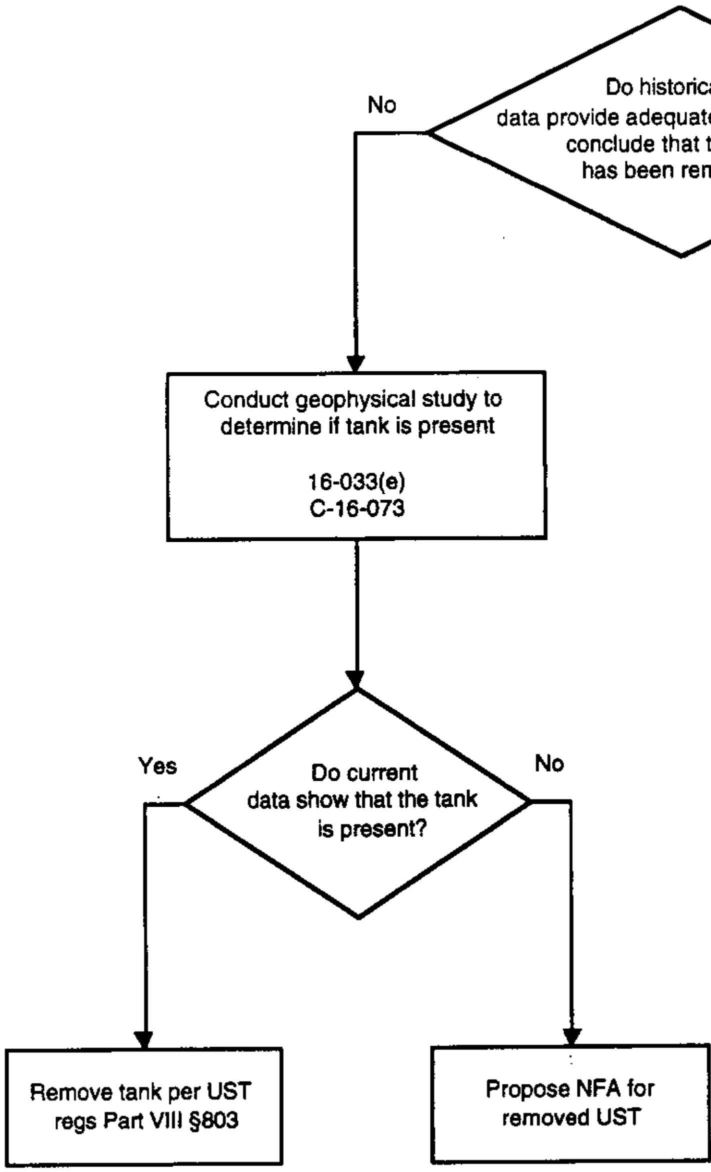


Fig. 5-27-3. UST decision logic flow chart.

Fig. 5-27-4. Geophysical survey location southwest of building TA-16-200.

The geophysical study will encompass a rectangle defined by the outside edge of the foundations for TA-16-12, TA-16-11, and TA-16-10 (Fig. 5-27-5).

5.27.2.3 Design Criteria

The design criteria for locating the USTs are based on engineering reports and judgmental information on the performance of the geophysical survey.

5.27.3 Sampling and Analysis Plan

Geophysical surveys using magnetometers and ground-penetrating radar (GPR) will be used to determine if the USTs at SWMU 16-033(e) and C-16-073 have been removed. If they have been removed, then they will be recommended for NFA. If they remain in place, then they will be removed under the Laboratory's UST program.

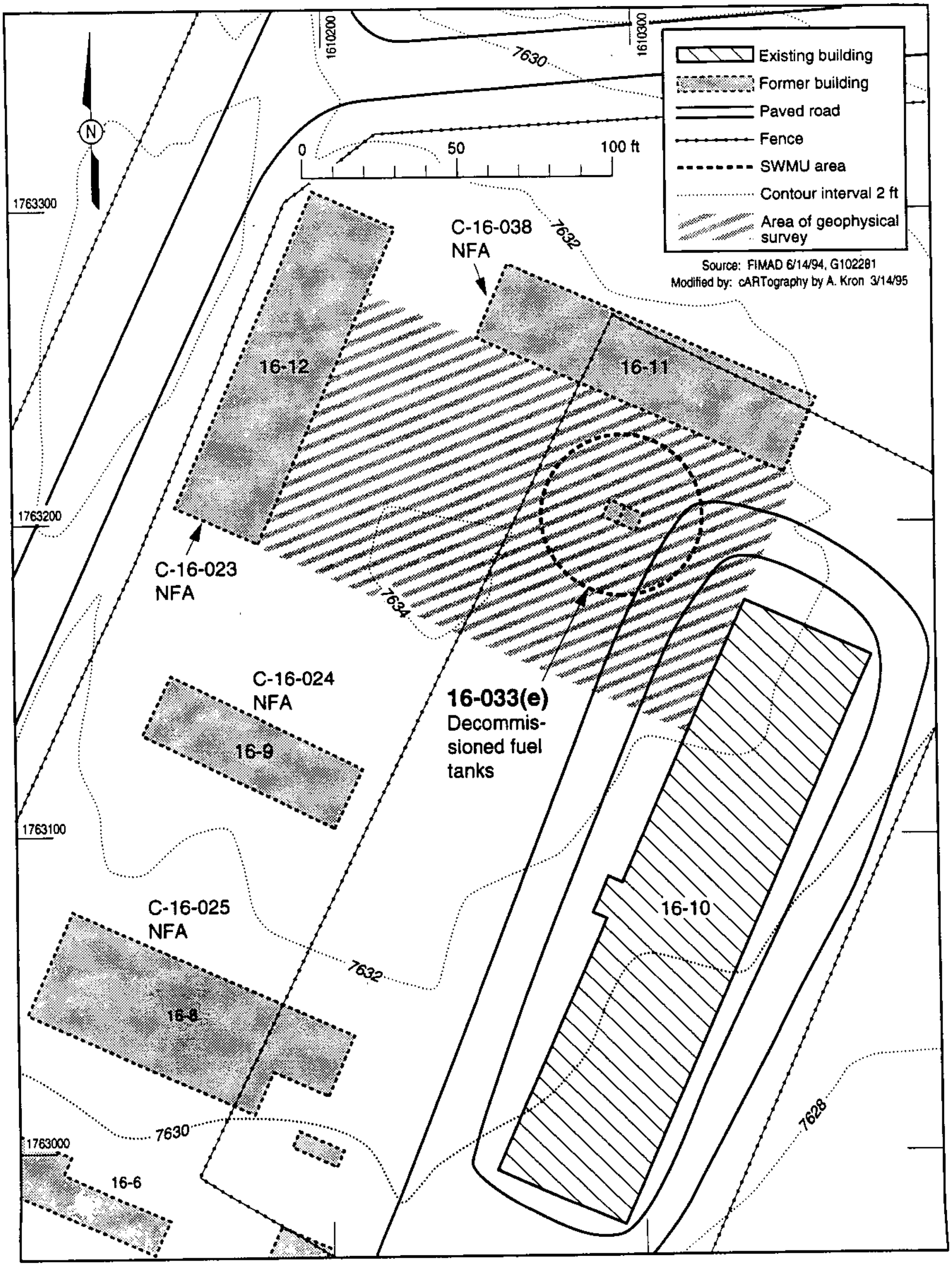


Fig. 5-27-5. Geophysical survey location northwest of building TA-16-10.

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5.28 Outfalls Aggregate

5.28.1 Background

This aggregate consists of 14 outfalls and one debris area associated with buildings located throughout S-Site. These PRSs are aggregated because of their similar physical descriptions and sampling plans. The COPCs at most of these sites include HE, SVOCs, VOCs, and metals, particularly barium and chromium. Sampling plans will require a small number of surface samples (one to five) and some subsurface samples in cases of potential VOC contamination. Table 5-28-1 lists PRSs in this aggregate.

TABLE 5-28-1

OUTFALL AND DRAINAGE AGGREGATE PRSs

PRS	HSWA STATUS	STRUCTURE NUMBER	DESCRIPTION	BUILDING DIMENSIONS (FT)
16-026(b2)	HSWA	TA-16-202	Machine shop oil overflow outfall	93 x 280 x 22
16-026(c2)	HSWA	TA-16-462	Chemical storage building outfall	22 x 18 x 10
16-026(i)	HSWA	TA-16-224	X-ray building outfall	58 x 44 x 10
16-026(j)	HSWA	TA-16-226	X-ray building outfall	58 x 44 x 10
16-026(k2)	HSWA	TA-16-260	HE machining building outfall	729 x 37 x 17.5
16-026(r)	HSWA	TA-16-180	Fire station oil overflow outfall	62 x 43 x 26.5
16-026(u)	HSWA	TA-16-195	Service station oil overflow outfall	30 x 112 x 18
16-028(b)	HSWA	TA-16-370	Barium nitrate grinding/metal shop outfall	131 x 86 x 37
16-028(c)	HSWA	TA-16-220	X-ray building outfall	41 x 68 x 20
16-028(d)	HSWA	TA-16-202	Machine shop outfall	93 x 280 x 22
16-029(j)	HSWA	TA-16-260	HE machining building sump and outfall	729 x 37 x 17.5
16-030(a)	HSWA	TA-16-344	Chemical storage building outfall	50 x 15 x 12
16-031(a)	HSWA	TA-16-372	Decommissioned cooling tower outfall	20 x 10 x 25
16-031(b)	HSWA	TA-16-262	Demolished cooling tower outfall	5 x 7.4 x 12.4
C-16-002	Non-HSWA	TA-16-262	Demolished cooling tower rubble	5 x 7.4 x 12.4

5.28.1.1 Description and History

Almost all of the buildings and drains in this aggregate were built in the early 1950s. Although many of the buildings are still in use, most of the drains are inactive. Most of the outfalls received effluent from floor drains in their associated buildings. Two of the outfalls are associated with decommissioned cooling tower drainage and one outfall is from inactive HE sumps. Unless an outfall is indicated with an NPDES permit number, the outfall is unpermitted.

5.28.1.1.1 Chemical Storage Building Outfalls

SWMUs 16-026(c2) and 16-030(a). SWMU 16-026(c2) is the outfall from TA-16-462, a chemical storage building located in the southwest quadrant of TA-16 (Fig. 5-28-1). TA-16-462 was built in 1952 to provide storage for chemicals used nearby in TA-16-460, an analytical and process control laboratory. HE was not stored in TA-16-462. Magazines TA-16-464 (now removed) and TA-16-463, located northwest of TA-16-460, stored the HE compounds used in the laboratory.

TA-16-462 is a small, single-story building divided into two rooms. One room contains a small inventory of solvents and oil. The other room has a more extensive inventory of inorganic and organic compounds including benzene, nitric acid, propanol, acetone, mineral oil, and tetrachloroethane (LANL 1992, 15-16-527). Both rooms have troughs in the floor that drain to separate drain lines outside the building. The two drain lines that make up SWMU 16-026(c2) are constructed of 6-in. vitrified clay pipe. They exit from the southeast side of TA-16-462 and travel southeast approximately 32 ft before they daylight next to one another in a grassy area sloped to the southeast. There is evidence from Engineering drawing ENG-C 16272 that a square collection pit once existed where the pipes daylight. On a site visit it appeared that the pit exists but is completely filled with sediment. Effluent collects in the pit and then flows southeast into a drainage ditch. The ditch leads to a corrugated metal culvert, draining to the northeast. The housekeeping practices and historical spill record of this outfall are not known. Archival information from the 1970s states that effluent from TA-16-462 is "effectively negligible" (Panowski and Salgado 1971, 15-16-038). Although TA-16-462 is currently active, the drains were plugged in July 1991 and, therefore, will not contribute further contamination to the outfall.

SWMU 16-030(a) is the outfall from an active chemical storage building (TA-16-344) built in 1951 in the southeast corner of P-Site (Fig. 5-28-2). This building has three 5 ft long x 2 ft wide cement drain troughs projecting from the south wall into a grassy, semicircular, bermed area 45 ft in diameter. The bermed pit could contain drainage from the two westernmost troughs (draining the west room). The drainage from the easternmost trough (draining the east room) does not flow into the pit but drains into a grassy area to the south.

The building is divided into two rooms and the floors are slightly sloped toward the troughs to receive floor drainage. The room to the east contains barrel rack storage for solvents such as toluene and n-butyl acetate. The room to the west contains

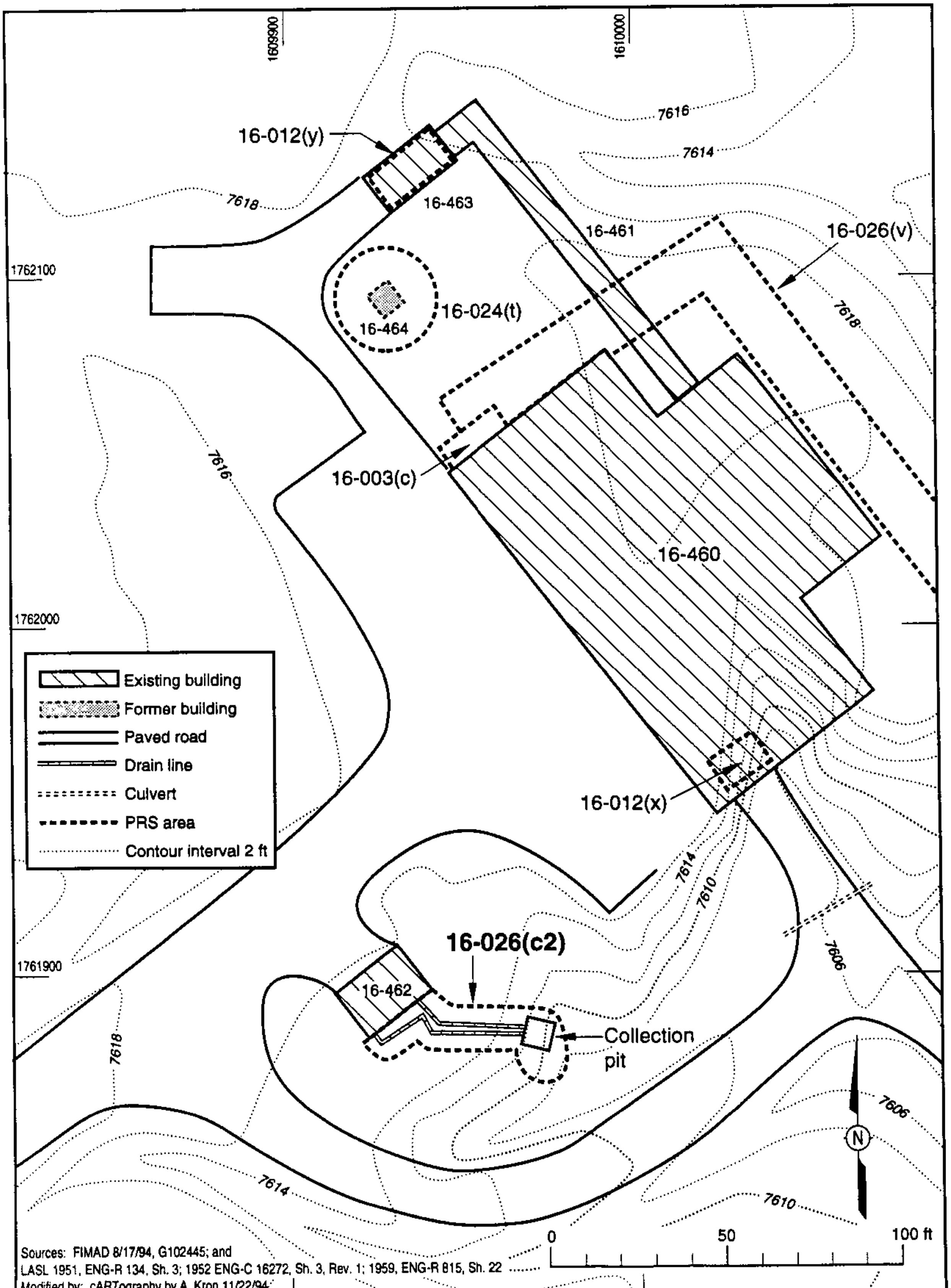


Fig. 5-28-1. Location of SWMU 16-026(c2) near TA-16-462.

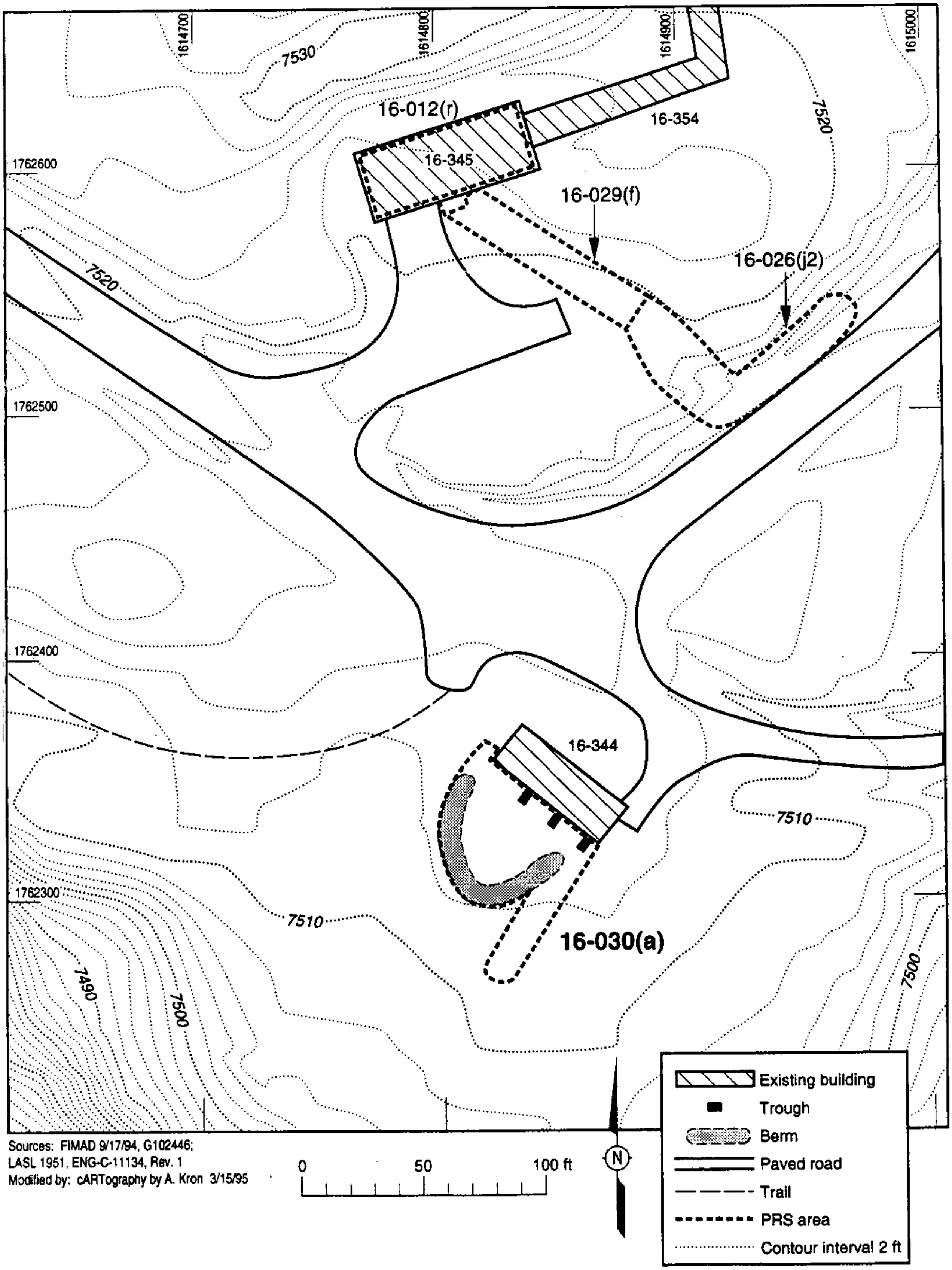


Fig. 5-28-2. Location of SWMU 16-030(a) at TA-16-344.

metals, plastics, and inert materials such as barium nitrate packed in containers. The building is still active, although secondary containment used since 1991 blocks the cement troughs and restricts chemical spills.

5.28.1.1.2 Oil Overflow Drain Outfalls

SWMUs 16-026(b2), 16-026(r), and 16-026(u) are soil contamination due to oil overflow lines from oil-water separators, which are also called oil interceptors on engineering drawings. These three SWMUs are associated with three different buildings, a decommissioned machine shop (TA-16-202), a fire station (TA-16-180), and a service station (TA-16-195) (Figs. 5-28-3 and 5-28-4). All are located in the current administration area at S-Site. The administration area is outside the fenced exclusion area where HE is handled.

All three buildings were built in 1952 during the expansion and construction of the administration area. The oil interceptors are still in place but are no longer used. It is not known when they were decommissioned. An oil interceptor is a 3 ft long x 3 ft wide x 3 ft deep below-floor-level cement pit placed in a wastewater line which receives oily water. The interceptor can receive up to 100 gal./minute of oily water (ENG-C 7161). Its purpose is to remove oil from the water to protect the sewer system from being overloaded with large volumes of oil. The oil interceptor takes advantage of the density difference between oil and water to separate oily wastewater into an oil layer and a water layer. The oil floats to the top of the pit, allowing water to sink to the bottom and flow out a drain at the bottom of the pit. Generally, the bottom drain carrying water connects directly to the sewer system. The oil layer flows into an oil overflow drain line located at the top of the pit that allows excess oil to flow away. These oil overflow lines are 2-in. cast iron pipes, which indicates that large volumes of oil were not expected from these interceptor drains. Ordinarily, the oil overflow lines drain directly onto the ground. Standard practices for cleaning these drains or regularly removing the oil are not known. However, there are no oil stains visible where the oil overflow drains daylight.

SWMU 16-026(b2) is associated with TA-16-202, a decommissioned machine shop (Fig. 5-28-4). Room 138, which contains the oil interceptor, is located in the east corner of the building. The room was used as a millwright shop. The oil interceptor was located near a welding table, a hood, and a steam cleaning pit. Although the exact decommissioning date of the oil interceptors is not known, by 1977 the room was no longer being used as a shop that required an oil overflow drain (Engineering

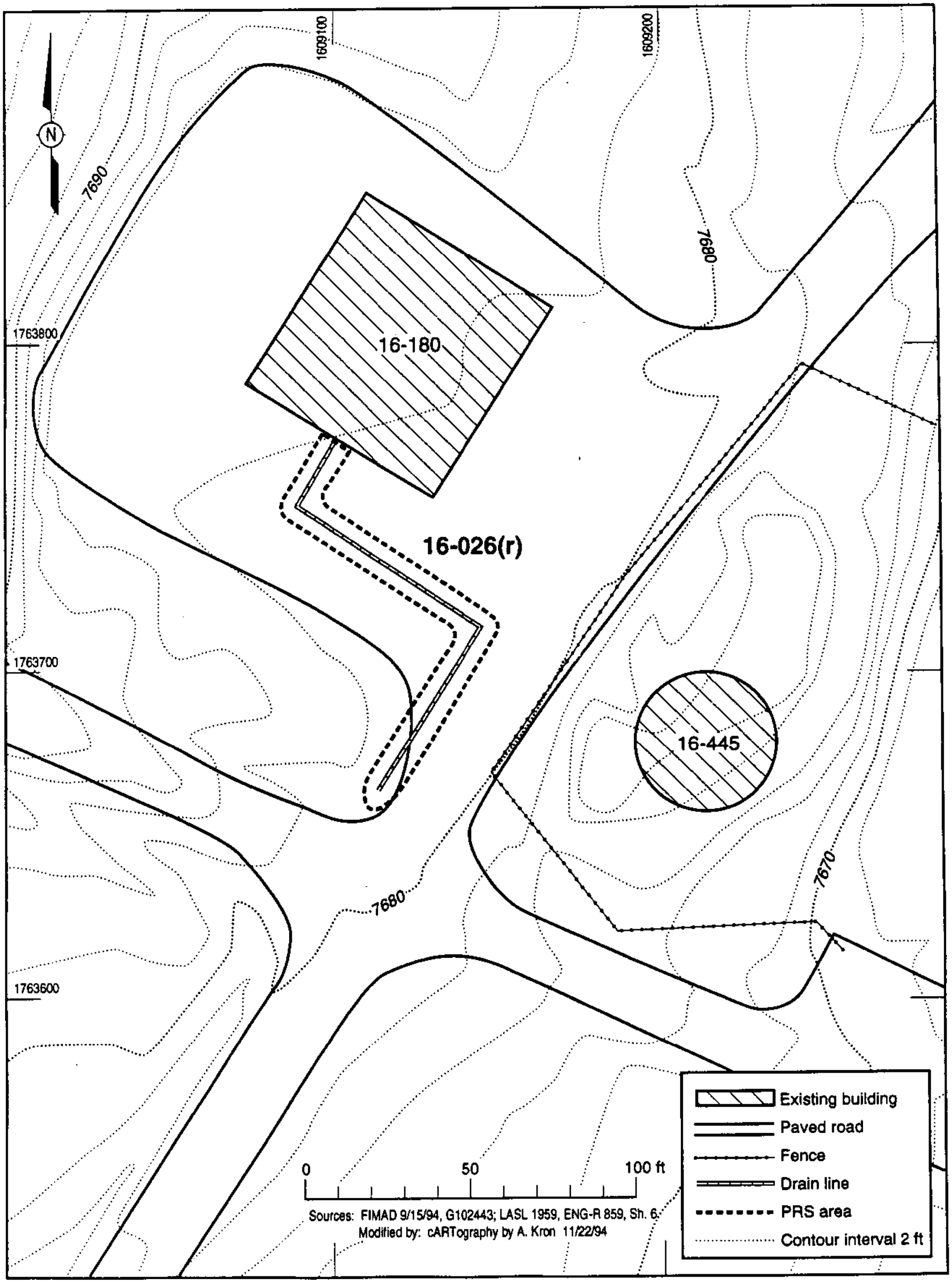


Fig. 5-28-3. Location of SWMU 16-026(r) at TA-16-180.

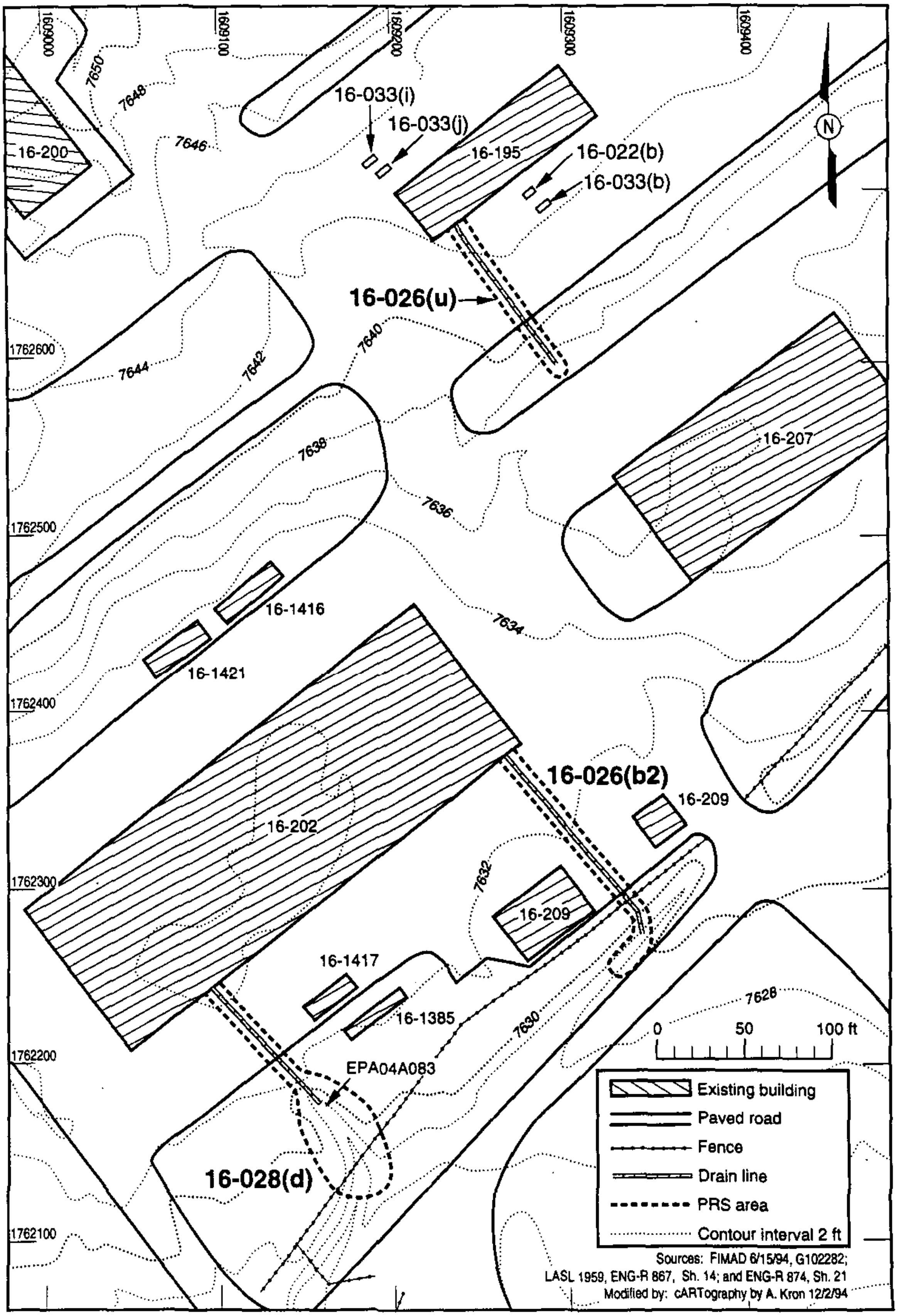


Fig. 5-28-4. Locations of SWMUs 16-026(u and b2) and 16-028(d) in the administration area.

drawing ENG-C 43025). A wooden plank now covers the oil interceptor and the room is an office. The oil overflow line runs southeast approximately 135 ft and daylights near the bottom of a drainage ditch running southwest along the road.

SWMU 16-026(r) is associated with TA-16-180, which is fire station Number 5 at TA-16 (Fig. 5-28-3). The oil interceptor is located in the middle of the south wall of the building and received floor washings from six floor drains. Presently, rags are used to mop up oil stains and the interceptor drain is inactive. On the basis of Engineering drawings (ENG-C 7158 and ENG-R 859) and a field investigation that used magnetic surveying, the oil overflow line is believed to daylight approximately 70 ft south of the building in an east-sloping grassy area near the road. However, the pipe is not visible. Engineering drawing ENG-C 7158 indicates that the water drain from the bottom of the interceptor did not connect to the sewer, as the others do, but instead drained into a field approximately 200 ft south of the building.

SWMU 16-026(u) is associated with TA-16-195, the TA-16 service station (Fig. 5-28-4). The oil interceptor is located in room 105, the tire and grease room on the north side of the building. It also receives floor washings from the wash area, the ambulance room, and the grease and repair room. According to Engineering drawing ENG-C 7158, the oil overflow drain runs approximately 90 ft southeast, near the asphalt surrounding TA-16-207. Although the pipe is not visible, a magnetic survey of the area confirmed this location. The general drainage of the area is to the east through culverts in the asphalt.

5.28.1.1.3 TA-16-202 Machine Shop Outfall

SWMU 16-028(d) is potentially contaminated soil from an NPDES permitted outfall from TA-16-202, which is located in the administration area (Fig. 5-28-4). From the time it was built in 1952 until June 1993, TA-16-202 was used as a secure machine shop, providing electrical, mechanical, pipefitting, milling, and other machining services. The machine shops are presently empty and the building is used for office space. Currently, the outfall only receives rainwater. Because it is located outside the exclusion area where HE is handled, only metals and plastics were machined in TA-16-202.

The outfall, NPDES permit 04A083, receives noncontact cooling water. The drain line is 8-in. vitrified clay pipe and daylights 80 ft southeast of the building in a swampy ditch filled with cattails. NPDES sampling results from 1979 to 1988 indicate that the noncontact cooling water volumes averaged 3 gal./minute (no author, no year, 15-16-109). This outfall also receives floor washings from two floor drains, effluent from two non-HE sump drains (on the north and south sides of TA-16-202), and discharge from two sink drains, as well as rainwater from 16 roof drains (LANL 1992, 15-16-533). One floor drain and one sink drain are located in room 107, the largest machining room in the building. The floor drain could not be located during a site visit. One sink drain is located in room 120, previously a pipe shop. Oil residue visibly coated the surface of the sink, evidence of past poor housekeeping practices. The other floor drain flows through the sump system into the outfall. The sumps receive steam and vacuum condensate, not HE wastewater.

Historically, there is evidence that TA-16-202 used a variety of compounds during machining. Memos report that brazing alloy was used (1 lb per year) and chemicals such as trichloroethane (12 gal. per year), petroleum distillates (2.5 gal. per year), and hydrochloric acid (1 gal. per year) were used on cleaning rags and in other processes and, therefore, could be in the drains (Panowski and Salgado 1971, 15-16-038). Chemicals such as toluene diisocyanate were used in the plastics machined here and could have entered the drain absorbed on chips and dust (Campbell 1959, 15-16-254).

5.28.1.1.4 Radiography Building Outfalls

SWMUs 16-026(i,j) and 16-028(c) are soil contamination associated with outfalls from three x-ray buildings located on the north end of S-Site (Figs. 5-28-5, 5-28-6, 5-28-7). The radiography area at S-Site was built in 1952 and consists of seven buildings: three rest houses, three x-ray buildings, and a centrally located photoprocessing building. The buildings are connected by a series of enclosed walkways. The rest houses store finished, packaged HE components before and after they are radiographed. The components are transported between the rest houses and the x-ray buildings via the enclosed walkways. When components arrive at the x-ray buildings, they are removed from their packaging, x-rayed, and then repackaged. Site workers from 1945 to the present indicate that HE dust and small chips (up to 0.125 in. diameter) would break off during this process and could end up in the floor drains (Paige 1994,15-16-520; Paige 1994, 15-16-553). Because these SWMUs are associated with floor drains in the x-ray buildings, it is possible that HE contamination could be present at the outfall of the

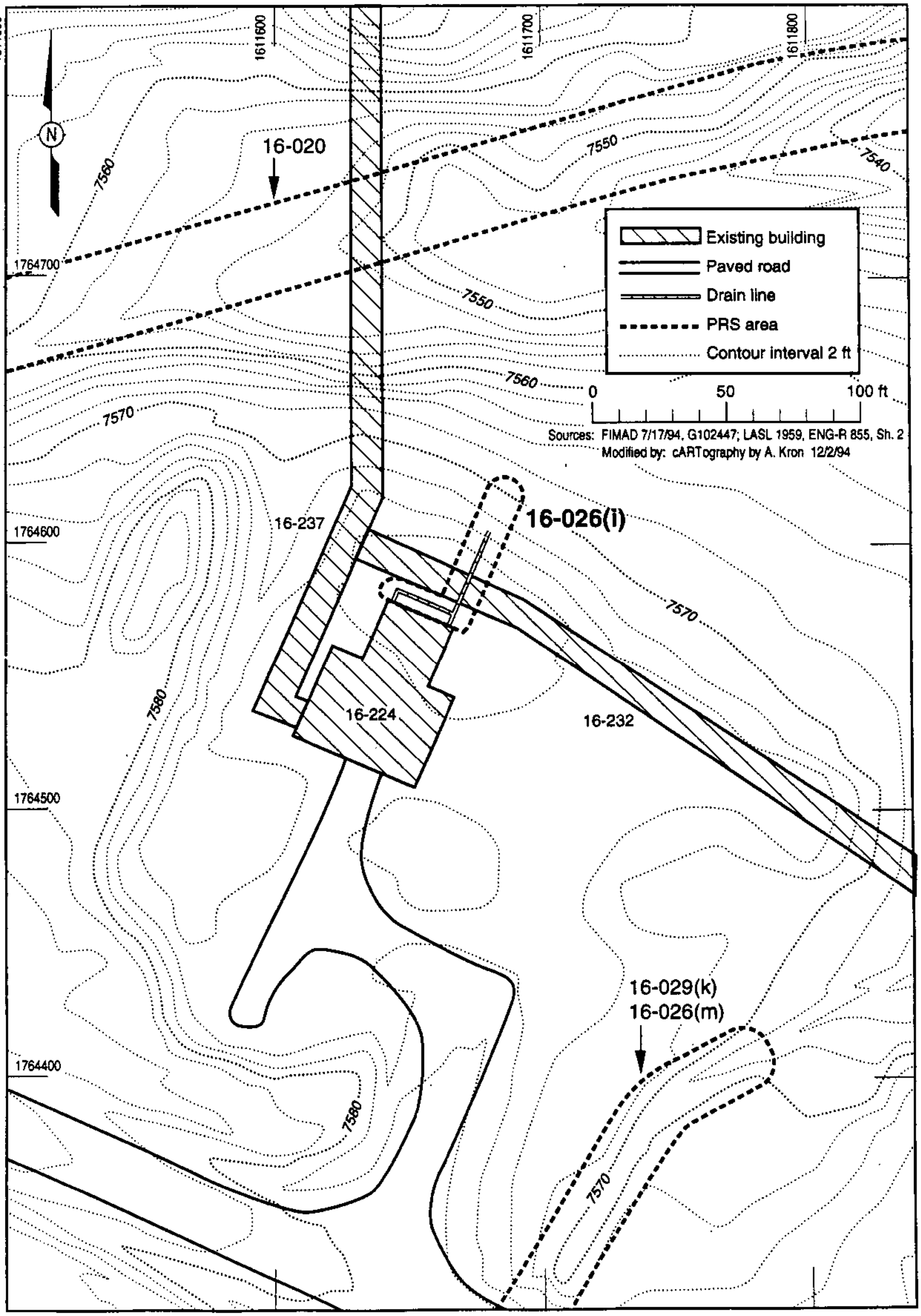


Fig. 5-28-5. Location of SWMU 16-026(i) at TA-16-224 in the radiography area.

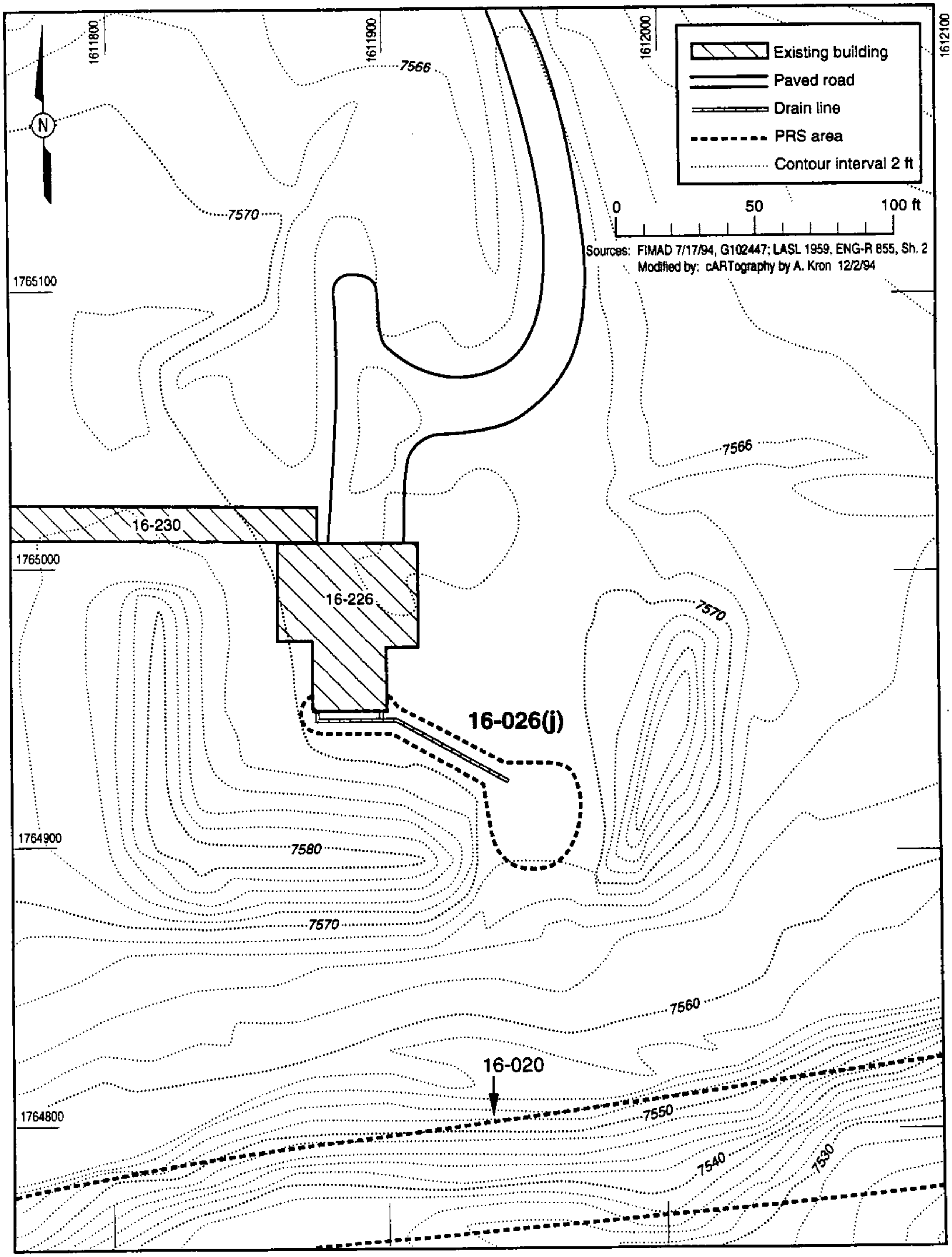


Fig. 5-28-6. Location of SWMU 16-026(j) at TA-16-226 in the radiography area.

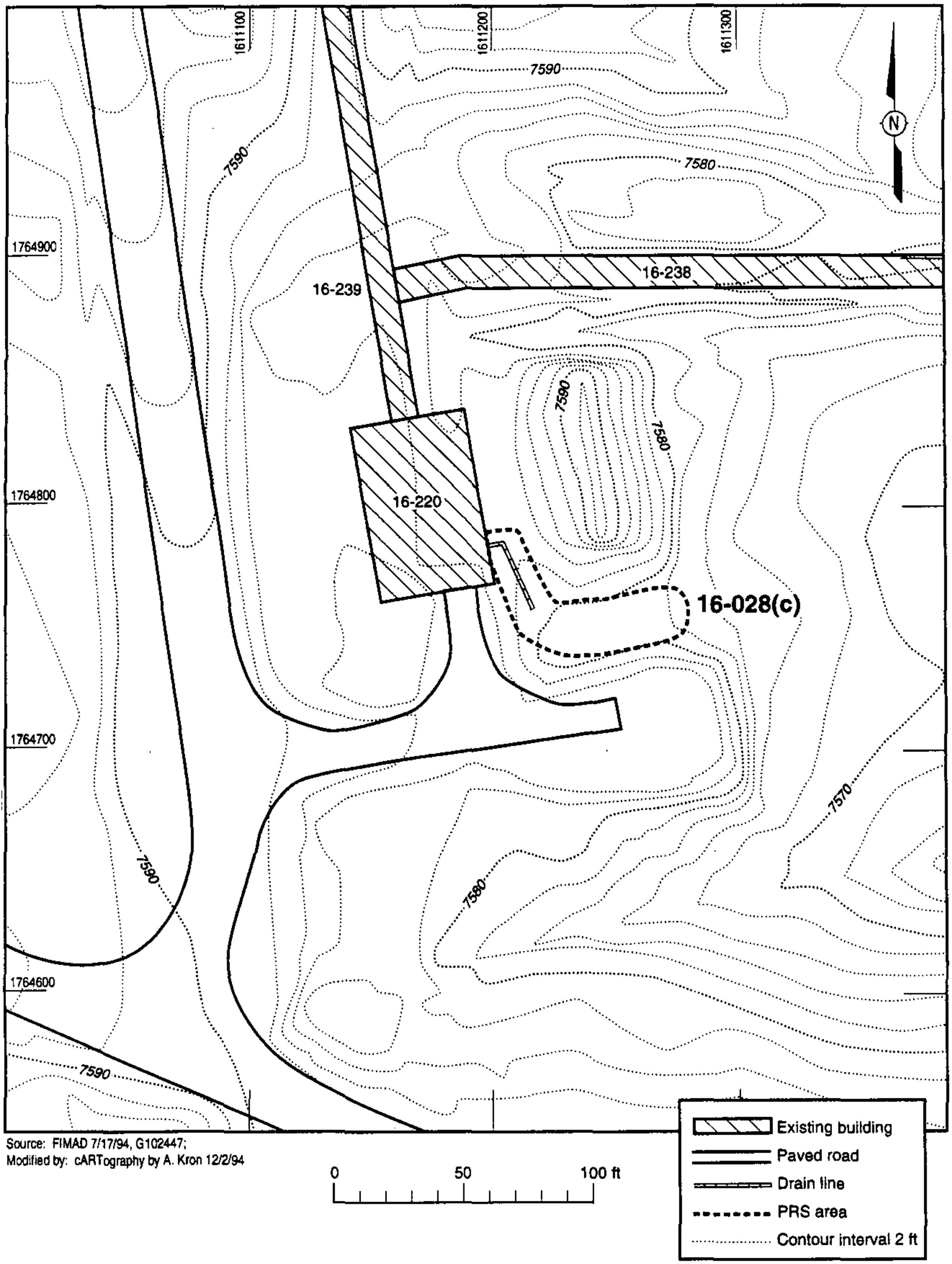


Fig. 5-28-7. Location of SWMU 16-028(c) at TA-16-220 in the radiography area.

drain lines. In the past, small chips of HE have been seen inside at least one of these drains (LANL 1992, 15-16-530).

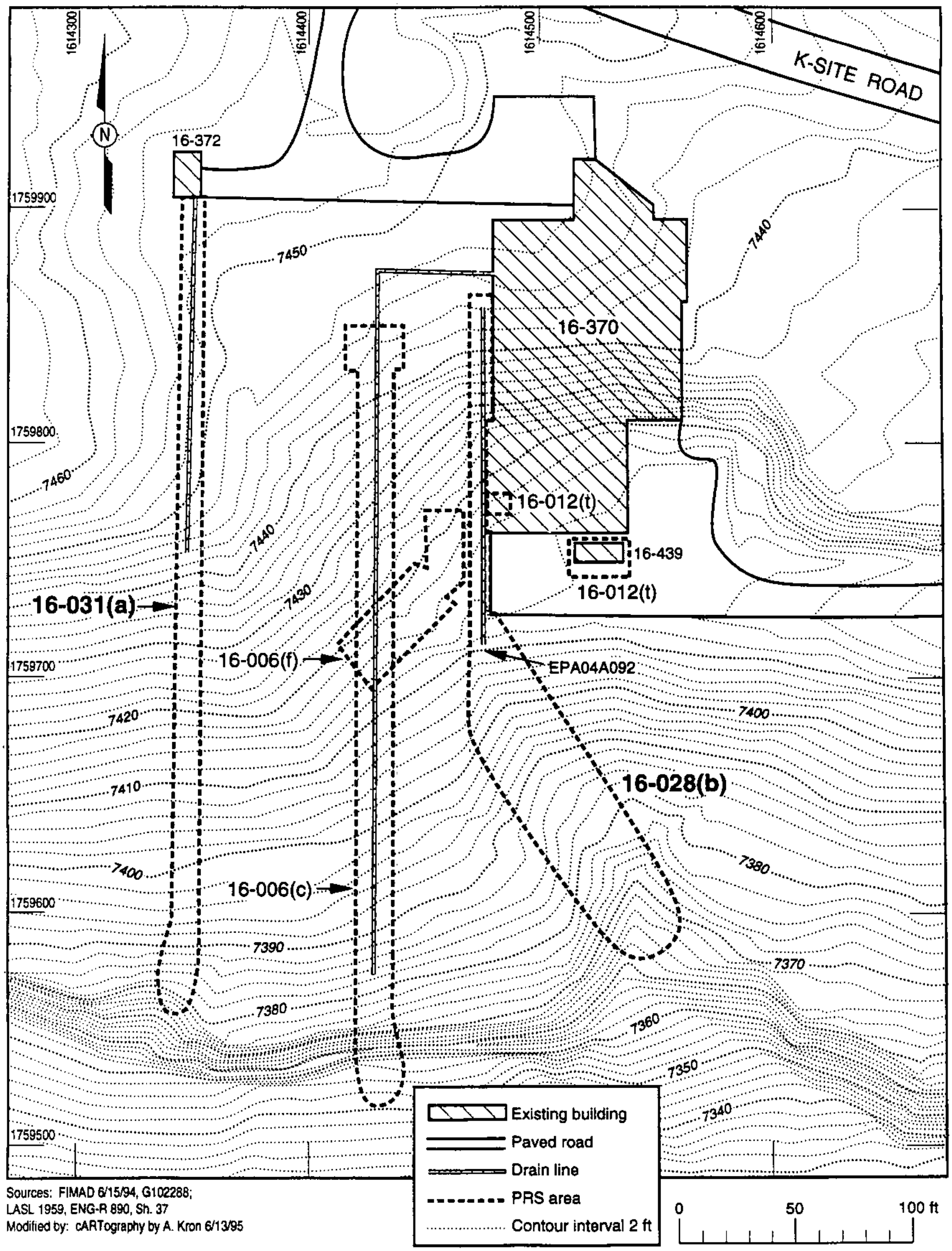
The x-ray buildings use x-ray machines, rather than radioactive sources, to generate the x-rays used to photograph finished HE components (Paige 1994, 15-16-553). If radioactive sources had been used, the buildings would have had lead-lined pits similar to those in other radiography buildings at TA-16 that used sources. Therefore, radionuclides are not COPCs for these SWMUs. Although the buildings are still active, the floor drains were plugged in 1991.

SWMU 16-026(i) is an outfall associated with TA-16-224 (Fig. 5-28-5) and SWMU 16-026(j) is an outfall associated with TA-16-226 (Fig. 5-28-6). Both buildings house 1 000 KeV x-ray machines. The floor drains that discharge to these SWMUs are located in the northeast and northwest corners of room 101 in TA-16-224 and the southeast and southwest corners of room 101 in TA-16-226. The corner floor drains join and form one 6-in. vitrified clay pipe drain line out of each building, draining into grassy, gradually sloping areas. The drain from TA-16-224 daylights northeast of the building. Although the location of the drain outfall from TA-16-226 could not be located on several site visits, Engineering drawing ENG-C 15605 shows the drain flowing toward the southeast.

SWMU 16-028(c) is an outfall associated with TA-16-220 (Fig. 5-28-7). This building was the low energy x-ray building, housing a 250 KeV x-ray machine. This outfall, NPDES permit 04A070, receives effluent from eight floor drains in TA-16-220. This effluent includes 2 000 gal./month of noncontact cooling water, minimal volumes of chiller condensate, and periodic discharge from an HE vacuum pump and floor washings (LANL 1992, 15-16-530). The 6-in. vitrified clay pipe daylights in a rocky ditch near the building. The ditch flows into a relatively flat, grassy field.

5.28.1.1.5 TA-16-370 Outfall

SWMU 16-028(b) is potentially contaminated soil from a permitted outfall at TA-16-370. TA-16-370 is a three-story building located on K-Site Road built in 1953 as a barium nitrate grinding facility (Fig. 5-28-8). Barium nitrate is a stable component of some types of explosives. In the late 1950s TA-16-370 was converted to a metal forming shop for steel and aluminum and is still active in that capacity (Tidwell 1989, 15-16-097). HE was never used in the building due to the explosive hazard that grinding and machining posed. TA-16-370 was also a safe



Sources: FIMAD 6/15/94, G102288;
LASL 1959, ENG-R 890, Sh. 37
Modified by: cARTography by A. Kron 6/13/95

Fig. 5-28-8. Locations of SWMUs 16-028(b) and 16-031(a) near TA-16-370.

house for nearby workers to retreat to during shots at K-Site (Brooks 1956, 15-11-014).

The SWMU is an outfall to Water Canyon from the west side of the building. The pipe is 6-in. vitrified clay pipe that daylights approximately 50 ft south of the building in a steep, rocky area near an oak tree. The outfall receives effluent from 29 floor drains in the building as well as from an eyewash, a drinking fountain, and a sink. Many of the floor drains are in the process of being plugged. Average effluent volumes from this outfall have been over 4 000 gal./day (Paige 1995, 15-16-601). This active outfall carries NPDES permit 04A092 for release of noncontact cooling water. Because it was a machine shop and grinding facility, it is very likely that metal chips, oils, solvents (up to 1 gal./month of kerosene on metal chips and 15 gal./month of trichloroethene in drain effluent) (Panowski and Salgado 1971, 15-16-038), and barium compounds were washed down the drains.

5.28.1.1.6 Cooling Tower Outfalls and Associated Debris

SWMUs 16-031(a,b) and C-16-002 are areas of potential soil contamination associated with outfalls from cooling towers used at TA-16. These cooling towers contained closed-cycle water lines that provide coolant for equipment. COPCs for these towers are chemicals commonly used in the water to inhibit algae growth, such as chromates, although there is no documentation that such chemicals were used.

SWMU 16-031(a) is associated with decommissioned cooling tower TA-16-372, which served TA-16-370, a barium nitrate grinding facility and metal forming shop. The cooling tower is a dilapidated wooden structure located approximately 125 ft west of TA-16-370 on K-Site Road (Fig. 5-28-8). The cooling tower was built in 1953 when TA-16-370 was built. It is not known when it was decommissioned. Chilled water from the cooling tower cycled through pumps and machinery located on the ground floor of TA-16-370. The 6-in. vitrified clay pipe originates from a drain inside the southeast corner of TA-16-372 and runs approximately 150 ft south to the edge of the canyon where it daylights. The effluent flows down a steep, rocky slope into Water Canyon.

SWMU 16-031(b) and C 16-002 are associated with decommissioned cooling tower, TA-16-262, which served TA-16-260, an HE machining building (Fig. 5-28-9). SWMU 16-031(b) is potential soil contamination associated with the drain from the tower; C-16-002 is potential soil contamination associated with the footprint of the

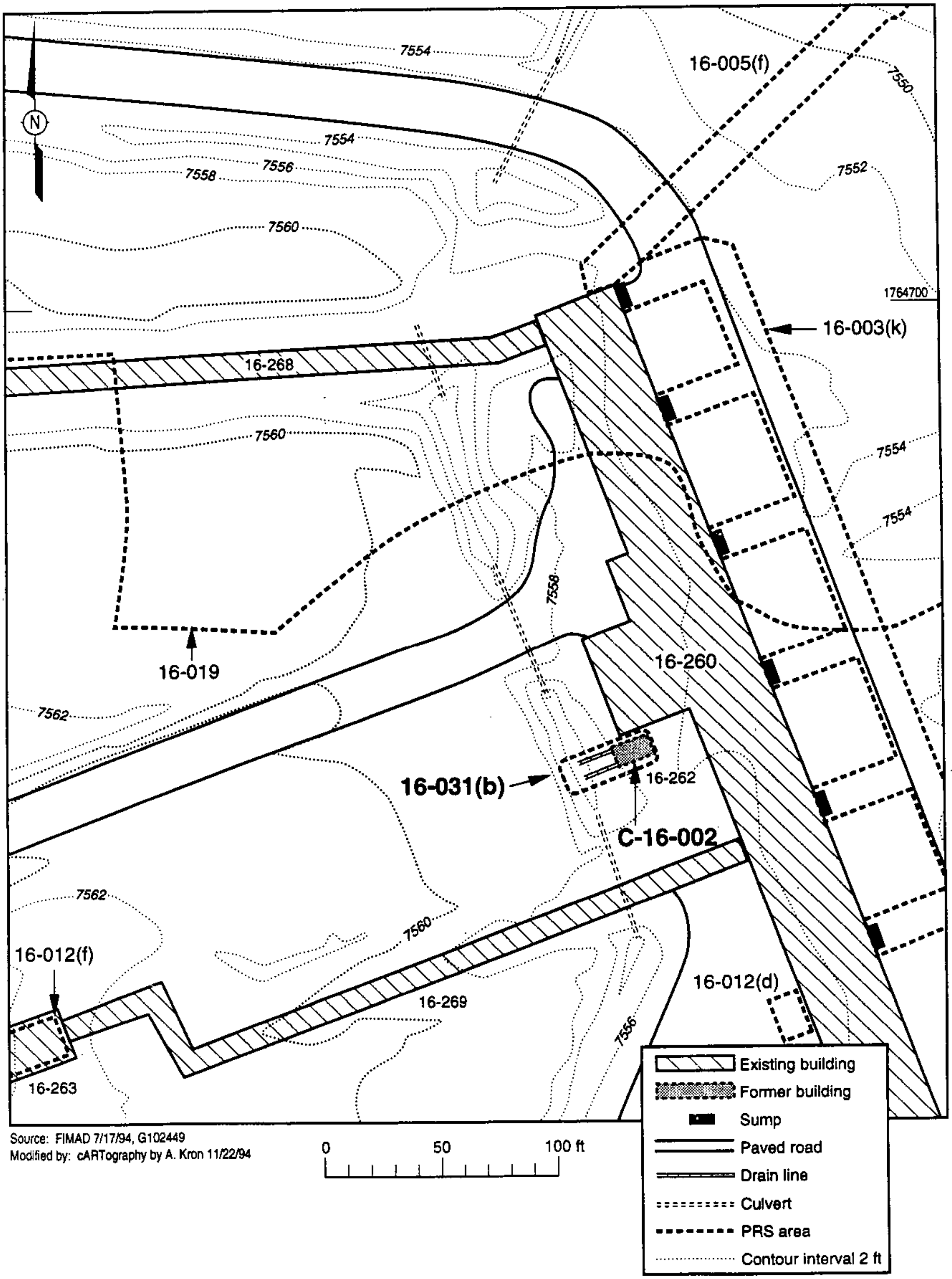


Fig. 5-28-9. Locations of PRSs 16-031(b) and C-16-002 associated with TA-16-262.

tower structure. Cooling tower TA-16-262 was located 50 ft north of walkway TA-16-269 and 12 ft west of TA-16-260. The purpose of this cooling tower is not known. According to the structure list, the tower was of wooden construction and mounted on a 3-ft-high concrete base. It was originally built in August 1946 at TA-16-42, relocated to TA-16-260 in 1951, and removed in 1957 according to the Weston Task Report (LANL 1989, 15-16-362). It is not known if the industrial waste system was removed along with the structure at that time. A former site worker noted that no hazardous materials were associated with this structure (Blackwell 1983, 15-16-076; Paige 1995, 15-16-600). All that presently remains of the tower is a pile of rubble and two 2-in. cast iron pipes that discharge southwest into a drainage ditch.

5.28.1.1.7 TA-16-260 Outfalls

SWMUs 16-026(k2) and 16-029(j) are areas of potential surface contamination associated with outfalls from TA-16-260, a major HE machining building at TA-16 located in the northeast quadrant of S-Site (Fig. 5-28-10). Both outfalls originate from bay 25, located on the south end of the building. TA-16-260 was built in 1951 and bay 25 was added immediately after completion of the building. bay 25 is taller than the other bays in TA-16-260. The square bay is divided into two triangular-shaped compartments by a hallway. A machining room is located on the east side of the hallway and a control cubicle is located on the west side of the hallway (Engineering drawing ENG-C 3282). There is a door isolating the machining room from the hallway. There is no doorway separating the control cubicle from the hallway.

SWMU 16-026(k2) is potentially contaminated soil associated with an outfall from TA-16-260. The SWMU Report notes that this SWMU originates on the north and south ends of TA-16-260 (LANL 1990, 0145). However, there are only storm drains that lead to culverts located on the north and south ends of TA-16-260. The Weston photos show an outfall which they list as from an unknown source (LANL photograph RN88-111-031). In fact, the drain shown in the Weston photo originates from a floor drain located inside the south end of TA-16-260. This floor drain will be addressed as SWMU 16-026(k2).

The drain line, made of 4-in. vitrified clay pipe, daylights in a drainage ditch approximately 15 ft south of TA-16-260. The drainage ditch is connected by two culverts to the drainage ditches on the north side of the walkway, TA-16-271, and the drainage ditch on the east side of the road. These ditches drain rainwater away from TA-16-260. However, the drainage ditch that the pipe drains into is so heavily silted

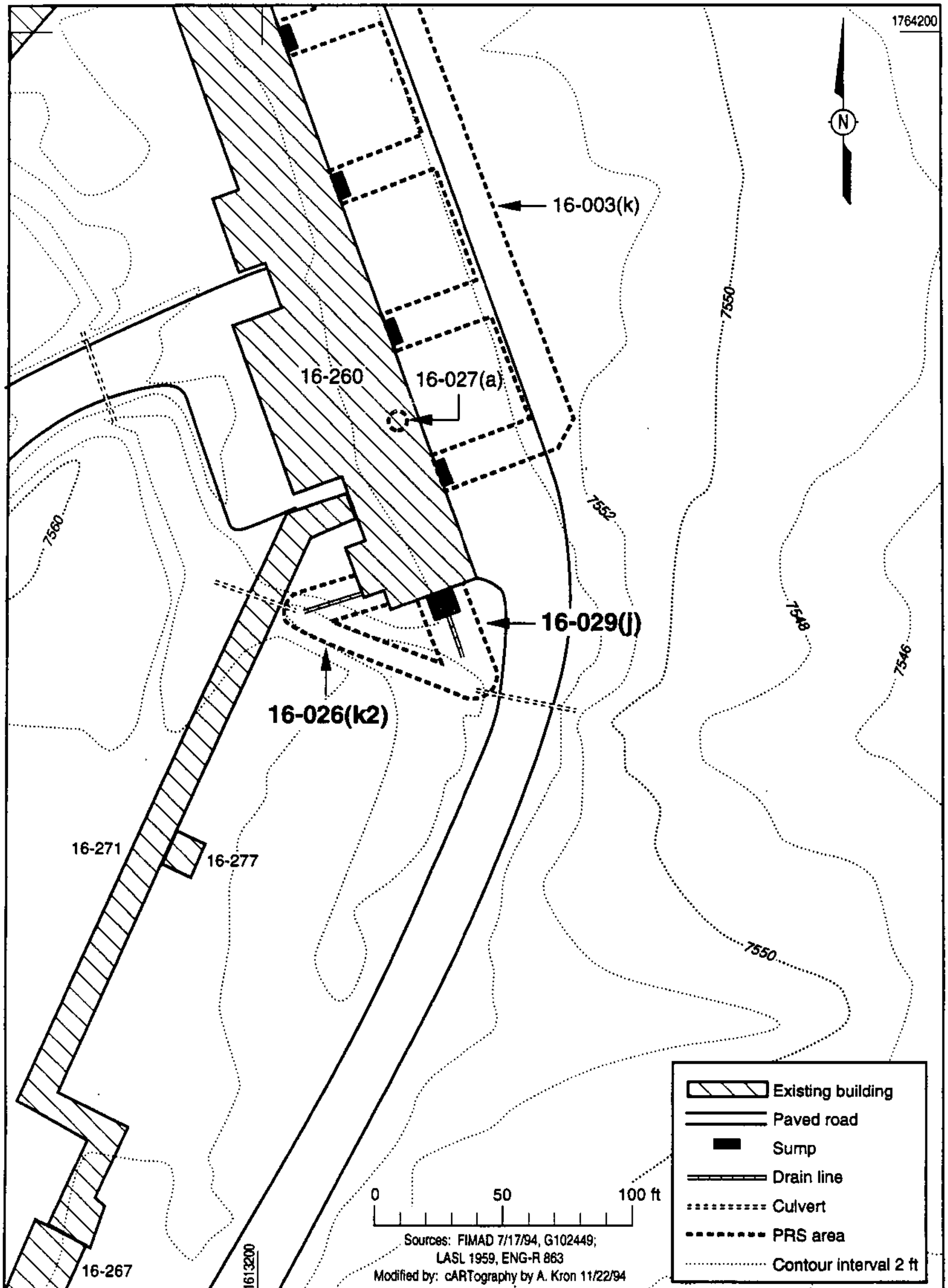


Fig. 5-28-10. Locations of SWMUs 16-026(k2) and 16-029(j) at TA-16-260.

that the corrugated metal culvert can barely be seen. This indicates that the soil layer containing potential historical contamination from this outfall may exist well below the exposed layer of soil.

The outfall is associated with a floor drain in TA-16-260, located in the hallway between the machining room in bay 25 and the control cubicle for bay 25. It is located directly below a water hose, which is used to wash down the bays. There are no other drains located near bays in TA-16-260. According to past site workers, the drain was used to receive hallway sweepings (Martin and Hickmott 1994, 15-16-549). However it is possible that HE from the machining area could enter this floor drain. This floor drain has not been plugged.

SWMU 16-029(j) is potential soil contamination from an inactive sump and drain line on the south side of TA-16-260. The concrete sump is 4 ft long x 4 ft wide x 4 ft deep in size and contained a 1.5 ft long x 1.5 ft wide x 1.5 ft deep filter basket for collecting HE. The drain from the sump is a 2-in. cast iron pipe, indicating that low volumes were expected from the sump. The drain line extends approximately 10 ft south and daylights into the grassy drainage ditch 15 ft south of TA-16-260, that also receives effluent from SWMU 16-026(k2). The sump received floor wash down water from the control cubicle of bay 25. This sump was added to TA-16-260 in 1961 and its use was discontinued by 1970. Historically, the control cubicle was used for patching HE components using Composition B (Wilder 1970, 15-16-282; Thrap 1970, 15-16-001). Although the floor drain has not been plugged, the control cubicle is no longer used for patching operations and discharges no waste.

5.28.1.2 Nature and Extent of Contamination

Table 5-28-2 lists COPCs for PRSs in this aggregate. No quantitative analytical data are available for any of the PRSs located in this aggregate except for SWMU 16-028(b). Two studies have been conducted at this outfall. The SWMU Report indicates that in 1971 barium contamination was found 150 ft south of TA-16-370 (LANL 1990, 0145; Turner and Schwartz 1971, 15-16-284). This was determined from a study of barium and HE in water and soil at various outfalls throughout S-Site in August 1971. The study determined TNT content, barium content, and HMX/RDX content in water. Water extractions of soil samples were analyzed to obtain a relative concentration of soil contaminants.

TABLE 5-28-2

POTENTIAL RELEASE SITES AND CHEMICALS OF POTENTIAL CONCERN CONTAINED IN OU 1082, OUTFALLS AGGREGATE

PRS	DESCRIPTION	PRIMARY ACTIVITY LEADING TO A POTENTIAL PROBLEM	ACTIVE	HE			RAD	METALS			
				UNDETONATED HE	HE DEGRADATION PRODUCTS	HE BURN PRODUCTS	URANIUM	METALS SUITE	BARIUM	VOLATILES	SEMIVOLATILES
16-026(b2)	TA-16-202	Metal machining	N					X		X	X
16-026(c2)	TA-16-462	Chemical storage	N					X		X	X
16-026(i)	TA-16-224	Radiography of HE components	N	X	X			X	X	X	X
16-026(j)	TA-16-226	Radiography of HE components	N	X	X			X	X	X	X
16-026(k2)	TA-16-260	HE machining	Y	X	X			X	X	X	X
16-026(r)	TA-16-180	Fire station	N					X		X	X
16-026(u)	TA-16-195	Service station	N					X		X	X
16-028(b)	TA-16-370	Barium nitrate grinding	Y					X	X	X	X
16-028(c)	TA-16-220	Radiography of HE components	Y	X	X			X	X	X	X
16-028(d)	TA-16-202	Metal machining	Y					X		X	X
16-029(j)	TA-16-260	HE machining	N	X	X			X	X	X	X
16-030(a)	TA-16-344	Chemical storage	N					X	X	X	X
16-031(a)	TA-16-372	Cooling tower	N					X			
16-031(b)	TA-16-262	Cooling tower	N					X			
C-16-002	Debris from TA-16-262	Cooling tower	N					X			

A soil sample was taken from a point 150 yards south of TA-16-370. This point is located in the open drain for the building, according to a field description (Turner and Schwartz 1971, 15-16-284). Presumably this is the same drainage channel that is covered in SWMU 16-028(b). Results show no HE compounds, which is expected because no HE is handled in the building. The barium content of the Soxhlet extract of the soil showed 19 ppm barium (Table 5-28-3). This value is higher than the 14 ppm barium result obtained from soil samples in a drainage channel for the burning grounds, 30 ft west of TA-16-389. It is also higher than two measurements of soil samples taken 1 200 ft northeast of TA-16-260 and 300 ft further downstream. Soils at TA-16-260 and the burning grounds are expected to have high barium content. This study indicates that when the drainage from TA-16-370 was sampled in 1971, it was contaminated with barium from barium nitrate grinding in the building.

TABLE 5-28-3

ANALYSIS OF SOIL SAMPLES FOR BARIUM CONTENT[a]

LOCATION	BARIUM CONCENTRATION (ppm)[b]
150 ft south of TA-16-370, in open drain for building	19
30 ft west of TA-16-389, open drainage for burning grounds	14
1 200 ft northeast of TA-16-260, collected at surface	9
300 ft downstream from above sample, collected at surface	3

[a] From Turner and Schwartz 1971, 15-16-284

[b] Relative barium concentration in soils obtained by atomic absorption spectrometry of Soxhlet extraction of soil samples with water.

A 1994 study of the soil around TA-16-370 used laser induced breakdown spectroscopy (LIBS) and x-ray fluorescence (XRF) to determine the barium content. This study was conducted to compare the field results obtained by LIBS to lab-based XRF results and determine the precision of field-based LIBS measurements. Soil samples were collected between the outfall for SWMU 16-028(b) and 168 ft down the drainage channel. The farthest sample point is probably near the sample point collected by Turner and Schwartz. The XRF results obtained for the soil samples are shown in Table 5-28-4. These results show that the barium concentration in the drainage channel from TA-16-370 is well below the SAL of 5 600 ppm but in some places

TABLE 5-28-4

BARIUM CONCENTRATION IN SOIL SAMPLES MEASURED WITH XRF

SOIL SAMPLE	DISTANCE FROM OUTFALL (FT)	BARIUM (ppm)
Background	-1	458
Sample 1	0	553
Sample 2	26	603
Sample 3	57	1 478
Sample 4	66	1 476
Sample 5	90	389
Sample 6	111	850
Sample 7	168	445

above LANL background levels for barium in soil (Longmire et al. 1993, 0958).

5.28.2 Remediation Decision and Investigation Objectives

Generic decision criteria, decision logic, exposure pathways, and conceptual exposure models are located in Sections 4.3 and 5.0 of this document. Site-specific decision information is included in the following subsections.

5.28.2.1 Problem Statement

The COPCs for this aggregate are: 1) semivolatile and volatile organic compounds, metals, and oil from the chemical storage outfalls; 2) oil and metals from the oil overflow outfalls; 3) semivolatile organic compounds and metals used in the machine shop; 4) HE, HE degradation products, and barium from the radiography buildings; 5) volatile and semivolatile organic compounds, metals (barium), and oil from the machine shop and grinding facility; 6) chromates potentially used in the cooling towers; and, 7) HE and HE degradation products from outfalls associated with an HE machining building (Table 5-28-2).

The Phase I problem is to determine if contaminants are at levels of concern in any PRS in this aggregate. The structures include active and inactive drain lines and outfalls at S-Site. There is potential for near-surface (upper 6 in. of soil) and deep-surface (upper 24 in. of soil) contamination at many PRSs in this aggregate. There is potential for subsurface (below 24 in. of soil) contamination from volatile organics at a number of PRSs in this aggregate. The probability of contamination is moderate to low for most PRSs because the original source term is likely to be small.

5.28.2.2 Design Criteria

The design criteria for the screening assessment include the perceived severity and heterogeneity, of the primary COPC at each PRS. The severity of potential contamination was used to select the number of laboratory samples, and the heterogeneity of the constituents influenced the selection of field screening samples (see Section 5.0 for additional discussion of this approach). Heterogeneity is used here to describe variation in contaminant concentration. Heterogeneity of COPCs for each outfall was judged by considering the steepness of the slope where the outfall discharges and the volume of water that is released through the pipeline in a month. A small discharge was judged to be less than 100 gal./month, the average volume used for floor washing.

Table 5-28-5 shows the severity and heterogeneity ranks for these PRSs.

All of these PRSs were judged to either present a not very serious or negligible probability of contamination. The outfall for 29 floor drains from the barium nitrate grinding facility [SWMU 16-028(b)] was judged to present a not very serious probability of having contamination greater than SAL due to a combination of large amounts of barium originally released and subsequent weathering of this original source term after barium nitrate operations stopped in the late 1950s. The relatively high SAL (5 600 ppm) for barium also influenced the classification of this PRS as having a not very serious probability of exceeding its SAL. The 1994 XRF/LIBS study of barium in this outfall (see Subsection 5.28.1.2 and Table 5-28-4 above) supports this assessment. Potential contamination at this PRS was judged likely to be heterogeneous due to the steepness of the discharge point and the potential release of large volumes of water. Three buildings where HE was inspected by x-rays [SWMUs 16-026(i), 16-026(j), 16-028(c)] were also judged to present a not very serious probability that potential contamination exceeds SALs. The x-ray inspection operations created HE dust and chips that would have been washed through the drain line to the outfall. One of these outfalls, SWMU 16-028(c), has NPDES permit 04A070 that allows the release of up to 24 000 gal./ month, and thus potential contamination was judged to be heterogeneous. The other outfalls, SWMUs 16-026(i) and 16-026(j), receive small volumes of water and discharge onto

TABLE 5-28-5

GROUPING OF OUTFALL PRSs INTO SEVERITY AND HETEROGENEITY CATEGORIES

AMOUNT OF CONTAMINATION	EXPECT HETEROGENEOUS CONTAMINATION DOWNSTREAM OF OUTFALL; VERY STEEP SLOPE AT OUTFALL OR HIGH VOLUME THROUGH OUTFALL		EXPECT CONTAMINATION TO BE HOMOGENEOUS AND LOCALIZED NEAR THE OUTFALL GRADUAL SLOPE AT OUTFALL AND LOW VOLUME OF WATER	
	PRS	**Description**	**PRS**	**Description**
Very Serious				
Serious				
Not Very Serious	16-028(b)	Former barium nitrate grinding facility outfall	16-026(i) 16-026(j)	Radiography building outfalls
	16-028(c)	Radiography building outfalls		
Negligible	16-031(a)	Cooling tower outfall	16-026(k2)	TA-16-260 floor drains
	16-028(d)	Metal shop drain outfall	16-029(j)	TA-16-260 sump outfall
			16-026(b2) 16-026(r) 16-026(u)	Oil overflow drains
			16-031(b) and C-16-002	Cooling tower outfall
			16-026(c2)	Chemical storage building outfall
			16-030(a)	Chemical storage building outfall

gradual, grass-covered slopes. Potential contamination was judged to be homogeneous at these SWMUs.

The remainder of the PRSs in the outfall aggregate were judged to present a negligible probability that potential contamination exceeds SALs. The primary reason is that the potential source material for any of these PRSs is likely to be small. Two of these PRSs were judged to have heterogeneous potential contamination. One cooling tower outfall [SWMU 16-031(a)] discharges onto a steep and rocky slope, which indicates that potential contamination may be heterogeneously distributed. The metal shop drain [SWMU 16-028(d)] has NPDES permit 04A083 that allows release of up to 5 gal./minute and receives intermittent volumes of rainwater, which classifies potential contamination as heterogeneous.

The remainder of the PRSs in the outfall aggregate represent a negligible probability that potential contamination exceeds SALs and any contamination is expected to be relatively homogeneous within the PRS. This classification is due to outfalls discharging onto gently sloping terrain where a small volume of water was released from the pipe. In most cases, the only water routinely released through the pipeline was from floor washings. These PRSs include: oil overflow drains [SWMUs 16-026(b2), 16-026(r), and 16-026(u)], the cooling tower outfall [SWMU 16-031(b)] and the associated potential surface contamination area (C-16-002), the sump and floor drains for TA-16-260 [SWMU 16-029(j)], a metal shop outfall [SWMU 16-026(k2)], and the chemical storage building outfalls [SWMUs 16-026(c2) and 16-030(a)].

5.28.3 Sampling and Analysis Plan

SOPs that control field activities in this sampling plan are listed in Table 5-28-6. Appropriate health and safety precautions will be undertaken according to the ER Programs SOPs (LANL 1993, 0875) and the site-specific health and safety plan. Sampling numbers and required analyses are shown in Table 5-28-7. Field quality assurance samples will be collected according to the guidance provided in the latest revision of the IWP (LANL 1995, 1164). Any QA/QC duplicate samples planned to be collected during the course of the field investigations are included in Table 5-28-7.

Fixed-base laboratory analysis of samples will be at Level III for metals (SW-846 Method 6010), SVOCs (SW-846 Method 8270), and VOCs (SW-846 Method 8240), HE and its byproducts (SW-846 Method 8330). TNT and RDX are the principal HE of concern and the principal HE byproducts of concern are DNT, TNB, and DNB.

TABLE 5-28-6

STANDARD OPERATING PROCEDURES FOR FIELD ACTIVIES

LANL-ER-SOP	TITLE	NOTES
01.02, R0	Sample Containers and Preservation	Applied to all laboratory samples
01.03, R1	Handling, Packaging, and Shipping of Samples	Applied to all laboratory samples
01.04, R2	Sample Control and Field Documentation	Applied to all laboratory samples
03.01, R1	Land Surveying Procedures	Applied to all engineering surveys
06.09, R0	Spade and Scoop Method for Collection of Soil Samples	Applied to all surface samples
06.10, R0	Hand Auger and Thin-Wall Tube Sampler	Applied to all augered samples
10.06,R0	High Explosives Spot Test	Applied to all field-screened samples.
10.07,R0	Field Monitoring for Surface and Volume Radioactivity Levels	Applied to all field-screened samples
12.01, R1	Field Logging, Handling, and Documentation of Borehole Materials	Applied to all cored samples

A later version of any SOP will be used if the cited version is superseded.

5.28.3.1 Sampling

All samples will be field screened for HE by spot test and radionuclides by gross beta-gamma. Although radionuclides are not COPCs at any of these PRSs, any sampling interval exhibiting a positive rad screening will be submitted for total uranium analysis in the laboratory. Each sample will be field screened at its midpoint on 12-in. intervals. The detection limits of the HE spot test are at a level such that a positive reading for TNT or RDX indicates a sample with contamination at a level above its SAL. All samples greater than a 6-in. depth will be field screened for volatile organic compounds with a PID. SOPs for these procedures are currently in place. All samples which test positive for VOCs with the PID, for HE with the spot test, or have above-background metal or radiation readings (twice background or more), or are positive for other field screening tests will be sent for laboratory analysis. If a core section field screens positive, that interval and a sample collected two feet below that interval will be sent for laboratory analysis. If multiple positive screenings are obtained on a core, the shallowest positive interval, the deepest positive interval, and the interval below the deepest interval will be submitted for laboratory analysis in order to estimate the extent of contamination. In cases where no samples yield

TABLE 5-28-7

SUMMARY OF SITE SURVEYS, SAMPLING, AND ANALYSIS FOR OUTFALLS AGGREGATE

			LABORATORY #						FIELD SCREENING #							FIELD LAB						LABORATORY ANALYSES #											
PRS	PRS TYPE	SAMPLED MEDIA	NEAR-SURFACE	FIELD DUP	DEEP-SURFACE	FIELD DUP	SUBSURFACE	FIELD DUP	BTEX TEST KIT	GROSS GAMMA/BETA	ORGANIC VAPOR	HE SPOT TEST	CHROMIUM - LIBS or XRF	BARIUM - LIBS or XRF	A GEOLOGICAL CHARACTERIZATION	GROSS ALPHA	GROSS GAMMA/BETA	HIGH EXPLOSIVES	VOLATILE ORGANICS	B XRF	SOIL MOISTURE	ALPHA SPECTROSCOPY	GAMMA SPECTROSCOPY	C BETA SPECTROSCOPY	TOTAL URANIUM	ISOTOPIC PLUTONIUM	ISOTOPIC URANIUM	D VOCs (SW 8240)	E SEMIVOLATILES (SW 8270)	F METALS (SW 6010)	G ASBESTOS	H HIGH EXPLOSIVES (SW 8330)	CYANIDE
16-026(b2)	Outfall TA-16-202	Soil					1		1	1	1	1						+										1	1	1			
16-026(c2)	Outfall TA-16-462	Soil					1			3	3	3						+										1	1	1			
16-026(i)	Outfall TA-16-224	Soil	1				1			2	1	2		2				+										2	2	2		2	
16-026(j)	Outfall TA-16-226	Soil	1	1			1			2	1	2		2				+										2	2	2		2	
16-026(k2)	Outfall TA-16-260	Soil			3		1			3	3	3		3				+										4	4	4		4	
16-026(r)	Outfall TA-16-180	Soil					1		1	1	1	1						+										1	1	1			
16-026(u)	Outfall TA-16-195	Soil					1		1	1	1	1						+										1	1	1			
16-028(b)	Outfall TA-16-370	Soil			2					5	5	5		5				+										2	2	2			
16-028(c)	Outfall TA-16-220	Soil			2		1			3	3	3		3				+										3	3	3		3	
16-028(d)	Outfall TA-16-202	Soil			2				4	4	4	4						+										2	2	2			
16-029(j)**	Outfall TA-16-260	Soil																															
16-030(a)	Outfall TA-16-344	Soil			2	1				6	6	6		6				+										2	2	2			
16-031(a)	Cooling tower	Soil	1							5		5	5					+												1			
16-031(b)	Cooling tower	Soil	1							2		2	2					+												1			
C-16-002**	Debris	Soil																															

= The actual number of samples will depend on the results of the field screening and the depth of the cores. These numbers are a minimum.

A, B, C = not applicable; E = full suite; F = 1082 suite; H = full suite.

*any contamination associated with 16-029(j) will be detected in sampling 16-026(k2).

**any contamination associated with C-16-002 will be detected in sampling 16-031(b).

positive readings, a hierarchy for selecting laboratory samples is included with each sampling plan. In general, those samples nearest the outfall of an individual PRS and the deepest increment in cases of volatile and semivolatile organics as indicator COPCs, will be selected and the shallowest increment in cases of HE and metals as indicator COPCs will be selected.

The spatial boundaries of potential contamination for the outfall aggregate include the PRS boundaries for the drain lines and outfalls. It is expected that drain lines are excavated into the tuff, since the soil is shallow at S-Site, usually less than three feet deep. Thus, the depth boundary for the drain lines is from the surface to the soil-tuff interface. All near-surface samples will be collected to a 6-in. maximum depth. All deep-surface samples will collected to a 24-in. depth unless specified otherwise. Each subsurface core will be augered to a depth of three feet or the soil-tuff interface. Core samples will be field screened on a 12-in. interval. The field team leader has the option to focus screening and select laboratory samples at a given depth for deep surface cores taken in a PRS.

For each PRS, sampling points will be biased to areas believed most likely to contain the highest concentrations of COPCs based on field screening, orthocorrected aerial photographs, archival data, and the results of geomorphological surveys. Sample parameters, including complete lists of COPCs to be analyzed in the laboratory, are summarized in Table 5-28-7. Field screening locations are shown on individual figures referenced in the subsections below.

SWMU 16-028(c). Sampling at the outfall of inactive radiography building TA-16-220 is primarily concerned with barium and HE. This outfall has high flow, which may distribute potential contamination further downstream than the outfalls described below [SWMUs 16-026(i), 16-026(j)]. One subsurface core will be collected in the sediment trap at the outfall (Fig. 5-28-11). Two 0 to 24 in. samples will be collected at the culvert directly below the first sampling location and at the outlet of the culvert (50 ft downgradient of the outfall). In the absence of positive field screening points, one near-surface increment from each sampling location will be submitted for laboratory analysis.

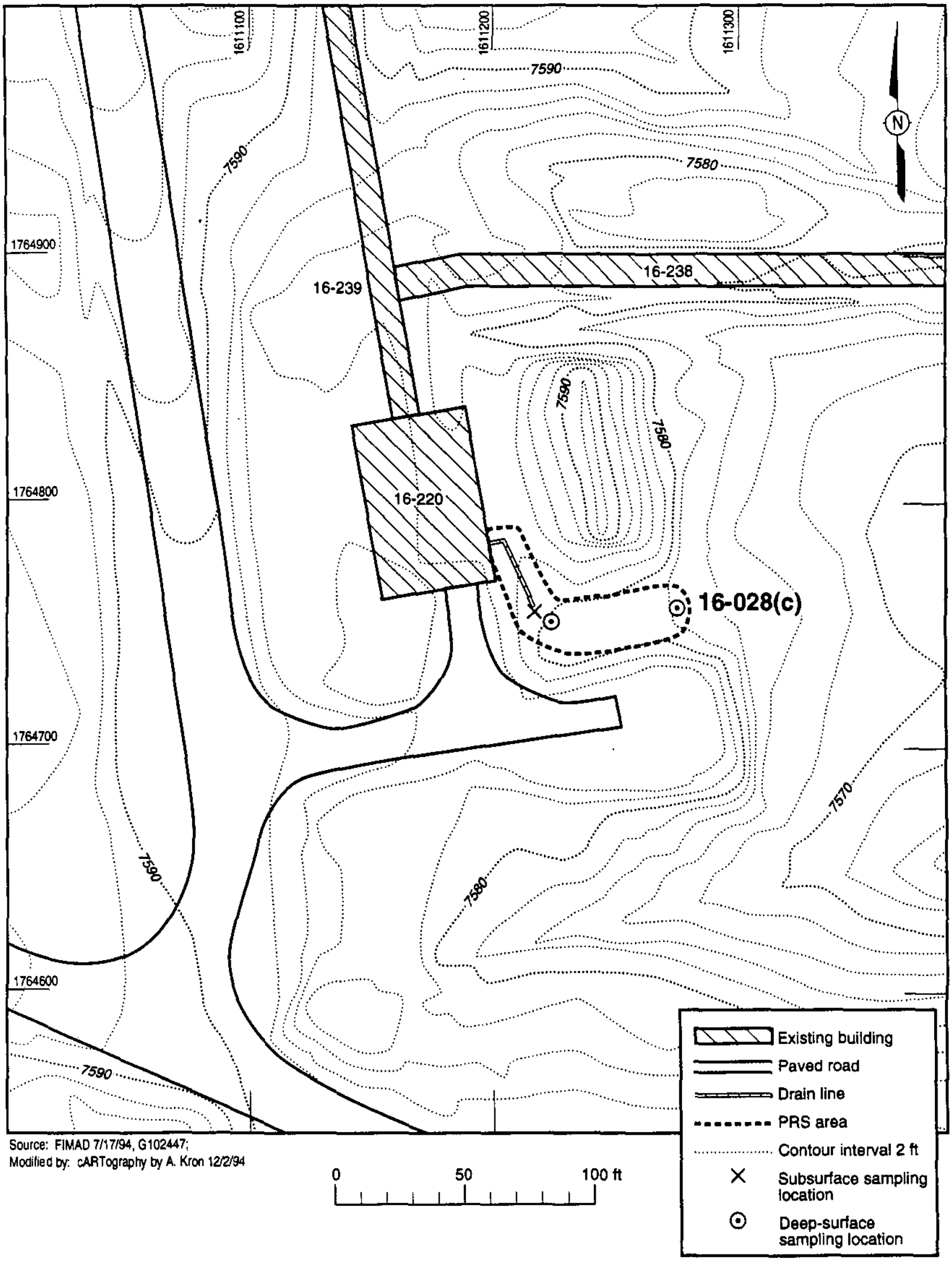


Fig. 5-28-11. Sampling locations for SWMU 16-028(c), outfall at TA-16-220 in the radiography area.

SWMU 16-026(i). Sampling at the outfall of inactive radiography building TA-16-224 is primarily concerned with barium and HE. The outfall is characterized by low flow onto a shallow, grassy slope, and sampling is limited to one augered subsurface location adjacent to the end of the pipe and one 0 to 6 in. sample location approximately 5 ft downgradient (Fig. 5-28-12). In the absence of positive field screening points, one 0 to 6 in. sample from each sampling location will be submitted for laboratory analysis.

SWMU 16-026(j). Sampling at the outfall of inactive radiography building TA-16-226 is primarily concerned with barium and HE. It is assumed that the outfall will be located by magnetic surveying during field surveys. The outfall is characterized by low flow onto a shallow, grassy slope, and sampling is limited to one subsurface core adjacent to the end of the pipe and one 0 to 6 in. sample located approximately 5 ft downgradient (Fig. 5-28-13). In the absence of positive field screening points, one 0 to 6 in. sample from each sampling location will be submitted for laboratory analysis.

SWMU 16-028(b). Sampling at the outfall of former barium nitrate grinding facility TA-16-370 is primarily concerned with volatile and semivolatile organics, and metals, including barium. These organics may be present due to the metal operations that succeeded the grinding facility operations. The drainage downgradient of the outfall is well defined for a distance of 60 ft downstream, at which point it joins a drainage from a steam pit drain in TA-16-370 [SWMU 16-026(a)]. Four screening locations for 0 to 24 in. samples will be selected in the sediment traps in this drainage (Fig. 5-28-14). One screening location will be selected approximately 110 ft downgradient from the outfall, near the marshy area of the drainage. In the absence of positive field screening points, two laboratory samples will be selected from screening locations by selecting the core increments through the following hierarchy: 1st) increments with greater than background barium readings (2 x background) as measured by LIBS or XRF; 2nd) the shallowest soil increment from the sediment trap furthest from the outfall; and, 3rd) the deepest increment from the sediment trap furthest from the outfall. At least one laboratory sample will be selected at or below the confluence of the drainage channels,where the marshy area acts as a sediment trap.

SWMU 16-031(a). Sampling of the outfall for inactive cooling tower TA-16-372 is primarily concerned with potential chromium contamination. Five 0 to 6 in. samples

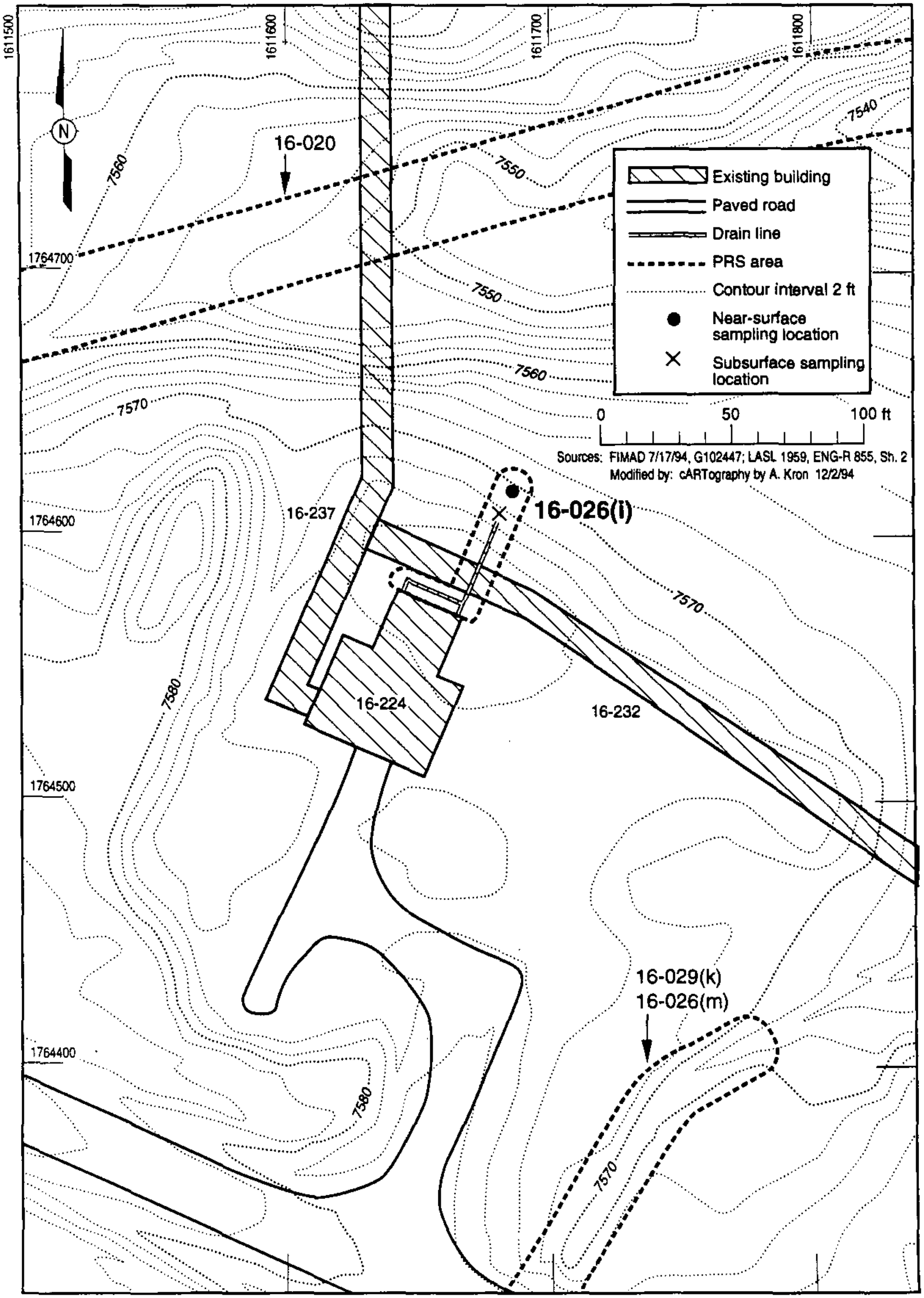


Fig. 5-28-12. Sampling locations for SWMU 16-026(i), outfall at TA-16-224 in the radiography area.

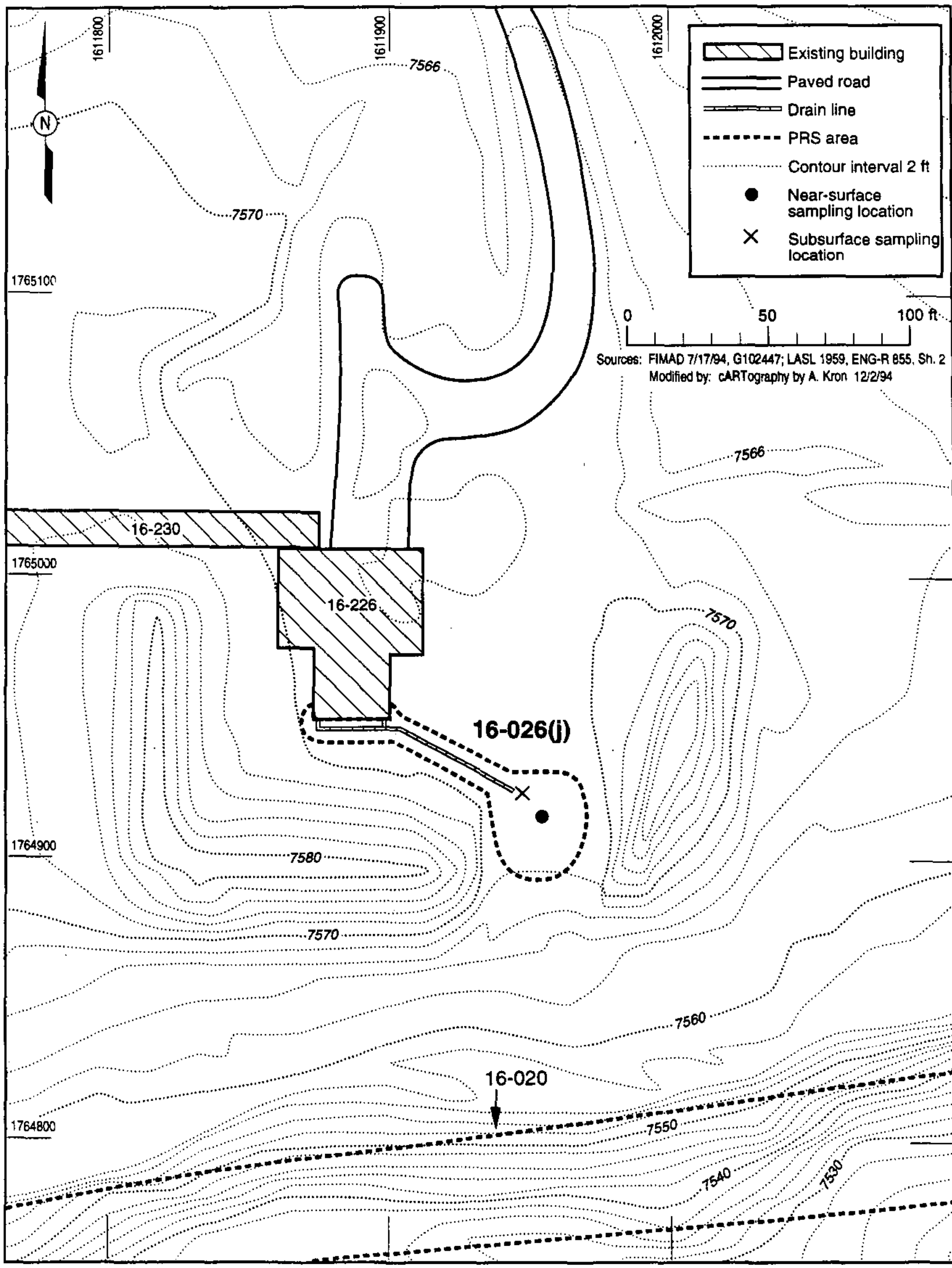


Fig. 5-28-13. Sampling locations for SWMU 16-026(j), outfall at TA-16-226 in the radiography area.

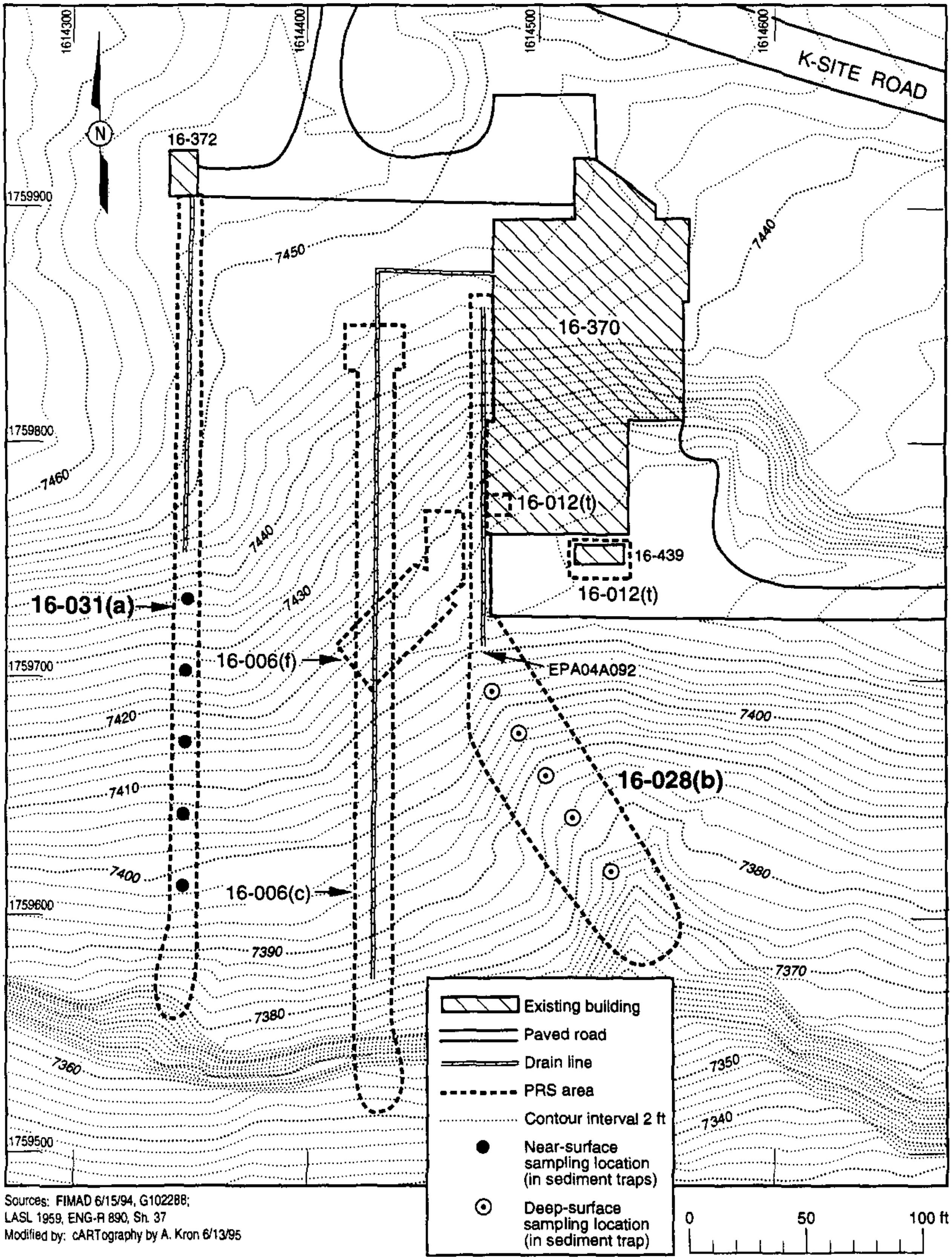


Fig. 5-28-14. Sampling locations for SWMUs 16-028(b) and 16-031(a), outfalls near TA-16-370, the barium nitrate grinding facility.

will be selected in sediment traps between the outfall and the steep canyon wall, which is approximately 200 ft downgradient (Fig. 5-28-14). The closest sediment traps will be sampled, regardless of distance. The five samples will be field screened by field XRF or LIBS for chromium, and one will be submitted for laboratory analysis based on the following biasing scheme: 1st) the highest above-background chromium reading (2 x background), 2nd) the shallowest core increment from the sampling location nearest the outfall.

SWMU 16-031(b) and C-16-002. Sampling the outfall will be representative of both the SWMU and AOC related to decommissioned cooling tower TA-16-262. Sampling is primarily concerned with potential chromate contamination in the drainage downgradient of the outfalls (Fig. 5-28-15). One 0 to 6 in. sample will be collected in the drainage ditch at the end of each outfall pipe for a total of two surface sampling locations. Samples will be field screened by XRF or LIBS and one sample will be submitted for laboratory analysis based on the following biasing scheme: 1st) the highest above-background chromium reading (2 x background), and 2nd) the sampling location nearest the downgradient outfall.

SWMUs 16-026(k2) and 16-029(j). The drainage for the outfall will be sampled to detect potential HE contamination from the sump and drain line associated with TA-16-260, a building where HE machining occurred. Three augered subsurface samples will be collected downgradient of the outfalls to the soil-tuff interface (Fig. 5-28-16). The first two locations will be at the points where the 2-in. and 4-in. drain lines enter the drainage. The other sample location will be in the sediment trap located in the drainage before the culvert crosses under the roadway. In the absence of positive field screening points, three randomly selected core intervals from all of the sampling locations will be submitted for laboratory analysis along with the deepest interval from the core taken before the culvert.

If contamination above SALs or background is found by field testing the outfall for the sump, then additional Phase I sampling beneath the sump will be initiated. The sampling will consist of:

1) Investigating the interior of the sump for signs of cracks or leaks. If leak points are observed, site a core hole sample to pass near the leak points.

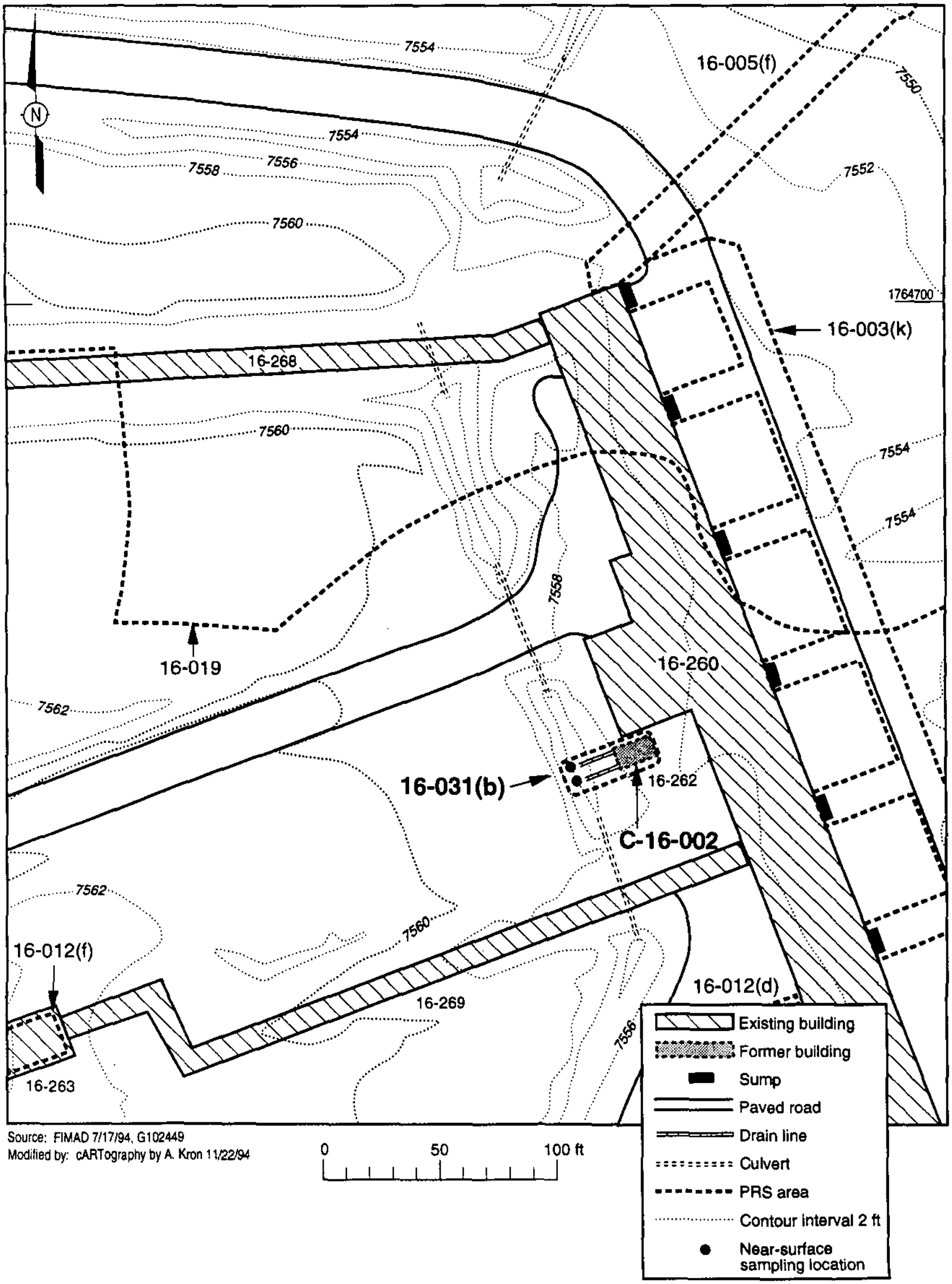


Fig. 5-28-15. Sampling locations for PRSs 16-031(b) and C-16-002, outfalls associated with TA-16-262, a decommissioned cooling tower.

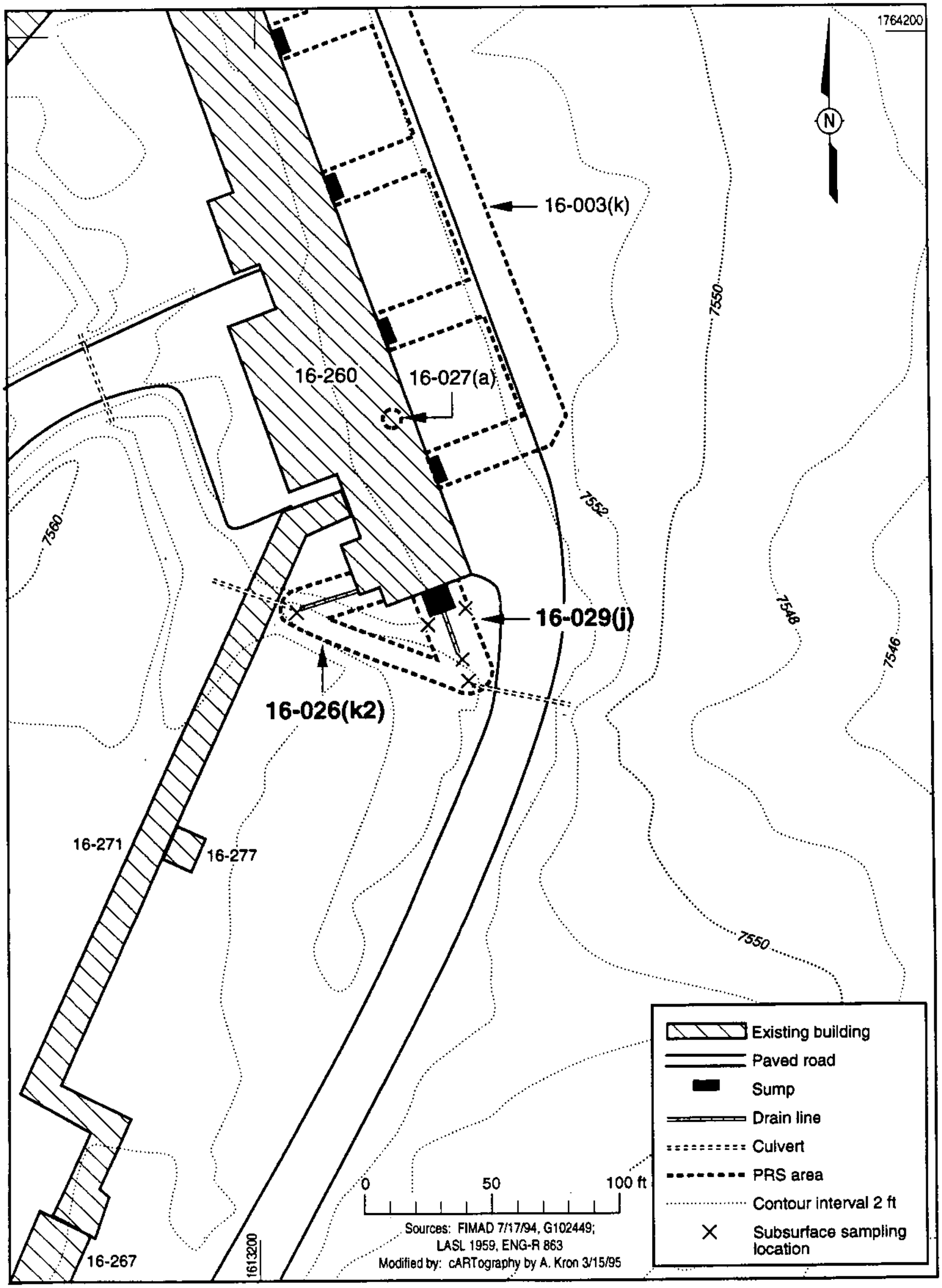


Fig. 5-28-16. Sampling locations for SWMUs 16-026(k2) and 16-029(j), outfalls at TA-16-260, an HE machining building.

2) Accurately surveying the location of at least two core holes. The preliminary locations are indicated on Fig. 5-28-16. Core hole siting is designed to pass near the sump/drain line joint (a high probability location of leakage for many sumps).

3) Drilling the core holes and collecting soil samples.

4) Field screening the core at 12-in. intervals for VOCs, HE, and radionuclides.

5) Submitting all above-background samples for laboratory analysis.

6) In the absence of positive field screening results, submitting the deepest sample from the downgradient core hole for laboratory analysis.

SWMUs 16-026(b2,r,u). Sampling these outfalls from oil overflow drains is primarily concerned with potential volatile and semivolatile contamination. One augered sample will be collected at the end of each outfall pipe to the soil-tuff interface (Figs. 5-28-17 and 5-28-18). Samples will be field screened by immunoassay test kit for BTEX. One laboratory sample will be selected from the core at each outfall. If there are no samples that screen positive, the deepest core increment from each outfall will be submitted for laboratory analysis. The oil separators located inside each building will be visually inspected for cracks and leaks. If cracks or leaks are observed, a core hole will be sited to pass near the leak point. If needed, hand-cored vertical samples will be collected inside the building. The core sample will be collected to a depth of five feet or to the soil-tuff interface. Samples will be field screened by immunoassay test kit for BTEX. If there are no samples that screen positive, the deepest core increment from each core hole will be submitted for laboratory analysis.

SWMU 16-028(d). Sampling this machine shop (TA-16-202) drain outfall is primarily concerned with potential semivolatile contamination. Four locations for 0 to 24 in. samples will be selected in the two sediment traps downgradient of the outfall (Fig. 5-28-18). Samples will be field screened by an immunoassay test kit for BTEX. If no sample tests positive during field screening, one sample interval from one of the deepest core increments of each of the two sediment traps sampled will be submitted for laboratory analysis.

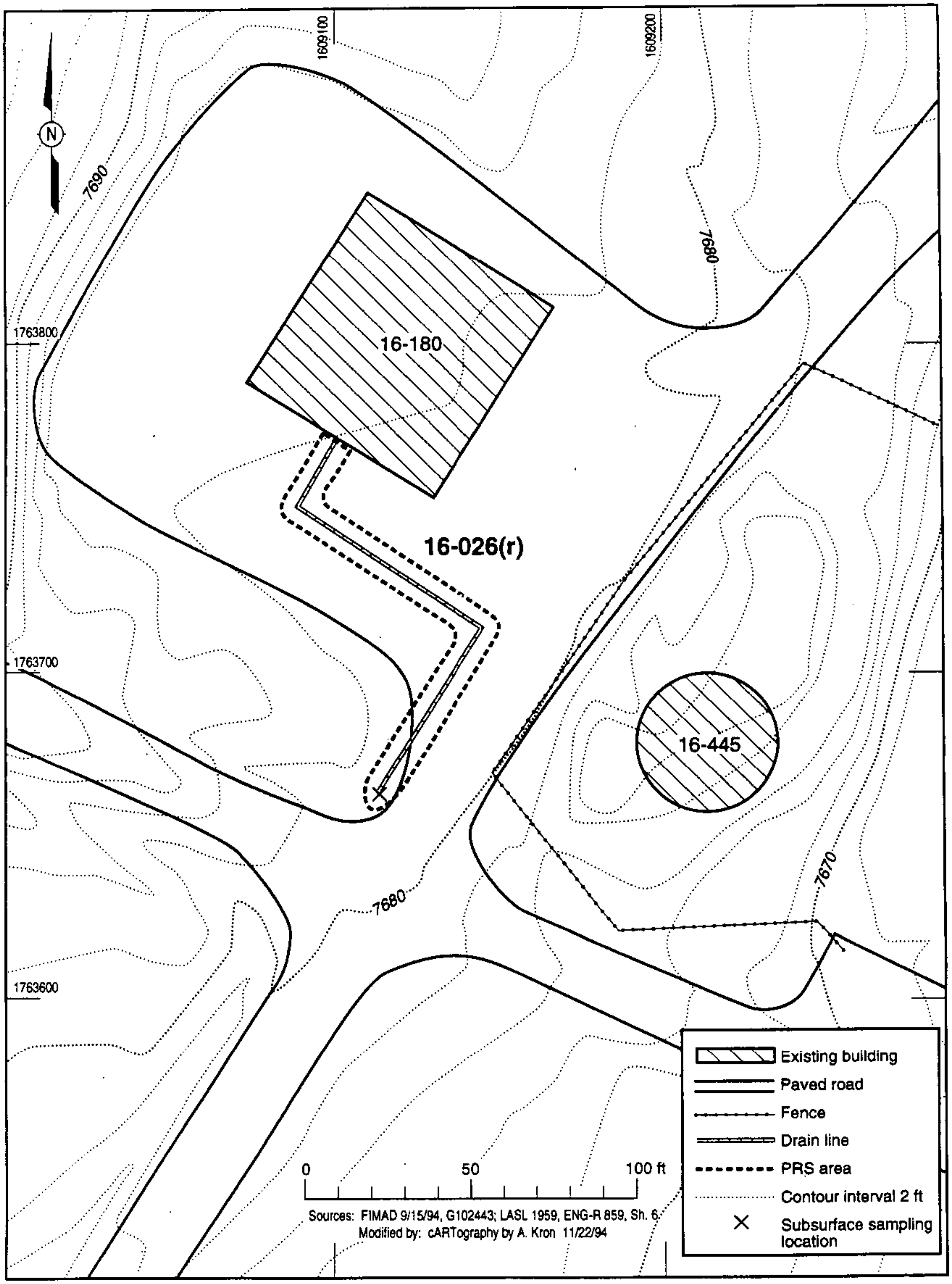


Fig. 5-28-17. Sampling location for SWMU 16-026(r), outfall at TA-16-180, a fire station.

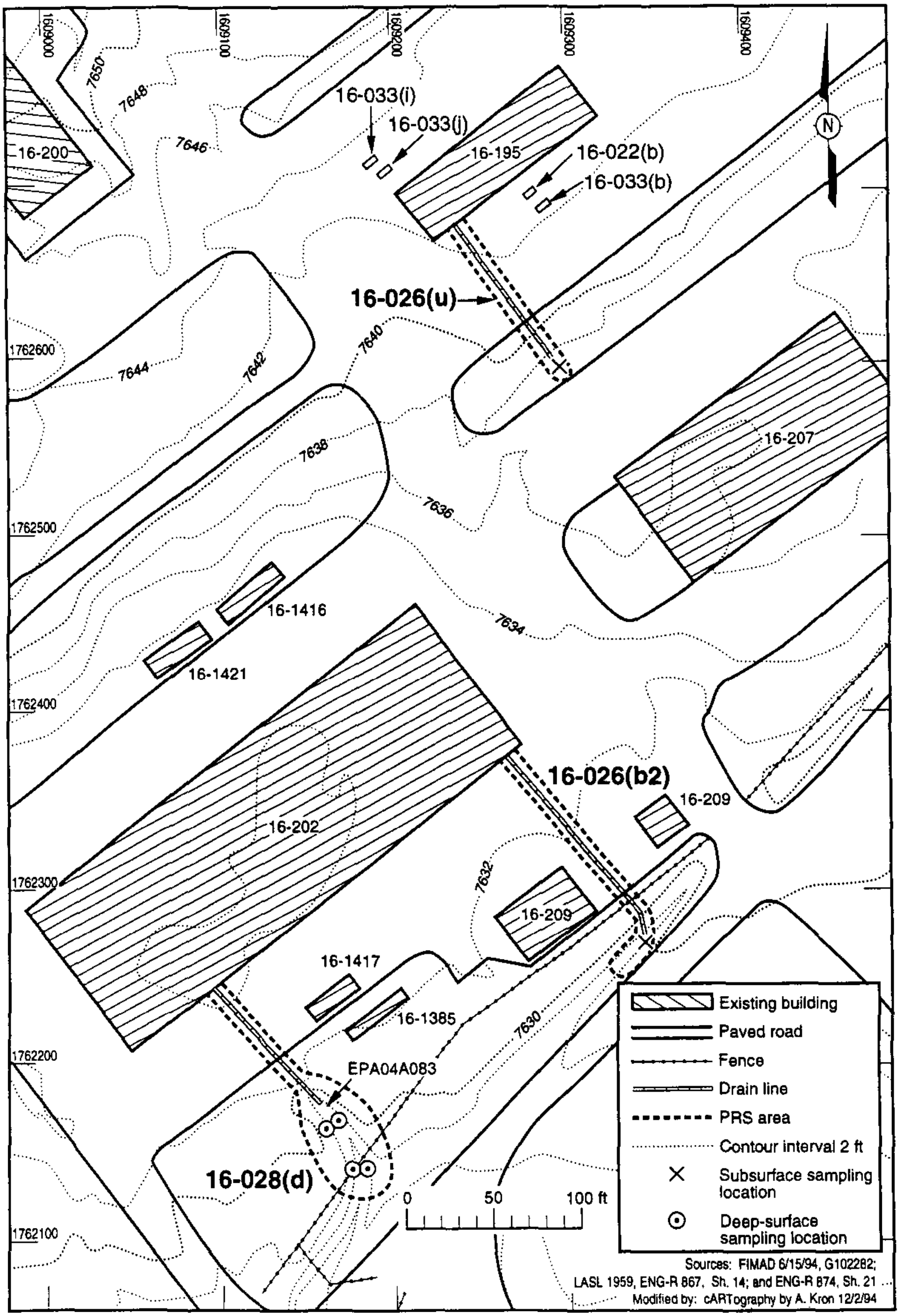


Fig. 5-28-18. Sampling locations for SWMUs 16-026(u and b2) and 16-028(d), outfalls in the administration area.

SWMU 16-026(c2). Sampling this outfall from chemical storage building TA-16-462 will be primarily concerned with potential volatile and semivolatile contamination. One hand-augered sample will be collected from the outfall's sedimentation pit down to the soil-tuff interface. Two 0 to 24 in. samples will be collected at each outfall (Fig. 5-28-19). In the absence of positive field screening points, one increment will be submitted for laboratory analysis from the deepest core sample of a randomly selected core.

SWMU 16-030(a). Sampling this outfall from chemical storage building TA-16-344 will be primarily concerned with potential volatile, semivolatile, and metals contamination. A total of six 0 to 24 in. samples will be selected in the following manner. Two samples will be collected from the deepest points of the semicircular outfall overflow impoundment, located along the southwest wall of TA-16-344 (Fig. 5-28-20). Three samples will be collected directly in front of the drainage troughs. One additional sample will be collected 20 ft downgradient from the trough that exits the southern end of TA-16-344. At least two increments will be submitted for laboratory analysis, one from the center of the pit and one directly in front of the southern trough in the absence of positive field screening results.

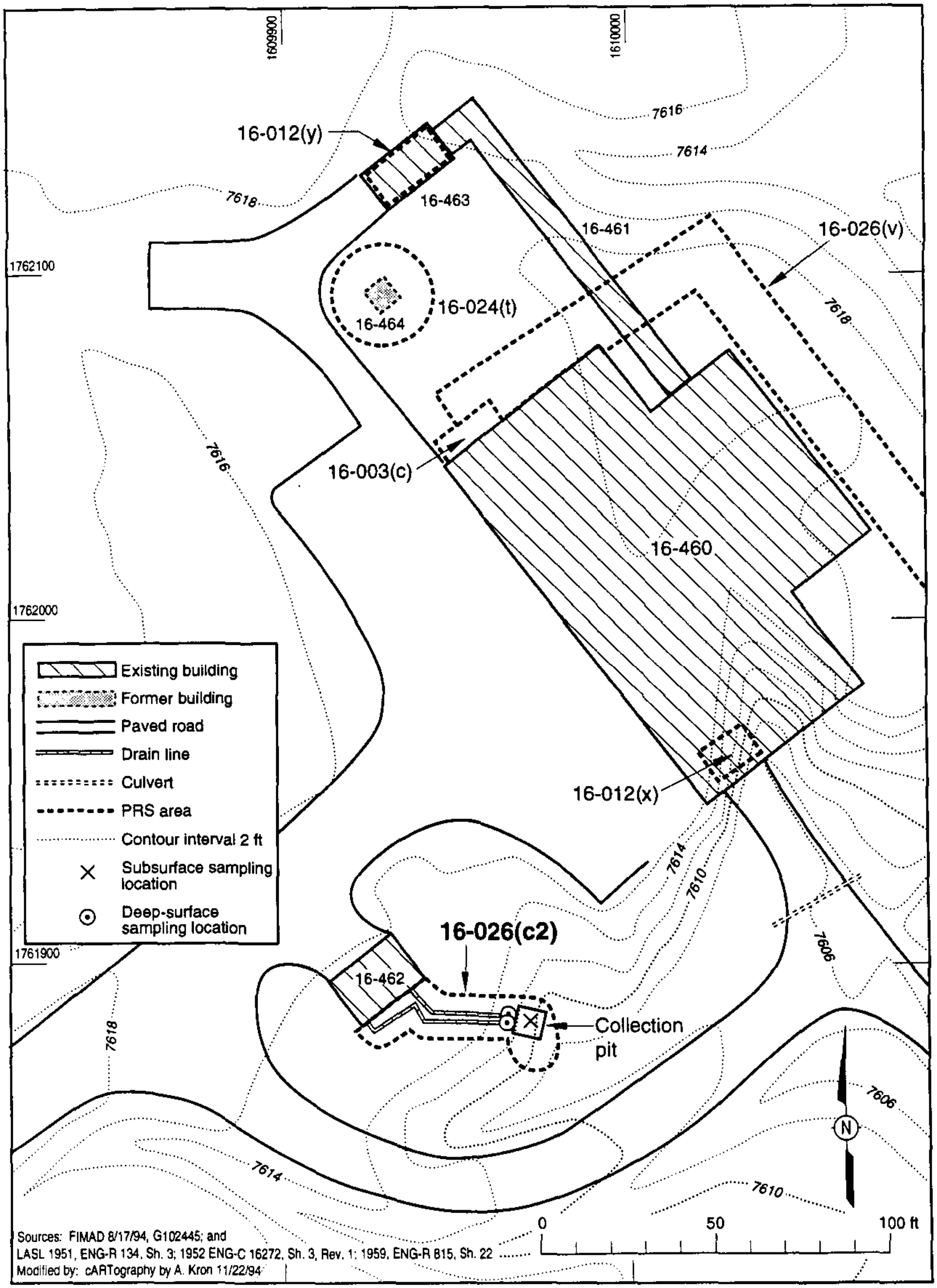


Fig. 5-28-19. Sampling locations for SWMU 16-026(c2), outfall near chemical storage building TA-16-462.

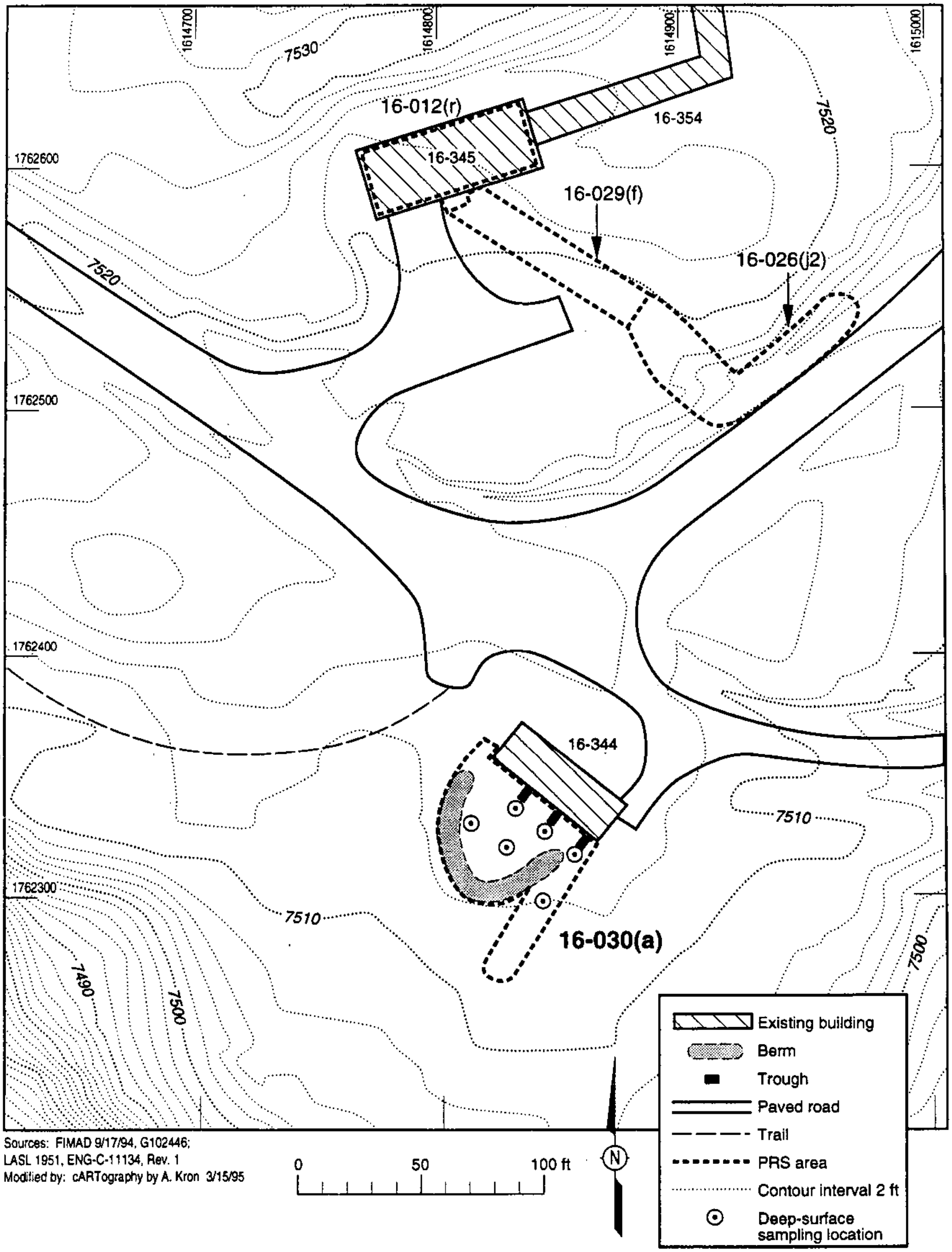


Fig. 5-28-20. Sampling locations for SWMU 16-030(a) outfall at TA-16-344.

5.29 TA-16-478 Aggregate

5.29.1 Background

This aggregate consists of SWMUs 16-003(p) and 16-029(h), the sump and drain lines from TA-16-478 (formerly TA-13-4). These SWMUs are aggregated because they are anticipated to be more seriously contaminated than the other SWMUs in Addendum 2 and may be recommended for expedited cleanup (EC) after initial sampling occurs.

5.29.1.1 Description and History

TA-16-478 is on the eastern end of the current TA-16 area in an area formerly known as P-Site (TA-13). The buildings at P-Site were built in 1944 and are some of the older buildings at LANL. The general history of P-Site is in Subsection 5.13.1.1 (LANL 1993, 1094). P-Site was originally built to study implosion using x-rays and later used to study initiators. Because of its remote location, it was also used to machine toxic or extremely dangerous explosives. After a 1959 accident machining HE at TA-16-260, TA-16-478 was used for remote HE machining tests, specifically high-speed machining tests on experimental HE compounds for characterization purposes. High-speed machining tests were done approximately fifteen times a year during the 1970s and 1980s (Paige 1994, 15-16-566).

TA-16-478 is rarely used now and the sump and outfall are plugged and inactive. The building is scheduled to be decommissioned and has been deactivated by turning off water and power to the structure. The sump is drained by vacuum when fluid is present (the source of the fluid is rainwater, as the structure is inactive). The sump measures 15 ft long x 5 ft wide x 4 ft deep. The building is U-shaped and consists of a 15 ft x 17 ft x 10 ft machining room, a 12 ft long x 16 ft wide x 8 ft high utility room, and a 34 ft long x 13 ft wide x 6.5 ft high control room.

TA-16-478 is one of two battleship bunkers oriented at right angles to each other (Fig. 5-29-1). The other bunker, TA-16-477 (SWMU 16-036), is addressed in Subsection 5.13 of the RFI Work Plan for OU 1082 (LANL 1993, 1094). These two bunkers are surrounded by a driveway to the north, west, and east, and an earthen berm to the south. The bunkers are located near the eastern edge of the mesa on which TA-16 is situated. The drainage in this level grass and asphalt-covered area is generally east into Cañon de Valle.

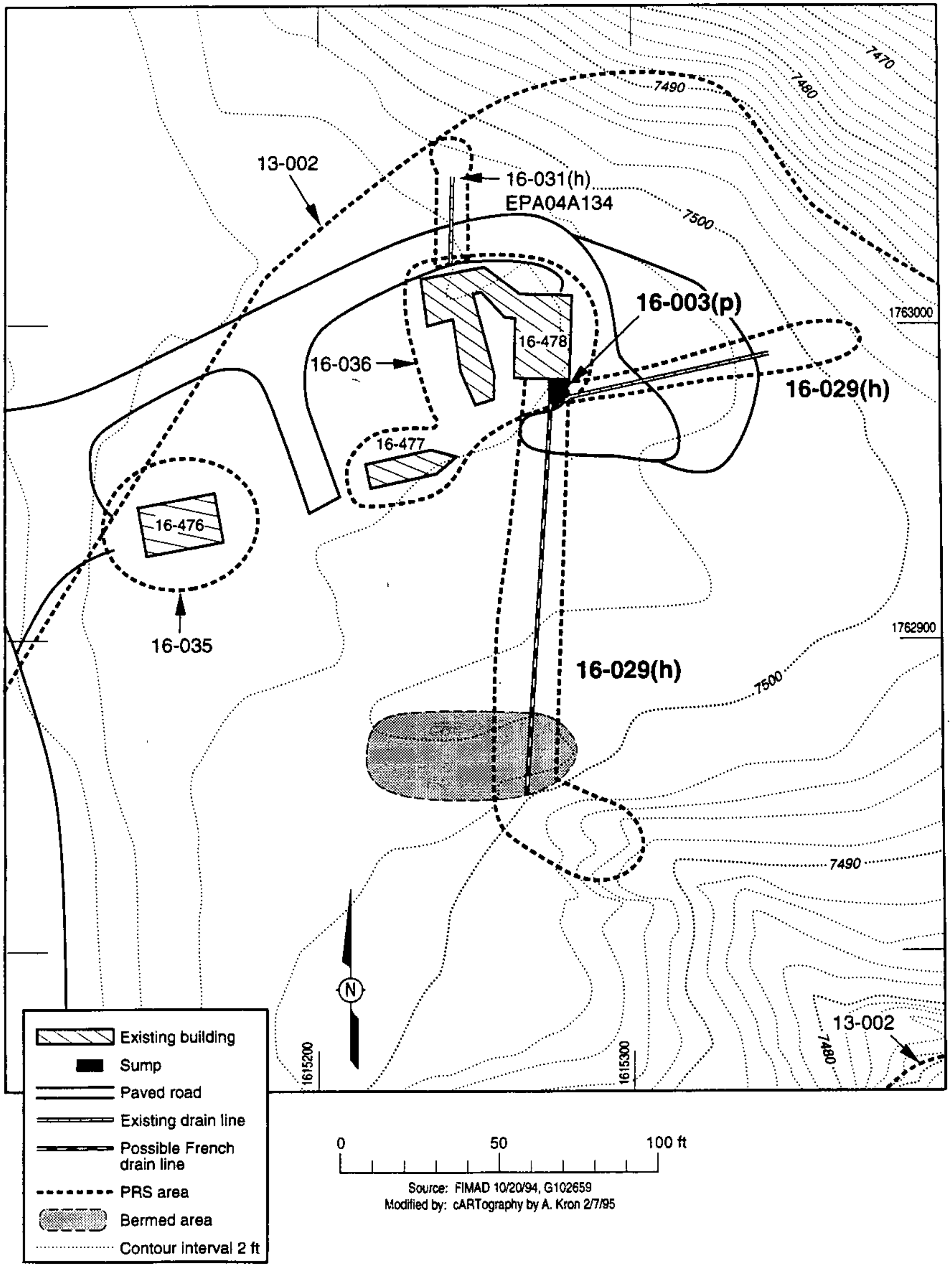


Fig. 5-29-1. SWMUs 16-003(p) and 16-029(h) at TA-16-478.

The bunkers were built in 1944; however, two rooms were added to TA-16-478 in August 1949. A utility room was added north of the bunker and a control room and a high-speed machining room were connected to the utility room by an enclosed hallway. The machining room walls are 20-in.-thick and made of steel-reinforced concrete with wooden panels that open to the outside along one wall, probably for blowout protection. The machining room also has a 6-in.-wide drain trough on the floor that drains to the sump located on the south end of the room. The floor is spark-proof and has a metal grounding plate for mounting machining equipment.

Engineering drawings of the building differ in their descriptions of the sump's orientation with respect to TA-16-478. Two of the drawings (ENG-C 14849 and 14850) show the sump oriented along the length of the south wall with the drain from the sump draining to the southeast. Engineering drawing ENG-C 17572 shows the sump positioned perpendicular to the south wall of TA-16-478 with the drain directed south. A later Engineering drawing (ENG-C 26678) shows the sump in its actual, current position, perpendicular to the south wall.

Two drain lines associated with the sump may be present. One drain pipe, exiting the southeast corner of the sump, was plugged in July 1987 (LANL 1990, 0145). This drain line runs 80 ft east of the sump, where the 6-in. vitrified clay pipe daylights on the rocky, tree-covered canyon rim. A recent HE spot test at this outlet indicated the presence of less than 100 ppm of HE in the pipe. Visual inspection of the interior of the sump shows that this is the only drain line currently attached to the sump. The other drain is the alleged French drain that at least one site worker, who worked at S-Site until 1979, reports may have existed at one time, possibly as late as the 1960s (Martin and Hickmott 1994, 15-16-549). A French drain is a permeable drainage system constructed to allow effluent to seep into a porous layer of rock located below the pipe.

In addition to site worker opinions, there is conflicting archival information concerning the sump drain. Engineering drawing ENG-C 17572 shows the sump in its present orientation (perpendicular to the south wall of TA-16-478) but with a drain line flowing south to open drainage instead of draining east as the sump currently does. ENG-C 17572 describes this drain line as an 8-in. cast iron soil pipe connecting to an 8-in. vitrified clay pipe. It is possible that this is the French drain. This archival information and previous site worker opinion are the basis for showing the drain to the south of TA-16-478 (Fig. 5-29-1). The French drain is believed to extend approximately 125 ft to the south of TA-16-478 and intersect an off-site drainage channel. Because a French drain is a semiporous drainage system, it could cause contamination to spread. Both drains are expected to be contaminated with HE as a result of past and present activities in this area and will need to be located and removed.

HE compounds were not the only materials machined in TA-16-478. Because the structure is so small and isolated, dangerous experimental compounds were often remotely studied there. Some of the compounds machined at this site included tuballoy/niobium laminates with HE (Drake 1966, 15-16-129). Tuballoy was the code name used at Los Alamos for nonenriched uranium. Because of their toxicity, radioactivity, and pyrophoric nature, these laminates were machined in TA-16-478 to protect TA-16-260, the main HE machining facility. As a result, both HE and uranium chips could be present in the sump and drain.

5.29.1.2 Conceptual Exposure Model

The conceptual exposure model for SWMUs 16-003(p) and 16-029(h) is presented in Sections 5.0 and 4.3 of this document. Site-specific information on potential release sources, chemicals of concern, migration pathways, and potential receptors is presented below.

5.29.1.2.1 Nature And Extent Of Contamination

A limited sampling program conducted from 1970 to 1986 indicates potential HE contamination at this outfall (Baytos 1986, 15-16-267; Baytos 1985, 15-16-268; Baytos 1974, 15-16-273; Baytos 1970, 15-16-276; and Baytos 1970, 15-16-278). Table 5-29-1 lists the results from the soil samples collected at this outfall. Surface samples (less than 4-in. depth) were collected near TA-16-478 and HE compounds were chemically extracted from the soil. RDX and HMX were present in the greatest concentrations. These samples were reported to have been collected from near a culvert, from the sump effluent outlet, from 3.3 ft below the berm, and from 9.8 ft below the berm. The exact location of the outlet is not known. It is also not known if these various locations are identical to one another. There is a berm located south of TA-16-478 (Fig. 5-29-1). The alleged French drain has not been located but is believed to be south of TA-16-478 based on Engineering drawing ENG-C 17572, which would place it near this berm.

TABLE 5-29-1

HIGH EXPLOSIVES IN DRAINAGE DITCHES AT SUMP EFFLUENT OUTLET BAYTOS' STUDIES OF 1970 - 1986 AT TA-16-478 [a,b]

SAMPLE DATE	SAMPLE LOCATION	HMX/RDX wt %	TNT wt %	TOTAL HE wt %
4/29/70	Effluent outlet	3.8	0.02	3.8
11/18/70	Effluent outlet	0.2	0.0	0.2
11/14/74	Culvert	0.1	0.0	0.1
7/18/84	3 ft below berm	0.1	0.0	0.1
7/18/84	10 ft below berm	4.6	0.1	4.7
9/12/85	10 ft below berm	4.3	0.0	4.3

[a] The sampling techniques and analytical methods are described in Baytos 1985, 15-16-268 and Baytos 1970, 15-16-278.

[b] SALs in soil are: TNT = 40 ppm (0.004 wt %); HMX = 4 000 ppm (0.4 wt %); and, RDX = 64 ppm (0.0064 wt %).

The COPCs for this SWMU include HE (RDX, HMX, and TNT), semivolatile HE degradation products (DNT, TNB, DNB), VOCs, SVOCs, barium, uranium, and metals. Concentrations of RDX and HMX in the soil at this outfall ranged up to 4.6 wt % from 1970 to 1986. Concentrations of TNT never exceeded 0.1 wt % (Baytos 1986, 15-16-267; Baytos 1985, 15-16-268; Baytos 1974, 15-16-273; Baytos 1970, 15-16-276; and Baytos 1970, 15-16-278). Based on Baytos' data, the TA-16-478 outfall was the second most highly contaminated sump outfall at TA-16; the TA-16-260 outfall was the most highly contaminated.

5.29.1.2.2 Potential Pathways And Exposure Routes

SWMUs 16-003(p) and 16-029(h) consist of a sump and two possible drain line outfalls. Discharge from the outfalls could have transported potential contaminants down the drainage and accumulated in sedimentation areas. Contamination of surface soils could have occurred through overflow and spillage from the sump. Leaks from joints and cracks in the sump and drain lines and discharge from the French drain could have resulted in release of COPCs into subsurface soils. Potential subsurface contamination does not pose a human health risk until excavation or erosion has exposed subsurface soils to the surface.

Current human receptors are limited to on-site workers. Future receptors could include on-site workers, recreational users, and trespassers. Chapter 4 of Addendum 1 contains a detailed discussion of the migration pathways, conversion mechanisms, human receptors, and exposure routes for contaminants (LANL 1994, 1160).

5.29.2 Remediation Decisions and Investigation Objectives

5.29.2.1 Problem Statement

The drainage systems associated with TA-16-478 are believed to be contaminated with HE, HE residues, metals, barium, VOCs, and possibly depleted or natural uranium. At present, it is unclear how many drain lines constitute the drainage system for this SWMU, but anecdotal evidence suggests that there are two separate drain lines. One of these drain lines may be a French drain or a semiporous drainage system. The sump [SWMU 16-003(p)] associated with TA-16-478 may also have spread contamination into the surrounding soil.

5.29.2.2 Decision Process

The sampling plan for SWMUs 16-003(p) and 16-029(h) has several objectives. First, each drain line will be located and traced to its terminus. Then the drain line and terminus will be sampled. Second, sampling will be required to determine the potential extent of contamination from releases. Finally, the sump will be sampled around its perimeter to detect potential releases.

The sampling described above will determine if COPC concentrations are above SALs in subsurface soils. If COPC concentrations are below SALs and there are no multiple constituent concerns, then a NFA decision may be proposed. If COPC concentrations are greater than SALs and background levels, then a Phase II study may be initiated to determine the extent of contamination, or the site may be proposed for EC. Sampling information obtained during Phase I will be used to estimate extent of contamination, identify waste constituents, and approximate waste volumes to determine if an EC would be feasible and effective for this SWMU.

5.29.2.3 Inputs

Prior to sampling, the location of the drain lines and the presence or absence of pipe in the drain trench will be ascertained. The vitreous clay drain line which exits the sump flowing east has already been visually located. Geophysical surveys and sampling results associated with other SWMUs near TA-16-478 may provide information about the location of drain lines at this structure. See Subsection 5.13 of the 1993 RFI Work Plan for OU 1082 for descriptions of sampling plans near TA-16-478 (LANL 1993, 1094). This information will be incorporated into this sampling plan as it becomes available. Other techniques may be needed to determine the location of subsurface structures and drain lines. Results from a recent pilot study using GPR at TA-16 indicate that GPR can successfully locate vitreous clay drain lines (LANL 1995, 15-16-610). Trenching will indicate if the pipe in the drain line is present or absent, or if a drain line ever existed to the south of the sump.

The primary data need from this phase of the investigation is sampling information from the outfall area that will allow a comparison to background and SALs to determine if a contaminant release occurred.

5.29.2.4 Boundaries

The spatial boundaries of potential contamination for the outfall aggregate include the PRS boundaries for the sump, drain lines, and outfalls. It is expected that drain lines were excavated into the tuff because the soil is shallow at S-Site, usually less than three feet deep. Thus, the depth boundary for the drain lines is from the surface to a minimum of 2.5 ft into the tuff. The depth boundary for the sump is two feet below the bottom of the sump or approximately six feet below the surface given the four-foot depth of the sump. This would extend at least three feet into the tuff. The rationale for the depth boundary is based on the characteristics of tuff in the area of the drain line. If a French drain is present, then the surface to a minimum of five feet into the tuff will be used as the depth boundary. This deeper boundary is used for the French drain because it was designed to seep the constituents into gravel or other material below the drain line. The depth boundary for the outfall will be the top 24 in. of soil or to the soil-tuff interface.

Sampling points and sampling depth will be biased to areas believed to most likely contain the highest constituent concentrations based on areas of visible HE contamination, field screening, orthocorrected aerial photographs, archival data, and results of geomorphological surveys. The field team leader has the option to extend the depth of core samples taken in this PRS based on visual inspection, laboratory analytical results, field screening results, and other field information.

5.29.2.5 Decision Logic

If the drain locations have not been determined by visual inspection, prior sampling, or geophysical surveys, shallow surface scraping will be used to determine the presence of drain line ditches that have been excavated into the tuff. If scraping does not reveal the location of the drain lines, trenching near the sump and extending south should reveal the presence of any drain system originating with the sump.

The presence or absence of a drain system to the south of the sump will determine which of two possible sampling scenarios are carried out. If no drain system is located south of TA-16-478, the area directly south of the sump will not be sampled. However, samples will be collected below the berm at TA-16-478, based on the high HE levels which were allegedly measured there in 1984 and 1985 (Baytos 1986, 15-16-267; Baytos 1985, 15-16-268). The berm presently located south of TA-16-478 is assumed to be the berm referred to in this archival information.

Assuming that a drain pipe or rock-filled drainage ditch is located south of TA-16-478, samples will be collected along the drain line. Sampling will be biased toward the site of open joints in the pipe, if they are present and located. Samples will also be collected at the terminus of the drain line. HE spot test results taken in the field will be used to guide the depth of sampling. Samples will be collected downgradient from the end of the outfall to estimate the extent of contamination. Samples will also be collected below the berm, due to archival information indicating contamination there.

5.29.2.6 Design Criteria

If prior sampling information in this area is available before this sampling plan is implemented, the design of this sampling plan may change to reflect additional information. Sample locations from earlier Phase I studies in this area (see Subsection 5.13 of this document) are marked on the sampling figures. The sampling plan will be coordinated with decommissioning activities at TA-16-478.

The proposed sampling plan constitutes a minimum number of sampling points required to characterize this PRS, based on archival information. The two possible sampling scenarios incorporate assumptions about the location of the drain line south of TA-16-478, near the berm. The historical information available indicates that this PRS may be contaminated. Because the suspected contamination originates from an outfall, the contamination is expected to be homogeneous, decreasing gradually with distance from the source. The minimum sampling plan proposed incorporates this assumption of severity and homogeneity.

5.29.3 Sampling and Analysis Plan

SOPs that control field activities in this sampling plan are listed in Table 5-29-2. Appropriate health and safety precautions will be undertaken according to the ER Project SOPs (LANL 1993, 0875) and the site-specific health and safety plan. Proposed sampling numbers and required analyses are shown in Table 5-29-3. Field quality assurance samples will be collected according to the guidance provided in the latest revision of the IWP or other appropriate documentation (LANL 1995, 1164). Any QA/QC duplicate samples planned to be collected during the course of the field investigations are included in Table 5-29-3.

Fixed-base laboratory analysis of samples will be at Level III for radionuclides (LANL or DOE method), metals (SW-846 Method, 6010), VOCs (SW-846 Method 8240), SVOCs (SW-846 Method 8270), and HE and its byproducts (SW-846 Method 8330). The principal radionuclide of concern is uranium. TNT and RDX are the two most frequently used HE and the principal HE byproducts of concern are DNT, TNB, and DNB.

TABLE 5-29-2

STANDARD OPERATING PROCEDURES FOR FIELD ACTIVITIES

LANL-ER-SOP	TITLE	NOTES
01.02, R0	Sample Containers and Preservation	Applied to all laboratory samples
01.04, R2	Sample Control and Field Documentation	Applied to all laboratory samples
03.01, R1	Land Surveying Procedures	Applied to all engineering surveys
03.10, R0	Trenching and Logging	Applies to the trenching survey
04.01, R0	Drilling Methods and Drill Site Management	Applied to all subsurface samples
06.09, R0	Spade and Scoop Method for Collection of Soil Samples	Used for surface samples at the outfall or other samples collected of unconsolidated soil or tuff
06.10, R0	Hand Auger and Thin-Wall Tube Sampler	Applied to all hand augered samples
10.06, R0	High Explosives Spot Test	Applied to all field-screened samples
10.07, R0	Field Monitoring for Surface and Volume Radioactivity Levels	Applied to all field-screened samples

5.29.3.1 Surface Scraping and Trenching Surveys

Geophysical studies of the area will be conducted at least two years prior to the implementation of this work plan, probably in fiscal year 1995. See Subsection 5.13 of the 1993 RFI Work Plan for OU 1082 for a detailed description of the survey (LANL 1993, 1094). If geophysical studies do not locate the subsurface structures at P-Site, other techniques may be needed. Given that the drain lines for this SWMU are expected to be buried into the tuff, surface scraping and trenching will be used to locate these underground structures. Shallow surface scraping will be used initially because it is a less intrusive technique. Differences in the tuff due to the presence of a drain line should be visible once the top layer of soil is scraped away.

If surface scraping does not reveal the drain line locations, trenches will be used. A likely trench pattern is shown in Fig. 5-29-2. The first trench will be located near the sump to determine the direction of the drain lines. Two or more additional trenches will be located along the drain line to completely map the location of the drain. All drain lines will be completely located to their termini.

TABLE 5-29-3

SUMMARY OF SITE SURVEYS, SAMPLING, AND ANALYSIS FOR TA-16-478 AGGREGATE

PRS	PRS TYPE	SAMPLED MEDIA	LABORATORY #: STRUCTURE	LABORATORY #: STRUCTURE FIELD DUP	LABORATORY #: SURFACE	LABORATORY #: SURFACE FIELD DUP	LABORATORY #: SUBSURFACE	LABORATORY #: SUBSURFACE FIELD DUP	FIELD SCREENING #: GROSS ALPHA	FIELD SCREENING #: GROSS GAMMA/BETA	FIELD SCREENING #: ORGANIC VAPOR	FIELD SCREENING #: HE SPOT TEST	FIELD SCREENING #: GEOPHYSICS SURFACE	FIELD SCREENING #: BARIUM - LIBS OR XRF	FIELD SCREENING #: A GEOLOGICAL CHARACTERIZATION	FIELD: GROSS ALPHA	FIELD: GROSS GAMMA/BETA	FIELD: HIGH EXPLOSIVES	FIELD: VOLATILE ORGANICS	FIELD: B XRF	FIELD: SOIL MOISTURE	LABORATORY ANALYSES #: ALPHA SPECTROSCOPY	LABORATORY ANALYSES #: GAMMA SPECTROSCOPY	LABORATORY ANALYSES #: C BETA SPECTROSCOPY	LABORATORY ANALYSES #: TOTAL URANIUM	LABORATORY ANALYSES #: ISOTOPIC PLUTONIUM	LABORATORY ANALYSES #: ISOTOPIC URANIUM	LABORATORY ANALYSES #: D VOCs (SW 8240)	LABORATORY ANALYSES #: E SEMIVOLATILES (SW 8270)	LABORATORY ANALYSES #: F METALS (SW 6010)	LABORATORY ANALYSES #: G ASBESTOS	LABORATORY ANALYSES #: H HIGH EXPLOSIVES (SW 8330)	LABORATORY ANALYSES #: CYANIDE
16-003(p)	Sump	Soil					2	1		3		3		3				*							2			2	2	2		2	
16-029(h)	East drain	Soil					3			8		8		8				*							3			3	3	3		3	
16-029(h)	Scenario one	Soil					4	1		10		10		10				*							4			4	4	4		4	
16-029(h)	Scenario two	Soil					1			5		5		5				*							1			1	1	1		1	

= The actual number of samples will depend on the results of the field screening and the depth of the cores. These numbers are a minimum.
A, B, C, D = not applicable; E = full suite ; F = 1082 suite; H = full suite.
* All samples with positive HE spot test results will be analyzed in the field for HE content in order to permit transportation of samples.

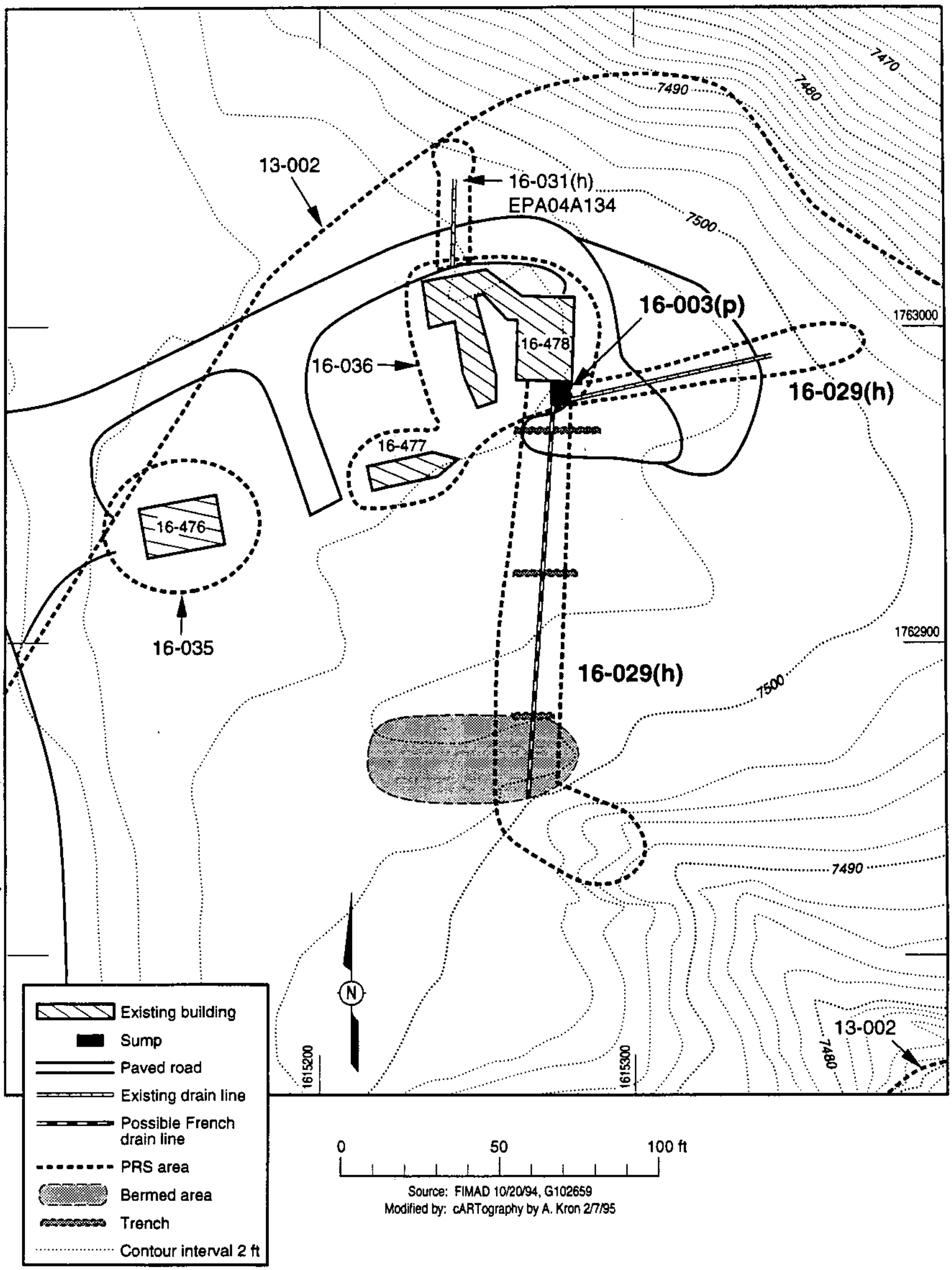


Fig. 5-29-2. Likely trench pattern for SWMU 16-029(h).

The trench located near the sump may be used to collect samples to estimate the extent of contamination due to leakage from the sump.

5.29.3.2 Sampling

Sampling of the drainage channels from P-Site will be conducted as described in Subsection 5.13 of the RFI work plan (LANL 1993, 1094). This sampling begins approximately 175 ft downgradient from the berm near TA-16-478. Therefore, this sampling would not be expected to detect contamination specifically from the sump or French drain at P-Site. However, information from this sampling will be incorporated into this sampling plan as relevant results become available.

Sampling will be done at the sump for TA-16-478, along the sump drain lines, directly at the outfalls, and downgradient from the outfalls. All samples will be field screened for HE by spot test and radionuclides by gross beta-gamma. LIBS or XRF will be used to field screen for barium. Each sample will be field screened at its midpoint on 12-in. intervals. The detection limits of the HE spot test are at a level such that a positive reading for TNT or RDX indicates a sample with contamination at a level above its SAL. All samples greater than a 6-in. depth will be field screened for volatile organic compounds with a PID. SOPs for these procedures have been prepared and are noted in Table 5-29-2. All samples that yield positive readings, defined as a positive HE or PID reading or a metals or radiation reading of twice background or more, will be sent for laboratory analysis. If a core section field screens positive, that interval and a sample collected two feet below that interval will be sent for laboratory analysis in order to estimate the vertical extent of contamination. If multiple positive screenings are obtained on a core, the shallowest positive interval, the deepest positive interval, and the interval below the deepest interval will be submitted for laboratory analysis.

Each subsurface core will be augered to a depth of 2.5 ft beneath the soil-tuff interface. The field team leader has the option to focus screening and laboratory sample selection at a given depth for deep surface cores taken in a PRS. For each PRS, sampling points will be biased to areas believed most likely to contain the highest concentrations of COPCs based on field screening, orthocorrected aerial photographs, archival data, and the results of geomorphological surveys. Sample parameters, including complete lists of constituents to be analyzed in the laboratory, are summarized in Table 5-29-3. A number of different sampling techniques may be used at this site including remote drilling, hand augering, and hand digging.

Two possible sampling scenarios could occur. A flow chart of the samples to be collected for the two scenarios is shown in Fig. 5-29-3. In the first scenario, it is assumed that the French drain to the south of the structure is located. In the second scenario, it is assumed that the French drain is not located. These two scenarios lead to different sampling plans which are described below.

In both scenarios, the soil near the building sump will be sampled. Any liquid in the sump (rainwater) will be removed to allow visual inspection of the sump for cracks or leaks. The removed liquid will not be sampled. In the absence of cracks that would direct the sampling, subsurface core samples will be collected at the most likely source of leakage from the sump, under the joints connecting the drain lines and the sump, and also in the northwest corner of the sump opposite the joints. A minimum of two laboratory samples will be selected from the cores at these three locations based on field screening and visual inspection. In the absence of positive field screening results, the interval containing the tuff interface from the two samples near the sump joints will be sent for laboratory analysis.

In both scenarios the east drain line, which has been located, will be sampled by coring every 20 to 25 ft along the drain line. This would lead to a minimum of four sampling locations for the east drain. One sample location will be situated where the drain line daylights. A core sample will also be collected every 10 ft for 40 ft downgradient from the east drain, for a total of four downgradient sample locations from the east drain. Each subsurface sample will be augered at least 2.5 ft below the soil-tuff interface or as deep as field screening dictates. The selection of core segments to be submitted for laboratory analysis will be guided by field screening and visual inspection. If no samples test positive with field screening, one laboratory sample will be selected at the mouth of the outfall at the surface, one will be randomly selected from the cores along the drain line at an interval beneath the drain line, and one will be randomly selected from the surface samples downgradient, for a total of three laboratory samples.

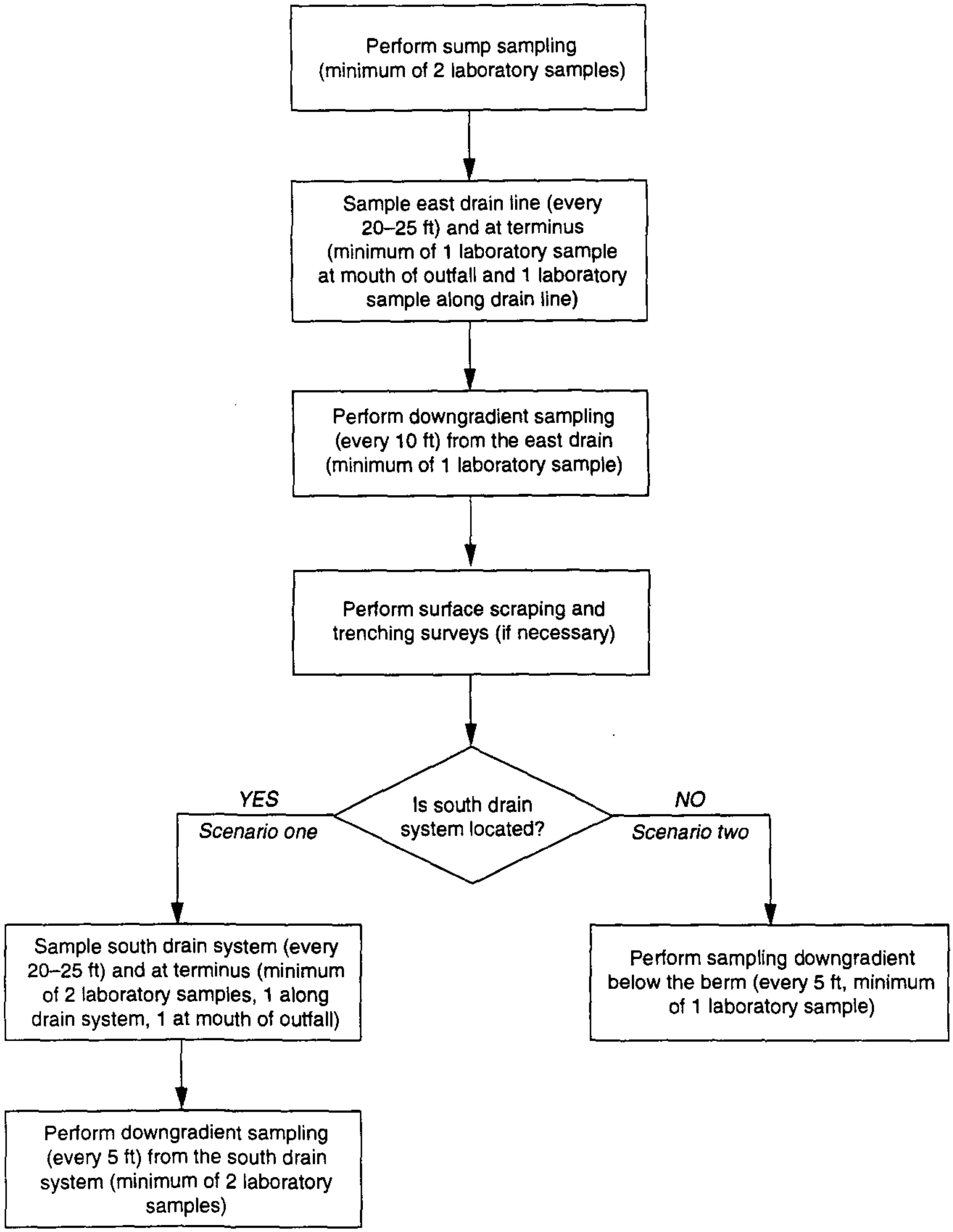


Fig. 5-29-3. TA-16-478 outfall aggregate sampling decision flow.

Scenario one: If the French drain to the south of the structure is located, it will be sampled in a similar manner to the existing drain, every 20 to 25 ft along the drain line (Fig. 5-29-4). This would lead to a minimum of five cores along the south drain. One sample core will be located where the drain line daylights. Samples will also be collected downgradient from the outfall. Four samples total will be collected at a point every five feet downgradient from the south drain outfall. The selection of core segments to be submitted for laboratory analysis will be guided by field screening and visual inspection. If no samples test positive with field screening, one laboratory sample will be randomly selected along the drain line at a depth beneath the drain line, one laboratory sample will be selected at the mouth of the outfall at the surface, one laboratory sample will be selected 10 ft downgradient from the mouth of the south outfall at the surface, and one laboratory sample will be selected the furthest downgradient from the outfall at the surface.

Scenario two: If the alleged French drain is not located, no samples will be collected directly south of TA-16-478 (Fig. 5-29-5). However, five core samples will be collected in the area below the berm, where archival information indicates possible contamination. In the early 1980s, soil samples from 10 ft below the berm at TA-16-478 contained more than 4 wt % of HE in soil (Baytos 1986, 15-16-267; Baytos 1985, 15-16-268). These five cores will be collected at a point every five feet downgradient from the berm. The samples should detect HE contamination in this area if it is still present. The selection of core segments to be submitted for laboratory analysis will be guided by field screening and visual inspection. If no samples test positive with field screening, one laboratory surface sample will be selected 10 ft downgradient from the berm.

A total of three toxicity characteristic leaching procedure (TCLP) samples will be collected near the sump's pipe joints and at the outfalls. These samples are in addition to the sampling plan described above. TCLP samples will be guided by field screening, particularly for barium, with default sample selection of one sample from the sump and one from each outfall. TCLP methods will be used to identify and quantify RCRA constituents in order to evaluate whether this SWMU is a possible candidate for EC after Phase I sampling.

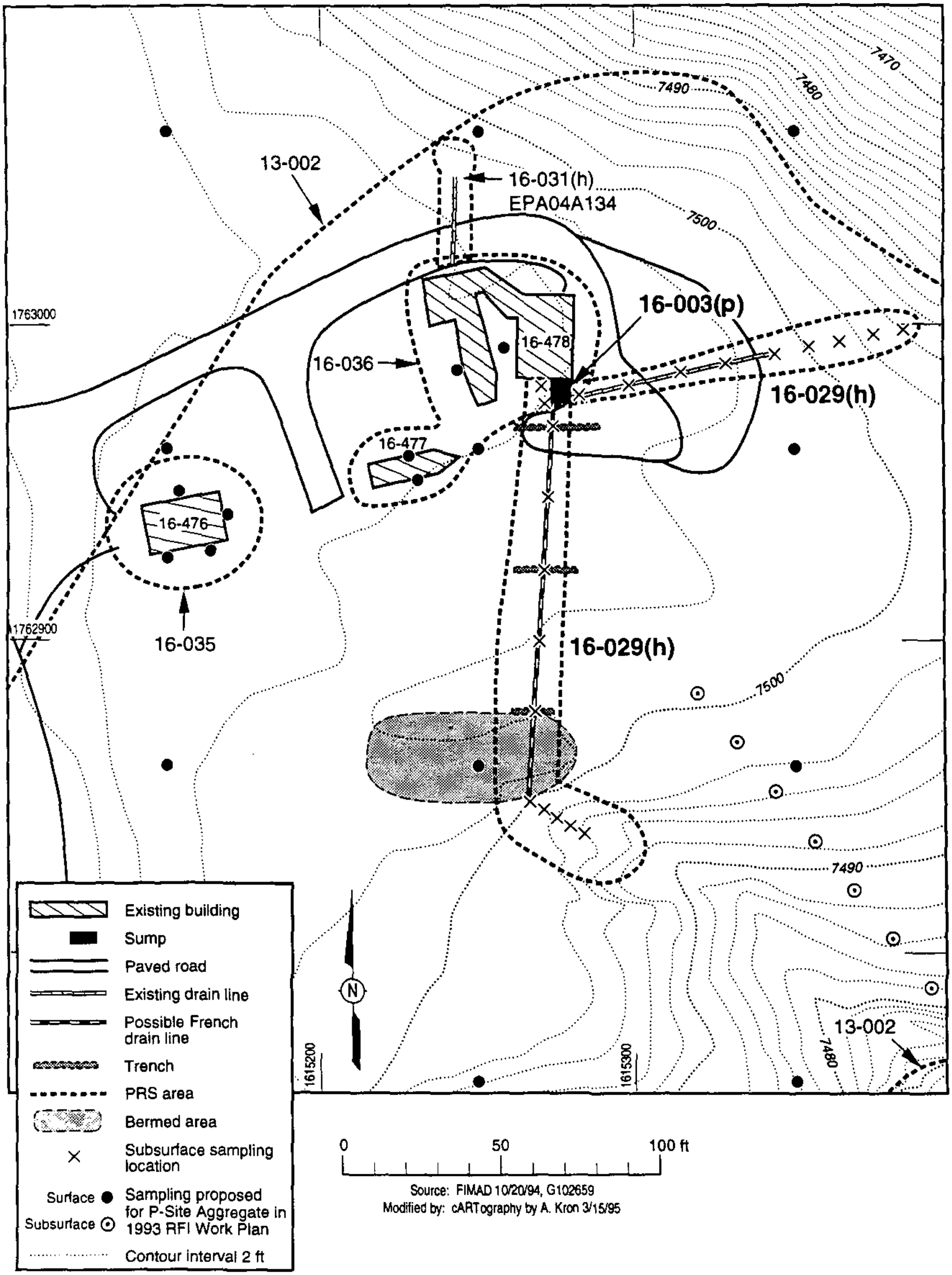


Fig. 5-29-4. Sampling plan scenario one.

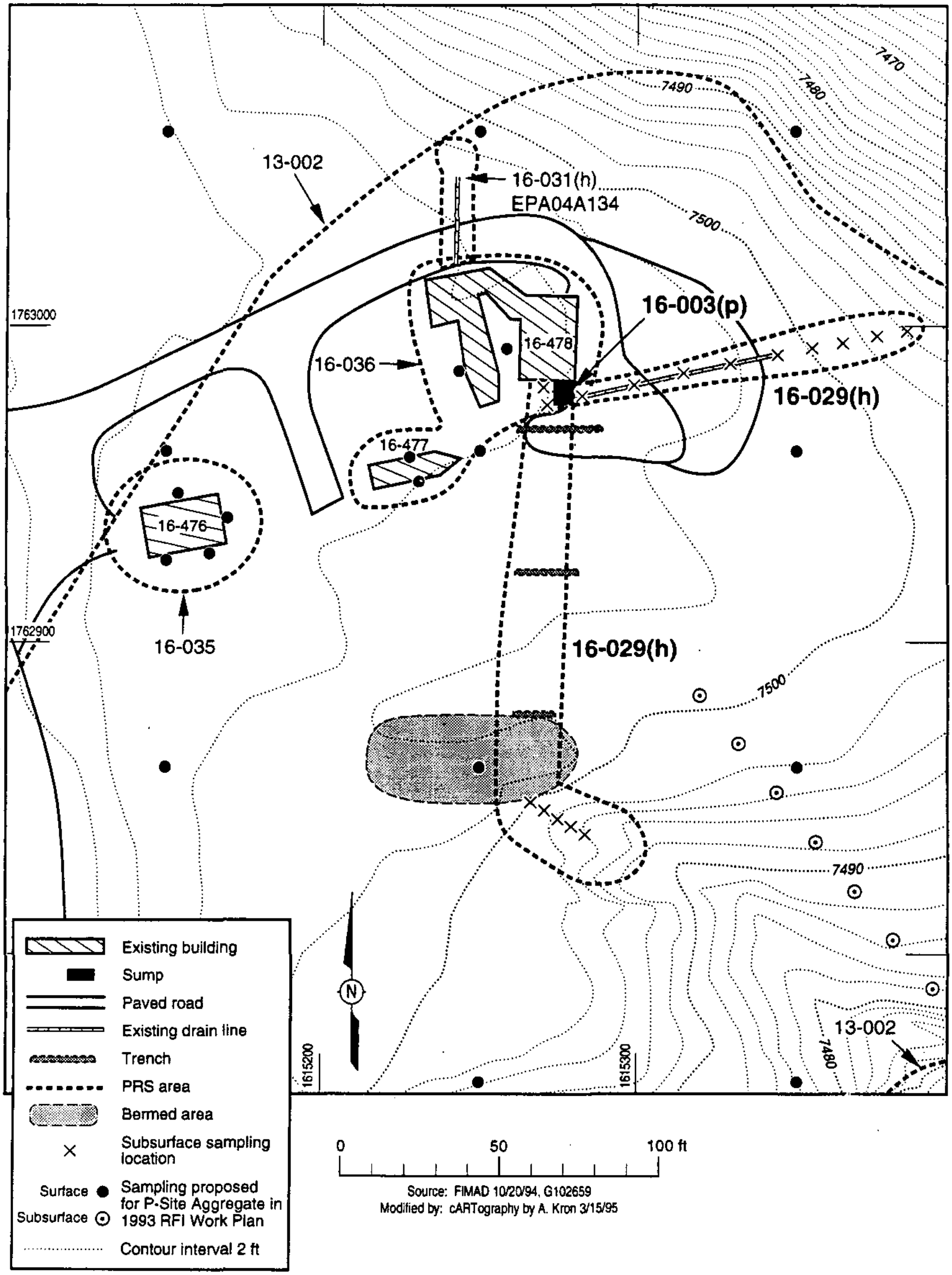


Fig. 5-29-5. Sampling plan scenario two.

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Executive Summary

Chapter 1
Introduction

Chapter 2
Background Information for Operable Unit 1082

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

Chapter 6

RFI Work Plan (1993)

- HSWA PRSs—No Further Action
- Non-HSWA PRSs—Deferred Action/ No Further Action
- HSWA/Non-HSWA—Deferred Action-migration

Addendum 1 (1994)

- HSWA—Deferred Action/No Further Action
- Non-HSWA—No Further Action

Addendum 2 (1995)

- HSWA—No Further Action
- Non-HSWA—No Further Action
- PRS Recommended for Voluntary Corrective Action

NOTE: ALL POTENTIAL RELEASE SITES (PRSs) LISTED IN TABLE 6-11 AND SUBSEQUENTLY DESCRIBED BELOW ARE PART OF THE JULY 1995 ADDENDUM 2 TO THIS WORK PLAN.

CLEANUP DOCUMENTATION FOR PRSs IN SUBSECTIONS 6.6.3, 6.7.3, AND 6.7.4 CAN BE FOUND IN ATTACHMENT A TO CHAPTER 6. ATTACHMENT A IS PUBLICLY AVAILABLE AT THE LOS ALAMOS NATIONAL LABORATORY (LANL) READING ROOM AND RECORDS PROCESSING FACILITY.

TABLE 6-11

PRSs RECOMMENDED FOR NO CURRENT RCRA FACILITY INVESTIGATION IN ADDENDUM 2

PRS AGGREGATE(S), DESCRIPTION(S)	EVALUATION STEP CRITERION[a]	SUBSECTION
16-028(e), outfall; and 16-029(i), active sump	First	6.6.1.1
16-016(d,e,g), surface disposal	First	6.6.1.2
16-026(a,l,t,z) and 16-030(c), outfalls	First	6.6.1.3
16-026(a2), outfall	First	6.6.1.4
16-026(y), outfall	First	6.6.1.5
16-031(h), outfall	First	6.6.1.6
16-031(e), active outfall cooling tower; and 16-031(f), inactive outfall cooling tower	First	6.6.1.7
16-026(d2,e2,f2,g2,h,k,x) and 16-030(b,e,f), outfalls	Second	6.6.2.1
16-026(f), outfall	Second	6.6.2.2
16-026(g), outfall	Second	6.6.2.3
16-034(i,k), soil contamination at decommissioned buildings	Second	6.6.2.4
16-025(e2,f2,h2), soil contamination at decommissioned storage buildings	Fourth	6.6.3.1
C-16-072, fuel tank	First	6.7.1.1
16-003(q), active HE sump and C-16-071, hydraulic oil spill	First	6.7.1.2
C-16-049, decommissioned office and shop	First	6.7.1.3
C-16-062 and C-16-063, decommissioned electrical manholes	First	6.7.1.4
C-16-018, decommissioned water storage tank	First	6.7.1.5
C-16-020, decommissioned office building	First	6.7.1.6
C-16-034 and C-16-035, decommissioned water tanks	First	6.7.1.7
C-16-061, decommissioned latrine	First	6.7.1.8
C-16-041, decommissioned hose house	First	6.7.1.9
C-16-044 and C-16-046, decommissioned steam manholes	First	6.7.1.10

TABLE 6-11 (continued)

PRSs RECOMMENDED FOR NO CURRENT RCRA FACILITY INVESTIGATION IN ADDENDUM 2

PRS AGGREGATE(S), DESCRIPTION(S)	EVALUATION STEP CRITERION	SUBSECTION
C-16-050, decommissioned storage building	First	6.7.1.11
16-037, industrial waste tank	First	6.7.1.12
C-16-001, crossover platform	First	6.7.1.13
16-033(c,d), decommissioned aboveground fuel tanks	Second	6.7.2.1
C-16-008, implement shed; C-16-009, mess hall; C-16-010, storage building; C-16-012, decommissioned blacksmith shop; C-16-013, decommissioned lumber storage area; C-16-014, decommissioned equipment room; C-16-015, decommissioned hose house; C-16-016, decommissioned fire house; C-16-036, decommissioned latrine	Second	6.7.2.2
C-16-047, C-16-051, and C-16-058, decommissioned oil switches	Second	6.7.2.3
16-027(d), transformer	Second	6.7.2.4
C-16-019, decommissioned pump house	Second	6.7.2.5
C-16-070, underground fuel tank	Second	6.7.2.6
16-022(a), soil contamination	Third	6.7.3.1
16-033(a,b,f-j) and 16-022(b), underground storage tanks	Third	6.7.3.2
16-027(a-c), transformers	Fourth	6.7.4.1
16-021(b), operational release	Fourth	6.7.4.2
16-016(f), surface disposal area	Fourth	6.8.1.1

[a] All evaluation step criteria are based on the No Further Action Criteria Policy, EM/ER:95-PCT-015, dated March 28, 1995 (Project Consistency Team, 1210).

6.6 Solid Waste Management Units Listed in the Hazardous and Solid Waste Amendments (HSWA) Module VIII Recommended for No Further Action

6.6.1 Solid Waste Management Units Recommended for No Further Action Under Step One of the Four-Step Criteria

Step one of the four-step criteria includes PRSs that have never been used for the management of Resource Conservation and Recovery Act (RCRA) solid or hazardous waste and/or constituents, or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances; PRSs which have never been located; nonexistent

PRSs; duplicate PRSs; and PRSs investigated as part of another PRS (Project Consistency Team, 1210).

6.6.1.1 Outfall, SWMU 16-028(e); Active Sump, SWMU 16-029(i)

6.6.1.1.1 Background

SWMU 16-028(e) is potentially contaminated soil associated with a permitted outfall, Environmental Protection Agency (EPA) 04A091, from the sump at Technical Area (TA) 16-450. This sump is addressed as Solid Waste Management Unit (SWMU) 16-029(g) in Subsection 5.2 of the 1993 RCRA Facility Investigation (RFI) Work Plan for Operable Unit (OU) 1082 (LANL 1993, 1094). Additional information on TA-16-450 is provided in Subsections 5.2.1.1 and 5.5.1.1.

SWMU 16-029(i) is a sump that serves TA-16-342. This sump is addressed as SWMU 16-003(n) in Subsection 5.2 of the 1993 RFI Work Plan for OU 1082 (LANL 1993, 1094). Additional information on TA-16-342 is provided in Subsection 5.2.1.1.

6.6.1.1.2 Recommendation

SWMUs 16-028(e) and 16-029(i) are recommended for no further action (NFA) because they were covered as SWMUs 16-029(g) and 16-003(n), respectively, in the 1993 RFI Work Plan (LANL 1993,1094).

6.6.1.1.3 Rationale for Recommendation

SWMU 16-028(e) was covered in the 1993 RFI Work Plan as SWMU 16-029(g) (LANL 1993,1094). SWMU 16-029(g) addresses the sump and permitted outfall (EPA 04A091) associated with TA-16-450. There is only one sump and permitted outfall associated with TA-16-450. Therefore, SWMU 16-028(e) and SWMU 16-029(g) are identical.

SWMU 16-029(i) was covered in the 1993 RFI Work Plan as SWMU 16-003(n) (LANL 1993,1094). SWMU 16-003(n) is designated as an active sump outfall. SWMU 16-029(i) designates this outfall as an inactive sump outfall. Because there is only one sump attached to this building, SWMUs 16-029(i) and 16-003(n) must be identical.

6.6.1.2 Surface Disposal, SWMUs 16-016(d,e,g)

6.6.1.2.1 Background

SWMU 16-016(d) is a small debris area at TA-16-222. The most hazardous item observed was a paint can that had been used to mix a small amount of cement. Other items included a few segments of corrugated metal pipe, some cable, and rebar. All material appears to be waste associated with the construction of the building rather than operational waste. These materials were field screened for radioactivity and high explosives (HE) and removed to the burning grounds by the operating group under work order LN 05057 on March 27, 1995.

SWMU 16-016(e) is located among graded soil and tuff 150 ft southeast of TA-16-360. The SWMU Report describes the item as a white fibrous mass, possibly asbestos (LANL 1990, 0145). Photographs taken by Weston during the original SWMU investigations also show a white fibrous mass, which could be located by the surroundings visible in the photograph (LANL photograph RN88-109-070).

SWMU 16-016(g) is a debris area associated with TA-16-370. TA-16-370 is a metal machining facility and was formerly a barium nitrate grinding facility. The debris includes a few cans and several pipes spread over a 20 ft diameter area located 60 ft south of the building. All material appears to be waste associated with the construction of the building rather than operational waste.

The debris area lies in a drainage ditch south of TA-16-370. Soil samples were taken from this drainage in a study of SWMU 16-028(b) described in Subsection 5.28.1.2 of Addendum 2. Three samples were collected below the confluence of SWMU 16-028(b) and the drainage ditch associated with SWMU 16-016(g). X-ray fluorescence (XRF) measurements of metals in the soil are shown in Table 6-12 along with the background range of these metals in Los Alamos soil (Longmire et al. 1993, 0958). The XRF results show that almost all the metals are within the background range. Barium is above background because the structure was used as a barium nitrate grinding facility.

TABLE 6-12

XRF AND BACKGROUND VALUES FOR SOIL NEAR TA-16-370

METAL	XRF MEASUREMENT FOR THREE SAMPLES DOWNGRADIENT FROM SWMU 16-028(b)			BACKGROUND IN ppm (MINIMUM)	BACKGROUND IN ppm (MAXIMUM)
	AT CONFLUENCE	21 FEET BELOW CONFLUENCE	78 FEET BELOW CONFLUENCE		
Barium	388.8 ppm	850.5 ppm	445.0 ppm	124.80	828.90
Chromium	13.4 ppm	27.6 ppm	28.4 ppm	2.03	71.07
Iron	2.014%	1.293%	1.720%	1.086%	4.864%
Manganese	0.041%	0.174%	0.036%	0.018%	0.155%
Nickel	Not detected	Not detected	10.4 ppm	Not available	Not available
Niobium	29.6 ppm	34.4 ppm	38.4 ppm	Not available	Not available
Titanium	0.132%	0.176%	0.183%	0.118%	0.5438%
Vanadium	18.8 ppm	41.8 ppm	26.9 ppm	11.54	113.10
Zinc	127.2 ppm	Not detected	82.0 ppm	19.97	146.20
Zirconium	206.5 ppm	258.0 ppm	298.2 ppm	148.00	704.30

SWMU 16-028(b) is being sampled for metals as described in Subsection 5.28.3.1. At least one laboratory sample will be collected below the confluence of the two drainages and tested for metals and other constituents.

6.6.1.2.2 Recommendation

SWMUs 16-016(d,e,g) are recommended for NFA because there are no hazardous constituents present at these sites.

6.6.1.2.3 Rationale for Recommendation

The items seem to be construction debris. Field observation suggests that the remnants are not of a hazardous nature or extent. HE spot tests were conducted at all three locations on various pieces of debris, and none of the materials was found to be HE contaminated (Watanabe 1994, 15-16-569). Preliminary XRF results from the drainage near SWMU 16-016(g) show no contamination associated with SWMU 16-016(g). SWMU 16-016(d) was found to be nonhazardous and the debris was removed. The white fibrous mass southeast of TA-16-360 [SWMU 16-016(e)] was analyzed by x-ray diffraction and found to be fiberglass insulation, not asbestos (Hickmott 1994, 15-16-567).

6.6.1.3 Outfalls, SWMUs 16-026(a,l,t,z) and 16-030(c)

6.6.1.3.1 Background

SWMU 16-026(a) is soil associated with two outfalls from TA-16-370. TA-16-370, built in 1953 as a barium nitrate grinding facility, was converted to a metal forming shop in the late 1950s (Tidwell 1989, 15-16-097). The two outfalls in question serve a roof drain on the east side of the building and a steam pit condensate drain from the south side of the building. The two other outfalls from the building, a sanitary drain and a permitted outfall, are covered as SWMU 16-006(c) in the 1993 RFI Work Plan and SWMU 16-028(b) of Addendum 2, respectively. The east outfall is listed on various maps and drawings as a downspout draining rainwater (ENG-C 15856-7, ENG-C 15857). The east outfall is 6-in. cast iron pipe and daylights 29 ft southeast of the building. The steam pit drain is 4-in. cast iron pipe and daylights 70 ft south of TA-16-370. The steam pit is physically isolated from the building and is located just north of the door in the southeast corner of the building. The physical isolation of the steam pit drain from the rest of the building makes contamination highly unlikely, since the building itself is the only source of contaminated material. Effluent from both outfalls drains south into Water Canyon down a steep, rocky grade.

The steam pit drain joins an EPA permitted outfall [SWMU 16-028(b)] as it drains into Water Canyon. Soil samples were taken from this drainage in a study of SWMU 16-028(b) described in Subsection 5.28.1.2 of Addendum 2. Three samples were collected below the confluence of SWMU 16-028(b) and SWMU 16-026(a). Preliminary XRF measurements of various machining metals are shown in Table 6-12 along with the background range of these metals in Los Alamos soil (Longmire et al. 1993, 0958). The XRF results show that almost all the metals are within background. SWMU 16-028(b) is being sampled for metals as described in Subsection 5.28.3.1. At least one laboratory sample will be collected below the confluence of the two outfalls and tested for metals.

SWMU 16-026(l) is soil associated with outfalls from TA-16-220. TA-16-220 is an x-ray facility for HE components. It was built in 1952 along with seven similar buildings in the radiography area. This SWMU consists of drains from the east wall and the northeast and southeast corners of TA-16-220. The outfalls could not be located. Engineering drawing ENG-C 15660 shows that roof drainage is from the northeast and southeast corners of the building and that the east wall contains a steam pit drain. The only other drain is a permitted floor drain outfall covered under SWMU 16-028(c) of Addendum 2. The physical isolation of the steam pit drain from the rest of the building makes contamination highly unlikely. The SWMU Report states that the steam pit drain was located on the south side of the building, but field investigation found the drain to be on the east wall (LANL 1990, 0145).

SWMU 16-026(t) is soil associated with an outfall from TA-16-207. TA-16-207, built in 1954 in the administration area of S-Site, was a secure storehouse that contained small quantities of depleted uranium (Paige 1994, 15-16-586). In 1993 it was decontaminated and converted into a packaging test facility (Paige 1994, 15-16-565). Engineering drawing ENG-C 7162 shows two roof drains, which carry only rainwater, joining on the north end of the building and flowing east. The drains are 8-in. vitrified clay pipe. This outfall daylights near the security fence about 80 ft southeast of the building and drains into a drainage ditch along old Anchor Ranch Road. According to ENG-C 46139, the only other drains in the building are sanitary drains.

SWMU 16-026(z) is soil associated with an outfall from TA-16-306. TA-16-306 is a plastics component development facility that has been operational since 1953. According to ENG-R 879, the building has one sanitary drain, four sump drains that were covered under SWMU 16-003(g) of the 1993 RFI Work Plan, and the outfall covered under SWMU 16-026(z). This outfall flows from a roof drain downspout near the southeast side of TA-16-306. The SWMU Report states that the outfall was located on the south side of the building, but field investigation located the outfall on the southeast corner (LANL 1990, 0145). The outfall leads directly into a paved drainage ditch located next to the building. This drainage ditch carries rainwater to a culvert and eventually into Water Canyon.

SWMU 16-030(c) is soil associated with an outfall from TA-16-222. TA-16-222, built in 1953, is an x-ray film processing lab located in the center of the radiography area in TA-16. The outfall originates from a roof drain downspout located on the northwest side of the building. ENG-R 855 shows four drains exiting from the corners of TA-16-222. The drawing indicates that they are roof drains. Upon site visit, the outfall could not be located. This drawing also shows the sanitary sewer lines and the only other building drain, a chemical drain that was covered under SMWU 16-020 of the 1993 RFI Work Plan.

6.6.1.3.2 Recommendation

SWMUs 16-026(a,l,t,z) and 16-030(c) are recommended for NFA because there have been no process-related hazardous constituents introduced into the roof drains or the steam pit drains.

6.6.1.3.3 Rationale for Recommendation

These SWMUs are recommended for NFA because none of them is contaminated and threatens the environment. The steam pits and drains at buildings TA-16-370 and TA-16-220 are completely isolated from the process buildings that they serve. It is highly unlikely that the steam pits are contaminated.

There are no documented releases of contaminants to the roof of any building associated with each SWMU. It is doubtful that any of the roof downspouts are carrying any type of contamination to the environment.

6.6.1.4 Outfall, SWMU 16-026(a2)

6.6.1.4.1 Background

SWMU 16-026(a2) is soil associated with an outfall from TA-16-200. The outfall is a 12-in. corrugated metal drain that flows from the south end of TA-16-200. The outfall daylights 200 ft southeast of TA-16-200 near TA-16-202. The outfall receives effluent from thirteen roof drains and two floor drains. The floor drains, which receive floor washings and compressor condensate, are located in basement equipment rooms. The floors show some oil or dirt stains. The equipment rooms contain building wiring, ductwork, sprinkler system pipes, and small pumps containing less than one gallon of oil.

6.6.1.4.2 Recommendation

SWMU 16-026(a2) is recommended for NFA because there are no hazardous constituents associated with this SMWU.

6.6.1.4.3 Rationale for Recommendation

TA-16-200, in operation since 1952, has always been designated as the administration building at S-Site. Historical evidence confirms that no hazardous processes occurred in this building and no hazardous materials were generated (Martin and Hickmott 1994, 15-16-549).

6.6.1.5 Outfall, SWMU 16-026(y)

6.6.1.5.1 Background

SWMU 16-026(y) is soil associated with an outfall on the east side of TA-16-411. TA-16-411, built in 1951, is used as an assembly building for finished HE components. In 1976 and 1977, modifications were made to the building in order to house special nuclear materials weapons components. A vault and a temperature and humidity control room were added to regulate the environment of the components. According to the former site safety officer, the building has always been used as an assembly station. Components to be assembled arrive in a finished condition. No forming, machining, or washing has ever been done at this facility (Martin and Hickmott 1994, 15-16-549). The outfall from this building has several sources. An isolated utility room containing pumps and compressors has a floor drain that receives condensate. The pumps and compressors are small and contain less than one gallon of oil. Within the building an eyewash station, drinking fountain, and sink drain contribute effluent to the line. Externally, two roof drains and a steam pit also connect to the outfall. The 4-in. vitrified clay pipe daylights 2 ft south of a double security fence, approximately 100 ft south of TA-16-411. The effluent drains down a very steep, rocky, canyon edge. Effluent volume averages 600 gal./month, 500 gal. as a result of precipitation (LANL 1992, 15-16-534).

6.6.1.5.2 Recommendation

SWMU 16-026(y) is recommended for NFA because there are no hazardous constituents associated with this SWMU.

6.6.1.5.3 Rationale for Recommendation

TA-16-411 is used for storage and assembly of finished components only. No forming, machining, or washing is done at this facility (Martin and Hickmott 1994, 15-16-549). Site workers use the sink to clean their hands prior to assembly to avoid contaminating the components (Paige 1994, 15-16-576). Solvents and chemicals were not extensively used in any processes that occur at TA-16-411. Administrative controls restrict dumping any chemicals into the sink. Finally, the pumps and compressors in the isolated utility room are small (less than one gallon of oil) and have not had any known leaks.

6.6.1.6 Outfall, SWMU 16-031(h)

6.6.1.6.1 Background

SWMU 16-031(h) is soil associated with an outfall from a utility room in TA-16-478. The outfall receives effluent from a floor drain in the utility room on the northwest corner of the building. The drain, which consists of 4-in. vitrified clay pipe, daylights approximately 30 ft from the building. TA-16-478, originally P-4, was initially part of TA-13, and was used as a bunker for photographing explosive testing. In 1950 the building was modified to be a facility for testing the effects of machining on HE products. The utility room was an addition to the building during this modification.

Engineering drawing ENG-C 14851 shows a drain in the utility room that serves a sink and floor drain. A site visit confirmed that the drain received floor wash down water and sink drainage. The site visit also revealed a vacuum line connected to a vacuum pump in the utility room marked "Caution - Contains HE." The water-sealed/water-cooled vacuum pump drained cooling water into the floor drain.

6.6.1.6.2 Recommendation

SWMU 16-031(h) is recommended for NFA because the SWMU has never been used for the management of hazardous constituents.

6.6.1.6.3 Rationale for Recommendation

Interviews with past site workers indicate that the utility room is not contaminated with HE because it was located adjacent to the control room that employees were careful not to contaminate (Martin and Hickmott 1994, 15-16-549; Paige 1994, 15-16-557). Engineering drawing ENG-C 14852 shows a natural gas-powered hot water boiler with an automatic pilot and push-button electric ignition that was installed in 1949 in the utility room. The boiler remained until approximately 1962. The open flame associated with this natural gas system supports the claim that employees were careful not to contaminate the utility room with HE.

According to a former building manager for TA-16-478, the vacuum system was used to hold HE pieces for machining. HE dust and chip production during machining was minimized with use of liberal amounts of water, which drained to the sump. A water filter is incorporated into the vacuum line to prevent HE from traveling down the line. The former building manager stated that it is unlikely that any HE got into the vacuum pump water lines (Paige 1994, 15-16-566).

6.6.1.7 Active Outfall Cooling Tower, SWMU 16-031(e); Inactive Outfall Cooling Tower, SWMU 16-031(f)

6.6.1.7.1 Background

SWMU 16-031(e) is soil associated with an outfall at TA-16-560. TA-16-560 is the chlorination station for TA-16. It was built in 1952 in Water Canyon and was later moved to its present site on West Jemez Road near the entrance to TA-16. The building measures 11 ft long x 17 ft wide x 9 ft high. The outfall receives effluent from a concrete trench and a floor drain on the southeast corner of the building. The trench carries possible leakage from water inlet and outlet lines. The outfall also receives drainage from a beam scale sump. The beam scale is used to measure the amount of chlorine gas added to the water. The cast iron drain line daylights approximately 40 ft southeast in the drainage ditch along West Jemez Road.

SWMU 16-031(f) is soil associated with an outfall from decommissioned chlorination station TA-16-21. TA-16-21 was a wooden building built in 1944 measuring 18 ft long x 18 ft wide x 10 ft high. It was located in the old administration area of S-Site approximately 90 ft southeast of the old cafeteria, TA-16-16. The building was stripped of usable equipment in 1953 when the new chlorination station (TA-16-560) came on-line. TA-16-21 was removed in 1992 for the construction of TA-16-1374. This outfall received effluent from a line draining from the southeast corner of the building. Engineering drawing ENG-R 868 shows a 4-in. vitrified clay pipe leaving the southeast corner and daylighting 26 ft to the southwest.

6.6.1.7.2 Recommendation

SWMUs 16-031(e) and 16-031(f) are recommended for NFA because there are no hazardous wastes associated with these SWMUs.

6.6.1.7.3 Rationale for Recommendation.

SWMUs 16-031(e) and 16-031(f) are both outfalls that received drainage from concrete trenches within chlorination stations. The trenches are designed to drain leakage from water inlet and outlet lines. The chlorinator adds chlorine to the water as a gas, making any releases to the environment airborne. Any water that might leak into the trench would be chlorinated drinking water or pump condensate. No reported historical releases were associated with either chlorination station.

6.6.2 SWMUs Recommended for No Further Action Under Step Two of the Four-Step Criteria

Step two of the four-step criteria includes PRSs that have had no releases to the environment (Project Consistency Team, 1210).

6.6.2.1 Outfalls, SWMUs 16-026(d2,e2,f2,g2,h,k,x) and 16-030(b,e,f)

6.6.2.1.1 Background

SWMUs 16-026(d2,e2,f2,g2,h,k,x) and 16-030(b,e,f) are soil associated with outfalls that originated in utility rooms of rest houses. The rest houses associated with each SWMU are listed in Table 6-13. A rest house is an HE component storage building connected to an assembly, process, or machining building. Each rest house has an isolated 4 ft long by 8 ft wide utility room that houses condensate pumps used to move condensed steam from building to building and air compressors used for heating and ventilating the building. Small amounts of pump oil have been known to leak from the pumps and some staining is visible. However, there are no visible stains in the soil where the pipes daylight. The total volume of oil used in each of these pumps is less than one gallon. Pump oil is typically a mineral oil that contains no hazardous constituents. A floor drain in each room carries condensate to an outfall. These outfalls typically drain through 4-in. vitrified clay pipe to daylight 20 ft to 90 ft from their associated structures. Many of the outfalls could not be located, probably due to low flow volume.

TABLE 6-13

REST HOUSES AND REST HOUSE UTILITY ROOM DRAINS

SWMU	ASSOCIATED REST HOUSE
16-026(d2)	TA-16-435
16-026(e2)	TA-16-415
16-026(f2)	TA-16-413
16-026(g2)	TA-16-285
16-026(h)	TA-16-281
16-026(k)	TA-16-221
16-026(x)	TA-16-437
16-030(b)	TA-16-343
16-030(e)	TA-16-225
16-030(f)	TA-16-223

6.6.2.1.2 Recommendation

SWMUs 16-026(d2,e2,f2,g2,h,k,x) and 16-030(b,e,f) are recommended for NFA because no release to the environment has occurred.

6.6.2.1.3 Rationale for Recommendation

The only entrance to each utility room is an outside door so that the room is completely isolated from the HE storage area in each rest house. This isolation makes the possibility of HE contamination highly unlikely. The condensate drainage is of such low volume that it is unlikely that any environmentally damaging amounts of oil contamination could be carried down the outfall. Currently, condensate is collected in buckets and no oil is present. The oils were probably nonhazardous mineral oil. The volume of oil present in the utility room equipment is less than one gallon. There is no documented case of a release to the environment involving a utility room for a rest house.

6.6.2.2 Outfall, SWMU 16-026(f)

6.6.2.2.1 Background

SWMU 16-026(f) is the soil associated with two outfalls from TA-16-308. TA-16-308, built in 1953, was initially used as a drying building for nitrocellulose explosives. After the 1960s, the building was used to store detonators and squibs (HE initiators). TA-16-308 has a utility basement housing compressors and condensate pumps and is accessed by ladder only. Currently, basement access requires a confined space permit. Maintenance work in the basement is conducted annually or biennially. According to the building manager of the past fifteen years, no explosives or hazardous materials were ever stored or used in the basement and there is no water line to the building other than the sprinkler system (Paige 1994, 15-16-577). The outfall on the northeast corner of the building drains from a downspout that carries rainwater from the roof. The 4-in. vitrified clay pipe daylights approximately 20 ft northeast of the building. The outfall on the southeast corner of the building receives effluent from two basement floor drains that carry condensate from steam lines and pumps. The pipe opening could not be visually located; however, there is a shallow trench extending southeast that is believed to be the outfall's drainage (LANL 1992, 15-16-526).

6.6.2.2.2 Recommendation

SWMU 16-026(f) is recommended for NFA because no release to the environment has occurred.

6.6.2.2.3 Rationale for Recommendation

The chemicals of potential concern (COPCs) in TA-16-308 do not have a suitable pathway to the environment. The northeast outfall received effluent from a roof downspout. There is no documented knowledge of a release from the building that contaminated the roof; therefore, it is unlikely that COPCs were released to the environment. There are no floor drains on the first floor and no significant water source for drainage from the basement drains. The first floor and basement are not connected to each other and have separate entrances. HE and other hazardous materials were never stored in the basement, partly due to inconvenient access. The equipment located in the basement typically contains less than one gallon of oil. Therefore, no contaminants could have been carried through the basement drains.

6.6.2.3 Outfall, SWMU 16-026(g)

6.6.2.3.1 Background

SWMU 16-026(g) is soil associated with an outfall from TA-16-280. TA-16-280, built in 1951, is an HE physical inspection building. Both HE and natural and depleted uranium components are handled and inspected on the first floor of this facility (Voelz 1979, 15-37-003). Engineering drawing ENG-C 4115 shows the outfall receiving effluent from four equipment drains and five floor drains in the basement. A site visit showed that the floor drains are now plugged. The basement is used as a utility room. The first floor and basement are not connected to each other and have separate entrances. No hazardous materials are stored in the basement. The 6-in. vitrified clay drain line daylights 300 ft to the northeast of TA-16-280.

6.6.2.3.2 Recommendation

SWMU 16-026(g) is recommended for NFA because no release to the environment has occurred.

6.6.2.3.3 Rationale for Recommendation

According to the current building manager for TA-16-280, the basement has always been used as a utility room for pumps and compressors. No components were inspected in the basement (Paige 1994, 15-16-551). The only likely contaminant that could enter the drain would be pump oil, typically mineral oil that contains no hazardous constituents. At most, there are a few gallons of oil contained in the equipment located in the basement of TA-16-280. Generally, unless there is a spill, the amount of oil leakage from the compressors and pumps is insignificant. There is no record of oil spills from this drain. The basement of the building was kept free of contamination because it also functions as an emergency fallout shelter. In addition, the basement and first floor processing area are not connected.

6.6.2.4 Soil Contamination at Decommissioned Buildings, SWMUs 16-034(i,k)

6.6.2.4.1 Background

SWMUs 16-034(i,k) were two buildings, built in 1944 and 1945, as part of a Zia Company satellite maintenance station used for the upkeep of S-Site buildings. This maintenance station was near the decommissioned S-Site fire station, whose foundation still exists. The maintenance station was removed by 1995. The area is now a field covered with grass and small trees. The maintenance station is west of West Road, the only entry to S-Site prior to 1951. This road, which was fenced on the east side, formed the boundary of the HE exclusion zone. HE was not allowed beyond the boundary of the exclusion zone. Thus, the maintenance station was protected from exposure to HE by administrative control.

The former Zia maintenance manager during most of the life of the station stated that methods and policies insured that no HE would enter the maintenance station and that contamination would be insignificant (Miller 1994, 15-16-552). A former worker at the site during World War II also claims that the area was not contaminated (Martin 1993, 15-16-477; Martin and Hickmott 1994, 15-16-549). Both of these buildings are listed in Blackwell's 1981 report on destroyed buildings as potentially HE contaminated (Blackwell 1983, 15-16-076; Paige 1995, 15-16-600). The conversations with two site workers indicate that Blackwell was in error. Both of these buildings were removed, not destroyed by burning, which further suggests that HE contamination was not present.

SWMU 16-034(i) was TA-16-141, a small, portable wooden building 16 ft square and 9 ft high, previously numbered S-146. It was used originally for storage at the Zia satellite maintenance station, but was later moved to TA-35 for use as a construction shack.

SWMU 16-034(k) was storage building TA-16-140, previously numbered S-145. It was 16 ft square and 9 ft high. The exact location of TA-16-140 has not been determined from available photos. It is not known what was stored in the structure.

6.6.2.4.2 Recommendation

SWMUs 16-034(i,k) are recommended for NFA because no release to the environment has occurred.

6.6.2.4.3 Rationale for Recommendation

Extensive information from former site workers familiar with the operations of the Zia maintenance station indicates that there is no HE contamination at this site. It is unlikely that any other significant types of contamination would be associated with these structures. One of the storage buildings [SWMU 16-034(i)] was considered clean enough to permit moving the building off site. There is no reason to believe that these storage buildings were contaminated and pose a threat to the environment.

6.6.3 SWMUs Recommended for No Further Action Under Step Four of the Four-Step Criteria

Step four of the four-step criteria includes PRSs that have been characterized or remediated in accordance with current applicable regulations, and available data indicate that contaminants of concern are either not present or present in concentrations that would pose an acceptable level of risk (Project Consistency Team, 1210).

6.6.3.1 Soil Contamination at Decommissioned Storage Buildings, SWMUs 16-025(e2,f2,h2)

6.6.3.1.1 Background

SWMUs 16-025(e2,f2,h2) are the soil and remnants of three small (6 ft x 6 ft) wood frame storage buildings. TA-16-106, TA-16-107, and TA-16-109, originally A-1, A-2, and A-4, were built in mid-1944 on the western edge of S-Site and removed in 1950. The structures resembled magazines with earthen berms on three sides and a door on the fourth. According to a former site safety officer, they were largely used for the storage of non-HE materials such as aluminum powder, lead oxide, and barium nitrate but there is a possibility that small quantities of HE might have been stored there (Martin and Hickmott 1994, 15-16-549). An associated building, TA-16-108 [SWMU 16-025(g2)], was recommended and approved for NFA in Subsection 6.4.3.5 of the RFI Work Plan for OU 1082, Addendum 1 (LANL 1994, 1160).

6.6.3.1.2 Recommendation

SWMUs 16-025(e2,f2,h2) are recommended for NFA because information indicates that they have been removed or remediated and there are no contaminants of concern to pose a threat to human health or the environment.

6.6.3.1.3 Rationale for Recommendation

TA-16-106, TA-16-107, and TA-16-109 were small, lightly used buildings. If HE was stored at this location, it would have been in a containerized or packaged form (Martin and Hickmott 1994, 15-16-549). HE was stored at these locations until it was taken to other facilities for processing. None of these buildings was located in the HE exclusion zone. No HE processing was done at any of these locations, and there are no documented cases of a release to the environment. In February 1945 construction began on four large HE storage magazines on the southeast side of S-Site that replaced TA-16-106, TA-16-107, and TA-16-109 (Martin and Hickmott 1994, 15-16-549). Therefore, if HE was stored at in these structures, it would have been there for less than one year. Finally, it appears that all three buildings are either near or under State Road 501 which is elevated and fully graded for drainage. Construction of the road involved moving quantities of soil that would have dispersed any traces of contaminants.

A memorandum titled "Destruction of Building A-1 at S-Site" states that TA-16-106 was intentionally blown up with more than 125 lb of explosives in August 1949 (Drake 1949, 15-16-144). As a result, minimal residual materials remain at this particular building site.

6.7 SWMUs and AOCs Not Listed in the HSWA Module That Are Recommended for No Further Action

6.7.1 SWMUs Recommended for No Further Action Under Step One of the Four-Step Criteria

Step one of the four-step criteria includes PRSs that have never been used for the management of RCRA solid or hazardous waste and/or constituents, or other CERCLA hazardous substances; PRSs which have never been located; nonexistent PRSs; duplicate PRSs; and PRSs investigated as part of another PRS (Project Consistency Team, 1210).

6.7.1.1 Fuel Tank, C-16-072

6.7.1.1.1 Background

C-16-072 is listed in the SWMU Report as a fuel tank, TA-16-216 (LANL 1990, 0145). The tank is referenced on 1983 Engineering drawing ENG-R 5111 structure location index sheet as not shown. Other structure indexes from earlier years list the area as reserved. The historical structure list at ENG-7 lists TA-16-216 as proposed. Interviews with site personnel indicated no location for the tank. Evidence indicates that the tank was never installed.

6.7.1.1.2 Recommendation

C-16-072 is recommended for NFA because its location and existence cannot be established and it is assumed that the tank was never installed.

6.7.1.1.3 Rationale for Recommendation

The existence of this area of concern (AOC) cannot be verified based on the information in the SWMU Report or as a result of an extensive archival search. Because the existence and location of C-16-072 cannot be established, it is impossible to develop an applicable sampling plan.

6.7.1.2 Active HE Sump, SWMU 16-003(q); Hydraulic Oil Spill, C-16-071

6.7.1.2.1 Background

16-003(q) is listed in the SWMU Report as an active HE sump that serves TA-16-450, a materials testing facility (LANL 1990, 0145). This sump is addressed as SWMU 16-029(g) in Subsection 5.2.1.1 of the 1993 RFI Work Plan for OU 1082 and additional information on TA-16-450 is provided in Subsections 5.2 and 5.5 (LANL 1993, 1094).

C-16-071 is listed as a hydraulic oil spill associated with TA-16-430, an HE pressing facility. There was a spill of hydraulic fluid in this facility in the late 1980s. This spill is addressed as SWMU 16-021(b) in Subsection 6.7.4.2 of Addendum 2.

6.7.1.2.2 Recommendation

SWMU 16-003(q) and C-16-071 are recommended for NFA because they are inaccurately listed as being separate from SWMU 16-029(g) and SWMU 16-021(b), respectively. SWMU 16-029(g) was addressed in the 1993 RFI Work Plan (LANL 1993,1094) and SWMU 16-021(b) is currently addressed in Addendum 2.

6.7.1.2.3 Rationale for Recommendation.

SWMU 16-003(q) is a duplicate of SWMU16-029(g). SWMU 16-029(g) addresses the sump and NPDES permitted outfall (04A091) associated with TA-16-450. There is only one sump and permitted outfall associated with TA-16-450. Therefore, SWMUs 16-028(e) and 16-029(g) are identical. SWMU 16-029(g) has already been addressed as noted above.

C-16-071 is a duplicate of SWMU 16-021(b). SWMU 16-021(b) is an operational release of hydraulic fluid from TA-16-430. C-16-071 is a hydraulic fluid spill from TA-16-430. Only one hydraulic fluid leak has been reported at TA-16-430. Therefore, C-16-071 and SWMU 16-021(b) are identical. SWMU 16-021(b) is addressed as noted above.

6.7.1.3 Decommissioned Office and Shop, C-16-049

6.7.1.3.1 Background

C-16-049 is the soil associated with TA-16-475, a 24 ft x 75 ft structure that was built in 1944 and removed in 1951. The building, located at P-Site approximately 250 ft east of TA-16-343, consisted of a workshop addition containing workbenches and shelving; a middle section housing a generator and storage area; and a northern section containing an office, a lab, a workroom, a bathroom, and a darkroom. Because the building was situated on a concrete slab floor, the most likely source of potential soil contaminants is the northern section of the building containing drain lines. A plumbing diagram (ENG-C 1643) shows that the only drain lines in the building were from a lead sink in the darkroom and the sanitary facilities in the lavatory that connected to a septic tank, TA-16-486, located north of TA-16-475. The septic tank was located at the end of a 100-ft drain line from the lavatory in TA-16-475. Septic tank TA-16-486 and its drain field are a separate site covered under SWMUs 13-003(a,b) in Subsection 5.4.1.1 of the 1993 RFI Work Plan for OU 1082 (LANL 1993, 1094). These SWMUs will be sampled for HE, barium, metals, radionuclides, organics, silver, and cyanide.

6.7.1.3.2 Recommendation

C-16-049 is recommended for NFA because the drain line, septic tank, and associated drain field that constitute the most likely source of contamination at the site are already being sampled under Subsection 5.4.1.1 of the 1993 RFI Work Plan for OU 1082 (LANL 1993, 1094).

6.7.1.3.3 Rationale for Recommendation

Because TA-16-475 was situated on a concrete slab, it is unlikely that potential soil contamination could have reached the footprint of the building under the concrete. The most likely source of contamination would have been through drain lines, and the only septic system and drain field associated with this building are already being sampled as noted above.

6.7.1.4 Decommissioned Electrical Manholes, C-16-062 and C-16-063

6.7.1.4.1 Background

C-16-062 and C-16-063 are decommissioned electrical manholes, TA-16-889 and TA-16-888, used to access underground electrical conduits at P-Site. They were installed in 1950 and removed in 1972. A site visit confirmed that they were removed. No hazardous materials were ever associated with these structures (Blackwell 1983, 15-16-076).

6.7.1.4.2 Recommendation

C-16-062 and C-16-063 are recommended for NFA because there are no hazardous constituents associated with these sites.

6.7.1.4.3 Rationale for Recommendation

There were no hazardous materials used at these locations (Blackwell 1983, 15-16-076).

6.7.1.5 Decommissioned Water Storage Tank, C-16-018

6.7.1.5.1 Background

C-16-018 was a 30 000-gal. water tank, TA-16-172, that was located in the area along Jemez Road across from the current entrance to TA-16. It was located approximately 125 ft north of water tank TA-16-171 and 100 ft west of water tank TA-16-247. TA-16-172 was 48 ft long and 10.5 ft in diameter. It was used from 1945 until 1959 when it was moved to TA-49 and renumbered FM-66. It was later moved to TA-3 and renumbered SM-178.

6.7.1.5.2 Recommendation

C-16-018 is recommended for NFA because it has never been used for the management of hazardous waste.

6.7.1.5.3 Rationale for Recommendation

There were no hazardous constituents associated with this water tank (Blackwell 1983,15-16-076), and the movement of the structure to another technical area indicates that it was free of contamination.

6.7.1.6 Decommissioned Office Building, C-16-020

6.7.1.6.1 Background

C-16-020, TA-16-22, was originally a 20 ft wide x 70 ft long x 9 ft high office building built in 1944 near the old cafeteria, TA-16-16, in the administration area of S-Site. The structure was moved to the Los Alamos ice rink in 1961.

6.7.1.6.2 Recommendation

C-16-020 is recommended for NFA because it has never been used for the management of hazardous waste.

6.7.1.6.3 Rationale for Recommendation

This structure was not used for the handling or storage of hazardous constituents (Blackwell 1983,15-16-076). The relocation of the structure to a public area indicates that it was free of contamination at the time it was moved.

6.7.1.7 Decommissioned Water Tanks, C-16-034 and C-16-035

6.7.1.7.1 Background

C-16-034 and C-16-035 were 50 000-gal. water tanks, TA-16-1130 and TA-16-1131. The 15 ft high, 23.3 ft diameter tanks were located along Jemez Road near the current location of the 1 000 000-gal. water tank, TA-16-171, at the entrance to S-Site. The water tanks were used from 1944 until 1949. Engineering drawing ENG-R 793 shows the tanks connected to the site water supply via the pump station, TA-16-20, located in the central administration area of S-Site. These structures had no hazardous materials associated with them (Blackwell 1983, 15-16-076), and the area is physically isolated from the HE facilities at S-Site.

6.7.1.7.2 Recommendation

C-16-034 and C-16-035 are recommended for NFA because they have never been used for the management of hazardous waste.

6.7.1.7.3 Rationale for Recommendation.

These structures were not used for the handling or storage of hazardous materials (Blackwell 1983,15-16-076), and they were isolated from the HE or other operational facilities at S-Site.

6.7.1.8 Decommissioned Latrine, C-16-061

6.7.1.8.1 Background

C-16-061 is potential soil contamination associated with TA-16-396, the latrine for the burning grounds at TA-16. TA-16-396 was a 4 ft long x 4 ft wide x 7.5 ft high wooden frame building located approximately 80 ft east of TA-16-390, the central basket wash facility for the burning grounds. At TA-16-390, HE baskets were washed down in troughs that drained to filter beds (Engineering drawing ENG-R 790). The latrine was built in 1951 and removed in 1968. It contained no plumbing. According to the structure list, all materials from the removal were disposed of at the Area P landfill. No evidence of it remains. No hazardous materials were ever associated with the latrine (Blackwell 1983, 15-16-076). Given its size and distance from TA-16-390, it is unlikely that HE contaminated the facility.

6.7.1.8.2 Recommendation

C-16-061 is recommended for NFA because it has never been used for the management of hazardous waste.

6.7.1.8.3 Rationale for Recommendation

This structure was not used for the handling or storage of hazardous constituents (Blackwell 1983, 15-16-076). It contained no hand washing facilities and due to its distance from TA-16-390, is extremely unlikely to have inadvertently been contaminated with HE.

6.7.1.9 Decommissioned Hose House, C-16-041

6.7.1.9.1 Background

C-16-041 was a small hose house, TA-16-198, built in 1945 on the driveway into the old burning area along Anchor Ranch Road north of the administration area at S-Site. The 6.5 ft long x 3.5 ft wide x 7.5 ft high wooden building was used to store and protect lengths of fire hose. The building tested free of radioactive contamination in 1967 (Buckland 1967, 15-16-131). According to a 1983 memo, the structure had no hazardous materials associated with it (Blackwell 1983, 15-16-076). The removal date of TA-16-198 is uncertain. Although the engineering structure list indicates that it was removed in 1958, according to other documentation the building was monitored for radioactivity in 1967 (Buckland 1967, 15-16-131). In either case, the building is no longer present.

6.7.1.9.2 Recommendation

C-16-041 is recommended for NFA because it has never been used for the management of hazardous waste.

6.7.1.9.3 Rationale for Recommendation

This structure was not used for handling or storage of hazardous materials (Blackwell 1983, 15-16-076). It specifically tested free of radioactive contamination (Buckland 1967, 15-16-131).

6.7.1.10 Decommissioned Steam Manholes, C-16-044 and C-16-046

6.7.1.10.1 Background

C-16-044 was a steam manhole, TA-16-1079, made of reinforced concrete with a wooden cover. It was located along Anchor Ranch Road near the decommissioned fire station, TA-16-142. The manhole was built in 1945, and decommissioned at an unknown date, and then filled with gravel. A site visit confirmed that the manhole has been decommissioned. It is believed to have contained pipes that carried only distilled steam vapor or cool condensate water to and from the steam plant. There were no hazardous materials associated with the manhole (Blackwell 1983, 15-16-076).

C-16-046 was a steam manhole, TA-16-1090, constructed of 5-ft diameter corrugated metal pipe. The manhole was 9 ft deep with a gravel bottom and sheet metal cover. Its exact location is not known; however, it was near TA-16-460, southeast of the present administration area. The manhole is believed to have contained pipes that carried only distilled steam vapor or cool condensate water to and from the steam plant. No hazardous materials were ever associated with TA-16-1090 (Blackwell 1983, 15-16-076). Engineering drawing ENG-R 5111 indicates that the manhole was removed in 1970.

6.7.1.10.2 Recommendation

C-16-041 and C-16-046 are recommended for NFA because they have never been used for the management of hazardous waste.

6.7.1.10.3 Rationale for Recommendation

These decommissioned steam manholes carried only steam or condensate to the steam plant and have never had any hazardous materials associated with them (Blackwell 1983, 15-16-076). There is no record of any releases associated with either of these steam manholes. Chromates were used to prevent corrosion in the main steam plant cooling tower through the late 1960s, but they were not used in steam systems.

6.7.1.11 Decommissioned Storage Building, C-16-050

6.7.1.11.1 Background

C-16-050 was a wooden frame storage building, TA-16-482, located near TA-16-475. It measured 16 ft long x 16 ft wide x 8 ft high. It was constructed in 1944 at TA-30 and was moved from TA-30 to TA-16 in July 1947. It was subsequently moved and designated TA-11-9 in July 1949. It is not known what was stored in this structure. However, a site worker with 35 years of experience reported that no hazardous materials were associated with the structure (Paige 1995, 15-16-600; Blackwell 1983, 15-16-076).

6.7.1.11.2 Recommendation

C-16-050 is recommended for NFA because it has never been used for the management of hazardous waste.

6.7.1.11.3 Rationale for Recommendation

No hazardous materials were ever associated with this structure (Blackwell 1983, 15-16-076).

6.7.1.12 Industrial Waste Tank, SWMU 16-037

6.7.1.12.1 Background

SWMU 16-037 is listed in the SWMU Report as an industrial waste tank, structure TA-16-215 (LANL 1990, 0145).

6.7.1.12.2 Recommendation

SWMU 16-037 is recommended for NFA because the SWMU Report incorrectly identifies the existence of the SWMU.

6.7.1.12.3 Rationale for Recommendation

After extensive investigation by field team members, it appears that SWMU 16-037, industrial waste tank TA-16-215, does not exist. In 1982 TA-16-215 was proposed. However, no lab jobs or work orders are listed for this structure. In 1983, the tank is mentioned on structure location index sheet ENG-R 5111, but there is no information about the structure. It appears that this tank was never installed. Interviews with former site workers provided no further information.

6.7.1.13 Crossover Platform, C-16-001

6.7.1.13.1 Background

C-16-001 is a T-shaped, elevated, crossover platform, TA-16-384, that runs across the three HE slurry drain troughs [SWMUs 16-010(h,m,n)] coming out of TA-16-390 at the burning grounds of TA-16. The platform is made of steel, with an open crosshatched floor and is approximately 7 ft long x 9 ft wide x 3 ft high. The platform was built in 1962 to allow workers to cross over the trough area instead of walking around it. Laboratory records indicate that the structure was intended for removal in 1970 (Russo 1970, 15-16-015; Blackwell 1983, 15-16-076). However, it remains in place. There is some debate as to whether or not the platform was ever HE contaminated. While an engineering department memo lists the structure as HE contaminated (Russo 1970, 15-16-015), a former site worker includes the structure on a list of structures removed from TA-16 and states that it was not associated with hazardous materials (Blackwell 1983, 15-16-076; Paige 1995, 15-16-600). The crossover platform is presently inactive, but will probably be used when the drain trough area is sampled as planned in Subsection 5.8.4 of the 1993 RFI Work Plan for OU 1082 (LANL 1993, 1094).

6.7.1.13.2 Recommendation

C-16-001 is recommended for NFA because it has never been used for the management of hazardous waste.

6.7.1.13.3 Rationale for Recommendation

The crossover platform [C-16-001] presents no current human health or environmental risk on or off site. The only COPC associated with the platform itself would be HE. Because the crossover platform is made of open, crosshatched steel, HE would not collect on the top of the platform. It is unlikely that HE would splash up from the troughs located one foot below the platform. The environmental risk at this site is limited to what is already being considered for the HE slurry troughs.

6.7.2 SWMUs and AOCs Recommended for No Further Action Under Step Two of the Four-Step Criteria

Step two of the four-step criteria includes PRSs that have had no releases to the environment (Project Consistency Team, 1210).

6.7.2.1 Decommissioned Aboveground Fuel Tanks, SWMUs 16-033(c,d)

6.7.2.1.1 Background

SWMU 16-033(c) was a 52 000-gal. aboveground fuel oil storage tank, TA-16-29, constructed of metal and mounted in concrete saddles. The 62 ft long x 12 ft diameter tank was located approximately 50 ft north of the cafeteria, TA-16-16. It was installed in 1945 and removed in 1956. According to a former site worker with 35 years of tenure at S-Site, the piping went directly from the tank to the pump house, TA-16-19, and then to the steam plant, TA-16-7 (Martin and Hickmott 1994, 15-16-549). During a site visit, no obvious soil staining was observed, and archival research reveals no record of any releases. There is a chance that filling the tank could have resulted in minimal spills down the side of the tank and caused some surface contamination. However, because all but one of the berms around the tank has been removed, it is unlikely that any surface contamination could presently be found.

SWMU 16-033(d) was an aboveground propane tank, TA-16-1140, that once served the cafeteria, TA-16-16. The tank was installed in 1946 and removed in 1956. It was located 50 to 60 ft west of TA-16-16, near transportable TA-16-1407. The exact size of the tank is not known. The two saddles that held the tank still remain and are positioned seven feet apart. There are no records of any releases from this tank. A 1983 memo reports no hazardous materials were associated with the tank (Blackwell 1983, 15-16-076).

6.7.2.1.2 Recommendation

SWMUs 16-033(c,d) are recommended for NFA because no release to the environment has occurred.

6.7.2.1.3 Rationale for Recommendation

No visible soil stains were found during site visits and there are no records of any releases at either SWMU. Any oil spills small enough not to have been reported would probably be dispersed and very difficult to trace because the tanks (TA-16-29 and TA-16-1140) and three of the four berms around TA-16-29 have been removed.

6.7.2.2 Implement Shed, C-16-008; Mess Hall, C-16-009; Storage Building, C-16-010; Decommissioned Blacksmith Shop, C-16-012; Decommissioned Lumber Storage Area, C-16-013; Decommissioned Equipment Room, C-16-014; Decommissioned Hose House, C-16-015; Decommissioned Fire House, C-16-016; Decommissioned Latrine, C-16-036

6.7.2.2.1 Background.

C-16-008, C-16-009, C-16-010, C-16-012, C-16-013, C-16-014, C-16-015, C-16-016, and C-16-036 were part of a cluster of buildings that were used by The Zia Company for storage of equipment and tools used for utilities maintenance in the World War II era S-Site (Table 6-14). All the buildings were removed in 1955, although the foundation of TA-16-142 (C-16-016) remains. The area is now a field covered with grass and small trees. The buildings were located west of West Road, the only entry to S-Site prior to 1951. No unpackaged HE was allowed west of West Road, so this group of buildings did not handle or store unpackaged HE. A 1983 memo lists each of the structures associated with the above areas of concern as having no association with hazardous materials (Blackwell 1983, 15-16-076), and a former site worker with 35 years of tenure at S-Site specifically states that TA-16-139 through TA-16-146 were not HE contaminated (Martin and Hickmott 1994, 15-16-549). The most likely source of HE contamination to any of these structures would have occurred as a result of personnel and equipment inadvertently introducing HE particles or chunks into the area. A former site worker states that the possibility of HE contamination by these means would be limited because The Zia Company took precautions to prevent HE contamination of this area (Miller 1994, 15-16-552). Other hazardous constituents are not likely at any of these units based on knowledge of the processes that occurred in them.

TABLE 6-14

DECOMMISSIONED ZIA MAINTENANCE FACILITY STRUCTURES

AOC NUMBER	STRUCTURE NUMBER	FUNCTION	OPERATIONAL DATES	DIMENSIONS, LENGTH X WIDTH X HEIGHT (FT)
C-16-008	TA-16-136	Implement shed	1944-1955	18 x 32 x 9
C-16-009	TA-16-134	Mess hall	1944-1955	32 x 52 x 10
C-16-010	TA-16-135	Storage building	1944-1955	16 x 16
C-16-012	TA-16-138	Decommissioned blacksmith shop	1944-1955	8 x 10 x 9
C-16-013	TA-16-133	Lumber storage area	1944-1955	18 x 69 x 10, open on one long side
C-16-014	TA-16-144	Decommissioned equipment room	1945-1955	20 x 45 x 10
C-16-015	TA-16-143	Decommissioned hose house	1945-1955	12 x 55 x 10
C-16-016	TA-16-142	Decommissioned fire house	1945-1955	56 x 74 x 13
C-16-036	TA-16-145	Decommissioned latrine	1945-1955	7 x 7 x 9

6.7.2.2.2 Recommendation

C-16-008 through C-16-010, C-16-012 through C-16-016, and C-16-036 are recommended for NFA because no release to the environment has occurred.

6.7.2.2.3 Rationale for Recommendation

The historical use of each structure is well documented, and there were no known hazardous materials used at these locations (Blackwell 1983, 15-16-076). Further, the group of buildings was physically isolated from work involving HE.

6.7.2.3 Decommissioned Oil Switches, C-16-047, C-16-051, and C-16-058

6.7.2.3.1 Background

C-16-047, C-16-051, and C-16-058 are decommissioned 200- to 400-gal. oil switches used to control large amounts of electrical power for several clusters of buildings at S-Site (Table 6-15). These oil switches were in service from 1952 to 1967 when they were removed. Each was mounted on a 7 ft x 7 ft concrete pad that was surrounded by a metal fence. The pads and some attached metal pieces remain in place.

6.7.2.3.2 Recommendation

C-16-047, C-16-051, and C-16-058 are recommended for NFA because no release to the environment has occurred.

TABLE 6-15

OIL SWITCHES

AOC NUMBER	STRUCTURE NUMBER	FUNCTION	OPERATIONAL DATES	CAPACITY (GALLONS)
C-16-047	TA-16-1101	Oil switch controlling power to radiography buildings	1952-1967	200 to 400
C-16-051	TA-16-1103	Oil switch controlling power to the 300 Line	1952-1967	200 to 400
C-16-058	TA-16-1102	Oil switch controlling power to the assembly and pressing area	1952-1967	200 to 400

6.7.2.3.3 Rationale for Recommendation

There were no known hazardous materials associated with these sites (Blackwell 1983, 15-16-076), and no documented releases. The most likely COPC would be lubricating oil containing polychlorinated biphenyls (PCBs). However, a specialist from Westinghouse Electrical Engineering Service Division stated that mineral oil is generally the lubricant chosen for oil switches and that oil containing PCBs would be a poor replacement because of its consistency (Miller 1994, 15-16-559). Site inspection showed no staining in the area around the oil switches.

6.7.2.4 Transformer, SWMU 16-027(d)

6.7.2.4.1 Background

SWMU 16-027(d) is listed in the SWMU Report as a leak from a transformer, TA-16-569, located approximately 100 ft north of TA-16-430. The SWMU Report claims that the slow leak, discovered in 1987, was oil with a 25 000 ppm PCB content (LANL 1990, 0145). Extensive archival research revealed no record of any releases from TA-16-569. Further, records on the transformer indicate that it never contained oil with a 25 000 ppm PCB concentration (Wechsler 1994, 15-16-595), but rather it contained a mineral oil dielectric fluid which, according to 40 CFR 761.123, must be assumed to contain 50 to 499 ppm PCBs. Based on these records, it is assumed that the spill listed in the SWMU Report refers to a nearby transformer, TA-16-563, that did contain oil with a 25 000 ppm PCB content and that did have a reported release in 1987. TA-16-563 is discussed as SWMU 16-027(c) in Subsection 6.7.4.1 in Addendum 2. Transformer TA-16-569 has no record of releases and was dechlorinated in 1992 and reclassified February 3, 1993, as a non-PCB transformer containing 2 ppm PCBs (Wechsler 1994, 15-16-595). In addition, a soil sample was collected from the area around the transformer April 28, 1994, with a result of 7.3 ppm PCBs (LANL 1994, 15-16-562), which places it within PCB limits of 25 ppm mandated by 40 CFR 761.125.

6.7.2.4.2 Recommendation

SWMU 16-027(d) is recommended for NFA because no release to the environment has occurred.

6.7.2.4.3 Rationale for Recommendation

There have been no known releases from this site. Transformer TA-16-569 never used oil containing 25 000 ppm PCBs, and it was reclassified to non-PCB containing status in 1993. It is believed that the spill described at this site in the SWMU Report actually refers to a spill at a nearby transformer, TA-16-563. The latter site is covered under SWMU 16-027(c) in Subsection 6.7.4.1 of Addendum 2.

6.7.2.5 Decommissioned Pump House, C-16-019

6.7.2.5.1 Background

C-16-019 was a small wooden pump house, TA-16-19, previously numbered S-16, located in the old administration area of S-Site. The 10 ft x 10 ft building, built in 1945 and removed in 1956, was located approximately 50 ft northeast of the former cafeteria, TA-16-16. The concrete foundation remains in place. The pump house moved fuel from nearby tank TA-16-29 across Anchor Ranch Road via overhead pipes to TA-16-7 to fuel steam boilers (Martin and Hickmott 1994, 15-16-549). There is no record of any fuel spills occurring in the area during the eleven years it was in use and no stained soil is visible in the area.

While a 1983 memo cites this pump house as HE contaminated (Blackwell 1983, 15-16-076), based on archival review it is unlikely that any HE would have come into contact with the pump house. The only possible source of HE contamination in this structure would have been from the movement of people between HE-contaminated areas and the administration area. Former site workers have stated that special care was taken to prevent contamination of the administration area, including TA-16-19 (Martin and Hickmott 1994, 15-16-549).

6.7.2.5.2 Recommendation

C-16-019 is recommended for NFA because no release to the environment has occurred.

6.7.2.5.3 Rationale for Recommendation

The historical use of TA-16-19, as well as its location, do not support the conclusion that the pump house was HE contaminated. Former site workers have stated that special care was taken to prevent contamination of the administration area in which the structure was located (Martin and Hickmott 1994, 15-16-549). Given the proximity of pump house TA-16-19 to the cafeteria and other commonly used buildings, and the distance of the structure from facilities associated with HE, it seems clear that workers would not only have good cause to keep TA-16-19 clear of HE contamination, but also the ability to do so. Further, any possible HE contamination would have been in such small amounts that it would be untraceable nearly 40 years after removal of the building.

There are no records of any fuel spills at the pump house and no evidence of any spills. Any spills that may have occurred would have spilled onto the concrete foundation which is still in place. In addition, the soil in this area has been highly disturbed due to redistribution of soil from the berms surrounding nearby tank TA-16-29. This would make detection of spill residues highly unlikely.

6.7.2.6 Underground Fuel Tank, C-16-070

6.7.2.6.1 Background

C-16-070 is TA-16-391, a 3 063-gal. underground propane tank that was installed at the burning grounds in 1951. This tank provided fuel to heat and dry the sand in filter tanks TA-16-401 and TA-16-406 before the sand was burned to remove HE (Martin and Hickmott 1994, 15-16-549). The tank was 24 ft long by 5 ft in diameter and lay approximately 50 ft northeast of TA-16-390. It had a manhole to access tank valves and a 6-in. corrugated metal drain from the manhole (ENG-C 1098 and ENG-R 790). The tank was abandoned in place in 1970. Although there is no record of its removal, the tank is no longer present. The building manager recalls that it was removed approximately five years ago (Paige 1994, 15-16-563). There is only a level, cleared, pebble-covered area where the tank was located. A vitrified clay pipe was discovered approximately 50 ft east of the tank but it is not known if this is associated with the tank or with another structure.

This structure had no hazardous materials associated with it (Blackwell 1983, 15-16-076). In addition, it has been specifically cleared of both HE and radioactive contamination (Brooks 1970, 15-16-002; Buckland 1970, 15-16-005).

6.7.2.6.2 Recommendation

C-16-070 is recommended for NFA because no release to the environment has occurred.

6.7.2.6.3 Rationale for Recommendation

C-16-070 is underground propane tank TA-16-391, which is no longer in place, and was never associated with any hazardous materials (Blackwell 1983, 15-16-076). It is assumed that the former location of the tank also contains no COPCs.

6.7.3 SWMUs Recommended for No Further Action Under Step Three of the Four-Step Criteria

Step three of the four-step criteria includes PRSs regulated or closed under a different authority that addresses corrective action (Project Consistency Team, 1210).

6.7.3.1 Soil Contamination, SWMU 16-022(a)

6.7.3.1.1 Background

SWMU 16-022(a) is an area where a steel underground storage tank (UST) containing diesel fuel was once located. The tank had a 560-gal. capacity and was 6 ft in length and 4 ft in diameter. The UST served TA-16-205, the tritium processing building. According to the SWMU Report, the tank was installed in 1984 and was located near the northwest corner of the building (LANL 1990, 0145). Upon removal of the UST September 22, 1993, no visual soil contamination was noted beneath the tank. However, according to a letter from LANL's Environmental Management Division Office to the New Mexico Environment Department (NMED), a faint odor of diesel fuel was noticed in the soil. Because the tank had no evidence of leaks and passed a tightness test, it was assumed that the odor came from past surface spills that might have occurred when refilling the UST (Gunderson 1993,15-16-544).

Pursuant to Part XII, Section 1205 of the New Mexico Underground Storage Tank Regulations, LANL must determine the extent of the diesel fuel contamination; therefore, beginning on September 22, 1993, samples were collected from the excavation in accordance with Appendix C, Part XII. All samples were analyzed for total petroleum hydrocarbons (TPH) using EPA SW-846, Analytical Method 418.1. On August 5, 1994, borehole one was resampled. Sample locations and results are listed in Table 6-16.

The soil beneath the tank at TA-16-205 was not found to be highly contaminated. The results of the resampled boreholes show no TPH >100 µg/g. According to New Mexico UST Regulation §1209, soil must be excavated until TPH values are <100 µg/g. The extent of contamination was

TABLE 6-16

ANALYTICAL RESULTS FROM BOREHOLE SAMPLES AT TA-16-205

TA-BOREHOLE NUMBER-DEPTH	TPH (µg/g)	DATE COLLECTED
16-BM (bls)[a]	3 881	9/22/93
16-BM-S/C (10 ft bls)	9 062	9/22/93
16-ES (7 ft bls)	2 086	9/22/93
16-1 (10 ft bls)	1 898	10/14/93
16-B (10.5 ft bls)	20 067	10/14/93
16-W	3 716	10/14/93
16-E	399	10/14/93
16-S	1 325	10/14/93
16-1-5	1 600	11/16/93
16-1-10	960	11/16/93
16-1-15	230	11/16/93
16-2-5	14	11/16/93
16-2-10	2	11/16/93
16-2-15	12	11/16/93
16-3-5	2	11/16/93
16-3-10	2	11/16/93
16-3-15	<1	11/16/93
16-4-5	<1	11/16/93
16-4-10	<1	11/16/93
16-4-15	4	11/16/93
16-1-10 [b]	3	8/5/94
16-1-15[b]	10	8/5/94
16-1-20 [b]	<1	8/5/94
16-1-25 [b]	<1	8/5/94

[a] bls = below land surface.
[b] Resampled.

determined to be 12 ft laterally and 20 ft vertically (Garvey 1994, 15-16-574).

LANL has determined that there is no immediate threat to human health and the environment from the diesel fuel contamination at SWMU 16-022(a). Depth to the main aquifer beneath TA-16 is approximately 1 000 ft. There are no private water supply wells within a 1 000 ft radius or municipal water wells within a one mile radius of this UST removal site. Additionally, there are no surface water courses within 500 ft of this site. The nearest utility corridor is approximately 20 ft away; however, no diesel fuel or potentially explosive vapors have been detected in this corridor or in the vicinity of this UST removal (Gunderson 1993, 15-16-544).

6.7.3.1.2 Recommendation

SWMU 16-022(a) is recommended for NFA because it has gone through the regulatory closure process. NMED has stated that it currently requires no additional work on this UST evaluation and cleanup (Moreland 1994, 15-16-568).

6.7.3.1.3 Rationale for Recommendation

The NMED reviewed a status report received June 24, 1994, for the above-referenced SWMU. The NMED determined that the site does not pose an immediate public health or environmental threat for the following reasons: the horizontal and vertical extent of soil contamination has been adequately defined and is greater than 900 ft above high static water; and, the depth to groundwater at the site is greater than 1 000 ft. Based on this information, the department required that no additional work was needed (Moreland 1994, 15-16-568).

6.7.3.2 Underground Storage Tanks, SWMUs 16-033(a,b,f-j), and 16-022(b)

6.7.3.2.1 Background

The USTs described below were removed from TA-16 prior to 1988, with the exception of TA-16-197. The USTs only contained product fuel and their use was in no way related to building activities or processes. Table 6-17 provides an overview of these removed USTs.

SWMU 16-033(a) is a diesel fuel tank that was located east of TA-16-16 in the administration area. According to the SWMU Report, there was a documented release from this tank (LANL 1990, 0145). The tank was rectangular and attached to a larger cylindrical tank that had a volume of 1 000 gal. Analysis of the tank for gross alpha, beta, gamma, and tritium prior to removal in 1987 revealed no detectable activity. During removal approximately 15 yd^3 of contaminated soil were excavated and taken to TA-54 for land farming. The excavation was backfilled with clean soil (McInroy 1995, 15-16-597).

TABLE 6-17

UNDERGROUND STORAGE TANKS REMOVED FROM TA-16

PRS NO.	STRUCTURE NO.	DESCRIPTION	INSTALLATION DATE	REMOVAL DATE
16-022(b)	TA-16-197	4 000-gal. unleaded gas tank; served TA-16-195	1952	1990
16-033(a)	Unknown	1 000-gal. diesel tank; served TA-16-16	*	1987
16-033(b)	TA-16-196	4 000-gal. leaded gas tank; served TA-16-195	1951	1987
16-033(f)	TA-16-512	1 000-gal. oil tank; served TA-16-502	1944	1968
16-033(g)	TA-16-1138	Sizes unknown; served	1951	*
16-033(h)	TA-16-1139	TA-16-260		
16-033(i)	TA-16-1341	Two 5 000-gal. leaded gas	Early	1980
16-033(j)	TA-16-1342	tanks; served TA-16-195	1950s	

* Unknown

SWMU 16-033(f) is a 1 000-gal. oil tank once located at T-Site approximately 750 ft northeast of TA-16-54. In 1960 the tank was found to be free of radioactivity and toxic contamination (Blackwell 1960, 15-16-114). According to a 1983 memo, no hazards were found to be associated with TA-16-512 (Blackwell 1983, 15-16-076).

SWMUs 16-033(g,h) consist of two tanks, TA-16-1138 and TA-16-1139, that were located west of TA-16-260. The Comprehensive Environmental Assessment Response Program (CEARP) Report lists these structures as possibly being aboveground (DOE 1987, 0264); however, after examination of Engineering drawing ENG-C 3556, it is apparent the tanks were underground. Construction started on the tanks in 1949 and was completed in February 1951. According to the Engineering structure list, the tanks were abandoned in place in July 1951 when the main steam line was connected to TA-16-260. The tanks were found to be free of radioactive and toxic contamination before removal (date unknown) (Buckland 1967, 15-16-131). This survey presumably occurred after the tanks had been excavated prior to removal.

It is assumed the tanks were used temporarily for heating during the construction of building TA-16-260. There was no visible evidence indicating that the tanks are still present. A preliminary site screening with a metal detector did not locate the tanks. It is presumed that they have been removed, probably in 1967 when the contamination survey was conducted.

SWMUs 16-033(i,j) are leaded gasoline tanks, TA-16-1341 and TA-16-1342, that once served the TA-16 service station, TA-16-195. The installation dates for the tanks are unknown but it is estimated to be the early 1950s when TA-16-195 was constructed. The tanks were located on the west side of the building and were removed in 1980 with no record of historical releases (LANL 1990, 0145).

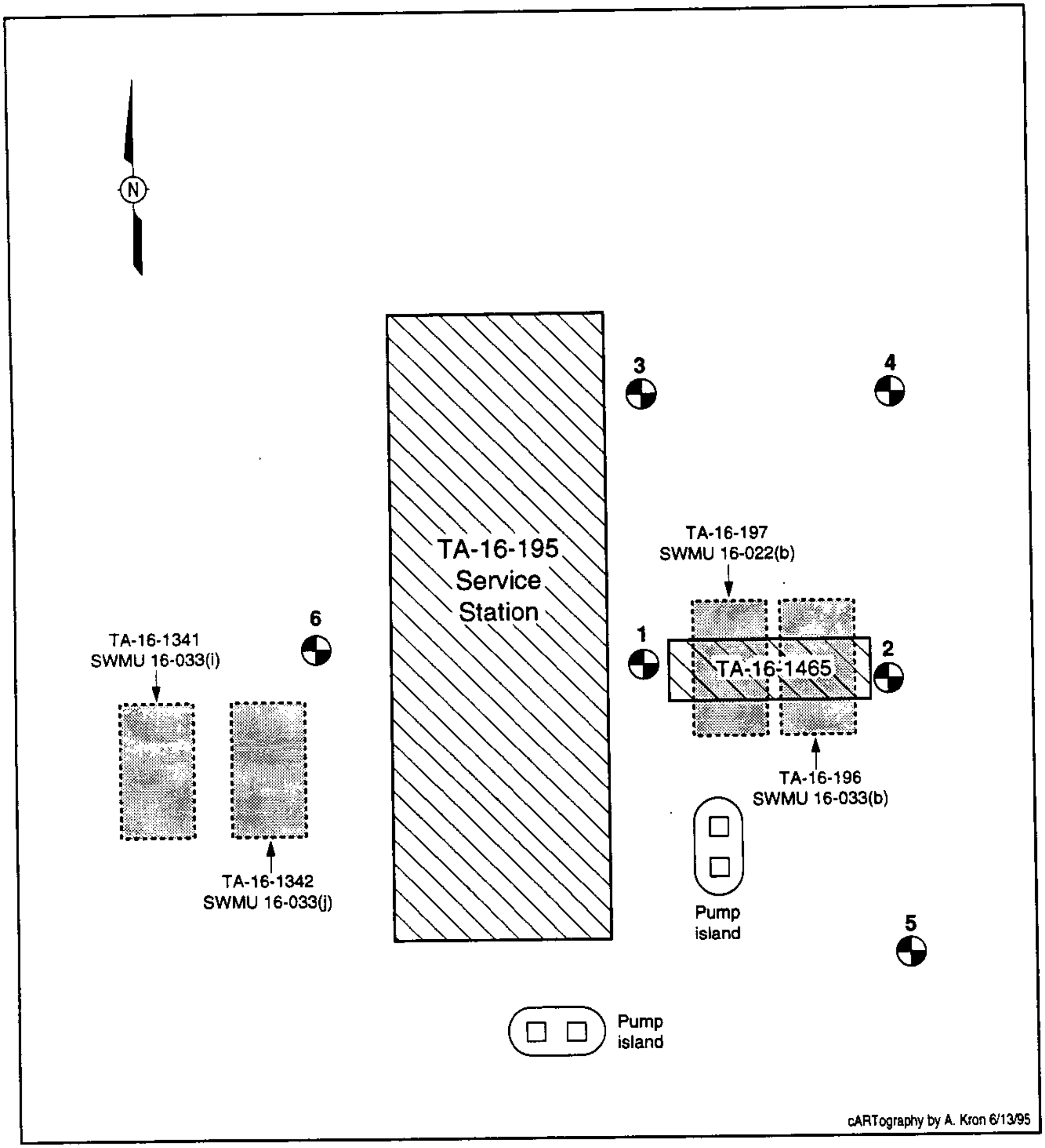
SWMU 16-033(b) is a 4 000-gal. leaded gasoline tank, TA-16-196, once located next to tank TA-16-197 on the east side of the TA-16 service station, TA-16-195. Before removal in 1987 attempts were made to remove soil contaminated by TA-16-196, but further excavation was impeded by the adjacent UST, TA-16-197, and TA-16-195 (LANL 1990, 0145; McInroy 1995, 15-16-596).

SWMU 16-022(b) is a 4 000-gal. unleaded gasoline tank, TA-16-197. In 1987 tank TA-16-197 tested tight. During removal in 1990, scale was dislodged from the bottom of the tank resulting in a 15 to 20 gal. release of residual fuel (LANL 1990, 0145). The contaminated soil was removed immediately. The area of contamination was cleaned in compliance with the Corrective Action Section, Part XII of the New Mexico Underground Storage Tank Regulations (Tiedman 1990, 15-16-540). After the contaminated soil was removed, a 10 000-gal. tank, TA-16-1465, was installed.

On August 3, 1994, during repairs to tank TA-16-1465, light soil staining and a faint odor of gasoline was discovered. The NMED, Underground Storage Tank Bureau was notified of a gasoline release from overfills of tank TA-16-1465. This structure, which has been incorrectly identified as TA-16-197 in a few ESH-19 reports, is a 10 000-gal. unleaded gasoline tank that was installed after the removal of TA-16-197 (Garvey 1994, 15-16-573). TA-16-1465 is located in the pit where tanks TA-16-196 and TA-16-197 were located.

On September 28, 1994, two boreholes were drilled to a depth of 35 ft to determine the extent of contamination. Samples were collected for volatile analysis. Because there is known residual contamination from TA-16-196, additional samples were collected and analyzed for total lead. Five of the six holes were drilled on the east side of the service station, TA-16-195. An additional hole was drilled on the west side of the building. See Fig. 6-1 for a map of the borehole locations. The sample results from the borehole on the west side determined that no contamination had spread under TA-16-195; in addition, the results did not indicate residual contamination from former tanks TA-16-1341 and TA-16-1342 (LANL 1994, 15-16-585). These two tanks contained leaded gasoline and are recommended for NFA [see SWMUs 16-033 (i,j)]. The analytical results of the soil samples taken from the six boreholes, listed in Tables 6-18 and 6-19, show elevated levels of BTEX (benzene, toluene, ethylbenzene, and xylene) in borehole number one at 30 ft below land surface. This suggests historical contamination from tank TA-16-196.

On October 12, 1994, all potentially contaminated soil in the vicinity of the spill was removed. Ninety-four drums of soil were collected and sampled for BTEX. Eighty-one of the 94 drums did not contain any measurable amount of gasoline; 13 drums contained measurable amounts of gasoline; 5 of the 13 drums contained benzene over 10 mg/kg. Eighty-nine drums were sent to Sigma Mesa for reuse and the remaining five were shipped to the Chemical and Mixed Waste Science Group (CST-5) to be managed as a special waste under New Mexico Solid Waste Management Regulations (SWMR-4) (Carmichael 1994, 15-16-588).



Underground storage tank (removed)

Existing structure

1 Borehole location and number

Note: drawing not to scale

Fig. 6-1. Borehole locations for sampling near TA-16-1465.

TABLE 6-18

HEADSPACE TEST RESULTS[a]

DEPTH/BORING (IN FT)	1	2	3	4	5	6
5	N/S[b]	N/S	2	1	1	50
10	N/S	N/S	40	1	150	50
15	N/S	N/S	13	2	100	400
20	N/S	450	32	1	50	450
25	350	375	6	8	20	500
30	400	c	5	c	50	550
35	400	c	3	1	c	500

[a]All readings measure BTEX in parts per million (ppm)
[b]N/S Interval not sampled
[c] No test conducted on this sample, poor sample recovery

TABLE 6-19

RESULTS OF LABORATORY ANALYSES[a]

BOREHOLE	DEPTH (FT)	BENZENE	TOLUENE	ETHYLBENZENE	TOTAL XYLENES
1	35-35.5	0.69	34	36	280
2	30-30.5	<0.05	<0.05	<0.05	<0.05
3	10-11.5	<0.05	<0.05	<0.05	<0.05
4	35-36	<0.05	<0.05	<0.05	<0.05
5	10-11.5	<0.05	<0.05	<0.05	<0.05
6	35-36	<0.1	<0.1	<0.10	1.1

[a]All concentrations are in mg/kg; 1 000 µg/kg = 1 mg/kg = 1 ppm

Additional samples from borehole number one were collected February 13, 1995. A sample was collected at 44 ft and submitted for BTEX analysis using EPA Method 8020. The analysis found the following: benzene 1.5 ppm; toluene 47 ppm; ethyl benzene 33 ppm; and total xylenes 260 ppm. Drilling continued in an effort to define the lateral and vertical extent of contamination because total xylenes were above 100 ppm (Geo-Test 1995, 15-16-602). An air drill was necessary to continue drilling past 45 ft. On April 28, 1995, the air drill lost the core stem at 65 ft. The stem could not be retrieved and the hole was abandoned. Photoionization detector readings at 55, 60, and 65 ft were 2 300, 2 068, and 1 908 ppm, respectively (Cook 1995, 15-16-607). Currently, ESH-19 is in the process of submitting a report to the New Mexico UST Bureau on the drilling status at this site.

6.7.3.2.2 Recommendation

NFA for RCRA Facility Investigation is being proposed for SWMUs 16-033(a,f,g,h) because historical information does not suggest that a potential threat to human health and the environment exists . Furthermore, fuel USTs do not manage hazardous waste. The common practice of closing USTs prior to 1988 consisted of removing obviously contaminated soil and collecting samples for analysis of extraction procedure (EP) toxicity test levels of lead, benzene, toluene, and xylene prior to regrading the excavation (Barr 1988, 15-16-589).

The current investigation of TA-16-1465 is addressing potential contamination from tanks TA-16-196, TA-16-197, TA-16-1341, and TA-16-1342 [SWMUs 16-022(b) and 16-033(b,i,j)]. LANL is in the process of determining extent of contamination from tank TA-16-1465; in doing so, any residual contamination from past releases from the other tanks that served the service station will be included in the overall investigation.

6.7.3.2.3 Rationale for Recommendation

Once the extent of contamination is determined for the current investigation of TA-16-1465, further action will be taken under the current UST program in accordance with the New Mexico state regulations. According to the New Mexico UST Regulation §803, Applicability To Previously Closed UST Systems, the owner and operators of the UST are not obligated to assess the excavation zone of USTs closed prior to December 22, 1988, if releases from the decommissioned UST pose no current or potential threat to human health or the environment. For all these tanks, depth to groundwater is greater than 700 ~~1 000~~ ft with no private wells within 1 000 ft or municipal water wells within one mile (LANL 1993, 1094).

6.7.4 SWMUs and AOCs Recommended for No Further Action Under Step Four of the Four-Step Criteria

Step four of the four-step criteria includes PRSs that have been characterized or remediated in accordance with current applicable regulations, and available data indicate that contaminants of concern are either not present or present in concentrations that would pose an acceptable level of risk (Project Consistency Team, 1210).

6.7.4.1 Transformers, SWMUs 16-027(a-c)

6.7.4.1.1 Background

SWMU 16-027(a) is a leak from a transformer in TA-16-260, an HE processing building. Located in equipment room 110 (PCB ID #5607, 5608), the transformer was estimated to be 31 to 35 years old and contained 100- to 500-gal. of PCB-containing dielectric oil listed at concentrations greater than 500 000 ppm (LANL 1990, 0145). May 17, 1990, a spill characterized as a high-concentration spill involving a nonreportable release occurred. Contaminated materials were nonimpervious solid surfaces: the concrete floor, a concrete sump, and an impervious metal sump cover. Cleanup was initiated immediately using the double-wash/double-rinse method. The cleanup was completed on the following day using the scabbler concrete removal system. There were subsequent cleanup efforts four other times in 1990. These cleanup efforts employed the Penetone® double-wash/double-rinse method and the Capsur® foam method. Final cleanup was November 13, 1990 (LANL 1990, 15-16-386).

During the cleanup process, the concrete floor under the transformer was scabbled, sampled, and encapsulated. The concrete floor and sump under the pump and drums were cleaned using various cleaning agents, including the Capsur® cleaning method. The sump lid was taken to Area G at TA-54. After ascertaining that all grid points were below the 100 µg/100 cm^2 required by 40 CFR 761.125, the entire floor of the room was encapsulated using two-tone epoxy coating. Post-cleanup sampling, based on Midwest Research Institute guidelines, was conducted after each cleanup effort. Surface samples were taken using gauze, cyclohexane, and 100 cm^2

templates (LANL 1990, 15-16-386). The transformer was drained, removed, and replaced with a non-PCB-containing unit on July 9, 1990 (Sandoval 1994, 15-16-546).

SWMU 16-027(b) is a leak from a transformer (PCB ID #5020) located on the second floor of TA-16-540, a steam plant. The transformer contained 100 to 500 gal. of PCB-containing dielectric oil listed at concentrations greater than 500 000 ppm. The SWMU Report characterizes the transformer as being 31 to 35 years old and having a moderate leak (LANL 1990, 0145). According to a memo from the Environmental Protection Group (ESH-8), the transformer at this location had a slow leak, but never spilled onto surfaces that required cleanup (Sandoval 1994, 15-16-546). The leak was contained in a metal can, so no spill records exist. The transformer began a retrofill process July 15, 1988, and was reclassified as non-PCB containing September 6, 1990. Disposal of the PCB-containing and retrofill fluids is documented (Sandoval 1994, 15-16-546).

SWMU 16-027(c) is a leak from a transformer, TA-16-563, that contained 100 to 500 gal. of 25 000 ppm PCB-containing oil. The outside, fenced, pad-mounted transformer was located approximately 100 ft north of TA-16-430. It was built in 1952 and was also known as Station 9. A moderate leak of 0.5 to 1 gal. was detected July 28, 1987, and the surrounding soil and concrete pad on which the transformer was mounted underwent immediate cleanup. The concrete was cleaned with the double-wash/double-rinse method, and the soil was removed to a depth of approximately 2.5 ft, drummed, and taken to Area G at TA-54. In 1989 inspection and sampling revealed a need for further cleanup. Several sampling and cleanup efforts followed, including removal of the transformer and concrete pad, excavation of the contaminated soil underneath the pad, and replacement of the transformer and pad with a non-PCB transformer and a new pad (Bailey 1993, 15-16-547; Sandoval 1994, 15-16-546). A total of 691 ft^3 of soil was removed from TA-16-563. The site cleanup was completed November 12, 1992, when samples revealed PCB levels below the 25 ppm Toxic Substances Control Act (TSCA) mandated cleanup levels for low-contact outdoor electrical substations (Bailey 1993, 15-16-547).

6.7.4.1.2 Recommendation

SWMUs 16-027(a,b,c) are recommended for NFA because they have been remediated and no longer pose a threat to human health or the environment.

6.7.4.1.3 Rationale for Recommendation

Each of these transformer leaks has been remediated in accordance with the Toxic Substances Control Act regulations found in 40 CFR 761. The PCB-containing dielectric oil units have been replaced with non-PCB units as noted above (Sandoval 1994, 15-16-546).

6.7.4.2 Operational Release, SWMU 16-021(b)

6.7.4.2.1 Background

SWMU 16-021(b) is the soil associated with a hydraulic fluid leak from TA-16-430. A leak of approximately 500 gal. of hydraulic fluid occurred in Bay 1 of TA-16-430 June 6, 1986. The exact volume of hydraulic fluid that reached the environment is not known. The incident was reported immediately after the leak occurred. Analysis of the fluid indicated that no PCBs or HE were present (Nylander 1986, 15-16-590). The spill area was bermed and trenched to avoid spreading contamination into the canyon. Although the spill documentation states that the spill was not cleaned up further, a site visit shows that the outfall area has been cleaned up. The rock surface at the outfall appears to have been chipped off, removing contaminated material.

6.7.4.2.2 Recommendation

SWMU 16-021(b) is recommended for NFA because the site has been remediated and no longer poses a threat to human health or the environment.

6.7.4.2.3 Rationale for Recommendation

The hydraulic fluid used at the time of the leak was an ethylene glycol/water mixture, which has a relatively high screening action level (SAL) in soil (160 000 mg/kg) and is easily dissolved and washed away (Nylander 1986, 15-16-590; LANL 1993, 1017). The hydraulic fluid did not contain PCBs or

HE. Given the rapid response to the leak, the low toxicity of the spilled material, and the apparent cleanup, there is no longer a problem at this outfall.

6.8 SWMU Recommended for Voluntary Corrective Action

6.8.1 SWMU Recommended for No Further Action due to Voluntary Corrective Action Under Step Four of the Four-Step Criteria

The following SWMU is recommended for NFA because it is in the process of undergoing voluntary corrective action (VCA) in fiscal year 1995. During the VCA process, the SWMU will be completely remediated in accordance with current applicable state or federal regulations. Therefore, this SWMU is recommended for NFA under step four of the four-step criteria (Project Consistency Team, 1210).

6.8.1.1 Surface Disposal, SWMU 16-016(f)

6.8.1.1.1 Background

SWMU 16-016(f) is a construction debris site southeast of TA-16-360. The debris consists of black cellular glass foam material (Foamglas®) that is used for roof insulation and of miscellaneous materials such as aluminum cans, broken insulators, rusted wires, and cans. A piece of friable asbestos was also identified at the site (Paige 1995, 15-16-599).

6.8.1.1.2 Recommendation

SWMU 16-016(f) is recommended for NFA because it is undergoing VCA. The friable asbestos will be removed according to the Occupational Safety and Health Administration (OSHA) and TSCA regulations. All other on-site debris will be evaluated for asbestos contamination and disposed of accordingly.

6.8.1.1.3 Rationale for Recommendation

SWMU 16-016(f) will be completely remediated during VCA in fiscal year 1995.

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ATTACHMENT A
TO CHAPTER 6

This attachment contains cleanup documentation for SWMUs recommended for no further action under step 3 or 4 of the the four-step criteria.

The SWMU, its location in Chapter 6, and associated documentation are listed below:

SWMU	Subsection	Documentation
16-021(b)	6.7.4.2	15-16-590
16-022(a)	6.7.3.1	15-16-568
16-022(b)	6.7.3.2	15-16-540, 15-16-585
16-025(e2,f2,h2)	6.6.3.1	15-16-144
16-027(a-c)	6.7.4.1	15-16-546, 15-16, 547, 15-16-386
16-033(a,b,f-j)	6.7.3.2	15-16-076, 15-16-114, 15-16-131, 15-16-602, 15-16-607, 15-16-588, 15-16-585, 15-16-597, 15-16-596

16-000590

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Jesse Aragon,
HSE Division Leader, MS K491

DATE: June 17, 1986

THRU: Thomas C. Gunderson,
HSE-8 Group Leader, MS K490

MAIL STOP/TELEPHONE: K490/7-5021

CKN TG

FROM: Charlie Nylander, HSE-8

SYMBOL: HSE8-86-689

SUBJECT: OIL SPILL AT TA-16, BUILDING ~~340~~ 430 CKN

On June 6, 1986 I received a telephone call at 10:00 a.m. from Larry Hupke, Waste Management Group (HSE-7), informing me that there had been an oil spill at TA-16, Building ~~340~~ 430 Larry was proceeding to the site following our telephone conversation, and I was to follow shortly thereafter. At approximately 10:30 a.m. I arrived at the site and recorded the following facts and observations.

At approximately 9:00 on June 6, 1986 the 20,000 pound hydraulic press in Bay 1 of Building ~~340~~ 430 was being readied for use. The hydraulic system that operates the press is located in the basement below it. As the hydraulic system was turned on, the operators heard noises and upon investigation found that the hydraulic system was leaking and oil was spreading across the basement floor. Approximately 500 to 600 gallons of hydraulic oil spread across the basement floor, flowed through a floor drain, and drained from the floor drain outlet pipe onto a terrace above Water Canyon.

By 10:30 a.m. the floor drain had been plugged, and the discharge from the pipe was a mere trickle. A berm and trench had been constructed on the terrace to prevent the flow of any oil reaching the canyon. The wetted area on the terrace was estimated to be approximately 1,000 square feet. Samples of the oil were collected and analyzed for high explosive (HE) content and polychlorinated biphenyls (PCB). A specialized janitorial crew from Zia was called in to clean up the basement. The janitorial crew (trained in cleaning up PCBs) was instructed to wear booties, gloves, and coveralls. However, because the hydraulic equipment had been checked for PCBs two years ago, the negative PCB analytical results, the oil was presumed to be non-PCB and respirators were not recommended.

The hydraulic oil was a water-based Texaco Safety Oil #46. This is a water solution of blends of high and low molecular weight glycols. It contains approximately 40 percent water. Upon analysis the oil did not have any PCB contamination, nor did it contain HE waste. Therefore, based upon the Materials Data Sheet for the water-based oil and the laboratory results, the fluids that had spilled onto the terrace were left in place. Professional judgement would indicate that biological degradation, sorption, and volatilization will render the spill innocuous to the environment.

Glycol is not listed under the Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) "List of Hazardous Substances and Reportable Quantities," so we were not required to notify the Environmental Protection Agency's National Response Center. Glycol is also not a Resource Conservation and Recovery Act (RCRA) waste.

However, the spill did discharge through an outlet pipe that was not permitted under our National Pollutant Discharge Elimination System (NPDES) permit. We are evaluating the options of requesting a permit for this outfall or eliminating it.

TCG:tp

Cy: W. Hansen, HSE-DO, MS K491
R. Garde, HSE-7, MS E518
A. Drypolcher, HSE-8, MS K490
C. Nylander, HSE-8, MS K490
J. White, HSE-8, MS K490
D. Garvey, ECMO, MS A120
J. Mitchell, ADLC, MS A189

16-000568

June 27, 1994

Los Alamos National Laboratory
Joe Vozella, LAAO
Environment, Safety & Health Group
Mailstop A316
Los Alamos, NM 87545

RE: NO FURTHER ACTION REQUIRED AT TA-16 FOR UST #TA-16-205

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

Dear Mr. Vozella:

The New Mexico Environment Department has reviewed the Status Report received on June 24, 1994 for the above-referenced site. The Department has determined that this site does not pose an immediate public health or environmental threat for the following reasons:

1. The horizontal extent of soil contamination has been adequately defined. The vertical extent of soil contamination has been adequately defined and is greater than 900 feet above high static ground water.

2. Depth to ground water at the site is greater than 1000 feet below ground surface.

Based on this information, the Department requires no additional work at this time, although it reserves the right to do so should petroleum hydrocarbon contamination resulting in a threat to public health or the environment is discovered.

Thank you for your cooperation in this matter.

Sincerely,

Anthony Moreland
Geologist
Underground Storage Tank Bureau

cc: NMED District II Office
NMED Espanola Field Office
✓Jeff Carmichael, Los Alamos National Laboratory, ES&H Group, Mailstop K490, Los Alamos, New Mexico 87545

Bruce King
Governor

Judith M. Espinosa
Secretary

Ron Curry
Deputy Secretary

Harold Runnels Building
1190 St. Francis Drive

TA-16-197 16-000540 206877

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

ASSOCIATE DIRECTOR FOR OPERA[TIONS]
Coordination/Approval Sheet

ADO ACTION REQUI[RED]
SUBJECT
DATE RECEIVED
TIME RECEIVED

Originated By (Name)	Phone	Group/Division
David McInroy	7-0819	HSE-8: 90-845

Subject	Suspense Date (If Applicable)
Notification to State EID, Leak from Laboratory UST	Postmarked by 9/14

Seq.	Phone/MS	Office	Initials	Date	ACTION	Seq.	Phone/MS	Office	Initials	Date	ACTION	Seq.	Phone/MS	Office	Initials	Date	ACTION
	7-5101 A100	DIR					7-4515 A150	CRM					5-2448 G733	ISEC			
	7-4168 A101	DD					7-6131 M719	ENG					7-3535 A120	QA			
5	7-9390 A120	AD				2	7-4218 K491	HSE	[illegible]	9/12			5-2179 G731	SAO			
	7-3535 A120	LG DEP	G	9/13	signed		7-4355 P360	IS					5-1248 E584	SNM			
	7-3535 A120	JS DEP					7-4849 D472	MEC					7-8558 P368	IR			
	7-9390 A120	ASST BUD					7-5911 G729	OS				6	7-7320 A150	CRM-4			
4	7-9390 A120	ADMIN	[illegible]	13			7-5720 A118	PA				3	7-3970 A183	LC	[illegible]	9/13	ok
	7-4998 A120	EXEC					7-2121 M998	OM				1	7-5021 K490	HSE-8	[illegible]	9/12/90	Approved

WHAT:

This is a written notification to the State's UST Bureau informing them of leak from a Laboratory UST. This notification is a requirement of the State's UST Regulations.

DISCUSSION:

- The State has been verbally notified of the occurrence.
- This notification must be postmarked by Friday September 14, 1990.
- Problem, clean-up has already taken place.

RECOMMENDATION:

Approve and sign ASAP to meet regulatory deadline.

original hand-delivered
9/13/90

Return To	Mail Stop	Phone Number
HSE-8 - Please call when signed		7-5021

Form Number 1123 (3/90) - Replaces Form Number 1123 (12/89) which is obsolete

INSTRUCTIONS FOR COMPLETION ON BACK

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE: September 13, 1990
IN REPLY REFER TO: ADO:90- 670
MAIL STOP: A120
TELEPHONE: (505) 665-2167
(FTS) 855-2167

Mr. Harry T. Season, Jr.
Area Manager
U.S. Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Dear Mr. Season:

Enclosed for your review and approval/disapproval is a self-explanatory letter to the New Mexico Environmental Improvement Division's Underground Storage Tank (UST) Bureau (EID/USTB) transmitting the notification of a release from one of the Laboratory's USTs. This written notification is required by Part II of the UST regulations enforced by the EID. It must be postmarked no later than seven days after discovery of a potential release from a tank system. This potential release was discovered on September 8, and this notice should be postmarked no later then September 14, 1990.

Dave McInroy of my staff and Paul Schumann of your staff notified the State verbally on Monday the 10th. This is also required under Part II of the regulations. This release has since been cleaned up to comply with the State's Corrective Action Section of the Underground Storage Tank Regulations.

Should you have any questions, please feel free to call Dave McInroy of the Environmental Protection Group (HSE-8) at 667-0819.

Sincerely,

LHCintzo for

Allen J. Tiedman
Associate Director
for Operations

AJT:DM/gr

Enc. a/s

Cy: J. Puckett, HSE-DO, MS K491
K. Hargis, (HSE-8:90-845), HSE-8, MS K490
J. White, HSE-8, MS K490
CRM-4, MS A150
Circ. File

DRAFT
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Marcy Leavitt, Program Manager
Corrective Action Section
Underground Storage Tank Bureau
1100 St. Francis Drive
Harold Runnels Building
Santa Fe, New Mexico 87503

Dear Ms. Leavitt:

RE: RELEASE DISCOVERED DURING TANK REMOVAL

On September 8, 1990 an underground storage tank was removed from the ground at Technical Area 16. The tank was a 4,000 gallon gasoline tank registered with your bureau as Tank ID number TA-16-197. The tank was tested "tight" in 1987 and showed no problems with inventory records and subsequent reconciliation. During the removal, scale was dislodged from the bottom of the tank, resulting in a release of the residual fuel that could not be pumped prior to removal. It was estimated that between 15 and 20 gallons of fuel was released in the area of the excavation. This contaminated soil was immediately removed and will be land farmed with other soil removed from the excavated area (presumed to be contaminated from overfill practices). The area of contamination has been cleaned up in a matter to comply with the Corrective Action Section, Part XII of the Underground Storage Tank Regulations.

As required in Part II, Section 204 B, of the Underground Storage Tank Regulations, we are notifying you in writing of this occurrence. As required in Part II, Section 204, A, of the UST regulations, 24 hour notification was made to your bureau on Monday, September 10, to Mr. Reid Allen. This call was made by Dave McInroy of Los Alamos National Laboratory and Paul Schumann of the Department of Energy at 2:30 p.m.

Should you have any questions, please contact Paul Schumann of my staff at 665-5027.

Sincerely,

Harry T. Season Jr.
Acting Area Manager

HTS:DM/gr

Cy: A. Tiedman, LANL, ADO, MS A120
J. Puckett, LANL, HSE-DO, MS K491
K. Hargis, (HSE-8:90-845-1), HSE-8, MS K490
J. White, HSE-8, MS K490

16-00503

GEO-TEST

Subsurface Exploration and
Laboratory Analysis
Service Station Building #195
S-Site, TA-16
Los Alamos National Laboratory
Los Alamos, New Mexico

Geo-Test Job No. 6-40902

GEO-TEST

GEO-TEST

SANTA FE, NEW MEXICO ALBUQUERQUE, NEW MEXICO LAS CRUCES, NEW MEXICO

)-TEST

October 26, 1994

Ms. Paula T. Cook
EMCM
Johnson Controls Inc.
P.O. Box 50
Los Alamos, New Mexico 87544

Re: **Subsurface Exploration and Laboratory Analysis, Service Station Building #195, S-Site, TA-16, Los Alamos National Laboratory, Los Alamos, New Mexico, Geo-Test Job No. 6-40902**

Dear Ms. Cook:

Geo-Test, Inc., is pleased to provide the enclosed data summary report presenting the procedures and findings of the subsurface exploration and laboratory analysis of soil samples for the gasoline release at the referenced site.

The report includes data from our subsurface exploration and soil sampling, field screening of soil samples, and laboratory analysis. This report completes the tasks described the Los Alamos National Laboratory purchase order #AM5895ML4-J8 dated August 27, 1994 confirmed on September 26, 1994 by Ms. Terry Cde Baca.

The following report has been prepared by the undersigned. It has been a pleasure to serve you on this project and we look forward to providing services to you in the future. Should there be any questions concerning this report, please feel free to call me at (505) 857-0933.

Sincerely,
GEO-TEST, INC.

John R. Dickey, E.I.
Environmental Services Manager

enclosure

Copies to: Addressee (3)

TEST, INC.
PARKWAY DRIVE
A FE,
MEXICO
471-1101
505) 471-2245

INGTON, NE
RQUE,
MEXICO
857-0933
505) 857-0803

TABLE 1 - HEAD SPACE TEST RESULTS						
Depth/Boring	1	2	3	4	5	6
5 Feet	N/S	N/S	2	1	1	50
10 Feet	N/S	N/S	40	1	150	50
15 Feet	N/S	N/S	13	2	100	400
20 Feet	N/S	450	32	1	50	450
25 Feet	350	375	6	8	20	500
30 Feet	400	*	5	*	58	550
35 feet	400	*	3	1	*	500

All readings are in parts per million (ppm)
* - no test conducted on this sample, poor sample recovery
N/S - interval not sampled

The results of the field screening are also presented on the boring logs (Appendix A). Based on the sample recovery, the quality of the sample, and the results of the field screening the following soil samples were submitted to the laboratory: 1 @ 35-35½', 2 @ 30-30½', 3 @ 10-11½', 4 @ 35-36', 5 @ 10-11½', and 6 @ 35-36'.

3.0 LABORATORY ANALYSIS

Soil samples from the borings were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) according to EPA Method 8020 by Hall Environmental Analysis Laboratory in Albuquerque. The results of the analyses and the laboratory quality control reports are presented in Appendix B. Table 2 lists the results of soil sample analyses:

TABLE 2 - RESULTS OF LABORATORY ANALYSES

SAMPLE	Benzene	Toluene	Ethylbenzene	Total Xylenes
1 @ 35-35½'	0.69	34	36	280
2 @ 30-30½'	<0.05	<0.05	<0.05	<0.05
3 @ 10-11½'	<0.05	<0.05	<0.05	<0.05
4 @ 35-36'	<0.05	<0.05	<0.05	<0.05
5 @ 10-11½'	<0.05	<0.05	<0.05	<0.05
6 @ 35-36'	<0.1	<0.1	<0.1 0	1.1

All concentrations are in mg/Kg
1000 μg/Kg = 1000 ppb = 1 mg/Kg = 1 ppm

GEO-TEST, INC.

8904 WASHINGTON NE
'LBUQUERQUE, NEW MEXICO 87113
505) 857-0933

SERVICE STATION BLDG. #195,
S-SITE, TA-16

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

Boring No. 6
Page 1 of 2
File No. 6-40902
Chkd. By: JRD

Boring Co. GEO-TEST, INC.
eman
GTI Rep. TB
Date Start 9/29/94 End 9/29/94
Location
GS.Elev. Datum

	Casing	Sampler
Type		SS
I.D./O.D.		1.4/2.0
Hammer Wt.		140
Hammer Fall		30
Other		5" HSA

Groundwater Readings

Date	Time	Depth	Casing	Stab. Time

DEPTH	LOG	No.	TYPE	Depth (Ft.)	Blows/ 6"	PID (ppm)	Sample Description & Classification	Unified Soil Class	RMKS	Equipment Installed
5		1	SS	5-6.5	3 5 6	50				
10		2	SS	10-11.5	5 6 10	50				
							CLAY, sandy, intermixed with TUFF, low to medium plasticity, moist, brown	CL		
15		3	SS	15-16.5	18 20 24	400				
20		4	SS	20-21.5	20 26 28	450				
25		5	SS	25-26.5	21 31 43	500	TUFF, welded, competent, non plastic, gray-purple			

Remarks

SS = split spoon sampler
UD = undisturbed ring
AC = auger cuttings
CS = continuous sampler

No Groundwater Encountered

atification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

Boring No. 6

GEO-TEST, INC.

?04 WASHINGTON NE
?UQUERQUE, NEW MEXICO 87113
?5) 857-0933

SERVICE STATION BUILDING #195,
S-SITE, TA-16

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

Boring No. 6

File No. 6-40902
Chkd. By: JRD

DEPTH	LOG	Sample Information No.	TYPE	Depth (Ft.)	Blows/ 6"	PID (ppm)	Sample Description & Classification	Unified Soil Class	RMKS	Equipment Installed
		6	SS	30-30.2	50/2"	550				
35		7	SS	35-35.1	50/1"	500	STOPPED AUGER AT 35 FEET SAMPLER REFUSAL AT 35 FEET 1 INCH			
40										
45										
50										
55										
60										

Remarks

SS = split spoon sampler
UD = undisturbed ring
AC = auger cuttings
CS = continuous sampler

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

Boring No. 6

Results for sample: 6 @ 35-36'

Date collected: 9/29/94	Date received: 10/3/94
Date extracted: 10/4/94	Date analyzed: 10/6/94
Client: Geo-Test, Inc.	
Project Name: TA-16 Bldg. #195	Heal #: 9409085-6
Project Manager: John Dickey	Sampled by: T. Byres
Matrix: Non-Aqueous	

Test: EPA 8020

Compound	Amount	Units
Benzene	<0.1	PPM (MG/KG)
Toluene	<0.1	PPM (MG/KG)
Ethylbenzene	<0.1	PPM (MG/KG)
Total Xylenes	1.1	PPM (MG/KG)

BFB (Surrogate) Recovery = 100 %

Dilution Factor = 2

[redacted] 16-000144

12 August 1949

Department of Engineering, Attn. John Bolton

E. W. Drake

Destruction of Building A-1 at S-Site (TA-16)

Reference: GMX

This is to report to you the successful destruction at 6:33 A.M., 12 August 1949 of the explosive in magazine A-1 at S-Site mentioned in our recent memorandum to you.

The explosion caused the essentially complete demolition of the building, which may now be said no longer to exist. The destruction was accomplished without damage to other property and without injury to personnel.

Photographs of the result, which also are instructive about barricade performance, are being prepared and will be forwarded to you for your information and files.

E. W. Drake

EWD/vb
cc: J. Bolton
L. R. Hightower
R. Reider
E. Hoyt
File (3)

Ehrenkranz and Reider were at the site as observers; the incident was carried out without difficulty. It appeared as though there was more than 125 pounds of explosive. The barricading was barely disturbed and the extra sandbagging placed at the portal was effective.

RR

16-000546

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Margo Buksa, CST-6, MS E525 DATE: January 4, 1994

FROM: Tina Marie Sandoval, EM-8 *TMS* MAIL STOP/TELEPHONE: K490/5-2288

SYMBOL: EM-8/WQ&H:94-008

SUBJECT: **REQUEST FOR PCB-RELATED DOCUMENTATION**

Enclosed are copies of documentation you requested regarding PCB-related activities, including spills, which occurred at three Laboratory S-Site locations. Below is a summary of these activities.

TA-16-260, Room 110 (Transformer PCB s ID #'s 85-5607 and 85-5608)

- A PCB spill cleanup was performed at this location on May 17, 1990. EM-8/JENV PCB spill documentation is enclosed.
- The two transformers noted were drained, removed and replaced with non-PCB units on July 9, 1990. Disposal information is enclosed.

TA-16-540, (Transformer PCB ID # 85-5020)

- The transformer noted at this location had a slow leak, but never spilled onto surfaces which required cleanup. The spilled oil was contained in a coffee can which was disposed of. No EM-8/JENV PCB spill records exist for the spill activities occurring at this location.
- The transformer noted above, began a UNISON retrofill process on July 15, 1988 and was re-classified to non-PCB on September 6, 1990. Disposal information for the PCB oil and retrofill fluids is enclosed.

TA-16-563, Station 9, (Transformer PCB ID # 86-4997, which is located next to Building TA-16-430)

- A PCB spill cleanup was performed at this location beginning July 28, 1987. EM-8/JENV PCB spill documentation is enclosed.
- This transformer was drained, removed and replaced with a non-PCB unit in September 1993. In-service documentation reflecting a REM/STO (removal/storage) date is enclosed.

I hope the information provided herein satisfies your request. Please call me if you have any questions.

TMS/em

Enc. a/s

Cy: EM-8 Reading File, w/o enc.
Circ. File, w/o enc.

PCB TRANSFORMER/MISCELLANEOUS DISPOSAL REPORT (≥500 ppm)

OWNER	PCB ID#	TYPE	PCB WT. (kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	LOC	DESTRUCT DATE yy/mm/dd	CERT.#	SHIP WT. (lbs)	MANIF.#	F
ENG-4	855573	RT	2336.02	TRANSFORMER	89/12/08	90/03/16	U1	90/06/20	U0006318	32495	10144	2967
ENG-4	855574	RT	2336.02	TRANSFORMER	89/12/04	90/03/16	U1	90/03/21	U0003574		10144	2968
ENG-4	855575	RT	2336.02	TRANSFORMER	89/11/27	90/03/16	U1	90/08/01	U0006240		10144	2969
ENG-4	855576	RT	2336.02	TRANSFORMER	89/11/30	90/03/16	U1	90/06/20	U0006317		10144	2970
ENG-4	855577	RT	2866.73	TRANSFORMER	89/11/07	90/03/16	U1	90/07/27	U0006241		10144	2971
ENG-4	855607	RT	1734.99	TRANSFORMER	90/05/17	90/07/09	U1	90/10/26	U0006445	10350	11039	3462
* ENG-4	855608	RT	1734.99	TRANSFORMER	90/05/17	90/07/09	U1	90/10/26	U0006444		11039	3463
WX-3	902089	RT	2103.00	TRANSFORMER	90/05/04	90/07/16	U1	90/10/26	U0006454	3700	0007203	3655
WX-3	902090	RT	2103.00	TRANSFORMER	90/05/04	90/07/16	U1	90/10/26	U0006453		0007203	3656
JCI	855001	RT	3923.61	TRANSFORMER	90/09/05	90/09/10	U1	90/12/06	U0006545	40070	0007281	3657
JCI	855002	RT	3923.61	TRANSFORMER	90/09/05	90/09/10	U1	90/09/20	U0004196		0007281	3658
JCI	855006	RT	3742.17	TRANSFORMER	90/08/21	90/09/10	U1	90/12/06	U0006543		0007281	3659
JCI	855007	RT	3655.99	TRANSFORMER	90/08/21	90/09/10	U1	90/12/06	U0006544		0007281	3660
JCI	855000	RT	3923.61	TRANSFORMER	90/09/07	90/09/17	U1	90/09/28	U0004362	12918	0007306	3661
JCI	855003	RT	1355.80	TRANSFORMER	90/09/12	90/09/17	U1	90/12/06	U0006554		0007306	3662
JCI	855005	RT	235.87	TRANSFORMER	90/09/14	90/09/17	U1	91/03/23	U0006686		0007306	3663
M-6	909061	VP	101.15	VAC PUMP - DRAINED,FLUSHED	90/01/11	90/01/11	G	90/01/11	NONE	223	R-S900386	3894
M-6	919062	VP	101.15	BOOSTER PUMP - DRAINED,FLUSHED	90/02/06	90/02/06	G	90/02/06	NONE	223	R-S900390	3898

TOTAL PCB WT(kg)= 40849.75 TOTAL PCB WEIGHT SHIPPED (lbs)= 99979 18

RT=RADIAL TRANSFORMER
VP=VACUUM PUMP

PCB OIL/SOIL/RETROFILL FLUIDS/DISPOSAL REPORT

OWNER	PCB ID#	PCB WT. (kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	LOC	DESTRUCT DATE yy/mm/dd	CERT.#	SHIP WT. (lbs)	MANIF.#	FORM#
JCI	0-493	302.30	6 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3709
JCI	0-494	302.30	7 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3710
JCI	0-495	302.30	8 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3711
JCI	0-496	302.30	9 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3712
JCI	0-497	302.30	10 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3713
JCI	0-498	302.30	11 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3714
JCI	0-499	302.30	12 OF 12 55 GAL DRUM - OIL (855002)	90/09/05	90/09/19	R	90/09/26	NONE		00122882	3715
JCI	0-500	302.30	1 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3716
JCI	0-501	302.30	2 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3717
JCI	0-502	302.30	3 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3718
JCI	0-503	302.30	4 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3719
JCI	0-504	302.30	5 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3720
JCI	0-505	302.30	6 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3721
JCI	0-506	302.30	7 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3722
JCI	0-507	302.30	8 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3723
JCI	0-508	302.30	9 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3724
JCI	0-509	302.30	10 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3725
JCI	0-510	302.30	11 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3726
JCI	0-511	302.30	12 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3727
JCI	0-512	302.30	13 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3728
JCI	0-513	302.30	14 OF 14 55 GAL DRUM - OIL (855000)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3729
JCI	0-514	302.30	1 OF 4 55 GAL DRUM - OIL (855003)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3730
JCI	0-515	302.30	2 OF 4 55 GAL DRUM - OIL (855003)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3731
JCI	0-516	302.30	3 OF 4 55 GAL DRUM - OIL (855003)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3732
JCI	0-517	302.30	4 OF 4 55 GAL DRUM - OIL (855003)	90/09/12	90/09/19	R	90/09/26	NONE		00122882	3733
WX-12	0-518	302.30	1 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE	9140	00235492	3768
WX-12	0-519	302.30	2 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3769
WX-12	0-520	302.30	3 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/20	NONE		00235492	3770
WX-12	0-521	302.30	4 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/20	NONE		00235492	3771
WX-12	0-522	302.30	5 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3772
WX-12	0-523	302.30	6 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3773
WX-12	0-524	302.30	7 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3774
WX-12	0-525	302.30	8 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3775
WX-12	0-526	302.30	9 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3776
WX-12	0-527	302.30	10 OF 10 55 GAL DRUM - OIL (855607/8)	90/05/17	90/09/24	R	90/10/20	NONE		00235492	3777
WX-12	0-528	161.40	1 OF 1 55 GAL DRUM - OIL (855607)	90/05/17	90/09/24	R	90/10/13	NONE		00235492	3778
WX-12	0-529	152.30	1 OF 1 55 GAL DRUM - OIL (855608)	90/05/17	90/09/24	R	90/10/20	NONE		00235492	3779
WX-12	0-530	146.00	1 OF 1 55 GAL DRUM - FLUSH	90/05/17	90/09/24	R	90/10/20	NONE		00235492	3780

TA-16-540 PCB ID # 85 20 Reclassified/UNISON non-PC 7/6/90

AS OF: 12/31/88

PCB DISPOSAL REPORT (OIL/FLUSH/DEBRIS)

OWNER	ID#	TYPE	WT(kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	DESTINATION	DESTRUCT DATE yy/mm/dd	CERT.#	SHIP WT.	MANIF#	FORM#
PAN AM	0-12		188.60	1 DRUM OIL	87/10/21	88/01/14	ENSCO	88/02/16	32194	1769	AR262208	80
PAN AM	0-13		178.60	1 DRUM OIL	87/10/21	88/01/14	ENSCO	88/02/16	32194		AR262208	81
PAN AM	0-14		184.10	1 DRUM OIL	87/10/21	88/01/14	ENSCO	88/02/16	32194		AR262208	82
PAN AM	0-15		182.20	1 DRUM OIL	87/10/21	88/01/14	ENSCO	88/02/16	32194		AR262208	83
PAN AM	0-16		186.80	1 DRUM OIL	87/10/21	88/01/14	ENSCO	88/02/16	32193	883	AR262208	84
PAN AM	0-17		178.60	1 DRUM OIL	87/10/20	88/01/14	ENSCO	88/02/16	32193		AR262208	85
PAN AM	0-18		171.30	1 DRUM OIL	87/05/18	88/01/14	ENSCO		32186	415	AR262208	86
MEC-DO	0-19		2843.10	8 DRUMS					32192	5333	AR262208	87
PAN AM	0-20		185.00	1 D					32193	901	AR262208	88
PAN AM	0-21		186.80	1 D					32193		AR262208	89
MEC-DO	0-22		1791.80	6 D					32191	8855	AR262208	90
MEC-DO	0-23		1989.50	7 D					32191		AR262208	91
HSE-07	0-24		426.80	8 D					31730	1356	AR262227	92
HSE-7	0-25		194.10	1 D					10479	421	AR262212	434
HSE-7	0-26		528.60	5 D					14608	1837	AR262222	435
HSE-7	0-27		533.20	3 D					14463	624	AR263382	436
PAN AM	0-28		170.50	1 D					10479	3786	AR262212	473
PAN AM	0-29		175.00	1 DI					0479		AR262212	474
PAN AM	0-30		182.30	1 DI					0479		AR262212	475
PAN AM	0-31		179.50	1 DI					0479		AR262212	476
PAN AM	0-32		161.40	1 DI					0479		AR262212	477
PAN AM	0-33		182.30	1 DR					0479		AR262212	478
PAN AM	0-34		180.40	1 DR					0479		AR262212	479
PAN AM	0-35		179.50	1 DR					0479		AR262212	480
PAN AM	0-36		183.20	1 DR					0479		AR262212	481
ENG	0-37		254.00	1 DR					1479	421	AR262212	559
ENG	0-38		60.90	1 -					1479	421	AR262212	560
ENG-01	0-39		45.00	1 55					7648	196	AR270803	1604
PAN AM	0-40		152.30	1 55					1790	370	AR270687	1605
PAN AM	0-41		95.90	1 55					7648	246	AR270803	1606
PAN AM	0-42		176.40	1 55			ENSCO	88/06/09	40790	423	AR270687	1607
HSE-7	0-43		45.40	1 55 [illegible] DRUM DEBRIS	88/05/16	88/05/23	ENSCO	89/05/05	47648	135	AR270803	1608
PAN AM	0-44		73.20	1 DRUM DEBRIS	88/06/08	88/06/28	ENSCO	89/05/26	48271	655	AR270688	1873
PAN AM	0-45		25.00	1 DRUM DEBRIS	88/06/08	88/06/28	ENSCO	89/05/26	48271		AR270688	1874
HSE-7	0-46		149.50	1 DRUM DEBRIS	88/05/31	88/06/28	ENSCO	89/05/26	48271		AR270688	1875
HSE-7	0-47		4904.50	26 DRUMS OF OIL	88/05/31	88/06/28	ENSCO	88/08/05	41214	11700	AR270688	1876
PAN AM	0-48		313.00	1 55 GALLON DRUM OIL	88/07/06	88/11/21	ENSCO	88/11/29	43225	257	AR270724	2352
MST-06	0-49		217.00	1 55 GALLON DRUM OIL	88/07/06	88/11/21	ENSCO	88/11/29	43225	351	AR270724	2353
MEC-05	0-50		241.00	1 55 GALLON DRUM OIL	88/08/24	88/11/21	ENSCO	88/11/29	43225	717	AR270724	2354
MEC-05	0-51		323.00	1 55 GALLON DRUM OIL	88/08/24	88/11/21	ENSCO	88/11/29	43225		AR270724	2355
CLS-07	0-52		353.00	1 55 GALLON DRUM OIL	88/09/23	88/11/21	ENSCO	88/11/29	43225	439	AR270724	2356
HSE-07	0-53		177.00	1 55 GALLON DRUM DEBRIS	88/08/05	88/11/21	ENSCO	/ /		428	AR270724	2357
HSE-07	0-54		275.00	1 55 GALLON DRUM DEBRIS	88/08/05	88/11/21	ENSCO	/ /			AR270689	2358
HSE-07	0-55		171.00	1 55 GALLON DRUM DEBRIS	88/08/05	88/11/21	ENSCO	/ /		681	AR281063	2359
HSE-07	0-56		117.00	1 55 GALLON DRUM DEBRIS	88/08/05	88/11/21	ENSCO	/ /			AR281063	2360
HSE-07	0-57		79.00	1 55 GALLON DRUM DEBRIS	88/08/05	88/11/21	ENSCO	/ /			AR281063	2361
PAN AM	0-58		83.00	1 55 GALLON DRUM DEBRIS	88/09/28	88/11/21	ENSCO	/ /			AR281063	2362
PAN AM	0-59		520.00	1 55 GALLON DRUM DEBRIS	88/09/28	88/11/21	ENSCO	/ /		1201	AR270689	2363
* PAN AM	0-60		590.00	1 55 GALLON DRUM DEBRIS	88/09/28	88/11/21	ENSCO	/ /			AR270689	2364*
* PAN AM	#855020		1500.00	5 DRUMS OIL	88/07/15	88/07/29	APTUS	88/09/14	~~15396~~ } 7159		11519	2465*
ENG-04	855559		1200.00	4 DRUMS OIL	88/07/16	88/07/29	APTUS	88/09/14	~~15396~~		11519	2466

Located at TA-16 Steamplant -

Never leaked onto floor or other surfaces. Slow leaker - fluid was contained w/ coffee can until it (the transformer) was retrofilled by UNISON to non-PCB on 9/6/90. The retrofill process started on 7/15/88.

AS OF: 02/05/90

PCB DISPOSAL REPORT (OIL/FLUSH/DEBRIS)

****FOR ABBREVIATIONS: E,R,C,A,U3, SEE PAGE ii,iii

OWNER	ID#	TYPE	WT(kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	DEST	DESTRUCT DATE yy/mm/dd	CERT#	SHIP WT (lbs)	MANIF#	FORM#
ENG-1	0-192		280.00	9 OF 9 55 GALLON DRUM - OIL (855577)	89/11/08	89/12/19	R	89/12/21	NONE		00145468	2891
ENG-1	0-193		311.33	1 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2892
ENG-1	0-194		311.33	2 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2893
ENG-1	0-195		311.33	3 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2894
ENG-1	0-196		311.33	4 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2895
ENG-1	0-197		311.33	5 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2896
ENG-1	0-198		311.33	6 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2897
ENG-1	0-199		311.33	7 OF 7 55 GALLON DRUM - OIL (855575)	89/11/27	89/12/19	R	89/12/21	NONE		00145468	2898
ENG-1	0-200		311.33	1 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2899
ENG-1	0-201		311.33	2 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2900
ENG-1	0-202		311.33	3 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2901
ENG-1	0-203		311.33	4 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2902
ENG-1	0-204		311.33	5 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2903
ENG-1	0-205		311.33	6 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2904
ENG-1	0-206		311.33	7 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2905
ENG-1	0-207		311.33	8 OF 8 55 GALLON DRUM - OIL (855576)	89/11/30	89/12/19	R	89/12/21	NONE		00145468	2906
ENG-1	0-208		311.33	1 OF 6 55 GALLON DRUM - OIL (855574)	89/12/04	89/12/19	R	89/12/21	NONE		00145468	2907
ENG-1	0-209		311.33	2 OF 6 55 GALLON DRUM - OIL (855574)	89/12/04	89/12/19	R	89/12/21	NONE		00145468	2908
ENG-1	0-210		311.33	3 OF 6 55 GALLON DRUM - OIL (855574)	89/12/04	89/12/19	R	89/12/21	NONE		00145468	2909
ENG-1	0-211		311.33	4 OF 6 55 GALLON DRUM - OIL (855574)	89/12/04	89/12/19	R	89/12/21	NONE		00145468	2910
ENG-1	0-212		311.33	5 OF 6 55 GALLON DRUM - OIL (855574)	89/12/04	89/12/19	R	89/12/21	NONE		00145468	2911
ENG-1	0-213		311.33	6 OF 6 55 GALLON DRUM - OIL (855574)	89/12/04	89/12/19	R	89/12/21	NONE		00145468	2912
ENG-1	0-214		311.33	1 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2913
ENG-1	0-215		311.33	2 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2914
ENG-1	0-216		311.33	3 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2915
ENG-1	0-217		311.33	4 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2916
ENG-1	0-218		311.33	5 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2917
ENG-1	0-219		311.33	6 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2918
ENG-1	0-220		311.33	7 OF 7 55 GALLON DRUM - OIL (855573)	89/12/08	89/12/19	R	89/12/21	NONE		00145468	2919
PAN AM	0-221		307.00	1 OF 4 55 GALLON DRUM - OIL (855060)	89/11/18	89/12/19	R	89/12/21	NONE		00145468	2920
PAN AM	0-222		307.00	2 OF 4 55 GALLON DRUM - OIL (855060)	89/11/18	89/12/19	R	89/12/21	NONE		00145468	2921
PAN AM	0-223		307.00	3 OF 4 55 GALLON DRUM - OIL (855060)	89/11/18	89/12/19	R	89/12/21	NONE		00145468	2922
PAN AM	0-224		307.00	4 OF 4 55 GALLON DRUM - OIL (855060)	89/11/18	89/12/19	R	89/12/21	NONE		00145468	2923
PAN AM	0-225		189.00	1 55 GALLON DRUM - OIL (855560)	89/11/18	89/12/19	R	89/12/21	NONE		00145468	2924
* PAN AM	855020		2619.00	9 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/22	89/01/03	C	89/06/05	02335	26576	11781	2925 *
ENG-4	855549		1746.00	6 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/20	89/01/03	C	89/06/05	02335		11781	2926
ENG-4	855548		1455.00	5 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/31	89/01/03	C	89/06/05	02335		11781	2927
ENG-4	855599		2037.00	7 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/27	89/01/03	C	89/06/05	02335		11781	2928
ENG-4	855600		1746.00	6 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/28	89/01/03	C	89/06/05	02335		11781	2929
ENG-4	855602		1261.00	5 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/28	89/01/03	C	89/06/05	02335		11781	2930
ENG-4	855601		1455.00	5 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/27	89/01/03	C	89/06/05	02335		11781	2931
ENG-4	855601		22.70	1 55 GALLON DRUM - PCB DEBRIS (SOL)	88/12/27	89/01/03	A	89/06/05	7037	100	11781	2932
ENG-4	855548		22.70	1 55 GALLON DRUM - PCB DEBRIS (SOL)	88/12/21	89/01/03	A	89/06/05	7037		11781	2933

AS OF: 02/05/90

PCB DISPOSAL REPORT (OIL/FLUSH/DEBRIS)

****FOR ABBREVIATIONS: E,R,C,A,U3, SEE PAGE ii,iii

OWNER	ID#	TYPE	WT(kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	DEST	DESTRUCT DATE yy/mm/dd	CERT#	SHIP WT (lbs)	MANIF#	FORM#
ENG-4	855559		2328.00	8 55 GALLON DRUMS - PCB FLUSH (TFX)	89/12/31	89/01/01	C	89/06/05	02335	18256	11782	2934
ENG-4	855605		1900.00	7 55 GALLON DRUMS - PCB FLUSH (TFX)	89/01/01	89/01/01	C	89/06/05	02335		11782	2935
ENG-4	855603		2037.00	7 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/29	89/01/03	C	89/06/05	02335		11782	2936
ENG-4	855604		2037.00	7 55 GALLON DRUMS - PCB FLUSH (TFX)	88/12/30	89/01/03	C	80/06/05	02335		11782	2937
ENG-4	855605		22.70	1 55 GALLON DRUM - PCB DEBRIS (SOL)	89/01/01	89/01/03	A	89/06/05	7037	50	11782	2938
ENG-4	855548		354.76	3 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/19	89/09/23	U3	/ /		1184	11968	2939
ENG-4	855549		173.76	1 55 GALLON DRUM - PCB SIL-LIQ (SILX)	89/09/19	89/09/23	U3	/ /			11968	2940
ENG-4	855548		90.80	4 55 GALLON DRUMS - PCB DEBRIS (SOL)	89/09/19	89/09/23	U3	/ /		200	11968	2941
ENG-4	855559		1455.00	5 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/04	89/09/06	R	89/11/03	112242-	30128	11991	2942
ENG-4	855604		2328.00	8 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/03	89/09/06	R	89/11/03	112242-		11991	2943
ENG-4	855548		1164.00	4 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/03	89/09/06	R	89/11/03	112242-		11991	2944
ENG-4	855549		873.00	3 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/02	89/09/06	R	89/11/03	112242-		11991	2945
PAN AM	855020		1455.00	5 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/04	89/09/06	R	89/11/03	112242-		11991	2946
ENG-4	855605		1164.00	4 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/03	89/09/06	R	89/11/03	112242-		11991	2947
ENG-4	855601		1746.00	6 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/02	89/09/06	R	89/11/03	112242-		11991	2948
ENG-4	855602		1164.00	4 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/01	89/09/06	R	89/11/03	112242-		11991	2949
ENG-4	855600		1455.00	5 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/01	89/09/06	R	89/11/03	112242-		11991	2950
ENG-4	855599		1164.00	4 55 GALLON DRUMS - PCB FLUSH (TFX)	89/09/02	89/09/06	R	89/11/03	112242-		11991	2951
ENG-4	855559		597.00	3 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/04	89/09/06	U3	/ /		16900	11993	2952
ENG-4	855604		1194.00	6 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/03	89/09/06	U3	/ /			11993	2953
ENG-4	855548		464.00	3 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/03	89/09/06	U3	/ /			11993	2954
ENG-4	855549		597.00	3 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/02	89/09/06	U3	/ /			11993	2955
PAN AM	855020		796.00	4 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/04	89/09/06	U3	/ /			11993	2956
ENG-4	855605		796.00	4 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/03	89/09/06	U3	/ /			11993	2957
ENG-4	855601		1393.00	7 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/02	89/09/06	U3	/ /			11993	2958
ENG-4	855602		796.00	4 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/01	89/09/06	U3	/ /			11993	2959
ENG-4	855600		796.00	4 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/01	89/09/06	U3	/ /			11993	2960
ENG-4	855599		398.00	2 55 GALLON DRUMS - PCB SIL-LIQ (SILX)	89/09/02	89/09/06	U3	/ /			11993	2961
ENG-4	855548		22.70	1 55 GALLON DRUM - PCB DEBRIS (SOL)	89/09/03	89/09/06	U3	/ /		250	11993	2962
PAN AM	855020		91.00	4 55 GALLON DRUMS - PCB DEBRIS (SOL)	89/09/04	89/09/06	U3	89/09/16	51925		11993	2963

TOTAL PCB WT(kg)= 83452.86

TOTAL PCB SHIP WT(lbs)= 188141 202

PCB OIL/SOIL/RETROFILL FLUIDS/DISPOSAL REPORT

OWNER	PCB ID#	PCB WT. (kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	LOC	DESTRUCT DATE yy/mm/dd	CERT.#	SHIP WT. (lbs)	MANIF.#	FORM#
MST	0-341	194.51	1 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3380
MST	0-342	194.51	2 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3381
MST	0-343	194.51	3 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3382
MST	0-344	198.20	4 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3383
MST	0-345	198.20	5 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3384
MST	0-346	198.20	6 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3385
MST	0-347	198.20	7 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3386
MST	0-348	198.20	8 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3387
MST	0-349	198.20	9 OF 9 55 GAL DRUM - SILX (855602)	90/05/17	90/05/20	C	90/08/14	11257		10244	3388
MST	0-350	194.51	1 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3389
MST	0-351	194.51	2 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3390
MST	0-352	194.51	3 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3391
MST	0-353	194.51	4 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3392
MST	0-354	198.20	5 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3393
MST	0-355	198.20	6 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3394
MST	0-356	198.20	7 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3395
MST	0-357	198.20	8 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3396
MST	0-358	198.20	9 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3397
MST	0-359	198.20	10 OF 10 55 GAL DRUM - SILX (855601)	90/05/18	90/05/20	C	90/08/14	11257		10244	3398
MST	0-360	194.51	1 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3399
MST	0-361	194.51	2 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3400
MST	0-362	194.51	3 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3401
MST	0-363	198.20	4 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3402
MST	0-364	198.20	5 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3403
MST	0-365	198.20	6 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3404
MST	0-366	198.20	7 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3405
MST	0-367	198.20	8 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3406
MST	0-368	198.20	9 OF 9 55 GAL DRUM - SILX (855600)	90/05/19	90/05/20	C	90/08/14	11257		10244	3407
MST	0-369	194.51	1 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	90/08/14	11257		10244	3408
MST	0-370	194.51	2 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3409
MST	0-371	194.51	3 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3410
MST	0-372	194.51	4 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3411
MST	0-373	198.20	5 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3412
MST	0-374	198.20	6 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3413
MST	0-375	198.20	7 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3414
MST	0-376	198.20	8 OF 8 55 GAL DRUM - SILX (855603)	90/05/20	90/05/20	U	/ /	11257		10244	3415
WX-DO	0-377	95.42	1 OF 1 55 GAL DRUM - SILX (855020)	90/05/20	90/05/20	C	90/08/14	11257		10244	3416
MST	0-378	22.72	1 OF 1 55 GAL DRUM - SOL (855604)	90/05/15	90/05/20	R	90/10/26	120299-	101	10244	3417

PCB OIL/SOIL/RETROFILL FLUIDS/DISPOSAL REPORT

OWNER	PCB ID#	PCB WT. (kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	LOC	DESTRUCT DATE yy/mm/dd	CERT.#	SHIP WT. (lbs)	MANIF.#	FORM#
MST	0-379	22.72	1 OF 1 55 GAL DRUM - SOL (855603)	90/05/20	90/05/20	R	90/10/26	120299-		10244	3418
MP/WX	0-380	194.51	1 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257	17667	10246	3419
MP/WX	0-381	194.51	2 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3420
MP/WX	0-382	194.51	3 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3421
MP/WX	0-383	194.51	4 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3422
MP/WX	0-384	198.20	5 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3423
MP/WX	0-385	198.20	6 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3424
MP/WX	0-386	198.20	7 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3425
MP/WX	0-387	198.20	8 OF 8 55 GAL DRUM - SILX (855605)	90/05/28	90/05/29	C	90/08/14	11257		10246	3426
INC/WX	0-388	198.20	1 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3427
INC/WX	0-389	198.20	2 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3428
INC/WX	0-390	198.20	3 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3429
INC/WX	0-391	198.20	4 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3430
INC/WX	0-392	198.20	5 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3431
INC/WX	0-393	198.20	6 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3432
INC/WX	0-394	198.20	7 OF 7 55 GAL DRUM - SILX (855549)	90/05/25	90/05/29	C	90/08/14	11257		10246	3433
INC/WX	0-395	194.51	1 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	3434
INC/WX	0-396	194.51	2 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	3435
INC/WX	0-397	194.51	3 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	3436
INC/WX	0-398	194.51	4 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	3437
INC/WX	0-399	194.51	5 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	[illegible]
INC/WX	0-400	194.51	6 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	[illegible]
INC/WX	0-401	194.51	7 OF 7 55 GAL DRUM - SILX (855548)	90/05/26	90/05/29	C	90/08/14	11257		10246	3440
P/J/WX	0-402	194.51	1 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3441
P/J/WX	0-403	194.51	2 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3442
P/J/WX	0-404	194.51	3 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3443
P/J/WX	0-405	194.51	4 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3444
P/J/WX	0-406	198.20	5 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3445
P/J/WX	0-407	198.20	6 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3446
P/J/WX	0-408	198.20	7 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3447
P/J/WX	0-409	198.20	8 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3448
P/J/WX	0-410	198.20	9 OF 9 55 GAL DRUM - SILX (855559)	90/05/27	90/05/29	C	90/08/14	11257		10246	3449
* WX-DO	0-411	194.51	1 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3450 *
* WX-DO	0-412	194.51	2 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3451 *
* WX-DO	0-413	194.51	3 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3452 *
* WX-DO	0-414	194.51	4 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3453 *
* WX-DO	0-415	194.51	5 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3454 *
* WX-DO	0-416	198.20	6 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3455 *

PCB OIL/SOIL/RETROFILL FLUIDS/DISPOSAL REPORT

OWNER	PCB ID#	PCB WT. (kg)	DESCRIPTION	REM/STO DATE yy/mm/dd	TRANSPORT DATE yy/mm/dd	LOC	DESTRUCT DATE yy/mm/dd	CERT.#	SHIP WT. (lbs)	MANIF.#	FORM#
* WX-DO	0-417	198.20	7 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3456 *
* WX-DO	0-418	198.20	8 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3457 *
* WX-DO	0-419	198.20	9 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3458 *
* WX-DO	0-420	198.20	10 OF 10 55 GAL DRUM - SILX (855020)	90/05/29	90/05/29	C	90/08/14	11257		10246	3459 *
INC/WX	0-421	22.72	1 OF 1 55 GAL DRUM - SOL (855549)	90/05/29	90/05/29	R	90/10/26	120229-	176	10246	3460
* WX	0-422	22.72	1 OF 1 55 GAL DRUM - SOL (855020)	90/05/29	90/05/29	R	90/10/26	120229-		10246	3461 *
JCI	0-423	60.45	1 55 GAL DRUM - DEBRIS	90/01/22	90/07/12	R	90/08/31	NONE	1625	00269594	3534
CTR	0-424	43.64	1 55 GAL DRUM - DEBRIS	90/03/12	90/07/12	R	90/08/31	NONE		00269594	3535
JCI	0-425	11.34	1 55 GAL DRUM - DEBRIS	90/03/13	90/07/12	R	90/08/31	NONE		0026594	3536
JCI	0-426	58.20	1 55 GAL DRUM - DEBRIS	90/03/13	90/07/12	R	90/08/31	NONE		00269594	3537
JCI	0-427	143.20	1 55 GAL DRUM - DEBRIS	90/03/27	90/07/12	R	90/08/31	NONE		00269594	3538
WX-12	0-428	32.72	1 55 GAL DRUM - DEBRIS	90/05/17	90/07/12	R	90/08/31	NONE		00269594	3539
JCI	0-429	9.10	1 55 GAL DRUM - DEBRIS	90/05/24	90/07/12	R	90/08/31	NONE		00269594	3540
JCI	0-430	62.73	1 55 GAL DRUM - DEBRIS	90/05/24	90/07/12	R	90/08/31	NONE		00269594	3541
WX-17	0-431	55.50	1 55 GAL DRUM - DEBRIS	90/05/18	90/07/12	R	90/08/31	NONE		00269594	3542
HSE-7	0-432	34.10	1 55 GAL DRUM - DEBRIS	90/05/02	90/07/12	R	90/08/31	NONE		00269594	3543
P-10	0-433	197.72	1 55 GAL DRUM - OIL	90/03/15	90/07/12	R	90/07/28	NONE	2593	00269594	3544
CLS	0-434	165.91	1 55 GAL DRUM - OIL	90/03/27	90/07/12	R	90/07/28	NONE		00269594	3545
HSE-8	0-435	175.00	1 55 GAL DRUM - OIL	90/04/16	90/07/12	R	90/07/28	NONE		00269594	3546
HSE-8	0-436	56.82	1 55 GAL DRUM - OIL	90/04/16	90/07/12	R	90/07/28	NONE		00269594	3547
WX-3	0-437	185.00	1 55 GAL DRUM - OIL	90/05/04	90/07/12	R	90/07/28	NONE		00269594	3548
WX-3	0-438	102.30	1 55 GAL DRUM - OIL	90/05/04	90/07/12	R	90/07/28	NONE		00269594	3549
WX-3	0-439	185.00	1 55 GAL DRUM - OIL	90/05/04	90/07/12	R	90/07/28	NONE		00269594	3550
	0-440	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/05/16	90/07/15	E1	90/07/27	66593	4515	456308	3647
	0-441	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/05/15	90/07/15	E1	90/07/27	66593		456308	3648
	0-442	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/05/15	90/07/15	E1	90/07/27	66593		456308	3649
	0-443	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/06/11	90/07/15	E1	90/07/27	66593		456308	3650
	0-444	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/06/12	90/07/15	E1	90/07/27	66593		456308	3651
	0-445	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/06/12	90/07/15	E1	90/07/27	66593		456308	3652
	0-446	400.00	1 55 GAL DRUM - SYSTEM 50 FLUID	90/06/13	90/07/15	E1	90/07/27	66593		456308	3653
	0-447	200.00	1 55 GAL DRUM - DEBRIS	90/07/15	90/07/15	E1	90/10/20	71540	106	456307	3654
JCI	0-448	302.30	1 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE	45020	00122882	3664
JCI	0-449	302.30	2 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE		00122882	3665
JCI	0-450	302.30	3 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE		00122882	3666
JCI	0-451	302.30	4 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE		00122882	3667
JCI	0-452	302.30	5 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE		00122882	3668
JCI	0-453	302.30	6 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE		00122882	3669
JCI	0-454	302.30	7 OF 14 55 GAL DRUM - OIL (855006)	90/08/21	90/09/19	R	90/09/26	NONE		00122882	3670

TA-16-430 (The building) is located next to TA-16-563 — the PCB Transformer Station which housed PCB Transformer 86-4997, 25,000 ppm which had the slow leak in July 1987.

This transformer was removed + replaced in Sept. 1993. A non-PCB transform is now in its place.

TABLE XI

06/30/93 PAGE 35

IN-SERVICE PCB TRANSFORMER/MISCELLANEOUS ARTICLE REPORT (≥500 ppm)

TA-BLDG	VICINITY	OWNER	TYPE	CONC(ppm)	ITEM ID#	PCB ID#	VOL(gal)	PCB WT(kg)	REM/STO yy/mm/dd
00 0000		CLS-DO	RT	> 2318	CAT-C17E5P	923159	0.00	159.00	92/12/19
02 0051	NORTHEAST OF BLDG. 44	JCI	RT	>500000	GE-C-863956	855021	290.00	1723.67	/ /
02 0051	NORTHEAST OF BLDG. 44	JCI	RT	>500000	GE-C-863964	855616	100.00	589.68	/ /
03 0190	NORTHWEST CORNER OF SM-16	JCI	RT	>500000	ITE-9983-63	855010	260.00	1542.23	/ /
03 0229	SOUTH OF BLDG. 206	JCI	RT	>500000	GE-C-858476	855012	380.00	2227.16	/ /
03 0290	WEST OF BLDG. 287	JCI	RT	>500000	WES-YAR-99701	855013	145.00	771.12	/ /
03 0290	WEST OF BLDG. 287	JCI	RT	>500000	WES-YAR-99731	855014	300.00	1564.91	/ /
03 0290	WEST OF BLDG. 287	JCI	RT	>500000	WES-YAR-99691	855015	260.00	1356.25	/ /
03 0290	WEST OF BLDG. 287	JCI	RT	>500000	WES-UAV4732-01	855016	203.00	1059.15	/ /
03 0367	SOUTH SIDE BLDG. SM-216	JCI	RT	>500000	WES-7027589	855018	170.00	997.91	/ /
03 0000		CTR-DO	RT	709	ITE-6660	912134 *1	50.00	0.20	91/11/18
03 0039		MEC-DO	EM	> 500	ELOX MACHINE	919158	0.00	545.54	/ /
03 0105	OUTSIDE-WEST	CTR-DO	VR	> 500	GE-D-583429	919191	690.00	2.00	/ /
03 0039		MEC-DO	PH	> 500	BC-489808	929159	0.00	590.90	92/03/05
15 0196	WEST OF BLDG. 183	JCI	RT	>500000	ESC-4022243	855019	325.00	1914.16	/ /
15 0000		M-4	VR	1227	GE-D583441	912124	530.00	3.70	/ /
[illegible]185		ENG-DO	SG	> 500	23986-1	923160	0.00	1000.00	92/09/25
[illegible]5		ENG-DO	SG	> 500	23987-1	923281	0.00	1200.00	92/09/25
[illegible]71	337	JCI	RT	> 500	9477681	845508 *2	65.00	0.19	93/04/13
1[illegible]563	NORTH OF BLDG. 430	ENG-4	RT	25000	PEN-19091-7	864997	395.00	57.30	93/9/10 *
21 0193	SOUTHEAST OF BLDG. 215	JCI	RT	>500000	GE-E68531	855017	210.00	1224.71	/ /
35 0032	SOUTH OF BLDG. 29	JCI	RT	>500000	GE-C-862754	855024	340.00	1995.83	/ /
35 0053	SOUTH OF BLDG. 27	JCI	RT	>500000	STA-175023 WEST	855025	350.00	2095.62	/ /
35 0053	SOUTH OF BLDG. 27	JCI	RT	>500000	STA-175022 EAST	855026	350.00	2095.62	/ /
35 0087		P-4	VP	> 500		929160	0.00	63.63	92/06/07
46 0036		CLS-DO	PS	590	AMER-	939468	15.00	0.50	/ /
50 0004	EAST OF BLDG. 1	JCI	RT	>500000	GE-E-687176	855023	265.00	1587.59	/ /
52 0009	NORTH OF BLDG. 1	JCI	RT	>500000	GE-E-688470A	855027	250.00	1406.14	/ /

*1: DISPOSED OF IN 1991 UNDER PCB ID# 919195.
*2: PREVIOUSLY LISTED IN PCB-CONTAMINATED TRANSFORMER/MISCELLANEOUS INVENTORY (50-499 ppm); MISANALYZED.
*3: UNDERGOING RETROFILL BY UNISON. (PROCESS SOLD TO ENSR)
*4: UNDERGOING RETROFILL BY ENSR.

RT=RADIAL TRANSFORMER
EM=ELOX MACHINE
[illegible]VER HACKSAW
[illegible]TAGE REGULATOR
SG[illegible]TCH GEAR
VP[illegible]CUUM PUMP
PS=POWER SUPPLY
SF=SCREEN FILTER

16- 000 586

NON-REPORTABLE

CLEANUP RECORD OF HIGH-CONCENTRATION SPILLS INVOLVING NON REPORTABLE RELEASES

TA- 16 - 260.

Equipment Room 110

Records. The responsible party shall document the cleanup with records of decontamination. The records must be maintained for a period of 5 years. The records and certification shall consist of the following:

I. Identification of the source of the spill, e.g., type of equipment.

PCB transformers, PCB ID # 5607 and 5608.

II. Estimated or actual date and time of the spill occurrence.

Spill occurred on May 17, 1990 at approximately 7:00 pm

III. The date and time cleanup was completed or terminated (if cleanup was delayed by emergency or adverse weather: the nature and duration of the delay).

Cleanup initiated immediately on May 17, 1990, using the double wash/ double rinse method and completed on May 18, 1990 at approximately 4:00pm, using the scabbler concrete removal system.

Subsequent cleanup efforts were done on;

July 2, 1990, Penetone, double wash/double rinse
August 27 and 28, 1990, Capsur foam method
October 4 and 5, 1990, Capsur foam method

Cleanup completed on

November 13, 1990, Penetone, double wash/double rinse

IV. A brief description of the spill location and the nature of the materials contaminated. (This information should include whether the spill occurred in an outdoor electrical substation, other restricted access location, or in a nonrestricted access area.)

Spill occurred in Room 110 at Technical Area (TA) 16, Building 260. Contaminated material was nonimpervious solid surfaces; concrete floor, concrete sump, and an impervious metal sump cover. This location is considered as a "restricted access area".

CLEANUP RECORD
High concentration.

TA- 16 - 260.

Equipment Room 110

V. Pre-cleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces and a brief description of the sampling methodology used to establish the spill boundaries.

Spill boundaries established using visual stain under transformer and visible stain under pump and drums.

VI. A brief description of the solid surfaces cleaned.

Concrete floor under transformer was scabbled, sampled and encapsulated. Concrete floor and sump under the pump and drums was cleaned using the double wash/double rinse methodology using various cleaning agents. The Capsur cleaning process was also used in these areas. The metal sump lid was wrapped in plastic and taken to at TA-54, Area G. The floor area of the entire room was encapsulated using a two tone epoxy coating, all grid points were below the required 100ug/100cm² prior to encapsulation.

VII. Approximate depth of soil excavation and the amount of soil removed.

No soil removed during this cleanup process.

VIII. Post-cleanup verification sampling data and, if not otherwise apparent from the documentation, a brief description of the sampling methodology and analytical technique used.

* *Post-cleanup sampling was conducted after each cleanup effort. Sampling scheme established using the MRI guidelines. Surface swipes were taken using gauze, cyclohexane, and 100cm² templates.*

Optional: 1) Estimated cost of cleanup (by man-hours, dollars, or both).

16-00054 /

JOHNSON CONTROLS

March 09, 1993
JENV.93-202

Los Alamos National Laboratory
Los Alamos, NM 87544

ATTN: Raul Morales, EM-8, MS K490

THRU: Michael Brown, Deputy Manager, JENV

THRU: Richard Perkins, Environmental Compliance Supervisor, JENV

SUBJECT: SUBCONTRACT NO. 9-X86-Y7575-1, CLOSURE REPORT FOR NON-REPORTABLE PCB RELEASE AT TA-16, STRUCTURE 563, STATION 9

A PCB cleanup at TA-16, Structure 563, Station 9, was completed on November 12, 1992. A closure document stating the cleanup effort in chronological order is attached to this cover letter. A certification statement is included on page 4 of the closure document. If there are any questions or concerns about this report, please contact Michael Bailey, or Michael Brown, JENV, at 7-0104 or MS A-199, JENV.

Very truly yours,

Michael Bailey

Michael Bailey
Environmental Engineer, JCI/JENV

Attachment: 4 pages Non-Reportable Cleanup Record TA-16, Structure 563, Station 9

cy:
R. Reines, EM-DO, MS J591
Steve Rae, EM-8, K490
S. J. Calanni, VP/General Manager, JMGR
G. Vavra, Manager, Operations, OMDO
J. J. Lopez, Manager, JHSE
Joe Richardson, Env. Eng., JENV
JENV file
Reading file

NON-REPORTABLE

CLEANUP RECORD AND CERTIFICATION FOR

HIGH-CONCENTRATION SPILLS WHICH INVOLVE

LESS THAN 1 POUND OF PCBS BY WEIGHT

LOCATION: TA-16, STRUCTURE 563, STATION 9

SPILL OCCURRED:	Date:	July 28, 1987	Time: AM
SPILL DISCOVERED:	Date:	July 28, 1987	Time: 1:00 PM
SPILL STOPPED:	Date:	August 1, 1987, AM	

I. Source of spill: A PCB transformer containing 25,000 PPM PCBs at TA-16, Structure 563, Station 9, PCB ID #4997, had a small leak from the electrical conduit pipe where the wiring was connected to the transformer. The oil was leaking through a bushing gasket up on the side of the transformer where the conduit was connected, and traveled down the electrical conduit to the concrete pad, and then onto the soil next to the pad. Approximately one half to one gallon of oil had leaked from the bushings (visual estimate), and traces of oil were found in the soil next to and below the pad. The transformer is located on a concrete pad surrounded by a fence with a locked gate. The transformer had a blue non-PCB label on it before and after the release, due to the fact that the transformer was retrofilled in 1984 with non-PCB mineral oil. It was sampled at that time, and found to be below 50 ppm PCBs. But, over the years, PCBs leached back into the oil, and when sampled again in 1987, was found to contain 25,000 PPM PCBs.

II. **Estimated or actual date and time of the spill occurrence:**

The date and time that the leak started is unknown, but visual inspection of the transformer, indicated that the leak occurred shortly before discovery.

III. **Chronology of cleanups and cleanup details:**

- Cleanup started on July 28, 1987, by the Johnson Control Linemen. The visible oil was washed from the transformer and the concrete using Penetone Power Cleaner 155, rags, and water. Contaminated soil was removed and placed in a 55 gallon drum.

Per 40 CFR 761.120 "Definitions", the method of cleanup to be used will be a "Double wash/rinse." This is a minimum requirement to cleanse solid surfaces (both impervious and non-impervious) two times with an appropriate solvent or other material in which PCBs are at least 5 percent soluble (by weight).

- The transformer continued to leak a very small amount until the morning of August 1, 1987. The transformer was inspected daily between July 28 and August 1, and for a period of two weeks following repair. On August 1, an outage was scheduled, and the Linemen repaired the leaking conduit coming from the transformer. A double wash/rinse was conducted on the concrete pad of the transformer using Penetone Power Cleaner 155, brushes, and water for rinse.

  The transformer was found to be non-leaking after the repair. The soil and pad had received a cleanup in July 1987, and the transformer was inspected monthly for leaks after that. An inspection on August 3, 1989, by JENV, revealed the need for further sampling where the 1987 release had occurred. Five soil and three swipe samples were taken on August 25, 1989, by HSE-8 (now EM-8). The results of these samples indicated that further cleanup was necessary to ensure that PCB levels meet or are below levels required in EPA's PCB spill cleanup policy for old spills (40 CFR 761.120(a)(1)).

- A meeting was held on September 27, 1989 between EM-8 and JENV concerning further cleanup at Station 9. A grid of the area was completed by EM-8 on October 17. Sampling of the grid points was done on October 23 and November 3, 1989. Sample results indicated that further cleanup was necessary to ensure that PCB levels meet or are below levels required in 40 CFR 761.120(a)(1).

- JENV marked the fence around the pad and transformer with PCB signs, and increased the level of surveillance along with monthly inspections until further cleanup could be done. Further cleanup was to continue in conjunction with the transformer replacement.

- The cleanup continued on May 12 and 13, 1992. The fence was removed from around the transformer, and the transformer was removed from the pad and placed nearby. The pad was removed along with soil around and under the pad at this time. Approximately 352 cubic feet of soil (including the pad) was removed to TA-54, Area G.

- Sampling of the grid points was done on May 18, 1992, by EM-8. Sample results indicated that further cleanup was necessary to ensure that PCB levels meet or are below levels required in 40 CFR 761.120(a)(1), which is 25 ppm in soils.

- The cleanup continued on June 16, 1992. Approximately 198 cubic feet of soil was removed.

- Sampling of the grid points was done on July 15, 1992, by EM-8. Sample results indicated that further cleanup was necessary.

- The cleanup continued on August 7, 1992. Approximately 15 cubic feet of soil was removed at this time.

- Sampling of the grid points was done on August 11, 1992, by EM-8. Sampling results indicated that further cleanup was necessary.

- The cleanup continued on September 16, 1992. Approximately 36 cubic feet of soil was removed at this time.

- Sampling of the grid points was done on September 18, 1992, by EM-8. Sampling results indicated that further cleanup was necessary.

IV. The date and time cleanup was completed or terminated:

- The cleanup was completed on November 12, 1992, when and additional 90 cubic feet of soil was removed from Structure 563, Station 9. Sampling of the grid points was done on November 13 by EM-8. All PCB levels in the soil are now below the TSCA mandated cleanup levels for low-contact outdoor electrical substations of 25 ppm.

V. A brief description of the spill location:

- The spill location is at TA-16, Structure 563, Station 9 which is located north of TA-16 Building 430. Structure 563, Station 9, is an outside fenced-in pad mounted PCB transformer (PCB ID #4997).

VI. Precleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces, and a brief description of the sampling methodology used to establish spill boundaries.

- A standard wipe test (40 CFR 761.130) was done by EM-8 in accordance with EPA methodologies. A grid of the cleanup area was designed by EM-8 using methods described in the EPA publication "Field Manual for Grid Sampling of PCB Spill Sites to

Verify Cleanup" (EPA 560/5-86-017, May 1986).

- o Grids, sample results, and information about the cleanup at TA-16, Structure 563 can be obtained from EM-8.

VII. **A brief description of the solid surfaces cleaned and of the wash/rinse method used:**

- o See Section III.

VIII. **Approximate depth of soil excavation and the amount of soil removed:**

The soil was excavated to a depth of 12 inches in some locations, and as deep as eight and one half feet in one location where a crack was evident on the pad (excavation of this area took place after the pad was removed). A total of 691 cubic feet of soil was removed from TA-16, Structure 563, Station 9.

IX. **A certification statement signed by the responsible party stating that the cleanup requirements have been met and that the information contained in the record is true to the best of his/her knowledge.**

Signature Michael Bailey Date: 3/9/93

Pan Am World Services, Inc.

INTER-OFFICE MEMORANDUM

TO: Stan Nalley, Utilities Department Manager, UMDO
Bob Greuter, UESD Superintendent, UESD

THRU: Joe J. Lopez, Manager, PHSE

THRU: Charlie Barnett, Acting Supervisor, PENV

FROM: Environmental Engineer, PENV Page 1

===

DATE: August 18, 1989 MEMO NO: PENV89-354

SUBJECT: ADDITIONAL PCB CLEANUP OF TRANSFORMER AT TA-16 BUILDING 430, STATION 9

An inspection on August 3 by PENV of a PCB (>500 ppm PCB oil) transformer at TA-16 Building 430, Station 9, and the immediate area by the pad revealed the need to sample these areas. PENV will take samples of the soil around the pad, and swipe the pad for PCB contamination. Utilities will ensure that the sampling by PENV personnel is being done in accordance with written safety procedures for electrical equipment.

After the sample results are received for the soil and the pad, a cleanup under the direction of PENV will take place, if necessary. Soil will be removed at this time, and the pad subjected to a cleanup with Penetone Power Cleaner 155. PENV will resample to ensure that PCB levels are below the limits required by EPA. Clean backfill soil will be used to fill in the cavity under the pad after it is determined that soil PCB contamination is at or below levels required.

On July 28, 1987, this outdoor transformer was reported to be leaking oil. A memo was written about the incident (Memo No. THH87-96, July 29, 1987). Contaminated soil was removed and placed in a 55 gallon drum and Zorball was also used to clean up oil on the concrete pad. The transformer is located on a concrete pad surrounded by a fence with a locked gate.

The transformer has not leaked since August 1, 1987, but because the contaminated soil excavation was never backfilled with clean soil, there is a noticable cavity underneath the pad where stained soil and pipes can be seen. Also, the pad is still stained from the July 1987 spill. Stains present in the soil and pad do not automatically mean that there are PCB oil levels in the range above those required by EPA for an effective outdoor electrical substation cleanup (25 ppm for the soil and 100 µg per 100 square centimeters for the cement pad).

If you have any concerns or questions please do not hesitate to contact either myself or Charlie Barnett.

Michael Bailey

Michael Bailey

cy:

Charlie Nylander, HSE-8, K490
S. J. Calanni, PMGR
A. L. Da Silva, OMDO
file
reading file

Laboratory Support Division
P.O. Box 50
Los Alamos, NM 87544-0050

Pan Am World Services, Inc.

TO: DISTRIBUTION

THRU: Joe J. Lopez, Manager PHSE

FROM: Tom Holm-Hansen, Supervisor PENV TH

DATE: July 29, 1987 MEMO NO. THH87-96

SUBJECT: PCB RELEASE AT TA16 BUILDING 430

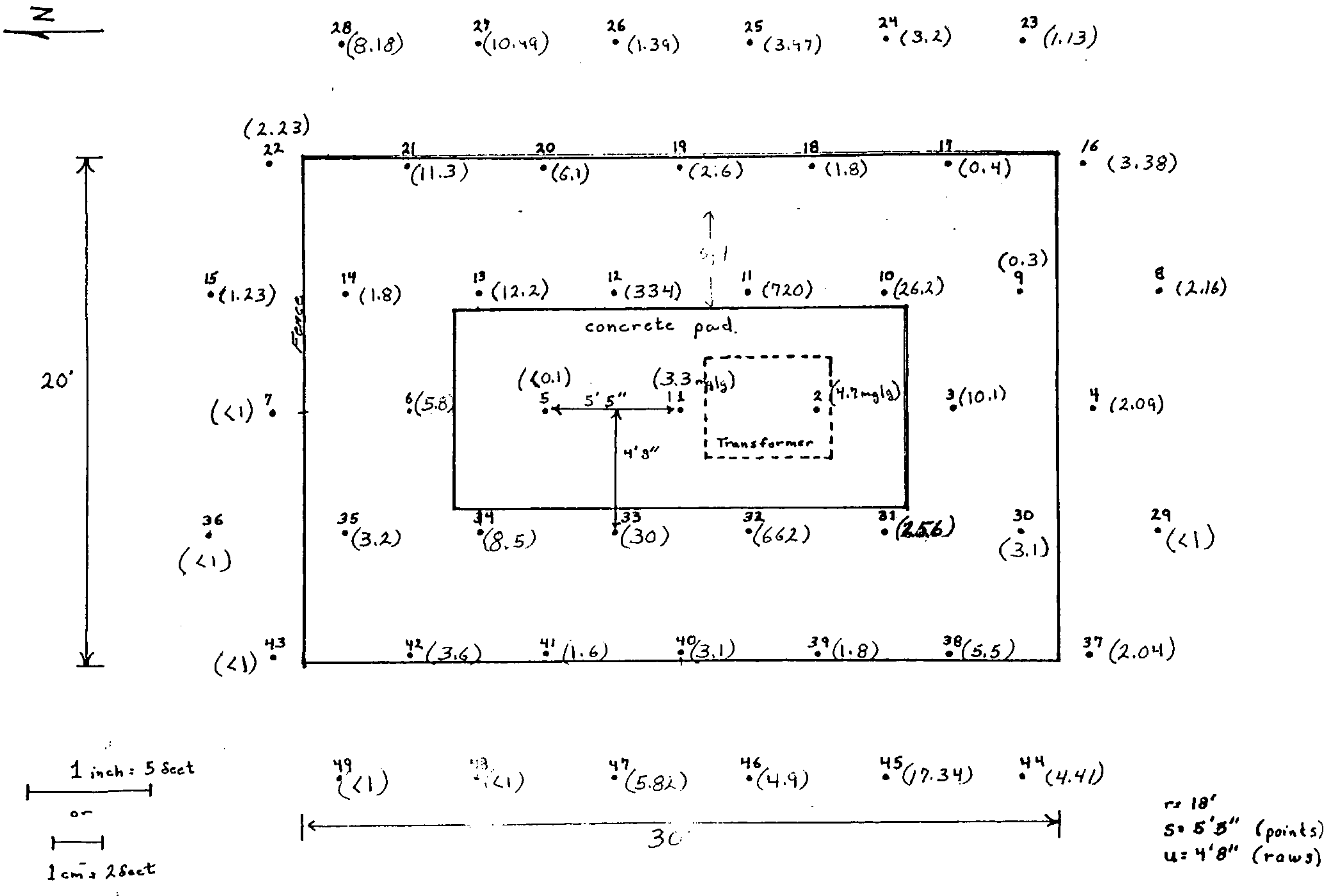
A transformer containing approximately 25,000 parts-per-million (ppm) PCBs at TA-16, Building 430, Station 9 was reported to be leaking oil on July 28. According to Larry Hupke, HSE-7, the report was made to HSE-3 who then contacted HSE-7. Mr. Hupke contacted HSE-8, Pan Am Utilities, and Pan Am Environmental Protection (PENV). Mike Bailey of PENV met a crew of linemen at the transformer at approximately 3:00 P.M. Contaminated soil was removed and placed in a 55 gallon drum and Zorball was also used to clean up oil on the concrete pad. The amount of oil spilled appeared to be one to three gallons, which would not be considered a reportable quantity.

The transformer is continuing to slowly leak and Zorball is being used to contain the oil. Additional containment and cleanup measures are being taken today (July 29). Repairing the transformer will require an outage and this is scheduled for August 1 (Saturday) from 7:00 A.M until 4:30 P.M. according to Mr. Manny Lopez of ENG-5 who coordinated with the LANL operational group. Daily inspections of this transformer will continue until the leak is repaired.

PENV is in the process of auditing and cross referencing our monthly transformer inspection list and the PCB transformer inventory (fire list). This is being done to ensure that all PCB transformers are on the monthly inspection list. This will be completed by August 1.

DISTRIBUTION:

Anthony Drypolcher, HSE-8, K490
Charles Nylander, HSE-8, K490
Larry Hupke, HSE-7, E518
M.R. Heineman, HSE-3, K489
Manny Lopez, ENG-5, C944
S.J. Calanni, PMGR
Jack Nuckels, OMDO
Stan Nalley, UMDO


N
28 (8.18)
27 (10.49)
26 (1.39)
25 (3.47)
24 (3.2)
23 (1.13)
(2.23) 22
21 (11.3)
20 (6.1)
19 (2.6)
18 (1.8)
17 (0.4)
16 (3.38)
20'
15 (1.23)
14 (1.8)
13 (12.2)
12 (334)
11 (720)
10 (26.2)
(0.3) 9
8 (2.16)
Fence
concrete pad.
(<0.1) 5
5' 5"
(3.3 mg/g) 1
2 (4.7mg/g)
Transformer
4'8"
(<1) 7
6 (5.8)
3 (10.1)
4 (2.09)
36 (<1)
35 (3.2)
34 (8.5)
33 (30)
32 (662)
31 (256)
30 (3.1)
29 (<1)
(<1) 43
42 (3.6)
41 (1.6)
40 (3.1)
39 (1.8)
38 (5.5)
37 (2.04)
1 inch = 5 feet
or
1 cm = 2 feet
49 (<1)
48 (<1)
47 (5.82)
46 (4.9)
45 (17.34)
44 (4.41)
30'
r = 18'
s = 5'5" (points)
u = 4'8" (rows)

HSE-9 ANALYTICAL SERVICE AGREEMENT

Request No. 8263

I. PRESAMPLING CONFERENCE

Program Code WA56 No. Samples Expected 22

Submission Date 10/24/89 Completion Date TBA

Chain of Custody? No Special Protocol? *(EPA etc.)* EPA

Analyses Requested: List analyses on HSE-9 Analytical Chemistry Request Sheet.
(Indicate expected concentration range and required detection limits under remarks.) PCB's/Soil

Container Type glass/teflon Preservative None
(See Memo HSE-9/88-304. Guidelines for Collection and Preservation of Liquid Samples.)

Storage Conditions *(circle one or more)*: None Refrigerate Freeze Darkness

Sample Hazards Present? *(Circle one or more)*
No hazard Toxic Radioactive: alpha beta gamma Flammable Explosive/Reactive

Sample Disposal: Return ______ Discard ✓
(All hazardous samples or TRU wastes will be returned to the customer.)

Customer Michael R. Alexander HSE-9 Section Leader ______ Organic
Customer Phone 5-0453 MS --490 ______ Inorganic
104-2027 ______ Radiocher
Date 10/24/89

II. EMERGENCY SAMPLES

Emergency Status requires the following signatures:

Customer Group Leader ______
HSE-9 Group Leader ______
Date ______

III. SAMPLE RECEIPT

Signature MB Phillips Date 10/24/89 Total No. Samples Received 22+2QC

HSE-9 Sample No. Range 89.17139 to 89.17161, 00.20072

Customer Sample No. Range 89.01811 to 89.01832.

REQUESTOR DATA SHEET # ____

Log Book ____ Page ____

Sampled by *Michael R. Alexander* Collection Date *10/23/89* Time *pm* Weather ——— Witness ____

Presampling Conference Completed With *Chuck R.* On *10/23/89* Send Report To *Mike Alexander* MS *K490*

Phone *5-0453* Source of Sample: *TA-16-340, Transformer 563* Reason for Sampling *Leak & stains in area.*

Group *ENG-6* Site *16* Building *340* Room No. *outside*

Priority Assigned: 1. Emergency; 2. Recognized Danger; 3. Imminent Deadline; 4. Special Survey; 5. Routine;

(Circle One) Priority Approval: ____ (1. GL or DGL; 2. or 3. AGL; 4. or 5. SL)

Method of Analysis Complies With: ____

Background Information Useful to Analyst (Contamination Levels, Hazards, Etc.) *PCB suspect*

Chain of Custody: Yes ____ (See Attached Form) No ____ Other Information ____

All Samples Submitted to HSE-9 Must Be Screened For Radioactivity. Samples Containing Greater Than 20 dpm Total Alpha or 100 dpm Combined Gamma/Beta Contamination Cannot Be Handled At TA-59.

Sample Number	Other I.D.	Sampling Location	Analysis Requested	Sampling Method	Sample Type	Preservative Utilized	Radioactivity Scan (dpm) Alpha	Radioactivity Scan (dpm) Beta/Gamma	Remarks
	See	*attachment!*							

Sampling Method: 24FC=24 Hour Flow-Weighted Composite; 24TC=24 Hour Time-Weighted Composite; G=Grab; B=Bail; D=Drill; C=Core; P=Pump; O=Other (Please Specify)

Sample Type: E=Effluent; SL=Sludge: SO=Soil; SC-Soil Core; WW-Well Water; SW=Surface Water; O=Other

Preservative: F=Filtered; NF=Non-Filtered; NA=Non Acidified; A-H_2SO_4(2 ml/l); A-HNO_3(5 ml/l); A-HNO_3(5 ml/l); A-H_3PO_4 & $CuSO_4$; A-Other; I=Iced; P-NaOH.

SUPPLEMENTAL REQUESTOR DATA SHEET # ________

Sample Number	Sampling Location	Sampling Method	Sample Type*	Remarks**
89.01811	TA-16-430	grab	Soil	
89.01812				
.01813				
.01814				
.01815				
.01816				
.01817				
.01818				
.01819				
.01820				
.01821				
.01822				
.01823				
.01824				
.01825				
.01826				
.01827				
.01828				
.01829				
.01830				
.01831				
.01832	TA-16-430	grab	Soil	

* Indicate whether sample is soil, sludge, water, etc.

** Note preservation.

NP: No preservation; sample stored at room temperature.

P-Ice Sample stored in ice (not frozen).

P-$Na_2S_2O_3$: Sample preserved in $Na_2S_2O_3$ to remove chlorine residual.

REPORT NUMBER: 4793

******************** HSE-9 ANALYTICAL REPORT ********************

Prepared by: ESG on 17-Nov-1989

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 8263 MATRIX: SS ANALYST: Scott Brendecke

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0453

SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
89.01811	89.17139	1336363	2.09	0.42	UG/G	11/16/89	Mixed-Aroclor	
89.01812	89.17140	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor	
89.01813	89.17141	1336363	2.16	0.88	UG/G	11/16/89	Mixed-Aroclor	
89.01814	89.17142	1336363	1.23	0.25	UG/G	11/16/89	Mixed-Aroclor	
89.01815	89.17143	1336363	3.38	1.8	UG/G	11/16/89	Mixed-Aroclor	
89.01816	89.17144	1336363	2.23	0.44	UG/G	11/16/89	Mixed-Aroclor	
89.01817	89.17145	1336363	1.13	0.22	UG/G	11/16/89	Mixed-Aroclor	
89.01818	89.17146	1336363	3.2	0.64	UG/G	11/16/89	Mixed-Aroclor	
89.01819	89.17147	1336363	3.97	0.54	UG/G	11/16/89	Mixed-Aroclor	
89.01820	89.17148	1336363	1.39	0.27	UG/G	11/16/89	Mixed-Aroclor	
89.01821	89.17149	1336363	10.99	2.19	UG/G	11/16/89	Mixed-Aroclor	
89.01822	89.17150	1336363	8.18	1.63	UG/G	11/16/89	Mixed-Aroclor	
89.01823	89.17151	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor	
89.01824	89.17152	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor	
89.01825	89.17153	1336363	2.04	0.41	UG/G	11/16/89	Mixed-Aroclor	
89.01826	89.17154	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor	
89.01827	89.17155	1336363	4.41	0.9	UG/G	11/16/89	Mixed-Aroclor	
89.01828	89.17156	1336363	17.34	3.5	UG/G	11/16/89	Mixed-Aroclor	
89.01829	89.17157	1336363	4.9	1.	UG/G	11/16/89	Mixed-Aroclor	
89.01830	89.17158	1336363	5.82	1.2	UG/G	11/16/89	Mixed-Aroclor	
89.01831	17159	1336363	< 1.		UG/G	'89	Mixed-Aroclor	

89.01832	89.17160	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor

DETAILED PCB DATA for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
89.01811	89.17139	1336363	2.09	0.42	UG/G	11/16/89		Mixed-Aroclor
89.01811	89.17139	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01811	89.17139	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01811	89.17139	11096825	2.09	0.42	UG/G	11/16/89		Aroclor 1260
89.01812	89.17140	1336363	< 1.		UG/G	11/16/89		Mixed-Aroclor
89.01812	89.17140	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01812	89.17140	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01812	89.17140	11096825	< 1.		UG/G	11/16/89		Aroclor 1260
89.01813	89.17141	1336363	2.16	0.88	UG/G	11/16/89		Mixed-Aroclor
89.01813	89.17141	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01813	89.17141	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01813	89.17141	11096825	2.16	0.88	UG/G	11/16/89		Aroclor 1260
89.01814	89.17142	1336363	1.23	0.25	UG/G	11/16/89		Mixed-Aroclor
89.01814	89.17142	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01814	89.17142	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01814	89.17142	11096825	1.23	0.25	UG/G	11/16/89		Aroclor 1260
89.01815	89.17143	1336363	3.38	1.8	UG/G	11/16/89		Mixed-Aroclor
89.01815	89.17143	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01815	89.17143	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01815	89.17143	11096825	3.38	1.8	UG.G	11/16/89		Aroclor 1260
89.01816	89.17144	1336363	2.23	0.44	UG/G	11/16/89		Mixed-Aroclor
89.01816	89.17144	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01816	89.17144	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01816	89.17144	11096825	2.23	0.44	UG/G	11/16/89		Aroclor 1260
89.01817	89.17145	1336363	1.13	0.22	UG/G	11/16/89		Mixed-Aroclor
89.01817	89.17145	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01817	89.17145	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01817	89.17145	11096825	1.13	0.22	UG/G	11/16/89		Aroclor 1260
89.01818	89.17146	1336363	3.2	0.64	UG/G	11/16/89		Mixed-Aroclor
89.01818	89.17146	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01818	89.17146	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01818	89.17146	11096825	3.2	0.64	UG/G	11/16/89		Aroclor 1260
89.01819	89.17147	1336363	3.97	0.54	UG/G	11/16/89		Mixed-Aroclor
89.01819	89.17147	53469219	< 1.		UG/G	11/16/89		Aroclor 1242
89.01819	89.17147	11097691	< 1.		UG/G	11/16/89		Aroclor 1254
89.01819	89.17147	11096825	3.97	0.54	UG/G	11/16/89		Aroclor 1260
89.0182[illegible]	[illegible].17148	1336363	1.39	0.27	UG/G	[illegible]/89		Mixed-Aroclor

89.01820	89.17148	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01820	89.17148	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01820	89.17148	11096825	1.39	0.27	UG/G	11/16/89	Aroclor 1260
89.01821	89.17149	1336363	10.99	2.19	UG/G	11/16/89	Mixed-Aroclor
89.01821	89.17149	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01821	89.17149	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01821	89.17149	11096825	10.99	2.19	UG/G	11/16/89	Aroclor 1260
89.01822	89.17150	1336363	8.18	1.63	UG/G	11/16/89	Mixed-Aroclor
89.01822	89.17150	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01822	89.17150	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01822	89.17150	11096825	8.18	1.63	UG/G	11/16/89	Aroclor 1260
89.01823	89.17151	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor
89.01823	89.17151	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01823	89.17151	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01823	89.17151	11096825	< 1.		UG/G	11/16/89	Aroclor 1260
89.01824	89.17152	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor
89.01824	89.17152	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01824	89.17152	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01824	89.17152	11096825	< 1.		UG/G	11/16/89	Aroclor 1260
89.01825	89.17153	1336363	2.04	0.41	UG/G	11/16/89	Mixed-Aroclor
89.01825	89.17153	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01825	89.17153	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01825	89.17153	11096825	2.04	0.41	UG/G	11/16/89	Aroclor 1260
89.01826	89.17154	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor
89.01826	89.17154	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01826	89.17154	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01826	89.17154	11096825	< 1.		UG/G	11/16/89	Aroclor 1260
89.01827	89.17155	1336363	4.41	0.9	UG/G	11/16/89	Mixed-Aroclor
89.01827	89.17155	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01827	89.17155	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01827	89.17155	11096825	4.41	0.9	UG/G	11/16/89	Aroclor 1260
89.01828	89.17156	1336363	17.34	3.5	UG/G	11/16/89	Mixed-Aroclor
89.01828	89.17156	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01828	89.17156	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01828	89.17156	11096825	17.34	3.5	UG/G	11/16/89	Aroclor 1260
89.01829	89.17157	1336363	4.9	1.	UG/G	11/16/89	Mixed-Aroclor
89.01829	89.17157	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01829	89.17157	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01829	89.17157	11096825	4.9	1.	UG/G	11/16/89	Aroclor 1260
89.01830	89.17158	1336363	5.82	1.2	UG/G	11/16/89	Mixed-Aroclor
89.01830	89.17158	53469219	< 1.		UG/G	11/16/89	Aroclor 1242
89.01830	89.17158	11097691	< 1.		UG/G	11/16/89	Aroclor 1254
89.01830	89.17158	11096825	5.82	1.2	UG/G	11/16/89	Aroclor 1260
89.01831	89.17159	1336363	< 1.		UG/G	11/16/89	Mixed-Aroclor
89.01831	'17159	53469219	< 1.		UG/G	'89	Aroclor 1242

89.01831	89.17159	11097691	< 1.	UG/G	11/16/89	Aroclor 1254
89.01831	89.17159	11096825	< 1.	UG/G	11/16/89	Aroclor 1260
89.01832	89.17160	1336363	< 1.	UG/G	11/16/89	Mixed-Aroclor
89.01832	89.17160	53469219	< 1.	UG/G	11/16/89	Aroclor 1242
89.01832	89.17160	11097691	< 1.	UG/G	11/16/89	Aroclor 1254
89.01832	89.17160	11096825	< 1.	UG/G	11/16/89	Aroclor 1260

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REPORT NUMBER: 4793 (continued)

*************** HSE-9 QUALITY ASSURANCE REPORT **************

Prepared by: ESG on 17-Nov-1989

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 8263 MATRIX: SS ANALYST: Scott Brendecke

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0453

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND
00.20101	00.20101	1336363	15.75	3.9	UG/G	25.	2.	11/16/89	WARNING 2-3 SIG	Mixed-Aroclor
00.20101	00.20101	53469219	< 1.		UG/G			11/16/89	UNDER CONTROL	Aroclor 1242
00.20101	00.20101	11097691	< 1.		UG/G			11/16/89	UNDER CONTROL	Aroclor 1254
00.20101	00.20101	11096825	15.75	3.9	UG/G	25.	2.	11/16/89	WARNING 2-3 SIG	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND-NAME
89.17630	1336363	20.29	5.1	UG/G	11/16/89	UNDER CONTROL	Mixed-Aroclor
89.17630	53469219	< 1.		UG/G	11/16/89	UNDER CONTROL	Aroclor 1242
89.17630	11097691	< 1.		UG/G	11/16/89	UNDER CONTROL	Aroclor 1254
89.17630	11096825	20.29	5.1	UG/G	11/16/89	UNDER CONTROL	Aroclor 1260

Analyst	Section Leader	QA Officer
11-17-87	11/20/87	
Date	Date	Date
		11/22/87

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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HSE-9 ANALYTICAL SERVICE AGREEMENT

Request No. 8278

I. PRESAMPLING CONFERENCE

Program Code 6/A56 No. Samples Expected 29

Submission Date 11/13/89 Completion Date ____

Chain of Custody? No Special Protocol? *(EPA etc.)* EPA

Analyses Requested: List analyses on HSE-9 Analytical Chemistry Request Sheet. PCB, soils, swipe
(Indicate expected concentration range and required detection limits under remarks.)

Container Type glass / teflon Preservative ____
(See Memo HSE-9/88-304. Guidelines for Collection and Preservation of Liquid Samples.)

Storage Conditions *(circle one or more)*: None Refrigerate Freeze Darkness

Sample Hazards Present? *(Circle one or more)*
No hazard Toxic Radioactive: alpha beta gamma Flammable Explosive/Reactive

Sample Disposal: Return ____ Discard ✓
(All hazardous samples or TRU wastes will be returned to the customer.)

Customer [signature] HSE-9 Section Leader [signature] Organic
Customer Phone 5-0453 MS K-490 ____ Inorganic
____ Radioche:

Date 11/13/89

II. EMERGENCY SAMPLES

Emergency Status requires the following signatures:

Customer Group Leader ____
HSE-9 Group Leader ____
Date ____

III. SAMPLE RECEIPT

Signature [signature] Date 11/13/89 Total No. Samples Received 29+5Q(

HSE-9 Sample No. Range 89.17636 to 89.17667.

Customer Sample No. Range 89.01834 to 89.01862.

3-8-89

REQUESTOR DATA SHEET # _____

Log Book _____ Page _____

Sampled by Mike Alexander Collection Date 11/3/88 Time am Weather _____ Witness Mike Bailey

Presampling Conference Completed With Chuck On _____ Send Report To Mike Alexander MS K-490

Phone 5-0453 Source of Sample: Transformer Station Reason for Sampling spill clean-up

Group WX Site 16 Building 430 Room No. _____

Priority Assigned: 1. Emergency; 2. Recognized Danger; 3. Imminent Deadline; 4. Special Survey; 5. Routine;

(Circle One) Priority Approval: _____ (1. GL or DGL; 2. or 3. AGL; 4. or 5. SL)

Method of Analysis Complies With: _____

Background Information Useful to Analyst (Contamination Levels, Hazards, Etc.) _____

Chain of Custody: Yes _____ (See Attached Form) No _____ Other Information _____

All Samples Submitted to HSE-9 Must Be Screened For Radioactivity. Samples Containing Greater Than 20 dpm Total Alpha or 100 dpm Combined Gamma/Beta Contamination Cannot Be Handled At TA-59.

Sample Number	Other I.D.	Sampling Location	Analysis Requested	Sampling Method	Sample Type	Preservative Utilized	Radioactivity Scan (dpm) Alpha	Radioactivity Scan (dpm) Beta/Gamma	Remarks
	See	Attachments.							

Sampling Method: 24FC=24 Hour Flow-Weighted Composite; 24TC=24 Hour Time-Weighted Composite; G=Grab; B=Bail; D=Drill; C=Core; P=Pump; O=Other (Please Specify)

Sample Type: E=Effluent; SL=Sludge: SO=Soil; SC-Soil Core; WW-Well Water; SW=Surface Water; O=Other

Preservative: F=Filtered; NF=Non-Filtered; NA=Non Acidified; A-H_2SO_4(2 ml/l); A-HNO_3(5 ml/l); A-HNO_3(5 ml/l); A H_3PO_4 & $CuSO_4$; A-Other; I=Iced; P-NaOH.

SUPPLEMENTAL REQUESTOR DATA SHEET # ________

Sample Number	Sampling Location	Sampling Method	Sample Type*	Remarks**
89.01834	TA-16-430	grab	swipe	
.01835			swipe	
.01836			soil	
.01837			swipe	
.01838			soil	
.01839				
.01840				
.01841				
.01842				
.01843				
.01844				
.01845				
.01846				
.01847				
.01848				
.01849				
.01850				
.01851				
.01852				
.01853				
.01854				
.01855				
.01856				
.01857				
.01858				
89.01859				

* Indicate whether sample is soil, sludge, water, etc.

** Note preservation.

NP: No preservation; sample stored at room temperature.

P-Ice Sample stored in ice (not frozen).

P-$Na_2S_2O_3$; Sample preserved in $Na_2S_2O_3$ to remove chlorine residual.

SUPPLEMENTAL REQUESTOR DATA SHEET # ________

Sample Number	Sampling Location	Sampling Method	Sample Type*	Remarks**
89.01860	16-430	grab	Soil	
.01861			Rock (BH)	
89.01862			gravel (BH)	

* Indicate whether sample is soil, sludge, water, etc.

** Note preservation.

NP: No preservation; sample stored at room temperature.

P-Ice Sample stored in ice (not frozen).

P-$Na_2S_2O_3$; Sample preserved in $Na_2S_2O_3$ to remove chlorine residual.

REPORT NUMBER: 4948

******************** HSE-9 ANALYTICAL REPORT ********************

Prepared by: DMS on 1-Dec-1989

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 8278 MATRIX: S ANALYST: Dee Seitz

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0453

SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
89.01836	89.17637	1336363	10.1	2.2	UG/G	12/01/89		Mixed-Aroclor
89.01838	89.17638	1336363	5.8	1.2	UG/G	12/01/89		Mixed-Aroclor
89.01839	89.17639	1336363	0.3	0.06	UG/G	12/01/89		Mixed-Aroclor
89.01840	89.17640	1336363	26.2	5.2	UG/G	12/01/89		Mixed-Aroclor
89.01841	89.17641	1336363	720.	144.	UG/G	12/01/89		Mixed-Aroclor
89.01842	89.17642	1336363	334.	67.	UG/G	12/01/89		Mixed-Aroclor
89.01843	89.17643	1336363	12.2	2.4	UG/G	12/01/89		Mixed-Aroclor
89.01844	89.17644	1336363	1.8	0.4	UG/G	12/01/89		Mixed-Aroclor
89.01845	89.17645	1336363	0.4	0.08	UG/G	12/01/89		Mixed-Aroclor
89.01846	89.17646	1336363	1.8	0.4	UG/G	12/01/89		Mixed-Aroclor
89.01847	89.17647	1336363	2.6	0.5	UG/G	12/01/89		Mixed-Aroclor
89.01848	89.17648	1336363	6.1	1.2	UG/G	12/01/89		Mixed-Aroclor
89.01849	89.17649	1336363	11.3	2.2	UG/G	12/01/89		Mixed-Aroclor
89.01850	89.17650	1336363	3.1	0.[illegible]	UG/G	12/01/89		Mixed-Aroclor
89.01851	89.17651	1336363	25.6	5.1	UG/G	12/01/89		Mixed-Aroclor
89.01852	89.17652	1336363	662.	132.	UG/G	12/01/89		Mixed-Aroclor
89.01853	89.17653	1336363	30.	6.	UG/G	12/01/89		Mixed-Aroclor
89.01854	89.17654	1336363	8.5	1.7	UG/G	12/01/89		Mixed-Aroclor
89.01855	89.17655	1336363	3.2	0.6	UG/G	12/01/89		Mixed-Aroclor
89.01856	89.17656	1336363	5.5	1.1	UG/G	12/01/89		Mixed-Aroclor
89.01857	89.17657	1336363	1.8	0.4	UG/G	12/01/89		Mixed-Aroclor

89.018_	89.17658	1336363	3.1	0.6	UG/G	[illegible]/89		Mixed-Aroclor
89.01859	89.17659	1336363	1.6	0.3	UG/G	12/01/89		Mixed-Aroclor
89.01860	89.17660	1336363	3.6	0.7	UG/G	12/01/89		Mixed-Aroclor
89.01834	89.17662	1336363	3.3	0.7	MG/SAMPLE	12/01/89		Mixed-Aroclor
89.01835	89.17663	1336363	4.7	0.9	MG/SAMPLE	12/01/89		Mixed-Aroclor
89.01837	89.17664	1336363	< 0.1		UG/SAMPLE	12/01/89		Mixed-Aroclor
89.01861	89.17665	1336363	< 0.1		UG/SAMPLE	12/01/89		Mixed-Aroclor
89.01862	89.17666	1336363	< 0.1		UG/SAMPLE	12/01/89		Mixed-Aroclor

<u>DETAILED PCB DATA</u> for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
89.01836	89.17637	1336363	10.1	2.2	UG/G	12/01/89		Mixed-Aroclor
89.01836	89.17637	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01836	89.17637	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01836	89.17637	11096825	10.1	2.2	UG/G	12/01/89		Aroclor 1260
89.01838	89.17638	1336363	5.8	1.2	UG/G	12/01/89		Mixed-Aroclor
89.01838	89.17638	1336363	< 500.		PPM	12/01/89	KIT	Mixed-Aroclor
89.01838	89.17638	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01838	89.17638	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01838	89.17638	11096825	5.8	1.2	UG/G	12/01/89		Aroclor 1260
89.01839	89.17639	1336363	0.3	0.06	UG/G	12/01/89		Mixed-Aroclor
89.01839	89.17639	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01839	89.17639	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01839	89.17639	11096825	0.3	0.06	UG/G	12/01/89		Aroclor 1260
89.01840	89.17640	1336363	26.2	5.2	UG/G	12/01/89		Mixed-Aroclor
89.01840	89.17640	1336363	< 500.		PPM	12/01/89	KIT	Mixed-Aroclor
89.01840	89.17640	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01840	89.17640	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01840	89.17640	11096825	26.2	5.2	UG/G	12/01/89		Aroclor 1260
89.01841	89.17641	1336363	720.	144.	UG/G	12/01/89		Mixed-Aroclor
89.01841	89.17641	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01841	89.17641	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01841	89.17641	11096825	720.	144.	UG/G	12/01/89		Aroclor 1260
89.01842	89.17642	1336363	334.	67.	UG/G	12/01/89		Mixed-Aroclor
89.01842	89.17642	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01842	89.17642	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01842	89.17642	11096825	334.	67.	UG/G	12/01/89		Aroclor 1260
89.01843	89.17643	1336363	12.2	2.4	UG/G	12/01/89		Mixed-Aroclor
89.01843	89.17643	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01843	89.17643	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01843	89.17643	11096825	12.2	2.4	UG/G	12/01/89		Aroclor 1260

89.0184	89.17644	1336363	1.8	0.4	UG/G	12[illegible]/89		Mixed-Aroclor
89.01844	89.17644	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01844	89.17644	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01844	89.17644	11096825	1.8	0.4	UG/G	12/01/89		Aroclor 1260
89.01845	89.17645	1336363	0.4	0.08	UG/G	12/01/89		Mixed-Aroclor
89.01845	89.17645	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01845	89.17645	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01845	89.17645	11096825	0.4	0.08	UG/G	12/01/89		Aroclor 1260
89.01846	89.17646	1336363	1.8	0.4	UG/G	12/01/89		Mixed-Aroclor
89.01846	89.17646	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01846	89.17646	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01846	89.17646	11096825	1.8	0.4	UG/G	12/01/89		Aroclor 1260
89.01847	89.17647	1336363	< 500.		PPM	12/01/89	KIT	Mixed-Aroclor
89.01847	89.17647	1336363	2.6	0.5	UG/G	12/01/89		Mixed-Aroclor
89.01847	89.17647	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01847	89.17647	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01847	89.17647	11096825	2.6	0.5	UG/G	12/01/89		Aroclor 1260
89.01848	89.17648	1336363	6.1	1.2	UG/G	12/01/89		Mixed-Aroclor
89.01848	89.17648	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01848	89.17648	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01848	89.17648	11096825	6.1	1.2	UG/G	12/01/89		Aroclor 1260
89.01849	89.17649	1336363	11.3	2.2	UG/G	12/01/89		Mixed-Aroclor
89.01849	89.17649	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01849	89.17649	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01849	89.17649	11096825	11.3	2.2	UG/G	12/01/89		Aroclor 1260
89.01850	89.17650	1336363	3.1	0.6	UG/G	12/01/89		Mixed-Aroclor
89.01850	89.17650	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01850	89.17650	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01850	89.17650	11096825	3.1	0.6	UG/G	12/01/89		Aroclor 1260
89.01851	89.17651	1336363	25.6	5.1	UG/G	12/01/89		Mixed-Aroclor
89.01851	89.17651	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01851	89.17651	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01851	89.17651	11096825	25.6	5.1	UG/G	12/01/89		Aroclor 1260
89.01852	89.17652	1336363	662.	132.	UG/G	12/01/89		Mixed-Aroclor
89.01852	89.17652	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01852	89.17652	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01852	89.17652	11096825	662.	132.	UG/G	12/01/89		Aroclor 1260
89.01853	89.17653	1336363	< 500.		PPM	12/01/89	KIT	Mixed-Aroclor
89.01853	89.17653	1336363	30.	6.	UG/G	12/01/89		Mixed-Aroclor
89.01853	89.17653	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01853	89.17653	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01853	89.17653	11096825	30.	6.	UG/G	12/01/89		Aroclor 1260
89.01854	89.17654	1336363	8.5	1.7	UG/G	12/01/89		Mixed-Aroclor
89.01854	89.17654	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01854	89.17654	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254

89.0185[illegible]	89.17654	11096825	8.5	1.7	UG/G	1[illegible]/89		Aroclor 1260
89.01855	89.17655	1336363	3.2	0.6	UG/G	12/01/89		Mixed-Aroclor
89.01855	89.17655	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01855	89.17655	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01855	89.17655	11096825	3.2	0.6	UG/G	12/01/89		Aroclor 1260
89.01856	89.17656	1336363	5.5	1.1	UG/G	12/01/89		Mixed-Aroclor
89.01856	89.17656	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01856	89.17656	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01856	89.17656	11096825	5.5	1.1	UG/G	12/01/89		Aroclor 1260
89.01857	89.17657	1336363	1.8	0.4	UG/G	12/01/89		Mixed-Aroclor
89.01857	89.17657	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01857	89.17657	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01857	89.17657	11096825	1.8	0.4	UG/G	12/01/89		Aroclor 1260
89.01858	89.17658	1336363	3.1	0.6	UG/G	12/01/89		Mixed-Aroclor
89.01858	89.17658	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01858	89.17658	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01858	89.17658	11096825	3.1	0.6	UG/G	12/01/89		Aroclor 1260
89.01859	89.17659	1336363	< 500.		PPM	12/01/89	KIT	Mixed-Aroclor
89.01859	89.17659	1336363	1.6	0.3	UG/G	12/01/89		Mixed-Aroclor
89.01859	89.17659	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01859	89.17659	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01859	89.17659	11096825	1.6	0.3	UG/G	12/01/89		Aroclor 1260
89.01860	89.17660	1336363	3.6	0.7	UG/G	12/01/89		Mixed-Aroclor
89.01860	89.17660	53469219	< 0.1		UG/G	12/01/89		Aroclor 1242
89.01860	89.17660	11097691	< 0.1		UG/G	12/01/89		Aroclor 1254
89.01860	89.17660	11096825	3.6	0.7	UG/G	12/01/89		Aroclor 1260
89.01834	89.17662	1336363	3.3	0.7	MG/SAMPLE	12/01/89		Mixed-Aroclor
89.01834	89.17662	53469219	< 1.		MG/SAMPLE	12/01/89		Aroclor 1242
89.01834	89.17662	11097691	< 1.		MG/SAMPLE	12/01/89		Aroclor 1254
89.01834	89.17662	11096825	3.3	0.7	MG/SAMPLE	12/01/89		Aroclor 1260
89.01835	89.17663	1336363	4.7	0.9	MG/SAMPLE	12/01/89		Mixed-Aroclor
89.01835	89.17663	53469219	< 1.		MG/SAMPLE	12/01/89		Aroclor 1242
89.01835	89.17663	11097691	< 1.		MG/SAMPLE	12/01/89		Aroclor 1254
89.01835	89.17663	11096825	4.7	0.9	MG/SAMPLE	12/01/89		Aroclor 1260
89.01837	89.17664	1336363	< 0.1		UG/SAMPLE	12/01/89		Mixed-Aroclor
89.01837	89.17664	53469219	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1242
89.01837	89.17664	11097691	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1254
89.01837	89.17664	11096825	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1260
89.01861	89.17665	1336363	< 0.1		UG/SAMPLE	12/01/89		Mixed-Aroclor
89.01861	89.17665	53469219	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1242
89.01861	89.17665	11097691	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1254
89.01861	89.17665	11096825	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1260
89.01862	89.17666	1336363	< 0.1		UG/SAMPLE	12/01/89		Mixed-Aroclor
89.01862	89.17666	53469219	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1242
89.01862	89.17666	11097691	< 0.1		UG/SAMPLE	12/01/89		Aroclor 1254

89.018[illegible]	89.17666	11096825	< 0.1	UG/SAMPLE	[illegible]/89	Aroclor 1260

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REPORT NUMBER: 4948 (continued)

**************** HSE-9 QUALITY ASSURANCE REPORT ***************

Prepared by: DMS on 1-Dec-1989

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 8278 MATRIX: S ANALYST: Dee Seitz

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0453

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND
00.20100	00.20100	1336363	21.	4.2	UG/G	22.	2.	12/01/89	UNDER CONTROL	Mixed-Aroclor
00.20100	00.20100	53469219	< 0.1		UG/G			12/01/89	UNDER CONTROL	Aroclor 1242
00.20100	00.20100	11097691	< 0.1		UG/G			12/01/89	UNDER CONTROL	Aroclor 1254
00.20100	00.20100	11096825	21.	4.2	UG/G	22.	2.	12/01/89	UNDER CONTROL	Aroclor 1260
00.99998	00.99998	1336363	8.	1.6	UG/SAMPLE	8.5	0.8	12/01/89	UNDER CONTROL	Mixed-Aroclor
00.99998	00.99998	53469219	< 0.1		UG/SAMPLE			12/01/89	UNDER CONTROL	Aroclor 1242
00.99998	00.99998	11097691	< 0.1		UG/SAMPLE			12/01/89	UNDER CONTROL	Aroclor 1254
00.99998	00.99998	11096825	8.	1.6	UG/SAMPLE	8.5	0.8	12/01/89	UNDER CONTROL	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND-NAME
89.17636	1336363	25.8	5.2	UG/G	12/01/89	UNDER CONTROL	Mixed-Aroclor
89.17636	53469219	< 0.1		UG/G	12/01/89	UNDER CONTROL	Aroclor 1242
89.17636	11097691	< 0.1		UG/G	12/01/89	UNDER CONTROL	Aroclor 1254
89.17636	11096825	25.8	5.2	UG/G	12/01/89	UNDER CONTROL	Aroclor 1260

89.17661	1336363	15.1	3.	UG/G	12/01/89	UNDER CONTROL	Mixed-Aroclor
89.17661	53469219	< 0.1		UG/G	12/01/89	UNDER CONTROL	Aroclor 1242
89.17661	11097691	< 0.1		UG/G	12/01/89	UNDER CONTROL	Aroclor 1254
89.17661	11096825	15.1	3.	UG/G	12/01/89	UNDER CONTROL	Aroclor 1260
89.17667	1336363	11.6	2.3	UG/SAMPLE	12/01/89	UNDER CONTROL	Mixed-Aroclor
89.17667	53469219	< 0.1		UG/SAMPLE	12/01/89	UNDER CONTROL	Aroclor 1242
89.17667	11097691	< 0.1		UG/SAMPLE	12/01/89	UNDER CONTROL	Aroclor 1254
89.17667	11096825	11.6	2.3	UG/SAMPLE	12/01/89	UNDER CONTROL	Aroclor 1260

Analyst	Section Leader	QA Officer
		mag
12/4/89	12-5-89	12-5-89
Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

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Sample #	Date	TA-Bldg.	Grid Point Room	Equipment	Analytical
89.01811	10/23/89	TA-16-430	4		2.09 ug/g
.01812			7	Transformer #	<1
.01813			8	Pad # 16-563	2.16 "
.01814			15		1.23
.01815			16		3.38
.01816			22		2.23
.01817			23		1.13
.01818			24		3.2
.01819			25		3.97
.01820			26		1.39
.01821			27		10.99
.01822			28		8.18
.01823			29		<1
.01824			36		<1
.01825			37		2.04
.01826			43		<1
.01827			44		4.41
.01828			45		17.34
.01829			46		4.9
.01830			47		5.82
.01831			48		<1
89.01832	10/23/89	TA-16-430	49		<1
39.01833	11/1/89	TA-35-7	outside	Capacitor	<10
89.01834	11/3/89	TA-16-430	1	Transformer	3.3 MG/sample
.01835			2	Pad 16-563	4.7 MG/sample
.01836			3		10.1 ug/g
.01837			5		<0.1 ug/sample
.01838			6		5.8 ug/g
.01839			9		0.3 " "
.01840			10		26.2 "
.01841			11		720 "
.01842			12		334
.01843			13		12.2
.01844			14		1.8
.01845			17		0.4
.01846			18		1.8
.01847			19		2.6
.01848			20		6.1
.01849			21		11.3
.01850			30		3.1
.01851			31		25.6
.01852			32		662
39.01853			33		30 ug/g

Sample #	Date	TA- Bldg	Grid Point ~~Room~~	Equipment	Analytical
89.01854	11/3/89	16 - 430	34	Transformer Pad, 16-563	8.5 ug/g
.01855			35		3.2 "
.01856			38		5.5
.01857			39		1.8
.01858			40		3.1
.01859			41		1.6 ~~1.6 3.3~~
.01860			42		3.6 ~~3.4.9~~ ug/g
.01861			Blank		<0.1
.01862	11-3-89	16-43	Blank		<0.1

DRAFT

NON-REPORTABLE

CLEANUP RECORD OF HIGH-CONCENTRATION SPILLS INVOLVING NON REPORTABLE RELEASES

TA- 16 - 563.

PCB ID # 864997

Records. The responsible party shall document the cleanup with records of decontamination. The records must be maintained for a period of 5 years. The records and certification shall consist of the following:

I. Identification of the source of the spill, e.g., type of equipment.

PCB Transformer at TA-16, Building 430, Station 9, Structure 563, PCB ID # 864997, concentration 25,000 ppm.

II. Estimated or actual date and time of the spill occurrence.

July 28,1987 a leak form a transformer was noticed and reported to HSE-3, HSE-7 and HSE-8. Leak was fixed on August 1, 1987.

III. The date and time cleanup was completed or terminated (if cleanup was delayed by emergency or adverse weather: the nature and duration of the delay).

Cleanup was initiated on July 28, 1987 at 3:00 pm and continued on July 29, 1987 at which time the cleanup was completed.

IV. A brief description of the spill location and the nature of the materials contaminated. (This information should include whether the spill occurred in an outdoor electrical substation, other restricted access location, or in a nonrestricted access area.)

The released fluid went onto the transformer pad and surrounding soil. The transformer is located in a fenced off substation. Contaminated material was nonimpervious solid surfaces; concrete pad, soil, and impervious solid surfaces, metal conduit. This location is considered as a "outdoor electrical substation".

CLEANUP RECORD
High concentration.

TA- 16 - 563

Room PCB ID # 864997

V. Pre-cleanup sampling data used to establish the spill boundaries if required because of insufficient visible traces and a brief description of the sampling methodology used to establish the spill boundaries.

Spill boundaries established visually around transformer. Grid established in 1989 to determine the extent of the original spill cleanup and release.

VI. A brief description of the solid surfaces cleaned.

Free oil and stained area was cleaned using an absorbent and drummed.

VII. Approximate depth of soil excavation and the amount of soil removed.

Soil was removed to a depth of approximately 2.5 feet and drummed. One drum of soil was removed.

VIII. Post-cleanup verification sampling data and, if not otherwise apparent from the documentation, a brief description of the sampling methodology and analytical technique used.

Post-cleanup sampling was conducted after each cleanup effort. Sampling scheme established using the MRI guidelines. Soil samples were taken at the various grid points.

Optional: 1) Estimated cost of cleanup (by man-hours, dollars, or both).

DRAFT

DOCUMENTATION CHECKLIST

CHECK APPROPRIATE BOX

- [x] GRID
- [x] ANALYTICAL
- [ ] INCIDENT REPORT
- [x] MEMO'S
- [ ] NOTES
- [ ] COPY OF SJT OR WO'S
- [ ] PHOTOGRAPHS

******************** EM-9 ANALYTICAL REPORT ********************

Prepared by: LAK on 24-Aug-1992

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 13363 MATRIX: SS ANALYST: JEFFREY ROBERTS PROGRAM CODE: W21D NOTEBOOK: NA PAGE: NA

OWNER: Daniel E. Bryant GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0814 TECHNIQUE: GCEC ANALYTICAL PROCEDURE:

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
92.0220	92.25441	1336363	170.	90.	UG/G	8/20/92	Mixed-Aroclor	

DETAILED PCB DATA for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	ANALYTICAL RESULT	ANALYTICAL UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
92.0220	92.25441	1336363	170.	90.	UG/G	8/20/92	Mixed-Aroclor	
92.0220	92.25441	53469219	< 6.		UG/G	8/20/92	Aroclor 1242	
92.0220	92.25441	11097691	< 6.		UG/G	8/20/92	Aroclor 1254	
92.0220	92.25441	11096825	170.	90.	UG/G	8/20/92	Aroclor 1260	

*************** EM-9 QUALITY ASSURANCE REPORT ***************

POLYCHLORINATED BIPHENYLS Prepared by: LAK on 24-Aug-1992

REQUEST NUMBER: 13363 MATRIX: SS ANALYST: JEFFREY ROBERTS PROGRAM CODE: W21D NOTEBOOK: NA PAGE: NA

OWNER: Daniel E. Bryant GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0814 TECHNIQUE: GCEC ANALYTICAL PROCEDURE:

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 EM-9

**************** EM-9 QUALITY ASSURANCE REPORT ***************

*************** 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
92.25442	1336363	16.	8.	UG/G	11.	1.	8/20/92	UNDER CONTROL	Mixed-Aroclor
92.25442	53469219	< 0.6		UG/G	0.0		8/20/92	UNDER CONTROL	Aroclor 1242
92.25442	11097691	< 0.6		UG/G	0.0		8/20/92	UNDER CONTROL	Aroclor 1254
92.25442	11096825	16.	8.	UG/G	11.	1.	8/20/92	UNDER CONTROL	Aroclor 1260

REPORT NUMBER: 14986

Analyst	Reviewer	Section Leader	QA Officer
8/21/92	8/24/92	9/1/92	9/1/92
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: 1986,' LA-11114-MS, pp. 3-4.

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Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO Distribution

DATE April 20, 1992

FROM H. Nunes

MAIL STOP/TELEPHONE M721/7-3322

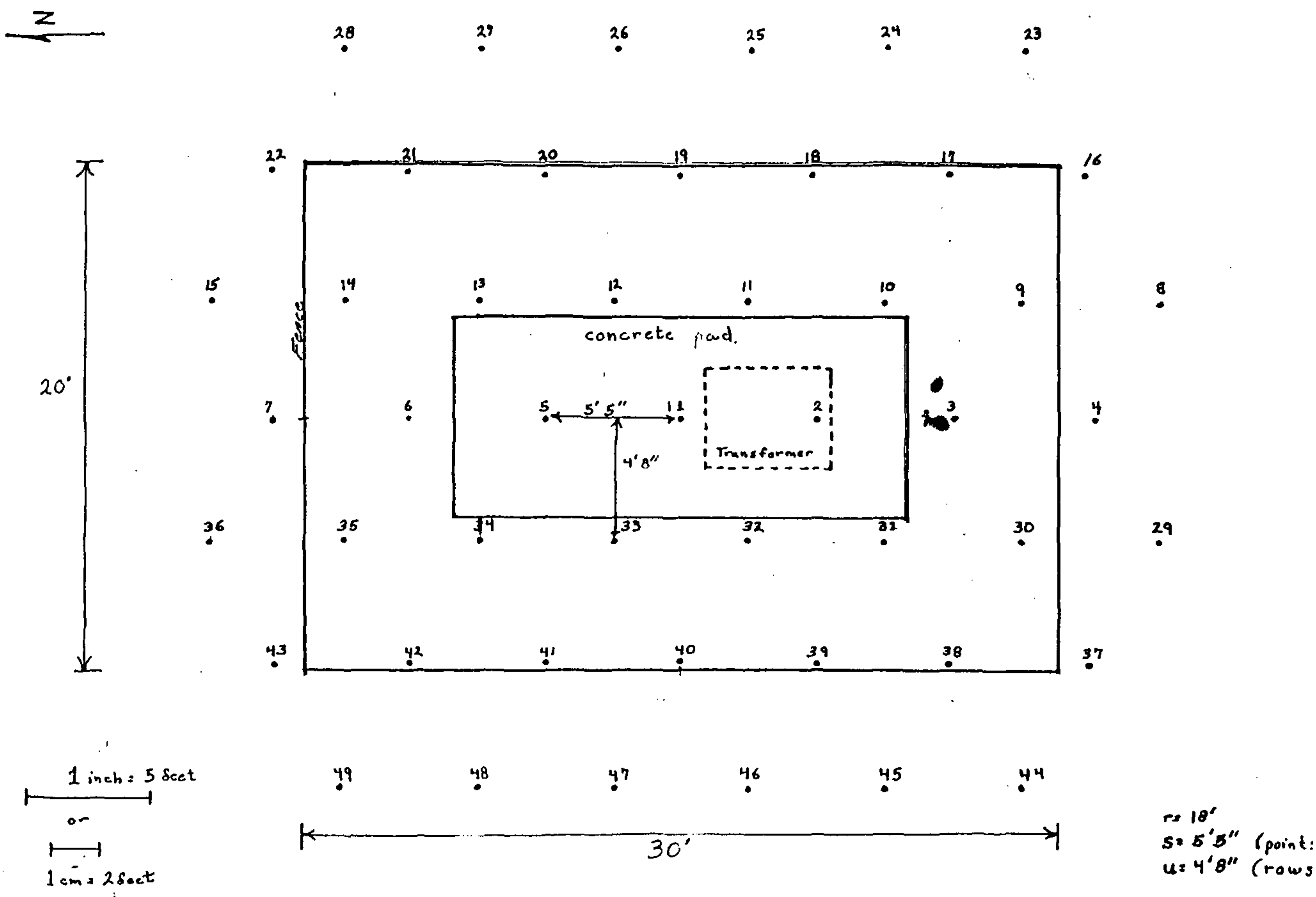
SYMBOL ENG-1/HN/92-29

SUBJECT (REVISED) PRECONSTRUCTION MEETING, TA-16, PCB TRANSFORMATION REPLACEMENT

On Thursday, April 23, a meeting will be held at 9:00 a.m. to discuss any unique needs prior to the start of work on-site. The meeting will be held at the removal site TA-16/B563. If you have any questions, please call.

HN:pp

Distribution:
M. Valasquez, JCI, MS A199
L. Livermore, JCI, MS A199
J. Richardson, JCI, MS A199
L. Stretz, WX-3, MS C930
J. Harper, EM-7, MS J595
J. Kelly, EM-7, MS J595
R. Morales, EM-8, MS K490
R. Tolman, ENG-1, MS M721
D. Allen, ENG-3, MS M984
W. Long, ENG-5, MS M713
M. Aguilar, ENG-8, MS M718
P.I. 12506, MS M703, Doc. # 2.71
ENG-1 File
File hn29



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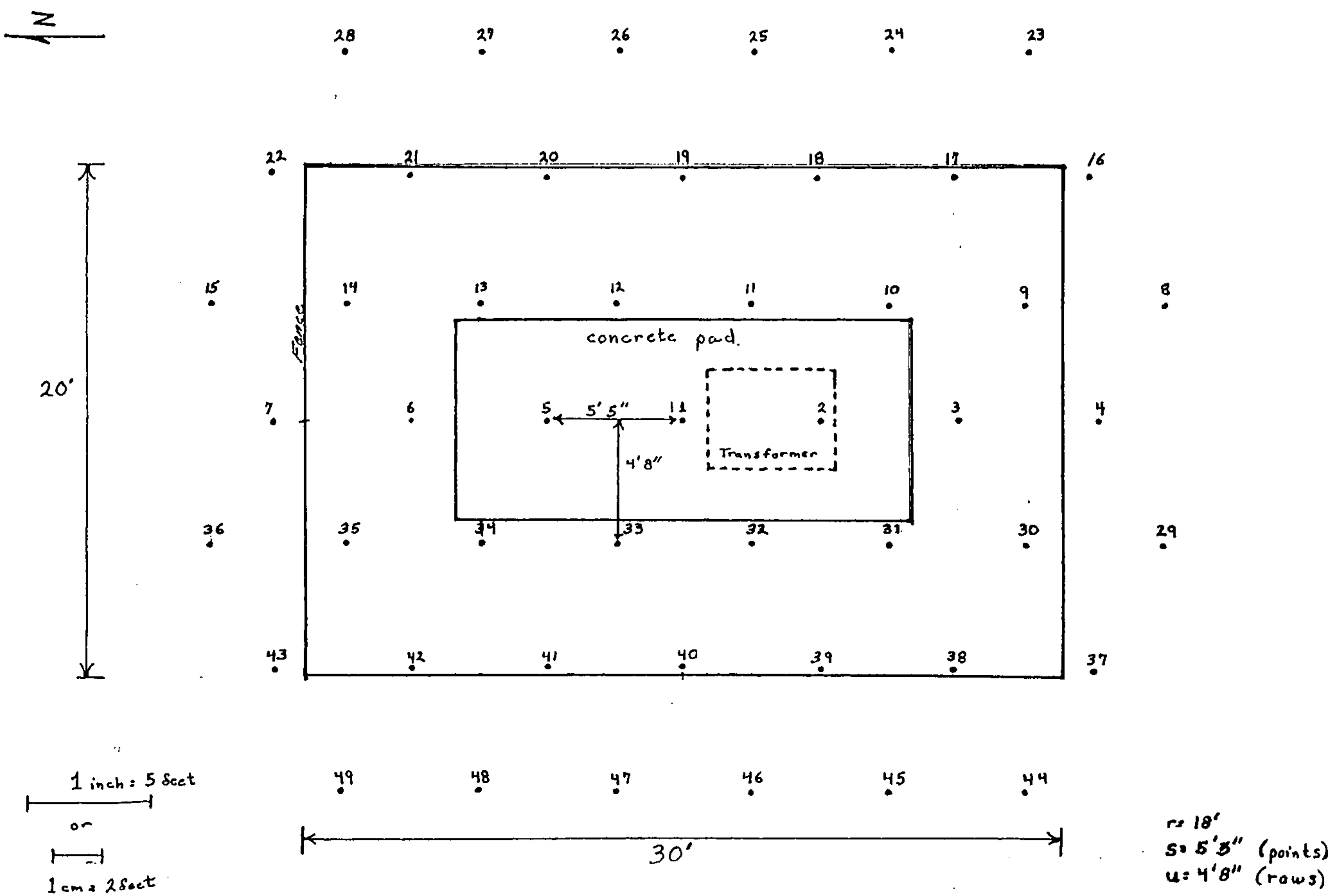
or
1 cm = 2 feet
30'
r= 18'
s= 5'5" (points
u= 4'8" (rows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concrete pad.
20'
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4' 8"
Transformer
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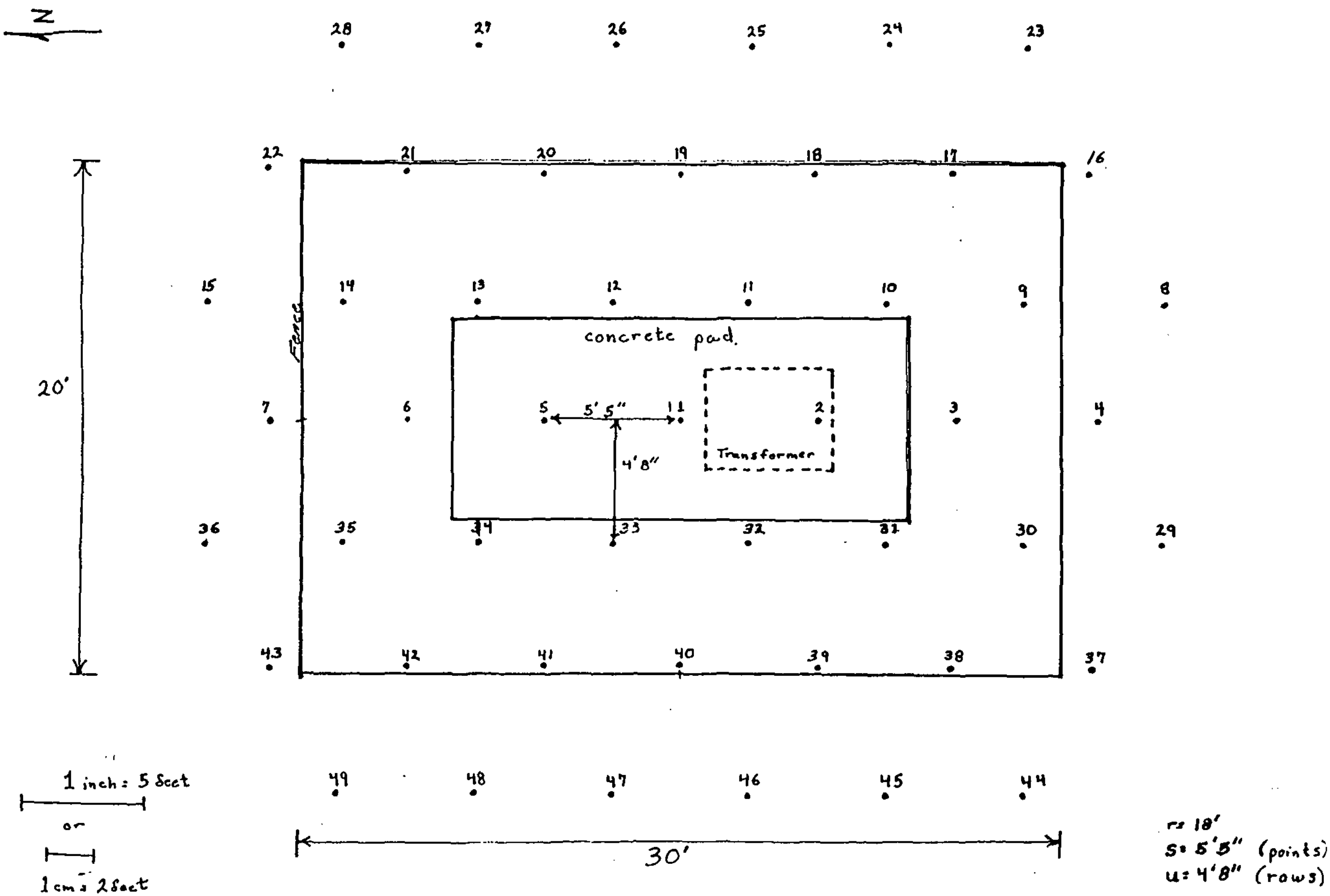
1 inch = 5 feet
or
1 cm = 2 feet
30'
r = 18'
s = 5' 5" (points)
u = 4' 8" (rows)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or
1 cm = 2 feet
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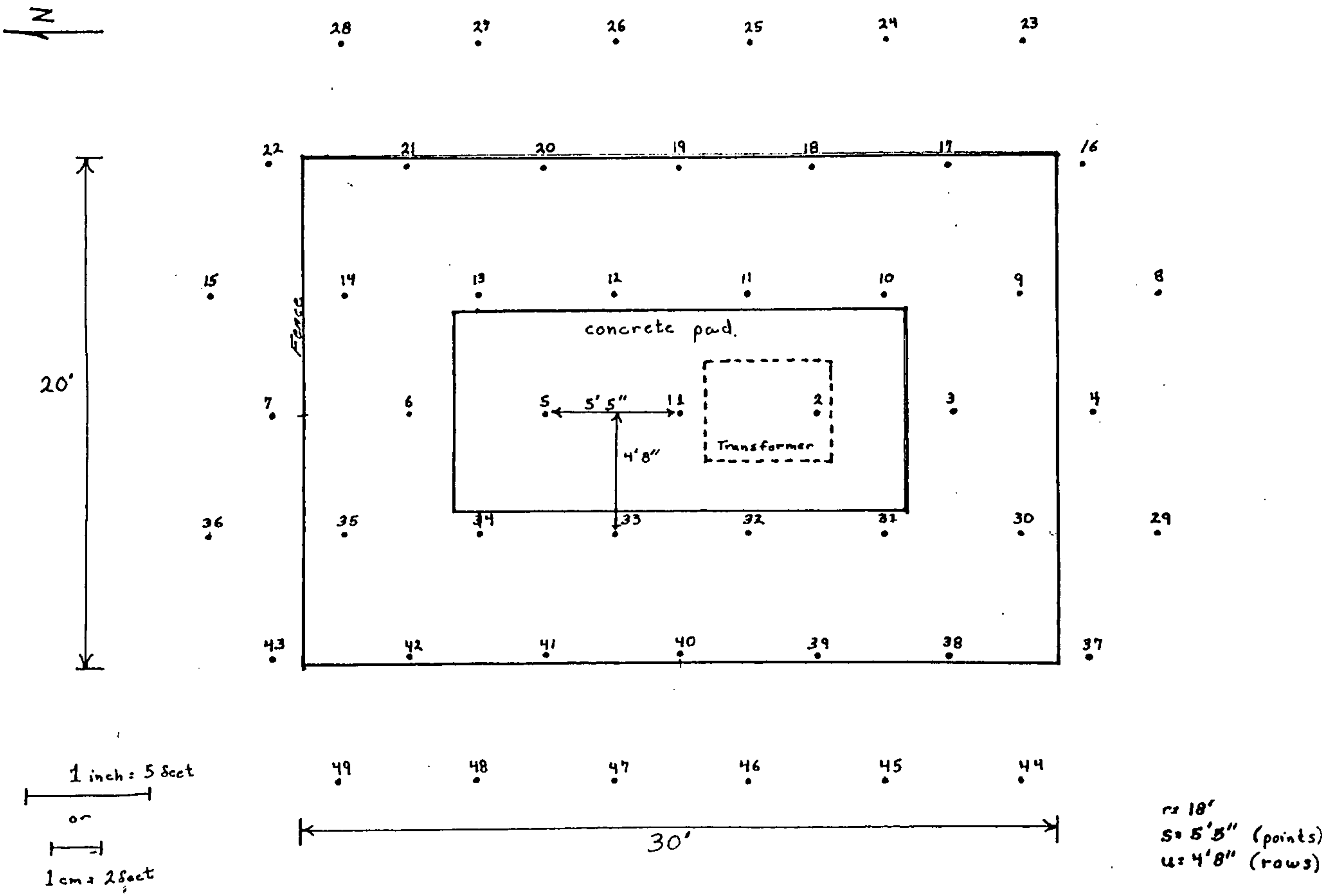

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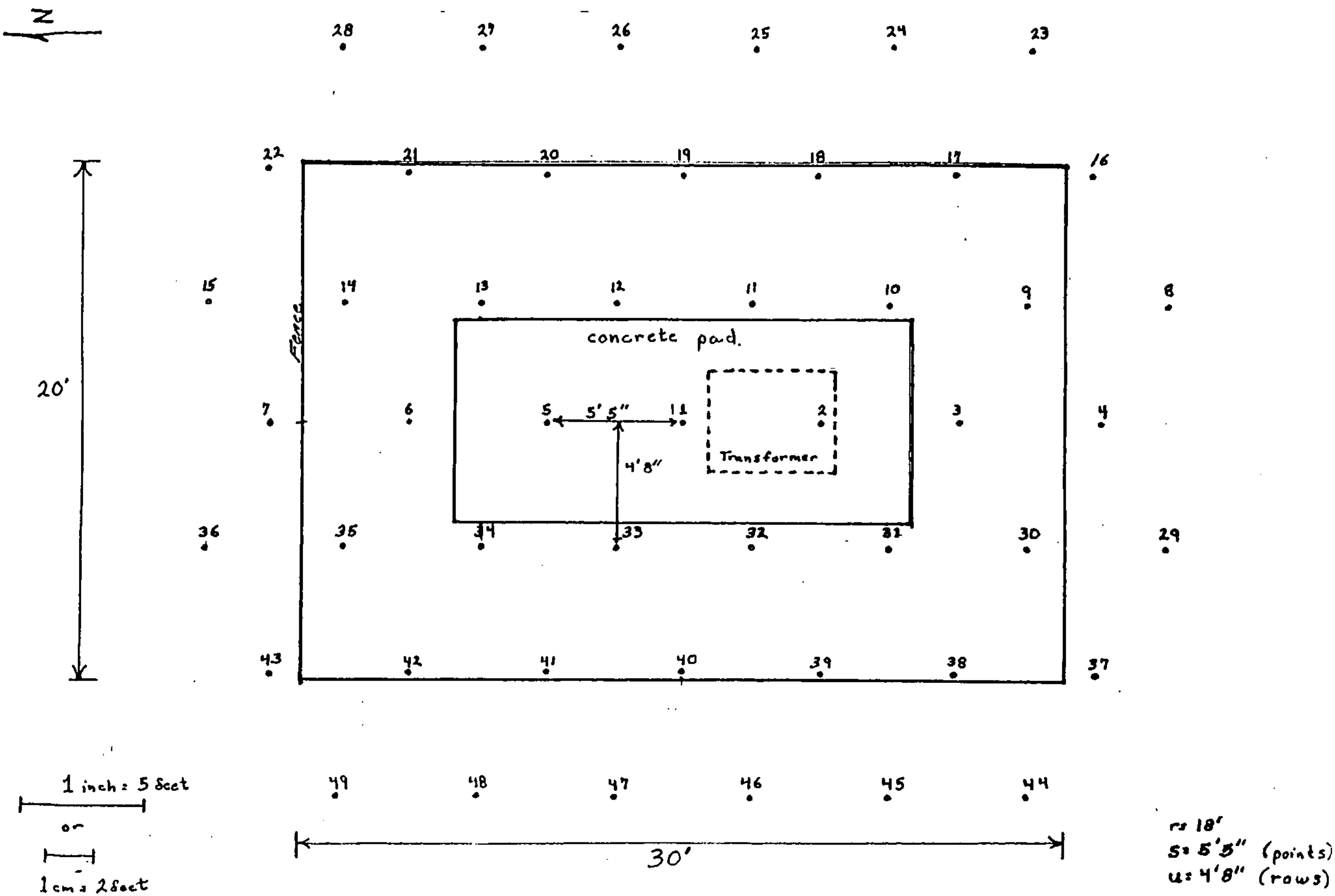
1 inch = 5 feet
or
1 cm = 2 feet
30'
r = 18'
s = 5'5" (points)
u = 4'8" (rows)



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22 21 20 19 18 17 16
15 14 13 12 11 10 9 8
Fence
concrete pad.
7 6 5 5'5" 11 2 3 4
4'8"
Transformer
36 35 34 33 32 31 30 29
43 42 41 40 39 38 37
49 48 47 46 45 44
20'
30'
1 inch = 5 feet
or
1 cm = 2 feet
r = 18'
s = 5'5" (points)
u = 4'8" (rows)

Replacement, PCB x-former

Los Alamos

Los Alamos National Laboratory
Los Alamos,New Mexico 87545

memorandum

TO: Carlos Ortiz, ENG-1, MS M721

DATE: May 17, 1991

FROM: Raul Morales, HSE-8 RM

MAIL STOP/TELEPHONE: K490/7-0814

SYMBOL: HSE-8:91-823

SUBJECT: **HSE PROJECT QUESTIONNAIRE 90-0385: TRANSFORMER REPLACEMENT AT TA-16-563**

I have reviewed questionnaire 90-0385 pertaining to the PCB transformer replacement at TA-16-563 and have made the following determinations:

1. The existing PCB transformer leaked in the past, and although the pad and surrounding soil were cleaned and excavated, it is prudent to remove the pad and excavate a 3 ft area to a depth of 6 in. on both the eastern and western sides of the pad.

2. A new pad and clean backfill soil will be required.

3. JCI and HSE-7 will need to follow standard procedures in handling, transporting, and disposing of potentially PCB-contaminated soil and concrete.

4. HSE-8 will sample soil and immediate surroundings after excavation.

5. Continue to adhere to the same procedures and protocols followed with the other successful PCB transformer replacements which have been in line with PCB regulations in 40 CFR 761.

RM:smm

Cy: S. Rae, HSE-8, MS K490
M. Alexander, HSE-8, MS K490
A. Pendergrass, HSE-8, MS K490
D. Helmer, HSE-3, MS K489
R. Gonzales, HSE-13, MS K481
L. Hupke, HSE-7, MS E518
F. Snow, ENG-1, MS M721
Circ. File

E S & H PROJECT CHECK LIST
REPLACE PCB TRANSFORMERS,TA-16-563 (PCB CORRECTIVE ACTIVITY)

Distribution:

J. Gutierrez, ENG-DO, MS M767
J. CARLOS ORTIZ/ENG-1, MS M721
P. Bussolini, ENG-3, MS M984
W. McCorkle, ENG-5, MS M713
G. Neely, HSE-1, MS G732
D. Helmer, HSE-3, MS K489
T. Grieggs, HSE-8, MS K490
J. Corpion, HSE-8, MS K490
A. Pendergrass, HSE-8, MS K490
M. Alexander, HSE-8, MS K490
R. Morales, HSE-8, MS K490
F. Bolton, HSE-DO, MS K491
ENG-7, LJ File 11695-16, MS M703
HSE-LJ File 11695-16
NEPA, MS K490

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: R. MORALES, HSE-8, MS K490

DATE: April 26, 1991

FROM: Joseph M. Ortega, HSE-3

MAIL STOP/TELEPHONE: J566/7-7782

SYMBOL: HSE-Q-90-0385

SUBJECT: E S & H PROJECT CHECK LIST
REPLACE PCB TRANSFORMERS, TA-16-563 (PCB CORRECTIVE ACTIVITY)
LAB JOB #: 11695-16

A team of Laboratory Environmental, Safety, & Health staff has reviewed your Project Questionnaire against applicable rules, regulations, Department of Energy (DOE) orders, and Laboratory E S & H policy (Laboratory Health and Safety Manual). The purpose of this procedure is to identify potential problems that may affect the project in its early stages. The questionnaire now indicates that the procedural and documentation requirements attached will probably have to be completed for your project. As the project becomes more well-defined, other E S & H concerns may be identified.

If the checklist indicates that an item is REQUIRED, work on E S & H activities related to your project will begin only after you contact the listed representative. Early communication is important since many items must be completed (approved by the issuing agency or incorporated into the project design) prior to construction. Approvals by external agencies generally take at least 3-4 months.

If the checklist indicates that an item is IN PROCESS, action is being taken by the appropriate personnel. If you need further assistance, please direct your questions to the listed representative.

If the checklist indicates that an item is COMPLETE, you do not need to contact the listed representative.

Costs for services specific to your undertaking which exceed those normally provided by indirect funding will be charged to the project.

(pcktext)

E S & H PROJECT CHECK LIST
REPLACE PCB TRANSFORMERS,TA-16-563 (PCB CORRECTIVE ACTIVITY)

I. EXTERNAL (NON-LABORATORY) APPROVAL REQUIRED

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REVIEW REQUIRED
Approval: DOE
Contact : Ann Pendergrass, HSE-8, 5-0458

SOLID WASTE REGULATIONS REVIEW REQUIRED
Approval: New Mexico Enviromental Department (NMED)
Contact : Juan Corpion, HSE-8, 5-0455

RESOURCE CONSERVATION & RECOVERY ACT (RCRA) (HAZARDOUS WASTE) REVIEW REQUIRED
Approval: Environmental Protection Agency (EPA)
Contact : Tony Grieggs, HSE-8, 5-0451

POLYCHLORINATED BIPHENYLS/TOXIC SUBSTANCES CONTROL ACT (PCBs/TSCA) REVIEW REQUIRED
Approval: Environmental Protection Agency (EPA)
Contact : Raul Morales, HSE-8, 7-0814

II. LABORATORY ACTION REQUIRED

FACILITIES QUALITY CONTROL (QC) REVIEW IN PROCESS
Contact : Don Helmer, HSE-3, 5-5762

SPILL PREVENTION CONTROL & COUNTERMEASURE (SPCC) PLAN REVIEW REQUIRED
Contact : Mike Alexander, HSE-8, 5-4752

SPECIAL WORK PERMIT REQUIRED FOR RADIATION WORK
Contact : Glenn Neely, HSE-1, 5-5301

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: DISTRIBUTION

DATE: April 9, 1991

FROM: Joseph M. Ortega

J. M. Ortega

MAIL STOP/TELEPHONE: J566/7-7782

SYMBOL: HSE-Q-90-0385

SUBJECT: HSE PROJECT SUMMARY AND QUESTIONNAIRE
ES&H QUESTIONNAIRE COMMITTEE REVIEW
REPLACE PCB TRANSFORMERS, TA-16-563 (PCB CORRECTIVE ACTIVITY)

TA/BLDG : 16/563
LAB JOB # : 11695-16
QUEST. # : 90-0385

Please review the attached HSE project summary and questionnaire in your area of responsibility. The project will be discussed at the next ES&H Questionnaire Committee meeting on Thursday, 04/18/91, 8:30 a.m. at TA-59, OH-30, HSE conference room.

MRH/gb

Att. a/s

Distribution:

G. Neely, HSE-1, MS G732
H. Lindberg, HSE-3, MS J566
R. Kruse, HSE-3, MS E503
B. Gallimore, HSE-5, MS K486
S. Vessard, HSE-6, MS F691
G. Fritz, HSE-7, MS J593
D. Garvey, HSE-8, MS K490 (2 Copies)
M. Poling, ENG-2, MS K319
R. Yetter, ENG-6, MS D451
W. Maybee, ENG-8, MS M718
R. Gonzales, HSE-13, MS K481

Cy: J. CARLOS ORTIZ/ENG-1, MS M721
R. MORALES, HSE-8 , MS K490
HSE-PQRF

ATTACHMENT A: E S & H PROJECT SUMMARY QUEST # 90-0385

LJ # 11695-16

A. Project Identification

1. Brief description of the project:

Replace existing 500KVA PCB Substation at TA 16 Str 563. Provide new concrete pad w/ oil containment, Remove existing concrete pad and conduit.

2. Funding Amount: $ 200K

Source: [ ] Line Item [✓] GPP [ ] Equipment

[ ] Operating [ ] Other CORRECTIVE ACTIVITIES GPP -

3. Funding begins: FY 91 Construction begins: 6/24/91

Operations start: Ongoing Duration of operations: Ongoing

B. Project Scope:

YES	NO	N/A	
[X]	[ ]	[ ]	Will this project involve any ground breaking? (Documentation mandatory per Federal Regs.)
[ ]	[X]	[ ]	Will this project generate new or altered airborne emissions or liquid effluents?
[X]	[ ]	[ ]	Will this project generate wastes that may be radioactive or hazardous?
[ ]	[X]	[ ]	Will this project involve high energy sources (e.g., radiation, electromagnetic, lasers, and explosives)?
[X]	[ ]	[ ]	Will this project require decommissioning of existing facilities? EXISTING TRANSFORMER ONLY.
[X]	[ ]	[ ]	Could this project result in accidental releases or safety concerns involving toxic chemicals, oils, corrosives, solvents, gases, radioactivity, explosives, biological agents, carcinogens, or asbestos?
[ ]	[X]	[ ]	Is this a project that may generate significant public concern?

C. IF THE ANSWER TO ANY OF THE ABOVE IS YES, PLEASE COMPLETE ATTACHMENT B, HSE QUESTIONNAIRE.

SIGNED: JCOrtiz

DATE: 4/3/91

7-1801
D Palmer

ATTACHMENT B: HSE QUESTIONNAIRE QUEST # 900385

PROJECT OR
LAB JOB TITLE REPLACE PCB TRANSFORMER LJ # 11695.

COMPLETED BY J.C. ORTIZ DATE 4/3/91

Please respond to the following questions with:

1) relevant information,
2) not applicable (NA), or
3) not yet determined (ND).

Add a separate sheet if you need more space to adequately address a topic.

A. LOCATION

If the work is not within an existing facility, please provide clear siting information.

1. Attach map or sketch of project location if not in an existing structure. Include facility and access roads/parking if part of the project. NA

2. Describe location if within an existing structure (e.g. room or other identification). TA-16 STR 563

3. Special utility requirements:
EXISTING 13.2KV TO 480V TRANSFORMER

4. Security or isolation requirements:
TA-16 SECURITY AREA

5. Storage tanks? Describe (contents, number, size, above- or below-ground): NA

B. DESCRIPTION OF OPERATIONS

1. Project purpose: Replace existing PCB transformer w/ non-PCB unit.

2. Principal operations:
NA

3. Primary equipment:
500KVA TRANSFORMER

4. Is the project similar to existing operations at LANL?
YES - OTHER PCB TRANSFORMER REPLACEMENT PROJECTS

5. Does this project have more than one phase? Identify phases. REPLACEMENT - JCI
DISPOSAL - HSE-7

6. Number of employees directly involved in project:
NA

7. Increase in number of employees at site due to project:
NA

C. MATERIALS INVOLVED IN OPERATIONS

Identify the major materials involved; indicate if a given category is not relevant (NA).

	Types	Approximate Quantities
1. Gases	NA	
2. Liquids (non-water)	NA	
3. Water	NA	
4. Solids	TRANSFORMER	
5. Oils	PCBs	170 Gal
6. Solvents	RINSING AGENTS (KEROSENE)	
7. Biological	NA	
8. Corrosives	NA	
9. Explosives	NA	
10. Heavy metals	NA	
11. Radioactive substances	NA	
12. Toxic substances	PCB oils	
13. Carcinogens	PCB oils	
14. NESHAP* substances (benzene, beryllium, inorganic arsenic, mercury, radionuclides, vinyl chloride)	NA	
15. Other	NA	

* These materials have special regulatory requirements

D. ENERGY SOURCES INVOLVED IN OPERATIONS

Identify the major energy sources; indicate if a given category will not be used.

		Source	Intensity/strength
1.	Electrical	EXISTING - 13.2KV - 480V	
2.	Thermal	NA	
3.	Chemical	NA	
4.	Explosives	NA	
5.	Mechanical	NA	
6.	Nuclear/ Radiation	NA	
7.	Nonionizing Radiation	NA	
8.	Electro-magnetic field	NA	
9.	High pressures	NA	
10.	Other	NA	

E. ROUTINE WASTE GENERATION

Identify the major waste materials; indicate if a given category is not applicable (NA).

		Source	Approximate Quantities
1.	Liquid effluents.		
	a. sanitary	NA	
	b. chemical		
	c. industrial		
	d. radioactive		
	e. other	PCB oils and rinsing/cleaning solvents	

	Source	Approximate Quantities
2. Solid wastes		
a. uncontaminated trash	NA	
b. toxic or hazardous waste	PCB Transformers -	
c. radioactive waste	NA	
3. Airborne emissions		
a. non-hazardous	NA	
b. toxic or hazardous	NA	
c. radioactive	NA	

4. Modifications to existing exhaust systems:

NA

F. DECOMMISSIONING

1. Will currently used facilities require decommissioning? Identify.

No - Disposal - Transformer only + Conc Slab

2. Is there a possibility for the presence of asbestos?

No

3. Are there special decommissioning requirements after completion of project operations?

No

G. IDENTIFICATION OF CRITICAL SYSTEMS AND/OR DOCUMENTATION

1. Normal conditions per Telecon Don Palmer 4/5/91 - Mike Barr responsible for bldg operations 7-6866

a. Engineered control and safety systems which must function under normal operating conditions:

None -

b. Your assessment of the safety and environment consequences if these engineered systems fail during normal operations:

None -

2. Abnormal or accident conditions

a. Possible abnormal or accident conditions under which the engineered control and safety systems must function.

None -

b. Your assessment of the consequences should these engineered systems fail during abnormal or accident conditions.

NA

3. Documentation. Identify relevant health, safety, and environment documents.

		Existing	Indicated
a.	Standard Operating Procedures (SOP)	Pressing SOPS & Equip operating Instr.	
b.	Safety work permits (SWP)	- As reqd for work in HE area.	
c.	Safety Analysis Report (SAR) or Safety Assessment (SA)	NA	
d.	Failure mode and effect analysis	NA	
e.	Siting study	NA	
f.	Environmental regulations, permits, or registrations	NA	

H. <u>Any other possible health, safety and environments issues:</u>

Unknown - PCB transformer may have a leak in it.

Attachment A: E S & H PROJECT SUMMARY QUEST # 90-0385 (Supplement)
LJ # 11695-16

A. Project Identification

1. Brief description of the project:

Removes soil, and concrete pad from transformer substation, Pad and soil contaminated with PCB's and will be cleaned to acceptable levels per 40 CFR 761.125, with HSE-8 oversight.

2. Funding Amount: $

☐ Line Item ☐ GPP ☐ Equipment

☐ Operating ☒ Other Corrective Activities FY91

3. Funding begins: FY 91 Construction begins: 8/01/91
Operations start: 9/01/91 Duration of operations:

B. Project Scope:

Yes	No	N/A	
X			Will this project involve any ground breaking? (Documentation mandatory per Federal Regs.)
	X		Will this project generate new or altered airborne emissions or liquid effluents?
	X		Will this project generate wastes that may be radioactive or hazardous?
	X		Will this project involve high energy sources (e.g., radiation, electromagnetic, lasers, and explosives)?
	X		Will this project require decommissioning of existing facilities?
X			Could this project result in accidental releases or safety concerns involving toxic chemicals, oils, corrosives, solvents, gases, radioactivity, explosives, biological agents, carcinogens, or asbestos?
	X		Is this a project that may generate significant public concern?

C. IF THE ANSWER TO ANY OF THE ABOVE IS YES, PLEASE COMPLETE ATTACHMENT B, HSE QUESTIONNAIRE.

SIGNED: [signature]
DATE: June 17 1991

.TTACHMENT B: HSE QUESTIONNAIRE QUEST # 90-0385

PROJECT OR
LAB JOB TITLE Replace PCB Transformer, 16-563, Supplement LJ# 11695-16
COMPLETED BY Michael R. Alexander DATE 5/17/91

Please respond to the following questions with:

1) relevant information,
2) not applicable (NA), or
3) not yet determined (ND).

Add a separate sheet if you need more space to adequately address a topic.

A. LOCATION

If the work is not within an existing facility, please provide clear siting information.

1. Attach map or sketch of project location if not in an existing structure. Include facility and access roads/parking if part of the project. Sketch attached.

2. Describe location if within an existing structure (e.g. room or other identification).

3. Special utility requirements: N/A

4. Security or isolation requirements: N/A

5. Storage tanks? Describe (contents, number, size, above - or below-ground): None

B. DESCRIPTION OF OPERATIONS

1. Project purpose:

Clean-up PCB contaminated concrete pad and soil from transformer substation.

2. Principal operations

Soil removal, concrete removal.

3. Primary equipment:

Heavy equipment.

4. Is the project similar to existing operations at LANL?

Will be similar to other PCB cleanups.

5. Does this project have more than one phase? Identify phases.

No.

6. Number of employees directly involved in project:

None.

7. Increase in number of employees at site due to project:

JCI, Laborers, operators, and environmental support.

C. MATERIALS INVOLVED IN OPERATIONS

Identify the major materials involved; indicate if a given category is not relevant (NA).

	Types	Approximate Quantities
1. Gases	N/A	
2. Liquids (non-water)	N/A	
3. Water	N/A	
4. Solids	Soil and concrete contaminated with PCB's.	
5. Oils	N/A	
6. Solvents	N/A	
7. Biological	N/A	
8. Corrosives	N/A	
9. Explosives	N/A	
10. Heavy metals	N/A	
11. Radioactive substances	N/A	
12. Toxic substances	N/A	
13. Carcinogens	N/A	
14. NESHAP* substances	N/A	
(benzene, beryllium,	N/A	
inorganic arsenic,	N/A	
mercury, radionuclides,	N/A	
vinyl chloride)	N/A	
15. Other	PCB from a leaking Askeral transformer.	

* These materials have special regulatory requirements

D. ENERGY SOURCES INVOLVED IN OPERATIONS

	Source	Intensity/strength
1. Electrical	N/A	
2. Thermal	N/A	
3. Chemical	N/A	
4. Explosives	N/A	
5. Mechanical	N/A	
6. Nuclear/ Radiation	N/A	
7. Nonionizing Radiation	N/A	
8. Electro-magnetic field	N/A	
9. High Pressure	N/A	
10. Other	N/A	

E. ROUTINE WASTE GENERATION

Identify the major waste materials; indicate if a given category is not applicable (N/A).

	Source	Approximate Quantities
1. Liquid effluents.		
a. sanitary	N/A	
b. chemical	N/A	
c. industrial	N/A	
d. radioactive	N/A	
e. other		

2. **Solid Waste** **Source** **Approximate Quantities**

a. **uncontaminated trash** N/A

b. **toxic or hazardous waste** Soil, concrete, contaminated with PCB's to be disposed of at Area G.

c. **radioactive waste** N/A

3. **Airborne emissions**

a. **non-hazardous** N/A

b. **toxic or hazardous** N/A

c. **radioactive** N/A

4. **Modifications to existing exhaust systems:**

N/A

F. DECOMMISSIONING

1. **Will currently used facilities require decommissioning?** Identify.

Yes, concrete foundation for transformer.

2. **Is there a possibility for the presence of asbestos?**

N/A

3. **Are there special decommissioning requirements after completion of project operations?**

Yes, clean-up of soil to less than 10 ppm.

G IDENTIFICATION OF CRITICAL SYSTEMS AND/OR DOCUMENTATION

1. **Normal conditions**

a. **Engineered control and safety systems which must function under normal operating conditions:** N/A

b. **Your assessment of the safety and environment consequences if these engineered systems fail during normal operations:** N/A

2. Abnormal or accident conditions

   a. Possible abnormal or accident conditions under which the engineered control and safety systems must function.

      N/A

   b. Your assessment of the consequences should these engineered systems fail during abnormal or accident conditions.

      N/A

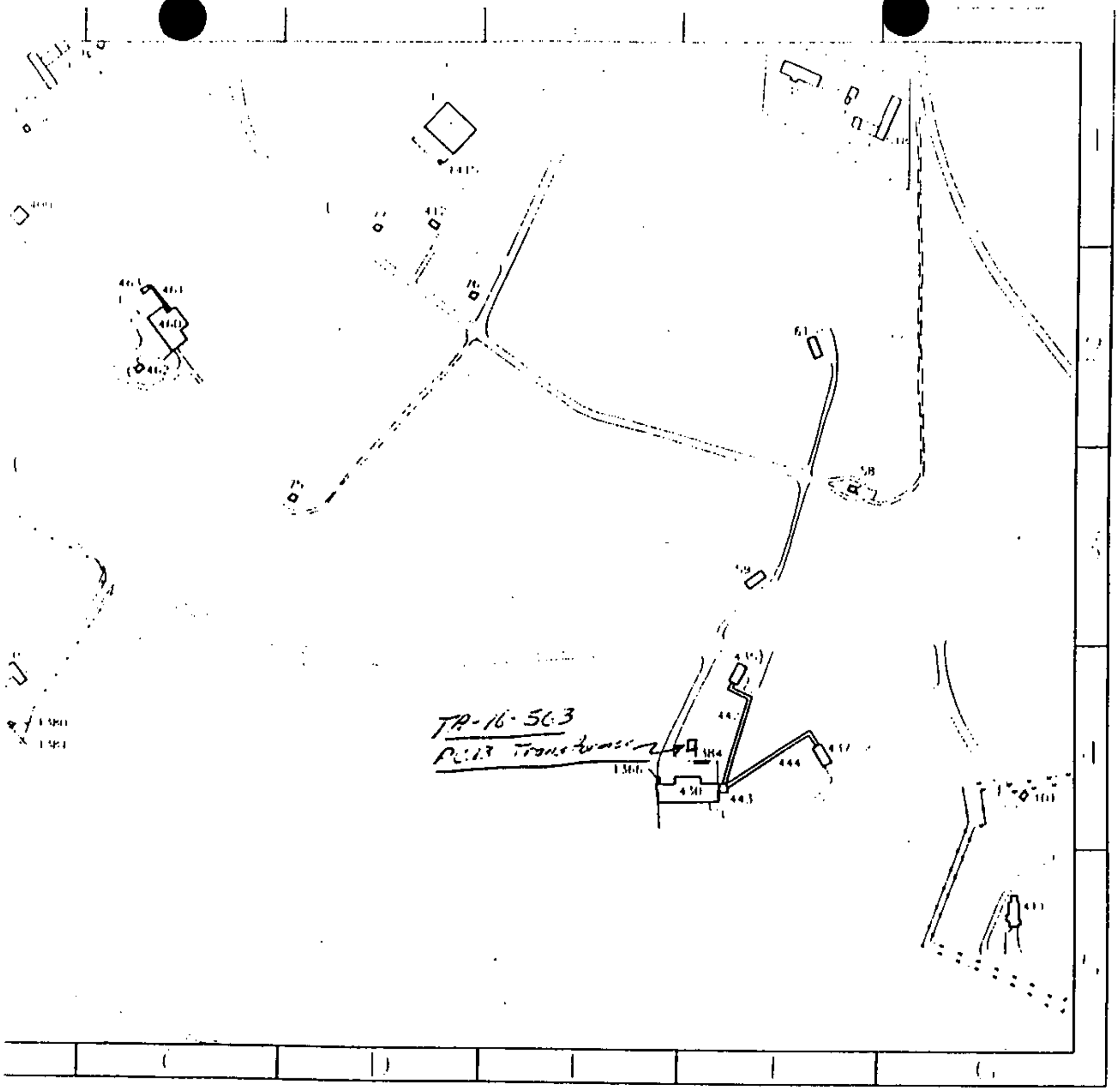
3. Documentation.

      PCB clean-up report to be complete by HSE-8.

	Existing	Indicated
a. Standard Operating Procedures (SOP)	JCI SPI on PCB cleanup	
b. Safety work permits (SWP)		
c. Safety Analysis Report (SAR) or Safety Assessment (SA)		
d. Failure mode and effect analysis		
e. Siting study		
f. Environmental regulations, permits, or registrations		

H. <u>Any other possible health, safety and environments issues:</u>

Area has to be cleaned to acceptable level before the placement of the new non-PCB Transformer.



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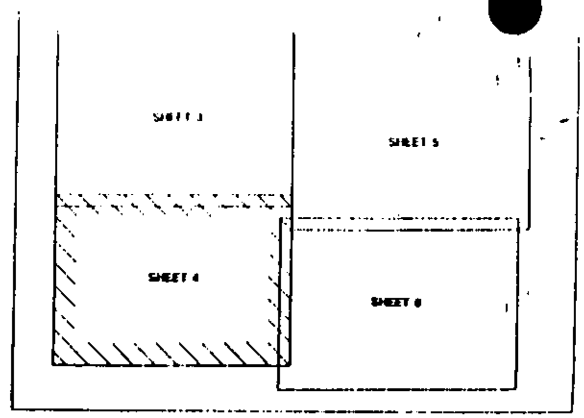


TA-16 MAP GUIDE

NO	DATE	CLASS REV	REVISIONS	DWN	DES	CHD	REL	SUB	REL	APP

FACILITIES ENGINEERING DIVISION

STRUCTURE LOCATION MAP

TA-16

S-SITE

DRAWN	C SANDOVAL
DESIGN	
CHECKED	B. COMER
RELEASED	B. COMER
DATE	03-20-91

BLDG.

SUBMITTED | RECOMMENDED | APPROVED

LOS ALAMOS — LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NEW MEXICO 87545

SHEET 4 of 6

CLASSIFICATION U — REVIEWER — DATE

LAB JOB NO — DRAWING NO. ENG-R 5111 — REV 24

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Raul Morales, HSE-8, MS K490

DATE: May 21, 1990

FROM: L. A. Stretz

MAIL STOP/TELEPHONE: C930/7-6495

SYMBOL: WX-3

SUBJECT: PCB CLEANUP AT TA-16-260

It is my understanding based on our telephone conversation on May 21, 1990 that encapsulation of the floor area of the equipment room at Building 260 is acceptable for fixing the small amount of remaining PCB. We will proceed based on your recommendation.

Reasons for following this course are:

1. Cleaning (surface scabbling) reduced measured PCB levels to well below 100µg although levels still exceed 10µg.

2. The room is isolated from the outside environment and from the operating area of Building 260.

3. The Building is used for essential operations and must be returned to service without delay.

4. Encapsulation will assure protection of the environment and employees against PCB exposure.

L. A. Stretz

LAS/klm

Cy: J. L. Parkinson, WX-3, MS C930
R. Taylor, WX-12, MS C932
B. McCormick, WX-12, MS C923
R. A. Hildner, WX-3, MS C934
File

16-000386

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

SPILL REPORT

Spill Coordinator	Telephone	Mail Stop	Division	Group
Michael Bailey	7-01-4	PENV	PAWS	PENV

SPILL INFORMATION

Date of Spill	Time of Spill	Location
5/17/90	7:00 PM	TA-16 Building 260 Room 110

Amount of Spilled Material	Type of Spilled Material
½ to 2/4 gallon	PCB (Greater than 500 ppm) liquid

Basis of Estimate ☐ Inventory ☒ Visual Estimate ☐ Recovered Volume ☐ Other

Cause (Describe events leading up to the spill, if applicable.)

A PCB transformer (PCB ID# 5608) was being drained by the Pan Am Inside Electricians at the time of the spill. A drum overflowed. A non-reportable quantity of PCB liquid (non-RQ) was released.

Injuries or Exposure? ☐ Yes ☒ No (If yes, please describe.)

Did evacuation occur? ☐ Yes ☒ No | Were facilities or equipment damaged? ☐ Yes ☒ No

Did fire/explosion occur? ☐ Yes ☒ No | Was there a potential for fire/explosion? ☐ Yes ☒ No

Did the spill enter sewer drains, streams, or stream beds? ☐ Yes ☒ No (If yes, give location and ultimate drainage.)

Who discovered the spill?

Michael Bailey, PENV

SPILL RESPONSE

Describe the spill response, in chronological order. Include a call-out of response personnel, steps taken to contain the spill, and ... etc. Also describe spill control equipment used.

A PCB transformer (PCB ID# 5608), was being drained at TA-16 Building 260, Room 110. The Pan Am Inside Electricians decided to take a break before emptying the second of two transformers at this site. The first transformer was drained without incident. The pump was set up and all hoses were in place for the second draining. The electricians did not close a bypass valve on the pump before the break. The transformer siphoned into the drum until the drum overflowed. A sump with no drain received approximately ½ to 3/4 gallon of PCB oil from the drum. The drum happened to be over the sump when it overflowed. The spill occurred at 7:00 PM. Michael Bailey, who was on the scene for the draining, was the first responder to the spill. Sorbent sheets were placed in the sump to contain the spill. The sump was given a double wash/double rinse with "Naturalizer" PCB solvent. The spill was completely cleaned by 8:30 PM. The cleanup was delayed while the transformer was drained into drums.

Laboratory Support Division
P.O. Box 50
Los Alamos, NM 87544-0050

Pan Am World Services, Inc.

TO: Distribution

THRU: Mike Brown, Supervisor, PENV MFB

FROM: Michael Bailey, Environmental Engineer, PENV

DATE: May 14, 1990 MEMO: PENV.90-237

SUBJECT: PAN AM HSE PROCEDURES FOR THE REMOVAL OF PCB TRANSFORMERS AT TA-16 BUILDING 260, ROOM 110

Replacement of two PCB transformers at TA-16 Building 260, Room 110, is scheduled to start on May 17, 1990. Health, safety, and environmental protection procedures have been written to ensure the safe removal of these transformers. Room 110 is an equipment room located on the outside of Building 260, and is easily accessible by two large double doors.

A list of the personnel that will be involved in the removal follows:

Construction Supervisor - Robert Tarleton, CA3D
Electricians - Foreman Larry Meira
Linemen - Foreman Ruben Salazar
Riggers - Foreman Ray Smith
Operators - Foreman Ray Smith
Laborers - CA1D Laborers (have been trained in PCBs)
HSE-7 Personnel - Larry Hupke
PENV Personnel - Michael Bailey
PSFT Personnel - Tito N. Trujillo, Lorenzo Chavez

Information about the two PCB transformers follows:

Tech Area	Bldg.	Room No.	Serial No.	PCB ID No.	Fluid Vol.
TA-16	260	110	57988	5607	294 gal
TA-16	260	110	59344	5608	294 gal

The two transformers will be emptied on site and transported by the Pan Am Riggers through a double door to the outside. The transformers will be loaded by a crane to a truck with a drip pan that covers the entire bed of the truck by the Riggers. A High Explosives Decontamination Permit (WX-12-1) will be optained from WX-12 personnel, and a Hazardous Materials On-Site Transfer (OTM-1) Form will be required.

TO: KenH

CC: MikeA
RaulM
RoyB
SteveR
TinaS

DATE: 05-21-90
TIME: 16:34

FROM: RaulM
SUBJECT: PCBs ON THE FLOOR AT TA16,BLD260, RM110
PRIORITY:
ATTACHMENTS:

Ken,

1. As you already know, PCBs were found on the floor beneath a transformer at TA-16, Bldg 260, Room 110 while the transformer was in the process of being replaced. Analytical chemistry results indicate PCB concentrations in that area to be less than 100ug/100sq cm after cleanup.

2. In the process of emptying the Askarel 1260 from the transformer, World Services personnel had a couple of spills -- one of about a pint and the other 3/4 gallon. This area is to be sampled once initial cleanup procedures have been completed.

ACTIONS TAKEN TO ADDRESS THE ABOVE

Having just returned from a PCB course in Washington D.C., I had obtained information on the regulations which helped put the above items in perspective. For PCB concentrations of less than 100ug/100sq cm as described in (1) above, we can encapsulate the PCBs in the floor (and place in our files a report of what happened and how we alleviated or corrected the situation). We have already conveyed this information to the responsible parties and the encapsulation and transformer replacement is proceeding. We do not need to notify the EPA or obtain approval to encapsulate, but accordin to the regulations the EPA can disallow our encapsulation. I believe that will be unlikely since no threat to the environment is presented by this situation.

The spills described in (2) present a different situation. Under TSCA, w must report spills involving 10# of pure PCBs to the EPA. Under CERCLA, 1# or more must be reported to the National Response Center (who typically reports it to the EPA). Although we may have about 10# of PCBs spilled in this case, there is no need to report either to the EPA or NRC because the regulations address RELEASES TO THE ENVIRONMENT. In this case, we have a workplace release, i.e., a closed place with no emissions to the environment. There are no drains or similar conduits in the room.

Appropriate reports will be written and filed for the incident.

Rae wanted me to bring you up-to-date on the above. If you have questions call me at 7-0814.

===

PAN AM WORLD SERVICES, INC.
FIELD AUTHORIZATION

DATE 7/3/90
% COMP. 98
FA# 5

PART A: DESCRIPTION AND JUSTIFICATION

PRIME NO. 9095-54 TITLE PCB TRANSFORMER REPL
ASSOCIATE NO. 5-8401-98 TA 16 BLDG. 260

TO AUTHORIZE CLEANUP OF PCB'S LEAKED FROM OLD TRANSFORMERS AND COVER TIME LOST DUE TO SHUTDOWN OF JOB

ONE HALF OF The room WAS ENCAPSULATED ON 11-21-90 - including Sump.

REVISED TARGET DATE 7/31/90 ACTIVITY NO. (S) 01050

PART B: CAUSES

- ___ PROJECT REVISION <2K
- ___ WORK DEFINITION
- ___ PRODUCTIVITY
- ___ WORKMANSHIP
- ___ SCHEDULING
- ___ ESTIMATE ___ PLAN ___
- ___ SUPERVISION
- ___ FIELD DIRECTION
- ___ MATERIALS ___ TOOLS ___
- ___ TRANSP. ___ EQUIP. ___
- ___ PLANS & SPECIFICATIONS
- ___ CONGESTION
- ___ OVERTIME
- ___ SITE ACCESS
- X FIELD CONDITIONS
- ___ RATE CHANGES
- ___ H. ___ S. ___ OR E. ___
- ___ WEATHER
- ___ OTHER ___

PART C: HOURS

CARPENTERS		FITTERS	
ROOFERS		INSULATORS	
FLOOR CREW		ELECTRICIANS	88½
PAINTERS	13	LINEMEN	
MASONS		RIGGERS	
LABORERS	228	FAB SHOPS	
TEAMSTERS	3	S & T	
OPERATORS	8	CUSTODIAL	
IRON WKRS	12		
TINNERS			
		NON-MANUAL	
SUB-TOTAL	264	SUB-TOTAL	88½

TOTAL HRS. 352½

PART D: COSTS

LOADED LABOR	$ 11,000	INCLUDES $ -0- FOR NON-MANUAL
MATERIAL & HANDLING	$ 500	
EQUIPMENT	$	INCLUDES ___ HOURS
SUBTOTAL	$ 11,500	
G&A — GRT	$ 2,622	
TOTAL ESTIMATED COST	$ 14,122	BASIS: ✓ WORKSHEET, ___ PLANNERS, ___ ESTIMATORS

ak

PART E: APPROVALS

[signature]	Bill Long	[signature]
FUNDING ORGANIZATION	W.O. AUTHOR	PAN AM CONST. SUPV.
DATE 7/5/90	DATE 7-5-90	

12. Laborers dressed in personal protection equipment (PPE) will clean area where transformers were in place with Chemsearch Naturalizer non-hazardous solvent and rags in a double wash/double rinse method as determined by PENV.

13. A Hazardous Materials On-Site Transfer (OTM-1) Form will be completed by PENV and given to the driver of the truck for each load. Truck will be placarded with PCB labels, front, sides, and back, by PENV.

14. A High Explosives Decontamination Permit (WX-12-1) will be completed by Bill McCormick, WX-12, at this time and given to the driver (no high explosives are suspected to contaminate these transformers, as stated by Bill McCormick).

15. Drums of oil and empty transformers will be taken to TA-54 Building 39 (HSE-7 PCB Management Facility) by the truck, and the Pan Am Riggers will unload the cargo at an area specified by Larry Hupke, HSE-7.

Michael Bailey

Michael Bailey

Distribution:
Robert Tarleton, CA3D
Steve Rae, HSE-8, K490
Raul Morales, HSE-8, K490
Larry Hupke, HSE-7, K518
Bill McCormick, WX-12, C935
M. R. Heineman, HSE-3, K489
S. J. Calanni, PMGR
A. L. Da Silva, OMDO
Joe J. Lopez, PHSE
Stan Nalley, UMDO
Tito N. Trujillo, PSFT
Lorenzo Chavez, PSFT
Charlie Barnett, PENV
file
reading file

JUN 12 1990

Circ: to: Steve Rae
Roy Bohn
Raul Morales
(copy)

PAN AM WORLD SERVICES, INC.

MEMORANDUM

TO: Joe Lopez, Manager, Health, Safety & Env., PHSE

THRU: Manager, Construction Department, CDDO JC

FROM: Construction Superintendent, CA2D

DATE: 25 May 1990 MEMO NO.: CA2D.90-212

SUBJECT: PCB TRANSFORMER REMOVAL WORK LESSONS LEARNED

The listed items were things that were dealt with, left out, poorly communicated, etc. on the work done at TA-16-260 and should be considered in future activities concerning PCB work:

1. PCB removal procedures were provided at the last moment but requests for these procedures were made at the pre-job conference two months prior with additional inquiries about the status of the procedures during that two month period.

2. The procedures didn't require any pre-job swiping or indexing to determine if there were existing PCBs oil residuals on the floor prior to beginning transformer and switchgear removal operations. This data would have provided a base from which to formulate a more comprehensive work plan.

3. There didn't seem to be a clear line of communication established between Pan Am Safety and HSE as to who was responsible for what and who was to contact whom.

4. The scabbling machine that was provided at the job site was grossly undersized for the work task and mechanically unsound to start with. There was no back-up machine available if the one provided would have completely failed.

5. The marshaling of resources to deal with this one small incident seemed too fragmented and clearly incomplete.

6. The mopping "double wash" activities seemed to be taken lightly. The scabbling machine was utilized perhaps prematurely. It seems like a more comprehensive "double wash" method with perhaps the appropriate solvents and scrubbing devices other then mops might have remedied the situation with substantially less cost.

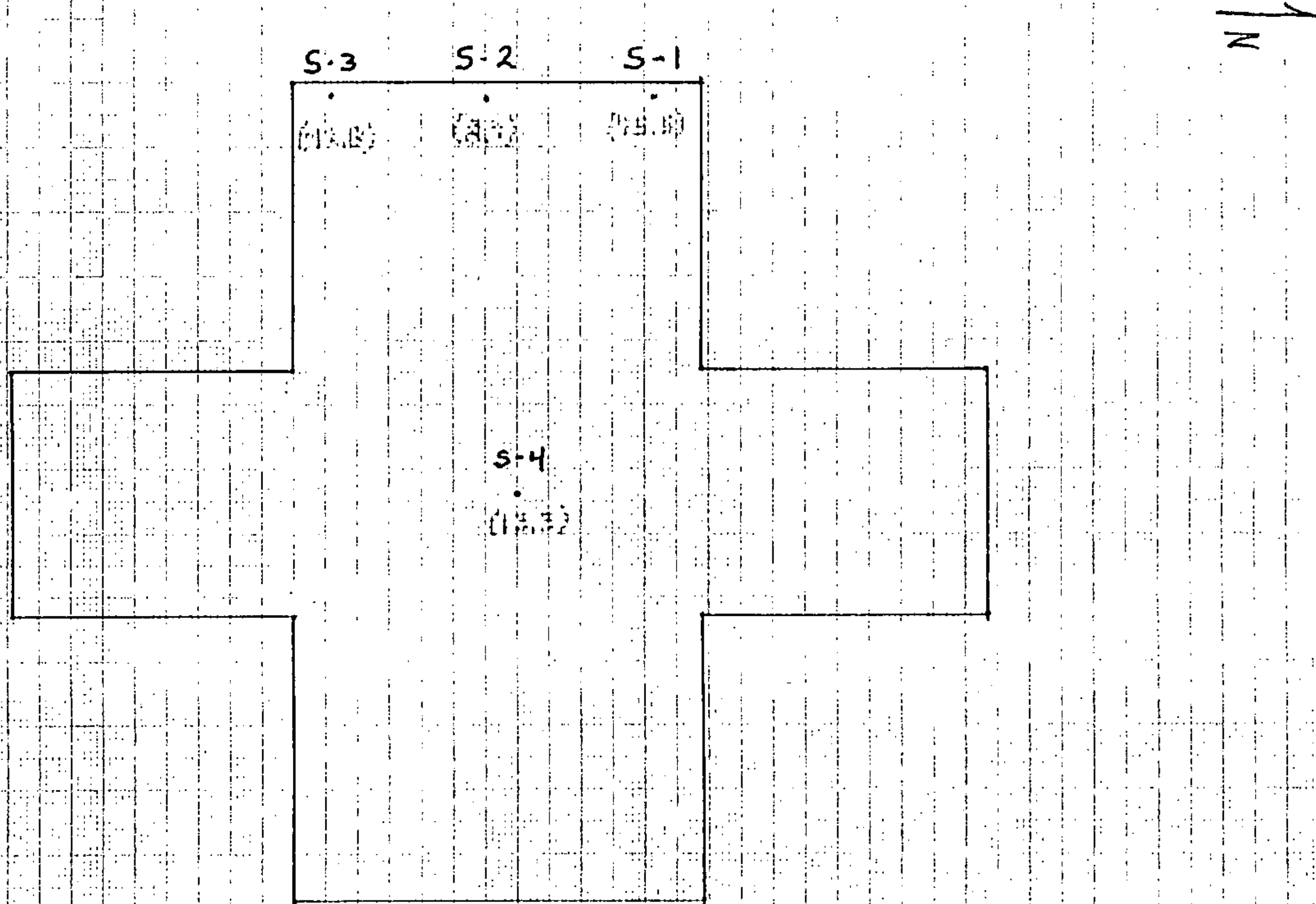
DOCUMENTATION CHECKLIST

CHECK APPROPRIATE BOX

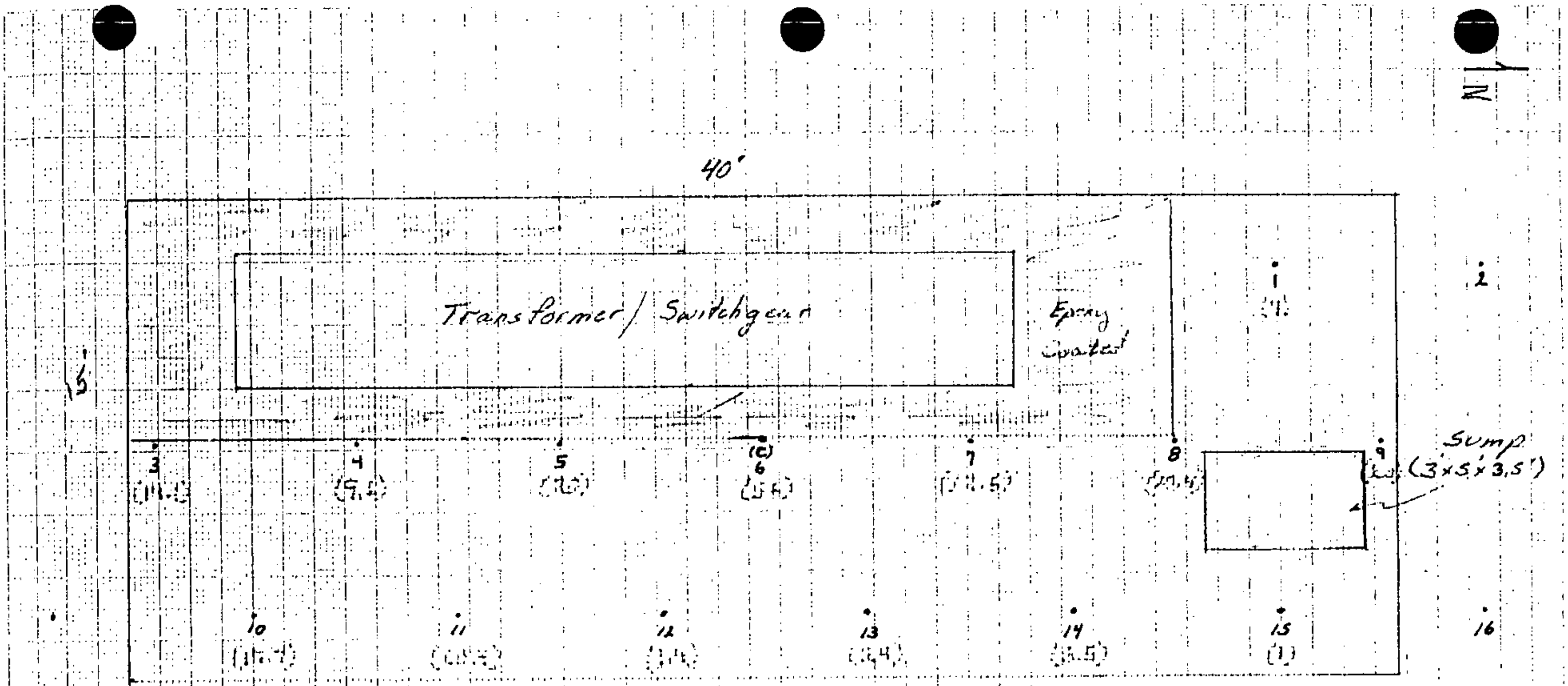
- ☑ GRID
- ☑ ANALYTICAL
- ☑ INCIDENT REPORT
- ☑ MEMO'S
- ☑ COPY OF SJT OR WO'S
- ☐ NOTES
- ☐ PHOTOGRAPHS

1" = 2'

~~Radius 5'6"~~
~~Distance between points (3) = 2'6", 2'8"~~
~~Distance between points (4) = 2'3", 2'4"~~
Grab Samples



1" = 2'



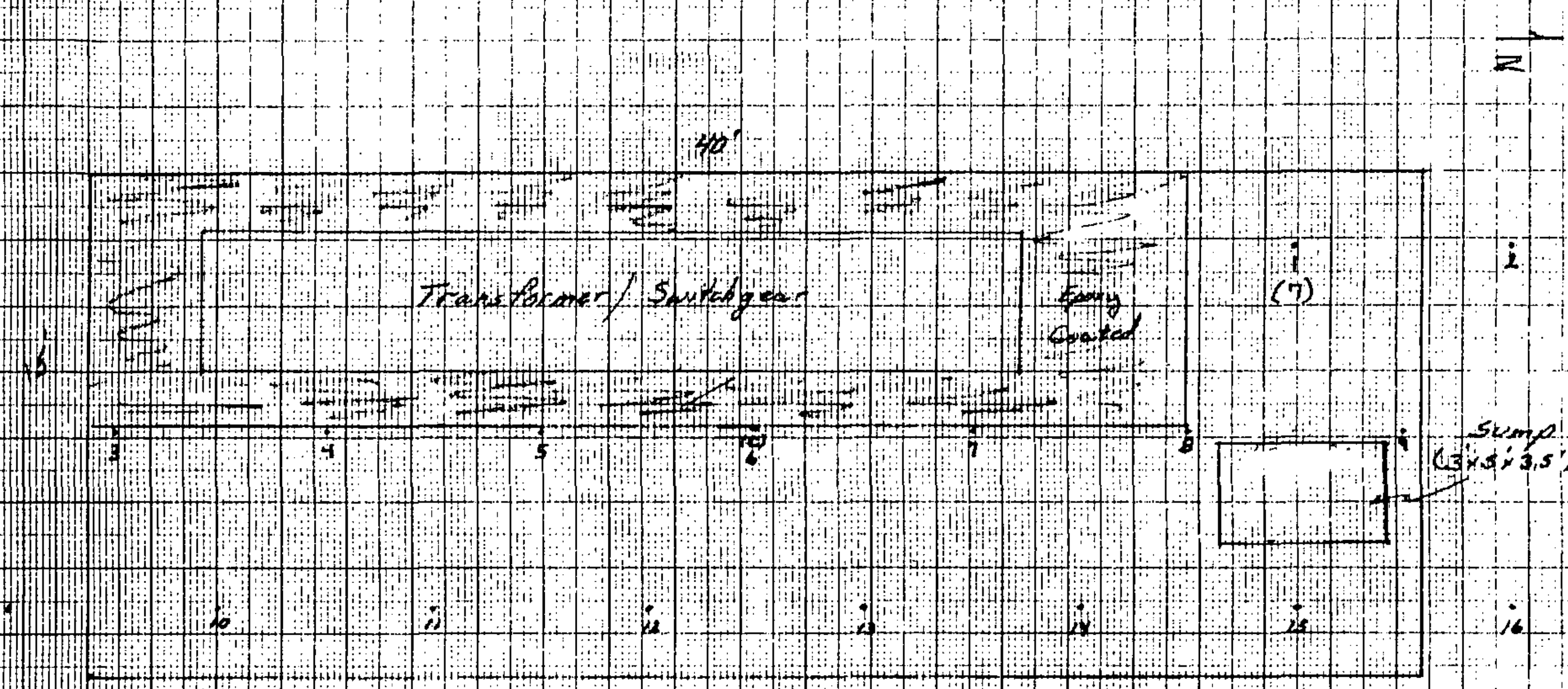
TA-16-260, Final Values

Radius, r = 21.5'
Distance between points, (S) = 6.45' or 6'5"
Distance between rows, (W) = 5.6' or 5'7"

1" = 5'

[illegible]

TA-16-260



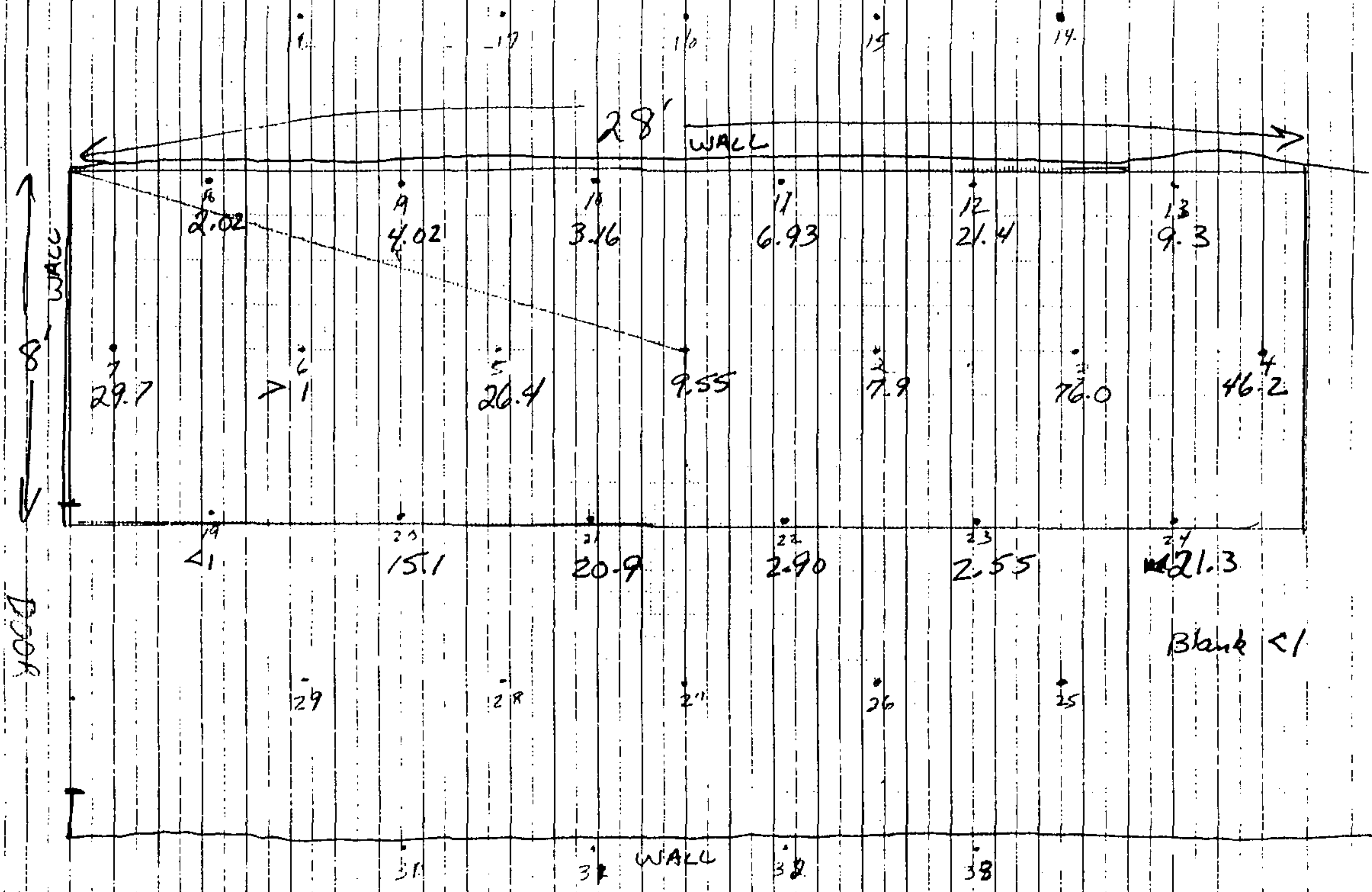
Radius; (r) = 2.5'
Distance between points; (S) = 6.45' or 6'5"
Distance between rows; (W) = 5.6' or 5'7"

1" = 5'

TA-16-260, Samples 11/13/70

5/20/90

TA-16-260, Grid under transformer 5/20/90



n = 14.56' = 14'6"
37 Sampling Points
S = 4.36' horizontal ≈ 4'4"
V = 3.7' vertical ≈ 3'7"

REPORT NUMBER: 8823

******************** HSE-9 ANALYTICAL REPORT ********************

Prepared by: DMS on 14-Nov-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10963 MATRIX: FS ANALYST: Dee Seitz PROGRAM CODE: WH54

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 5-4752

<u>SUMMARY of TOTAL PCB's</u> for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90.01391-MRA	90.19161	1336363	7.	1.4	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01392-MRA	90.19162	1336363	75.5	15.1	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01393-MRA	90.19163	1336363	8.7	1.7	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01394-MRA	90.19164	1336363	42.8	8.6	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01395-MRA	90.19165	1336363	13.3	2.7	UG/SAMPLE	11/14/90		Mixed-Aroclor

<u>DETAILED PCB DATA</u> for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90.01391-MRA	90.19161	1336363	7.	1.4	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01391-MRA	90.19161	53469219	< 0.4		UG/SAMPLE	11/14/90		Aroclor 1242
90.01391-MRA	90.19161	11097691	< 0.4		UG/SAMPLE	11/14/90		Aroclor 1254
90.01391-MRA	90.19161	11096825	7.	1.4	UG/SAMPLE	11/14/90		Aroclor 1260
90.01392-MRA	90.19162	1336363	75.5	15.1	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01392-MRA	90.19162	53469219	< 0.4		UG/SAMPLE	11/14/90		Aroclor 1242
90.01392-MRA	90.19162	11097691	< 0.4		UG/SAMPLE	11/14/90		Aroclor 1254
90.01392-MRA	90.19162	11096825	75.5	[illegible].1	UG/SAMPLE	11/14/90		Aroclor 1260
90.01393-MRA	90.19163	1336363	8.7	1.7	UG/SAMPLE	11/14/90		Mixed-Aroclor
90.01393-MRA	90.19163	53469219	< 0.4		UG/SAMPLE	11/14/90		Aroclor 1242

TA-16-260, Sample 11/13/90

90.01393-MRA	90.19163	11097691	< 0.4		UG/SAMPLE	11/14/90	Aroclor 1254
90.01393-MRA	90.19163	11096825	8.7	1.7	UG/SAMPLE	11/14/90	Aroclor 1260
90.01394-MRA	90.19164	1336363	42.8	8.6	UG/SAMPLE	11/14/90	Mixed-Aroclor
90.01394-MRA	90.19164	53469219	< 0.4		UG/SAMPLE	11/14/90	Aroclor 1242
90.01394-MRA	90.19164	11097691	< 0.4		UG/SAMPLE	11/14/90	Aroclor 1254
90.01394-MRA	90.19164	11096825	42.8	8.6	UG/SAMPLE	11/14/90	Aroclor 1260
90.01395-MRA	90.19165	1336363	13.3	2.7	UG/SAMPLE	11/14/90	Mixed-Aroclor
90.01395-MRA	90.19165	53469219	< 0.4		UG/SAMPLE	11/14/90	Aroclor 1242
90.01395-MRA	90.19165	11097691	< 0.4		UG/SAMPLE	11/14/90	Aroclor 1254
90.01395-MRA	90.19165	11096825	13.3	2.7	UG/SAMPLE	11/14/90	Aroclor 1260

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REPORT NUMBER: 8823 (continued)

**************** HSE-9 QUALITY ASSURANCE REPORT ***************

Prepared by: DMS on 14-Nov-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10963 MATRIX: FS ANALYST: Dee Seitz PROGRAM CODE: WH54

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 5-4752

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QA SAMPLES RUN WITH THIS BATCH

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.21737	00.21737	1336363	19.2	3.8	UG/SAMPLE	13.	1.	11/14/90	UNDER CONTROL	Mixed-Aroclor
00.21737	00.21737	53469219	19.2	3.8	UG/SAMPLE	13.	1.	11/14/90	UNDER CONTROL	Aroclor 1242
00.21737	00.21737	11097691	< 0.4		UG/SAMPLE	0.0		11/14/90	UNDER CONTROL	Aroclor 1254
00.21737	00.21737	11096825	< 0.4		UG/SAMPLE	0.0		11/14/90	UNDER CONTROL	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
90.19166	1336363	10.3	2.1	UG/SAMPLE	6.	0.6	11/14/90	UNDER CONTROL	Mixed-Aroclor
90.19166	53469219	10.3	2.1	UG/SAMPLE	6.	0.6	11/14/90	UNDER CONTROL	Aroclor 1242
90.19166	11097691	< 0.4		UG/SAMPLE	0.0		11/14/90	UNDER CONTROL	Aroclor 1254

90.19166	11096825	< 0.4	UG/SAMPLE	0.0	11/14/90	UNDER CONTROL	Aroclor 1260

REPORT NUMBER: 8823

Diane Armenta	[signature]	[signature]	
Analyst	Reviewer	Section Leader	QA Officer
11/15/90	11/15/90	11/15/90	
Date	Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

****

REPORT NUMBER: 8581

******************** HSE-9 ANALYTICAL REPORT ********************

Prepared by: DLN on 29-Oct-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10868 MATRIX: MOL ANALYST: Dee Seitz PROGRAM CODE: WH54

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 5-4752 TASK-ID:

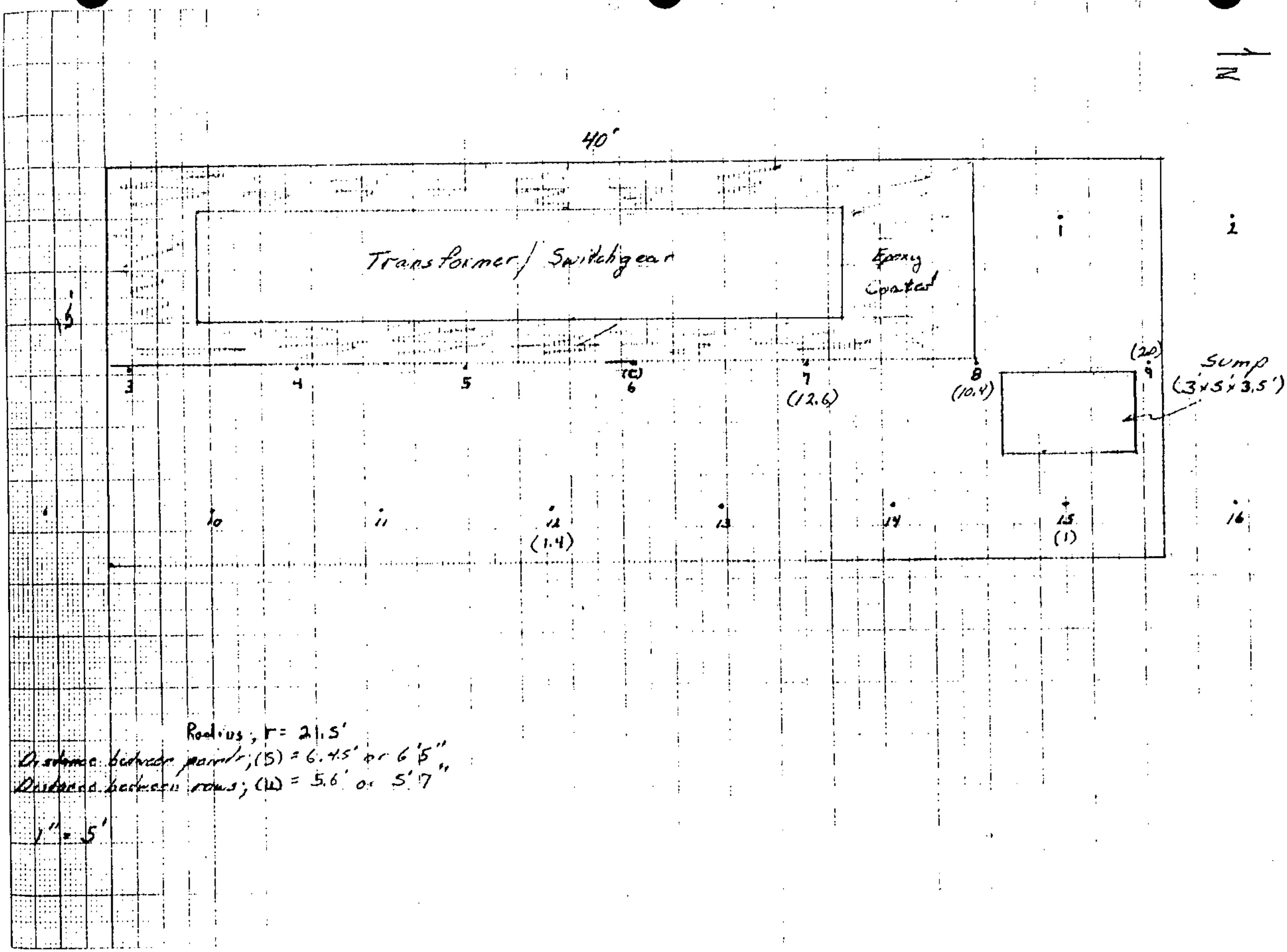
SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90.01366	90.18463	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01374	90.18464	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01375	90.18465	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01376	90.18466	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01377	90.18467	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01378	90.18468	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01379	90.18469	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01380	90.18470	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01381	90.18471	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01382	90.18472	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01367	90.18474	1336363	1.4	0.2	UG/SAMPLE	10/24/90		Mixed-Aroclor
90.01368	90.18475	1336363	12.6	2.5	UG/SAMPLE	10/24/90		Mixed-Aroclor
90.01369	90.18476	1336363	10.4	2.	UG/SAMPLE	10/24/90		Mixed-Aroclor
90.01370	90.18477	1336363	2.	0.4	UG/SAMPLE	10/24/90		Mixed-Aroclor
90.01371	90.18478	1336363	1.	0.2	UG/SAMPLE	10/24/90		Mixed-Aroclor
90.01372	90.18479	1336363	2.6	0.5	UG/SAMPLE	10/24/90		Mixed-Aroclor
90.01373	90.18480	1336363	0.8	0.2	UG/SAMPLE	10/24/90		Mixed-Aroclor

DETAILED PCB DATA for customer samples on this report

CUSTOMER SAMPLE COMPLETION

T.A-16-260



TA-16-260, Sampled 10/5/90

NUM	NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	DATE	COMMENT	COMPOUND NAME
90.01366	90.18463	1336363	< 50.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01366	90.18463	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01366	90.18463	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01366	90.18463	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01366	90.18463	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01374	90.18464	1336363	< 500.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01374	90.18464	1336363	> 50.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01374	90.18464	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01374	90.18464	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01374	90.18464	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01374	90.18464	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01375	90.18465	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01375	90.18465	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01375	90.18465	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01375	90.18465	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01376	90.18466	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01376	90.18466	1336363	< 500.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01376	90.18466	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01376	90.18466	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01376	90.18466	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01377	90.18467	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01377	90.18467	1336363	> 50.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01377	90.18467	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01377	90.18467	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01377	90.18467	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01378	90.18468	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01378	90.18468	1336363	< 50.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01378	90.18468	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01378	90.18468	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01378	90.18468	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01379	90.18469	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01379	90.18469	1336363	< 50.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01379	90.18469	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01379	90.18469	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01379	90.18469	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01380	90.18470	1336363	< 50.		PPM	10/24/90	KIT	Mixed-Aroclor
90.01380	90.18470	1336363	< 4.		UG/G	10/24/90		Mixed-Aroclor
90.01380	90.18470	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01380	90.18470	11097691	< 4.		UG/G	10/24/90		Aroclor 1254
90.01380	90.18470	11096825	< 4.		UG/G	10/24/90		Aroclor 1260
90.01381	90.18471	1336363	< 4.		UG/G	10/[illegible]		Mixed-Aroclor
90.01381	90.18471	1336363	< 50.		[illegible]	10/[illegible]	KIT	Mixed-Aroclor
90.01381	90.18471	53469219	< 4.		UG/G	10/24/90		Aroclor 1242
90.01381	90.18471	11097691	< 4.		UG/G	10/24/90		Aroclor 1254

90.01381	90.18471	11096825	< 4.		UG/G	10/24/90	Aroclor 1260
90.01382	90.18472	1336363	< 4.		UG/G	10/24/90	Mixed-Aroclor
90.01382	90.18472	53469219	< 4.		UG/G	10/24/90	Aroclor 1242
90.01382	90.18472	11097691	< 4.		UG/G	10/24/90	Aroclor 1254
90.01382	90.18472	11096825	< 4.		UG/G	10/24/90	Aroclor 1260
90.01367	90.18474	1336363	1.4	0.2	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01367	90.18474	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01367	90.18474	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01367	90.18474	11096825	1.4	0.2	UG/SAMPLE	10/24/90	Aroclor 1260
90.01368	90.18475	1336363	12.6	2.5	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01368	90.18475	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01368	90.18475	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01368	90.18475	11096825	12.6	2.5	UG/SAMPLE	10/24/90	Aroclor 1260
90.01369	90.18476	1336363	10.4	2.	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01369	90.18476	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01369	90.18476	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01369	90.18476	11096825	10.4	2.	UG/SAMPLE	10/24/90	Aroclor 1260
90.01370	90.18477	1336363	2.	0.4	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01370	90.18477	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01370	90.18477	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01370	90.18477	11096825	2.	0.4	UG/SAMPLE	10/24/90	Aroclor 1260
90.01371	90.18478	1336363	1.	0.2	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01371	90.18478	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01371	90.18478	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01371	90.18478	11096825	1.	0.2	UG/SAMPLE	10/24/90	Aroclor 1260
90.01372	90.18479	1336363	2.6	0.5	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01372	90.18479	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01372	90.18479	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01372	90.18479	11096825	2.6	0.5	UG/SAMPLE	10/24/90	Aroclor 1260
90.01373	90.18480	1336363	0.8	0.2	UG/SAMPLE	10/24/90	Mixed-Aroclor
90.01373	90.18480	53469219	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1242
90.01373	90.18480	11097691	< 0.4		UG/SAMPLE	10/24/90	Aroclor 1254
90.01373	90.18480	11096825	0.8	0.2	UG/SAMPLE	10/24/90	Aroclor 1260

****

REPORT NUMBER: 8581 (continued)

**************** HSE-9 QUALITY ASSURANCE REPORT ***************

Prepared by: DLN on 29-Oct-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10868 MATRIX: MOL ANALYST: Dee Seitz PROGRAM CODE: WH54

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 5-4752 TASK-ID:

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QA SAMPLES RUN WITH THIS BATCH

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.21374	00.21374	1336363	3.4	0.7	UG/SAMPLE	5.	0.5	10/24/90	UNDER CONTROL	Mixed-Aroclor
00.21374	00.21374	53469219	< 0.4		UG/SAMPLE	0.0		10/24/90	UNDER CONTROL	Aroclor 1242
00.21374	00.21374	11097691	< 0.4		UG/SAMPLE	0.0		10/24/90	UNDER CONTROL	Aroclor 1254
00.21374	00.21374	11096825	3.4	0.7	UG/SAMPLE	5.	0.5	10/24/90	UNDER CONTROL	Aroclor 1260
00.97411	00.97411	1336363	18.8	3.8	UG/G	25.	2.	10/24/90	UNDER CONTROL	Mixed-Aroclor
00.97411	00.97411	53469219	< 4.		UG/G	0.0		10/24/90	UNDER CONTROL	Aroclor 1242
00.97411	00.97411	11097691	< 4.		UG/G	0.0		10/24/90	UNDER CONTROL	Aroclor 1254
00.97411	00.97411	11096825	18.8	3.8	UG/G	25.	2.	10/24/90	UNDER CONTROL	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME

90.18473	1336363	40.7	8.1	UG/G	57.	6.	10/24/90	UNDER CONTROL	Mixed-Aroclor
90.18473	53469219	< 4.		UG/G	0.0		10/24/90	UNDER CONTROL	Aroclor 1242
90.18473	11097691	< 4.		UG/G	- 0.0		10/24/90	UNDER CONTROL	Aroclor 1254
90.18473	11096825	40.7	8.1	UG/G	57.	6.	10/24/90	UNDER CONTROL	Aroclor 1260
90.18481	1336363	11.6	2.3	UG/SAMPLE	15.	2.	10/29/90	UNDER CONTROL	Mixed-Aroclor
90.18481	53469219	< 0.4		UG/SAMPLE	0.0		10/29/90	UNDER CONTROL	Aroclor 1242
90.18481	11097691	< 0.4		UG/SAMPLE	0.0		10/29/90	UNDER CONTROL	Aroclor 1254
90.18481	11096825	11.6	2.3	UG/SAMPLE	15.	2.	10/29/90	UNDER CONTROL	Aroclor 1260

REPORT NUMBER: 8581

Analyst — Section Leader — QA Officer

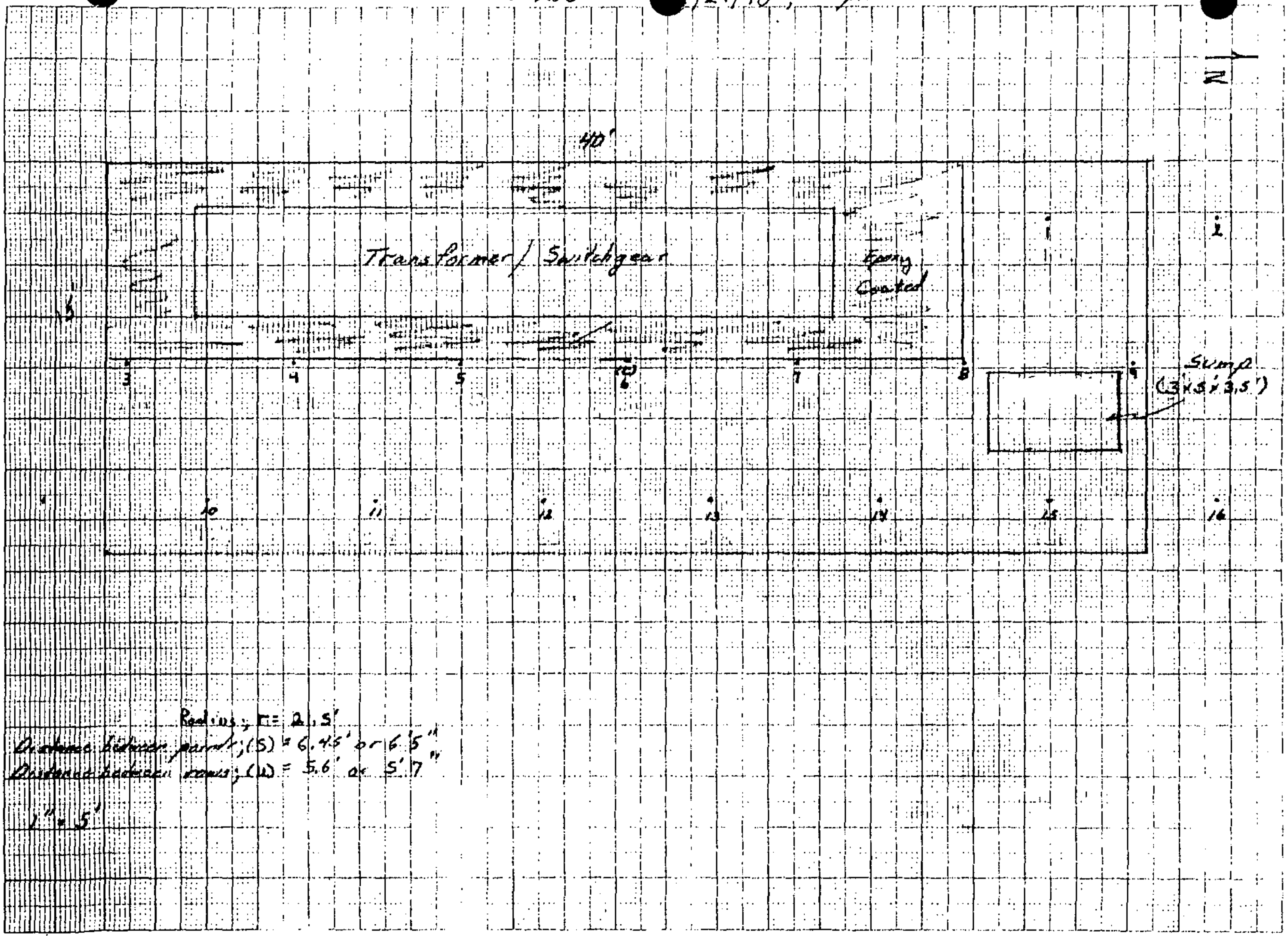
11/7/90 11/6/90

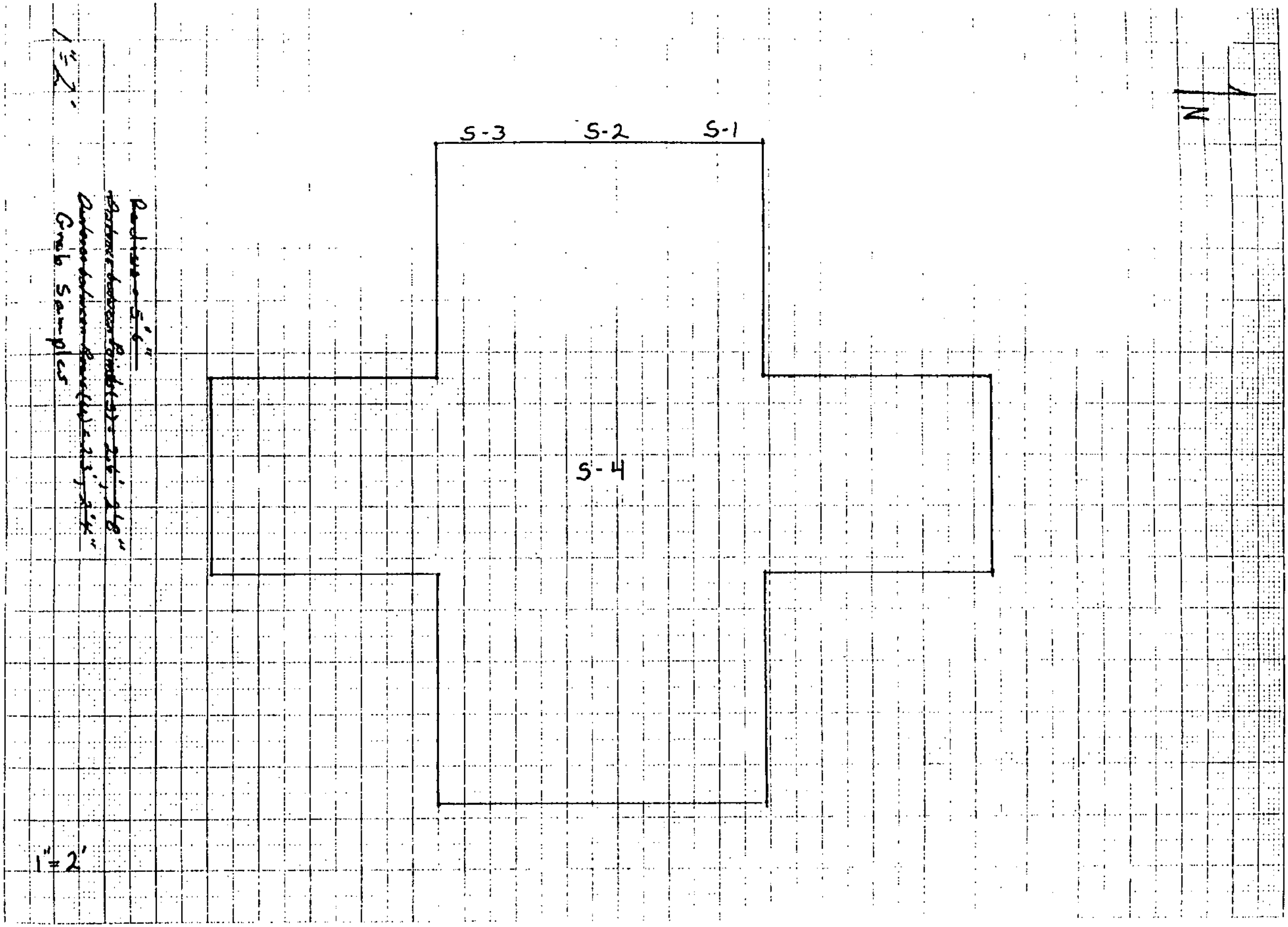
Date — Date — Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in 'Quality Assurance for Health and Environmental Chemistry: 1986,' LA-11114-MS, pp. 3-4.

****

TA-16-260 [illegible]/29/90, Sampled




1"=2'
Radius = 5'6"
Grab Samples
S-3
S-2
S-1
S-4
N
1"=2'

REPORT NUMBER: 8167

******************** HSE-9 ANALYTICAL REPORT ********************

Prepared by: DMS on 14-Sep-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10731 MATRIX: FS ANALYST: Dee Seitz PROGRAM CODE: WA56

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 5-4752 TASK-ID:

SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90.01304-MRA	90.17071	1336363	107.	43.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01305-MRA	90.17072	1336363	14.1	2.8	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01306-MRA	90.17073	1336363	9.6	1.9	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01307-MRA	90.17074	1336363	20.	4.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01308-MRA	90.17075	1336363	56.	22.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01309-MRA	90.17076	1336363	610.	240.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01310-MRA	90.17077	1336363	260.	100.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01311-MRA	90.17078	1336363	866.	350.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01312-MRA	90.17079	1336363	17.7	3.5	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01313-MRA	90.17080	1336363	< 0.4		UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01314-MRA	90.17081	1336363	85.	34.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01315-MRA	90.17082	1336363	24.	4.7	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01316-MRA	90.17083	1336363	8.5	1.7	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01317-MRA	90.17084	1336363	131.	52.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01318-MRA	90.17085	1336363	129.	[illegible]	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01319-MRA	90.17086	1336363	183.	[illegible]	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01320-MRA	90.17087	1336363	271.	108.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01321-MRA	90.17088	1336363	276.	110.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01322-MRA	90.17089	1336363	290.	[illegible]	UG/SAMPLE	9/14/90		Mixed-Aroclor

DETAILED PCB DATA for customer samples on this report

TA-16-26; Samples 8/27/90

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90.01304-MRA	90.17071	1336363	107.	43.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01304-MRA	90.17071	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01304-MRA	90.17071	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01304-MRA	90.17071	11096825	107.	43.	UG/SAMPLE	9/14/90		Aroclor 1260
90.01305-MRA	90.17072	1336363	14.1	2.8	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01305-MRA	90.17072	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01305-MRA	90.17072	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01305-MRA	90.17072	11096825	14.1	2.8	UG/SAMPLE	9/14/90		Aroclor 1260
90.01306-MRA	90.17073	1336363	9.6	1.9	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01306-MRA	90.17073	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01306-MRA	90.17073	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01306-MRA	90.17073	11096825	9.6	1.9	UG/SAMPLE	9/14/90		Aroclor 1260
90.01307-MRA	90.17074	1336363	20.	4.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01307-MRA	90.17074	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01307-MRA	90.17074	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01307-MRA	90.17074	11096825	20.	4.	UG/SAMPLE	9/14/90		Aroclor 1260
90.01308-MRA	90.17075	1336363	56.	22.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01308-MRA	90.17075	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01308-MRA	90.17075	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01308-MRA	90.17075	11096825	56.	22.	UG/SAMPLE	9/14/90		Aroclor 1260
90.01309-MRA	90.17076	1336363	610.	240.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01309-MRA	90.17076	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01309-MRA	90.17076	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01309-MRA	90.17076	11096825	610.	240.	UG/SAMPLE	9/14/90		Aroclor 1260
90.01310-MRA	90.17077	1336363	260.	100.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01310-MRA	90.17077	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01310-MRA	90.17077	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01310-MRA	90.17077	11096825	260.	100.	UG/SAMPLE	9/14/90		Aroclor 1260
90.01311-MRA	90.17078	1336363	866.	350.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01311-MRA	90.17078	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01311-MRA	90.17078	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01311-MRA	90.17078	11096825	866.	350.	UG/SAMPLE	9/14/90		Aroclor 1260
90.01312-MRA	90.17079	1336363	17.7	3.5	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01312-MRA	90.17079	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01312-MRA	90.17079	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01312-MRA	90.17079	11096825	17.7	3.5	UG/SAMPLE	9/14/90		Aroclor 1260
90.01313-MRA	90.17080	1336363	< 0.4		UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01313-MRA	90.17080	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242
90.01313-MRA	90.17080	11097691	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1254
90.01313-MRA	90.17080	11096825	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1260
90.01314-MRA	90.17081	1336363	85.	34.	UG/SAMPLE	9/14/90		Mixed-Aroclor
90.01314-MRA	90.17081	53469219	< 0.4		UG/SAMPLE	9/14/90		Aroclor 1242

90.01314-MRA	90.17081	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01314-MRA	90.17081	11096825	85.	34.	UG/SAMPLE	9/14/90	Aroclor 1260
90.01315-MRA	90.17082	1336363	24.	4.7	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01315-MRA	90.17082	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01315-MRA	90.17082	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01315-MRA	90.17082	11096825	24.	4.7	UG/SAMPLE	9/14/90	Aroclor 1260
90.01316-MRA	90.17083	1336363	8.5	1.7	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01316-MRA	90.17083	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01316-MRA	90.17083	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01316-MRA	90.17083	11096825	8.5	1.7	UG/SAMPLE	9/14/90	Aroclor 1260
90.01317-MRA	90.17084	1336363	131.	52.	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01317-MRA	90.17084	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01317-MRA	90.17084	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01317-MRA	90.17084	11096825	131.	52.	UG/SAMPLE	9/14/90	Aroclor 1260
90.01318-MRA	90.17085	1336363	129.	52.	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01318-MRA	90.17085	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01318-MRA	90.17085	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01318-MRA	90.17085	11096825	129.	52.	UG/SAMPLE	9/14/90	Aroclor 1260
90.01319-MRA	90.17086	1336363	183.	73.	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01319-MRA	90.17086	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01319-MRA	90.17086	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01319-MRA	90.17086	11096825	183.	73.	UG/SAMPLE	9/14/90	Aroclor 1260
90.01320-MRA	90.17087	1336363	271.	108.	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01320-MRA	90.17087	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01320-MRA	90.17087	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01320-MRA	90.17087	11096825	271.	108.	UG/SAMPLE	9/14/90	Aroclor 1260
90.01321-MRA	90.17088	1336363	276.	110.	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01321-MRA	90.17088	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01321-MRA	90.17088	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01321-MRA	90.17088	11096825	276.	110.	UG/SAMPLE	9/14/90	Aroclor 1260
90.01322-MRA	90.17089	1336363	290.	116.	UG/SAMPLE	9/14/90	Mixed-Aroclor
90.01322-MRA	90.17089	53469219	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1242
90.01322-MRA	90.17089	11097691	< 0.4		UG/SAMPLE	9/14/90	Aroclor 1254
90.01322-MRA	90.17089	11096825	290.	116.	UG/SAMPLE	9/14/90	Aroclor 1260

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REPORT NUMBER: 8167 (continued)

**************** HSE-9 QUALITY ASSURANCE REPORT ***************

Prepared by: DMS on 14-Sep-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10731 MATRIX: FS ANALYST: Dee Seitz PROGRAM CODE: WA56

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 5-4752 TASK-ID:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUN
00.99952	00.99952	1336363	13.2	2.6	UG/SAMPLE	12.5	1.	9/14/90	UNDER CONTROL	Mixed-Aroclor
00.99952	00.99952	53469219	13.2	2.6	UG/SAMPLE	12.5	1.	9/14/90	UNDER CONTROL	Aroclor 1242
00.99952	00.99952	11097691	< 0.4		UG/SAMPLE			9/14/90	UNDER CONTROL	Aroclor 1254
00.99952	00.99952	11096825	< 0.4		UG/SAMPLE			9/14/90	UNDER CONTROL	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
90.17090	1336363	11.2	2.2	UG/SAMPLE	10.	1.	9/14/90	UNDER CONTROL	Mixed-Aroclor
90.17090	53469219	11.2	2.2	UG/SAMPLE	10.	1.	9/14/90	UNDER CONTROL	Aroclor 1242
90.17090	11097691	< 0.4		UG/SAMPLE			9/14/90	UNDER CONTROL	Aroclor 1254
90.17090	11096825	< 0.4		UG/SAMPLE			9/14/90	UNDER CONTROL	Aroclor 1260

Dee Seitz 9/14/90

Reviewed 9/14/90

9/07/90

Amended 9/5/90

****

HSE-9 ANALYTICAL SERVICE AGREEMENT REQUEST-NUMBER: 10731

****

I. PRESAMPLING CONFERENCE: Organic Section

Program code: WA56 Task ID #: No. Samples Expected: 0019

Request date: 30-Aug-1990 Completion date: 27-Sep-1990

Chain of Custody: N Special protocol: NONE

Container Type: GLASS Preservative: NONE Storage Conditions: NONE

(See Memo HSE-9/88-304. Guidelines for Collection and Preservation of Liquid Samples)

Sample Hazards Present:
NONE

Sample Disposal: DISCARD (All hazardous samples or TRU wastes will be returned to the Customer.)

Customer: Michael Alexander HSE_9 SECTION LEADER: CPR

Customer initials: MRA Customer phone: 5-4752 MS: K490 Date: 5-Sep-1990

===

II. EMERGENCY SAMPLES: Emergency status REQUIRES the following approvals:

Customer Group Leader ______________________ HSE-9 Group Leader ______________________ Date ____________

===

III. SAMPLE RECEIPT

Signature [illegible] Date: 31-Aug-1990 Total No. received: 19 + 2QCs

Matrix	Initial SN		Final SN	# Received
FS	00.99952	to	00.99952	1
FS	90.17071	to	90.17090	20

Translation table of HSE-9/Customer numbers will be provided by Sample-Receiving and appear on each final data report

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HSE-9 ANALYTICAL CHEMISTRY REQUEST REQUEST-NUMBER: 10731

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Program code: WA56 Task ID number: Request date: 30-Aug-1990

Customer initials: MRA Customer phone: 5-4752 MS: K490

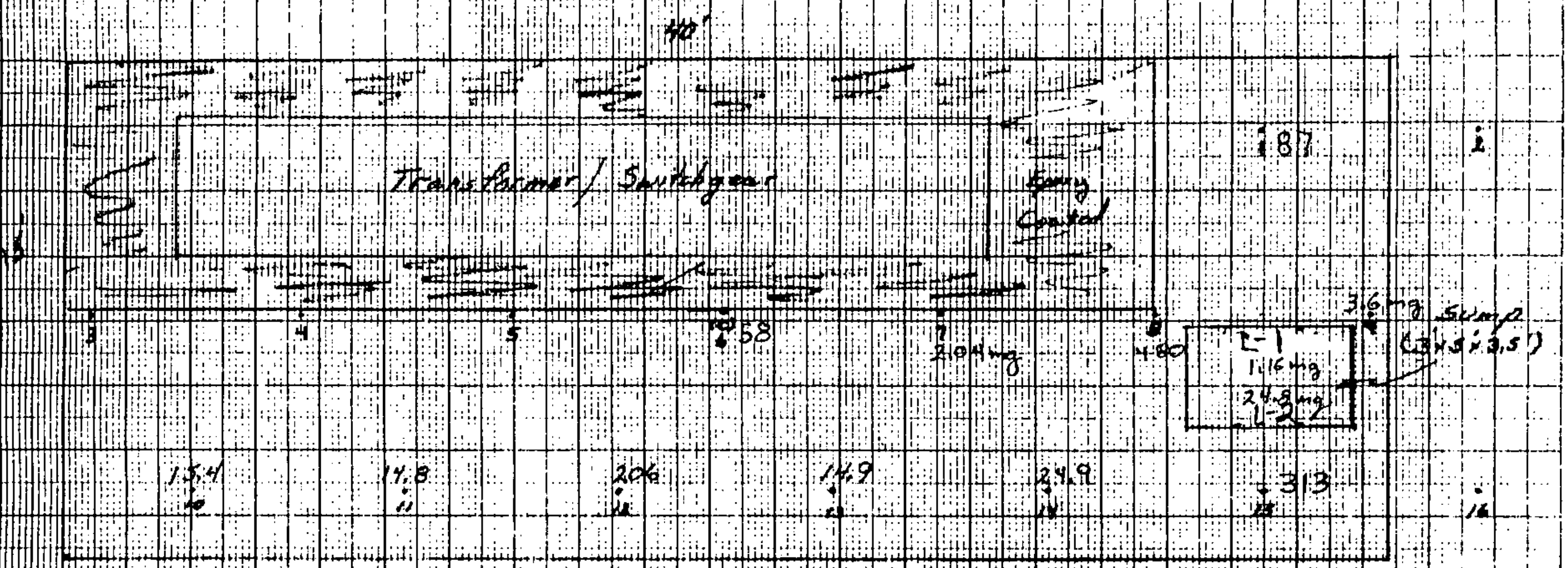
MATRIX	Initial		Final
FS	00.99952	to	00.99952
FS	90.17071	to	90.17090

Section	Analysis	Technique	Analyst	Due-date
0	1336363	GCEC	DMS	9/27/90

REMARKS:

PCB/SWIPES

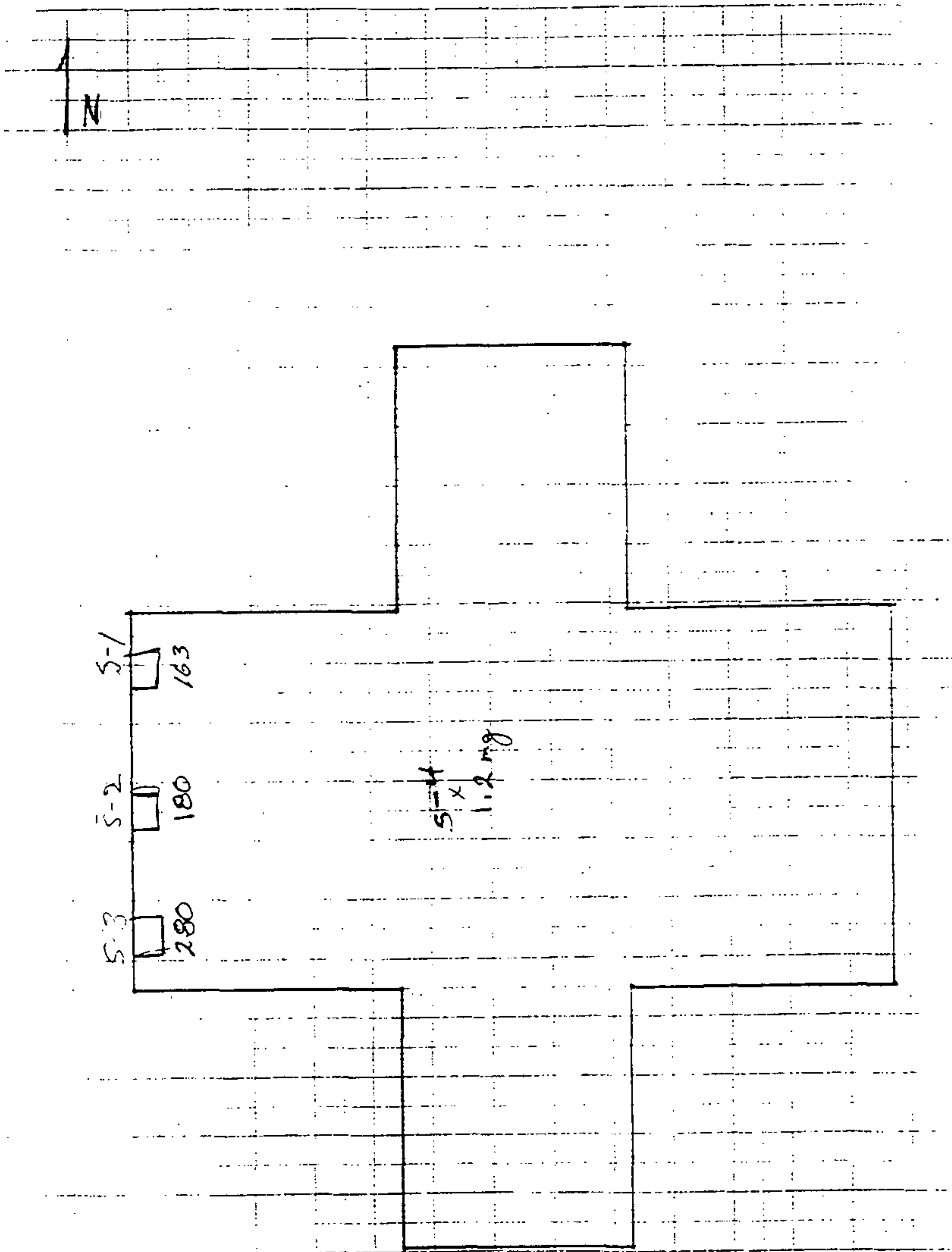
TA-16-260



Radius; m = 1.5'
[illegible] points; (S) = 6.45' or 6'5"
[illegible] rows; (W) = 5.6' or 5'7"

1" = 5'

TA-16-260, Sampled 7/13/90



~~Radius = 5'6"~~
~~Distance between Points(s) = 2.6', 2'8"~~
~~Distance between Rows(s) = 2.3', 2'4"~~
Grab Samples

1" = 2'

1" = 2'

REPORT NUMBER: 7364

******************** HSE-9 ANALYTICAL REPORT ********************

Prepared by: DMS on 19-Jul-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10597 MATRIX: FS ANALYST: Dee Seitz PROGRAM CODE: WA56

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0453 TASK-ID:

SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90-00575-MRA	90.15862	1336363	87.	17.4	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00576-MRA	90.15863	1336363	58.	11.6	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00577-MRA	90.15864	1336363	2.04	0.41	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00578-MRA	90.15865	1336363	480.	96.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00579-MRA	90.15866	1336363	3.6	0.72	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00580-MRA	90.15867	1336363	15.4	3.1	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00581-MRA	90.15868	1336363	14.8	2.9	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00582-MRA	90.15869	1336363	206.	41.2	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00583-MRA	90.15870	1336363	14.9	3.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00584-MRA	90.15872	1336363	24.9	5.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00585-MRA	90.15873	1336363	313.	62.6	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00586-MRA	90.15874	1336363	1.16	0.23	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00587-MRA	90.15875	1336363	24.8	4 94	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00588-MRA	90.15876	1336363	163.	3[illegible]	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00589-MRA	90.15877	1336363	180.	36.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00590-MRA	90.15878	1336363	280.	56.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00591-MRA	90.15879	1336363	1.2	0.2	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00592-MRA	90.15880	1336363	< 0.4		UG/SAMPLE	7/18/90		Mixed-Aroclor

DETAILED PCB DATA for customer samples on this report

TA-16-260, Sampled 7/13/90

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
90-00575-MRA	90.15862	1336363	87.	17.4	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00575-MRA	90.15862	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00575-MRA	90.15862	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00575-MRA	90.15862	11096825	87.	17.4	UG/SAMPLE	7/18/90		Aroclor 1260
90-00576-MRA	90.15863	1336363	58.	11.6	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00576-MRA	90.15863	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00576-MRA	90.15863	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00576-MRA	90.15863	11096825	58.	11.6	UG/SAMPLE	7/18/90		Aroclor 1260
90-00577-MRA	90.15864	1336363	2.04	0.41	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00577-MRA	90.15864	53469219	< 0.04		MG/SAMPLE	7/18/90		Aroclor 1242
90-00577-MRA	90.15864	11097691	< 0.04		MG/SAMPLE	7/18/90		Aroclor 1254
90-00577-MRA	90.15864	11096825	2.04	0.41	MG/SAMPLE	7/18/90		Aroclor 1260
90-00578-MRA	90.15865	1336363	480.	96.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00578-MRA	90.15865	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00578-MRA	90.15865	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00578-MRA	90.15865	11096825	480.	96.	UG/SAMPLE	7/18/90		Aroclor 1260
90-00579-MRA	90.15866	1336363	3.6	0.72	MG/SAMPLE	7/18/90		Mixed-Aroclor
90-00579-MRA	90.15866	53469219	< 0.04		MG/SAMPLE	7/18/90		Aroclor 1242
90-00579-MRA	90.15866	11097691	< 0.04		MG/SAMPLE	7/18/90		Aroclor 1254
90-00579-MRA	90.15866	11096825	3.6	0.72	MG/SAMPLE	7/18/90		Aroclor 1260
90-00580-MRA	90.15867	1336363	15.4	3.1	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00580-MRA	90.15867	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00580-MRA	90.15867	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00580-MRA	90.15867	11096825	15.4	3.1	UG/SAMPLE	7/18/90		Aroclor 1260
90-00581-MRA	90.15868	1336363	14.8	2.9	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00581-MRA	90.15868	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00581-MRA	90.15868	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00581-MRA	90.15868	11096825	14.8	2.9	UG/SAMPLE	7/18/90		Aroclor 1260
90-00582-MRA	90.15869	1336363	206.	41.2	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00582-MRA	90.15869	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00582-MRA	90.15869	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00582-MRA	90.15869	11096825	206.	41.2	UG/SAMPLE	7/18/90		Aroclor 1260
90-00583-MRA	90.15870	1336363	14.9	3.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00583-MRA	90.15870	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00583-MRA	90.15870	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00583-MRA	90.15870	11096825	14.9	3.	UG/SAMPLE	7/18/90		Aroclor 1260
90-00584-MRA	90.15872	1336363	24.9	5.	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00584-MRA	90.15872	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00584-MRA	90.15872	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254
90-00584-MRA	90.15872	11096825	24.9	5.	UG/SAMPLE	7/18/90		Aroclor 1260
90-00585-MRA	90.15873	1336363	313.	62.6	UG/SAMPLE	7/18/90		Mixed-Aroclor
90-00585-MRA	90.15873	53469219	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1242
90-00585-MRA	90.15873	11097691	< 0.4		UG/SAMPLE	7/18/90		Aroclor 1254

90-00585-MRA	90.15873	11096825	313.	62.6	UG/SAMPLE	7/18/90	Aroclor 1260
90-00586-MRA	90.15874	1336363	1.16	0.23	MG/SAMPLE	7/18/90	Mixed-Aroclor
90-00586-MRA	90.15874	53469219	< 0.04		MG/SAMPLE	7/18/90	Aroclor 1242
90-00586-MRA	90.15874	11097691	< 0.04		MG/SAMPLE	7/18/90	Aroclor 1254
90-00586-MRA	90.15874	11096825	1.16	0.23	MG/SAMPLE	7/18/90	Aroclor 1260
90-00587-MRA	90.15875	1336363	24.8	4.94	MG/SAMPLE	7/18/90	Mixed-Aroclor
90-00587-MRA	90.15875	53469219	< 0.04		MG/SAMPLE	7/18/90	Aroclor 1242
90-00587-MRA	90.15875	11097691	< 0.04		MG/SAMPLE	7/18/90	Aroclor 1254
90-00587-MRA	90.15875	11096825	24.8	4.94	MG/SAMPLE	7/18/90	Aroclor 1260
90-00588-MRA	90.15876	1336363	163.	32.6	UG/SAMPLE	7/18/90	Mixed-Aroclor
90-00588-MRA	90.15876	53469219	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1242
90-00588-MRA	90.15876	11097691	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1254
90-00588-MRA	90.15876	11096825	163.	32.6	UG/SAMPLE	7/18/90	Aroclor 1260
90-00589-MRA	90.15877	1336363	180.	36.	UG/SAMPLE	7/18/90	Mixed-Aroclor
90-00589-MRA	90.15877	53469219	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1242
90-00589-MRA	90.15877	11097691	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1254
90-00589-MRA	90.15877	11096825	180.	36.	UG/SAMPLE	7/18/90	Aroclor 1260
90-00590-MRA	90.15878	1336363	280.	56.	UG/SAMPLE	7/18/90	Mixed-Aroclor
90-00590-MRA	90.15878	53469219	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1242
90-00590-MRA	90.15878	11097691	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1254
90-00590-MRA	90.15878	11096825	280.	56.	UG/SAMPLE	7/18/90	Aroclor 1260
90-00591-MRA	90.15879	1336363	1.2	0.2	MG/SAMPLE	7/18/90	Mixed-Aroclor
90-00591-MRA	90.15879	53469219	< 0.04		MG/SAMPLE	7/18/90	Aroclor 1242
90-00591-MRA	90.15879	11097691	< 0.04		MG/SAMPLE	7/18/90	Aroclor 1254
90-00591-MRA	90.15879	11096825	1.2	0.2	MG/SAMPLE	7/18/90	Aroclor 1260
90-00592-MRA	90.15880	1336363	< 0.4		UG/SAMPLE	7/18/90	Mixed-Aroclor
90-00592-MRA	90.15880	53469219	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1242
90-00592-MRA	90.15880	11097691	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1254
90-00592-MRA	90.15880	11096825	< 0.4		UG/SAMPLE	7/18/90	Aroclor 1260

REPORT NUMBER: 7364 (continued)

**************** HSE-9 QUALITY ASSURANCE REPORT **************

Prepared by: DMS on 19-Jul-1990

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10597 MATRIX: FS ANALYST: Dee Seitz PROGRAM CODE: WA56

OWNER: Michael Alexander GROUP: HSE-8 MAIL-STOP: K490 PHONE: 7-0453 TASK-ID:

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND
00.99802	00.99802	1336363	13.5	2.7	UG/SAMPLE	19.	2.	7/18/90	UNDER CONTROL	Mixed-Aroclor
00.99802	00.99802	53469219	< 0.4		UG/SAMPLE			7/18/90	UNDER CONTROL	Aroclor 1242
00.99802	00.99802	11097691	< 0.4		UG/SAMPLE			7/18/90	UNDER CONTROL	Aroclor 1254
00.99802	00.99802	11096825	13.5	2.7	UG/SAMPLE	19.	2.	7/18/90	UNDER CONTROL	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
90.15871	1336363	6.4	1.3	UG/SAMPLE	8.5	0.8	7/18/90	UNDER CONTROL	Mixed-Aroclor
90.15871	53469219	< 0.4		UG/SAMPLE			7/18/90	UNDER CONTROL	Aroclor 1242
90.15871	11097691	< 0.4		UG/SAMPLE			7/18/90	UNDER CONTROL	Aroclor 1254
90.15871	11096825	6.4	1.3	UG/SAMPLE	8.5	0.8	7/18/90	UNDER CONTROL	Aroclor 1260

Dee Seitz 7/19/90

7/23/90

7/26/90

****

HSE-9 ANALYTICAL SERVICE AGREEMENT REQUEST-NUMBER: 10597

****

I. PRESAMPLING CONFERENCE: Organic Section

Program code: WA56 Task ID #: No. Samples Expected: 0018

Request date: 16-Jul-1990 Completion date: 13-Aug-1990

Chain of Custody: N Special protocol: NONE

Container Type: GLASS Preservative: NONE Storage Conditions: REFRIGERATE

(See Memo HSE-9/88-304. Guidelines for Collection and Preservation of Liquid Samples)

Sample Hazards Present:
NONE

Sample Disposal: DISCARD (All hazardous samples or TRU wastes will be returned to the Customer.)

Customer: Michael Alexander HSE_9 SECTION LEADER: LAT

Customer initials: MRA Customer phone: 7-0453 MS: K490 Date: 16-Jul-1990

==

II. EMERGENCY SAMPLES: Emergency status REQUIRES the following approvals:

Customer Group Leader ______________ HSE-9 Group Leader ______________ Date ________

==

III. SAMPLE RECEIPT

Signature Elizabeth A. Sosa Date: 16-Jul-1990 Total No. received: 18+20C

Matrix	Initial SN		Final SN	# Received
FS	00.99802	to	00.99802	1
FS	90.15862	to	90.15880	19

Translation table of HSE-9/Customer numbers will be provided by Sample-Receiving and appear on each final data report

****

HSE-9 ANALYTICAL CHEMISTRY REQUEST REQUEST-NUMBER: 10597

****

Program code: WA56 Task ID number: Request date: 16-Jul-1990

Customer initials: MRA Customer phone: 7-0453 MS: K490

MATRIX	Initial		Final
FS	00.99802	to	00.99802
FS	90.15862	to	90.15880

Section	Analysis	Technique	Analyst	Due-date
0	1336363	GCEC	DMS	8/13/90

REMARKS:

MIKE WOULD LIKE PRELIMINARY RESULTS BY THE MIDDLE OF NEXT WEEK

16-000076

Los Alamos

Los Alamos National Laboratory
Los Alamos,New Mexico 87545

memorandum

TO A. John Ahlquist, HSE-8, MS K490

DATE: November 17, 1983

FROM Charles D. Blackwell, HSE-1

MAIL STOP/TELEPHONE: K490

SYMBOL HSE8-83-794

SUBJECT STRUCTURES REMOVED FROM TA-16

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-1	Admin. Bldg.	1956	None
TA=16-2	Office	1956	None
TA-16-3	ZIA Elect. Bldg.	1956	None
TA-16-4	Inflam. Stk. Storage	1956	Var. chem.
TA-16-5	Instrument Shop	1956	None
TA-16-6	ZIA Repair Shop	1956	None
TA-16-8	ZIA Cabinet Shop	1956	None
TA-16-9	Motor Pool Dispatch Off.	1956	None
TA-16-11	Storage	1956	None
TA-16-12	Warehouse	1956	None
TA-16-14	Guard House	1956	None
TA-16-15	Laundry & Locker Room	1956	HE
TA-16-17	Plumbing Shop	1956	HE
TA-16-18*	Steam Washing House	1960	HE
TA-16-19	Pump House	1956	HE
TA-16-20	Water Pump Pit	1953	HE
TA-16-22	Office	1961	None
TA-16-23	Storage	1951	None
TA-16-24	Analytical Lab	1968	HE
TA-16-25*	Process Bldg.	1960	HE
TA-16-26	Process Bldg.	1968	HE
TA-16-28	Water Cooling Tower	1968	None
TA-16-29	Fuel oil tank	1956	None
TA-16-30*	Magazine	1960	HE
TA-16-31*	Mach. Bldg.	1960	HE
TA-16-32*	Mach. Bldg.	1960	HE
TA-16-33*	Mach. Bldg.	1960	HE
TA-16-34*	Magazine	1960	HE
TA-16-35*	Equipment Room	1960	HE
TA-16-36*	Steam Cleaning	1960	HE
TA-16-37*	Explosive Testing	1960	HE
TA-16-38*	Experimental casting	1960	HE

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Cont.-2

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-39*	Radiographic Bldg.	1960	^{238}U, ^{60}Co, ^{226}Ra
TA=16-40*	Radiographic Bldg.	1960	^{238}U, ^{60}Co, ^{226}Ra
TA-16-41*	Process Lab	1960	HE
TA-16-42*	Process Bldg.	1960	HE
TA-16-43*	Process Bldg.	1960	HE
TA-16-44*	Process Bldg.	1960	HE
TA-16-45*	Process Bldg.	1960	HE
TA-16-46*	Process Bldg.	1960	^{238}U, HE
TA-16-47*	Equipment Bldg.	1960	HE
TA-16-48*	Smoking Room	1960	^{238}U
TA-16-49*	Analytical Lab	1960	HE
TA-16-50*	Experimental Casting	1960	HE
TA-16-51*	Steam Cleaning	1960	HE
TA-16-52*	Explosive Material	1960	HE
TA-16-53*	Optical Equip. Storage	1960	HE
TA-16-55*	Grinding Bldg.	1960	HE
TA-16-56*	Testing Lab	1960	HE
TA-16-57*	Magazine	1960	HE
TA-16-60	Magazine	1950	HE
TA-16-62	Magazine	1968	HE
TA-16-64	Magazine	1951	HE
TA-16-65	Magazine	1951	HE
TA-16-66*	Magazine	1960	HE
TA-16-67*	Magazine	1960	HE
TA-16-68*	Magazine	1960	HE
TA-16-69*	Magazine	1960	HE
TA-16-70*	Magazine	1960	HE
TA-16-71*	Magazine	1960	HE
TA-16-72*	Magazine	1960	HE
TA-16-74*	Magazine	1960	HE
TA-16-81*	Process Bldg. & Fan Room	1960	HE
TA-16-82	Storage	1968	HE
TA-16 83*	Laboratory	1960	HE
TA-16-84*	Magazine	1960	HE
TA-16-85	Warehouse	1947	None
TA-16-86*	Laboratory	1960	HE
TA-16-87*	Machine Shop Trailer	1960	None
TA-16-94*	Equipment & Control	1960	HE
TA-16-95*	Mach. Bldg.	1960	HE
TA-16-96*	Mach. Bldg.	1960	HE
TA-16-97*	Mach. Bldg.	1960	HE
TA-16-98*	Mach. Bldg.	1960	HE
TA-16-100*	Process Bldg.	1960	HE

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Contd.-3

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-102*	Passageway	1960	None
TA=16-103*	Passageway	1960	None
TA-16-104*	Passageway	1960	None
TA-16-105	Passageway	1968	None
TA-16-106	Storage	1949	HE
TA-16-107	Storage	1950	HE
TA-16-108	Storage	1950	HE
TA-16-109	Storage	1950	HE
TA-16-110	Barricade	1968	None
TA-16-113*	Barricade	1960	None
TA-16-114*	Barricade	1960	None
TA-16-115*	Barricade	1960	None
TA-16-116*	Barricade	1960	None
TA-16-117	Barricade	1951	None
TA-16-118	Barricade	1950	None
TA-16-119	Barricade	1948	None
TA-16-120*	Barricade	1960	None
TA-16-121	Barricade	1968	None
TA-16-122	Barricade	1962	None
TA-16-123	Barricade	1949	None
TA-16-124	Barricade	1949	None
TA-16-125*	Barricade	1960	None
TA-16-126*	Barricade	1960	None
TA-16-127*	Barricade	1960	None
TA-16-128*	Barricade	1960	None
TA-16-129*	Barricade	1960	None
TA-16-130	Guard House	1956	None
TA-16-131*	Guard House	1960	None
TA-16-132	Paint Shop Shed	1955	None
TA-16-133	Lumber Storage	1955	None
TA-16-134	Mess Hall	1955	None
TA-16-135	Storage Bldg.	1953	None
TA-16 136	Implement Shed	1955	None
TA-16-137	Plb. & Elect. Shop	1955	HE
TA-16-138	Blacksmith Shop	1955	None
TA-16-139	Storage Bldg.	1955	HE
TA-16-140	Storage Bldg.	1955	HE
TA-16-141	Storage Bldg.	1955	HE
TA-16-142	Fire House	1955	None
TA-16-143	Hose House	1955	None
TA-16-144	Equipment Room	1955	None
TA-16-145	Latrine	1955	None
TA-16-146	Storage	1955	HE

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Contd.-4

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-147	Road Block	1954	None
TA-16-148	Equip Bldg.	1968	None
TA-16-149	Guard House	1950	None
TA-16-150	Hose House	1958	None
TA-16-151	Hose House	1958	None
TA-16-152	Hose House	1958	None
TA-16-158*	Barricade	1960	None
TA-16-159*	Barricade	1960	None
TA-16-160	Road Block	1956	None
TA-16-161	Septic tank	-	None
TA-16-162	Latrine	1971	None
TA-16-165	Guard House	1956	None
TA-16-166*	Passageway	1960	None
TA-16-167	Hose House	1958	None
TA-16-168	Manhole	1952	None
TA-16-172	Water Storage Tank	Relocated to TA-49-66	None
TA-16-174	Septic Tank Sanitary	-	None
TA-16-176	Septic Tank, Sanitary	-	None
TA-16-177	Septic Tank, Sanitary	1968	None
TA-16-179	Septic Tank, Sanitary	-	None
TA-16-181	Tank Housing	1956	None
TA-16-182	Diesel Unit Bldg.	1956	None
TA-16-183	Drum Storage	1968	Var. Chem.
TA-16-184	Drum Storage	-	Var. Chem.
TA-16-185	Drum Storage	-	Var. Chem.
TA-16-186	Drum Storage	-	Var. Chem.
TA-16-187	Drum Storage	-	Var. Chem.
TA-16-188	Drum Storage	1956	Var. Chem.
TA-16-189	Cooling Tower	1960	None
TA-16-190	Drum Storage	1955	Var. Chem.
TA-16-198	Hose House	-	None
TA-16-199	Reserve	-	None
TA-16 211	Road Block	Relocated to TA-6-50	None
TA-16-212	Road Block	Relocated to TA-15-215	None
TA-16-262	Cooling Tower	1957	None
TA-16-272	Septic Tank	-	None
TA-16-273	Dosing Chamber	-	HE
TA-16-274	Distribution Box	-	None
TA-16-346	Road Block	1962	None
TA-16-347	Road Block	1962	None
TA-16-348	Road Block	1962	None
TA-16-384	Reserve	1970	None
TA-16-393	Filter Bed	1964	HE

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Contd.-5

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-396	Latrine	1968	None
TA-16-397	Road Block	1960	None
TA-16-403	Reserve	1968	None
TA-16-464	Magazine	1966	HE
TA-16-475	Office & Shop Bldg.	1951	None
TA-16-479	Storage Bldg.	1951	^{238}U
TA-16-480	Experimental Chamber	1950	^{238}U, HE
TA-16-481	Magazine	1951	HE
TA-16-482	Storage Bldg.	1951	None
TA-16-483	Barricade	1951	None
TA-16-485	Road Block	1951	None
TA-16-486	Septic Tank	1951	None
TA-16-487	Transformer Sta.	1951	None
TA-16-488	Magazine	1951	HE
TA-16-490*	Laboratory Bldg.	1960	^{238}U
TA-16-491*	Hutment	1960	^{238}U
TA-16-492*	Hutment	1960	^{238}U
TA-16-493*	Magazine	1960	HE
TA-16-494*	Magazine	1960	HE
TA-16-495*	Hutment	1960	^{238}U
TA-16-496*	Hutment	1960	^{238}U
TA-16-497*	Magazine	1960	HE 5/12/54)
TA-16-498*	Hutment	1960	^{238}U
TA-16-499*	Hutment	1960	^{238}U
TA-16-500*	Hutment	1960	^{238}U
TA-16-501	Guard House	1950	None
TA-16-502	Steam Plant	1960	None
TA-16-503	Radiation Barricade	1960	None
TA-16-504	Septic Tank, Sanitary	1960	None
TA-16-505*	Passageway	1960	None
TA-16-506	Manhole, Steam	1968	None
TA-16-507*	Sump pit, Chem.	1960	Var. Chem.
TA-16 508	Manhole, Water	1968	None
TA-16-509	Manhole, Steam	1968	None
TA-16-510*	Switch Box	1960	None
TA-16-511	Manhole, Steam	1968	None
TA-16-512	Underground Tank, oil	1968	None
TA-16-513	Road Block	1951	None
TA-16-521	Tank Stand	1968	None
TA-16-522	Bldg. No. 3	1945	Be
TA-16-523	Pit	1945	HE, Be
TA-16-524	Pit, elect.	1945	None
TA-16-556	Road Block	1951	None

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Contd.-6

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-557	Road Block	1956	None
TA-16-566	Transformer Sta	1959	None
TA-16-567	Transformer Sta	1966	None
TA-16-574	Transformer Sta	1966	None
TA-16-575	Transformer Sta	1966	None
TA-16-576	Transformer Sta	Relocated to TA-15-206	None
TA-16-577	Transformer Sta	1960	None
TA-16-578	Transformer Sta	1960	None
TA-16-579	Transformer Sta	1960	None
TA-16-580	Transformer Sta	1966	None
TA-16-581	Transformer Sta	1966	None
TA-16-582	Transformer Sta	1960	None
TA-16-583	Transformer Sta	1960	None
TA-16-584	Transformer Sta	1966	None
TA-16-800	Manhole, Industrial Waste	-	HE
TA-16-801	Manhole, Drainage	-	HE
TA-16-888	Mahhole, Elect.	1972	None
TA-16-889	Manhole, Elect.	1972	None
TA-16-1000	Guard House	Relocated to TA-18-112	None
TA-16-1001	Guard House	Relocated to TA-1-288	None
TA-16-1079	Manhole, Steam	-	None
TA-16-1083	Manhole, Steam	1951	None
TA-16-1084	Manhole, Steam	-	None
TA-16-1086	Reserve	1970	None
TA-16-1087	Reserve	1970	None
TA-16-1090	Reserve	1970	None
TA-16-1101	Oil Switch	1966	None
TA-16-1102	Oil Switch	1966	None
TA-16-1103	Oil Switch	1966	None
TA-16-1104	Drum Storage	-	Var Chem.
TA-16-1105	Drum Storage	-	Var. Chem
TA-16-1106	Drum Storage	-	Var. Chem.
TA-16 1107	Drum Storage	-	Var. Chem.
TA-16-1108	Drum Storage	-	Var. Chem.
TA-16-1109	Drum Storage	1956	Var. Chem.
TA-16-1110	Drum Storage	1958	Var. Chem.
TA-16-1111	Drum Storage	1968	Var. Chem.
TA-16-1130	Water Tank	1949	None
TA-16-1131	Water Tank	1949	None
TA-16-1132	Septic Tank	1956	None
TA-16-1133	Guard House	Relocated to TA-21-168	None
TA-16-1136	Trough (Basket Washing Fac.)	-	HE
TA-16-1137	Manhole (Grease Trap)	-	HE

This report covers only those structures removed from TA-16. Listed below are structure numbers, building nomenclature, removal date, structure use and/or hazardous materials used in each area, if known.

Contd.-7

Structure Number	Structure Nomenclature	Removal Date	Structure Use and/or Hazardous Material Use
TA-16-1138	Fuel Tank	-	None
TA-16-1139	Fuel Tank	-	None
TA-16-1140	Fuel Tank	1956	None
TA-16-1141	Guard Tower	1946	None

* The structures marked this way were burned in place in January or February of 1960. The remaining debris was disposed of in some unknown method.

CDB:mlk

16-000114

S. E. Russo, Group Leader, Eng-3 March 15, 1960

Charles D. Blackwell, Alt. Leader General Monitoring Section, H-1

CONTAMINATION SURVEY, TA-16

H-1

In regard to your request of March 14, 1960, to furnish radioactive contamination clearance of the below listed structures, we have checked into the past history of these structures and find they have never been used in conjunction with radioactive material. Therefore, they may be considered as free from all types of radioactive materials and subject to approval of Groups H-3 and H-5, may be released for further assignment.

Structure Number	Description
TA-16-174	Septic tank (sanitary)
TA-16-508	Manhole (water)
TA-16-509	Manhole (steam)
TA-16-511	Manhole (steam)
TA-16-512	Underground tank (oil)
TA-16-1084	Manhole (steam)

Charles D. Blackwell

Charles D. Blackwell

CDB/el

cc: Dean Meyer, H-1
Roy Reider, H-3
Harry Schulte, H-5
File

OFFICE MEMORANDUM

TO : S. E. Russo, Group Leader, ENG-3 DATE: July 10, 1967

THRU : Dean D. Meyer, Group Leader, H-1

FROM : Carl Buckland, Leader, General Monitoring Section, H-1

SUBJECT: RADIOACTIVE CONTAMINATION SURVEY: S-SITE STRUCTURES, TA-16

SYMBOL : H-1

16-000131

As requested in your memo of July 5, 1967, the following structures, including exposed and accessible outside utility lines, have been monitored by members of this Section and found to be free of any detectable radioactive contamination.

Structure Number	Description
TA-11-16	Tank, storage
TA-11-17	Tank, storage
*TA-11-18	Latrine
TA-16-174	Tank, septic
TA-16-177	Tank, septic
TA-16-183	Drum storage
TA-16-198	Hose house
TA-16-272	Tank, septic
*TA-16-273	Dosing chamber
*TA-16-274	Distribution box
TA-16-396	Latrine
TA-16-431	Tank, septic
TA-16-521	Platform
TA-16-575	Transformer station (concrete pad onl
TA-16-1111	Drum storage
TA-16-1138	Tank, fuel
TA-16-1139	Tank, fuel

*Has been removed, but area was monitored and found clean.

Also monitored were the following items which have no structure numbers including miscellaneous debris:

1) Six concrete piers, which formerly supported escape ramps, located around Building 16-27, TA-16.
2) Two underground gasoline tanks, fuel lines and pump bases, located northwest of Building 16-10, TA-16.
3) Underground gasoline tank located 6 feet south of Building 16-200, TA-16.

Carl Buckland

Carl Buckland

Rad'n + Contam. Survey

1967

CB/el
cc: File✓
Roy Reider, H-3
H. F. Schulte, H-5
W. R. Kennedy, H-6

I N T E R O F F I C E   M E M O R A N D U M

Date: 02-May-1995 05:55am MST
From: Postmaster@vega.jci.lanl.gov
Postmaster@vega.jci.lanl.gov@S
Dept:
Tel No:

TO: COOK_PAULA_T (COOK_PAULA_T@A1)

Subject: Undeliverable Mail

```
Bad address -- <carmechial_j@lanl.gov>
Error -- Address refused by receiver: <carmechial_j@lanl.gov> (550 <carmechial_j
Bad address -- <Martin_b@lanl.gov>
Error -- Address refused by receiver: <Martin_b@lanl.gov> (550 <Martin_b@lanl.go
Bad address -- <Buksa_m@lanl.gov>
Error -- Address refused by receiver: <Buksa_m@lanl.gov> (550 <Buksa_m@lanl.gov>

Start of returned message

  Received: with SMTP-MR; Tue, 2 May 1995 06:52:13 MST
  MR-Received: by mta VEGA; Relayed; Tue, 02 May 1995 06:52:13 -0700 (MST)
  Alternate-recipient: prohibited
  Date: Tue, 2 May 1995 06:50:39 MST
  From: PAULA COOK 7-7098 <COOK_PAULA_T@A1.JCI.LANL.GOV>
  Subject: FWD: TA-16 Drilling
  To: carmechial_j@lanl.gov, Martin_b@lanl.gov, Buksa_m@lanl.gov
  Message-id: <E14ZVSY9T9DC*/R=VEGA/R=A1/U=COOK_PAULA_T/@MHS>
  MIME-version: 1.0
  Content-type: MULTIPART/MIXED; BOUNDARY="Boundary (ID Pja6pUnWxmTlZG2JDy6C9Q)"
  Posting-date: Tue, 2 May 1995 06:52:00 MST
  Importance: normal
  Priority: normal
  UA-content-id: E14ZVSY9T9DC
  X400-MTS-identifier: [;31256020505991/58393@VEGA]
  A1-type: MAIL
  Hop-count: 0

  --Boundary (ID Pja6pUnWxmTlZG2JDy6C9Q)
  Content-type: TEXT/PLAIN

  For your information

  --Boundary (ID Pja6pUnWxmTlZG2JDy6C9Q)
  Content-type: MESSAGE/RFC822

  Date: Sun, 30 Apr 1995 12:25:05 MST
  Subject: TA-16 Drilling
  Sender: PAULA COOK 7-7098 <COOK_PAULA_T@A1.JCI.LANL.GOV>
  To: ROBERT GEORGIEFF <GEORGIEFF_ROBERT_K@A1.JCI.LANL.GOV>
  Cc: WILBERT HOBBS <HOBBS_WILBERT@A1.JCI.LANL.GOV>,
   DON MCCOY <MCCOY_DON_S@A1.JCI.LANL.GOV>,
   Jeff Carmechical <"PAPER MAIL"@A1.JCI.LANL.GOV>,
   Brad Martin <"PAPER MAIL"@A1.JCI.LANL.GOV>,
   Margo Buksa <"PAPER MAIL"@A1.JCI.LANL.GOV>
  Message-id: <E95ZVSWIAFQV*/R=VEGA/R=A1/U=COOK_PAULA_T/@MHS>
  Content-type: TEXT/PLAIN
  Delivery-date: Sun, 30 Apr 1995 12:48:00 MST
```

16-000060

Posting-date: Sun, 30 Apr 1995 12:48:00 MST
Importance: normal
A1-type: MAIL

Robert,

On Friday, April 28, 1995, we moved to the other boring after losing core bit in the first boring on Wednesday. We drilled using 7-1/2 inch auger 30 feet and then begin air coring. I never got any LEL readings from the TMX 410 at any point in drilling. We started our PID sampling at 55 feet. The following is readings recieved with the MSA Gas Dectector (Photon).

55 feet 2300 PID reading
60 feet 2068 PID reading
65 feet 1908 PID reading

The samples at 65 feet still smelled of fuel and as can see by the readings. It looked as though we may need to go deeper than the 75 feet at th time and so Carolyn Cooper from Geotest gave me a field estimate of $1537.50 t go 100 foot depth. She contacted Pat Byer and recieved an ok of this price wi him. I then contacted Margo and told her the situation and asked if they woul go the additional cost for 100 foot depth. After she consulted with Brad, he gave the go ahead for the additional 100 feet. I also contacteed the LANL Buy and explained the situation to Alice Travis. She said to write a justificatio and then to go ahead. However, they had difficultly getting the sampler to release on the next run of 5 feet. They then pulled the core stem up to see what the problem was and lost the core drill along with 10 feet of stem. We h to abondon this hole after they tried to retrieve it twice. The field crew called Pat and explained the situation. Pat talked to me and said that it wou be a while before they could get another piece. We come off site at 6:30 p.m. Tuesday I will contact Pat and get some firm information.

I will be out of the office on Monday, however, if you need to contact me my home phone is 662-2510. If not, I will contact you on Tuesday. Would y please forward this information to Jeff, Brad, and Margo. Margo's fax is 5-4632, her number is 7-3189. Thanks and see you Tuesday.

Paula

--Boundary (ID Pja6pUnWxmTlZG2JDy6C9Q)--

End of returned message

Post-it® Fax Note 7671	Date 5/2/95	# of pages ▶ 2
To Margo Buksa	From Paula Cook	
Co./Dept.	Co.	
Phone # 5-4632	Phone #	
Fax # 7-3189	Fax #	

Margo, I've attempted to send E-mail various ways & none of them work - Hopefully one day - Will call you later today or tomorrow with update - Paula

16-000602

Additional Subsurface Exploration and Laboratory Analysis
Service Station Building #195
S-Site, TA-16
Los Alamos National Laboratory
Los Alamos, New Mexico

Geo-Test Job No. 1-50203

Prepared For:
Johnson Controls Inc.
P.O. Box 50
Los Alamos, New Mexico 87544

Prepared by:
Geo-Test, Inc.
8904 Washington Street NE
Albuquerque, New Mexico 87113

GEO-TEST

GEO-TEST

GEO-TEST, INC.
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P.O. BOX 2487
LAS CRUCES,
NEW MEXICO
88004
(505) 526-6260
FAX (505) 523-1660

March 13, 1995

Ms. Paula T. Cook
EMCM
Johnson Controls Inc.
P.O. Box 50
Los Alamos, New Mexico 87544

Re: **Additional Subsurface Exploration and Laboratory Analysis, Service Station Building # 195, S-Site, TA-16, Los Alamos National Laboratory, Los Alamos, New Mexico, Geo-Test Job No. 1-50203.**

Dear Ms. Cook:

Geo-Test, Inc. is pleased to provide the enclosed data summary report. The report presents the procedures and findings of the additional subsurface exploration and laboratory analysis of soil samples from the referenced site.

The report includes data from our subsurface exploration, soil sampling, field screening of soil samples, and laboratory analysis. This report completes the tasks described in the Los Alamos National Laboratory purchase order #AP467SML5-J8 dated January 18, 1995 prepared by Ms. Terry Cde Baca.

The following report has been prepared by the undersigned. It has been a pleasure to serve you on this project and we look forward to providing services to you in the future. Should there be any questions concerning this report, please feel free to call me at (505) 857-0933.

Sincerely,
GEO-TEST, INC.

John R. Dickey

John R. Dickey, E.I.
Environmental Services Manager

attachment

copies to: Addressee (3)

TABLE OF CONTENTS

PAGE

1.0 INTRODUCTION 1

2.0 SUBSURFACE EXPLORATION, SOIL SAMPLING, AND FIELD SCREENING 1

3.0 LABORATORY ANALYSIS 4

APPENDICES

Boring Logs .... APPENDIX A
Chain-of-Custody Record and Laboratory Reports .... APPENDIX B

GEO-TEST

1.0 INTRODUCTION

Geo-Test has conducted additional subsurface exploration and laboratory analysis of soil samples from Service Station Building #195, S-Site, TA-16 at Los Alamos National Laboratory. The work was conducted to obtain additional data to evaluate the presence of gasoline in subsurface soils and volcanic tuff at the gasoline service station.

Geo-Test's scope of services for the contract included the following:

- Additional subsurface exploration to obtain soil samples for field screening and laboratory analysis,
- Field screening of soil samples,
- Laboratory analysis of soil samples, and
- Preparation of a data summary report.

2.0 SUBSURFACE EXPLORATION, SOIL SAMPLING, AND FIELD SCREENING

To develop additional data to evaluate the presence of gasoline compounds in the volcanic tuff, one boring (Boring 1-A) was advanced on February 6, 1995. This boring was offset from Boring 1, originally drilled on September 28, 1994. Original and subsequent boring locations were selected by personnel from Johnson Controls Inc. (JCI). Boring 1-A was advanced with a truck-mounted CME Modified 55 drill rig using 7¼ inch diameter, continuous flight, hollow-stem auger. As Boring 1 was originally sampled to a depth of 35 feet, soil samples were to be obtained from Boring 1-A beginning at a depth of 35 feet and every 5 feet thereafter until the boring was to be terminated at a depth of 50 feet.

Boring 1-A encountered refusal to auger drilling on a subterranean structure at a depth of 33 feet. Soil samples for field screening were obtained from drill cuttings from the boring. No soil samples were obtained for laboratory analysis. Boring 1-A was subsequently abandoned.

On February 13, 1995 original Boring 1 was re-entered and deepened (Boring 1-B). Boring 1-B was advanced with a truck-mounted CME Modified 55 drill rig using 5¼ inch diameter, continuous flight, hollow-stem auger. Initially, this boring was to be sampled with a 5 feet long, continuous sample barrel inserted into the hollow-stem auger. However, due to the hardness of the volcanic tuff and poor sample recovery with the continuous sampler, two inch diameter split spoon samplers were used instead to obtain discrete soil samples. Soil samples were to be obtained from Boring 1-B beginning at a depth of 35 feet and every 5 feet thereafter until the boring was to be terminated at a depth of 50 feet. When the appropriate depth was reached, the split spoon sampler was passed down the hollow-stem and the sampler was driven into the underlying volcanic tuff to obtain a relatively undisturbed sample. However, adequate discrete samples could not be obtained due to the hardness of the tuff. Consequently, to obtain a sufficient sample, sample intervals were over-drilled, drill cuttings were allowed to accumulate in the bottom of the boring, and the split-spoon sampler was used to obtain a composite sample of the volcanic tuff within each sample interval. Composite soil samples were obtained from 35 to 40 feet and 40 to 44 feet. The composite sample from 40 to 44 feet was submitted for laboratory analysis. Refusal to auger drilling was encountered in hard volcanic tuff at a depth of 44 feet in Boring 1-B.

To avoid possibly introducing any outside contamination, the drilling and sampling tools were cleaned prior to the drilling operations. The drilling tools were cleaned with a high pressure hot water washer, while the sampling tools were washed by hand with a detergent solution, rinsed with water, and finally rinsed with distilled water. The sampling tools were cleaned between samples to control cross contamination. Clean auger was used for each boring.

Color, texture, and odor of volcanic tuff were observed and noted by the field geologist. Samples along with drill cuttings were visually classified to maintain a geologic/lithologic log of borings. Boring logs are presented in Appendix A.

The borings generally encountered sandy clay, clayey sand, and welded ash flow tuff. The clay and sand contained variable amounts of tuff. The clay has a low to medium plasticity and is medium stiff to hard, moist to wet, and brown. The sand is loose, moist and dark brown. Beneath the clay, the borings encountered tuff. The tuff was found to be hard/competent, non-plastic, and gray/purple.

"Highly contaminated" soils (i.e. soils saturated with gasoline as defined by the NMED USTB regulations) or "oil sheens" were not observed in samples or cuttings from the borings. Petroleum odors were noted in samples from the borings.

Samples to be submitted for laboratory analysis were placed immediately after opening the split spoon sampler into pre-cleaned 4 ounce glass jars, sealed with a teflon lined lid, custody sealed, labeled, placed in a cooler with an ice pack, and transported to the laboratory. A chain-of-custody record was maintained and accompanied the transfer of the samples from the environmental technician to the laboratory. A copy of the chain-of-custody record is presented in Appendix B.

Head space tests for aromatic hydrocarbons and volatile organic compounds (VOCs) from gasoline were conducted on cuttings from the borings and the volcanic tuff samples obtained. The head space tests were conducted with a MSA Photon photoionization detector (PID). The instrument was calibrated using an isobutylene standard to be sensitive to VOCs from petroleum fuels. The PID determines the presence of vapors in soils from VOCs and provides relative readings of the concentrations. This evaluation was meant to be an in-field indicator and not an absolute measure of the VOC concentration present.

Head space tests were conducted by placing a portion a split spoon sample in a clean 1 pint glass jar, leaving approximately 2 inches of air space in the top of the jar, and then sealing the jar with aluminum foil and a lid. The sample was then warmed. After approximately 5 minutes of warming, the sample was shaken and the foil was pierced with the PID probe to immediately screen the contents.

Head space tests found vapor concentrations in samples of auger cuttings from Boring 1-A ranging from no instrument response (0.0 ppm) to 2,249 ppm (parts per million). Vapor concentrations in samples of auger cuttings from Boring 1-B ranged from no instrument response to 515 ppm. Composite samples from depths of 35 to 40 feet in Boring 1-B had vapor concentrations of 2,689 ppm and 1,485 ppm. The composite sample from 40 to 44 feet had a vapor concentration of 2,101 ppm. Results of field screening are also presented on the boring logs (Appendix A).

3.0 LABORATORY ANALYSIS

The soil sample from Boring 1-B at 40 to 44 feet was analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) according to EPA Method 8020 by Hall Environmental Analysis Laboratory in Albuquerque. The analysis found the following:

Benzene - 1.5 ppm
Toluene - 47 ppm
Ethylbenzene - 33 ppm
Total Xylenes - 260 ppm

GEO-TEST, INC.

8906 WASHINGTON NE
ALBUQUERQUE, NEW MEXICO 87113
(505) 857-0933

SERVICE STATION BUILDING #195
S-SITE, TA-16

LOS ALAMOS, NEW MEXICO

Boring No. 1-A
Page 1 of 2
File No. 1-50203
Chkd. By: JRD

Boring Co. GEO-TEST, INC.
Foreman
GTI Rep. RT
Date Start 2/6/95 End 2/6/95
Location offset of #1
GS.Elev. Datum

	Casing	Sampler
Type		SS
I.D./O.D.		1.4/2.0
Hammer Wt.		140
Hammer Fall		30
Other	7.25" OD HSA	

Groundwater Readings

Date	Time	Depth	Casing	Stab. Time

DEPTH	LOG	No.	TYPE	Depth (Ft.)	Blows/6"	PID (ppm)	Sample Description & Classification	Unified Soil Class	RMKS	Equipment Installed
							5" Asphalt			
							SAND, clayey, moist, low plasticity, brown	SC		
5		1	AC	0-5		0.0	CLAY, wet, plastic, dark brown	CL		
10		2	AC	5-10		27.8	CLAY, silty, slightly moist, low plasticity, dark brown	CL		
		3	AC	10-13		136.0				
15		4	AC	13-18		1981	GRAVEL, sandy, clayey	GC		
20		5	AC	18-23		2249	CLAY, sandy, slightly moist, low plasticity, brown	SC		
25		6	AC	23-26		1295	TUFF, cemented, dense, non plastic, purple with stained spots			

Remarks
SS = split spoon sampler
UD = undisturbed ring
AC = auger cuttings
CS = continuous sampler

No Groundwater Encountered

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

Boring No. 1-A

GEO-TEST, INC.

8904 WASHINGTON NE
ALBUQUERQUE, NEW MEXICO 87113
(505) 857-0933

SERVICE STATION BUILDING #195
S-SITE, TA-16

LOS ALAMOS, NEW MEXICO

Boring No. 1-A
Page 2 of 2
File No. 1-50203
Chkd. By: JRD

DPTH	LOG	Sample Information No.	TYPE	Depth (Ft.)	Blows/ 6"	PID (ppm)	Sample Description & Classification	Unified Soil Class	RMKS	Equipment Installed
		7	AC	26-33		1295				
							AUGER REFUSAL AT 33 FEET SAMPLER REFUSAL AT 33 FEET			
35										
40										
45										
50										
55										
60										

SS = split spoon sampler
UD = undisturbed ring
AC = auger cuttings
CS = continuous sampler

...cation lines represent approximate boundaries between soil types, transitions may be gradual. Water level ...dings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors ...er than those present at the time measurements were made.

Boring No. 1-A

GEO-TEST, INC.

8904 WASHINGTON NE
ALBUQUERQUE, NEW MEXICO 87113
(505) 857-0933

SERVICE STATION BUILDING #195
S-SITE, TA-16

LOS ALAMOS, NEW MEXICO

Boring No. 1-B
Page 1 of 2
File No. 1-50203
Chkd. By: JRD

Boring Co. GEO-TEST, INC.
Foreman
GTI Rep. RT
Date Start 2/13/95 End 2/13/95
Location Re-entry of #1
GS.Elev. Datum

	Casing	Sampler
Type		SS
I.D./O.D.		1.4/2.0
Hammer Wt.		140
Hammer Fall		30
Other	5.25" OD HSA	

Groundwater Readings

Date	Time	Depth	Casing	Stab. Time

DEPTH	LOG	No.	TYPE	Depth (Ft.)	Blows/ 6"	PID (ppm)	Sample Description & Classification	Unified Soil Class	RMKS	Equipment Installed
		1	AC	0-2		0.0	Approximately 3" Asphalt			
5		2	AC	5-7		0.0				
10		3	AC	10-12		0.0	SAND, clayey, moist, non plastic, dark brown	SC		
15		4	AC	15-17		0.0				
20		5	AC	20-22		5.0				
25		6	AC	25-27		20.0	TUFF, clayey sandy mix, wet, gray-purple			

SS = split spoon sampler
UD = undisturbed ring
AC = auger cuttings
CS = continuous sampler

No Groundwater Encountered

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

GEO-TEST, INC.

8904 WASHINGTON NE
ALBUQUERQUE, NEW MEXICO 87113
(505) 857-0933

SERVICE STATION BUILDING #195
S-SITE, TA-16

LOS ALAMOS, NEW MEXICO

Boring No. 1-8
Page 2 of 2
File No. 1-50203
Chkd. By: JRD

DEPTH	LOG	No.	TYPE	Depth (Ft.)	Blows/6"	PID (ppm)	Sample Description & Classification	Unified Soil Class	RMKS	Equipment Installed
		7	AC	30-32						
						406.0				
						515				
35		8	SS	35-36		2689				
							TUFF, cemented, dry, very dense			
		9	AC	43-55		1485				
40		10	SS	40-44					1	
						2101				
							AUGER REFUSAL AT 44 FEET			
45										
50										
55										
60										

SS = split spoon sampler
UD = undisturbed ring
AC = auger cuttings
CS = continuous sampler

1 = composite sample

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.

Boring No. 1-8

CHAIN-OF-CUSTODY RECORD

HALL ENVIRONMENTAL ANALYSIS LABORATORY
2403 San Mateo NE, Suite P-13
Albuquerque, New Mexico 87110
505.880.1803

Client: GEO-TEST, INC

Address: 8904 WASHINGTON N.E.
ALBUQUERQUE, NM 87113

Phone #: 505-857-0933

Fax #: 505-857-0803

Project Name: LOS ALAMOS S-SITE

Project #: 1-50203

Project Manager: J. DICKEY

Sampler: RANDY R. TEEL

Samples Cold? ☒ Yes ☐ No

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HCl	Preservative Other	HEAL No.	BTEX (Method 602/8020)	BTEX + MTBE (602/8020)	TPH Method 8015 MOD (Gas/Diesel)	BTEX + TPH + MTBE (Gasoline Only)	BTEX + MTBE + TPH (Gas + Diesel)	TPH (Method 418.1)	601/602 Volatiles	EDB (Method 504.1)	EDC	610 (PNA or PAH)				Air Bubbles or Headspace (Y or N)
-1995	11:55	SOIL	#1B @ 40'-44'	1-4oz.	NONE			9502052-1	/													N

Date	Time	Relinquished By: (Signature)	Received By: (Signature)
95	16:31	Randy R. Teel	Scott Hall
14/95	12:26		[illegible]

Remarks:

Hall Environmental
Analysis Laboratory

Hall Environmental Analysis Laboratory
2403 San Mateo NE, Suite P-13
Albuquerque, NM 87110
(505) 880-1803

2/17/95

Geo-Test, Inc.
8904 Washington St. NE
Albuquerque, NM 87113

Dear Mr. John Dickey,

Enclosed are the results for the analyses that were requested. These were done according to EPA procedures or the equivalent.

Detection limits are determined by EPA methodology. No determination of compounds below these levels (denoted by the < sign) has been made.

Please don't hesitate to contact me for any additional information or clarifications.

Sincerely,

Scott Hallenbeck 2/17/95

Scott Hallenbeck, Lab Manager

Project: Los Alamos S-Site

Results for sample: #1B @ 40-44'

Date collected: 2/13/95	Date received: 2/14/95
Date extracted: 2/14/95	Date analyzed: 2/15/95
Client: Geo-Test, Inc.	
Project Name: Los Alamos S-Site	Heal #: 9502052-1
Project Manager: John Dickey	Sampled by: R. Teel
Matrix: Non-Aqueous	

Test: EPA 8020

Compound	Amount	Units
Benzene	1.5	PPM (MG/KG)
Toluene	47	PPM (MG/KG)
Ethylbenzene	33	PPM (MG/KG)
Total Xylenes	260	PPM (MG/KG)

BFB (Surrogate) Recovery = ** %

Dilution Factor = 20

**Surrogate not recoverable due to dilution.

Results for QC: Reagent Blank

Date extracted: 2/14/95	Date analyzed: 2/14/95
Client: Geo-Test, Inc.	
Project Name: Los Alamos S-Site	Heal #: RB 2/14
Project Manager: John Dickey	
Matrix: Non-Aqueous	

Test: EPA 8020

Compound	Amount	Units
Benzene	<0.05	PPM (MG/KG)
Toluene	<0.05	PPM (MG/KG)
Ethylbenzene	<0.05	PPM (MG/KG)
Total Xylenes	<0.05	PPM (MG/KG)

BFB (Surrogate) Recovery = 94 %

Dilution Factor = 1

Results for QC: Blank Spike / Blank Spike Dup

Date extracted: 2/14/95	Date analyzed: 2/15/95
Client: Geo-Test, Inc.	
Project Name: Los Alamos S-Site	HEAL #: BS/BSD 2/14
Project Manager: John Dickey	
Matrix: Non-Aqueous	Units: PPM (MG/KG)

Test: EPA 8020

Compound	Sample Result	Amount Added	Matrix Spike	MS %	MS Dup	MSD %	RPD
Benzene	<0.05	1.00	0.98	98	0.98	98	0
Toluene	<0.05	1.00	0.99	99	1.00	100	1
Ethylbenzene	<0.05	1.00	0.98	98	0.99	99	1
Total Xylenes	<0.05	3.00	2.93	98	2.97	99	1

16-000588

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: Henry Nunes, FSS-6, MS D462

DATE: November 2, 1994

FROM: Jeff Carmichael, ESH-19 JAC

MAIL STOP/TELEPHONE: K498/5-2505

SYMBOL: ESH-19/HSWS-94-0399

SUBJECT: **GASOLINE SPILL WASTE DRUMS AT TA-16**

Ninety-four (94) drums of soil potentially contaminated with gasoline reside at the TA-16-195 gasoline station. After reviewing the Industrial Hygiene and Safety Group's (ESH-5) monitoring results, I am recommending that eighty-nine (89) drums out of the 94 drums of soil be sent to Sigma Mesa so the soil can be reused.

On October 12, 1994, ESH-5 evaluated the soil in the 94 drums to determine levels of gasoline contamination. On October 24, 1994, ESH-5 evaluated the soil in 13 drums for benzene contamination. On October 13, and 25, 1994, ESH-5 authored two memoranda on their monitoring results. Copies of the memoranda are enclosed. The October 13, 1994, memorandum discusses the monitoring results, which indicated that the soil in eighty-one (81) out of the 94 drums of soil did not contain any measurable amount of gasoline. The soil in the remaining thirteen (13) drums contained measurable amounts of gasoline.

It is my understanding that the Laboratory desires to reuse this soil. The soil will be placed on the land at Sigma Mesa prior to reuse. Placement of petroleum contaminated soil on the land is regulated by the New Mexico Solid Waste Management Regulations (SWMR-4), and to some extent, under the New Mexico Underground Storage Tank Regulations (USTR). To keep the soil from being regulated by both the SWMR-4 and the USTR, the soil to be placed on Sigma Mesa must meet the following criteria, the sum of the benzene, toluene, ethylbenzene, and xylene isomer (BTEX) concentrations must be less than 100 mg/kg, with benzene individually less than 10 mg/kg.

The sampling that occurred on October 24, 1994, was specifically designed to detect benzene concentrations in the soil contained in the 13 drums. Using a HNU photoionization detector, ESH-5's results indicate that out of the 13 drums sampled, five (5) of the drums have benzene concentrations over 10 mg/kg. Detector tubes used to detect benzene, detected a trace amount of benzene (0.5 ppm) in one drum.

Based on ESH-5's soil sampling results, I am recommending that 89 drums of soil be sent to Sigma Mesa for reuse. The other five drums, with drum numbers 21, 25, 30, 35, and 36 should be shipped to the Chemical and Mixed Waste Science Group (CST-5) to be managed as a special waste under SWMR-4. The soil should not be managed as a hazardous waste.

If you have questions, please give me a call at 665-2505.

JAC:es

Enclosures

Cy: B. Hargis, ESH-5, MS K486, w/enc.
B. Martin, [redacted]enc.
R. Georgieff, JCI-JENV, MS A199, w/enc.
HSWS Circ File

Los Alamos
NATIONAL LABORATORY
memorandum

Environment, Safety and Health Division
Industrial Hygiene and Safety Group (ESH-5)

To/MS: Henry Nunes, FSS- (M721)
From/MS: Charles P. Richards, ESH-5 (K494) CPR
Phone/FAX: 7-3133/7-1945
Symbol: ESH-5:94-15397
Date: October 13, 1994

SUBJECT: GASOLINE SPILL WASTE DRUM MONITORING RESULTS AT TA-16

On October 12, 1994, ESH-5 met with JCI at TA-16 to determine the levels of gasoline contamination in the barreled soils from the gasoline station spill. Each of the barrels was opened and monitored with two different H-NU's and the drums with positive results were rechecked with indicator tubes.

Of the ninety four (94) drums tested, eleven (11) were positive for gasoline contamination and marked with orange paint on the sides and tops of the drums. Each of the drums is numbered in black indelible marker. Contamination in parts per million was written on the drum lids. The contamination measurement is for the air above the soil and not a measurement of soil contamination. Uncontaminated drums were marked ND (none detected). Below is a list of contaminated drums by number and the test results.[1]

Drum No.	H-NU 10.2	H-NU 11.7	Detector Tube
15	10 ppm*	5 ppm	5 ppm
16	5 ppm*	1 ppm	Not detected
21	25 ppm*	12 ppm	15 ppm
22	18 ppm*	20 ppm	20 ppm
25	34 ppm*	12 ppm	20 ppm
26	12 ppm*	6 ppm	Not detected
30	25 ppm*	15 ppm	20 ppm
35	30 ppm*	17 ppm	30 ppm
36	175 ppm*	44 ppm	50 ppm
39	35 ppm*	20 ppm	30 ppm
44	1 ppm	7 ppm*	Not detected
51	Not detected	2 ppm*	Not detected
54	Not detected	2 ppm*	Not detected

[1]Test were conducted at different times with each instrument.
*Denotes Initial Reading when drum first opened.

A complete list of all drums tested is available upon request if you need the data. The drums listed above are the only ones indicating gasoline contamination. Please let us know if you need any further assistance.

CPR:mll

Cy: Field Support Files, ESH-5 (K494) (2)

F:\CPR\CPR94013.MSW

Los Alamos
NATIONAL LABORATORY

memorandum

Environment, Safety and Health Division
Industrial Hygiene and Safety Group (ESH-5)

To/MS: Jeff Carmichael, ESH-19 (K498)
From/MS: Charles P. Richards, ESH-5 (K494)
Phone/FAX: 7-3133/7-1945
Symbol: ESH-5:94-15658
Date: October 28, 1994

SUBJECT: TA-16 GASOLINE WASTE BARREL MONITORING RESULTS FOR BENZENE

At your request, the thirteen (13) barrels of suspected gasoline contaminated soils were "Head Space" tested for Benzene content. The drums were tested using detector tubes having a detection range from 0.5 to 10 ppm. Each of the drums was also retested with an HNU photoionization detector for total volatile organic compounds.

The results are as follows:

Drum No.	HNU 11.7[1] (total VOC's) ppm	Detector Tube[2] (Benzene Specific) ppm
15	0.3	ND (NOT DETECTED >.05)
16	0.2	ND
21	14.0	ND
22	8.5	ND
25	12.0	ND
26	6.0	ND
30	15.0	ND
35	22.0	ND
36	23.0	0.5
39	6.0	ND
40+	ND	ND+ (ADDED RECHECK)
44	5.0	ND
51	3.5	ND
54	ND	ND

1 ESH-5 Instrument #250. This was the same 11.7 unit used for the testing performed on 10/12/94.

2 Drager Tube 67 28 561 Pump #37

Notes: Temperature at 1330 to 1430 hours, 65°F +1. None of the drums showed any evidence of pressure build up, as was the case with drum number 36, on October 12, 1994, when the original survey was conducted.

CPR:eam

Cy: Field Support Files, ESH-5 (K494) (2)

F:\CPR\CPR94014.MSW

16-000597

Los Alamos
NATIONAL LABORATORY
memorandum

Environmental Restoration Project
EM/ER, M992

Date: January 31, 1995
To/MS: Karen Schultz Paige, CST-7, MS E525
From/MS: Dave McInroy, EM-ER, MS M992
Phone: 667-0819
Symbol: EM/ER:95-003

SUBJECT: INFORMATION PERTAINING TO REMOVAL OF UST ASSOCIATED WITH BUILDING TA-16-16

In response to your request, I am supplying you with information pertaining to an underground storage tank (UST) in which I oversaw the removal. The UST was located in TA-16, east of the old cafeteria building (TA-16-16).

In 1987 the Laboratory received funding to remove all abandoned USTs which historically stored petroleum products. These tanks were identified as a result of the Department of Energy's (DOE) Environmental Survey which was conducted during the same year. During this identification process the Environmental Surveillance Group (HSE-8) added UST 16-16 to the list of tanks to be removed.

The following information was recorded during the removal of the tank and was retrieved from my logbook number S11536, page 3.

- The tank contained diesel oil.
- The contents of the tank were analyzed for gross alpha, beta, gamma and tritium prior to removal. There was no detectable activity (NDA) associated with the contents of the tank. (sample number 87.00367)
- The tank was removed in August of 1987
- Prior to the removal of the vessel it was thought to measure 24 in. x 30.5 in. x 44 in.. Upon excavation it was discovered that this rectangular tank was attached to larger cylindrical tank with a volume of approximately 1000 gallons.
- The tank was found to be leaking from around the welds attaching the rectangular portion of the tank to the cylinder..
- Visually contaminated soil was removed (approx. 15 yd^3) and taken to TA-54 to be land farmed.
- Clean backfill was brought in to fill the void created by the excavation of the tank and contaminated soils.

It was standard practice that the liquid from these "petroleum" tanks was picked up by recycling companies. The contents of this tank were bulked with contents of other tanks and recycled. The UST itself was cut-up and the steel was salvaged by Johnson Controls (Pan Am at the time).

I currently maintain photo documentation of this removal. If you should have any questions or feel that you would like or need pictures for this event, please feel free to contact me at 667-0819.

DM:lyv

Cy:
Brad Martin, CST-18, MS E525
Jeff Carmichael, ESH-19, MS K498
RPF, MS M707

16-000596

Los Alamos
NATIONAL LABORATORY
memorandum
Environmental Restoration Project
EM/ER, M992

Date: January 31, 1995
To/MS: Karen Schultz Paige, CST-7, MS E525
From/MS: Dave McInroy, EM/ER, MS M992
Phone: 667-0819
Symbol: EM/ER:95-M004

SUBJECT: INFORMATION PERTAINING TO THE REMOVAL OF UST STRUCTURE NUMBER TA-16-196

Within this memo I hope to provide to you new or additional information pertaining to the removal of an underground storage tank (UST) located at the gas station within TA-16.

In 1987 the Laboratory received funding to remove all abandoned USTs which historically stored petroleum products. One of two leaded gasoline tanks located at the TA-16 gas station fell into this category. This tank was identified as TA-16-196.

The following information was recorded during the removal of the tank and was retrieved from my logbook, number S11536, page 3.

- At the time of removal, the UST was 35 years old.

-The tank had estimated volume of 4,000 gallons.

-It appeared that the tank was filled with water upon abandonment.

-The tank was badly rusted and appeared to be leaking (the tank was still 3/4 full of water).

-The tank was removed on September 2, 1987.

-The contents of the tank were analyzed for gross, alpha, beta, gamma and tritium, prior to the removal. There was no detectable activity (NDA) associated with the contents of the tank. (Sample number 87.00368)

-The contents of the tank as well as the soil adjacent to the tank were sampled for Pb using the EP tox extraction procedure. No Pb was detected associated with this sampling campaign. (Sample numbers 87.00374-87.00378)

-Contaminated soil was removed from the site until it was no longer possible without impeding the structural integrity of the adjacent tank (197) and associated pipeline. It was decided at that time that the remaining contaminated soil would be left in place and addressed when UST 197 was removed. The contaminated soil removed from this site was taken to TA-54 to be land farmed.

-The contents of the UST were disposed of by the Waste Management Group (HSE-7).

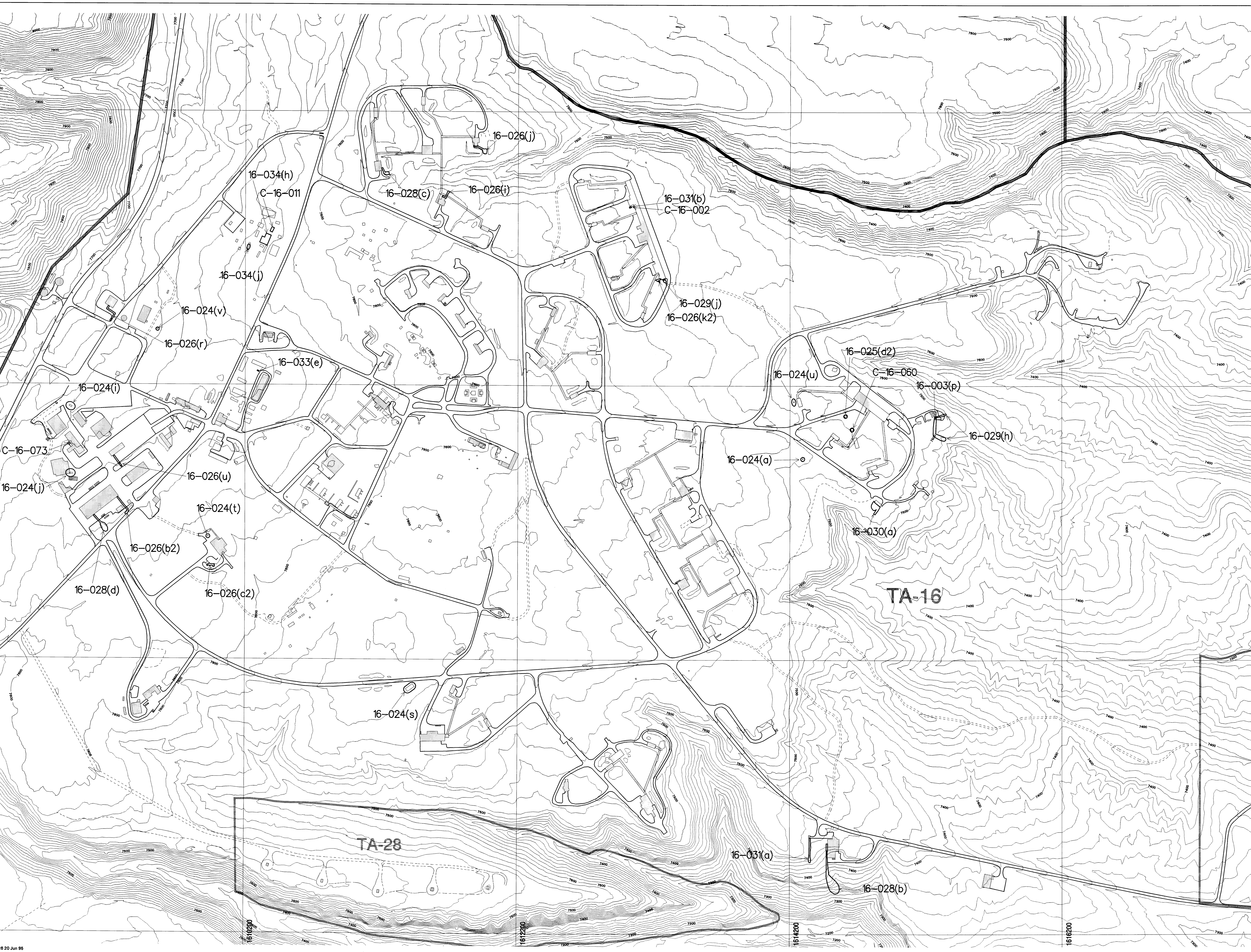
-The tank was cut up, crushed and trucked to the Pan Am salvage yard and sold for scrap.

I currently maintain photo documentation of this removal. If you would like or need pictures of this event, please feel free to contact me at 667-0819.

DM/lyv

Cy:

Brad Martin, CST-18, MS E525
Jeff Carmichael, ESH-19, MS K498
RPF, MS M707

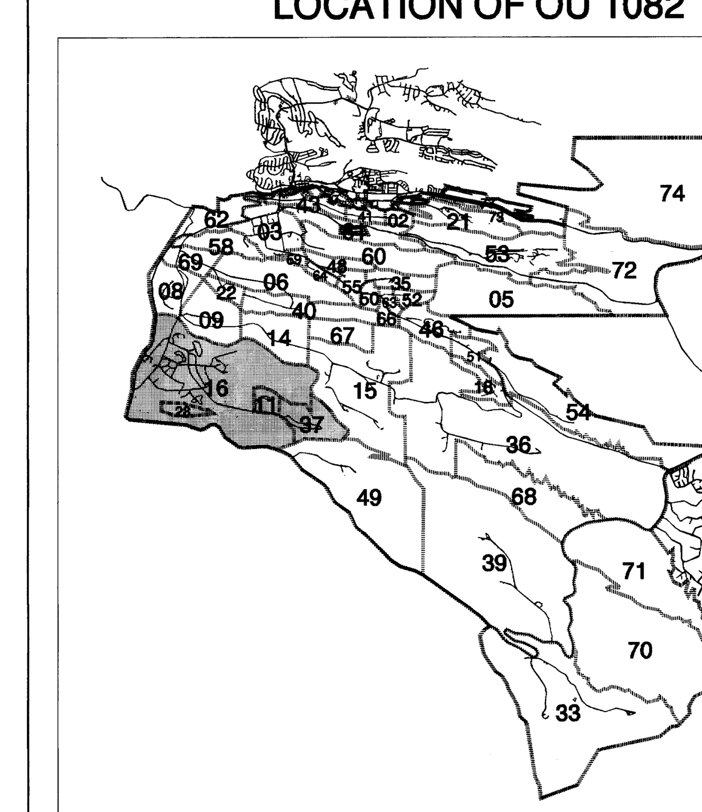


OU 1082 - Addendum
Chapter 5 PRSs

LEGEND

- Boundary, OU
- Boundary, TA
- Contours, 10 foot
- Contours, 100 foot
- PRS outline
- Roads, unimproved
- Roads, paved
- Roads, trail
- Former structure
- Permanent structure
- Temporary structure
- PRS, point location

LOCATION OF OU 1082



N

State Plane Coordinate System, New Mexico Central
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 2000
Feet per inch on map = 300

SCALE 1:3600

0 91 182 273 364
METERS

0 300 600 900 1200
FEET

NOTICE: The information on this map is provisional. Feature locations are dependent on scale and symbology and their accuracy may not have been confirmed. Los Alamos National Labora boundary is based on legal description established in 1995. Other boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data are from Los Alamos National Laboratory Environmental Restoration Project aerial survey, September 1991.

University of California

Los Alamos National Laboratory

Earth and Environmental Sciences Divis

FIMAD Facility for Information Management, Analysis, and FIMAD is the electronic data repository for the Envi Restoration Project at Los Alamos National Labora

Produced by: Doug Walther

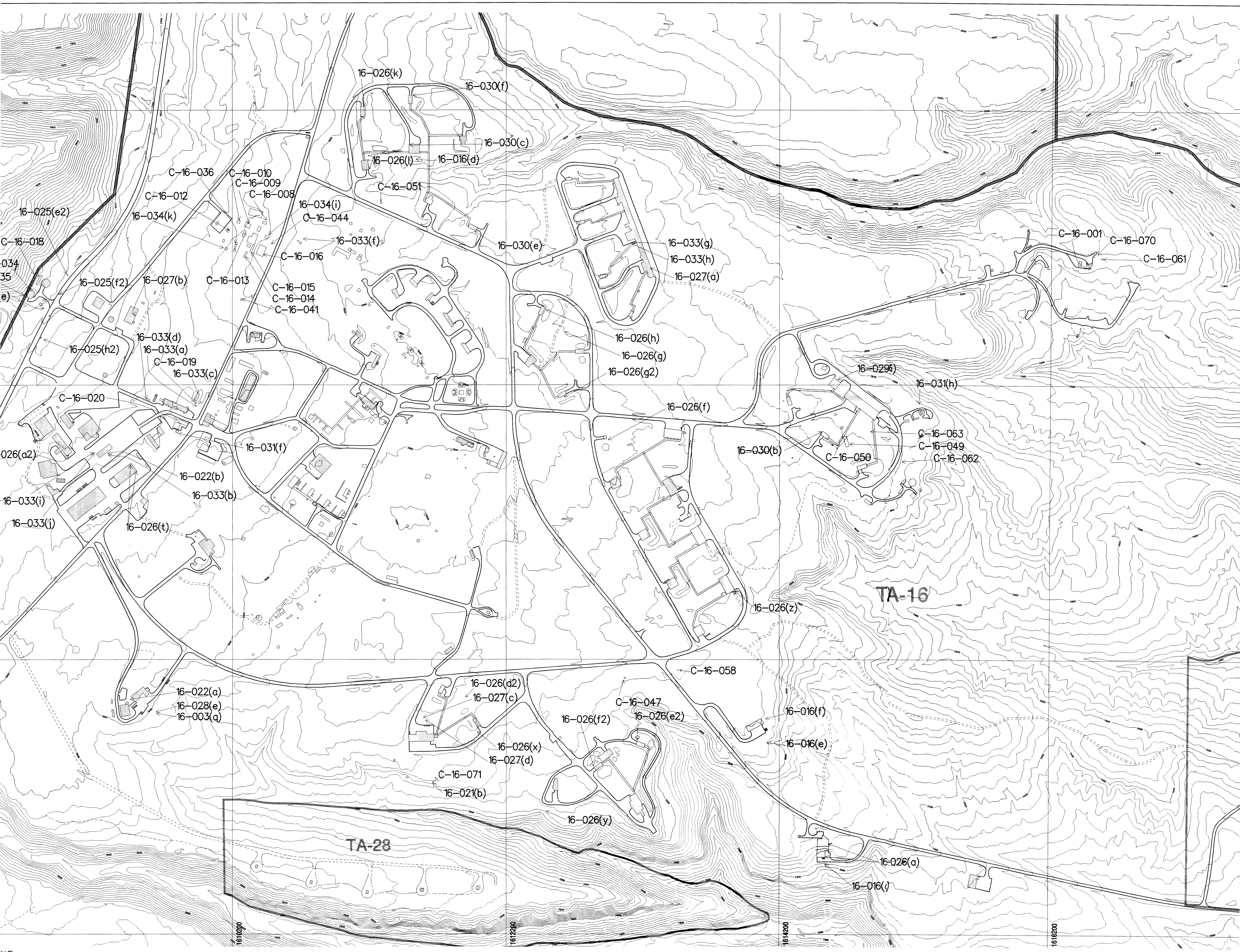
Date: June 20, 1995 FIMAD Plot ID: G103526

OU 1082 - Addendum 2
PRSs Proposed for NFA

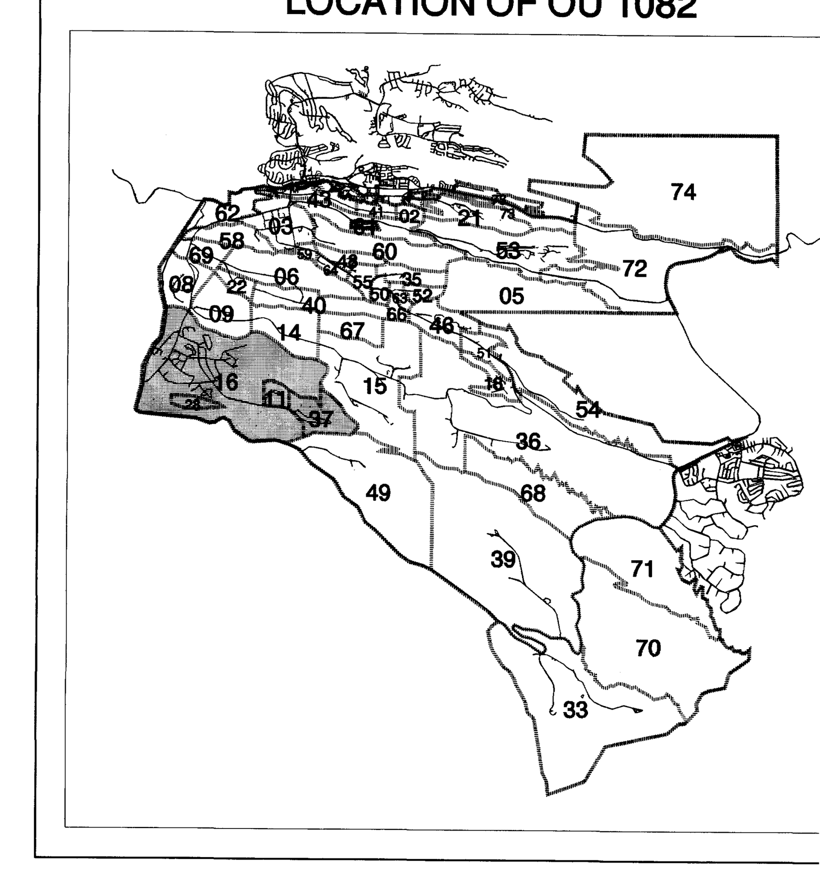
LEGEND

- Boundary, OU
- Boundary, TA
- Contours, 10 foot
- Contours, 100 foot
- Roads, unimproved
- Roads, paved
- Roads, trail
- Former structure
- Permanent structure
- Temporary structure

UNLOCATED PRSs PROPOSED FOR NFA:
16-037
C-16-072
C-16-046



LOCATION OF OU 1082



N

State Plane Coordinate System, New Mexico Central Zone
1983 North American Datum

Grid provides NM State Plane coordinates in feet.
Grid interval, in feet: 2000
Feet per inch on map = 300

SCALE 1:3600

0 91 182 273 364
METERS

0 300 600 900 1200
FEET

NOTICE: The information on this map is provisional. Feature locations are dependent on scale and symbology and their accuracy may not have been confirmed. Los Alamos National Laboratory boundary is based on legal description established in 1995. Other boundary, structure, and utility data are from Los Alamos National Laboratory Engineering Division and Los Alamos County Utility and Engineering Departments. Contour data are from Los Alamos National Laboratory Environmental Restoration Project aerial survey, September 1991.

University of California

Los Alamos National Laboratory

Earth and Environmental Sciences Division

FIMAD Facility for Information Management, Analysis, and Displa
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Restoration Project at Los Alamos National Laboratory.

Produced by: Doug Walther

Date: June 26, 1995 FIMAD Plot ID: G103525