VOLUME I OF III

CAFB00

LIBRARY COPY

HAZARDOUS AND SOLID WASTE AMENDMENTS / CORRECTIVE ACTION-RELATED PERMIT MODIFICATION REQUEST

NO FURTHER ACTION PROPOSALS

CANNON AFB, NEW MEXICO PERMIT NO. NM7572124454

Prepared for
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau

July 2000

July 1, 2000

VOLUME II OF III

LIBRARY COPY

HAZARDOUS AND SOLID WASTE AMENDMENTS / CORRECTIVE ACTION-RELATED PERMIT MODIFICATION REQUEST

NO FURTHER ACTION PROPOSALS

CANNON AFB, NEW MEXICO PERMIT NO. NM7572124454

Prepared for
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau

July 2000

LIBRARY COPY

VOLUME III OF III

HAZARDOUS AND SOLID WASTE AMENDMENTS / CORRECTIVE ACTION-RELATED PERMIT MODIFICATION REQUEST

NO FURTHER ACTION PROPOSALS

CANNON AFB, NEW MEXICO PERMIT NO. NM7572124454

Prepared for
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau

July 2000

TABLE OF CONTENTS

Volume Breakdown

Volume I of III

Executive Summary ES-1
Section 1 Introduction 1-1
Section 2 SWMU 74, Landfill No. 1 2-1
Section 3 AOC D, Asbestos Burial Pit 3-1
Section 4 SWMU 113, Landfill No. 5 4-1
Section 5 DP-33, Drum Disposal Pit 5-1
Section 6 SWMU 7, Oil/Water Separator No. 129 6-1
Section 7 SWMU 9, Aircraft Washrack Drain System 7-1
Section 8 SWMU 32A, Oil/Water Separator No. 186 (#1 - East) 8-1
Section 9 SWMU 33B, Oil/Water Separator No. 186 (#2 - West) 9-1
Section 10 SWMU 11, Oil/Water Separator No. 170 10-1
Section 11 SWMU 38, Oil/Water Separator No. 194 11-1
Section 12 SWMU 39, Oil/Water Separator No. 195 12-1
Section 13 SWMU 46, Oil/Water Separator No. 196 13-1
Section 14 SWMU 47, Oil/Water Separator No. 494 14-1
Section 15 SWMU 51, Oil/Water Separator No. 375 15-1
Section 16 SWMU 57, Oil/Water Separator No. 379 16-1
Section 17 SWMUs 61,62 and 63, Sand Traps 5077A and 5077B and Oil/Water Separator 5077C 17-1
Section 18 SWMU 92, Oil/Water Separator No. 5120 18-1
Section 19 SWMU 94, Oil/Water Separator No. 5144 19-1
Section 20 SWMU 8, Oil/Water Separator No. 165 20-1

Volume II of III

Section 21 SWMU 1, Oil/Water Separator No. 119 21-1
Section 22 SWMU 2, Recovered Diesel Tank No. 108 22-1
Section 23 SWMU 3, Oil/Water Separator No. 108 23-1
Section 24 SWMU 4, Recovered Oil Tank No. 121 24-1
Section 25 SWMU 5, Oil/Water Separator No. 121 25-1
Section 26 SWMU 6, POL Tank No. 129 26-1
Section 27 SWMU 10, POL Tank No. 170 27-1
Section 28 SWMU 16, Oil/Water Separator No. 680 28-1
Section 29 SWMU 34, AGE Drainage Ditch 29-1
Section 32 SWMU 49, Inactive POL Storage Tank No. 4028a 32-1
Section 33 SWMU 50, Inactive POL Storage Tank No. 4028b 33-1

Volume II of III, cont.

Section 34	SWMU 55, Lead Acid Battery Accumulation Point	34-1
Section 35	SWMU 72, Oil/Water Separator No. 390	35-1
Section 36	SWMU 75, Sanitary Sewage Lift Station Overflow Pit	36-1
Section 37	SWMU 76, Sludge Weathering Pit (WP-14)	37-1
Section 38	SWMU 77, Civil Engineering Container Storage Area	38-1
Section 39	SWMU 78, Fire Department Training Area No. 1	39-1
Section 40	SWMU 79, Underground Storage Tank	40-1
Section 41	SWMU 81, Solvent Disposal Site	41-1
Section 42	SWMU 82, Landfill No. 2	42-1
Section 43	SWMU 83, Sump	43-1
Section 44	SWMU 85, Stormwater Collection Point	44-1

Volume III of III

Section 45	SD-11, Engine Test Cell Area (SWMUs 86, 87, 88, 89, and 90)	45-1
Section 46	SWMU 91, Recovered Fuel Tank No. 5114	46-1
Section 47	SWMU 93, Oil/Water Separator No. 5121	47-1
Section 49	SWMU 96, Old Entomology Rinse Area	49-1
Section 50	SWMU 98, Sanitary Sewer Line	50-1
Section 51	SWMU 104, Landfill No. 4	51-1
Section 52	SWMU 105, Landfill No. 3	52-1
Section 53	SWMU 106, Fire Department Training Area No. 2	53-1
Section 54	SWMU 107, Fire Department Training Area No. 3	54-1
Section 55	SWMU 124, Inactive Underground Storage Tank No. 1	55-1
Section 56	SWMU 125, Inactive Underground Storage Tank No. 2	56-1
Section 57	SWMU 126, Inactive Underground Storage Tank No. 3	57-1
Section 58	SWMU 127, Sand Trap and Leach Field for Facility 4095 (#1)	58-1
Section 59	SWMU 128, Oil/Water Separator Near Tank 4095 (#2) and Leach Field	59-1
Section 62	AOC C, Blown Capacitor Site	62-1
Section 64	AOC F, Calibration Target Berm	64-1
Section 65	AOC G, Disturbed Area - North Housing Site	65-1
Section 66	AOC H, Disturbed Area - South Housing Site	66-1
Section 67	AOC 36, Building #214 Parking Lot	67-1

Vol. 1 - TABLE OF CONTENTS

Executive Summary **ES-1**

Section 1 Introduction **1-1**

1.1 Setting - Physical Geography 1-1
1.2 Demographics and Land Use at and Near Cannon AFB 1-1
1.3 Climatology 1-1
1.4 Geology 1-2
1.5 Hydrogeology 1-4
1.6 Soils 1-5
1.7 Background Metals Concentrations in Soil and Water Quality 1-6
1.8 Biological Resources 1-7
1.8.1 Plant Resources 1-7
1.8.2 Wildlife Resources 1-7

Section 2 SWMU 74, Landfill No. 1 ..... **2-1**

2.1 Summary 2-1
2.2 Site Description and Operational History 2-1
2.2.1 Site Description 2-1
2.2.2 Operational History 2-1
2.3 Land Use 2-2
2.3.1 Current 2-2
2.3.2 Future/Proposed 2-2
2.4 Investigative Activities 2-2
2.4.1 Summary 2-2
2.4.2 Investigation #1: Phase I RCRA Facility Investigation Report for Landfill No. 1 (SWMU 74) 2-3
2.4.2.1 Non-Sampling Data Collection 2-3
2.4.2.2 Sampling Data Collection 2-3
2.4.2.3 Data Gaps 2-3
2.4.2.4 Results and Conclusions 2-3
2.5 Site Conceptual Model 2-4
2.5.1 Nature and Extent of Contamination 2-4
2.5.2 Environmental Fate 2-4
2.6 Site Assessments 2-5
2.6.1 Summary 2-5
2.6.2 Screening Assessments 2-5
2.6.2.1 Human Health 2-5
2.6.2.2 Ecological 2-6
2.6.3 Risk Assessments 2-6
2.6.3.1 Human Health 2-6
2.6.3.2 Ecological 2-6

2.6.4 Other Applicable Assessments 2-6
2.6.4.1 Surface Water 2-6
2.6.4.2 Groundwater 2-6
2.6.4.3 Underground Storage Tanks (USTs) 2-6
2.6.4.4 Other 2-6
2.7 No Further Action Proposal 2-6
2.7.1 Rationale 2-6
2.7.2 Criterion 2-7

Section 3 AOC D, Asbestos Burial Pit 3-1
3.1 Summary 3-1
3.2 Site Description and Operational History 3-1
3.2.1 Site Description 3-1
3.2.2 Operational History 3-1
3.3 Land Use 3-1
3.3.1 Current 3-1
3.3.2 Future/Proposed 3-2
3.4 Investigative Activities 3-2
3.4.1 Summary 3-2
3.4.2 Investigation #1: Site Investigation (SI) Report, Area of Concern (AOC) D 3-2
3.4.2.1 Non-Sampling Data Collection 3-2
3.4.2.2 Sampling Data Collection 3-2
3.4.2.3 Data Gaps 3-2
3.4.2.4 Results and Conclusions 3-3
3.5 Site Conceptual Model 3-3
3.5.1 Nature and Extent of Contamination 3-3
3.5.2 Environmental Fate 3-3
3.6 Site Assessments 3-3
3.6.1 Summary 3-3
3.6.2 Screening Assessments 3-4
3.6.2.1 Human Health 3-4
3.6.2.2 Ecological 3-4
3.6.3 Risk Assessments 3-4
3.6.3.1 Human Health 3-4
3.6.3.2 Ecological 3-4
3.6.4 Other Applicable Assessments 3-4
3.6.4.1 Surface Water 3-4
3.6.4.2 Groundwater 3-4
3.6.4.3 Underground Storage Tanks (USTs) 3-4
3.6.4.4 Other 3-5

3.7 No Further Action Proposal 3-5
3.7.1 Rationale 3-5
3.7.2 Criterion 3-5

Section 4 SWMU 113, Landfill No. 5 4-1
4.1 Summary 4-1
4.2 Site Description and Operational History 4-2
4.2.1 Site Description 4-2
4.2.2 Operational History 4-2
4.3 Land Use 4-2
4.3.1 Current 4-2
4.3.2 Future/Proposed 4-3
4.4 Investigative Activities 4-3
4.4.1 Summary 4-3
4.4.2 Investigation #1: Installation Restoration Program (IRP) Phase II – Confirmation/Quantification Stage 1 at Landfill No. 5 (SWMU 113) 4-3
4.4.2.1 Non-Sampling Data Collection 4-3
4.4.2.2 Sampling Data Collection 4-3
4.4.2.3 Data Gaps 4-4
4.4.2.4 Results and Conclusions 4-4
4.4.3 Investigation #2: Remedial Investigation (RI) Report for 18 Solid Waste Management Units (SWMUs) at Landfill No. 5 (SWMU 113) 4-4
4.4.3.1 Non-Sampling Data Collection 4-4
4.4.3.2 Sampling Data Collection 4-4
4.4.3.3 Data Gaps 4-5
4.4.3.4 Results and Conclusions 4-5
4.4.4 Investigation #3: Phase I RCRA Facility Investigation (RFI) Report for Landfill No. 5 (SWMU 113/IRP No. LF-5) 4-5
4.4.4.1 Non-Sampling Data Collection 4-5
4.4.4.2 Sampling Data Collection 4-5
4.4.4.3 Data Gaps 4-6
4.4.4.4 Results and Conclusions 4-6
4.5 Site Conceptual Model 4-7
4.5.1 Nature and Extent of Contamination 4-7
4.5.2 Environmental Fate 4-7
4.6 Site Assessments 4-8
4.6.1 Summary 4-8
4.6.2 Screening Assessments 4-8
4.6.2.1 Human Health 4-8

4.6.2.2 Ecological 4-8
4.6.3 Risk Assessments 4-9
4.6.3.1 Human Health 4-9
4.6.3.2 Ecological 4-9
4.6.4 Other Applicable Assessments 4-9
4.6.4.1 Surface Water 4-9
4.6.4.2 Groundwater 4-9
4.6.4.3 Underground Storage Tanks (USTs) 4-9
4.6.4.4 Other 4-9
4.7 No Further Action Proposal 4-10
4.7.1 Rationale 4-10
4.7.2 Criterion 4-10

Section 5 DP-33, Drum Disposal Pit 5-1
5.1 Summary 5-1
5.2 Site Description and Operational History 5-1
5.2.1 Site Description 5-1
5.2.2 Operational History 5-1
5.3 Land Use 5-1
5.3.1 Current 5-1
5.3.2 Future/Proposed 5-1
5.4 Investigative Activities 5-2
5.4.1 Summary 5-2
5.4.2 Investigation #1: Rapid Response Corrective Action Report, DP-33 5-2
5.4.2.1 Non-Sampling Data Collection 5-2
5.4.2.2 Sampling Data Collection 5-2
5.4.2.3 Data Gaps 5-3
5.4.2.4 Results and Conclusions 5-3
5.5 Site Conceptual Model 5-4
5.5.1 Nature and Extent of Contamination 5-4
5.5.2 Environmental Fate 5-4
5.6 Site Assessments 5-4
5.6.1 Summary 5-4
5.6.2 Screening Assessments 5-5
5.6.2.1 Human Health 5-5
5.6.2.2 Ecological 5-5
5.6.3 Risk Assessments 5-5
5.6.3.1 Human Health 5-5
5.6.3.2 Ecological 5-5
5.6.4 Other Applicable Assessments 5-6

5.6.4.1 Surface Water 5-6
5.6.4.2 Groundwater 5-6
5.6.4.3 Underground Storage Tanks (USTs) 5-6
5.6.4.4 Other 5-6
5.7 No Further Action Proposal 5-6
5.7.1 Rationale 5-6
5.7.2 Criterion 5-6

Section 6 SWMU 7, Oil/Water Separator No. 129 6-1
6.1 Summary 6-1
6.2 Site Description and Operational History 6-1
6.2.1 Site Description 6-1
6.2.2 Operational History 6-1
6.3 Land Use 6-2
6.3.1 Current 6-2
6.3.2 Future/Proposed 6-2
6.4 Investigative Activities 6-2
6.4.1 Summary 6-2
6.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 6-2
6.4.2.1 Non-Sampling Data Collection 6-2
6.4.2.2 Sampling Data Collection 6-2
6.4.2.3 Data Gaps 6-3
6.4.2.4 Results and Conclusions 6-3
6.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 6-4
6.4.3.1 Non-Sampling Data Collection 6-4
6.4.3.2 Sampling Data Collection 6-4
6.4.3.3 Data Gaps 6-4
6.4.3.4 Results and Conclusions 6-4
6.5 Site Conceptual Model 6-5
6.5.1 Nature and Extent of Contamination 6-5
6.5.2 Environmental Fate 6-5
6.6 Site Assessments 6-6
6.6.1 Summary 6-6
6.6.2 Screening Assessments 6-6
6.6.2.1 Human Health 6-6
6.6.2.2 Ecological 6-6
6.6.3 Risk Assessments 6-7
6.6.3.1 Human Health 6-7
6.6.3.2 Ecological 6-7

6.6.4 Other Applicable Assessments 6-7
6.6.4.1 Surface Water 6-7
6.6.4.2 Groundwater 6-7
6.6.4.3 Underground Storage Tanks (USTs) 6-7
6.6.4.4 Other 6-7
6.7 No Further Action Proposal 6-8
6.7.1 Rationale 6-8
6.7.2 Criterion 6-8

Section 7 SWMU 9, Aircraft Washrack Drain System 7-1
7.1 Summary 7-1
7.2 Site Description and Operational History 7-1
7.2.1 Site Description 7-1
7.2.2 Operational History 7-1
7.3 Land Use 7-1
7.3.1 Current 7-1
7.3.2 Future/Proposed 7-2
7.4 Investigative Activities 7-2
7.4.1 Summary 7-2
7.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 7-2
7.4.2.1 Non-Sampling Data Collection 7-2
7.4.2.2 Sampling Data Collection 7-2
7.4.2.3 Data Gaps 7-2
7.4.2.4 Results and Conclusions 7-3
7.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 7-3
7.4.3.1 Non-Sampling Data Collection 7-3
7.4.3.2 Sampling Data Collection 7-4
7.4.3.3 Data Gaps 7-4
7.4.3.4 Results and Conclusions 7-4
7.5 Site Conceptual Model 7-5
7.5.1 Nature and Extent of Contamination 7-5
7.5.2 Environmental Fate 7-5
7.6 Site Assessments 7-5
7.6.1 Summary 7-5
7.6.2 Screening Assessments 7-6
7.6.2.1 Human Health 7-6
7.6.2.2 Ecological 7-6
7.6.3 Risk Assessments 7-6
7.6.3.1 Human Health 7-6

7.6.3.2 Ecological 7-7
7.6.4 Other Applicable Assessments 7-7
7.6.4.1 Surface Water 7-7
7.6.4.2 Groundwater 7-7
7.6.4.3 Underground Storage Tanks (USTs) 7-7
7.6.4.4 Other 7-7
7.7 No Further Action Proposal 7-7
7.7.1 Rationale 7-7
7.7.2 Criterion 7-8

Section 8 SWMU 32A, Oil/Water Separator No. 186 (#1 - East) 8-1
8.1 Summary 8-1
8.2 Site Description and Operational History 8-1
8.2.1 Site Description 8-1
8.2.2 Operational History 8-1
8.3 Land Use 8-2
8.3.1 Current 8-2
8.3.2 Future/Proposed 8-2
8.4 Investigative Activities 8-2
8.4.1 Summary 8-2
8.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 8-2
8.4.2.1 Non-Sampling Data Collection 8-2
8.4.2.2 Sampling Data Collection 8-2
8.4.2.3 Data Gaps 8-3
8.4.2.4 Results and Conclusions 8-3
8.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 8-4
8.4.3.1 Non-Sampling Data Collection 8-4
8.4.3.2 Sampling Data Collection 8-4
8.4.3.3 Data Gaps 8-4
8.4.3.4 Results and Conclusions 8-4
8.5 Site Conceptual Model 8-5
8.5.1 Nature and Extent of Contamination 8-5
8.5.2 Environmental Fate 8-5
8.6 Site Assessments 8-6
8.6.1 Summary 8-6
8.6.2 Screening Assessments 8-6
8.6.2.1 Human Health 8-6
8.6.2.2 Ecological 8-6
8.6.3 Risk Assessments 8-7

8.6.3.1 Human Health 8-7
8.6.3.2 Ecological 8-7
8.6.4 Other Applicable Assessments 8-7
8.6.4.1 Surface Water 8-7
8.6.4.2 Groundwater 8-7
8.6.4.3 Underground Storage Tanks (USTs) 8-7
8.6.4.4 Other 8-7
8.7 No Further Action Proposal 8-8
8.7.1 Rationale 8-8
8.7.2 Criterion 8-8

Section 9 SWMU 33B, Oil/Water Separator No. 186 (#2 - West) 9-1
9.1 Summary 9-1
9.2 Site Description and Operational History 9-1
9.2.1 Site Description 9-1
9.2.2 Operational History 9-1
9.3 Land Use 9-2
9.3.1 Current 9-2
9.3.2 Future/Proposed 9-2
9.4 Investigative Activities 9-2
9.4.1 Summary 9-2
9.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 9-2
9.4.2.1 Non-Sampling Data Collection 9-2
9.4.2.2 Sampling Data Collection 9-2
9.4.2.3 Data Gaps 9-3
9.4.2.4 Results and Conclusions 9-3
9.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 9-4
9.4.3.1 Non-Sampling Data Collection 9-4
9.4.3.2 Sampling Data Collection 9-4
9.4.3.3 Data Gaps 9-4
9.4.3.4 Results and Conclusions 9-4
9.5 Site Conceptual Model 9-5
9.5.1 Nature and Extent of Contamination 9-5
9.5.2 Environmental Fate 9-5
9.6 Site Assessments 9-6
9.6.1 Summary 9-6
9.6.2 Screening Assessments 9-6
9.6.2.1 Human Health 9-6
9.6.2.2 Ecological 9-6

9.6.3 Risk Assessments 9-7
9.6.3.1 Human Health 9-7
9.6.3.2 Ecological 9-7
9.6.4 Other Applicable Assessments 9-7
9.6.4.1 Surface Water 9-7
9.6.4.2 Groundwater 9-7
9.6.4.3 Underground Storage Tanks (USTs) 9-7
9.6.4.4 Other 9-7
9.7 No Further Action Proposal 9-8
9.7.1 Rationale 9-8
9.7.2 Criterion 9-8

Section 10 SWMU 11, Oil/Water Separator No. 170 10-1
10.1 Summary 10-1
10.2 Site Description and Operational History 10-1
10.2.1 Site Description 10-1
10.2.2 Operational History 10-1
10.3 Land Use 10-1
10.3.1 Current 10-1
10.3.2 Future/Proposed 10-2
10.4 Investigative Activities 10-2
10.4.1 Summary 10-2
10.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 10-2
10.4.2.1 Non-Sampling Data Collection 10-2
10.4.2.2 Sampling Data Collection 10-2
10.4.2.3 Data Gaps 10-2
10.4.2.4 Results and Conclusions 10-3
10.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 10-3
10.4.3.1 Non-Sampling Data Collection 10-3
10.4.3.2 Sampling Data Collection 10-3
10.4.3.3 Data Gaps 10-4
10.4.3.4 Results and Conclusions 10-4
10.5 Site Conceptual Model 10-4
10.5.1 Nature and Extent of Contamination 10-4
10.5.2 Environmental Fate 10-5
10.6 Site Assessments 10-5
10.6.1 Summary 10-5
10.6.2 Screening Assessments 10-5
10.6.2.1 Human Health 10-5

10.6.2.2 Ecological 10-6
10.6.3 Risk Assessments 10-6
10.6.3.1 Human Health 10-6
10.6.3.2 Ecological 10-6
10.6.4 Other Applicable Assessments 10-7
10.6.4.1 Surface Water 10-7
10.6.4.2 Groundwater 10-7
10.6.4.3 Underground Storage Tanks (USTs) 10-7
10.6.4.4 Other 10-7
10.7 No Further Action Proposal 10-7
10.7.1 Rationale 10-7
10.7.2 Criterion 10-7

Section 11 SWMU 38, Oil/Water Separator No. 194 11-1
11.1 Summary 11-1
11.2 Site Description and Operational History 11-1
11.2.1 Site Description 11-1
11.2.2 Operational History 11-1
11.3 Land Use 11-1
11.3.1 Current 11-1
11.3.2 Future/Proposed 11-2
11.4 Investigative Activities 11-2
11.4.1 Summary 11-2
11.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 11-2
11.4.2.1 Non-Sampling Data Collection 11-2
11.4.2.2 Sampling Data Collection 11-2
11.4.2.3 Data Gaps 11-2
11.4.2.4 Results and Conclusions 11-3
11.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 11-3
11.4.3.1 Non-Sampling Data Collection 11-3
11.4.3.2 Sampling Data Collection 11-4
11.4.3.3 Data Gaps 11-4
11.4.3.4 Results and Conclusions 11-4
11.5 Site Conceptual Model 11-5
11.5.1 Nature and Extent of Contamination 11-5
11.5.2 Environmental Fate 11-5
11.6 Site Assessments 11-5
11.6.1 Summary 11-5
11.6.2 Screening Assessments 11-6

11.6.2.1 Human Health 11-6
11.6.2.2 Ecological 11-6
11.6.3 Risk Assessments 11-6
11.6.3.1 Human Health 11-6
11.6.3.2 Ecological 11-7
11.6.4 Other Applicable Assessments 11-7
11.6.4.1 Surface Water 11-7
11.6.4.2 Groundwater 11-7
11.6.4.3 Underground Storage Tanks (USTs) 11-7
11.6.4.4 Other 11-7
11.7 No Further Action Proposal 11-7
11.7.1 Rationale 11-7
11.7.2 Criterion 11-8

Section 12 SWMU 39, Oil/Water Separator No. 195 12-1
12.1 Summary 12-1
12.2 Site Description and Operational History 12-1
12.2.1 Site Description 12-1
12.2.2 Operational History 12-1
12.3 Land Use 12-1
12.3.1 Current 12-1
12.3.2 Future/Proposed 12-2
12.4 Investigative Activities 12-2
12.4.1 Summary 12-2
12.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 12-2
12.4.2.1 Non-Sampling Data Collection 12-2
12.4.2.2 Sampling Data Collection 12-2
12.4.2.3 Data Gaps 12-2
12.4.2.4 Results and Conclusions 12-3
12.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 12-3
12.4.3.1 Non-Sampling Data Collection 12-3
12.4.3.2 Sampling Data Collection 12-4
12.4.3.3 Data Gaps 12-4
12.4.3.4 Results and Conclusions 12-4
12.5 Site Conceptual Model 12-4
12.5.1 Nature and Extent of Contamination 12-4
12.5.2 Environmental Fate 12-5
12.6 Site Assessments 12-5
12.6.1 Summary 12-5

12.6.2 Screening Assessments 12-5
12.6.2.1 Human Health 12-5
12.6.2.2 Ecological 12-6
12.6.3 Risk Assessments 12-6
12.6.3.1 Human Health 12-6
12.6.3.2 Ecological 12-6
12.6.4 Other Applicable Assessments 12-7
12.6.4.1 Surface Water 12-7
12.6.4.2 Groundwater 12-7
12.6.4.3 Underground Storage Tanks (USTs) 12-7
12.6.4.4 Other 12-7
12.7 No Further Action Proposal 12-7
12.7.1 Rationale 12-7
12.7.2 Criterion 12-7

Section 13 SWMU 46, Oil/Water Separator No. 196 13-1
13.1 Summary 13-1
13.2 Site Description and Operational History 13-1
13.2.1 Site Description 13-1
13.2.2 Operational History 13-1
13.3 Land Use 13-1
13.3.1 Current 13-1
13.3.2 Future/Proposed 13-2
13.4 Investigative Activities 13-2
13.4.1 Summary 13-2
13.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 13-2
13.4.2.1 Non-Sampling Data Collection 13-2
13.4.2.2 Sampling Data Collection 13-2
13.4.2.3 Data Gaps 13-2
13.4.2.4 Results and Conclusions 13-3
13.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 13-3
13.4.3.1 Non-Sampling Data Collection 13-3
13.4.3.2 Sampling Data Collection 13-3
13.4.3.3 Data Gaps 13-3
13.4.3.4 Results and Conclusions 13-3
13.5 Site Conceptual Model 13-4
13.5.1 Nature and Extent of Contamination 13-4
13.5.2 Environmental Fate 13-4
13.6 Site Assessments 13-5

13.6.1 Summary 13-5
13.6.2 Screening Assessments 13-5
13.6.2.1 Human Health 13-5
13.6.2.2 Ecological 13-5
13.6.3 Risk Assessments 13-6
13.6.3.1 Human Health 13-6
13.6.3.2 Ecological 13-6
13.6.4 Other Applicable Assessments 13-6
13.6.4.1 Surface Water 13-6
13.6.4.2 Groundwater 13-6
13.6.4.3 Underground Storage Tanks (USTs) 13-6
13.6.4.4 Other 13-6
13.7 No Further Action Proposal 13-6
13.7.1 Rationale 13-6
13.7.2 Criterion 13-7

Section 14 SWMU 47, Oil/Water Separator No. 494 14-1
14.1 Summary 14-1
14.2 Site Description and Operational History 14-1
14.2.1 Site Description 14-1
14.2.2 Operational History 14-1
14.3 Land Use 14-1
14.3.1 Current 14-1
14.3.2 Future/Proposed 14-2
14.4 Investigative Activities 14-2
14.4.1 Summary 14-2
14.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 14-2
14.4.2.1 Non-Sampling Data Collection 14-2
14.4.2.2 Sampling Data Collection 14-2
14.4.2.3 Data Gaps 14-3
14.4.2.4 Results and Conclusions 14-3
14.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 14-3
14.4.3.1 Non-Sampling Data Collection 14-3
14.4.3.2 Sampling Data Collection 14-3
14.4.3.3 Data Gaps 14-3
14.4.3.4 Results and Conclusions 14-3
14.5 Site Conceptual Model 14-4
14.5.1 Nature and Extent of Contamination 14-4
14.5.2 Environmental Fate 14-5

14.6 Site Assessments 14-5
14.6.1 Summary 14-5
14.6.2 Screening Assessments 14-5
14.6.2.1 Human Health 14-5
14.6.2.2 Ecological 14-6
14.6.3 Risk Assessments 14-6
14.6.3.1 Human Health 14-6
14.6.3.2 Ecological 14-6
14.6.4 Other Applicable Assessments 14-7
14.6.4.1 Surface Water 14-7
14.6.4.2 Groundwater 14-7
14.6.4.3 Underground Storage Tanks (USTs) 14-7
14.6.4.4 Other 14-7
14.7 No Further Action Proposal 14-7
14.7.1 Rationale 14-7
14.7.2 Criterion 14-7

Section 15 SWMU 51, Oil/Water Separator No. 375 15-1
15.1 Summary 15-1
15.2 Site Description and Operational History 15-1
15.2.1 Site Description 15-1
15.2.2 Operational History 15-1
15.3 Land Use 15-2
15.3.1 Current 15-2
15.3.2 Future/Proposed 15-2
15.4 Investigative Activities 15-2
15.4.1 Summary 15-2
15.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 15-2
15.4.2.1 Non-Sampling Data Collection 15-2
15.4.2.2 Sampling Data Collection 15-2
15.4.2.3 Data Gaps 15-3
15.4.2.4 Results and Conclusions 15-3
15.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 15-3
15.4.3.1 Non-Sampling Data Collection 15-3
15.4.3.2 Sampling Data Collection 15-3
15.4.3.3 Data Gaps 15-3
15.4.3.4 Results and Conclusions 15-4
15.4.4 Investigation #3: Corrective Measure Completion Report, Appendices II and III SWMUs 15-4
15.4.4.1 Non-Sampling Data Collection 15-4

15.4.4.2 Sampling Data Collection 15-4
15.4.4.3 Data Gaps 15-4
15.4.4.4 Results and Conclusions 15-4
15.5 Site Conceptual Model 15-6
15.5.1 Nature and Extent of Contamination 15-6
15.5.2 Environmental Fate 15-6
15.6 Site Assessments 15-7
15.6.1 Summary 15-7
15.6.2 Screening Assessments 15-7
15.6.2.1 Human Health 15-7
15.6.2.2 Ecological 15-7
15.6.3 Risk Assessments 15-8
15.6.3.1 Human Health 15-8
15.6.3.2 Ecological 15-8
15.6.4 Other Applicable Assessments 15-8
15.6.4.1 Surface Water 15-8
15.6.4.2 Groundwater 15-8
15.6.4.3 Underground Storage Tanks (USTs) 15-9
15.6.4.4 Other 15-9
15.7 No Further Action Proposal 15-9
15.7.1 Rationale 15-9
15.7.2 Criterion 15-9

Section 16 SWMU 57, Oil/Water Separator No. 379 16-1
16.1 Summary 16-1
16.2 Site Description and Operational History 16-1
16.2.1 Site Description 16-1
16.2.2 Operational History 16-1
16.3 Land Use 16-1
16.3.1 Current 16-1
16.3.2 Future/Proposed 16-2
16.4 Investigative Activities 16-2
16.4.1 Summary 16-2
16.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 16-2
16.4.2.1 Non-Sampling Data Collection 16-2
16.4.2.2 Sampling Data Collection 16-2
16.4.2.3 Data Gaps 16-2
16.4.2.4 Results and Conclusions 16-3
16.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 16-3

16.4.3.1 Non-Sampling Data Collection 16-3
16.4.3.2 Sampling Data Collection 16-3
16.4.3.3 Data Gaps 16-3
16.4.3.4 Results and Conclusions 16-3
16.5 Site Conceptual Model 16-4
16.5.1 Nature and Extent of Contamination 16-4
16.5.2 Environmental Fate 16-4
16.6 Site Assessments 16-5
16.6.1 Summary 16-5
16.6.2 Screening Assessments 16-5
16.6.2.1 Human Health 16-5
16.6.2.2 Ecological 16-5
16.6.3 Risk Assessments 16-6
16.6.3.1 Human Health 16-6
16.6.3.2 Ecological 16-6
16.6.4 Other Applicable Assessments 16-6
16.6.4.1 Surface Water 16-6
16.6.4.2 Groundwater 16-6
16.6.4.3 Underground Storage Tanks (USTs) 16-6
16.6.4.4 Other 16-6
16.7 No Further Action Proposal 16-6
16.7.1 Rationale 16-6
16.7.2 Criterion 16-7

Section 17 SWMUs 61,62 and 63, Sand Traps 5077A and 5077B and Oil/Water Separator 5077C 17-1

17.1 Summary 17-1
17.2 Site Description and Operational History 17-1
17.2.1 Site Description 17-1
17.2.2 Operational History 17-2
17.3 Land Use 17-2
17.3.1 Current 17-2
17.3.2 Future/Proposed 17-2
17.4 Investigative Activities 17-2
17.4.1 Summary 17-2
17.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 17-2
17.4.2.1 Non-Sampling Data Collection 17-2
17.4.2.2 Sampling Data Collection 17-3
17.4.2.3 Data Gaps 17-3
17.4.2.4 Results and Conclusions 17-3

17.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 17-4
17.4.3.1 Non-Sampling Data Collection 17-4
17.4.3.2 Sampling Data Collection 17-4
17.4.3.3 Data Gaps 17-4
17.4.3.4 Results and Conclusions 17-4
17.5 Site Conceptual Model 17-5
17.5.1 Nature and Extent of Contamination 17-5
17.5.2 Environmental Fate 17-5
17.6 Site Assessments 17-5
17.6.1 Summary 17-5
17.6.2 Screening Assessments 17-6
17.6.2.1 Human Health 17-6
17.6.2.2 Ecological 17-6
17.6.3 Risk Assessments 17-6
17.6.3.1 Human Health 17-6
17.6.3.2 Ecological 17-6
17.6.4 Other Applicable Assessments 17-7
17.6.4.1 Surface Water 17-7
17.6.4.2 Groundwater 17-7
17.6.4.3 Underground Storage Tanks (USTs) 17-7
17.6.4.4 Other 17-7
17.7 No Further Action Proposal 17-7
17.7.1 Rationale 17-7
17.7.2 Criterion 17-7

Section 18 SWMU 92, Oil/Water Separator No. 5120 18-1
18.1 Summary 18-1
18.2 Site Description and Operational History 18-1
18.2.1 Site Description 18-1
18.2.2 Operational History 18-1
18.3 Land Use 18-1
18.3.1 Current 18-1
18.3.2 Future/Proposed 18-2
18.4 Investigative Activities 18-2
18.4.1 Summary 18-2
18.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 18-2
18.4.2.1 Non-Sampling Data Collection 18-2
18.4.2.2 Sampling Data Collection 18-2
18.4.2.3 Data Gaps 18-3

18.4.2.4 Results and Conclusions 18-3
18.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 18-3
18.4.3.1 Non-Sampling Data Collection 18-3
18.4.3.2 Sampling Data Collection 18-3
18.4.3.3 Data Gaps 18-3
18.4.3.4 Results and Conclusions 18-3
18.4.4 Investigation #3: Corrective Measure Completion Report, Appendices II and III SWMUs 18-4
18.4.4.1 Non-Sampling Data Collection 18-4
18.4.4.2 Sampling Data Collection 18-4
18.4.4.3 Data Gaps 18-4
18.4.4.4 Results and Conclusions 18-4
18.5 Site Conceptual Model 18-5
18.5.1 Nature and Extent of Contamination 18-5
18.5.2 Environmental Fate 18-6
18.6 Site Assessments 18-6
18.6.1 Summary 18-6
18.6.2 Screening Assessments 18-6
18.6.2.1 Human Health 18-6
18.6.2.2 Ecological 18-7
18.6.3 Risk Assessments 18-7
18.6.3.1 Human Health 18-7
18.6.3.2 Ecological 18-8
18.6.4 Other Applicable Assessments 18-8
18.6.4.1 Surface Water 18-8
18.6.4.2 Groundwater 18-8
18.6.4.3 Underground Storage Tanks (USTs) 18-8
18.6.4.4 Other 18-8
18.7 No Further Action Proposal 18-8
18.7.1 Rationale 18-8
18.7.2 Criterion 18-8

Section 19 SWMU 94, Oil/Water Separator No. 5144 19-1
19.1 Summary 19-1
19.2 Site Description and Operational History 19-1
19.2.1 Site Description 19-1
19.2.2 Operational History 19-2
19.3 Land Use 19-2
19.3.1 Current 19-2
19.3.2 Future/Proposed 19-2

19.4 Investigative Activities 19-2
19.4.1 Summary 19-2
19.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 19-2
19.4.2.1 Non-Sampling Data Collection 19-2
19.4.2.2 Sampling Data Collection 19-3
19.4.2.3 Data Gaps 19-3
19.4.2.4 Results and Conclusions 19-3
19.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 19-3
19.4.3.1 Non-Sampling Data Collection 19-3
19.4.3.2 Sampling Data Collection 19-4
19.4.3.3 Data Gaps 19-4
19.4.3.4 Results and Conclusions 19-4
19.4.4 Investigation #3: Corrective Measure Completion Report, Appendices II and III SWMUs 19-4
19.4.4.1 Non-Sampling Data Collection 19-4
19.4.4.2 Sampling Data Collection 19-4
19.4.4.3 Data Gaps 19-5
19.4.4.4 Results and Conclusions 19-5
19.5 Site Conceptual Model 19-6
19.5.1 Nature and Extent of Contamination 19-6
19.5.2 Environmental Fate 19-6
19.6 Site Assessments 19-7
19.6.1 Summary 19-7
19.6.2 Screening Assessments 19-7
19.6.2.1 Human Health 19-7
19.6.2.2 Ecological 19-7
19.6.3 Risk Assessments 19-8
19.6.3.1 Human Health 19-8
19.6.3.2 Ecological 19-8
19.6.4 Other Applicable Assessments 19-8
19.6.4.1 Surface Water 19-8
19.6.4.2 Groundwater 19-8
19.6.4.3 Underground Storage Tanks (USTs) 19-9
19.6.4.4 Other 19-9
19.7 No Further Action Proposal 19-9
19.7.1 Rationale 19-9
19.7.2 Criterion 19-9

Section 20 SWMU 8, Oil/Water Separator No. 165 20-1
20.1 Summary 20-1

20.2 Site Description and Operational History 20-1
20.2.1 Site Description 20-1
20.2.2 Operational History 20-1
20.3 Land Use 20-2
20.3.1 Current 20-2
20.3.2 Future/Proposed 20-2
20.4 Investigative Activities 20-2
20.4.1 Summary 20-2
20.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 20-2
20.4.2.1 Non-Sampling Data Collection 20-2
20.4.2.2 Sampling Data Collection 20-2
20.4.2.3 Data Gaps 20-3
20.4.2.4 Results and Conclusions 20-3
20.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 20-4
20.4.3.1 Non-Sampling Data Collection 20-4
20.4.3.2 Sampling Data Collection 20-4
20.4.3.3 Data Gaps 20-4
20.4.3.4 Results and Conclusions 20-4
20.5 Site Conceptual Model 20-5
20.5.1 Nature and Extent of Contamination 20-5
20.5.2 Environmental Fate 20-5
20.6 Site Assessments 20-6
20.6.1 Summary 20-6
20.6.2 Screening Assessments 20-6
20.6.2.1 Human Health 20-6
20.6.2.2 Ecological 20-6
20.6.3 Risk Assessments 20-7
20.6.3.1 Human Health 20-7
20.6.3.2 Ecological 20-7
20.6.4 Other Applicable Assessments 20-7
20.6.4.1 Surface Water 20-7
20.6.4.2 Groundwater 20-7
20.6.4.3 Underground Storage Tanks (USTs) 20-7
20.6.4.4 Other 20-7
20.7 No Further Action Proposal 20-8
20.7.1 Rationale 20-8
20.7.2 Criterion 20-8

List of Figures

Figure 2-1	SWMU 74
Figure 3-1	AOC D
Figure 4-1	SWMU 113
Figure 4-3	SWMU 113
Figure 5-1	DP-33
Figure 6-1	SWMU 7
Figure 7-1	SWMU 9
Figure 8-1	SWMU 32A
Figure 9-1	SWMU 33B
Figure 10-1	SWMU 11
Figure 11-1	SWMU 38
Figure 12-1	SWMU 39
Figure 13-1	SWMU 46
Figure 14-1	SWMU 47
Figure 15-1	SWMU 51
Figure 16-1	SWMU 57
Figure 17-1	SWMUs 61, 62 and 63
Figure 18-1	SWMU 92
Figure 18-3	SWMU 92
Figure 19-1	SWMU 94
Figure 19-3	SWMU 94
Figure 20-1	SWMU 8

Vol. 1 - TABLE OF CONTENTS

List of Tables

Table 1-1	Summary of Background Elemental Concentrations in Soil Samples at Cannon AFB, New Mexico, Introduction
Table 1-2	Federal- and State-Protected Animals Potentially Occurring in the Vicinity of Cannon AFB (Curry County), Introduction
Table 2-1a	Results for Metals and Other Detected Chemical Compounds, SWMU 74
Table 2-1b	Summary of Organic Compounds, SWMU 74
Table 3-1a	Organic Analytical Results, AOC D
Table 3-1b	Analytical Data Summary of Detected Metals, AOC D
Table 3-1c	Asbestos Analytical Results, AOC D
Table 3-1d	Detected Metal Concentrations Compared to USEPA Region 6 Screening Levels, AOC D
Table 4-1	Results of Water Samples, SWMU 113
Table 4-2	Dissolved Metal Concentrations in Groundwater Samples, SWMU 113
Table 4-3	Metals Results and Detected Concentrations for Other Chemical Compounds, SWMU 113
Table 5-1a	Confirmation and Backfill Samples, DP-33
Table 5-1b	Profile Samples, DP-33
Table 5-1c	Confirmation and Profile Samples, DP-33
Table 5-1d	Backfill Sample, DP-33
Table 6-1a	Concentration (µg/kg) of VOCs, SWMU 7
Table 6-1b	Concentration (mg/kg) of Total Metals, SWMU 7
Table 6-2a	Summary of Soil Sample Results, SWMU 7
Table 6-2b	Maximum Soil Sample Concentrations, SWMU 7
Table 7-1a	Concentration (µg/kg) of VOCs, SWMU 9
Table 7-1b	Concentration (mg/kg) of Total Metals, SWMU 9
Table 7-2a	Summary of Soil Sample Results, SWMU 9
Table 7-2b	Maximum Soil Sample Concentrations, SWMU 9
Table 8-1a	Concentration (µg/kg) of VOCs, SWMU 32A
Table 8-1b	Concentration (mg/kg) of Total Metals, SWMU 32A
Table 8-2a,	Summary of Soil Sample Results, SWMU 32A
Table 8-2b	Maximum Soil Sample Concentration of Metals, SWMU 32A
Table 9-1a	Concentration (µg/kg) of VOCs, SWMU 33B
Table 9-1b	Concentration (µg/kg) of BTEX, SWMU 33B
Table 9-1c	Concentration (mg/kg) of Total Metals, SWMU 33B
Table 9-2a	Summary of Soil Sample Results, SWMU 33B
Table 9-2b	Maximum Soil Sample Concentration of Metals, SWMU 33B
Table 10-1a	Concentration (µg/kg) of VOCs, SWMU 11

List of Tables, cont.

Table 10-1b	Concentration (mg/kg) of Total Metals, SWMU 11
Table 10-2a	Summary of Soil Sample Results, SWMU 11
Table 10-2b	Maximum Soil Sample Concentrations, SWMU 11
Table 11-1a	Concentration (µg/kg) of VOCs, SWMU 38
Table 11-1b	Concentration (mg/kg) of Total Metals, SWMU 38
Table 11-2a	Summary of Soil Sample Results, SWMU 38
Table 11-2b	Maximum Soil Sample Concentration of Metals, SWMU 38
Table 12-1a	Concentration (µg/kg) of VOCs, SWMU 39
Table 12-1b	Concentration (mg/kg) of Total Metals, SWMU 39
Table 12-2a	Summary of Soil Sample Results, SWMU 39
Table 12-2b	Maximum Soil Sample Concentration of Metals, SWMU 39
Table 13-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 46
Table 13-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 46
Table 13-1c	Comparison of Maximum Concentrations with RBCs, SWMU 46
Table 13-2a	Summary of Soil Sample Results, SWMU 46
Table 13-2b	Maximum Soil Sample Concentration of Metals, SWMU 46
Table 14-1a	Summary of Chemicals Reported for Near-Surface Soil Samples Collected, SWMU 47
Table 14-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 47
Table 14-1c	Comparison of Maximum Concentrations with RBCs, SWMU 47
Table 14-2a	Summary of Soil Sample Results, SWMU 47
Table 14-2b	Maximum Soil Sample Concentration of Metals, SWMU 47
Table 15-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 51
Table 15-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 51
Table 15-1c	Comparison of Maximum Concentrations with RBCs, SWMU 51
Table 15-2	Summary of Human Health Risks, SWMU 51
Table 15-3a	Summary of Soil Sample Results, SWMU 51
Table 15-3b	Maximum Soil Sample Concentration of Metals, SWMU 51
Table 16-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 57
Table 16-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 57
Table 16-1c	Comparison of Maximum Concentrations with RBCs, SWMU 57
Table 16-2a	Summary of Soil Sample Results, SWMU 57

List of Tables, cont.

Table 16-2b	Maximum Soil Sample Concentration of Metals, SWMU 57
Table 17-1a	Summary of Chemicals Reported for Subsurface Soil, SWMUs 61-63
Table 17-1b	Summary of Chemicals Reported for Near-Surface Soil, SWMUs 61-63
Table 17-1c	Comparison of Maximum Concentrations with RBCs, SWMUs 61-63
Table 17-1d	Comparison of Maximum Concentrations with RBCs, SWMUs 61-63
Table 17-1e	Comparison of Maximum Concentrations with RBCs, SWMUs 61-63
Table 17-2a	Concentrations of COCs in Surface Soils, SWMUs 61-63
Table 17-2b	Concentrations of COCs in Total Soils, SWMUs 61-63
Table 17-2c	Summary of Human Health Risks, SWMUs 61-63
Table 18-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 92
Table 18-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 92
Table 18-2a	Comparison of Maximum Concentrations with RBCs, SWMU 92
Table 18-2b	Summary of Human Health Risks, SWMU 92
Table 18-2c	Risk Characterization Summary, SWMU 92
Table 18-3a	Summary of Soil Sample Results, SWMU 92
Table 18-3b	Maximum Soil Sample Concentration of Metals, SWMU 92
Table 19-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 94
Table 19-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 94
Table 19-2a	Comparison of Detected Concentrations with RBCs, SWMU 94
Table 19-2b	Summary of Human Health Risks, SWMU 94
Table 19-2c	Risk Characterization Summary, SWMU 94
Table 19-3a	Summary of Soil Sample Results, SWMU 94
Table 19-3b	Maximum Soil Sample Concentration of Metals, SWMU 94
Table 20-1a	Concentration (μg/kg) of BTEX, SWMU 8
Table 20-1b	Concentration (mg/kg) of Total Metals, SWMU 8
Table 20-2a	Summary of Soil Sample Results, SWMU 8
Table 20-2b	Maximum Soil Sample Concentrations, SWMU 8

Vol. 1 - TABLE OF CONTENTS

List of Appendices

Appendix A	Figures
Appendix B	Tables
Appendix C	References

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
ACM	Asbestos-containing material
AFB	Air Force Base
AOC	Area of Concern
AST	Aboveground Storage Tank
BRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CRQL	Contract Required Quantitation Limit
DPDO	Defense Property Disposal Office
DRO	Diesel-Range Organics
EP	Extraction Procedure
GC	Gas Chromatograph
GIS	Geographical Information System
GRO	Gasoline-Range Organics
HELP	Hydrologic Evaluation of Landfill Performance (Model)
HI	Hazard Index
IRP	Installation Restoration Program
JP-4	Jet Propellant
MCL	Maximum Contaminant Level
MCPP	2-(2-methyl-4-chlorophenoxy) propionic acid
mgd	million gallons per day
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MOGAS	Motor Gasoline
MSSL	Media-Specific Screening Level

MULTIMED	Multimedia Exposure Assessment Model
NFA	No Further Action
NMED	New Mexico Environment Department
OVA	Organic Vapor Analyzer
OWS	Oil/Water Separator
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PLM	Polarized light microscopy
POL	Petroleum, Oil, and Lubricants
ppb	parts per billion
ppm	parts per million
ppm/v	parts per million on a volume to volume basis
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
RBC	Risk-Based Concentration
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RL	Reporting Limit
RME	Reasonable Maximum Exposure
SI	Site Inspection
SSTL	Site-Specific Target Level
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCO	Total Chromatographable Organics
TIC	Tentatively Identified Compound

TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
VOC	Volatile Organic Compound
W-C	Woodward-Clyde
WWTP	Wastewater Treatment Plant

This document is intended to serve as a formal request for Class 3 modifications to the Cannon Air Force Base (AFB) Resource Conservation and Recovery Act (RCRA) Part B Permit pursuant to 40 CFR 270.42(c) of the Hazardous and Solid Waste Amendments of 1984 for closure of sixty-one Solid Waste Management Units (SWMUs) and seven Areas of Concern (AOCs). The SWMUs included in this document were listed in all three of the Appendices (I, II, and III) to the Cannon AFB RCRA Permit.

All of the SWMUs and AOCs addressed by this document, and the applicable New Mexico Environment Department (NMED) No Further Action (NFA) Proposal Criteria for their closure, are listed in the table below. (Please note that, based on investigative histories, SWMUs 61, 62, and 63, and SWMUs 86, 87, 88, 89, and 90 have been grouped together as Section 17 and 45, respectively.)

TABLE ES-1

Section	SWMU/AOC	Description	NMED Criterion
Section 2	SWMU 74	Landfill No. 1	5
Section 3	AOC D	Asbestos Burial Pit	4
Section 4	SWMU 113	Landfill No. 5, Cell 3	4
Section 5	DP-33	Drum Disposal Pit	4
Section 6	SWMU 7	Oil/Water Separator No. 129	5
Section 7	SWMU 9	Aircraft Washrack Drain System	5
Section 8	SWMU 32A	Oil/Water Separator No. 186 (#1 - East)	5
Section 9	SWMU 33B	Oil/Water Separator No. 186 (#2 - West)	5
Section 10	SWMU 11	Oil/Water Separator No. 170	5
Section 11	SWMU 38	Oil/Water Separator No. 194	5
Section 12	SWMU 39	Oil/Water Separator No. 195	5
Section 13	SWMU 46	Oil/Water Separator No. 196	5
Section 14	SWMU 47	Oil/Water Separator No. 494	5
Section 15	SWMU 51	Oil/Water Separator No. 375	5
Section 16	SWMU 57	Oil/Water Separator No. 379	5
Section 17	SWMUs 61, 62 and 63	Sand Traps Nos. 5077A and 5077B and Oil/Water Separator No. 5077C	5
Section 18	SWMU 92	Oil/Water Separator No. 5120	5
Section 19	SWMU 94	Oil/Water Separator No. 5144	5
Section 20	SWMU 8	Oil/Water Separator No. 165	5
Section 21	SWMU 1	Oil/Water Separator No. 119	5
Section 22	SWMU 2	Recovered Diesel Tank No. 108	1
Section 23	SWMU 3	Oil/Water Separator No. 108	5
Section 24	SWMU 4	Recovered Oil Tank No. 121	1
Section 25	SWMU 5	Oil/Water Separator No. 121	5

TABLE ES-1

Section	SWMU/AOC	Description	NMED Criterion
Section 26	SWMU 6	POL Tank No. 129	1
Section 27	SWMU 10	POL Tank No. 170	1
Section 28	SWMU 16	Oil/Water Separator No. 680	5
Section 29	SWMU 34	AGE Drainage Ditch	5
Section 30	SWMU 48A	Underground Waste Oil Tank	5
Section 31	SWMU 48B	Aboveground Overflow Capacity Tank	5
Section 32	SWMU 49	Inactive POL Storage Tank No. 4028A	1
Section 33	SWMU 50	Inactive POL Storage Tank No. 4028B	1
Section 34	SWMU 55	Lead Acid Battery Accumulation Point	5
Section 35	SWMU 72	Oil/Water Separator No. 390	1
Section 36	SWMU 75	Sanitary Sewage Lift Station Overflow Pit	2
Section 37	SWMU 76	Sludge Weathering Pit	5
Section 38	SWMU 77	Civil Engineering Container Storage Area	5
Section 39	SWMU 78	Fire Department Training Area No. 1	5
Section 40	SWMU 79	Underground Storage Tank	1
Section 41	SWMU 81	Solvent Disposal Site	1
Section 42	SWMU 82	Landfill No. 2	5
Section 43	SWMU 83	Sump	5
Section 44	SWMU 85	Stormwater Collection Point	5
Section 45	SWMUs 86-90	SD-11, Engine Test Cell Area	5
Section 46	SWMU 91	Recovered Fuel Tank No. 5114	2
Section 47	SWMU 93	Oil/Water Separator No. No. 5121	5
Section 48	SWMU 95	Northeast Stormwater Drainage Area	5
Section 49	SWMU 96	Old Entomology Rinse Area	5
Section 50	SWMU 98	Sanitary Sewer Line	5
Section 51	SWMU 104	Landfill No. 4	5
Section 52	SWMU 105	Landfill No. 3	5
Section 53	SWMU 106	Fire Department Training Area No. 2	5
Section 54	SWMU 107	Fire Department Training Area No. 3	5
Section 55	SWMU 124	Inactive Underground Storage Tank No. 1	1
Section 56	SWMU 125	Inactive Underground Storage Tank No. 2	1
Section 57	SWMU 126	Inactive Underground Storage Tank No. 3	2
Section 58	SWMU 127	Sand Trap and Leach Field No. Near Tank 4095 (#1)	5
Section 59	SWMU 128	Oil/Water Separator No. Near Tank 4095 (#2) and Leach Field	1
Section 60	AOC A	MOGAS Spill Site	2
Section 61	AOC B	JP-8 Fuel Spill Site	2
Section 62	AOC C	Blown Capacitor Site	2

TABLE ES-1

Section	SWMU/AOC		Description	NMED Criterion
Section 63	AOC	E	Runway Rubble Pile	5
Section 64	AOC	F	Calibration Target Berm	5
Section 65	AOC	G	Disturbed Area - North Housing Site	5
Section 66	AOC	H	Disturbed Area - South Housing Site	5
Section 67	AOC	36	Building #214 Parking Lot	2

The locations of each of the SWMUs and AOCs addressed herein are illustrated in Figure 1-2, Appendix A.

ORGANIZATION

Volume I of this document is organized as follows:

- Section 1: Introduction
- Section 2 - SWMU 74: Landfill No. 1
- Section 3 - AOC D: Asbestos Burial Pit
- Section 4 - SWMU 113: Landfill No. 5, Cell 3
- Section 5 - DP-33: Drum Disposal Pit
- Section 6 - SWMU 7: Oil/Water Separator No. 129
- Section 7 - SWMU 9: Aircraft Washrack Drain System
- Section 8 - SWMU 32A: Oil/Water Separator No. 186 (#1 - East)
- Section 9 - SWMU 33B: Oil/Water Separator No. 186 (#2 - West)
- Section 10 - SWMU 11: Oil/Water Separator No. 170
- Section 11 - SWMU 38: Oil/Water Separator No. 194
- Section 12 - SWMU 39: Oil/Water Separator No. 195
- Section 13 - SWMU 46: Oil/Water Separator No. 196
- Section 14 - SWMU 47: Oil/Water Separator No. 494
- Section 15 - SWMU 51: Oil/Water Separator No. 375
- Section 16 - SWMU 57: Oil/Water Separator No. 379
- Section 17 - SWMUs 61-63: Sand Traps Nos. 5077A and 5077B and Oil/Water Separator No. 5077C
- Section 18 - SWMU 92: Oil/Water Separator No. 5120
- Section 19 - SWMU 94: Oil/Water Separator No. 5144

- Section 20 - SWMU 8: Oil/Water Separator No. 165
- Appendix A: Figures
- Appendix B: Tables
- Appendix C: References

Volume II of this document is organized as follows:

- Section 21 - SWMU 1: Oil/Water Separator No. 119
- Section 22 - SWMU 2: Recovered Diesel Tank No. 108
- Section 23 - SWMU 3: Oil/Water Separator No. 108
- Section 24 - SWMU 4: Recovered Oil Tank No. 121
- Section 25 - SWMU 5: Oil/Water Separator No. 121
- Section 26 - SWMU 6: POL Tank No. 129
- Section 27 - SWMU 10: POL Tank No. 170
- Section 28 - SWMU 16: Oil/Water Separator No. 680
- Section 29 - SWMU 34: AGE Drainage Ditch
- Section 30 - SWMU 48A: Underground Waste Oil Tank
- Section 31 - SWMU 48B: Aboveground Overflow Capacity Tank
- Section 32 - SWMU 49: Inactive POL Storage Tank No. 4028A
- Section 33 - SWMU 50: Inactive POL Storage Tank No. 4028B
- Section 34 - SWMU 55: Lead Acid Battery Accumulation Point
- Section 35 - SWMU 72: Oil/Water Separator No. 390
- Section 36 - SWMU 75: Sanitary Sewage Lift Station Overflow Pit
- Section 37 - SWMU 76: Sludge Weathering Pit
- Section 38 - SWMU 77: Civil Engineering Container Storage Area
- Section 39 - SWMU 78: Fire Department Training Area No. 1
- Section 40 - SWMU 79: Underground Storage Tank
- Section 41 - SWMU 81: Solvent Disposal Site
- Section 42 - SWMU 82: Landfill No. 2
- Section 43 - SWMU 83: Sump
- Appendix A: Figures
- Appendix B: Tables
- Appendix C: References

Volume III of this document is organized as follows:

- Section 44 - SWMU 85: Stormwater Collection Point
- Section 45 - SWMUs 86-90: SD-11, Engine Test Cell Area
- Section 46 - SWMU 91: Recovered Fuel Tank No. 5114
- Section 47 - SWMU 93: Oil/Water Separator No. No. 5121
- Section 48 - SWMU 96: Old Entomology Rinse Area
- Section 49 - SWMU 98: Sanitary Sewer Line
- Section 50 - SWMU 104: Landfill No. 4
- Section 51 - SWMU 105: Landfill No. 3
- Section 52 - SWMU 106: Fire Department Training Area No. 2
- Section 53 - SWMU 107: Fire Department Training Area No. 3
- Section 54 - SWMU 124: Inactive Underground Storage Tank No. 1
- Section 55 - SWMU 125: Inactive Underground Storage Tank No. 2
- Section 56 - SWMU 126: Inactive Underground Storage Tank No. 3
- Section 57 - SWMU 127: Sand Trap and Leach Field No. Near Tank 4095 (#1)
- Section 58 - SWMU 128: Oil/Water Separator No. Near Tank 4095 (#2) and Leach Field
- Section 59 – AOC C: Blown Capacitor Site
- Section 60 – AOC E: Runway Rubble Pile
- Section 61 – AOC F: Calibration Target Berm
- Section 62 – AOC G: Disturbed Area - North Housing Site
- Section 63 – AOC H: Disturbed Area - South Housing Site
- Appendix A: Figures
- Appendix B: Tables
- Appendix C: References

Each of the individual sections listed above are divided into the following subsections:

- Summary – lists the past investigations and assessments completed at a given SWMU or AOC; summarizes the conclusions of these investigations and assessments; and states the rationale for a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) for closure of the SWMU or AOC.
- Description and Operational History – briefly describes the site and its operational history.

- Land Use – states current and future or proposed uses for the site.
- Investigatory Activities – briefly summarizes the past investigations and their conclusions; discusses any non-sampling data collected during the first investigation, discusses any sampling data collected during the first investigation, discusses any gaps in the data collected during the first investigation, and discusses the results and conclusions of the first investigation; and repeats these discussions for all subsequent investigations.
- Site Conceptual Model – describes the nature and extent and ultimate environmental fate of any contamination identified during the site investigations.
- Site Assessments – summarizes any assessments performed using the data collected during the site investigations; discusses any screening assessments that may have been performed to determine potential impacts on human health or the ecology; discusses any risk assessments that may have been performed to determine potential impacts on human health or the ecology; discusses any other applicable assessments that may have been performed at the site (e.g., on surface water, ground water, underground storage tanks, or other issues relevant to the site).
- No Further Action Proposal – summarizes the rationale for a Class 3 modification to the Cannon AFB RCRA Part B Permit, and concludes by stating the applicable NMED criterion used.

1.1 SETTING - PHYSICAL GEOGRAPHY

Cannon AFB is situated in the Southern High Plains Physiographic Province in the Llano Estacado subprovince. The Llano Estacado is a nearly flat plain sloping gently (10 to 15 feet per mile) to the east and southeast. Elevations in the eastern New Mexico portion of the Llano Estacado exceed 4,000 feet above mean sea level (msl). In the vicinity of Cannon AFB, elevations range from 4,250 feet to 4,350 feet above msl.

The most prominent geomorphic features in the vicinity of Cannon AFB are blowouts and broad, widely spaced valleys. Less common landforms are relict sand dunes located along the northern side of the Portales Valley south of the Base. Relict dunes are not found on or near Cannon AFB.

Blowouts are broad shallow depressions which form as the result of soil erosion by wind. Blowouts commonly collect surface runoff from small to moderate sized drainage areas. During periods of rainfall, runoff collects in blowouts to form ephemeral playa lakes. Playas have no external surface drainage. Water is lost by infiltration to the soil and evaporation; without recharge, playa lakes persist for only a few days or weeks. Three playas are located within the Base, and several more are found to the north and east of the Base.

Stream valleys tend to be fairly broad and widely spaced. Streams are ephemeral and drainages are poorly developed. No streams exist on or near Cannon AFB. Running Water Draw and Frio Draw, located about 10 and 20 miles, respectively, north of Cannon AFB, are the nearest streams. These are second-order streams. Both streams are very straight, flow southeast, and have rectilinear drainage patterns with short laterals (W-C 1991).

1.2 DEMOGRAPHICS AND LAND USE AT AND NEAR CANNON AFB

Cannon AFB is located just south of U.S. Highway 60-84 in a farming and ranching area (Figure 1-1, Appendix A). The majority of the SWMUs and AOCs addressed herein are located in an industrial/aircraft maintenance area of the Base (Figure 1-2, Appendix A). Two SWMUs, 74 and 75, and four AOCs, C, D, G, and H, are the exceptions; at least a portion of these six sites are located in either a residential or a recreational (golf course) area.

The majority of the land surrounding Cannon AFB is productive, irrigated farmland or grassland. The major crops are wheat, sorghum, sugar beets, corn, cotton, alfalfa, barley, and peanuts. The land is also used for cattle grazing, both beef and dairy, and Clovis is considered the "Cattle Capital of the Southwest." There were 32,767 people living in Clovis in 1990, while the Cannon AFB population was estimated to be 4,650 in 1990 (W-C 1991).

1.3 CLIMATOLOGY

The climate of east-central New Mexico is classified as tropical semiarid, with summer temperature and precipitation maxima. Average monthly temperatures range from a January low of 12°C (39°F) to a July high of 26°C (78°F). Extreme daily temperatures range from -24°C

(-11°F) to 41°C (106°F) (Lee Wan and Associates 1990). Average monthly precipitation ranges from 1 cm (0.4 inches) in winter to 6.9 cm (2.7 inches) in July. The maximum recorded 24-hour rainfall is 12.2 cm (4.8 inches), which occurred in August. Rainfall occurs on eight or more days per month during the summer precipitation maximum. Mean annual precipitation is approximately 41 cm (16 inches). The mean annual evapotranspiration rate is 181.4 cm/yr (71.4 inches/yr) (Lee Wan and Associates 1990). Prevailing winds are from the west at an average of 5 km/hr (3.1 mph) during fall, winter, and spring. During the summer, winds are from the south at an average of 3.7 km/hr (2.3 mph).

The atmosphere around the area of Cannon AFB is generally well mixed. The seasonal and annual average mixing heights can vary from 400 meters in the morning to 4,000 meters in the afternoon. The afternoon mixing heights are typically greater during the spring and fall seasons. The morning mixing heights are usually low, due to nighttime heat loss from the ground, producing surface-based temperature inversions. After sunrise, these inversions break up, and solar heating of the earth's surface causes vertical mixing in the atmosphere.

Dust is frequently entrained into the atmosphere in this region of the country because of gusty winds and the semiarid climate. The Texas Panhandle-eastern New Mexico area is considered the worst area in the United States for windblown dust. Occasionally, this windblown dust is of sufficient quantity to restrict visibility. Most of the seasonal dust storms occur in March and April, when the wind speeds are typically high (average 5 km/hr) (W-C 1991).

1.4 GEOLOGY

The near-surface stratigraphic units of interest at Cannon AFB are the Late Miocene-Late Pliocene-age Ogallala Formation and the Early Triassic Dockum Group as shown in Figure 1-3, Appendix A.

The Dockum Group consists of three formations. The stratigraphically lowest unit is the Santa Rosa Sandstone. Overlying the Santa Rosa Sandstone are the Chinle and Redonda Formations. The Chinle and Redonda Formations are composed mainly of red shales with lesser interbedded sands, and are known locally as "redbeds." The top of the Dockum Group is marked by an erosional unconformity having relief of up to several hundred feet (Lee Wan and Associates 1990).

Overlying the Dockum Group redbeds is the Ogallala Formation. The Ogallala Formation extends from eastern New Mexico and Colorado into Texas, Oklahoma, Kansas, Nebraska, and South Dakota. Drillers' logs from Cannon AFB indicate that the Ogallala Formation varies from 360 feet to 415 feet in thickness. The incised upper surface of Triassic redbeds strongly influences Ogallala thickness. Paleo valleys in the post-Triassic unconformity are deep and trend dominantly east-west. Ogallala thickness may thus vary significantly over short north-south distances.

The Ogallala is erosionally truncated to the south along the abandoned Portales Valley, to the west along the Pecos River Valley, and to the north in a series of ephemeral stream valleys. The

Ogallala Formation extends more than 125 miles to the east before terminating as an escarpment in Briscoe County, Texas. Springs and seeps are common along the erosional margins of the Ogallala.

The Ogallala dips gently and monoclinally to the southeast in the vicinity of Cannon AFB. As reported in Lee Wan and Associates (1990), data suggest that some Quaternary warping may have occurred; however, most of the structures are well to the northwest and southwest of Cannon AFB. No faults or buried structural lineaments are known in the vicinity of Cannon AFB.

The Ogallala Formation is composed of unconsolidated poorly sorted gravel, sand, silts, and clays. The base of the Ogallala is generally marked by a gravel, cobble, and boulder deposit. This basal member contains sediments derived from igneous and sedimentary rocks transported from the mountains to the west. The Ogallala Formation was laid down as stream and overbank deposits formed within coalescing alluvial fans. These fans form a broad pediment along the eastern flank of the Rocky Mountains. As is typical of alluvial deposits, Ogallala internal stratigraphy varies vertically and horizontally over short distances.

Except where strongly cemented by calcium carbonate (caliche), the sediments of the Ogallala are loose and friable. Authigenic and allogenic clays are found as a trace to abundant matrix mineral (Lee Wan and Associates 1990). As reported by Lee Wan and Associates (1990), five zones have been distinguished within the Ogallala of east central New Mexico on the basis of clay minerals. Smectites (montmorillonites) and attapulgite (with sepeotite) are the dominant clays throughout the Ogallala. Illite is a lesser, but persistent clay, as is kaolinite. Smectite is a swelling clay, causing deep cracks to form in dry surface soils. Smectite in particular and, to a lesser extent, attapulgite and illite, are clays with moderate to high cation exchange capacities (CEC). The formation as a whole should therefore have a relatively high CEC, which should inhibit the migration of charged contaminants, and especially ionic forms of metals.

Caliche is a major feature of the Ogallala Formation, occurring as nearly continuous to discontinuous layers throughout. A generalized geologic section at Cannon AFB is shown in Figure 1-3, Appendix A. Caliche is hard, white to pale tan on fresh surfaces, weathering to gray, and has a chalky appearance. Caliche forms as calcium carbonate, leached from overlying sediments, and precipitates in the pore space of the host sediments. Precipitation is caused by the evaporation of downward percolating water. The caliche may thus mark the position of ancient vadose zones. As reported in Lee Wan and Associates (1990) radiocarbon dates for the upper "climax" caliche range from 27,000 yr. Before Present (B.P.) to 42,000 yr. B.P.

Caliche is relatively soluble in acidic water (pH < 7) or in waters containing dissolved CO_2. The top surface of the upper "climax" caliche in fresh outcrop shows solution etching.

The Ogallala has numerous continuous to discontinuous caliche layers throughout its thickness. The uppermost caliche, termed the "climax" caliche, is pisolitic (consisting of spherical concentrically laminated aggregates 1 to 10 mm in diameter (Lee Wan and Associates 1990). The pisolites are thought to have formed as the caliche was repeatedly chemically weathered and

brecciated during Pleistocene pluvials (wet climate episodes) and later recemented during drier intervals. This upper caliche crops out around playas and the bounding escarpments of the Ogallala, and is locally termed "caprock." The "climax" caliche is typically 3 to 5 feet thick. Caliches which occur lower in the Ogallala are platy and harder. Caliche may be thin or absent below playas (W-C 1991).

1.5 HYDROGEOLOGY

The lower portion of the Ogallala Formation is the primary regional aquifer for both potable and irrigation water. No deeper aquifers are utilized in the vicinity of Cannon AFB. The Ogallala aquifer is part of the High Plains Aquifer which extends continuously from Wyoming and South Dakota into New Mexico and Texas. In east central New Mexico, the Ogallala aquifer rests on Dockum Group redbeds, which serve as the basal confining layer. The Ogallala is a water table, or unconfined, aquifer (Lee Wan and Associates 1990). The Ogallala aquifer has a southeasterly regional gradient of about 13 feet/mile. Well yields vary from less than one gallon per minute (gpm) in thin silts and sands, and up to 1,600 gpm in thick sands and gravels (Lee Wan and Associates 1990). Water quality is generally good, with hardness and fluorides being somewhat high (Lee Wan and Associates 1990).

At Cannon AFB, the depth to groundwater is greater than 200 feet, and the Ogallala aquifer has an average saturated thickness of 120 feet based on mid-1960s data. Saturated thickness ranges from 93 to 143 feet, and is influenced by the configuration of the erosional nonconformity surface marking the top of the Dockum Group. The local groundwater gradient is southeasterly at 7.5 feet/mile (Lee Wan and Associates 1990). Figure 1-4, Appendix A, shows water table elevation contours for 1984. Flow within the saturated zone may be influenced by the configuration of the top of the Dockum Group. Yields in tests of Cannon AFB water wells have ranged from 776 L/min (205 gpm) to 4,353 L/min (1150 gpm). Specific capacities range from 0.14 m^3/m (11.4 gal/ft) to 0.35 m^3/m (27.9 gal/ft) (Lee Wan and Associates 1990).

Very rough estimates of hydraulic conductivity were made from well pump tests in water wells 5 and 9 (Figure 1-5, Appendix A) using the Theis equation. An estimate of hydraulic conductivity for water well 8 was based on water level recovery data using the Bouwer and Rice approach (Lee Wan and Associates 1990). The data used in these calculations were obtained to evaluate pump rates, efficiency, and well yield, and were not intended for use in calculating aquifer properties. The results of these calculations should therefore be considered as first approximations.

Hydraulic conductivity values for water wells 5 and 9 were found to be approximately 2.0×10^{-3} cm/sec. Calculations for water well 8 resulted in a hydraulic conductivity of 2.0×10^{-2} cm/sec. In addition, slug testing of two monitoring wells (MW-O and MW-N) was done by Woodward-Clyde in February 1995 (W-C 1995a). The estimated hydraulic conductivities from these slug tests were both 3×10^{-3} cm/sec. These estimates appear to be low when compared to published hydraulic conductivity data for sands and gravels. As reported in Lee Wan and Associates (1990) a groundwater flow velocity of about 45 m/yr (150 ft/yr) has been estimated.

This calculates out to a hydraulic conductivity of approximately 1.0 x 10^{-1} cm/sec. Again, this appears to be low when compared with published data (Freeze and Cherry 1979).

The presence of interstitial clays may account for both the variability and low values of hydraulic conductivities. Boring logs from Cannon AFB IRP projects and published reports (Lee Wan and Associates 1990) indicated that interstitial and interstratified clays are abundant in the Ogallala Formation.

Recharge to the Ogallala is primarily through precipitation. As reported in Lee Wan and Associates (1990), a recharge rate of 0.5 inches/year was calculated using the Theis equation. Lee Wan and Associates (1990) reported that the recharge rate may be as much as 1.0 inches/yr. Due to the high evapotranspiration rate and low precipitation, recharge probably occurs only during heavy rainfall events in which the infiltration capacity of the soil is exceeded and runoff occurs, or during cool months when precipitation exceeds evapotranspiration. Excess runoff flows to playas, and the presence of water in playas may allow deep percolation to the aquifer. The occurrence of this process is evidenced by the presence of clay deposits in, and thin or nonexistent caliche layers directly below, playas. Caliche is soluble in acidic rain waters, and is leached over time to form percolation pathways.

Discharge from the Ogallala occurs through well pumping and springs along the eroded margins of the formation. Spring discharge does not occur on or near Cannon AFB. Domestic and irrigation water wells are common on and around the Base, however. The rate of discharge exceeds the rate of recharge. Water levels in the Ogallala have declined steadily from the 1930s to the present. A decline of 50 to 100 feet has been observed in the area around Clovis, New Mexico for the period from the 1930s to 1980. Lee Wan and Associates (1990), states "the largest area of water level decline exceeding 100 feet occurs south of the Canadian River extending from Curry Co., New Mexico to Crosby Co., Texas."

The dominant uses of groundwater in the Cannon AFB area are for potable and irrigation water. Numerous wells are found in the Cannon AFB area, most of which provide only irrigation water (Figure 1-5, Appendix A).

The Ogallala will continue to be used as the primary source of potable and irrigation water for eastern New Mexico. The New Mexico State Engineer designated Curry County as a Water Basin in 1989. This designation allows for regulation of water rights, usage, and well drilling (W-C 1991).

1.6 SOILS

Soils in the vicinity of Cannon AFB are classified as SM to SC under the Unified Classification Systems, and as aridisols (calciorthids) under the Soil Conservation Service Comprehensive Soil Classification System. The following summary is based on the Soil Conservation Service Curry County Soil Survey as reported in Lee Wan and Associates (1990).

The most common soil type on the Base is the Amarillo fine sandy loam, 0- to 2-percent slope phase (map symbol Ab Figure 1-6, Appendix A). This soil consists of a thin sandy A horizon, well-defined clayey B_{1-3} horizons, with a calcic B_3 horizon at depths below 40 inches. The calcic B_3 horizon lies on a calcic C horizon, or on caliche. The Amarillo fine sandy loam is present on all relatively flat surfaces at the Base, but is also found on slopes associated with playas (map symbol Ac).

Clovis fine sandy loams, 0- to 2-percent slope phase (map symbol Cb) and 2- to 5-percent slope phase (map symbol Cc), are very similar to Amarillo fine sandy loams. In the Clovis soils, the depth to the calcic C horizon ranges from 28 to 56 inches. The depth to caliche exceeds 56 inches. Clovis and Amarillo fine sandy loams occur in close association.

In a few limited areas, particularly along the steeper slopes around playas, Mausker fine sandy loam, 0- to 2-percent slope phase (map symbol Ma), and 2- to 5-percent phase (map symbol Mb) are found. Mausker fine sandy loams have no B horizons and are very calcareous. The calcic C horizon is within 2 feet of the surface.

The A and B horizons of Amarillo and Clovis fine sandy loams are rapidly to moderately permeable. Mausker fine sandy loam A and Ac horizons are rapidly permeable. Permeabilities in calcic B and C horizons are moderate (Lee Wan and Associates 1990).

1.7 BACKGROUND METALS CONCENTRATIONS IN SOIL AND WATER QUALITY

The natural soils in the vicinity of Cannon AFB are alkaline and rich in metals in general. Typically high concentrations of aluminum, iron, magnesium, manganese, and potassium combine with elevated levels of many other metals in the natural soils. Calcium is naturally present in the soils at levels up to nearly 200,000 mg/kg. Tightly cemented layers of "caliche" are present in several horizons in the natural soils and the Ogallala aquifer below.

The background levels of inorganic compounds in surface and subsurface soil at Cannon AFB are presented in Table 3-1, Appendix B, in the form of a mean value and statistical information on the ranges encountered for each element. Table 3-1 has been adapted from a final report by Woodward-Clyde dated September 1997 entitled "Naturally Occurring Concentrations of Inorganics and Background Concentrations of Pesticides at Cannon Air Force Base, New Mexico." This report summarizes background data for soil from numerous past investigations in the vicinity.

The mean values and upper tolerance limits (UTLs) presented in Table 3-1, Appendix B, are the background levels used in the screening of soil chemical results for this RFI. In addition to comparison to the UTL of the Base-wide background data (which is necessarily from a limited data set), other sources of naturally occurring metals concentrations, such as USGS (1984), were considered when determining whether metals concentrations are within background levels.

1.8 BIOLOGICAL RESOURCES

Land adjacent to Cannon AFB is primarily used for agriculture, and there is little natural vegetation remaining in the area. The wildlife species that are common to agricultural areas throughout the region include bobwhite quail and pheasant. There are a few playa lakes in the area; these are used by upland game for cover, by waterfowl for resting and feeding, and by wildlife in general for drinking. Nearby riverbeds also provide water sources during rainy seasons. During periods of low rainfall, the riverbeds are dry (W-C 1991).

1.8.1 Plant Resources

The climate of the Base area is considered to be semiarid. The thin layer of topsoil in the vicinity of Cannon AFB is sandy loam, which is highly susceptible to wind erosion. The undisturbed natural vegetation is mostly shortgrass prairie, including blue grama grassland and mixed grama grassland vegetation types, which have moderately fast recovery rates (W-C 1991).

Much of the study area has been previously cleared for agricultural crops. The predominant land use of the region is rangeland, primarily for cattle grazing. In general, moderately grazed rangeland areas of the types occurring in the project area are highly productive in terms of both forage quality and quantity. The rangeland in the vicinity may support up to 15 to 20 head of cattle per section, depending on the rainfall. Large trees do not uniformly exist in the vicinity of the range except where planted around buildings and other structures on the Base. Woodlands composed of large shrubs and small trees are confined to riparian areas and playa lakes in the vicinity (W-C 1991).

The following plants are candidate species for the Federal List of Endangered and Threatened Wildlife and Plants (CFR 1990) and are found within a 50-mile radius of Cannon AFB: chatterbox orchid (*Epipactus gigantea*), spiny aster (*Aster harridus*), Whittmans milkvetch (*Astragalus witmanii*), dune unicorn plant (*Proboscidea sabulosa*), and the tall plains spruce (*Eupjorbia strictior*). The dune unicorn plant is also on the state endangered plant species list. No federally protected endangered plants are known to be present on the Base (Lee Wan and Associates 1990).

1.8.2 Wildlife Resources

The eastern New Mexico area contains many nongame wildlife species that are typical of the High Plains. Most of these species are distributed widely throughout the western United States. Species diversity is low in most habitats because of the low vegetation diversity. Most amphibian species are associated with riparian habitats and playa lakes. Reptiles are found in all terrestrial habitat types, but are most abundant in scrub/grasslands. Nocturnal rodents are the most abundant members of the small mammal community.

Grasslands on the High Plains support a variety of seed-eating sparrows and other ground-dwelling birds, both as residents and migrants. Raptors (hawks and owls) are relatively abundant in all habitats in the region. Insectivorous and tree-nesting species are most abundant in riparian

areas. Shorebirds and waterbirds and migratory waterfowl in general utilize the rivers, playa lakes, and reservoirs of the region.

Two National Wildlife Refuges (NWRs) are in the region surrounding Cannon AFB. The Grulla and Muleshoe NWRs are within 30 miles of Cannon AFB. These areas provide high-quality habitat for migratory and breeding waterfowl.

Big-game species in the area include mule deer, white-tailed deer, pronghorn, and barbary sheep. Pronghorn are the most abundant game animal in the area. Several species of upland game, such as quail, ring-necked pheasant, and turkey are common in the area. Reservoirs (Ute Lake, Conchas Lake, and Clayton Lake) and playa lakes are important waterfowl habitats in the region. Numerous species of native and introduced fish inhabit the rivers and perennial streams, and the reservoirs support recreational fishing of warm-water species such as walleye, crappie, channel catfish, largemouth bass, and bluegill.

As determined by the regional office of the U.S. Fish and Wildlife Service, two federally listed endangered animal species, the bald eagle and peregrine falcon, are known to inhabit the area within a 50-mile radius of Cannon AFB. The New Mexico Department of Game and Fish also indicated that the state endangered Mississippi Kite, Baird's Sparrow, and the Black-Footed Ferret may also occur in the vicinity of the Base. The federal- and state-protected species are listed in Table 1-2, Appendix B.

Within Curry County, the only state-protected bird that is expected to occur is the Mississippi Kite. In New Mexico, since the early 1960s, this kite summers regularly and breeds in the Clovis region. The birds frequent the golf course at Cannon AFB. Two other state-protected birds that may occur within Curry County are the McCown's Longspur and Baird's Sparrow. These two species have not been sighted regularly in recent years. No information is available on the McCown's Longspur in New Mexico; however, Baird's Sparrow occurs mainly in autumn during migration in the eastern plains and southern lowlands. Migrants appear as early as the first week of August and move further south by November. The species seems to have declined in abundance throughout its range in the Southwest due to the loss of shrubby shortgrass habitats.

State-protected birds known to occur infrequently are the bald eagle and the peregrine falcon. The bald eagle migrates and winters from the northern border of New Mexico to the Gila, lower Rio Grande, middle Pecos, and Canadian valleys. It is seen occasionally in summer and as a breeding bird, with nests reported in the extreme northern and western parts of the state. Winter and migrant populations appear to have increased with reservoir construction. The peregrine falcon is widely distributed but population numbers are low. The American subspecies breeds statewide in New Mexico, but mainly west of the eastern plains (Source: Draft Environmental Impact Statement - Cannon AFB 1990).

2.1 SUMMARY

Solid Waste Management Unit (SWMU) 74, Landfill No. 1, has been listed as an Appendix I site. A Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of Landfill No. 1 (W-C 1997b) found elevated levels of one metal and five organic compounds (including one pesticide and one herbicide) in the area of SWMU 74. Based on the results of a limited risk assessment performed as part of this investigation, the recommendation in the Phase I RFI Report of a Class 3 modification to the Cannon Air Force Base (AFB) RCRA Part B Permit pursuant to 40 Code of Federal Regulations (CFR) 270.42(c) is warranted for closure of this SWMU.

2.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

2.2.1 Site Description

Landfill No. 1 (SWMU 74) was an inactive landfill located in the northwest area of Cannon AFB (Figure 2-1 in Appendix A) beneath a portion of the 14th fairway at the Whispering Winds Golf Course. The landfill was reportedly unlined, and it occupied approximately 8 acres of land. Overall, the landfill site is relatively flat and is covered by the grass of the 14th fairway. The general surface water runoff is toward the east, into a pond located east of the golf course's 15th fairway (W-C 1997b).

2.2.2 Operational History

Landfill No. 1 was the original landfill at Cannon AFB. It accepted wastes from 1943 to 1946. The landfill's operation apparently consisted of placing waste in trenches and burning it before burying it. Waste materials received at the site reportedly included domestic solid wastes and shop wastes, which included waste oils and solvents, paint strippers and thinners, outdated paint, pesticide containers, and various empty cans and drums (Radian 1986).

Radian Corporation previously investigated an area reported to be Landfill No. 1 in 1984 and 1985 under the Installation Restoration Program (IRP) (Radian 1986). This investigation focused on an area approximately 1,000 feet north of Cannon AFB hospital (Lee Wan and Associates 1990). However, landfill material was not encountered in any of the five soil borings drilled during this investigation.

Based on the uncertainty concerning the location of Landfill No. 1, Lee Wan and Associates, Inc. performed a review of aerial photographs from 1945 and 1946 (Lee Wan and Associates 1990). The exact location of the landfill could not be determined, but Lee Wan and Associates estimated the location to be northeast of the Base hospital. A subsequent review of aerial photographs from 1939 and 1951 through 1979, conducted by Woodward-Clyde (W-C) in conjunction with the U.S. Army Corps of Engineers (USACE) and Cannon AFB personnel in March 1992, found evidence of possible surface activity and or disturbance in the same area that had been identified by Lee Wan and Associates.

Based on the available information, W-C delineated the approximate area of the suspected landfill at a location approximately 400 feet northeast of the base hospital. In April and March 1992, W-C conducted a field investigation which included conducting a geophysical survey along 15 traverses, drilling 32 geotechnical soil borings, and collecting 25 lithographic soil samples for archival purposes. An electromagnetic geophysical survey was completed using a Geonics EM-31. The results of the geophysical survey indicated the presence of anomalies in the area suspected to be the location of Landfill No. 1. However, these anomalies had most likely been influenced by underground utilities, the golf course sprinkler system, and the moist soils found near the course's playa lakes and greens, rather than buried landfill materials. In addition, no landfill materials were encountered during the drilling of the soil borings. Based on the results of this investigation, it did not appear that Landfill No. 1 was present in the suspected location.

In the summer of 1993, Cannon AFB began to modify and expand the Whispering Winds Golf Course. In the process of installing the sprinkler system, evidence of burn and bury trenches, potentially associated with landfill activities, was encountered. These trenches were encountered approximately 1,000 feet north-northwest of the Base hospital, in the proximity of the area Radian had investigated in 1984 and 1985.

2.3 LAND USE

2.3.1 Current

Cannon AFB personnel use the Whispering Winds Golf Course frequently on a year-round basis. Approximately 23,000 rounds of golf (i.e., 23,000 person visits, with each visit lasting approximately 1 to 3 hours) are played on the course each year. The average daily usage consists of approximately 40 rounds played each weekday, and approximately 80 rounds played each weekend day. In addition, golf course maintenance personnel work in the area approximately 8 hours per day, 5 days per week.

2.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, it is possible that a change in the flying mission of Cannon AFB could result in the closure of the Whispering Winds Golf Course in the area of SWMU 74. Use classification will continue to remain industrial in nature.

2.4 INVESTIGATIVE ACTIVITIES

2.4.1 Summary

A Phase I RFI of Landfill No. 1 (W-C 1997b) found elevated levels of one metal and five organic compounds (including one pesticide and one herbicide) in the area of SWMU 74. The results of the human health risk evaluation conducted during the Phase I RFI at SWMU 74 indicated that this SWMU poses no unacceptable risk to human health.

2.4.2 Investigation #1: Phase I RCRA Facility Investigation Report for Landfill No. 1 (SWMU 74)

2.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a limited risk assessment performed using the results of this investigation. The limited risk assessment indicated that there is no unacceptable risk to human health from this SWMU (W-C 1997b).

2.4.2.2 Sampling Data Collection

A Phase I RFI was performed at SWMU 74 to determine whether a release of landfill-related chemicals had occurred. Two electromagnetic geophysical surveys were completed, one using a Geonics EM-31 and the other using a Geonics EM-61. The results of both surveys were interpreted, and the anomalies encountered were determined to be indicative of the presence of landfill materials. Based on these results, a subsurface soil investigation was designed. A total of 23 borings were drilled and subsurface soil samples were collected and submitted for chemical analyses from 15 of the borings (boring locations are shown in Figure 2-1 in Appendix A). The borings were advanced to depths ranging from 10 to 50 feet below the surface to determine the vertical extent of any potential contamination. Target analytes for the 43 samples collected from the 23 borings included Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), cyanide, pesticides, polychlorinated biphenyls (PCBs), herbicides, total recoverable petroleum hydrocarbons (TRPH), Target Analyte List (TAL) metals, and total organic carbon (TOC). In addition, the analytical laboratory reported three volatile and five semivolatile organic tentatively identified compounds (TICs).

2.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the Phase I RFI Quality Assurance Project Plan (QAPP). Therefore, no data gaps existed after the completion of the Phase I RFI.

2.4.2.4 Results and Conclusions

One VOC (toluene), two SVOCs (pyrene and pentachlorophenol), one herbicide, (2-[2-methyl-4-chlorophenoxy] propionic acid [MCPP]), one pesticide (4,4'-DDT), and one metal (barium) were detected at concentrations of potential concern during the Phase I RFI at Landfill No. 1. All other compounds detected were excluded from concern because they were detected below the associated background levels (W-C 1997a) in the case of metals, because they were considered to be a laboratory contaminant in the case of organic compounds, or because did not have risk screening criteria. The analytical results for this investigation are presented in Tables 2-1a and 2-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than

250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The landfill material encountered during the Phase I RFI included construction debris and domestic waste. No liquid wastes or soils saturated with liquid wastes were encountered during the field activities.

Based on the results of a limited risk assessment performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 74.

2.5 SITE CONCEPTUAL MODEL

2.5.1 Nature and Extent of Contamination

A total of 23 borings, to depths ranging from 10 to 50 feet, were installed during the Phase I RFI at Landfill No. 1 to effectively delineate the extent of contamination at SWMU 74. Chemical analyses detected elevated concentrations of metals and organic compounds in subsurface soil samples collected during the Phase I RFI at SWMU 74.

Metals that exceeded the associated background levels (W-C 1997a), and organics that were not dismissed as laboratory contaminants, were compared to the United States Environmental Protection Agency (USEPA) Region III Risk-Based Concentrations (RBCs). Additional chemicals were excluded as chemicals of interest if they did not have Region III RBCs (i.e., chemicals without a Region III RBC do not have USEPA-established toxicity values, and therefore cannot be quantitatively evaluated by a risk assessment).

Groundwater at SWMU 74 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

2.5.2 Environmental Fate

Contaminants encountered at Landfill No. 1 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Toluene is likely to be medium to highly mobile in subsurface soil and is not likely to persist for long periods of time due to high vapor pressure, high volatilization potential, and a high biodegradation rate.

MCPP is not likely to persist in the environment over time due to a very high water solubility, a tendency not to adsorb to clays, and a high biodegradation rate.

Pyrene, phenanthrene, and pentachlorophenol are likely to be relatively immobile due to low vapor pressure, low water solubility, and a tendency to adsorb to clays. In addition, these three compounds have moderate to low biodegradation rates.

4,4'-DDT is likely to persist in the environment due to its extremely low vapor pressure, low water solubility, and tendency to readily adsorb to soil. This compound also has a low biodegradation rate.

Based on the general subsurface characteristics at SWMU 74, including moderate to high clay content and an alkaline soil pH, metals (i.e., barium) are not likely to be very mobile in the subsurface; however, they do persist for long periods of time. The potential precipitation of metals in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the Phase I RFI.

2.6 SITE ASSESSMENTS

2.6.1 Summary

A limited risk assessment was conducted based on the results of the Phase I RFI. The results of the limited risk assessment are discussed below.

2.6.2 Screening Assessments

2.6.2.1 Human Health

A human health risk screening was performed for Landfill No. 1 to determine whether chemicals detected in soils at the site may pose an unacceptable risk to human health. Maximum concentrations of the chemicals were compared to USEPA Region III RBCs for residential soil ingestion to estimate potential noncarcinogenic hazard and carcinogenic risk. Conservative assumptions were used throughout the screening process; therefore, the results overestimate the actual hazard/risk and the site.

None of the chemicals detected above background levels (W-C 1997a) that were not dismissed as laboratory contaminants exceeded the established RBCs. The cumulative Hazard Index (HI) for noncarcinogenic effects was 0.4, less than USEPA's level of concern (1.0), indicating that the maximum concentrations of noncarcinogenic chemicals at the site do not pose an unacceptable risk to human health. The cumulative cancer risk from exposure to the maximum concentrations of 4,4'-DDT and pentachlorophenol was 1×10^{-8}, less than USEPA's "point of departure" of 1×10^{-6} for evaluating cancer risk at hazardous waste sites.

Concentrations without toxicity values (RBCs) and tentatively identified compounds were evaluated qualitatively and were found not to pose a threat to human health based on low toxicity, low potential for human exposure (due to infrequent detections), and low detected concentrations.

Based on the results of the human health risk screening, chemicals detected in soils at Landfill No. 1 do not pose an unacceptable risk to human health.

2.6.2.2 *Ecological*

No formal ecological risk screening has been performed at SWMU 74.

2.6.3 Risk Assessments

2.6.3.1 *Human Health*

Based on the conclusions of the human health risk screening, SWMU 74 did not contain any significant hazards/risks such that a formal ecological risk assessment was warranted.

2.6.3.2 *Ecological*

No formal ecological risk assessment has been performed at SWMU 74.

2.6.4 Other Applicable Assessments

2.6.4.1 *Surface Water*

SWMU 74 contained no surface water.

2.6.4.2 *Groundwater*

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

2.6.4.3 *Underground Storage Tanks (USTs)*

There is no record of any storage tanks, either underground or aboveground, in the area of SWMU 74.

2.6.4.4 *Other*

No other assessments have been conducted in the area of SWMU 74.

2.7 NO FURTHER ACTION PROPOSAL

2.7.1 Rationale

Based on the conclusions reached in the Phase I RFI, no further action (NFA) has been recommended for SWMU 74.

2.7.2 Criterion

SWMU 74 is proposed for NFA based on New Mexico Environment Department (NMED) NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

3.1 SUMMARY

Area of Concern (AOC) D, Asbestos Burial Pit, has been described as a demolition debris disposal pit, approximately 10 feet deep, located in the vicinity of the 7th hole on the Cannon AFB golf course. A Site Inspection (SI) of AOC D (IMS 1997) found chips of non-friable asbestos-containing material (ACM) near the ground surface in the area of this site. In a letter to Col. Clary, Commander Cannon AFB, on November 6, 1997, NMED stated the SI was technically adequate and approved the report.

The conclusions reached in the SI and the NMED letter are consistent in recommending that the only action required at AOC D is the removal and proper disposal of the exposed ACM. This action has been completed, and the action will be repeated in the future if additional ACM is exposed. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

3.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

3.2.1 Site Description

AOC D reportedly consists of a pit used for the disposal of demolition debris, potentially including ACM. The site underlies portions of the tee box and fairway at the 7th hole of the Whispering Winds Golf Course (Figure 3-1). The area investigated measured approximately 150 feet by 590 feet.

3.2.2 Operational History

AOC D was reportedly used as a disposal site for debris derived from the demolition of numerous buildings at Cannon AFB in the 1950s. The site was discovered during a golf course expansion project when a bulldozer removed a layer of topsoil approximately 1 foot thick from the surface and exposed the chips of non-friable ACM. The potential ACM appeared to be pieces of siding from a building wall, each piece measuring approximately 2 inches square. The lateral extent of the debris was unknown, but the maximum depth was estimated to be 10 feet (IMS 1997).

Other accounts from some base personnel suggested that any debris present at AOC D may have simply fallen off barracks buildings that were temporarily stored in this area, not intentionally disposed of here (W-C 1996).

3.3 LAND USE

3.3.1 Current

The area of AOC D is currently used as the tee box and fairway of the 7th hole at the Whispering Winds Golf Course. Therefore, the land use in this area may be classified as recreational.

3.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. Use classification will continue to remain recreational.

3.4 INVESTIGATIVE ACTIVITIES

3.4.1 Summary

An SI of AOC D (IMS 1997) found chips of non-friable ACM in the area of AOC D. No other contamination of any significance was detected in the area of this AOC. A letter from NMED recommended NFA beyond the proposed removal of any exposed ACM.

3.4.2 Investigation #1: Site Investigation (SI) Report, Area of Concern (AOC) D

3.4.2.1 Non-Sampling Data Collection

The SI included a risk evaluation, the results of which are discussed below. An EM-61 electromagnetic geophysical survey was also conducted in the area of AOC D prior to the SI field effort. These investigations found no significant metal (i.e., drums) or other debris buried at the site.

3.4.2.2 Sampling Data Collection

Nine borings were installed during the SI (boring locations are shown in Figure 3-1 in Appendix A). Eight of the nine borings were drilled to maximum depths of 10 feet, the ninth boring was drilled to a maximum depth of 25 feet based on the visible presence of potential transite debris near the surface of this boring. No other visual observation of potential contamination was made in any of the other borings. All headspace readings were below background levels.

Three samples were collected at depth intervals of 7, 15, and 25 feet from the deep boring and sent for laboratory analysis. Target analytes for all three samples included TCL VOCs, TCL SVOCs, TAL metals, and TRPH. In addition, two of the debris chips found in the near surface sample collected from the deep boring were sent for asbestos identification using polarized light microscopy (PLM).

3.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to determine the presence of potential contaminants in the area of AOC D. In addition, the data quality was deemed to be sufficient to meet the objectives of the SI. Therefore, no data gaps existed after the completion of the SI.

3.4.2.4 Results and Conclusions

Both chips of debris sent for asbestos identification using PLM were found to contain greater than 1 percent chrysotile asbestos. Therefore, based on this, the debris chips are an ACM. No organic compounds were detected above laboratory detection limits. All metals were detected at concentrations within established background ranges or below the USEPA Region VI Human Health Media-Specific Screening Levels (MSSLs). The vertical extent of contamination was adequately characterized by the soil borings. The analytical results from this investigation are shown in Tables 3-1a, 3-1b, 3-1c, and 3-1d in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

The SI recommended that the exposed chips of debris, an ACM, be removed.

3.5 SITE CONCEPTUAL MODEL

3.5.1 Nature and Extent of Contamination

The SI conducted at AOC D found ACM at levels of potential concern. Nine borings (eight to depths of 10 feet and one to a depth of 25 feet) were installed during the SI to effectively delineate the horizontal extent of contamination. No concentrations of organics and metals were detected at concentrations of potential concern. The vertical extent of contamination was characterized by the soil borings.

Groundwater at AOC D was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

3.5.2 Environmental Fate

The debris containing chrysotile asbestos can be expected to persist for long periods of time in the environment.

3.6 SITE ASSESSMENTS

3.6.1 Summary

The SI recommended that any exposed chips of asbestos-containing debris should be removed; NMED concurred in the letter referenced above.

3.6.2 Screening Assessments

3.6.2.1 Human Health

The greatest risk to human health from exposure to asbestos is via inhalation. However, the ACM found at AOC D did not appear to pose a significant health hazard in its observed condition. This is because the debris was classified as nonfriable, meaning the chips were not easily pulverized using normal hand pressure, and thus are unlikely to release fibers into the air. Therefore, barring any mechanical pressure or weathering, the asbestos fibers in any remaining chips of debris are unlikely to be respired by golfers or other people in the area.

3.6.2.2 Ecological

AOC D encompasses an area of mowed grass and golf course rough. It has been maintained as a near monoculture of grass and there was limited forage and biomass production. Therefore, it was not expected to be ecologically significant – nor would any such forage be considered attractive to native (relevant) New Mexico species. Based on this, AOC D did not contain any significant ecological component, and a formal ecological risk assessment was not warranted.

3.6.3 Risk Assessments

3.6.3.1 Human Health

Based on the findings of the SI, a formal human health risk assessment was not warranted for AOC D.

3.6.3.2 Ecological

Based on the conclusions of the SI, AOC D did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

3.6.4 Other Applicable Assessments

3.6.4.1 Surface Water

AOC D contained no surface water.

3.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this AOC contained no means for groundwater discharges to occur.

3.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at AOC D.

3.6.4.4 *Other*

No other assessments have been conducted in the area of AOC D.

3.7 NO FURTHER ACTION PROPOSAL

3.7.1 Rationale

The conclusions reached in the SI and the in letter from NMED were consistent in recommending that the exposed ACM be removed and disposed of properly. This has been completed, and it will be repeated in the future if additional ACM is observed. Based on this, NFA has been recommended for AOC D.

3.7.2 Criterion

AOC D is proposed for NFA based on NMED NFA Criterion 4: A release from the AOC to the environment has occurred, but the AOC was characterized under another authority (NMED's Hazardous and Radioactive Materials Bureau) and a closure letter is available.

4.1 SUMMARY

SWMU 113, Landfill No. 5, has been listed as an Appendix I site. This section is intended to address all of Landfill No. 5 except Cell #3, which is currently undergoing long-term monitoring. A Phase I IRP Records Search (CH2M Hill 1983) first evaluated the existence of and potential for contamination in the area of SWMU 113. The report associated with this records search stated that Landfill No. 5 warranted further investigation.

A Phase II (Stage 1) IRP investigation (Radian 1986) included the installation and sampling of four groundwater monitoring wells. The analytical results from the groundwater samples indicated that no groundwater contamination attributable to past or ongoing activities at Landfill No. 5 exists (Radian 1986).

A Preliminary Review/Visual Site Inspection RCRA Facility Assessment (RFA) (A.T. Kearney 1987) noted that Cell #3 was undergoing RCRA closure and recommended additional groundwater and vadose zone monitoring to determine if contaminants had migrated beneath SWMU 113.

A subsequent Remedial Investigation (RI) for 18 IRP/SWMUs at Cannon AFB (W-C 1992) included the sampling of six monitoring wells in the area of Landfill No. 5 for Appendix IX constituents, as listed in 40 CFR 264. Slightly elevated concentrations of three metals were detected during this investigation. This RI also included a Baseline Risk Assessment (BRA) that concluded potential impacts to human health and the environment from SWMU 113 were insignificant.

A Phase I RFI, completed at Landfill No. 5 in 1995, included site topographic surveying and mapping, surface geophysical surveying, a soil gas investigation, and a surface and subsurface soil investigation. The RFI included a human health risk screen, which indicated that no unacceptable risk to human health from the chemicals detected during this investigation was present at SWMU 113. The RFI recommended the continued monitoring of groundwater quality to assess potential impacts from Cell #3 as the only action required at Landfill No. 5 (W-C 1998).

Based on the results of the Phase I RFI, NMED issued a letter addressed to Col. Clary, Commander Cannon AFB, dated February 17, 1998, that stated that the RFI was technically adequate and approved the report. However, the letter stipulated that post-closure care, including groundwater monitoring, must continue at Cell #3. Based on this, closure of all of Landfill No. 5 except Cell #3 is appropriate at this time. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of SWMU 113, except Cell #3.

4.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

4.2.1 Site Description

Landfill No. 5 (SWMU 113) is a 70-acre inactive landfill located in the southeast area of Cannon AFB (Figure 4-1). Past trenching and waste disposal activities occurred across approximately 30 acres in the eastern portion of the site. A 4-foot-high, barbed-wire fence with two locked entrances surrounds this area. The western 40 acres appear to have received only construction debris for purposes of backfilling natural depressions in the area. Overall, the landfill site has relatively flat topography and is sparsely vegetated with only a few trees. The general surface water runoff is toward the southeast, or into local surface depressions (W-C 1998).

Cell #3, located within the landfill premises, is a capped, RCRA-regulated unit that reportedly received hazardous waste through 1981. Wastes received at Cell #3 reportedly included waste oil and solvents in quantities estimated at 5 to 10 gallons per month. No waste was received at the unit from the end of 1981 until the cell's closure in 1983. Closure activities included the installation of an impermeable clay cap and the construction of an additional security fence within the area of Landfill No. 5.

4.2.2 Operational History

Landfill No. 5 was active between 1968 and 1984. Waste materials received at this site reportedly included domestic solvent waste, waste oils, and solvents; paints, paint removers, and thinners; pesticide containers; and various empty drums and cans. From 1968 to 1972, the mode of this landfill's operation included burning and burying waste in trenches (CH2M Hill 1983). After 1981, the only waste received at Landfill No. 5 was tree limbs and construction rubble, and the standard operation of the site included direct burial of waste in trenches.

In 1988, two groundwater monitoring wells were installed along the southeast boundary of Landfill No. 5 by the Tulsa District of USACE (W-C 1998). In 1992, two additional monitoring wells were installed along the eastern edge of Landfill No. 5 by USGS to meet RCRA release detection monitoring requirements (W-C 1998). Including the wells installed during the Phase II (Stage 1) IRP investigation (Radian 1986), eight monitoring wells had been installed in the vicinity of SWMU 113. Geoscience Consultants completed a core sampling project at Cell #3 in 1985, but no VOCs were detected above the reporting limit. This investigation is not addressed herein because it focused solely on Cell #3, and this document is intended to address all of Landfill No. 5 except Cell #3.

4.3 LAND USE

4.3.1 Current

Landfill No. 5 is currently closed and no longer receives waste. In addition, a locked security fence surrounds the area of this SWMU. Land use in the area of SWMU 113 can be classified as airfield/industrial.

4.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. Land use in the area of SWMU 113 will remain industrial in nature.

4.4 INVESTIGATIVE ACTIVITIES

4.4.1 Summary

A Phase I IRP Records Search evaluated the potential existence of contamination at SWMU 113 and stated that this site warranted further investigation (CH2M Hill 1983); however, this records search did not include any investigative activities. A Phase II (Stage 1) IRP investigation indicated that no groundwater contamination attributable to past or ongoing activities existed at Landfill No. 5 (Radian 1986). A Preliminary Review/Visual Site Inspection RFA recommended additional groundwater and vadose zone monitoring to determine if contaminants from Cell #3 have migrated beneath SWMU 113 (A.T. Kearney 1987); however, this RFA did not include any additional investigative activities. A subsequent RI for 18 IRP/SWMUs included the collection of groundwater samples and a BRA that concluded potential impacts to human health and the environment from SWMU 113 were insignificant (W-C 1992). A Phase I RFI recommended the continued monitoring of groundwater quality to assess potential impacts from Cell #3 as the only action required at Landfill No. 5 (W-C 1998).

4.4.2 Investigation #1: Installation Restoration Program (IRP) Phase II – Confirmation/Quantification Stage 1 at Landfill No. 5 (SWMU 113)

4.4.2.1 Non-Sampling Data Collection

The Phase II (Stage 1) IRP investigation was a pure data collection effort.

4.4.2.2 Sampling Data Collection

The Phase II (Stage 1) IRP investigation included the installation of four groundwater monitoring wells and the collection and analysis of groundwater samples from these wells. One well was installed hydraulically upgradient from Landfill No. 5, and the other three wells were installed downgradient from the site (Figure 4-1 in Appendix A) in order to determine the nature, extent, and migration rate of any potential contaminants originating from this SWMU. Target analytes for the groundwater samples collected from the four wells included purgeable volatile aromatic compounds and purgeable halocarbon compounds, metals, and general water quality parameters.

No soil samples were collected during this investigation.

4.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the objectives of the Phase II (Stage 1) IRP investigation. Therefore, no data gaps existed after the completion of this investigation.

4.4.2.4 Results and Conclusions

None of the groundwater samples were found to contain chemicals in concentrations that exceeded drinking water standards for any of the parameters tested. Low concentrations of metals were detected in all four samples, and trichlorofluoromethane was detected in one sample at a concentration of 2.1 micrograms per liter (µg/L). However, the sample found to contain trichlorofluoromethane was collected from the upgradient well, and the report noted that trichlorofluoromethane is a common laboratory contaminant (Radian 1986). The analytical results for this investigation are presented in Table 4-1 in Appendix B.

No soil samples were collected or analyzed during this investigation.

Based on the results of this investigation, the Phase II (Stage 1) IRP report stated that no groundwater contamination attributable to past or ongoing activities existed at Landfill No. 5.

4.4.3 Investigation #2: Remedial Investigation (RI) Report for 18 Solid Waste Management Units (SWMUs) at Landfill No. 5 (SWMU 113)

4.4.3.1 Non-Sampling Data Collection

The RI included a BRA performed using the results of this investigation. Based on the analytical results, the findings of the BRA and a comparison of soil data with risk-based RFI criteria and/or proposed RCRA action levels, the RI report concluded that potential impacts to human health and the environment are not significant from this SWMU (W-C 1992). The BRA is discussed in Section 4.6.3 below.

4.4.3.2 Sampling Data Collection

The data collection effort completed as part of the RI consisted of collecting five groundwater samples from the four monitoring wells installed during the Phase II (Stage 1) IRP investigation, and from one downgradient well installed by the Tulsa District of USACE in 1988 (well locations are shown in Figure 4-1). All five samples collected were analyzed for the Appendix IX constituents listed in 40 CFR 264. In addition, samples from the upgradient well and two of the downgradient wells were also analyzed for total metals. Due to laboratory missed holding times, one of the downgradient wells had to be resampled. This sample was analyzed for TCL VOCs only.

No soil samples were collected during this investigation.

4.4.3.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the RI and the BRA. Therefore, no data gaps existed after the completion of the RI.

4.4.3.4 Results and Conclusions

No analytes, other than metals, were detected above the CRQL during the laboratory analysis of the groundwater samples collected as part of the RI. Barium and vanadium were detected in all five groundwater samples. However, the maximum detected concentration of barium (0.029 milligrams per liter (mg/L) fell below the corresponding maximum contaminant level (MCL) (1.0 mg/L); and although there is no established MCL for vanadium, the maximum detected concentration (0.036 mg/L) fell below the corresponding USEPA Region VI MSSL (0.26 mg/L). Lead was also detected in one groundwater sample, collected from a downgradient well, at a concentration of 0.016 mg/L. This concentration fell below the corresponding MCL (0.05 mg/L) for lead. The analytical results for this investigation are presented in Table 4-2.

No soil samples were collected or analyzed during this investigation.

Based on the analytical results, the findings of the BRA and a comparison of soil data with risk-based RFI criteria and/or proposed RCRA action levels, the RI report concluded that potential impacts to human health and the environment were not significant from this SWMU (W-C 1992).

4.4.4 Investigation #3: Phase I RCRA Facility Investigation (RFI) Report for Landfill No. 5 (SWMU 113/IRP No. LF-5)

4.4.4.1 Non-Sampling Data Collection

The RFI included site topographic surveying and mapping, and surface geophysical surveying to delineate the lateral extent of the landfill cells (exclusive of Cell #3) in the eastern two-thirds of SWMU 113. The RFI also included a human health risk screen based on the results of the soil gas investigation, and the surface and subsurface soil investigation. The risk screen indicated that no unacceptable risk to human health from the chemicals detected during the RFI was present at SWMU 113 (W-C 1998). The risk screen is discussed in Section 4.6.3 below.

4.4.4.2 Sampling Data Collection

A Phase I RFI was performed at SWMU 113 to determine whether a release of hazardous constituents to soils beneath Landfill No. 5 had occurred. Then, based on the results of a soil gas investigation, and a surface and subsurface soil investigation, potential risks to human health were evaluated.

The soil gas survey for VOCs was completed in two phases. The first phase included collecting and field screening soil gas samples from 800 locations within the area of SWMU 113. Samples were collected using direct push techniques, and the field screening was completed using a

photoionization detector (PID). Based on the results of the field screening, 78 additional soil gas samples were collected and analyzed for VOCs using a field gas chromatograph (GC). Of the 78 locations analyzed, 51 had results below the laboratory reporting limit of 1.2 parts per million (ppm) on a volume to volume basis (ppm/v). The VOCs that were detected were separated into three classes: petroleum-related or fuel additive compounds (i.e., benzene, toluene, ethylbenzene, xylenes [BTEX], and chloroethane); refrigerants or blowing agents (i.e., trichlorofluoromethane, dichlorodifluoromethane, and chloromethane); and solvents (i.e., methylene chloride, tetrachloroethene, trichloroethene, 1,1,1,2-tetrachloroethane, 1,1-trichloroethane, 1,1-dichloroethene, chlorobenzene, and trans 1,2-dichloroethene). The locations of the VOCs generally corresponded with landfill cell locations (Figure 4-3).

A surface and subsurface soil investigation was then designed based on the results of the soil gas investigation. The soil investigation include the drilling and sampling 30 analytical borings and three geotechnical borings. All borings were drilled to depths approximately 40 feet below the fill/native soil interface. Samples were collected at approximate 5-foot intervals and field screened. In total, 150 subsurface and 10 surface samples were submitted for the following analyses: TCL VOCs, TCL SVOCs, TAL metals, pesticides/PCBs, herbicides (60 samples), TOC (24 samples), and TRPH. In addition, Appendix IX analyses were conducted on the deepest sample from each boring.

4.4.4.3 Data Gaps

The analytical data, as qualified, was found to meet the QA objectives of the Phase I RFI specified in the validation protocols. Therefore, no data gaps existed after the completion of the Phase I RFI.

4.4.4.4 Results and Conclusions

Of the 78 soil gas samples that were collected and analyzed for VOCs using a field GC during the soil gas survey, 51 had results below the laboratory reporting limit of 1.2 ppm/v. The VOCs that were detected were separated into three classes: petroleum-related or fuel additive compounds (i.e., benzene, toluene, ethylbenzene, xylenes, and chloroethane); refrigerants or blowing agents (i.e., trichlorofluoromethane, dichlorodifluoromethane, and chloromethane); and solvents (i.e., methylene chloride, tetrachloroethene, trichloroethene, 1,1,1,2-tetrachloroethane, 1,1-trichloroethane, 1,1-dichloroethene, chlorobenzene, and trans 1,2-dichloroethene). The locations of the VOCs generally corresponded with landfill cell locations (Figure 4-3).

A total of eight VOCs were detected in samples collected from 16 locations scattered across Landfill No. 5. Ethylbenzene, styrene, and 4-methyl-2-pentanone were the only compounds detected at concentrations indicative of a potential release in the area of SWMU 113.

Twelve SVOCs were detected in subsurface samples collected from the 30 borings. However, all detected concentrations were just at or below the corresponding laboratory reporting limits.

Ten metals (aluminum, barium, chromium, copper, iron, magnesium, nickel, silver, vanadium, and zinc) were detected in at least one subsurface soil sample above the established background

ranges for Cannon AFB (W-C 1997a). The frequency that the detected concentrations exceeded background levels was approximately 4 percent. Typically, the metal exceeding background in a given boring was not detected above background levels in samples collected from immediately above or below the interval where the exceedance occurred. Thus, the detected concentrations of these metals are not likely due to contamination from Landfill No. 5.

Insignificant concentrations of Aroclor 1254 and TRPH were also detected during the Phase I RFI. No pesticides, herbicides, or cyanides were detected in any of the samples analyzed as part of this investigation. The analytical laboratory also identified a number of TICs. However, most of the TICs were non-toxic (potentially toxic TICs were evaluated during the human health risk screen). The results of this investigation are presented in Table 4-3.

Based on the results of a human health risk screen performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 113.

4.5 SITE CONCEPTUAL MODEL

4.5.1 Nature and Extent of Contamination

Samples collected from groundwater monitoring wells during the Phase II (Stage 1) IRP investigation and the RI were analyzed, and a BRA was performed on the chemicals detected during the RI.

Based on the results of topographic surveying and mapping, surface geophysical surveying, and a soil gas survey, 30 borings to maximum depths ranging from 51 to 81.5 feet were installed during the Phase I RFI at Landfill No. 5 to effectively delineate the extent of contamination at SWMU 113. Chemical analyses detected potentially elevated concentrations of metals, organic compounds, and PCBs in subsurface soil samples collected during the Phase I RFI at SWMU 113. Maximum concentrations of chemicals detected in subsurface soil during the Phase I RFI were compared to conservative, risk-based screening concentrations (i.e., proposed RCRA action levels for soil ingestion assuming residential use) during the human health risk screen.

4.5.2 Environmental Fate

Contaminants encountered at Landfill No. 5 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

VOCs are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressure, high volatilization potential, and a high biodegradation rate.

SVOCs are likely to be relatively immobile due to low vapor pressure, low water solubility, and a tendency to adsorb to clays. In addition, these compounds have moderate to low biodegradation rates.

Based on the general native subsurface characteristics at SWMU 113, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; however, they do persist for long periods of time. The potential precipitation of metals in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the Phase I RFI.

4.6 SITE ASSESSMENTS

4.6.1 Summary

Based on the results of the Phase II (Stage 1) IRP investigation, a risk assessment was not warranted for SWMU 113. However, a BRA was conducted based on the results of the RI, and a human health risk screen was performed using the results of the Phase I RFI. The results of both assessments are discussed below.

4.6.2 Screening Assessments

4.6.2.1 Human Health

The chemicals of potential concern (COPCs) identified by the BRA for SWMU 113 included antimony and lead. These metals were initially screened by comparing their detected concentrations to MCLs, and then to RFI criteria and proposed RCRA action levels. Because none of the detected chemicals exceeded the corresponding MCLs, the comparison did not identify any chemicals of concern (COCs) at SWMU 113. Any COCs identified would have been subjected to a quantitative risk characterization.

The results of the human health risk screen found that one carcinogen, beryllium, had a maximum concentration (0.7 milligrams per kilogram [mg/kg]) that exceeded the corresponding proposed RCRA action level (0.2 mg/kg). Out of the 160 samples analyzed, the maximum concentration was the only detected concentration that exceeded the upper limit of the background range for beryllium (0.6 mg/kg). Assuming a 70-year soil ingestion exposure, the associated cancer risk for this 0.7 mg/kg concentration of beryllium was 4×10^{-6}, a level within the USEPA target risk range of 1×10^{-6} to 1×10^{-4}. No noncarcinogens were detected at concentrations exceeding the corresponding proposed RCRA action levels during the Phase I RFI.

4.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels. Because none of the detected chemicals exceeded the corresponding MCLs, the comparison did

not identify any COCs at SWMU 113. Any COCs identified would have been subjected to a quantitative risk characterization.

An ecological risk screening was not included as part of the Phase I RFI report, but a human health risk screen was included. In this evaluation the screening criteria were not significantly exceeded by detected chemical concentrations attributable to SWMU 113 contamination. The proposed RCRA action levels for soil ingestion assuming residential use that were employed as screening criteria are highly conservative, and as such are protective of both human and ecological health.

4.6.3 Risk Assessments

4.6.3.1 Human Health

Because the BRA identified no COCs for human health risks at SWMU 113, a quantitative risk characterization was not warranted.

The Phase I RFI did not include a formal human health risk assessment for SWMU 113.

4.6.3.2 Ecological

Because the BRA identified no COCs for ecological health risks at SWMU 113, a quantitative risk characterization was not warranted.

The Phase I RFI did not include a formal ecological health risk assessment for SWMU 113.

4.6.4 Other Applicable Assessments

4.6.4.1 Surface Water

SWMU 113 is a closed landfill, and as such contains no surface water.

4.6.4.2 Groundwater

Groundwater at SWMU 113 was investigated during the Phase II (Stage 1) IRP investigation and the RI, both of which are discussed above.

4.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at SWMU 113.

4.6.4.4 Other

A Phase I IRP Records Search evaluated the potential existence of contamination at SWMU 113 and stated that this site warranted further investigation (CH2M Hill 1983); however, this records search did not include any investigative activities. A Preliminary Review/Visual Site Inspection RFA recommended additional groundwater and vadose zone monitoring to determine if

contaminants from Cell #3 had migrated beneath SWMU 113 (A.T. Kearney 1987); however, this RFA did not include any additional assessment activities.

Geoscience Consultants completed a core sampling project at Cell #3 in 1985, but no VOCs were detected above the reporting limit. This investigation is not addressed herein because it focused solely on Cell #3, and this document is intended to address all of Landfill No. 5 except Cell #3. No other assessments have been conducted in the area of SWMU 113.

4.7 NO FURTHER ACTION PROPOSAL

4.7.1 Rationale

Based on the conclusions reached in the Phase II (Stage 1) IRP report, the RI, and the Phase I RFI, NFA has been recommended for SWMU 113. In addition, based on the results of the Phase I RFI, an NMED letter addressed to Col. Clary, Commander Cannon AFB, and dated February 17, 1998, stated that the RFI was technically adequate and approved the report. However, the letter stipulated that post-closure care, including groundwater monitoring, must continue at Cell #3. Based on this, closure of all of Landfill No. 5 except Cell #3 is appropriate at this time.

4.7.2 Criterion

SWMU 113 is proposed for NFA based on NMED NFA Criterion 4: A release from the AOC to the environment has occurred, but the AOC was characterized under another authority (NMED's Hazardous and Radioactive Materials Bureau) and a closure letter is available.

5.1 SUMMARY

DP-33, Drum Disposal Pit, was discovered in 1991 during earthwork operations in the northeast portion of Cannon AFB, near Engineers Way Road. During the earthwork operations, a buried drum was excavated and its content spilled onto surrounding soils. IT Corporation performed a Rapid Response Corrective Action at the site. The corrective action, documented in a Final Project Report (IT 1995), included the removal and offsite disposal of approximately 25 buried drums and approximately 610 cubic yards of impacted soils.

In a letter to Col. W.P. Ard, Commander 27th Support Group, dated December 12, 1996, NMED stated the corrective action was consistent with applicable regulations and protective of both human health and the environment. Therefore, NMED approved the Final Project Report and required NFA at the site. In accordance, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this site.

5.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

5.2.1 Site Description

DP-33 was the site of a Rapid Response Corrective Action, which removed buried drums containing what appeared to be petroleum waste liquids. The corrective action resulted in an excavation measuring approximately 70 feet by 90 feet and 8 feet deep (Figure 5-1). In total, approximately 25 buried drums and approximately 610 cubic yards of impacted soils were excavated and sent off site for disposal. The site, discovered in 1991 during earthwork operations, was located in the northeast portion of Cannon AFB near Engineers Way Road (IT 1995).

5.2.2 Operational History

DP-33 reportedly was the historical location of an aircraft hangar. The hangar was demolished in the mid-1960s. Buried drums were first discovered here during earthwork operations in 1991.

5.3 LAND USE

5.3.1 Current

The area of DP-33 is currently used as an electrical equipment storage yard. The land use in this area may be classified as industrial.

5.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. Use classification will continue to remain industrial.

5.4 INVESTIGATIVE ACTIVITIES

5.4.1 Summary

During a Rapid Response Corrective Action, approximately 25 drums and approximately 610 cubic yards of soils were excavated from the area of DP-33. Confirmation samples were then collected from the limits of the resultant excavation and from the proposed backfill source areas, and NMED granted approval to backfill. A letter from NMED found the corrective action to be consistent with applicable regulations and protective of both human health and the environment.

5.4.2 Investigation #1: Rapid Response Corrective Action Report, DP-33

5.4.2.1 Non-Sampling Data Collection

The Rapid Response Corrective Action included a risk evaluation, the results of which are discussed in Section 5.6.2 below. Two exploratory trenches (one extending approximately 60 feet west of the main excavation and the other extending approximately 90 feet east of the main excavation) were also dug to further assess the potential presence of buried drums. No drums were encountered outside the main excavation.

5.4.2.2 Sampling Data Collection

Fourteen confirmation, profile and backfill samples were collected upon completion of the excavating activities at DP-33 (sample locations are shown in Figure 5-1 in Appendix A). Ten confirmation samples were collected from the excavation (two samples each from the floor and the four walls). Two composite samples were collected from each of the two stockpiles of excavated soil (one composed of soils removed from the immediate vicinity of the drums and the other composed of visually impacted soils from the excavation). Two samples were also collected from proposed backfill sources. The confirmation and backfill samples were analyzed for VOCs, SVOCs, PCBs/pesticides, total metals, and total petroleum hydrocarbons (TPH) (including diesel, JP-4 and TRPH). The profile samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, pesticides, metals, and TPH.

Two additional profile samples were later collected from each of the two soil stockpiles and analyzed for TRPH. Based on the TRPH results for one of the confirmation samples collected from the floor of the excavation, an additional confirmation sample was collected from a location 3 feet beneath the floor of the excavation to verify the extent of TRPH contamination. The samples of the proposed backfill materials were found to contain slightly elevated concentrations of TRPH (<200 mg/kg), so samples of an alternative backfill source were collected and analyzed for the same suite of analyses as the earlier samples.

Nine samples were also collected from the residual liquids found in the excavated drums. A field hazard categorization was performed on each sample.

5.4.2.3 Data Gaps

It was concluded that the data available from sample analysis was sufficient to determine the extent of contamination at DP-33, to dispose of the excavated materials properly, and to identify acceptable backfill soils. In addition, the data quality was deemed to be sufficient to meet the objectives of the Rapid Response Corrective Action. Therefore, no data gaps existed after the completion of the Rapid Response Corrective Action.

5.4.2.4 Results and Conclusions

One organic compound, xylene, was detected in the confirmation samples at a concentration above laboratory detection limits. Low concentrations of three pesticides, endosulfan, DDE and DDT, were also detected in the confirmation samples. Seventeen metals were detected in the confirmation samples, but only two metals, antimony and thallium, were detected at concentrations exceeding the USEPA Region VI Human Health MSSLs for residential properties. However, both compounds were detected at concentrations that were below the Region VI MSSLs for industrial sites (the appropriate classification for DP-33) and within established background ranges (W-C 1997a).

A slightly elevated concentration of TRPH (1,380 mg/kg) was also detected in one of the confirmation samples collected from the floor of the excavation. However, an additional sample was collected from a location proximate to this sample and at a depth 3 feet below the floor of the excavation and analyzed for total TRPH. Total TRPH was not detected above the laboratory detection limit in this sample (please note that the units in Table 5-1c should be mg/kg, not mg/L), demonstrating that concentrations of TRPH diminish within a few feet below the limits of the excavation. No other COPCs were detected in any of the confirmation samples. Thus the horizontal and vertical extents of contamination was adequately characterized by the soil samples. The analytical results from the confirmation samples are presented in Tables 5-1a and 5-1c in Appendix B.

The samples of the proposed backfill materials were found to contain slightly elevated concentrations of TRPH (<200 mg/kg), so samples of an alternative backfill source were collected and analyzed for the same suite of analyses as the earlier samples. TRPH and other chemicals were not detected at concentrations of potential concern in this third sample of proposed backfill material. The analytical results from the backfill samples are presented in Tables 5-1a and 5-1d in Appendix B.

Although 11 metals and TRPH were detected in the two disposal profile samples collected from the contaminated soil stockpiles and analyzed using TCLP methods, none of these analytes were detected at hazardous concentrations. Two additional disposal profile samples were later collected from the contaminated soil stockpiles and also analyzed for total TRPH, and again TRPH was not detected at hazardous concentrations in these samples (please note that the units in Table 5-1c should be mg/kg, not mg/L). The analytical results from the profile samples are presented in Tables 5-1b and 5-1c in Appendix B.

None of the nine residual liquid samples collected from the excavated drums exhibited hazardous characteristics when they were field hazard categorized.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath DP-33.

5.5 SITE CONCEPTUAL MODEL

5.5.1 Nature and Extent of Contamination

The Rapid Response Corrective Action included the excavation and off-site disposal of approximately 25 drums (the exact number could not be determined due to the deteriorated condition of the drums) and approximately 610 cubic yards of soils from DP-33. Confirmation, backfill and profile samples were collected and analyzed. The samples demonstrated that the horizontal and vertical extent of contamination had been determined, so the excavation was backfilled using approved soils. Therefore, all significant contamination has been removed from DP-33.

Groundwater at DP-33 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath DP-33.

5.5.2 Environmental Fate

Contaminants encountered at DP-33 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds, including TRPH, are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at DP-33, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

5.6 SITE ASSESSMENTS

5.6.1 Summary

Approximately 25 drums and 610 cubic yards of soils were excavated from the area of DP-33. Confirmation samples were then collected from the limits of the resultant excavation and from the proposed backfill source areas, and NMED granted approval to backfill. A letter from

NMED found the corrective action to be consistent with applicable regulations and protective of both human health and the environment.

5.6.2 Screening Assessments

5.6.2.1 Human Health

The Rapid Response Corrective Action report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

The maximum antimony and thallium concentrations detected during the Rapid Response Corrective Action exceeded the Region VI MSSLs for residential sites. However, the maximum detected concentrations of both metals were below the Region VI MSSLs for industrial sites (the appropriate classification for DP-33).

A slightly elevated concentration of TRPH (1,380 mg/kg) was also detected in one of the confirmation samples collected from the floor of the excavation. However, an additional sample was collected from a location proximate to this sample at a depth 3 feet below the floor of the excavation and analyzed for TRPH. TRPH was not detected in this sample, demonstrating that concentrations of TRPH diminish within a few feet below the limits of the excavation. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at DP-33.

5.6.2.2 Ecological

An ecological risk screening was not included as part of the Rapid Response Corrective Action report, but a human health risk screening/evaluation was included. In this evaluation, the screening criteria were not significantly exceeded by detected chemical concentrations attributable to DP-33 contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of both human and ecological health.

5.6.3 Risk Assessments

5.6.3.1 Human Health

Based on the findings of the screening assessment, a formal human health risk assessment was not warranted for DP-33.

5.6.3.2 Ecological

A formal ecological risk assessment was not completed for DP-33.

5.6.4 Other Applicable Assessments

5.6.4.1 Surface Water

DP-33 contained no surface water.

5.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this site contained no means for groundwater discharges to occur.

5.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at DP-33.

5.6.4.4 Other

No other assessments have been conducted in the area of DP-33.

5.7 NO FURTHER ACTION PROPOSAL

5.7.1 Rationale

Approximately 25 buried drums and approximately 610 cubic yards of soils were excavated from DP-33 and disposed of off site. Confirmation, backfill and profile samples were collected and analyzed. The samples demonstrated that the horizontal and vertical extent of contamination had been determined, so the excavation was backfilled using approved soils. NMED then issued a letter that found the corrective action to be consistent with applicable regulations and protective of both human health and the environment. Based on this, NFA has been recommended for DP-33.

5.7.2 Criterion

DP-33 is proposed for NFA based on NMED NFA Criterion 4: A release from the site to the environment has occurred, but the site was characterized under another authority (NMED's Ground Water Protection and Remediation Bureau) and a closure letter is available.

6.1 SUMMARY

SWMU 7, Oil/Water Separator (OWS) No. 129, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected three organic compounds (acetone, toluene, and xylenes) and four metals (arsenic, chromium, mercury, and nickel) at concentrations of potential concern in the area of SWMU 7. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 7, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 7, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 7.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

6.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

6.2.1 Site Description

SWMU 7, OWS No. 129, a grease or sand trap that had been misidentified as an OWS, was located adjacent to the northwest side of Building 129 (Figure 6-1 in Appendix A), and just south of Building 116. For the purposes of this report, this unit will be referenced herein as an OWS. The OWS was an underground concrete unit that consisted of one compartment of unknown capacity. The OWS measured approximately 5 feet by 7 feet in plan and extended approximately 5.5 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water generated from aircraft maintenance operations in Building 119, an aircraft maintenance hangar. Wastewaters from the unit were discharged to a storm sewer line.

6.2.2 Operational History

OWS No. 129 was active from approximately 1943 until the unit was removed in 1996 (USACE 1999). The OWS at SWMU 7 has been removed and no longer receives waste wash water.

6.3 LAND USE

6.3.1 Current

The current land use of the SWMU location is industrial.

6.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 129 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

6.4 INVESTIGATIVE ACTIVITIES

6.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected three organic compounds and four metals at concentrations of potential concern in the area of SWMU 7. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 7, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 7, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 7.

6.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

6.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

6.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 6-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5, and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed no evidence of contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, twelve soil samples were sent for chemical analyses.

6.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 7. In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

6.4.2.4 Results and Conclusions

Three organics (acetone, toluene and xylenes) and two metals (arsenic and chromium) were detected at low concentrations in the surface soil samples collected from at least one of the three borings. One organic (acetone) and two metals (mercury and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 6-1a and 6-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 7, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 7, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 7, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

6.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

6.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

6.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

6.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

6.4.3.4 Results and Conclusions

The OWS at SWMU 7 was pumped dry and cleaned. Then the unit was excavated by hand, due to the proximity of Building 116, a high-voltage electrical facility. No stained soil or fuel odors were observed during the excavation activities. The removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of 8 feet. A seventh, confirmatory sample was collected from the center of the excavation's bottom, at approximately 8 feet of depth, and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH – diesel-range organics (DRO), total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are shown in Tables 6-2a and 6-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 7. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

6.5 SITE CONCEPTUAL MODEL

6.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 7 included the drilling and sampling of a total of three borings to depths of 10 feet. Three organic compounds and four metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 7 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

6.5.2 Environmental Fate

Contaminants encountered at OWS No. 129 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 7, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

6.6 SITE ASSESSMENTS

6.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 7. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 7.

6.6.2 Screening Assessments

6.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB. Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 7.

6.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

6.6.3 Risk Assessments

6.6.3.1 *Human Health*

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 7, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 7, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

6.6.3.2 *Ecological*

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels. All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

6.6.4 Other Applicable Assessments

6.6.4.1 *Surface Water*

SWMU 7 contained no surface water.

6.6.4.2 *Groundwater*

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

6.6.4.3 *Underground Storage Tanks (USTs)*

OWS No. 129 was actually a single-compartment grease or sand trap constructed of concrete. This unit was removed in 1996.

6.6.4.4 *Other*

In 1987-1988, the Tulsa District of the Army Corps of Engineers collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

6.7 NO FURTHER ACTION PROPOSAL

6.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 7.

6.7.2 Criterion

SWMU 7 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

7.1 SUMMARY

SWMU 9, Aircraft Washrack Drain System, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected four organic compounds (acetone, tetrachloroethene, toluene and xylenes) and three metals (barium, chromium, and nickel) at concentrations of potential concern in the area of SWMU 9. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 9, the RFI recommended NFA for SWMU 9.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the Aircraft Washrack Drain System at SWMU 9, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 9.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

7.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

7.2.1 Site Description

SWMU 9, Aircraft Washrack Drain System, was a drain/sandtrap located in the center of a concrete washrack pad used to clean aircraft (Figure 7-1 in Appendix A). The washrack pad sloped to the Aircraft Washrack Drain System, which discharged to OWS No. 165 (SWMU 8). The Aircraft Washrack Drain System measured approximately 5 feet by 4 feet in plan and extended approximately 5 feet below the paved surface. The unit reportedly received waste wash water generated from aircraft cleaning operations at the washrack. Wastewaters from the unit were discharged to a sanitary sewer line.

7.2.2 Operational History

The Aircraft Washrack Drain System was active from approximately 1966 until the unit was removed in 1996 (USACE 1999). The Aircraft Washrack Drain System at SWMU 9 has been removed and no longer receives waste wash water.

7.3 LAND USE

7.3.1 Current

The current land use of the SWMU location is industrial.

7.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the Aircraft Washrack Drain System has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

7.4 INVESTIGATIVE ACTIVITIES

7.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected four organic compounds and three metals at concentrations of potential concern in the area of SWMU 9. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 9, the RFI recommended NFA for SWMU 9.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the Aircraft Washrack Drain System at SWMU 9, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 9.

7.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

7.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

7.4.2.2 Sampling Data Collection

Four borings, drilled to depths of 20 feet in the area of the Aircraft Washrack Drain System unit, were sampled during the RFI (boring locations are shown in Figure 7-1 in Appendix A). Soil samples were collected at the surface and from depths of, 5, 10, 15 and 20 feet to characterize the distribution of potential contaminants. Field screening with a PID detected readings as high as 480 parts per million during this investigation, indicating the potential presence of contamination in all four borings.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 20 soil samples were sent for chemical analyses.

7.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 9.

In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

7.4.2.4 Results and Conclusions

Four organics (acetone, tetrachloroethene, toluene, and xylenes) and three metals (barium, chromium and nickel) were detected at low concentrations in the surface soil samples collected from at least one of the three borings. One organic (acetone) and two metals (barium and chromium) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 7-1a and 7-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 9, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 9, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 9, the RFI recommended NFA for this SWMU.

7.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

7.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

7.4.3.2 Sampling Data Collection

After the Aircraft Washrack Drain System had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

7.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

7.4.3.4 Results and Conclusions

The Aircraft Washrack Drain System at SWMU 9 was pumped dry and cleaned. Two feet of soil surrounding the unit was excavated, and the drain system was removed from the excavation in pieces. Stained soil and fuel odors were observed during the excavation activities in the area of the 8-inch pipe that connected SWMU 9 to SWMU 8.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of 8 feet. Two additional samples were collected from the sand trap outlet areas, each at an approximate depth of 4 feet. A ninth, confirmatory sample was collected from the center of the excavation's bottom at approximately 8 feet of depth and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the outlet samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 7-2a and 7-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 9. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

7.5 SITE CONCEPTUAL MODEL

7.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 9 included the drilling and sampling of a total of four borings to depths of 20 feet. Four organic compounds and three metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the partial removal of the Aircraft Washrack Drain System from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a, so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 9 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

7.5.2 Environmental Fate

Contaminants encountered at Aircraft Washrack Drain System could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 9, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

7.6 SITE ASSESSMENTS

7.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 9. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 9.

7.6.2 Screening Assessments

7.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 9.

7.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

7.6.3 Risk Assessments

7.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 9, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 9, a level that fell below the USEPA's level of concern (1.0) for

noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

7.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

7.6.4 Other Applicable Assessments

7.6.4.1 Surface Water

SWMU 9 contained no surface water.

7.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

7.6.4.3 Underground Storage Tanks (USTs)

The Aircraft Washrack Drain System was actually a single-compartment drain or sand trap constructed of concrete. This unit was removed in 1996.

7.6.4.4 Other

In 1987-1988, the Tulsa District of the Army Corps of Engineers collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

7.7 NO FURTHER ACTION PROPOSAL

7.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 9.

7.7.2 Criterion

SWMU 9 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

8.1 SUMMARY

SWMU 32A, OWS No. 186 (#1 - East), has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected one organic compound, xylenes, and three metals, barium, mercury and nickel, at concentrations of potential concern in the area of SWMU 32A. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 32A, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 32A, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 32A.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

8.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

8.2.1 Site Description

SWMU 32A, OWS No. 186 (#1 - East), was located on the east side of Building 186 (Figure 8-1 in Appendix A), on the flightline side and adjacent to a washrack. The OWS was an underground concrete unit consisting of two compartments, each of which had a 300-gallon capacity. The OWS measured approximately 6 feet by 6 feet in plan and extended approximately 7.5 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water generated from the aircraft washrack. Wastewaters from the unit were discharged to a sanitary sewer line.

8.2.2 Operational History

OWS No. 186 (#1 - East) was active from approximately 1971 until the unit was removed in 1997 (USACE 1999). The OWS at SWMU 32A has been removed and no longer receives waste wash water.

8.3 LAND USE

8.3.1 Current

The current land use of the SWMU location is industrial.

8.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 186 (#1 - East) has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

8.4 INVESTIGATIVE ACTIVITIES

8.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected one organic compound and three metals at concentrations of potential concern in the area of SWMU 32A. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 32A, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 32A, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 32A.

8.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

8.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

8.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 8-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed a maximum reading of 1.8 parts per million, indicating a low potential for contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

8.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 32A. In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

8.4.2.4 Results and Conclusions

One organic (xylenes) and no metals were detected at low concentrations in the surface soil samples collected from at least one of the three borings. No organics and three metals (barium, mercury and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 8-1a and 8-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 32A, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 32A, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 32A, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

8.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

8.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

8.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

8.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

8.4.3.4 Results and Conclusions

The OWS at SWMU 32A was pumped dry and cleaned. The unit was then excavated routinely and without incident. No stained soil or fuel odors were observed during the excavation activities. A new OWS was installed to replace the old unit. The removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of 9 to 9.5 feet. A seventh, confirmatory sample was collected from the center of the excavation's bottom at approximately 8 feet of depth and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH–DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 8-2a and 8-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 32A. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

8.5 SITE CONCEPTUAL MODEL

8.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 32A included the drilling and sampling of a total of three borings to depths of 10 feet. One organic compound and three metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 32A was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

8.5.2 Environmental Fate

Contaminants encountered at OWS No. 186 (#1 - East) could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 32A, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

8.6 SITE ASSESSMENTS

8.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 32A. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 32A.

8.6.2 Screening Assessments

8.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 32A.

8.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

8.6.3 Risk Assessments

8.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 32A, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 32A, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

8.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

8.6.4 Other Applicable Assessments

8.6.4.1 Surface Water

SWMU 32A contained no surface water.

8.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

8.6.4.3 Underground Storage Tanks (USTs)

OWS No. 186 (#1 - East) was composed of two compartments, one of which was a 300-gallon oil storage tank constructed of concrete. The entire unit was removed in 1997.

8.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

8.7 NO FURTHER ACTION PROPOSAL

8.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 32A.

8.7.2 Criterion

SWMU 32A is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

9.1 SUMMARY

SWMU 33B, OWS No. 186 (#2 - West), has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected two organic compounds (acetone and toluene) and four metals (arsenic, barium, chromium, and nickel) at concentrations of potential concern in the area of SWMU 33B. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 33B, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 33B, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 33B.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

9.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

9.2.1 Site Description

SWMU 33B, OWS No. 186 (#2 - West), was located adjacent to the west side of Building 186 (Figure 9-1 in Appendix A), near the northwest corner. The OWS was an underground concrete unit consisting of two compartments, including an oil storage tank with a capacity of 140 gallons. The OWS measured approximately six feet by six feet in plan and extended approximately 7.5 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water from the drains in Building 186, an aircraft hangar. Wastewaters from the unit were discharged to a sanitary sewer line.

9.2.2 Operational History

OWS No. 186 (#2 - West) was active from approximately 1971 until the unit was removed in 1996 (USACE 1999). The OWS at SWMU 33B has been removed and no longer receives waste wash water.

9.3 LAND USE

9.3.1 Current

The current land use of the SWMU location is industrial.

9.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 186 (#2 - West) has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

9.4 INVESTIGATIVE ACTIVITIES

9.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected two organic compounds and four metals at concentrations of potential concern in the area of SWMU 33B. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 33B, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 33B, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 33B.

9.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

9.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

9.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 9-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed a maximum reading of 7.2 ppm, indicating a low potential for contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

9.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 33B. In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

9.4.2.4 Results and Conclusions

One organic, acetone, and two metals, chromium and nickel, were detected at low concentrations in the surface soil samples collected from at least one of the three borings. One organic, toluene, and two metals, arsenic and barium, were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 9-1a, 9-1b, and 9-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 33B, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 33B, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 33B, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

9.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

9.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

9.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

9.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

9.4.3.4 Results and Conclusions

The OWS at SWMU 33B was pumped dry and cleaned. The unit was then excavated routinely and without incident. Some stained soil was observed during the excavation activities, indicating that the unit had leaked. The removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of 8 to 9 feet. A seventh, confirmatory sample was collected from the center of the excavation's bottom at approximately 9 feet of depth and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 9-2a and 9-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 33B. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

9.5 SITE CONCEPTUAL MODEL

9.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 33B included the drilling and sampling of a total of three borings to depths of 10 feet. Two organic compounds and four metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 33B was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

9.5.2 Environmental Fate

Contaminants encountered at OWS No. 186 (#2 - West) could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 33B, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

9.6 SITE ASSESSMENTS

9.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 33B. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 33B.

9.6.2 Screening Assessments

9.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 33B.

9.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

9.6.3 Risk Assessments

9.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 33B, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 33B, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

9.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

9.6.4 Other Applicable Assessments

9.6.4.1 Surface Water

SWMU 33B contained no surface water.

9.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

9.6.4.3 Underground Storage Tanks (USTs)

OWS No. 186 (#2 - West) was composed of two compartments, one of which was a 140-gallon oil storage tank constructed of concrete. The entire unit was removed in 1996.

9.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

9.7 NO FURTHER ACTION PROPOSAL

9.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 33B.

9.7.2 Criterion

SWMU 33B is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

10.1 SUMMARY

SWMU 11, OWS No. 170, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected one organic compound (methylene chloride) and two metals (mercury and nickel) at concentrations of potential concern in the area of SWMU 11. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 11, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 11, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 11.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

10.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

10.2.1 Site Description

SWMU 11, OWS No. 170, was located on the west side of Building 170 (Figure 10-1 in Appendix A). The OWS was an underground concrete unit consisting of three compartments. The OWS measured approximately 5 feet by 7 feet in plan and extended approximately 5.5 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received effluent from the drains in Building 170, an aircraft maintenance hangar. Wastewaters from the unit discharged to a sanitary sewer line.

10.2.2 Operational History

OWS No. 170 was active from approximately 1963 until approximately 1989. The unit was removed in 1996 (USACE 1999). The OWS at SWMU 11 has been removed and no longer receives waste wash water.

10.3 LAND USE

10.3.1 Current

The current land use of the SWMU location is industrial.

10.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 170 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

10.4 INVESTIGATIVE ACTIVITIES

10.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected one organic compound (methylene chloride) and two metals (mercury and nickel) of potential concern in the area of SWMU 11. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 11, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 11, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 11.

10.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

10.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

10.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 10-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID detected low-level readings up to 6.0 mg/kg during this investigation, indicating the potential presence of contamination in all three borings.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

10.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 11. In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

10.4.2.4 Results and Conclusions

Low levels of VOCs were detected at insignificant concentrations in the surface soil samples collected at this SWMU. One organic (methylene chloride) and two metals (mercury and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 10-1a and 10-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 11, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 11, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 11, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

10.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

10.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

10.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

10.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

10.4.3.4 Results and Conclusions

The OWS at SWMU 11 was pumped dry and cleaned. The unit was then excavated routinely and without incident. No staining was observed on the exterior walls of the unit during the excavation activities. The removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of eight to nine feet. A seventh, confirmatory sample was collected from the center of the excavation's bottom at approximately 9 feet of depth and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH–DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 10-2a and 10-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for background soil concentrations to determine if a significant release had occurred in the area of SWMU 11. Barium was the only compound detected at a concentration that exceeded the corresponding MSSL. However, the maximum concentration of barium detected (456 mg/kg) fell below both the established background level for barium at Cannon AFB (805 mg/kg) (W-C 1997a) and the MSSL for residential soil (5,300 mg/kg), so the elevated concentration of barium was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases, posing an unacceptable human health risk for any potential exposure pathway, had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

10.5 SITE CONCEPTUAL MODEL

10.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 11 included the drilling and sampling of a total of three borings to depths of 10 feet. One organic compound and two metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the

detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the partial removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Barium was the only compound detected that exceeded the corresponding MSSL for background soil. However, the maximum concentration of barium detected fell below the established background levels for metals at Cannon AFB (W-C 1997a) and the MSSL for residential soil, so the elevated concentration of barium was dismissed as naturally occurring.

Groundwater at SWMU 11 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

10.5.2 Environmental Fate

Contaminants encountered at OWS No. 170 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 11, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

10.6 SITE ASSESSMENTS

10.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 11. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 11.

10.6.2 Screening Assessments

10.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for background soil concentrations to determine if a significant release had occurred in the area of SWMU 11. Barium was the only compound detected at a concentration that exceeded the corresponding MSSL. However, the maximum concentration of barium detected (456 mg/kg) fell below both the established background level for barium at Cannon AFB (805 mg/kg) (W-C 1997a) and the MSSL for residential soil (5,300 mg/kg), so the elevated concentration of barium was dismissed as naturally occurring.

10.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

10.6.3 Risk Assessments

10.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 11, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 11, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

10.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct

exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

10.6.4 Other Applicable Assessments

10.6.4.1 Surface Water

SWMU 11 contained no surface water.

10.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

10.6.4.3 Underground Storage Tanks (USTs)

OWS No. 170 consisted of three compartments, one of which was an oil storage tank of unknown size. The unit was removed in 1996.

10.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

10.7 NO FURTHER ACTION PROPOSAL

10.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 11.

10.7.2 Criterion

SWMU 11 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

11.1 SUMMARY

SWMU 38, OWS No. 194, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected three organic compounds (acetone, 1,1,1-trichloroethane, and toluene) and two metals (nickel and chromium) at concentrations of potential concern in the area of SWMU 38. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 38, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 38, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 38.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

11.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

11.2.1 Site Description

SWMU 38, OWS No. 194, was located adjacent to the southeast corner of Building 194 (Figure 11-1 in Appendix A). The OWS was an underground concrete unit consisting of three compartments, including an oil storage tank with a capacity of 140 gallons. The OWS measured approximately 9 feet by 7 feet in plan and approximately 12 feet in depth. The top of the unit sat approximately 1 foot above ground surface. The unit reportedly received waste wash water from the drains in Building 194, an aircraft hangar. Wastewaters from the unit were discharged to a sanitary sewer line.

11.2.2 Operational History

OWS No. 194 was active from approximately 1971 until the unit was removed in 1996 (USACE 1999). The OWS at SWMU 38 has been removed and no longer receives waste wash water.

11.3 LAND USE

11.3.1 Current

The current land use of the SWMU location is industrial.

11.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 194 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

11.4 INVESTIGATIVE ACTIVITIES

11.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected two organic compounds and four metals at concentrations of potential concern in the area of SWMU 38. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 38, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 38, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 38.

11.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

11.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

11.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 11-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed a maximum reading of 1.0 parts per million, indicating a low potential for contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

11.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 38.

In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

11.4.2.4 Results and Conclusions

Three organics, acetone, 1,1,1-trichloroethane and toluene, and no metals were detected at low concentrations in the surface soil samples collected from at least one of the three borings. Three organics (acetone, 1,1,1-trichloroethane and toluene) and two metals (chromium and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 11-1a and 11-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 38, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 38, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 38, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

11.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

11.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

11.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

11.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

11.4.3.4 Results and Conclusions

The OWS at SWMU 38 was pumped dry and cleaned. The unit was then excavated without incident. No stained soil or odors were observed during the excavation activities. The removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of 12 to 14 feet. A seventh, confirmatory sample was collected from the center of the excavation's bottom at approximately 14 feet of depth and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 100 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 11-2a and 11-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 38. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

11.5 SITE CONCEPTUAL MODEL

11.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 38 included the drilling and sampling of a total of three borings to depths of 10 feet. Three organics and two metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 38 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

11.5.2 Environmental Fate

Contaminants encountered at OWS No. 194 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 38, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

11.6 SITE ASSESSMENTS

11.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 38. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 38.

11.6.2 Screening Assessments

11.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 38.

11.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

11.6.3 Risk Assessments

11.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 38, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 38, a level that fell below the USEPA's level of concern (1.0) for

noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

11.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

11.6.4 Other Applicable Assessments

11.6.4.1 Surface Water

SWMU 38 contained no surface water.

11.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

11.6.4.3 Underground Storage Tanks (USTs)

OWS No. 194 was composed of two compartments, one of which was a 140-gallon oil storage tank constructed of concrete. The entire unit was removed in 1996.

11.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

11.7 NO FURTHER ACTION PROPOSAL

11.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 38.

11.7.2 Criterion

SWMU 38 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

12.1 SUMMARY

SWMU 39, OWS No. 195, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected two organic compounds, acetone and toluene, and four metals, barium, chromium, lead, and nickel, at concentrations of potential concern in the area of SWMU 39. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 39, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 39, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 39.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU..

12.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

12.2.1 Site Description

SWMU 39, OWS No. 195, was located adjacent to the northeast corner of Building 195 (Figure 12-1 in Appendix A). The OWS was an underground concrete unit consisting of two compartments, including an oil storage tank with a capacity of 140 gallons. The OWS measured approximately 9 feet by 7 feet in plan and approximately 8.5 feet in depth. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water from the drains in Building 194, an aircraft hangar. Wastewaters from the unit were discharged to a sanitary sewer line.

12.2.2 Operational History

OWS No. 195 was active from approximately 1971 until the unit was removed in 1996 (USACE 1999). The OWS at SWMU 39 has been removed and no longer receives waste wash water.

12.3 LAND USE

12.3.1 Current

The current land use of the SWMU location is industrial.

12.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 195 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

12.4 INVESTIGATIVE ACTIVITIES

12.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected two organic compounds and four metals at concentrations of potential concern in the area of SWMU 39. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 39, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 39, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 39.

12.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

12.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

12.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 12-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed a maximum reading of 21.0 ppm, indicating a potential for contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

12.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 39.

In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after completion of the RFI.

12.4.2.4 Results and Conclusions

Two organics, acetone and toluene, and no metals were detected at low concentrations in the surface soil samples collected from at least one of the three borings. Two organics, acetone and toluene, and four metals, barium, chromium, lead, and nickel, were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 12-1a and 12-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 39, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 39, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 39, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

12.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

12.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

12.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

12.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

12.4.3.4 Results and Conclusions

The OWS at SWMU 39 was pumped dry and cleaned. The unit was then excavated without incident. No stained soil or odors were observed during the excavation activities. The removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from each of the excavation's four walls, and two soil samples were collected from the bottom of the excavation, each at an approximate depth of 8.5 to 9 feet. A seventh, confirmatory sample was collected from the center of the excavation's bottom at approximately 9 feet of depth and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 100 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 12-2a and 12-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 39.

Because none of the detected chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, no further response action was recommended at this SWMU.

12.5 SITE CONCEPTUAL MODEL

12.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 39 included the drilling and sampling of a total of three borings to depths of 10 feet. Two organics and four metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected

concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. No detected chemicals exceeded the corresponding MSSL.

Groundwater at SWMU 39 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

12.5.2 Environmental Fate

Contaminants encountered at OWS No. 195 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and, groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 39, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; but they do persist for long periods of time.

12.6 SITE ASSESSMENTS

12.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 39. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 39.

12.6.2 Screening Assessments

12.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for

residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

No COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 39.

12.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

12.6.3 Risk Assessments

12.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 39, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 39, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

12.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

12.6.4 Other Applicable Assessments

12.6.4.1 Surface Water

SWMU 39 contained no surface water.

12.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

12.6.4.3 Underground Storage Tanks (USTs)

OWS No. 195 was composed of two compartments, one of which was a 140-gallon oil storage tank constructed of concrete. The entire unit was removed in 1996.

12.6.4.4 Other

In 1987-1988, the Tulsa District of the Army Corps of Engineers collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

12.7 NO FURTHER ACTION PROPOSAL

12.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 39.

12.7.2 Criterion

SWMU 39 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

13.1 SUMMARY

SWMU 46, OWS No. 196, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) found two metals (barium and antimony) at concentrations exceeding the corresponding RBCs in the area of SWMU 46. However, the report concluded that these detected metals were naturally occurring and were not SWMU-related. Because there was no evidence of a significant release in the area of SWMU 46, the Phase I RFI recommended NFA at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the partial removal of the OWS at SWMU 46, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 46.

The conclusions reached in the Phase I RFI and the Corrective Measure Completion Report were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

13.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

13.2.1 Site Description

SWMU 46, OWS No. 196, was located at the southwest corner of Building 196 (Figure 13-1 in Appendix A). The OWS was an underground concrete unit consisting of two compartments, a 560-gallon main compartment and a 135-gallon oil storage compartment. The OWS measured approximately 7 feet by 9 feet in plan and extended 8.5 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water generated from aircraft maintenance operations in Building 196, an aircraft maintenance hangar. Recovered oils were stored in the 135-gallon oil storage compartment and wastewaters were discharged to a sanitary sewer line.

13.2.2 Operational History

OWS No. 196 was active from approximately 1969 until the unit was partially removed in 1996 (USACE 1999). The OWS at SWMU 46 has been partially removed and no longer receives waste wash water.

13.3 LAND USE

13.3.1 Current

The current land use of the SWMU location is industrial.

13.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 196 has been partially removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

13.4 INVESTIGATIVE ACTIVITIES

13.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found two metals (barium and antimony) at concentrations exceeding the corresponding RBCs in the area of SWMU 46. However, the report concluded that these detected metals were naturally occurring and were not SWMU-related. Because there was no evidence of a significant release in the area of SWMU 46, the Phase I RFI recommended NFA at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the partial removal of the OWS at SWMU 46, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 46.

13.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

13.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a risk screening. The results of the risk screening are discussed below.

13.4.2.2 Sampling Data Collection

Three borings drilled to depths of 10 feet in the area of the separator unit were sampled during the Phase I RFI (boring locations are shown in Figure 13-1 in Appendix A). Soil samples were collected from the 0.5- to 2-foot, 2- to 4-foot, 4- to 6-foot, and 8- to 10-foot depth intervals to characterize the distribution of potential contaminants. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Near surface samples were collected at the 0.5- to 2-foot depth interval from directly beneath the asphalt pavement. In total, 12 soil samples were sent for chemical analyses.

13.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk screening and to determine that a significant release had not occurred in the area of SWMU 46.

In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

13.4.2.4 Results and Conclusions

Two metals, barium and antimony, were found at levels exceeding the corresponding RBCs. However, the detection of these metals was not attributable to contamination and reported concentrations were dismissed as naturally occurring. The analytical results from this investigation are shown in Tables 13-1a, 13-1b and 13-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the risk screening found that only the detected concentrations of barium and antimony exceeded the corresponding screening-level RBCs (by an approximate factor of 2). However, the detection of these metals was not attributable to contamination and reported concentrations were dismissed as naturally occurring. Based on this, the Phase I RFI recommended NFA for SWMU 46.

13.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

13.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

13.4.3.2 Sampling Data Collection

After the OWS had been partially removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

13.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

13.4.3.4 Results and Conclusions

The OWS at SWMU 46 was pumped dry and cleaned. Then the determination was made that the unit would only be partially removed, due to the presence of a 12-foot-diameter light pole foundation located adjacent to and within 15 inches of the unit. Two feet of soil were excavated from outside the walls of the unit, and the top 3 feet of the OWS were removed.

One soil sample was then collected from each of the four walls of the excavation at an approximate depth of 4 feet, and two soil samples were collected from holes drilled through the bottom of the unit at an approximate depth of 10 feet. A seventh, confirmatory sample was collected from the bottom of the excavation at approximately 10 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 100 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 13-2a and 13-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 46.

Because none of the detected chemicals exceeding the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, no further response action was recommended at this SWMU.

13.5 SITE CONCEPTUAL MODEL

13.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 46 included the drilling and sampling of a total of three borings to depths of 10 feet. Two metals (barium and antimony) were detected at concentrations of potential concern. However, the detection of these metals was not attributable to contamination and reported concentrations were dismissed as naturally occurring.

The Corrective Measure Completion Report documented the partial removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. No COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 46.

Groundwater at SWMU 46 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

13.5.2 Environmental Fate

Contaminants encountered at OWS No. 196 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air – movement within soil gas or the atmosphere, and wind transport of contaminants off site;
leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 46, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; but they do persist for long periods of time.

13.6 SITE ASSESSMENTS

13.6.1 Summary

The Phase I RFI included a risk screening and the Corrective Measure Completion Report included a risk evaluation for SWMU 46. Based on the results of the risk screening and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, no further response action was recommended for SWMU 46.

13.6.2 Screening Assessments

13.6.2.1 Human Health

The Phase I RFI's risk screening consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although two metals, barium and antimony, were detected at concentrations exceeding the corresponding RBCs, the detection of these metals was not attributable to contamination and reported concentrations were dismissed as naturally occurring.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

No COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 46.

13.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in these investigations. In each investigation, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. Both the Region III RBCs and the Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

13.6.3 Risk Assessments

13.6.3.1 Human Health

Because neither the risk screening nor the risk evaluation detected chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria, a full-scale human health risk assessment was not warranted for SWMU 46.

13.6.3.2 Ecological

Neither the risk screening nor the risk evaluation detected chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria. In addition, both the Region III RBCs and the Region VI MSSLs, used as screening criteria in the human health risk screening and risk evaluation, respectively, are highly conservative, and as such are protective of ecological health in addition to human health. Therefore, an ecological risk assessment was not warranted for SWMU 46.

13.6.4 Other Applicable Assessments

13.6.4.1 Surface Water

SWMU 46 contained no surface water.

13.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

13.6.4.3 Underground Storage Tanks (USTs)

OWS No. 196 included a 135-gallon underground oil storage compartment. This compartment was partially removed along with the unit's other compartments in 1996.

13.6.4.4 Other

No other assessments have been conducted in the area of SWMU 46.

13.7 NO FURTHER ACTION PROPOSAL

13.7.1 Rationale

Based on the conclusions reached in the Phase I RFI or the Corrective Measure Completion Report, NFA has been recommended for SWMU 46.

13.7.2 Criterion

SWMU 46 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

14.1 SUMMARY

SWMU 47, OWS No. 494, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) found insignificant concentrations of organic compounds and metals in the area of SWMU 47. None of the organics and none of the metals were detected at concentrations exceeding the corresponding RBCs. Because there was no evidence of a significant release in the area of SWMU 47, the Phase I RFI recommended NFA at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 47, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 47.

The conclusions reached in the Phase I RFI and the Corrective Measure Completion Report were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

14.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

14.2.1 Site Description

SWMU 47, OWS No. 494, consisted of an OWS unit located beneath an asphalt drive adjacent to the northeast wall of Building 494, the Auto Hobby Shop at Cannon AFB, and a large sand trap located at the east corner of the building (Figure 14-1 in Appendix A). The OWS was an underground concrete unit consisting of two compartments, a 50-gallon main compartment and a 50-gallon oil storage compartment. The OWS measured approximately 1 foot by 2.5 feet, and was estimated to extend less than 10 feet below the surface. The 200-gallon sand trap measured approximately 4 feet by 5 feet in plan, and extended approximately 4 feet below the surface. The units reportedly received waste wash water generated from personal vehicle maintenance operations by off-duty Air Force personnel in the Auto Hobby Shop. Recovered oils were stored in the 50-gallon oil storage compartment of the OWS and wastewaters were discharged to a sanitary sewer line.

14.2.2 Operational History

OWS No. 494 was active from approximately 1982 until its removal in 1996 (USACE 1999). The OWS at SWMU 47 has been removed and no longer receives waste wash water.

14.3 LAND USE

14.3.1 Current

The current land use of the SWMU location is industrial.

14.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 494 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

14.4 INVESTIGATIVE ACTIVITIES

14.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found insignificant concentrations of organic compounds and metals in the area of SWMU 47. None of the organics and none of the metals were detected at concentrations exceeding the corresponding RBCs. Because there was no evidence of a significant release in the area of SWMU 47, the Phase I RFI recommended NFA at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 47, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 47.

14.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

14.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a risk screening. The results of the risk screening are discussed below.

14.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the separator unit, were sampled during the Phase I RFI (boring locations are shown in Figure 14-1 in Appendix A). Soil samples were collected from the 0.5- to 2-foot (0- to 0.5-foot in one boring), 2- to 4-foot, 4- to 6-foot, and 8- to 10-foot depth intervals to characterize the distribution of potential contaminants. Two borings, drilled to depths of 10 feet in the area of the sand trap unit, were also sampled during the Phase I RFI (boring locations are shown in Figure 14-1 in Appendix A). Soil samples were collected from the 0- to 0.5-foot, 1.5- to 3.5-foot, 4- to 6-foot, and 8- to 10-foot depth intervals to characterize the distribution of potential contaminants. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Near surface samples were collected at the 0.2- to 0.5-foot depth interval in vegetated areas or from directly beneath the asphalt pavement for risk assessment purposes. In total, 20 soil samples were sent for chemical analyses.

14.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk screening and to determine that a significant release had not occurred in the area of SWMU 47. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

14.4.2.4 Results and Conclusions

The analyses detected insignificant concentrations of organic compounds and metals in the area of SWMU 47. None of the organics and none of the metals were detected at concentrations exceeding the corresponding RBCs. The analytical results from this investigation are shown in Tables 14-1a, 14-1b and 14-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the risk screening found that none of the detected concentrations of organics and none of the concentrations of metals exceeded the corresponding screening-level RBCs. Based on this, the Phase I RFI recommended NFA for SWMU 47.

14.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

14.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

14.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

14.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

14.4.3.4 Results and Conclusions

The OWS and the sand trap at SWMU 47 were pumped dry and cleaned. Two feet of soil were excavated from outside the walls of the units and then the units were removed without incident.

No staining or odors were observed during the removal activities. After the old units had been removed, they were replaced with a new OWS.

One soil sample was then collected from each of the four walls of the sand trap excavation at approximate depths of 7.5 feet, and two soil samples were collected from the bottom of the excavation at approximate depths of 7.5 feet. A seventh, confirmatory sample was collected from the bottom of the excavation at approximately 7.5 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 100 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Table 14-2a in Appendix B.

One soil sample was then collected from each of the four walls of the OWS excavation at approximate depths of 6 feet, and two soil samples were collected from the bottom of the excavation at approximate depths of 6 feet. A seventh, confirmatory sample was collected from the bottom of the excavation at approximately 6 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 100 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH –DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 14-2a and 14-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 47. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

14.5 SITE CONCEPTUAL MODEL

14.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 47 included the drilling and sampling of a total of five borings to a depth of 10 feet. The analyses detected insignificant concentrations of organic

compounds and metals in the area of SWMU 47. None of the organics and none of the metals were detected at concentrations exceeding the corresponding RBCs.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 47 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

14.5.2 Environmental Fate

Contaminants encountered at OWS No. 494 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 47, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; but they do persist for long periods of time.

14.6 SITE ASSESSMENTS

14.6.1 Summary

The Phase I RFI included a risk screening and the Corrective Measure Completion Report included a risk evaluation for SWMU 47. Based on the results of the risk screening and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 47.

14.6.2 Screening Assessments

14.6.2.1 Human Health

The Phase I RFI's risk screening consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations of

potential contaminants detected during the RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Insignificant concentrations of organic compounds and metals were detected in the area of SWMU 47. None of the organics and none of the metals were detected at concentrations exceeding the corresponding RBCs.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 1.

14.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in these investigations. In each investigation, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. Both the Region III RBCs and the Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

14.6.3 Risk Assessments

14.6.3.1 Human Health

Because neither the risk screening nor the risk evaluation detected chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria, a full-scale human health risk assessment was not warranted for SWMU 47.

14.6.3.2 Ecological

Neither the risk screening nor the risk evaluation detected chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria. In addition, both the Region III RBCs and the Region VI MSSLs, used as screening criteria in the human health risk

screening and risk evaluation, respectively, are highly conservative, and as such are protective of ecological health in addition to human health. Therefore, an ecological risk assessment was not warranted for SWMU 47.

14.6.4 Other Applicable Assessments

14.6.4.1 Surface Water

SWMU 47 contained no surface water.

14.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

14.6.4.3 Underground Storage Tanks (USTs)

OWS No. 494 included a 50-gallon underground oil storage compartment. This compartment was removed along with the units' other compartments in 1996.

14.6.4.4 Other

No other assessments have been conducted in the area of SWMU 47.

14.7 NO FURTHER ACTION PROPOSAL

14.7.1 Rationale

Based on the conclusions reached in the Phase I RFI or the Corrective Measure Completion Report, NFA has been recommended for SWMU 47.

14.7.2 Criterion

SWMU 47 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

15.1 SUMMARY

SWMU 51, OWS No. 375, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) detected concentrations of four organic compounds, plus TPH, and one metal at concentrations of potential concern in the area of SWMU 51. All four organics, plus TPH, and the one metal were detected at concentrations exceeding the corresponding RBCs. Because there was evidence of a potentially significant release in the area of SWMU 51, the Phase I RFI recommended that a BRA be completed for this SWMU.

The BRA for Appendix III SWMUs – Phase I (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases from this SWMU were expected, and recommended NFA for SWMU 51.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 51, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 51.

The conclusions reached in the BRA and the Corrective Measure Completion Report were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

15.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

15.2.1 Site Description

SWMU 51, OWS No. 375, consisted of an OWS unit and an oil containment vault. The OWS was located beneath 0.5 feet of asphalt pavement adjacent to the northwest side of Building 375, a vehicle maintenance facility within the motorpool compound (Figure 15-1 in Appendix A). The OWS measured approximately 5 feet square, and extended approximately 5.5 feet below the surface. The oil containment vault was located beneath and integral to the floor and the northwest foundation wall of Building 375. The oil containment vault measured approximately 2 feet by 10 feet, and extended approximately 7 feet below the surface. The units reportedly received waste wash water generated from vehicle maintenance operations. Recovered oils were stored in the oil containment vault and wastewaters were discharged to a sanitary sewer line.

15.2.2 Operational History

OWS No. 375 was active from approximately 1968 until the separator unit was removed and the oil containment vault was abandoned in place in 1997 (USACE 1999).

15.3 LAND USE

15.3.1 Current

The OWS at SWMU 51 has been removed and at the oil containment vault has been abandoned in place. Neither unit receives waste wash water.

15.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the OWS at SWMU 51 has been removed and at the oil containment vault has been abandoned in place. Neither unit receives waste wash water. Use classification will continue to remain industrial in nature.

15.4 INVESTIGATIVE ACTIVITIES

15.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found potentially significant concentrations of four organic compounds, plus TPH, and one metal in the area of SWMU 51. The organics and the metal were detected at concentrations exceeding the corresponding risk screening criteria.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 51, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 51.

15.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

15.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a risk screening. The results of the risk screening are discussed below.

15.4.2.2 Sampling Data Collection

Three borings, drilled to depths of 10 feet in the area of the separator unit, were sampled during the Phase I RFI (boring locations are shown in Figure 15-1 in Appendix A). Soil samples were collected from the 0.5- to 2-foot, 2- to 4-foot, 4- to 6-foot, and 8- to 10-foot depth intervals to characterize the distribution of potential contaminants. The area of the oil containment vault was

investigated during the Phase I RFI. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Near surface samples were collected from directly beneath the asphalt pavement for risk assessment purposes. In total, 12 soil samples were sent for chemical analyses.

15.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after completion of the Phase I RFI.

15.4.2.4 Results and Conclusions

Four organic compounds (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene), plus TPH, and one metal (barium) were found at levels exceeding the corresponding RBCs and/or other screening criteria. The highest concentrations of contaminants were detected in near-surface samples. The vertical extent of contamination was characterized by the soil borings. The analytical results from this investigation are shown in Tables 15-1a, 15-1b and 15-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 51.

15.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

15.4.3.1 Non-Sampling Data Collection

No additional data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the Phase I RFI.

15.4.3.2 Sampling Data Collection

No additional data was collected during the BRA.

15.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

15.4.3.4 Results and Conclusions

Potential receptors at SWMU 51 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to be exposed to soil via ingestion, dermal contact, and inhalation pathways. The maximum potential excess human risk at SWMU 51 was 1×10^{-8} for occupational workers. This level fell below the USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, thus indicating that no unacceptable risk was expected. The primary contributor to the risk was ingestion of polynuclear aromatic hydrocarbons (PAHs) in surface soils. A summary of human health risks at SWMU 51 are shown in Table 15-2 in Appendix B.

Potential human health risks from groundwater were evaluated using fate and transport modeling. The modeling indicated that contaminants would not reach groundwater at concentrations of potential concern. Therefore, this pathway was considered insignificant.

Results of the ecological risk assessment showed that no unacceptable ecological risks due to chemical releases are expected at SWMU 51.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, no further response action was recommended at this SWMU.

15.4.4 Investigation #3: Corrective Measure Completion Report, Appendices II and III SWMUs

15.4.4.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

15.4.4.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

15.4.4.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

15.4.4.4 Results and Conclusions

The OWS at SWMU 51 was pumped dry and cleaned. More than 2 feet of soil were excavated from outside the walls of the separator to accommodate the new unit, then the old unit was then removed. Significant staining and odors were observed during the removal activities near the

OWS's outlet pipe that led to the oil containment vault. After the old separator unit had been removed, it was replaced with a new OWS.

Holes were drilled in the bottom and side walls of the oil containment vault for sampling purposes. After the samples had been collected, the vault was filled with clean sand and capped with concrete. The vault was abandoned in place, not removed, in order to protect the integrity of Building 375.

Soil samples were then collected from the bases of southeast and southwest walls of the OWS excavation at approximate depths of 9 feet. Two soil samples were collected from the bottom of the excavation, at locations northeast and northwest of the separator unit, at an approximate depth of 10 feet. One sample was collected from the base of the excavation in the area of stained soil at an approximate depth of 10 feet. A sixth sample was collected from the bottom of the excavation, beneath the footprint of the unit, at an approximate depth of 10 feet. A seventh, confirmatory sample was collected from the bottom of the excavation at approximately 10 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, four duplicate samples were collected from the same locations as the southeast wall sample, the northeast bottom sample, the stained sample, and the footprint sample, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX.

Five soil samples were then collected from three of the four walls and the base of the oil containment vault at approximate depths of 8 feet. (The fourth wall of the vault was the foundation wall of Building 375, and the sampling activities associated with the OWS unit had adequately investigated the other side of this wall.) A sixth, confirmatory sample was collected from the bottom of the excavation at approximately 8 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH–DRO, total metals, and TCLP metals. In addition, one duplicate sample was collected from the same location as one of the wall samples and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 51. Although barium and selenium were both detected at maximum concentrations that exceeded the established background levels for Cannon AFB (W-C 1997a), arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring. The analytical results of this investigation are presented in Table 15-3a and 15-3b in Appendix B.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

15.5 SITE CONCEPTUAL MODEL

15.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 51 included the drilling and sampling of three borings to a depth of 10 feet. The analyses detected potentially significant concentrations of organic compounds and barium in the area of SWMU 51 at concentrations exceeding the corresponding RBCs.

The Corrective Measure Completion Report documented the removal of the OWS and the abandonment of the tank vault at this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Although barium and selenium were both detected at maximum concentrations that exceeded the established background levels for Cannon AFB (W-C 1997a), arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 51 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

15.5.2 Environmental Fate

Contaminants encountered at OWS No. 375 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 51, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; but they do persist for long periods of time.

15.6 SITE ASSESSMENTS

15.6.1 Summary

The Phase I RFI included a risk screening and the Corrective Measure Completion Report included a risk evaluation for SWMU 51. Based on the results of the risk screening and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 51.

15.6.2 Screening Assessments

15.6.2.1 Human Health

The Phase I RFI's risk screening consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Because organic compounds and barium were detected at concentrations slightly exceeding the corresponding RBCs, it was determined that a BRA was warranted for SWMU 51.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. Barium and selenium were both detected at concentrations that exceeded the established background levels for Cannon AFB; however, the maximum detected concentrations of these two metals both fell below the corresponding MSSLs. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 51.

15.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI, BRA, or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report investigation. In this investigation, the screening criteria

were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological and human health.

In addition, an ecological risk screening was not included as part of the BRA. However, an ecological risk assessment was included and is discussed below in Section 15.6.3.2.

15.6.3 Risk Assessments

15.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included occupational workers, hypothetical workers performing intrusive actions, and hypothetical trespassers. Based on site conditions at SWMU 51, the most significant exposure pathways included inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

The BRA found that all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for exposures at SWMU 51 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 51.

Because no COPCs were detected at concentrations exceeding the corresponding screening criteria during the Corrective Measure Completion Report investigation at SWMU 51, a full-scale human health risk assessment was not warranted for this investigation.

15.6.3.2 Ecological

SWMU 51 is located in a small area of very poor wildlife habitat quality within the developed portion of Cannon AFB, where existing ground cover consists mainly of asphalt paving and buildings. Because of the lack of habitat at SWMU 51, no key receptor species were identified. Therefore, the ecological risk assessment was not conducted.

15.6.4 Other Applicable Assessments

15.6.4.1 Surface Water

SWMU 51 contained no surface water.

15.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

15.6.4.3 Underground Storage Tanks (USTs)

OWS No. 375 included a 50-gallon underground oil storage tank. This tank was removed along with the unit's other compartments in 1996.

15.6.4.4 Other

No other assessments have been conducted in the area of SWMU 51.

15.7 NO FURTHER ACTION PROPOSAL

15.7.1 Rationale

Based on the conclusions reached in the Phase I RFI and the Corrective Measure Completion Report, NFA has been recommended for SWMU 51.

15.7.2 Criterion

SWMU 51 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

16.1 SUMMARY

SWMU 57, OWS No. 379, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) detected no metals and no organic compounds at concentrations exceeding the corresponding RBCs in the area of SWMU 57. Because there was no evidence of a significant release in the area of SWMU 57, the Phase I RFI recommended NFA at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 57, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 57.

The conclusions reached in the Phase I RFI and the Corrective Measure Completion Report were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

16.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

16.2.1 Site Description

SWMU 57, OWS No. 379, was located beneath the pavement adjacent to the southwest side of Building 379 (Figure 16-1 in Appendix A). The OWS was an underground concrete unit consisting of three compartments. The OWS measured approximately 6.5 feet by 5 feet in plan and extended approximately 6 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water generated from heavy vehicle maintenance operations in Building 379. Recovered oils were stored in the oil storage compartment and wastewaters were discharged to a sanitary sewer line.

16.2.2 Operational History

OWS No. 379 was active from approximately 1965 until the unit was removed in 1996 (USACE 1999). After OWS No. 379 had been completely removed, it was replaced with a new OWS unit. OWS No. 379 at SWMU 57 has been removed and no longer receives waste wash water.

16.3 LAND USE

16.3.1 Current

The current land use of the SWMU location is industrial.

16.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 379 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

16.4 INVESTIGATIVE ACTIVITIES

16.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found no metals and no organics at concentrations exceeding the corresponding RBCs in the area of SWMU 57. Because there was no evidence of a significant release in the area of SWMU 57, the Phase I RFI recommended NFA at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 57, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 57.

16.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

16.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a risk screening. The results of the risk screening are discussed below.

16.4.2.2 Sampling Data Collection

Three borings drilled to depths of 10 feet in the area of the separator unit were sampled during the Phase I RFI (boring locations are shown in Figure 16-1 in Appendix A). Soil samples were collected from the 0.5- to 2-foot, 2- to 4-foot, 4- to 6-foot, and 8- to 10-foot depth intervals to characterize the distribution of potential contaminants. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Near-surface samples were collected at the 0.5- to 2-foot depth interval from directly beneath the asphalt pavement. In total, 12 soil samples were sent for chemical analyses.

16.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete risk screening and to determine that a significant release had not occurred in the area of SWMU 57. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

16.4.2.4 Results and Conclusions

No metals and no organic compounds were detected at concentrations exceeding the corresponding RBCs or other risk screening criteria. The analytical results from this investigation are shown in Tables 16-1a, 16-1b, and 16-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the risk screening found that no detected concentrations of any chemicals exceeded the corresponding RBCs or other risk screening criteria. Based on this, the Phase I RFI recommended NFA for SWMU 57.

16.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

16.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

16.4.3.2 Sampling Data Collection

After the OWS had been removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

16.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

16.4.3.4 Results and Conclusions

The OWS at SWMU 57 was pumped dry and cleaned. Two feet of soil were excavated from outside the walls of the unit, then the unit was removed without incident. After OWS No. 379 had been completely removed, it was replaced with a new OWS unit.

One soil sample was then collected from each of the four walls of the excavation at an approximate depth of 8 feet, and two soil samples were collected from the bottom of the excavation at an approximate depth of 8 feet. A seventh, confirmatory sample was collected from the bottom of the excavation at an approximate depth of 8 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample

was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the wall and one of the bottom samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 16-2a and 16-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 57.

Because none of the detected chemicals exceeding the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

16.5 SITE CONCEPTUAL MODEL

16.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 57 included the drilling and sampling of three borings to depths of 10 feet. No COPCs were detected during the Phase I RFI. Therefore, NFA was recommended for SWMU 57.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. No COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 57.

Groundwater at SWMU 57 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

16.5.2 Environmental Fate

Contaminants encountered at OWS No. 379 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

However, because no chemicals were detected at concentrations of potential concern during either of the two investigations, the fate and transport of contaminants is irrelevant at SWMU 57.

16.6 SITE ASSESSMENTS

16.6.1 Summary

The Phase I RFI included a risk screening and the Corrective Measure Completion Report included a risk evaluation for SWMU 57. Based on the results of the risk screening and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 57.

16.6.2 Screening Assessments

16.6.2.1 Human Health

The Phase I RFI's risk screening consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

No COPCs were detected at concentrations exceeding the corresponding RBCs during the Phase I RFI. Therefore, NFA was recommended for SWMU 57.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

No COPCs were detected at concentrations exceeding the corresponding MSSLs during the Corrective Measure Completion Report investigation. Therefore, NFA was recommended for SWMU 57.

16.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in these investigations. In each investigation, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. Both the Region III RBCs and the Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological and human health.

16.6.3 Risk Assessments

16.6.3.1 Human Health

Because neither the risk screening nor the risk evaluation detected chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria, a full-scale human health risk assessment was not warranted for SWMU 57.

16.6.3.2 Ecological

Neither the risk screening nor the risk evaluation detected chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria. In addition, both the Region III RBCs and the Region VI MSSLs, used as screening criteria in the human health risk screening and risk evaluation, respectively, are highly conservative, and as such are protective of ecological and human health. Therefore, an ecological risk assessment was not warranted for SWMU 57.

16.6.4 Other Applicable Assessments

16.6.4.1 Surface Water

SWMU 57 contained no surface water.

16.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

16.6.4.3 Underground Storage Tanks (USTs)

OWS No. 379 included an underground oil storage tank. This tank was removed along with the unit's other compartments in 1996.

16.6.4.4 Other

No other assessments have been conducted in the area of SWMU 57.

16.7 NO FURTHER ACTION PROPOSAL

16.7.1 Rationale

Based on the conclusions reached in the Phase I RFI and the Corrective Measure Completion Report, NFA has been recommended for SWMU 57.

16.7.2 Criterion

SWMU 57 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

17.1 SUMMARY

SWMUs 61, 62, and 63, Sand Trap Nos. 5077A and 5077B, and OWS No. 5077C have been listed as Appendix III sites. Because of their close proximity, the three SWMUs were investigated together during a Phase I RFI of the Appendix III sites (W-C 1994a).

The Phase I RFI found no contaminants at concentrations that exceeded the corresponding RBCs and/or the corresponding background levels (W-C 1997a) in the area of SWMU 61. Therefore, NFA was recommended for this SWMU.

The Phase I RFI also found no contaminants at concentrations that exceeded the corresponding RBCs and/or the corresponding background levels (W-C 1997a) in the area of SWMU 62. Therefore, NFA was also recommended for this SWMU.

One metal and four organic compounds were detected at concentrations exceeding the screening criteria, including RBCs and background levels (W-C 1997a), at SWMU 63. Therefore, the Phase I RFI report recommended conducting a BRA at this site using the data collected during the Phase I RFI.

A BRA of the Appendix III SWMUs (W-C 1994b) later found that no unacceptable human health or ecological risks due to chemical releases were expected at SWMU 63. Based on this, the BRA recommended NFA for this SWMU.

The conclusions reached in the BRA recommended no further work at SWMU 63. Therefore, based on the recommendations of the Phase I RFI and the BRA, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

17.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

17.2.1 Site Description

Facility 5077 is a vehicle wash rack located in the Civil Engineering Squadron Compound at Cannon AFB(Figure 17-1 in Appendix A). The facility includes two 380-gallon sand traps (SWMUs 61 and 62) within the limits of the wash rack, and a 1,675-gallon OWS (SWMU 63) located to the southeast of the wash rack. Both sand traps and the wash rack are constructed of concrete. As-built plans show that each sand trap measures approximately 3 feet square, and the OWS measures approximately 5 feet by 10 feet. The exact depths of the three units are not known, but none are expected to be greater than 10 feet.

The sand traps and the OWS reportedly received wash water generated by motor vehicle cleaning activities. SWMU 63 has been described as an OWS, but field observations noted that it was a single-compartment unit with no baffles. Despite the fact that this unit appears to be a third sand trap, it will be referenced herein as an OWS.

17.2.2 Operational History

At the time of the field investigation, the wash rack area was roped off and out of use. According to the Base Civil Engineering Office, the facility was seldom used and has been taken out of service.

17.3 LAND USE

17.3.1 Current

Although the wash rack and its associated sand traps and OWS are still in place and functional, the facility was seldom used and has been taken out of service.

17.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, Sand Trap Nos. 5077A and 5077B and OWS No. 5077C were seldom used and have been taken out of service. Use classification will continue to remain industrial in nature.

17.4 INVESTIGATIVE ACTIVITIES

17.4.1 Summary

The Phase I RFI found no contaminants at concentrations that exceeded the corresponding RBCs and/or the corresponding background levels (W-C 1997a) in the areas of SWMU 61 or SWMU 62. Therefore, NFA was recommended for these SWMUs.

One metal and four organic compounds were detected at concentrations that exceeded the screening criteria, including RBCs and background levels (W-C 1997a), at SWMU 63. Therefore, the Phase I RFI report recommended conducting a BRA at this site using the data collected during the Phase I RFI.

A BRA of the Appendix III SWMUs (W-C 1994b) later found that no unacceptable human health or ecological risks due to chemical releases were expected at SWMU 63. Based on this, the BRA recommended NFA for this SWMU.

17.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

17.4.2.1 Non-Sampling Data Collection

The Phase I RFI was purely a field investigation and data collection effort. However, a BRA was performed using the results of the Phase I RFI for SWMU 63. The BRA is discussed as Investigation #2 below.

17.4.2.2 Sampling Data Collection

Six borings, two in the area of each of the three SWMUs, were drilled to a depth of 10 feet and sampled during the Phase I RFI (boring locations are shown in Figure 17-1 in Appendix A). Soil samples were collected from the 0.5- to 2-foot, the 2- to 4-foot, the 4- to 6-foot, and the 8- to 10-foot depth intervals at SWMUs 61 and 62, and from the 0.2- to 0.5-foot, the 1.5- to 3-foot, the 4- to 6-foot, and the 8- to 10-foot depth intervals at SWMU 63 to characterize the presence of potential contaminants.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Surficial samples were collected from the 0.2- to 0.5-foot depth interval at SWMU 63 to provide surface soil data for risk assessment purposes. Samples from the 0.5- to 2-foot interval were collected immediately beneath the pavement at SWMUs 61 and 62. In total, 12 soil samples were sent for chemical analyses.

17.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. In addition, it was concluded that the data available from this investigation was sufficient to complete a BRA. Therefore, no data gaps existed after the completion of the Phase I RFI.

17.4.2.4 Results and Conclusions

Low levels of organic compounds and metals were detected in the soil samples collected from the borings drilled at both SWMU 61 and SWMU 62. However, none of these chemicals were detected at concentrations that exceeded the corresponding RBCs and/or other screening criteria, including established background levels for metals (W-C 1997a). In addition, the highest concentrations of detected chemicals occurred in the near-surface soil samples. Therefore, the vertical extent of contamination has been characterized by the borings at SWMU 61 and at SWMU 62, and the potential impacts to groundwater have been characterized as low.

Four organic compounds (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) and one metal (barium) were found at levels exceeding the corresponding RBCs at SWMU 63. However, the highest detected concentration of barium fell within the range of background concentrations for the site and was dismissed as naturally occurring. The highest concentrations of all the contaminants were detected in near-surface samples. Therefore, the vertical extent of contamination has been characterized by the borings at SWMU 63, and the potential impacts to groundwater have been characterized as low. The analytical results from this investigation are shown in Tables 17-1a, 17-1b, 17-1c, 17-1d, and 17-1e in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 63, and NFA for SWMUs 61 and 62.

17.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

17.4.3.1 Non-Sampling Data Collection

No additional data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors and all appropriate exposure pathways was performed on the data collected during the Phase I RFI.

17.4.3.2 Sampling Data Collection

No additional data was collected during the BRA.

17.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

17.4.3.4 Results and Conclusions

Potential receptors at SWMU 63 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to be exposed to soil via ingestion, dermal contact, and inhalation pathways. The primary contributor to the risk was ingestion of PAHs in surface soils. The maximum potential excess human risk at SWMU 63 was 2×10^{-6} for occupational workers. This level fell within the USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, thus indicating that no unacceptable risk was expected. The concentrations of COCs identified during the BRA are shown in Table 17-2a and 17-2b in Appendix B. A summary of human health risks at SWMU 63 is shown in Table 17-2c in Appendix B.

Results of the ecological risk assessment showed that SWMU 63 COCs were unlikely to present an unacceptable risk to the raptor indicator species (i.e., robins). Therefore, no unacceptable ecological risks were expected at SWMU 63.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from SWMU 63. Therefore, NFA was recommended at this SWMU.

17.5 SITE CONCEPTUAL MODEL

17.5.1 Nature and Extent of Contamination

Low levels of organic compounds and metals were detected in the soil samples collected from the borings drilled at both SWMU 61 and SWMU 62. However, none of these chemicals were detected at concentrations that exceeded the corresponding RBCs and/or other screening criteria, including established background levels for metals (W-C 1997a). In addition, the highest concentrations of detected chemicals occurred in the near-surface soil samples. Therefore, the vertical extent of contamination has been characterized by the borings at SWMU 61 and at SWMU 62, and the potential impacts to groundwater have been characterized as low.

Four organic compounds and one metal were found at levels exceeding the corresponding RBCs at SWMU 63. The highest concentrations of all the contaminants were detected in near-surface samples. Therefore, the vertical extent of contamination has been characterized by the borings at SWMU 63, and the potential impacts to groundwater have been characterized as low.

Groundwater at SWMUs 61, 62, and 63 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

17.5.2 Environmental Fate

Contaminants encountered at Sand Trap Nos. 5077A and 5077B and OWS No. 5077C could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMUs 61, 62, and 63, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; however, they do persist for long periods of time. The potential for metals to precipitate in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the Phase I RFI.

Organic compounds are likely to be relatively to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

17.6 SITE ASSESSMENTS

17.6.1 Summary

As part of the Phase I RFI, detected chemicals were compared to the corresponding RBCs.

A BRA was also conducted based on the results of the Phase I RFI for SWMU 63. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 63.

17.6.2 Screening Assessments

17.6.2.1 Human Health

The risk screening at SWMUs 61, 62, and 63 consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations detected during the RFI posed a significant human health risk, and whether a risk assessment was warranted. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies. Based on this comparison, NFA was recommended for SWMUs 61 and 62. Because organic compounds and barium were detected at concentrations exceeding the corresponding RBCs, it was determined that a BRA was warranted for SWMU 63.

17.6.2.2 Ecological

An ecological risk screening was not included as part of the BRA for SWMU 63. However, an ecological risk assessment was included and is discussed below in Section 29.6.3.2.

17.6.3 Risk Assessments

17.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included occupational workers, hypothetical workers performing intrusive actions, and hypothetical trespassers. Based on site conditions at SWMU 63, the most significant exposure pathways included inhalation of fugitive VOCs or dust, and direct contact with soil, resulting in incidental ingestion or dermal absorption of chemicals from soil.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for exposures at SWMU 63 fell below or within the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 63.

17.6.3.2 Ecological

The ecological risk assessment portion of the BRA focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Potential risk from contaminants in soil to biota was considered greatest through indirect exposure of raptor species (i.e., robins) to SWMU-related chemicals bioaccumulated in the birds'

prey (earthworms) that inhabit SWMU 63, and the incidental soil consumption associated with the consumption of prey.

The ecological risk assessment found that no unacceptable ecological risks due to chemical releases were expected from SWMU 63. Therefore, NFA was recommended at this SWMU.

17.6.4 Other Applicable Assessments

17.6.4.1 Surface Water

SWMUs 61, 62, and 63 contained no surface water.

17.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, these SWMUs contained no means for groundwater discharges to occur.

17.6.4.3 Underground Storage Tanks (USTs)

Although SWMU 63 has been described as an OWS, it was observed to be a single-compartment unit with no baffles. Therefore, no storage tanks, aboveground or underground, are known to have existed in the areas of SWMUs 61, 62, and 63.

17.6.4.4 Other

No other assessments have been conducted in the area of SWMUs 61, 62, and 63.

17.7 NO FURTHER ACTION PROPOSAL

17.7.1 Rationale

Based on the conclusions reached in the Phase I RFI and the BRA, NFA has been recommended for SWMUs 61, 62, and 63.

17.7.2 Criterion

SWMUs 61, 62, and 63 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

18.1 SUMMARY

SWMU 92, OWS No. 5120, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) found slightly elevated levels of organic compounds, including PAHs, and one metal in the area of SWMU 92. The Phase I RFI report recommended conducting a BRA at this site using available data.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases were expected at this SWMU. Based on this, the BRA recommended NFA for SWMU 92.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 92, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 92.

The conclusions reached in the BRA and the Corrective Measure Completion Report were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

18.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

18.2.1 Site Description

This SWMU was formerly located east of Power Check Pad No. 5120. The OWS, which consisted of a two-compartment underground unit with a detached 100-gallon oil storage tank, reportedly received waste wash water generated from aircraft maintenance operations in Building 5120 (Figure 18-1 in Appendix A). Recovered oils were stored in the 100-gallon tank and the wastewaters were discharged to a leach well located approximately 40 feet east of the OWS.

18.2.2 Operational History

OWS No. 5120 was active from approximately 1957 to 1988. In 1988, the unit and the associated leach well were taken out of use after the demolition of Building 5120. The OWS and the associated leach well were physically removed in 1996.

18.3 LAND USE

18.3.1 Current

The OWS and the associated leach well no longer exist. Power Check Pad No. 5120 continues to be used for surface storage of aircraft maintenance vehicles and equipment.

18.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 5120 and the associated leach well no longer exist. Use classification will continue to remain industrial in nature.

18.4 INVESTIGATIVE ACTIVITIES

18.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found slightly elevated levels of organic compounds, including PAHs, and one metal in the area of SWMU 92.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 92, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 92.

18.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

18.4.2.1 Non-Sampling Data Collection

The Phase I RFI was purely a field investigation and data collection effort. However, a BRA, performed using the results of the Phase I RFI, is discussed as Investigation #2 in Section 18.4.3 below.

18.4.2.2 Sampling Data Collection

Five borings, two to depths of 10 feet in the area of the separator unit and three to depths of 60 feet in the area of the leach well, were drilled and sampled during the Phase I RFI (boring locations are shown in Figure 18-1 in Appendix A). Soil samples were collected from the 1.5- to 3.5-foot, 4- to 6-foot, and 8- to 10-foot depth intervals in all five borings. Additional samples were collected from the 18- to 20-foot, 28- to 30-foot, 38- to 40-foot, 48- to 50-foot, and 58- to 60-foot depth intervals in the three 60-foot borings to characterize the vertical distribution of potential contaminants.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Surficial samples were collected the 0.2- to 0.5-foot depth interval to provide surface soil data for risk assessment purposes. In total, 35 soil samples were sent for chemical analyses.

18.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

18.4.2.4 Results and Conclusions

Four organic compounds (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) and one metal (lead) were found at levels exceeding the corresponding RBCs. The highest concentrations of contaminants were detected in near-surface samples. The vertical extent of contamination was characterized by the soil borings. The analytical results from this investigation are shown in Tables 18-1a and 18-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 92.

18.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

18.4.3.1 Non-Sampling Data Collection

No additional data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors and all appropriate exposure pathways was performed on the data collected during the Phase I RFI.

18.4.3.2 Sampling Data Collection

No additional data was collected during the BRA.

18.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

18.4.3.4 Results and Conclusions

Potential receptors at SWMU 92 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to be exposed to soil via ingestion, dermal contact, and inhalation pathways. The primary contributor to the risk was ingestion of PAHs in surface soils. The maximum potential excess human risk at SWMU 92 was 2×10^{-6} for occupational workers. This level fell within the

USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, thus indicating that no unacceptable risk was expected. The concentrations of COCs identified during the BRA are shown in Table 18-2a and 18-2b in Appendix B. A summary of human health risks at SWMU 92 are shown in Table 18-2c in Appendix B.

Results of the ecological risk assessment showed there is a low potential for risk to predatory birds (i.e., the Northern Harrier) from SWMU-related chemicals. However, this risk is most likely insignificant because the SWMU 92 area represents only a very small percentage of the birds' hunting range.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, no further response action was recommended at this SWMU.

18.4.4 Investigation #3: Corrective Measure Completion Report, Appendices II and III SWMUs

18.4.4.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

18.4.4.2 Sampling Data Collection

After the OWS and the associated leach well had been removed, soil samples were collected from the walls and bottom of the resultant excavations and sent for chemical analyses (Figure 18-3 in Appendix A).

18.4.4.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

18.4.4.4 Results and Conclusions

The OWS at SWMU 92 was pumped dry and cleaned, then the leach well box and the top 2 feet of cobblestone were removed from the associated leach well. No significant staining or odors were observed during the removal. The separator unit and the leach well were both removed routinely and without incident.

Soil samples were collected from the walls of the OWS excavation at approximate depths of 9 feet. Two soil samples were collected from the bottom of the excavation at an approximate depth of 10 feet. These samples were field analyzed using immunoassay method 4030. Next, a confirmatory sample was collected from the bottom of the excavation and analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, a duplicate of one of the

samples collected from the bottom of the excavation was sent for laboratory analysis. No significant concentrations of TPH or BTEX compounds were detected in the duplicate sample. Finally, a composite soil sample collected from the excavation was field screened using immunoassay method 4030 and analyzed for TCLP metals.

Soil samples were collected from the walls of the leach well excavation at an approximate depth of 11 feet. One soil sample was also collected from the bottom of the excavation at an approximate depth of 12 feet. These samples were field analyzed using immunoassay method 4030. Next, a confirmatory sample was collected from the bottom of the excavation and analyzed for VOCs, SVOCs, TPH –DRO, total metals, and TCLP metals. In addition, a duplicate of one of the samples collected from the bottom of the excavation was sent for laboratory analysis. No significant concentrations of TPH or BTEX compounds were detected in the duplicate sample. Finally, a composite soil sample collected from the excavation was field screened using immunoassay method 4030 and analyzed for TCLP metals. The results of this investigation are shown in Tables 18-3a and 18-3b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 92. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels (W-C 1997a) for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

18.5 SITE CONCEPTUAL MODEL

18.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 92 found organic compounds and metals at levels of potential concern. Five borings (two to a depth of 10 feet and three to a depth of 60 feet) were installed during the field investigation to effectively delineate and characterize the horizontal and vertical extents of contamination. The highest concentrations of organics and metals were detected in near-surface samples.

The Corrective Measure Completion Report documented the partial removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 92 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

18.5.2 Environmental Fate

Contaminants encountered at OWS No. 5120 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 92, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; however, they would persist for long periods of time. The potential for metals to precipitate in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the IRP Phase II, the RFI, and the Phase II RFI.

VOCs are likely to be relatively to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

18.6 SITE ASSESSMENTS

18.6.1 Summary

A BRA was conducted based on the results of the Phase I RFI for SWMU 92. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 92.

18.6.2 Screening Assessments

18.6.2.1 Human Health

The risk screening consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations detected during the RFI posed a significant human health risk, and whether a risk assessment was warranted. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Because organic compounds and lead were detected at concentrations slightly exceeding the corresponding RBCs, it was determined that a BRA was warranted for SWMU 92.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 92.

18.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI, the BRA, or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological and human health.

An ecological risk screening was not included as part of the BRA. However, an ecological risk assessment was included and is discussed in Section 18.6.3.2 below.

18.6.3 Risk Assessments

18.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included occupational workers, hypothetical workers performing intrusive actions, and hypothetical trespassers. Based on site conditions at SWMU 92, the most significant exposure pathways included inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for exposures at SWMU 92 fell below or within the USEPA's target risk range (1.0×10^{-4} to 1.0×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 92.

Because no COPCs were detected at concentrations exceeding the corresponding screening criteria during the Corrective Measure Completion Report investigation at SWMU 92, a full-scale human health risk assessment was not warranted for this investigation.

18.6.3.2 Ecological

The ecological risk assessment portion of the BRA focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Potential risk from contaminants in soil to biota was considered greatest through indirect exposure of predatory birds (i.e., the robin) to SWMU-related chemicals bioaccumulated in the birds' prey (earthworms, etc.) that inhabits SWMU 92. However, this risk is most likely insignificant because the SWMU 92 area represents only a very small percentage of the predatory birds' hunting range.

18.6.4 Other Applicable Assessments

18.6.4.1 Surface Water

SWMU 92 contained no surface water.

18.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

18.6.4.3 Underground Storage Tanks (USTs)

OWS No. 5120 included a detached 100-gallon underground oil storage tank. This tank was removed along with the unit and associated leach well in 1996.

18.6.4.4 Other

No other assessments have been conducted in the area of SWMU 92.

18.7 NO FURTHER ACTION PROPOSAL

18.7.1 Rationale

Based on the conclusions reached in the BRA and the Phase II RFI, NFA has been recommended for SWMU 92.

18.7.2 Criterion

SWMU 92 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

19.1 SUMMARY

SWMU 94, OWS No. 5144, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) detected concentrations of five organic compounds and three metals at concentrations of potential concern in the area of SWMU 94. All four organics, plus TPH, and the three metals were detected at concentrations exceeding the corresponding RBCs. Because there was evidence of a potentially significant release in the area of SWMU 94, the Phase I RFI recommended that a BRA be completed for this SWMU.

The BRA for Appendix III SWMUs – Phase I (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases from this SWMU were expected, and recommended NFA for SWMU 94.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 94, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 94.

The conclusions reached in the BRA and the Corrective Measure Completion Report were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

19.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

19.2.1 Site Description

SWMU 94, OWS No. 5144, was comprised of an OWS and two sand traps that served a two-bay vehicle washrack adjacent to the Army, Air Force Exchange Service (AAFES) service station, located east of the intersection of D.L. Ingram Street and Argentia Avenue (Figure 19-1 in Appendix A). The 1,700-gallon OWS, which was located approximately 30 feet northeast of the two sand traps, was an underground concrete unit that reportedly received effluent from the neighboring sand traps. The OWS measured approximately 5 feet by 10 feet in plan, and extended approximately 9 feet below the surface. Recovered oils were stored in the unit and wastewaters were discharged to a sanitary sewer line. The OWS unit was a single-compartment unit with no baffles, and as such appeared to be a sand trap. However, because the unit was referred to as an OWS in earlier reports (including the Corrective Measure Completion Report, which documented the unit's removal), it is also referred to as an OWS herein.

The two sand traps were each located in the approximate center of each of the two vehicle washracks. The sand traps measured approximately 3.5 feet by 8 feet in plan, and extended approximately 6.5 feet below the surface. The sand traps reportedly received wash-down water from personal vehicle maintenance operations, and discharged effluent to the OWS.

19.2.2 Operational History

OWS No. 5144 was active from approximately 1960 until approximately 1988. The three units were removed in 1996 (USACE 1999). The OWS and the two sand traps at SWMU 94 have been removed. The units no longer receive waste wash water.

19.3 LAND USE

19.3.1 Current

The current land use of the SWMU location is industrial.

19.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the OWS and the two sand traps at SWMU 94 have been removed and no longer receive waste wash water. Use classification will continue to remain industrial in nature.

19.4 INVESTIGATIVE ACTIVITIES

19.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found potentially significant concentrations of four organics, plus TPH, and the three metals in the area of SWMU 94. The organics and the metals were all detected at concentrations exceeding the corresponding risk screening criteria.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU.

A Corrective Measure Completion Report (USACE 1999) documented the removal of the OWS at SWMU 94, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases are expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 94.

19.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

19.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a risk screening. The results of the risk screening are discussed below.

19.4.2.2 Sampling Data Collection

Six borings, two in the vicinity of each unit, were drilled to depths of 10 feet and sampled during the Phase I RFI (boring locations are shown in Figure 19-1 in Appendix A). Soil samples were collected from the 0- to 0.5-foot, 1.5- to 3.5-foot, 4- to 6-foot, and 8- to 10-foot depth intervals from the borings drilled near the OWS, and samples were collected from the 0.5- to 2-foot, 2- to 4-foot, 4- to 6-foot, and 8- to 10-foot depth intervals from the borings drilled near the sand traps, to characterize the distribution of potential contaminants. Minor soil staining was observed in two of the borings drilled near the sand traps during this investigation.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Near-surface samples were collected for risk assessment purposes. In total, 24 soil samples were sent for chemical analyses.

19.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

19.4.2.4 Results and Conclusions

Four organic compounds (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) plus TPH, and three metals (antimony, barium, and beryllium) were found at levels exceeding the corresponding RBCs and/or other screening criteria. The highest concentrations of organics were detected in near-surface samples. The highest concentration of barium was detected at approximately 4 feet in depth. However, the concentration of barium decreased to concentrations within the established background levels (W-C 1997a) with depth. The vertical extent of contamination was characterized by the soil borings. The analytical results from this investigation are shown in Tables 19-1a and 19-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 94.

19.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

19.4.3.1 Non-Sampling Data Collection

No additional data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the Phase I RFI.

19.4.3.2 Sampling Data Collection

No additional data was collected during the BRA.

19.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

19.4.3.4 Results and Conclusions

Potential receptors at SWMU 94 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to be exposed to soil via ingestion, dermal contact, and inhalation pathways. The maximum potential excess human risk at SWMU 94 was 6×10^{-7} for occupational workers. The primary contributor to the risk was ingestion of PAHs in surface soils. This level fell below the USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, thus indicating that no unacceptable risk was expected. The concentrations of COCs identified during the BRA are shown in Tables 19-2a and 19-2b in Appendix B. A summary of human health risks at SWMU 94 are shown in Table 19-2c in Appendix B.

Potential human health risks from groundwater were evaluated using fate and transport modeling. The modeling indicated that contaminants would not reach groundwater at concentrations of potential concern. Therefore, this pathway was considered insignificant.

Results of the ecological risk assessment showed that no unacceptable ecological risks due to chemical releases are expected at SWMU 94.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases are expected from this SWMU. Therefore, NFA was recommended at this SWMU.

19.4.4 Investigation #3: Corrective Measure Completion Report, Appendices II and III SWMUs

19.4.4.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

19.4.4.2 Sampling Data Collection

After the OWS and the two sand traps had been removed, soil samples were collected from the walls and bottoms of the resultant excavations and sent for chemical analyses (Figure 19-3 in Appendix A).

19.4.4.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

19.4.4.4 Results and Conclusions

The OWS and the two sand traps at SWMU 94 were pumped dry and cleaned. Stained soils were excavated from outside the walls of the westernmost sand trap during its removal. The other two units were removed routinely and without incident.

Soil samples were collected from the walls of the OWS excavation at an approximate depth of 8.5 feet. Two soil samples were collected from the bottom of the excavation at an approximate depth of 9 feet. These samples were field analyzed using immunoassay method 4030. Next, a confirmatory sample was collected from the bottom of the excavation and analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, a duplicate of one of the samples collected from the bottom of the excavation was sent for laboratory analysis. No significant concentrations of TPH or BTEX compounds were detected in the duplicate sample. Finally, a composite soil sample collected from the excavation was also analyzed for VOCs and TCLP metals.

Soil samples were collected from the walls of the west sand trap excavation at an approximate depth of 6 feet. Two soil samples were collected from the bottom of the excavation at an approximate depth of 6.5 feet. These samples were field analyzed using immunoassay method 4030. Next, a confirmatory sample was collected from the bottom of the excavation and analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, a duplicate of one of the samples collected from the bottom of the excavation was sent for laboratory analysis. No significant concentrations of TPH or BTEX compounds were detected in the duplicate sample. Finally, a composite soil sample collected from the excavation was also analyzed for VOCs and TCLP metals.

Soil samples were collected from the walls of the east sand trap excavation at an approximate depth of 6 feet. Two soil samples were collected from the bottom of the excavation at an approximate depth of 6.5 feet. These samples were field analyzed using immunoassay method 4030. Next, a confirmatory sample was collected from the bottom of the excavation and analyzed for VOCs, SVOCs, TPH – DRO, total metals, and TCLP metals. In addition, a duplicate of one of the samples collected from the bottom of the excavation was sent for laboratory analysis. No significant concentrations of TPH or BTEX compounds were detected in the duplicate sample. Finally, a composite soil sample collected from the excavation was also analyzed for VOCs and TCLP metals.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 94. Arsenic was the only compound that was detected in a

concentration that exceeded the corresponding MSSL. However, the maximum concentration of arsenic detected fell within the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring. The results of this investigation are shown in Tables 19-3a and 19-36 in Appendix B.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

19.5 SITE CONCEPTUAL MODEL

19.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 94 included the drilling and sampling of two borings to a depth of 10 feet. The analyses detected potentially significant concentrations of organic compounds and metals in the area of SWMU 94 at concentrations exceeding the corresponding RBCs.

The Corrective Measure Completion Report documented the removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound detected in a concentration that exceeded the corresponding MSSL. However, the maximum concentration of arsenic detected fell within the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 94 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

19.5.2 Environmental Fate

Contaminants encountered at OWS No. 5144 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 94, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

19.6 SITE ASSESSMENTS

19.6.1 Summary

The Phase I RFI included a risk screening and the Corrective Measure Completion Report included a risk evaluation for SWMU 94. Based on the results of the risk screening and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 94.

19.6.2 Screening Assessments

19.6.2.1 Human Health

The Phase I RFI's risk screening consisted of a comparison of the maximum detected Phase I RFI concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Because organic compounds and barium were detected at concentrations slightly exceeding the corresponding RBCs, it was determined that a BRA was warranted for SWMU 94.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

The maximum arsenic concentration detected during the Corrective Measure Completion, 6.4 mg/kg, exceeded the Region VI MSSLs for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the maximum concentration of arsenic detected falls within the established background levels for arsenic at Cannon AFB (W-C 1997a). Therefore, it has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 94.

19.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI, BRA, or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report investigation. In this investigation, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological and human health.

An ecological risk screening was not included as part of the BRA. However, an ecological risk assessment was included and is discussed below in Section 19.6.3.2.

19.6.3 Risk Assessments

19.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included occupational workers, hypothetical workers performing intrusive actions, and hypothetical trespassers. Based on site conditions at SWMU 94, the most significant exposure pathways included inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

The BRA found that all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for exposures at SWMU 94 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 94 based on the results of the BRA.

Because no COPCs were detected at concentrations exceeding the corresponding screening criteria during the Corrective Measure Completion Report investigation at SWMU 94, a full-scale human health risk assessment was not warranted for this investigation.

19.6.3.2 Ecological

The ecological risk assessment portion of the BRA focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Potential risk from contaminants in soil to biota was considered greatest through indirect exposure of predatory birds (i.e., the robin) to SWMU-related chemicals bioaccumulated in the birds' prey (earthworms, etc.) that inhabits SWMU 94.

However, this risk is most likely insignificant because the SWMU 94 area represents only a very small percentage of the predatory birds' hunting range.

19.6.4 Other Applicable Assessments

19.6.4.1 Surface Water

SWMU 94 contained no surface water.

19.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

19.6.4.3 Underground Storage Tanks (USTs)

OWS No. 5144 consisted of an underground OWS and two underground sand traps. All three units were removed in 1996.

19.6.4.4 Other

No other assessments have been conducted in the area of SWMU 94.

19.7 NO FURTHER ACTION PROPOSAL

19.7.1 Rationale

Based on the conclusions reached in the Phase I RFI and the Corrective Measure Completion Report, NFA has been recommended for SWMU 94.

19.7.2 Criterion

SWMU 94 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

20.1 SUMMARY

SWMU 8, OWS No. 165, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected one organic compound (xylenes) and three metals (barium, chromium, and nickel) at concentrations of potential concern in the area of SWMU 8. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 8, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the partial removal of the OWS at SWMU 8, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 8.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

20.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

20.2.1 Site Description

SWMU 8, OWS No. 165, was located at the east end of the aircraft washrack Facility 165 (Figure 20-1 in Appendix A). The OWS was an underground concrete unit that consisted of three compartments with a 4,500-gallon main compartment and a 710-gallon oil storage compartment. The OWS measured approximately 21 feet by 12 feet in plan and extended approximately 10 feet below the surface. The top of the unit sat approximately 1 foot above the surrounding ground surface. The unit reportedly received waste wash water generated from the aircraft washrack. Recovered oils were stored in the 710-gallon oil storage compartment and wastewaters were discharged to a sanitary sewer line.

20.2.2 Operational History

OWS No. 165 was active from approximately 1963 until the unit was partially removed in 1996 (USACE 1999). The OWS at SWMU 8 has been partially removed and no longer receives waste wash water

20.3 LAND USE

20.3.1 Current

The current land use of the SWMU location is industrial.

20.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 165 has been partially removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

20.4 INVESTIGATIVE ACTIVITIES

20.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected one organic compound and three metals at concentrations of potential concern in the area of SWMU 8. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 8, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the partial removal of the OWS at SWMU 8, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 8.

20.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

20.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

20.4.2.2 Sampling Data Collection

Three borings, drilled to a depth of 10 feet in the area of the OWS unit, were sampled during the RFI (boring locations are shown in Figure 20-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed evidence of slight contamination in one of the borings during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

20.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 8. In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

20.4.2.4 Results and Conclusions

No organics or metals were detected in the surface soil samples collected from the three borings. One organic compound (xylenes) and three metals (barium, chromium, and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 20-1a and 20-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 8, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 8, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 8, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

20.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

20.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

20.4.3.2 Sampling Data Collection

After the OWS had been partially removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

20.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

20.4.3.4 Results and Conclusions

The OWS at SWMU 8 was pumped dry and cleaned. Then the determination was made that the unit would only be partially removed, due to its proximity to the concrete washrack slab. All of the OWS, except the bottom, was removed, and the inlet and discharge pipes leading to and from the unit were disconnected and capped. The partial removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot.

One soil sample was then collected from beneath both the inlet and discharge pipes, one soil sample was also collected from both the east and the west walls of the excavation, and two soil samples were collected from holes drilled through the bottom of the unit each at an approximate depth of 12 feet. A seventh, confirmatory sample was collected from the bottom of the excavation at approximately 12 feet and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 20 ppm and that the BTEX content of each sample was less than 10 ppm. This sample was analyzed for VOCs, SVOCs, TPH –DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the pipe and one of the wall samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX. The analytical results for this investigation are presented in Tables 20-2a and 20-2b in Appendix B.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 8. Arsenic was the only compound detected in a concentration that exceeded the corresponding MSSL. However, the maximum concentration of arsenic

detected fell within the established background levels for metals at Cannon AFB (W-C 1997a), so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

20.5 SITE CONCEPTUAL MODEL

20.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 8 included the drilling and sampling of a total of three borings to a depth of 10 feet. One organic compound and three metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the partial removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound detected that exceeded the corresponding MSSL. However, the maximum concentration of arsenic detected fell within the established background levels for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 8 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

20.5.2 Environmental Fate

Contaminants encountered at OWS No. 165 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 8, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

20.6 SITE ASSESSMENTS

20.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 8. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 8.

20.6.2 Screening Assessments

20.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

The maximum arsenic concentration detected during the Corrective Measure Completion exceeded the Region VI MSSLs for both carcinogenic arsenic and noncarcinogenic arsenic. However, the maximum concentration of arsenic detected falls within the established background levels for arsenic at Cannon AFB. Therefore, it has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 8.

20.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

20.6.3 Risk Assessments

20.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 8, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 8, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

20.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels. All detected chemicals were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

20.6.4 Other Applicable Assessments

20.6.4.1 Surface Water

SWMU 8 contained no surface water.

20.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet, as such this SWMU contained no means for groundwater discharges to occur.

20.6.4.3 Underground Storage Tanks (USTs)

OWS No. 165 included a 710-gallon underground oil storage compartment. This compartment was partially removed along with the unit's other compartments in 1996. There have been no other storage tanks associated with the area of SWMU 1.

20.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this

study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

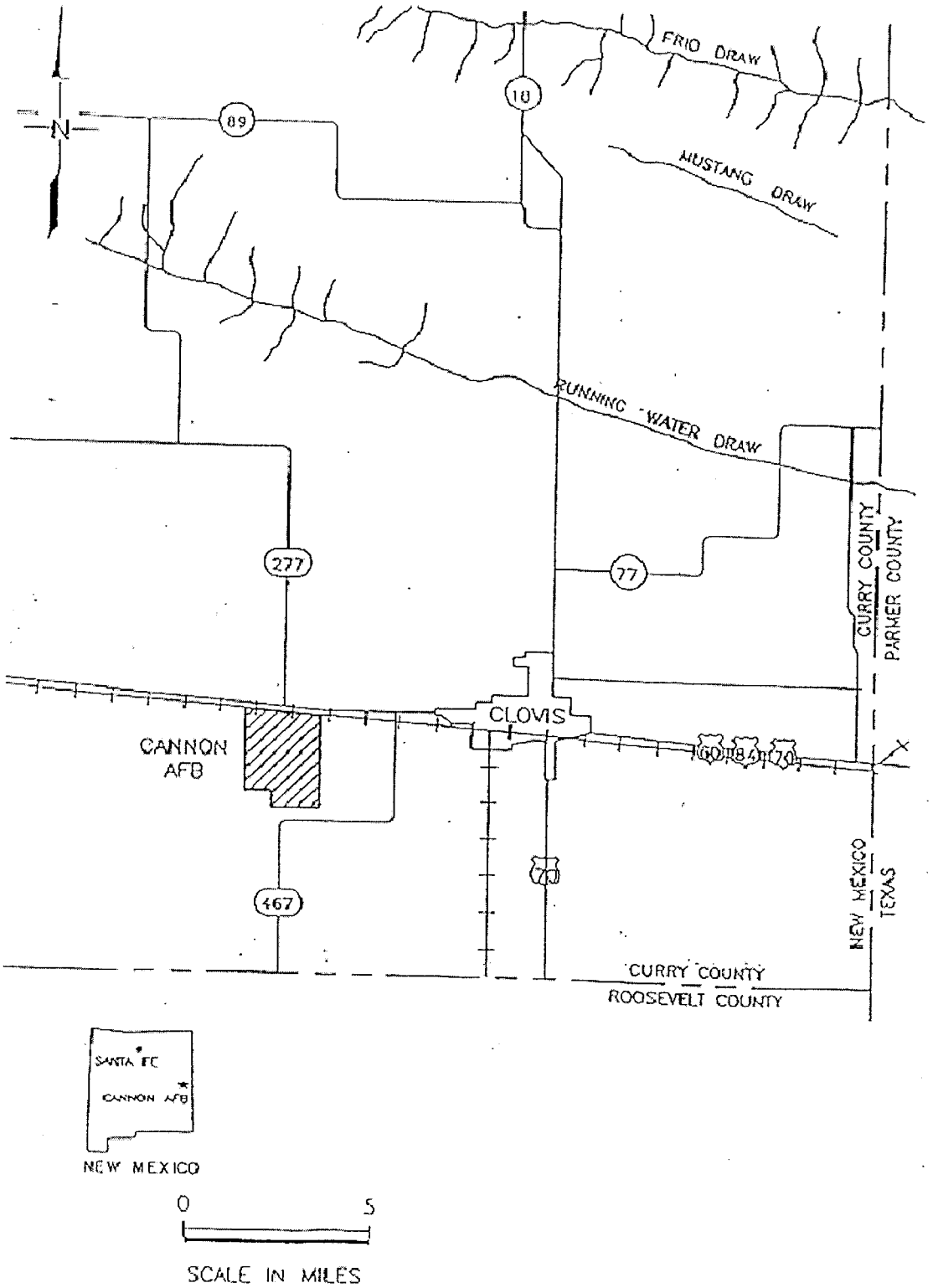
20.7 NO FURTHER ACTION PROPOSAL

20.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 8.

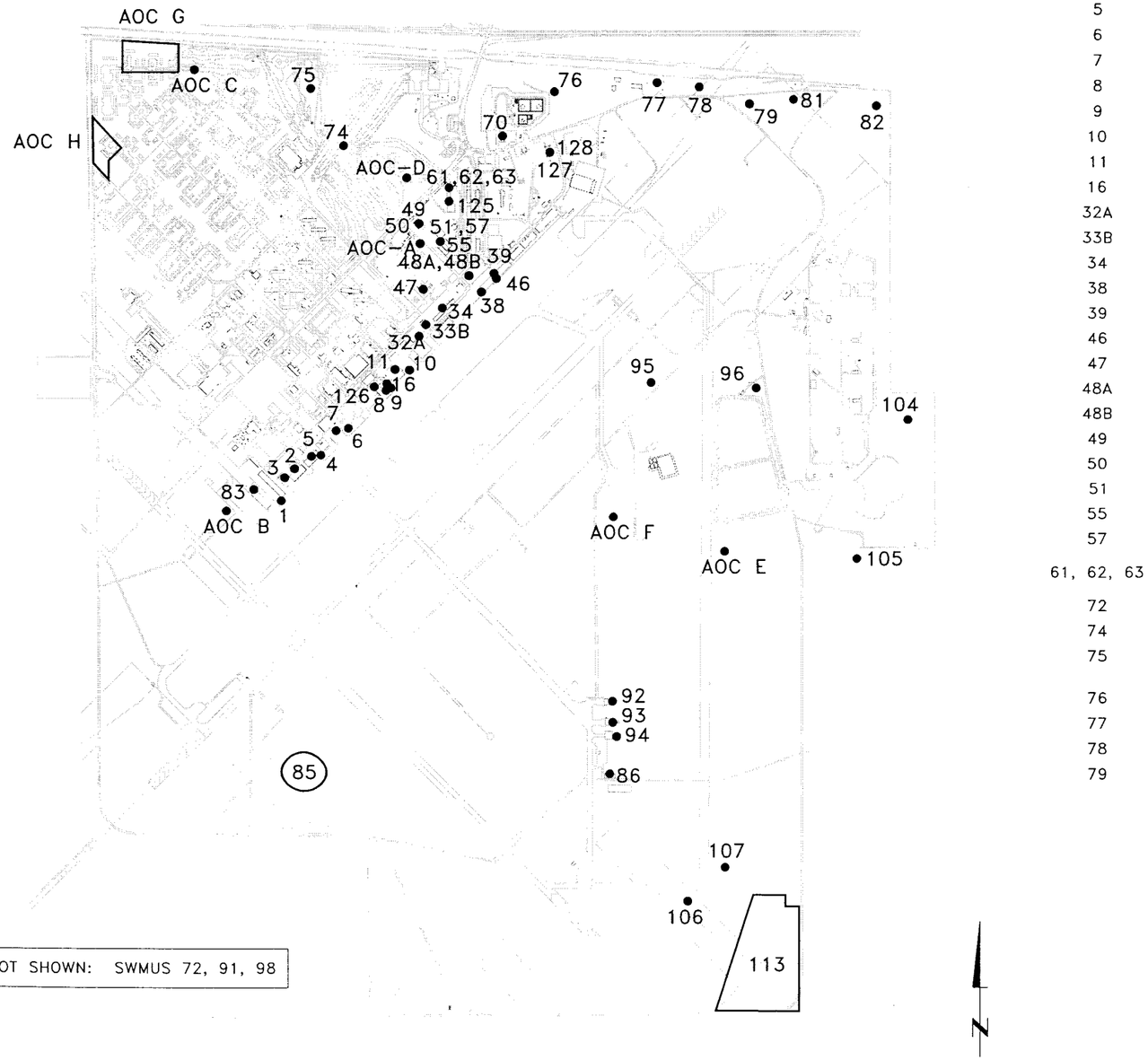
20.7.2 Criterion

SWMU 8 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.



June 23, 2000 11:06:06 a.m.
Drawing: T:\CANNON\M9602V\T6500\FIG3-3.DWG (DAP)

DRN. BY: TSSM	DATE: 03/24/99	REGIONAL MAP CANNON AIR FORCE BASE NEW MEXICO	PROJECT No.	FIG. No.
CHK'D. BY:	REVISIONS: 0		45FM9602NN.00	1-1



NOT SHOWN: SWMUS 72, 91, 98

LEGEND

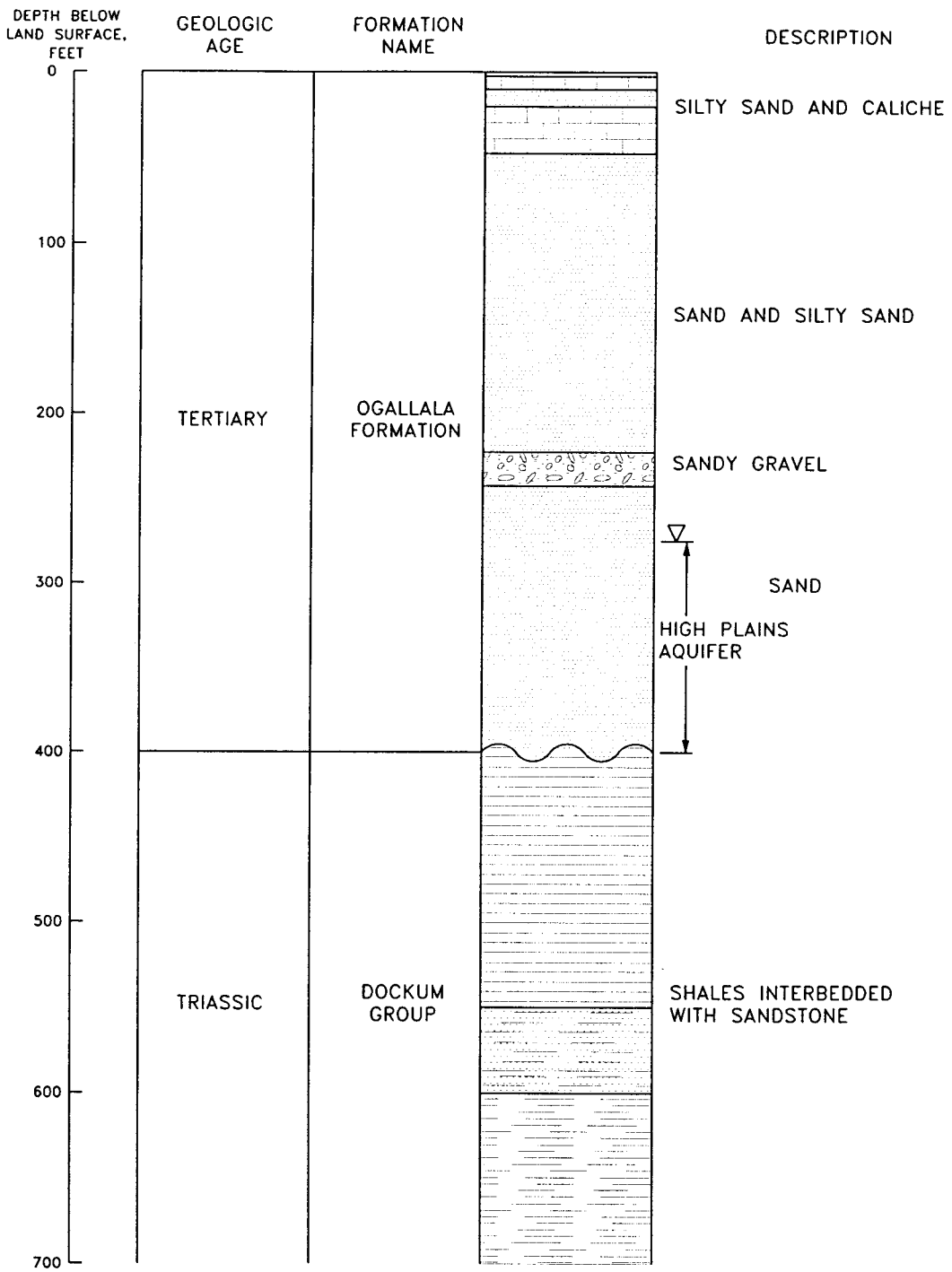
3 ● SOILD WASTE MANAGEMENT UNIT (SWMU) LOCATION AND NUMBER

SWMU No.	DESIGNATED AREA
1	OIL/WATER SEPARATOR No. 119
2	RECOVERED DIESEL TANK No. 108
3	OIL/WATER SEPARATOR No. 108
4	RECOVERED OIL TANK No 121
5	OIL/WATER SEPARATOR No. 121
6	POL TANK No. 129
7	OIL/WATER SEPARATOR No. 129
8	OIL/WATER SEPARATOR No. 165
9	AIRCRAFT WASHRACK DRAIN SYSTEM
10	POL TANK No. 170
11	OIL/WATER SEPARATOR No. 170
16	OIL/WATER SEPARATOR No. 680
32A	OIL/WATER SEPARATOR No. 186 (#1 – EAST)
33B	OIL/WATER SEPARATOR No. 186 (#2 – WEST)
34	AGE DRAINAGE DITCH
38	OIL/WATER SEPARATOR No. 194
39	OIL/WATER SEPARATOR No. 195
46	OIL/WATER SEPARATOR No. 196
47	OIL/WATER SEPARATOR No. 494
48A	UNDERGROUND WASTE OIL TANK
48B	ABOVEGROUND OVERFLOW CAPACITY TANK
49	INACTIVE POL STORAGE TANK No. 4028A
50	INACTIVE POL STORAGE TANK No. 4028B
51	OIL/WATER SEPARATOR No. 375
55	LEAD ACID BATTERY ACCUMULATION POINT
57	OIL/WATER SEPARATOR No. 379
61, 62, 63	SAND TRAPS No's. 5077A & 5077B, & OIL/WATER SEPARATOR No. 5077C
72	OIL/WATER SEPARATOR No. 390
74	LANDFILL No. 1
75	SANITARY SEWAGE LIFT STATION OVERFLOW PIT
76	SLUDGE WEATHERING PIT
77	CIVIL ENGINEERING CONTAINER STORAGE AREA
78	FIRE DEPARTMENT TRAINING AREA No. 1
79	UNDERGROUND STORAGE TANK

SWMU No.	DESIGNATED AREA
81	SOLVENT DISPOSAL SITE
82	LANDFILL No. 2
83	SUMP
85	STORMWATER COLLECTION POINT
86–90	SD–11 ENGINE TEST CELL AREA
91	RECOVERED FUEL TANK No. 5144
92	OIL/WATER SEPARATOR No. 5120
93	OIL/WATER SEPARATOR No. 5121
94	OIL/WATER SEPARATOR No. 5144
95	NE STORMWATER DRAINAGE AREA
96	OLD ENTOMOLOGY RINSE AREA
98	SANITARY SEWER LINE
104	LANDFILL No. 4
105	LANDFILL No. 3
106	FIRE DEPARTMENT TRAINING AREA No. 2
107	FIRE DEPARTMENT TRAINING AREA No. 3
113	LANDFILL No. 5
124	INACTIVE UNDERGROUND TANK No. 1
125	INACTIVE UNDERGROUND TANK No. 2
126	INACTIVE UNDERGROUND TANK No. 3
127	SAND TRAP AND LEACH FIELD FOR FACILITY No. 4095 (#1)
128	OIL/WATER SEPARATOR NEAR TANK No. 4095 (#2) AND LEACH FIELD
DP–33	DRUM DISPOSAL PIT
AOC A	MOGAS SPILL SITE
AOC B	JP–4 FUEL SPILL SITE
AOC C	BLOWN CAPACITOR SITE
AOC D	ASBESTOS BURIAL PIT
AOC E	RUNWAY RUBBLE PILE
AOC F	CALIBRATION TARGET BERM
AOC G	DISTURBED AREA – NORTH HOUSING SITE
AOC H	DISTURBED AREA – SOUTH HOUSING SITE
AOC 36	BUILDING #214 PARKING LOT

June 23, 2000 10:02:38 a.m.
Drawing: T:\CANNON\M9602NN\T1000\F16-1.DWG (DAP)
Xrefs: CAN-BASE.DWG

DRN. BY: JWB	DATE: 05/26/99	SITE PLAN AND LOCATION OF SWMU SITES PROPOSED FOR NFA CANNON AIR FORCE BASE CLOVIS, NEW MEXICO	PROJECT NO. FM9602NN
CHK'D. BY:	REVISION: 0		FIG. NO. 1–2



LEGEND

LITHOLOGIC CONTACT

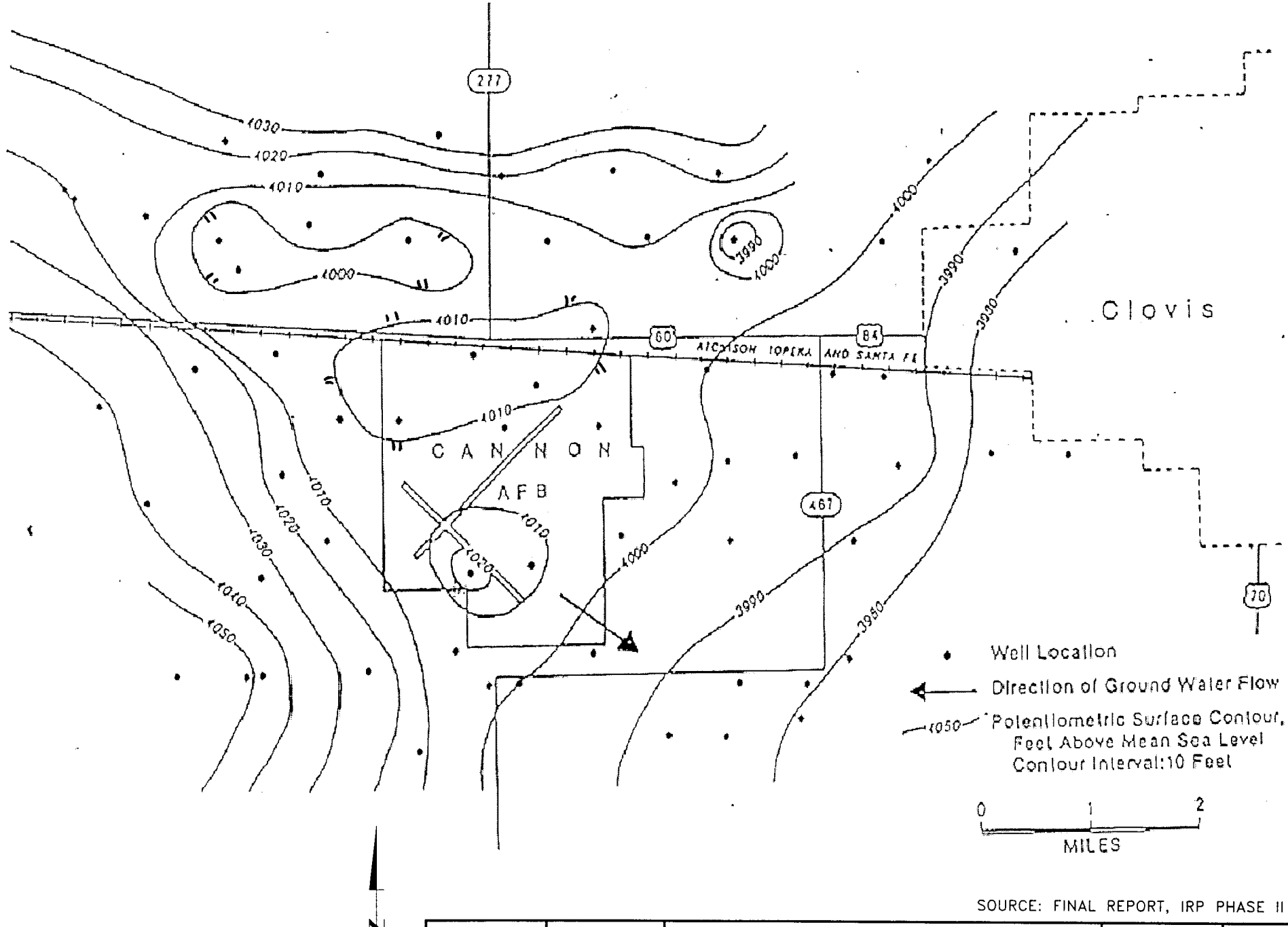
EROSINOAL UNCONFORMITY

WATER LEVEL

SOURCE: MODIFIED FROM GUTENTAG ET.AL., 1984

f:\cannon\m9602v\t6500\fig3-1.dgn

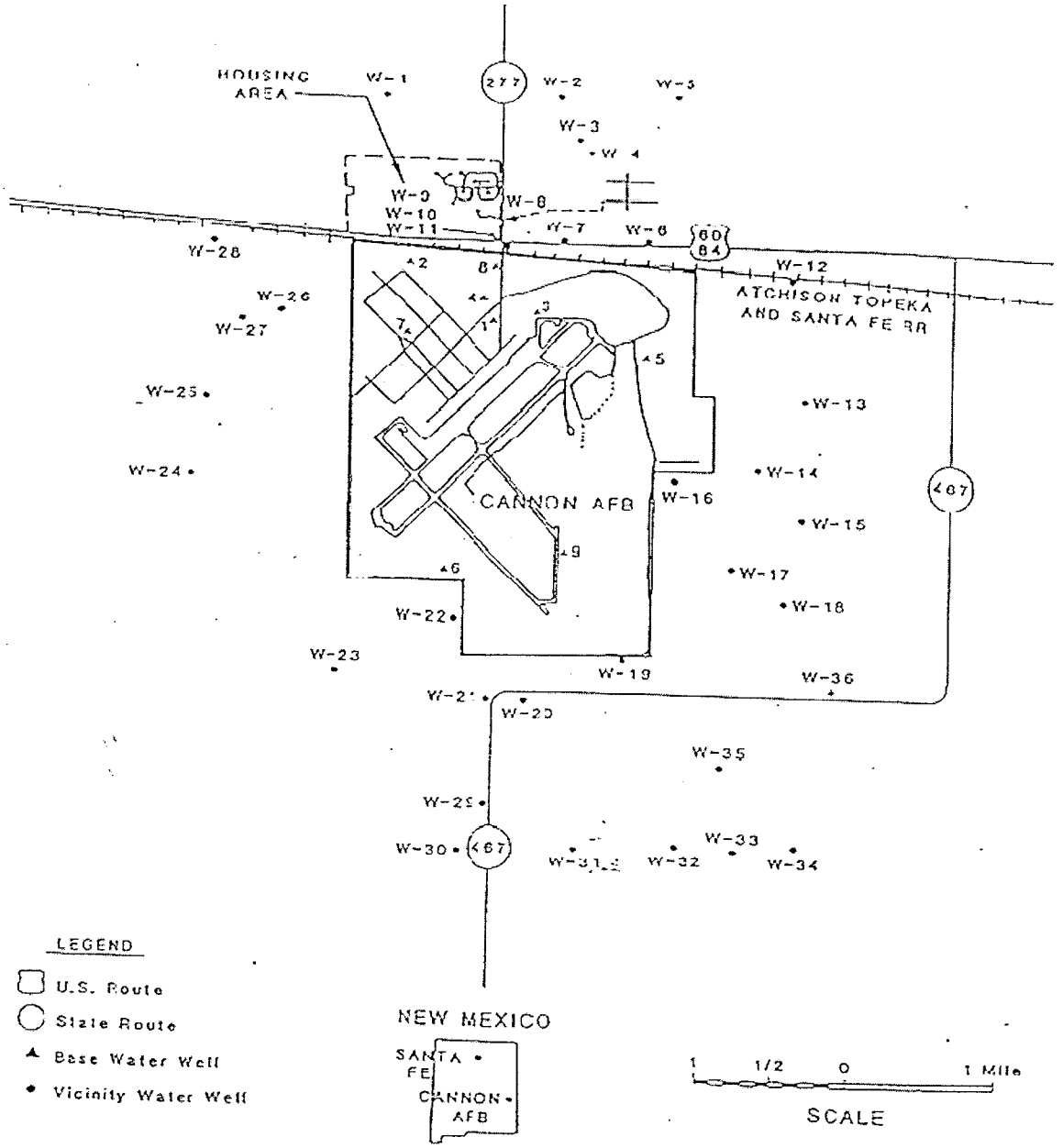
DRN BY TSSM	DATE: 03/24/99	GENERALIZED GEOLOGIC STRATA AT CANNON AIR FORCE BASE NEW MEXICO	PROJECT NO. 45FM9602NN.00	FIG. No. 1-3
CHK'D BY	REVISION 0			



SOURCE: FINAL REPORT, IRP PHASE II

June 23, 2000 11:09:00 a.m.
Drawing: T:\CANNON\M9602V\T6500\FIG3-2.DWG (DAP)

DRN BY TSSM	DATE 07/06/98	POTENTIOMETRIC SURFACE CONTOUR MAP, VICINTY OF CANNON AIR FORCE BASE NEW MEXICO	PROJECT No.	FIG. No.
CHK'D BY	REVISIONS: 0		45FM9602NN.00	1-4

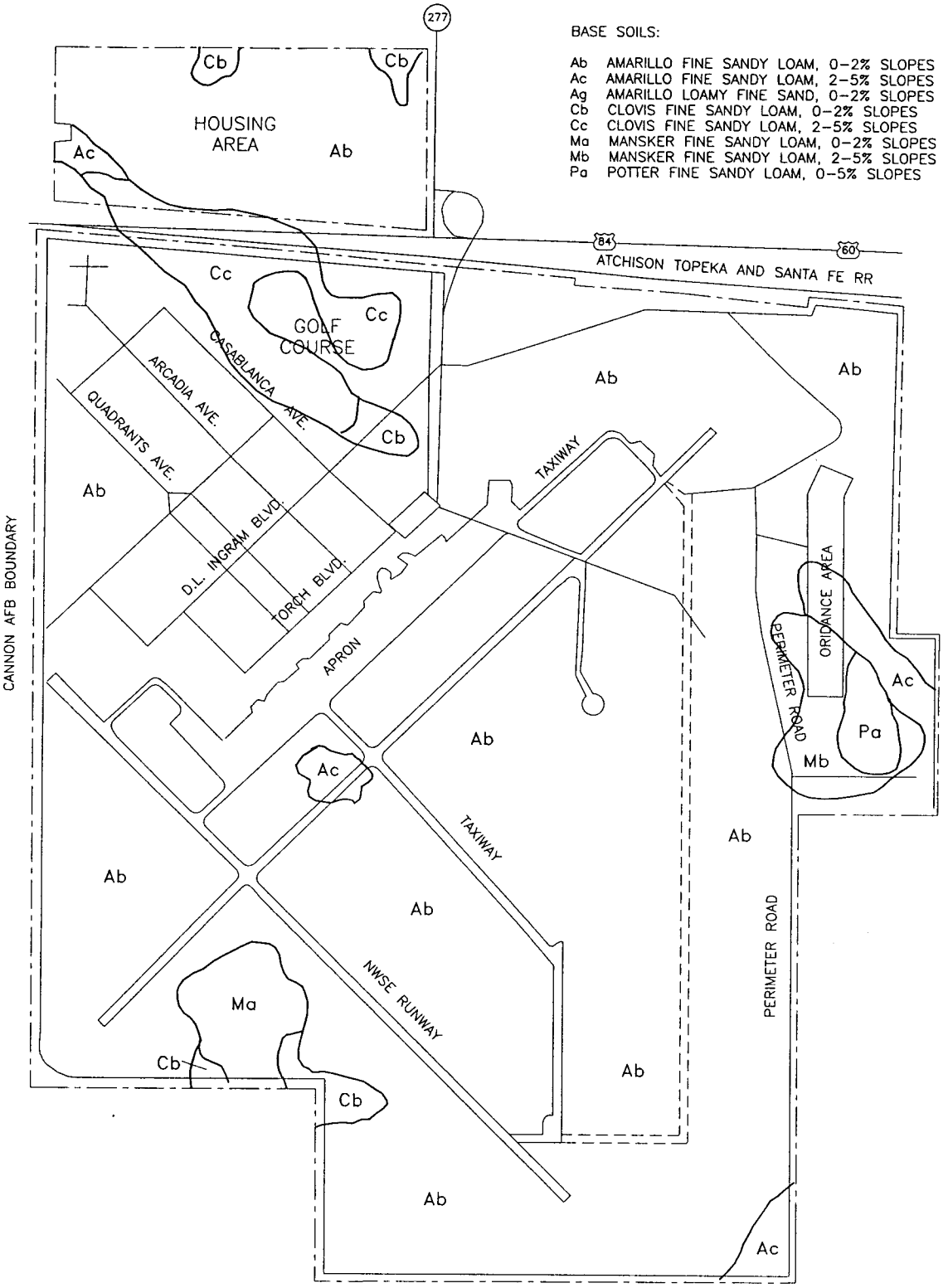


SOURCE: MODIFIED FROM GUTENTAG ET. AL., 1984

June 23, 2000 11:06:06 a.m.
Drawing: T:\CANNON\M9602V\T6500\FIG3-3.DWG (DAP)

N

DRN. BY: TSSM	DATE: 03/24/99	WATER WELL LOCATIONS ON AND NEAR CANNON AIR FORCE BASE NEW MEXICO	PROJECT No.	FIG. No.
CHK'D. BY:	REVISIONS: 0		45FM9602NN.00	1-5



SOURCE: USDA-S.C.S., SOIL SURVEY OF CURRY COUNTY N.M., 1958

March 24, 1999 11:28:12 a.m.
Drawing: T:\CANNON\M9602V\T6500\FIG3-4.DWG (TSM)

N

2000 1000 0 2000
SCALE IN FEET

DRN. BY: TSSM	DATE: 03/24/99	DISTRIBUTION OF SOILS, BY TYPE CANNON AIR FORCE BASE NEW MEXICO	PROJECT No.	FIG. No.
CHK'D. BY:	REVISIONS: 0		45FM9602NN.00	1-6

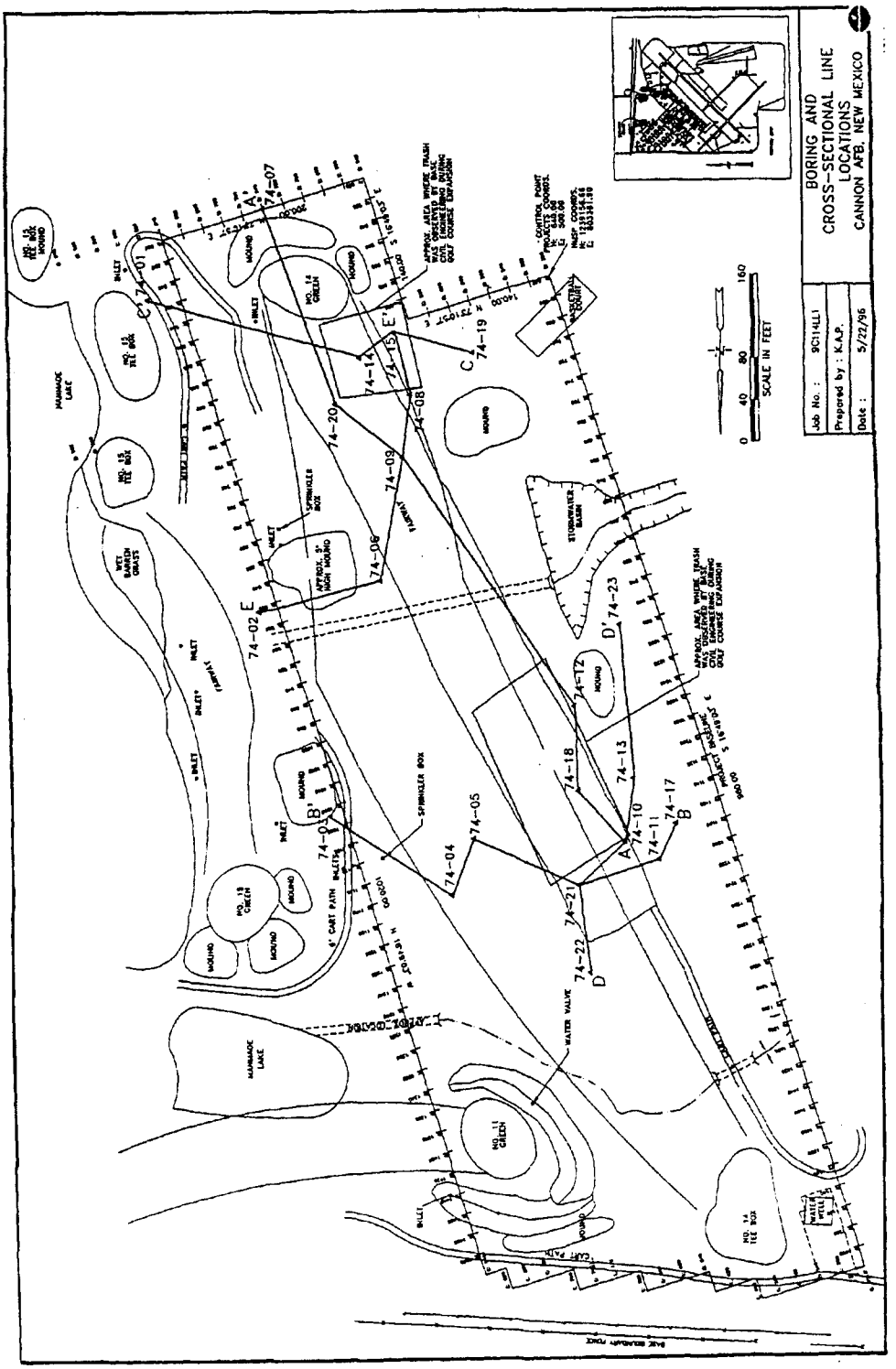


Figure 2-1

SWMU 74

Source: Woodward-Clyde, 1997

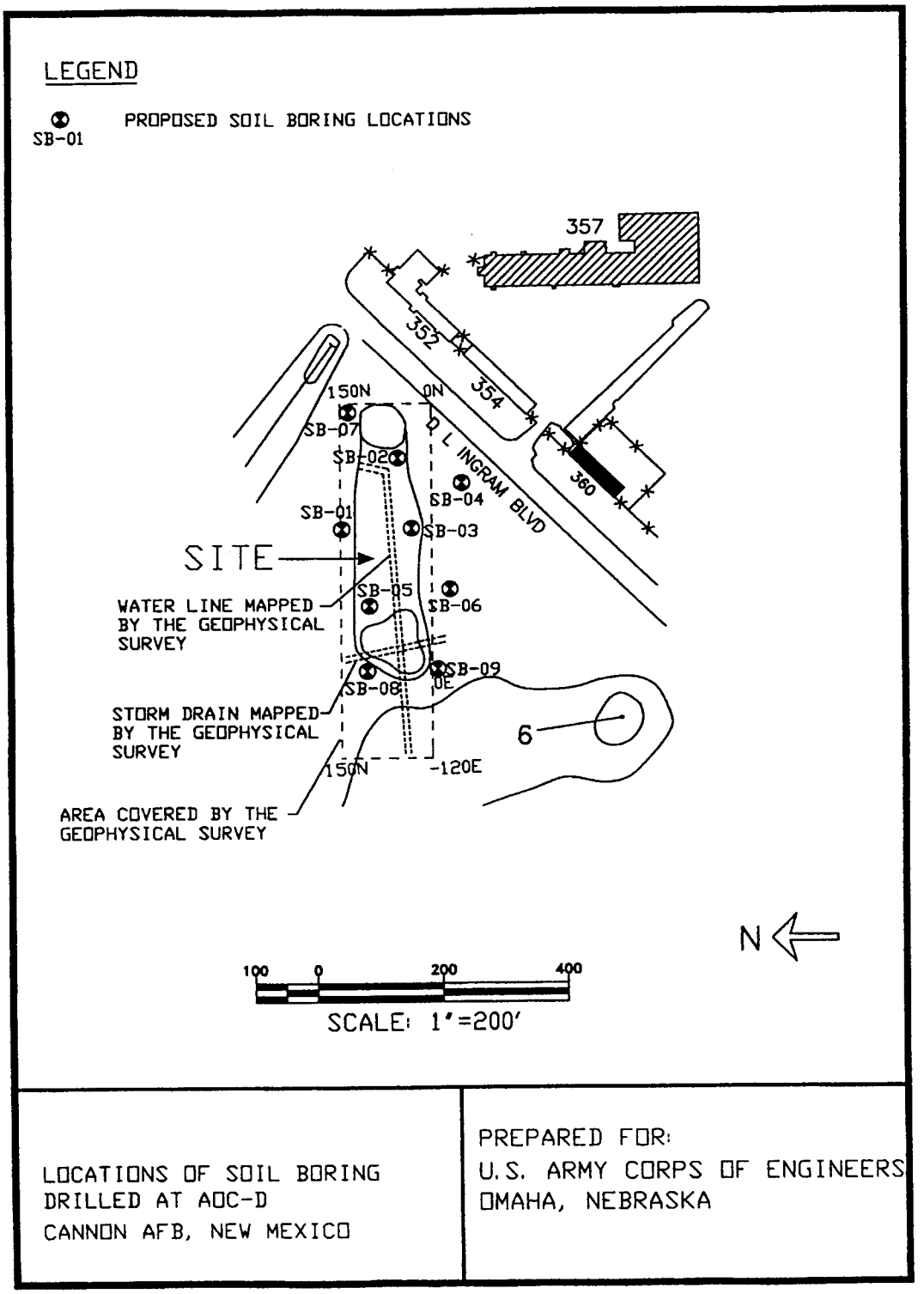


Figure 3-1

AOC D

Source: IMS, P.C., 1997

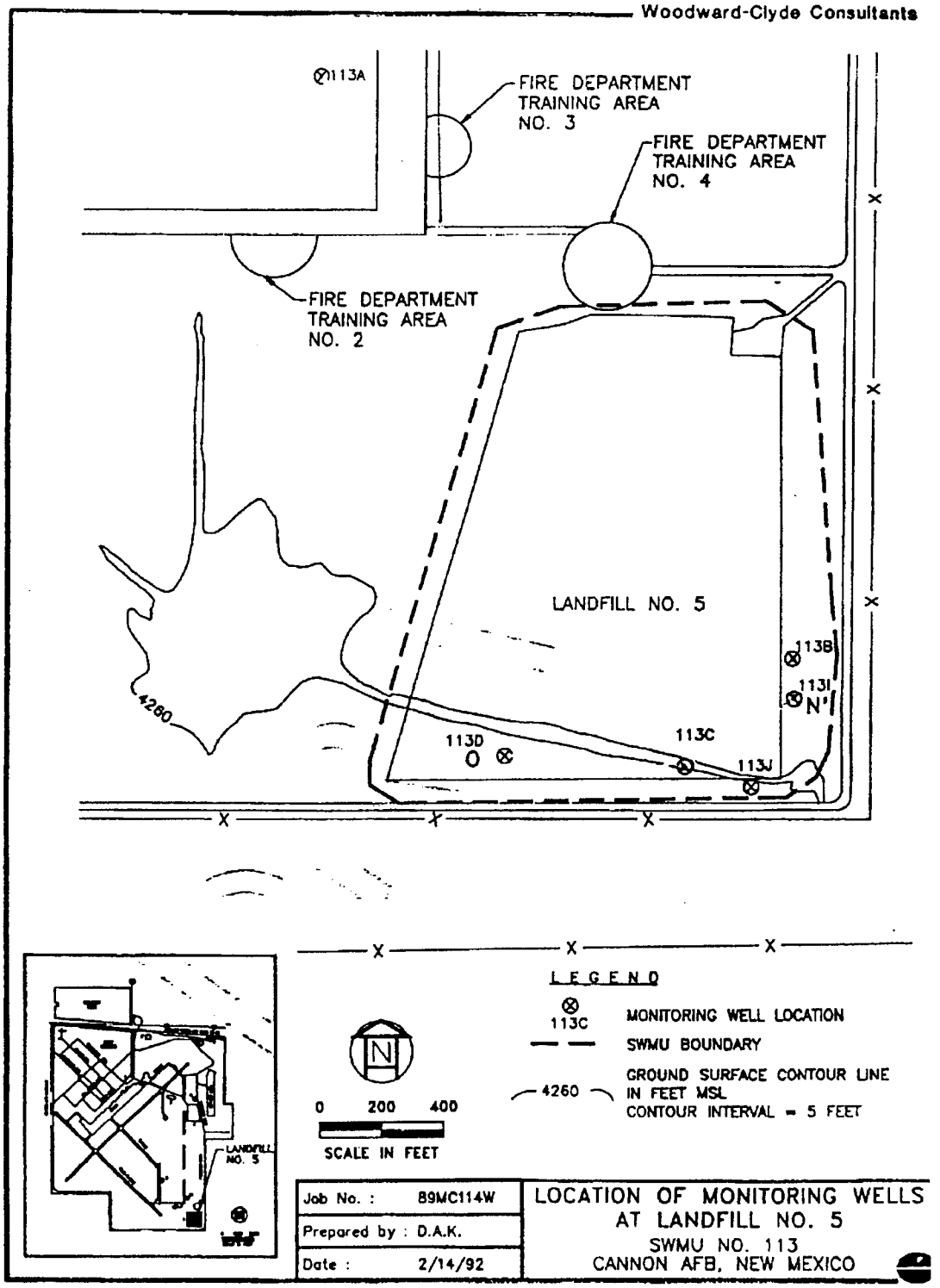


Figure 4-1

SWMU 113

Source: Woodward-Clyde, 1992

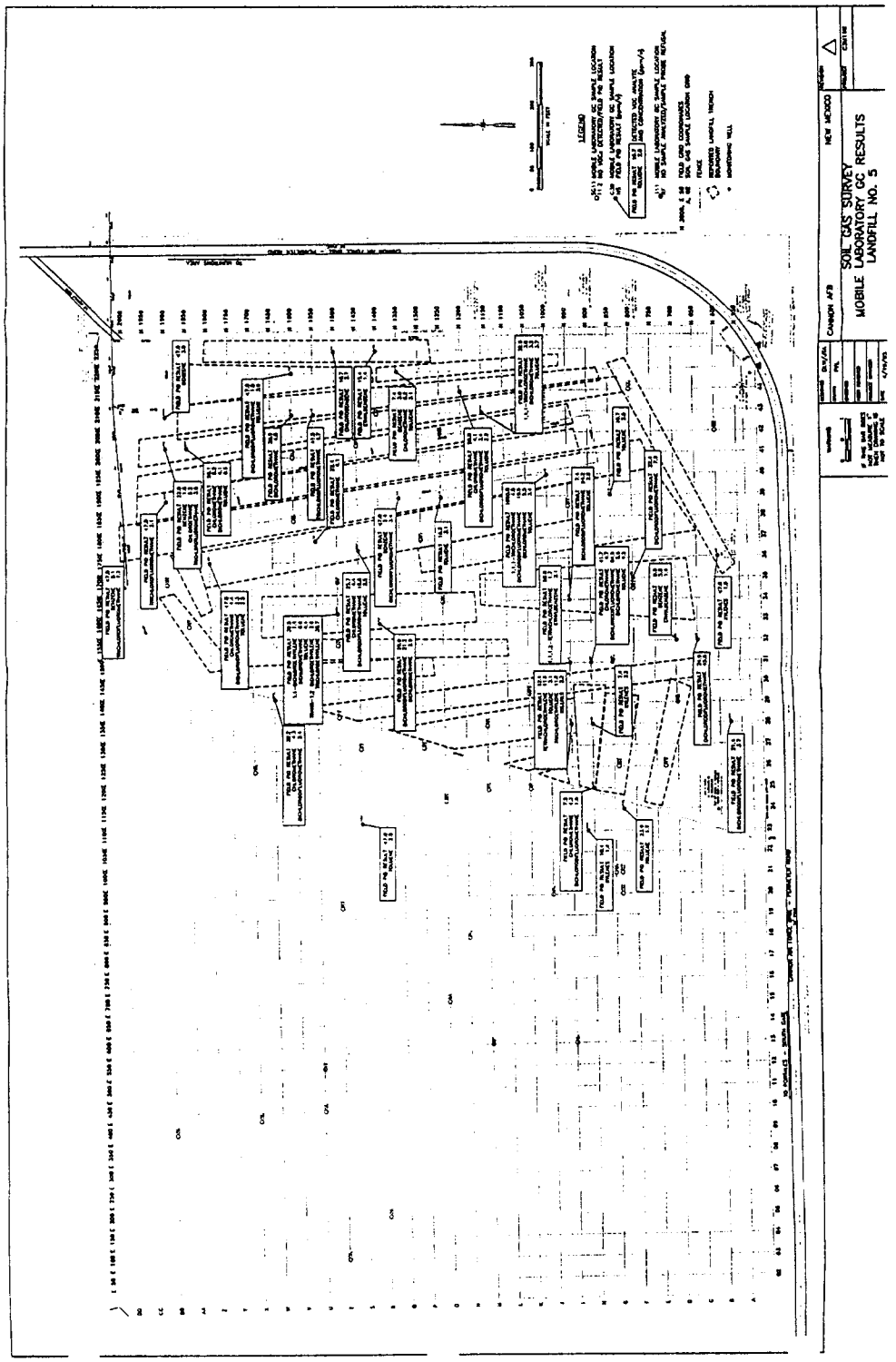


Figure 4-3

SWMU 113

Source: Woodward-Clyde, 1998

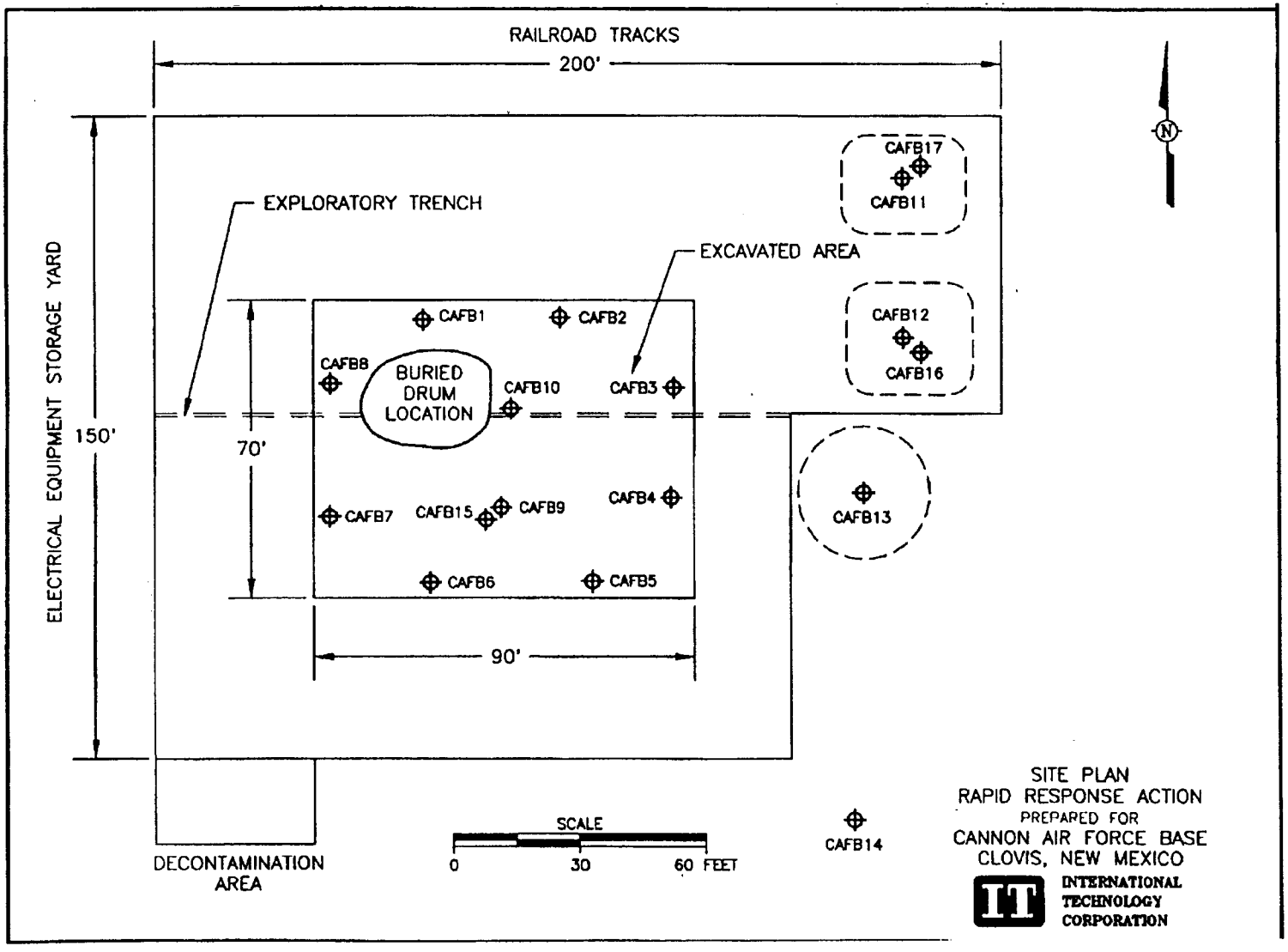
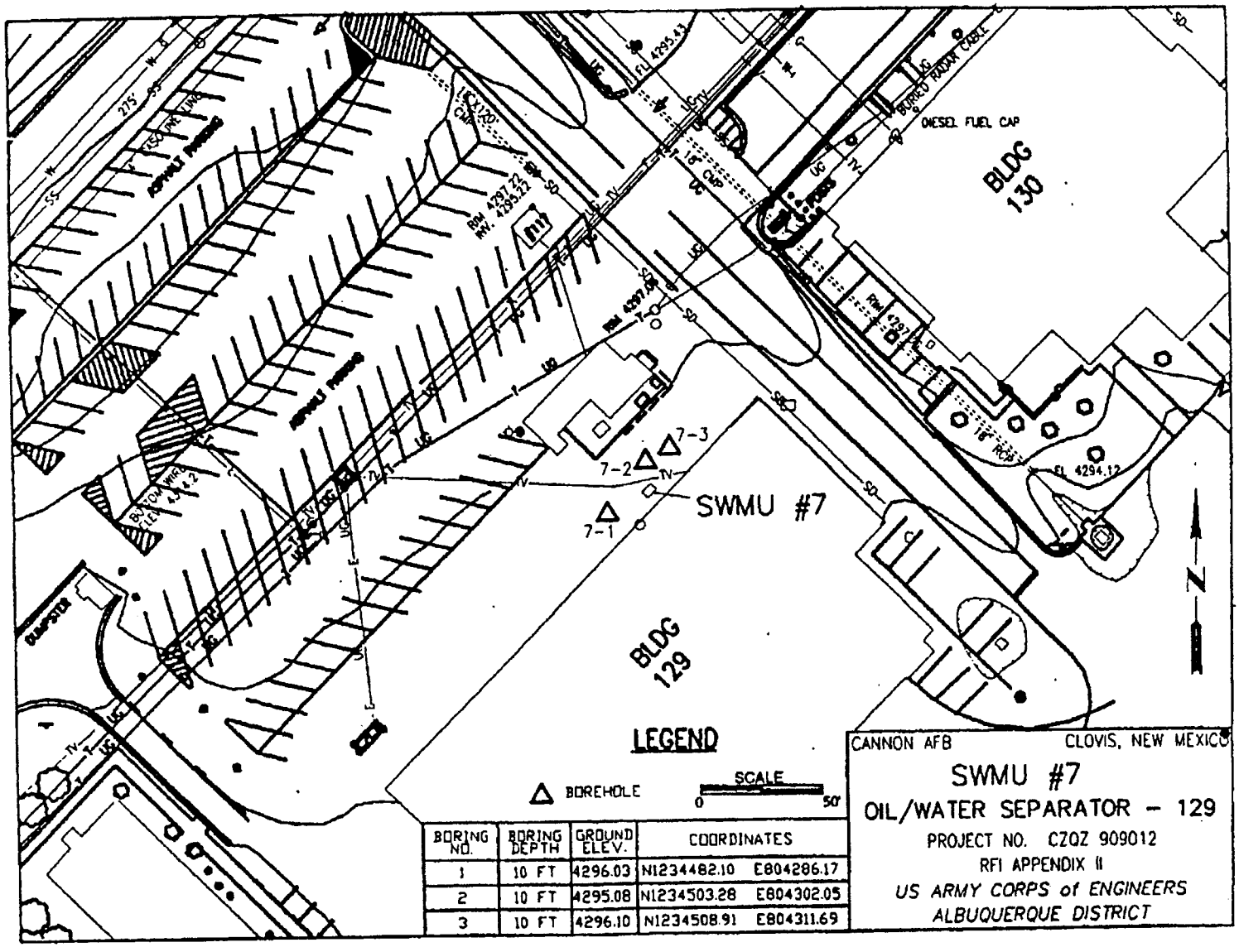
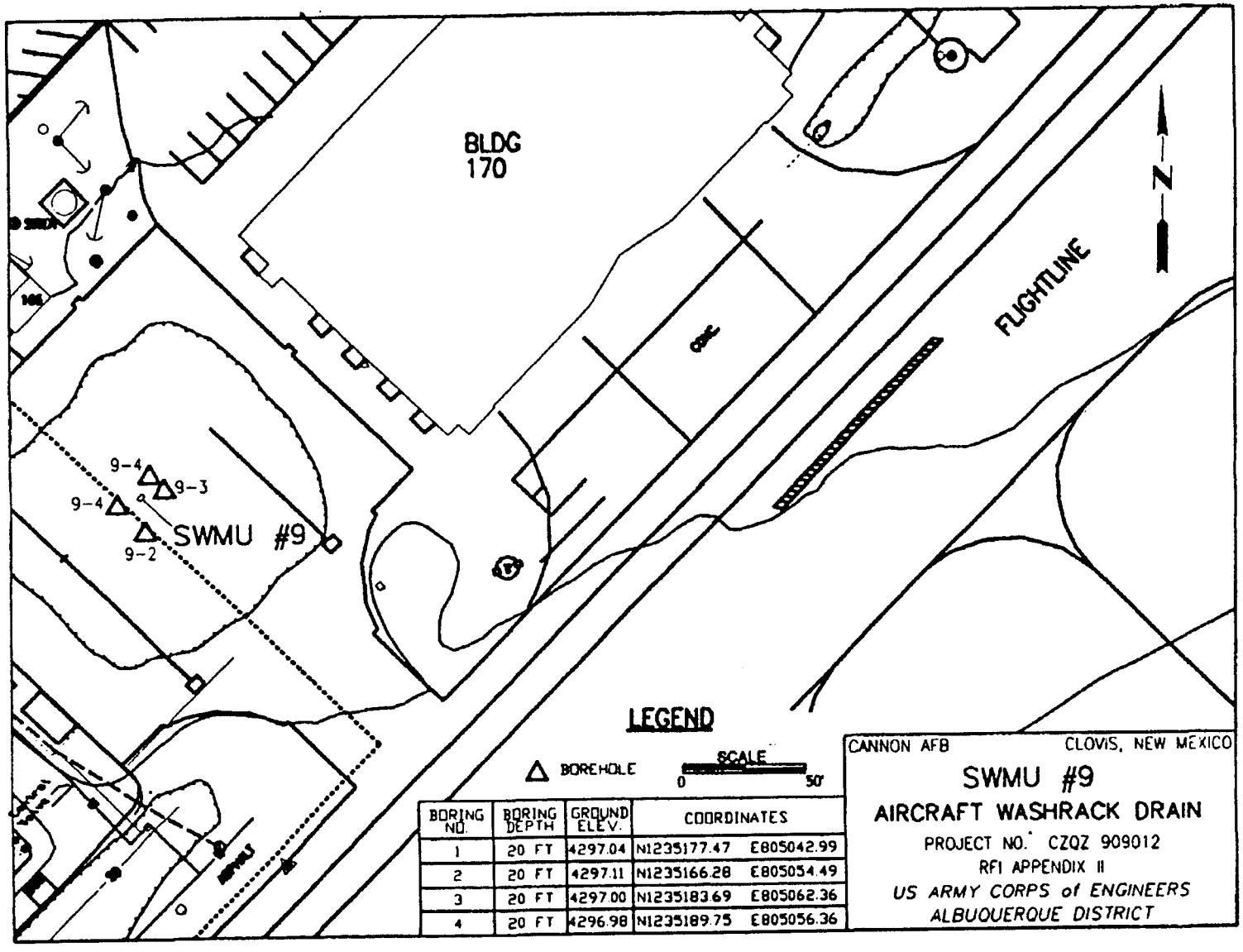


Figure 5-1
DP-33
Source: IT Corp., 1995



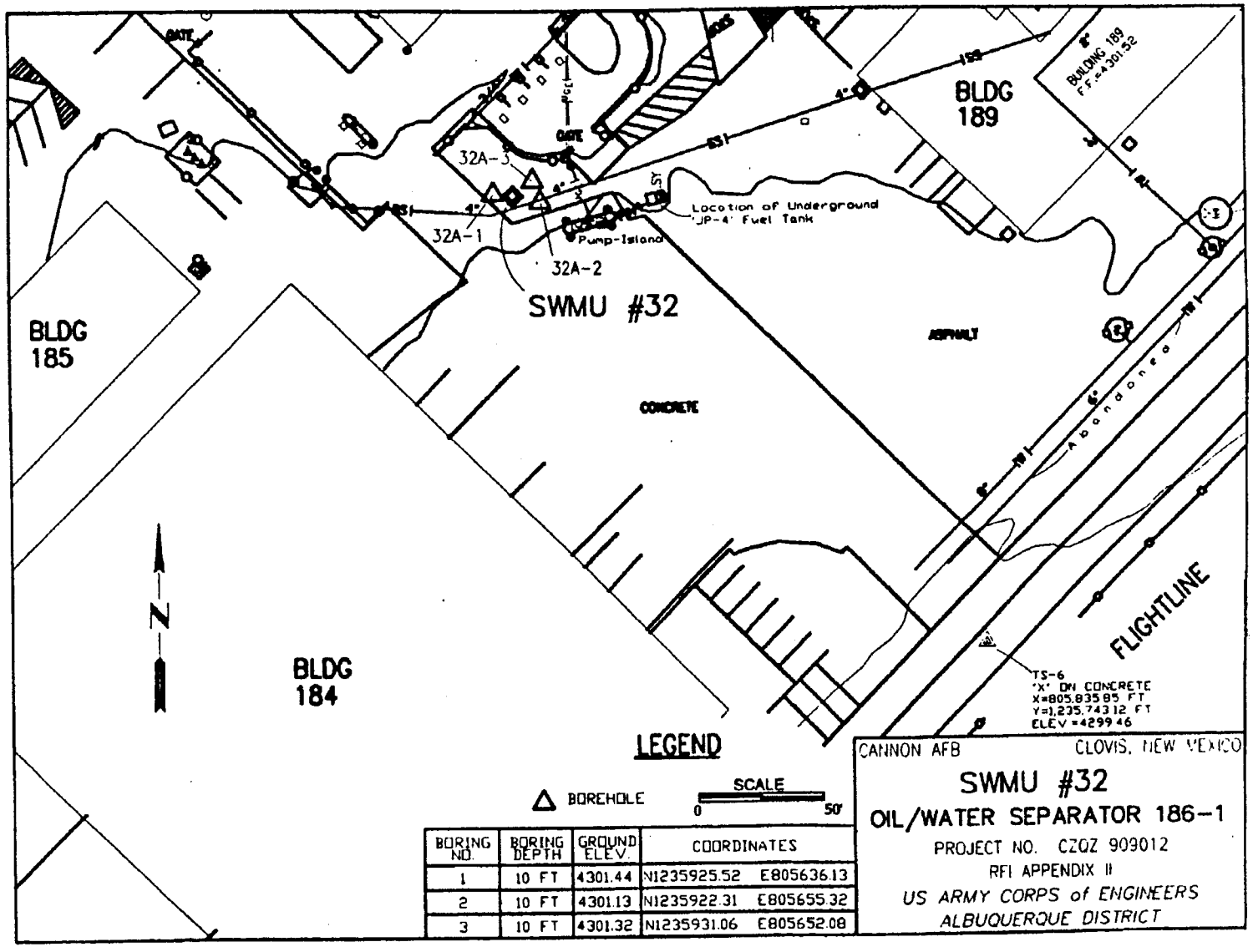
BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT	4296.03	N1234482.10	E804286.17
2	10 FT	4295.08	N1234503.28	E804302.05
3	10 FT	4296.10	N1234508.91	E804311.69

Figure 6-1
SWMU 7
Source: LRL Sciences, Inc., 1993



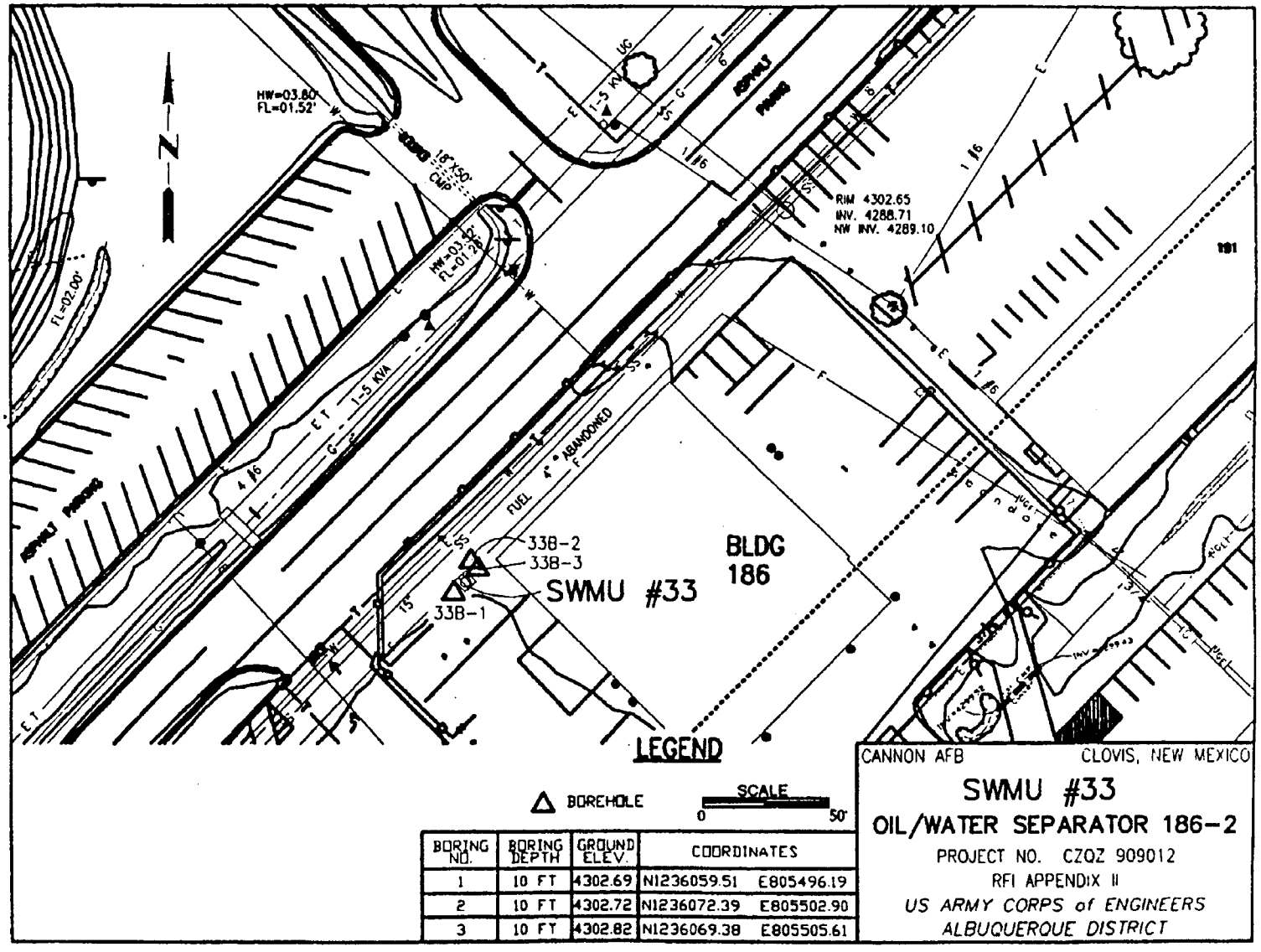
BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	20 FT	4297.04	N1235177.47	E805042.99
2	20 FT	4297.11	N1235166.28	E805054.49
3	20 FT	4297.00	N1235183.69	E805062.36
4	20 FT	4296.98	N1235189.75	E805056.36

Figure 7-1
SWMU 9
Source: LRL Sciences, Inc., 1993



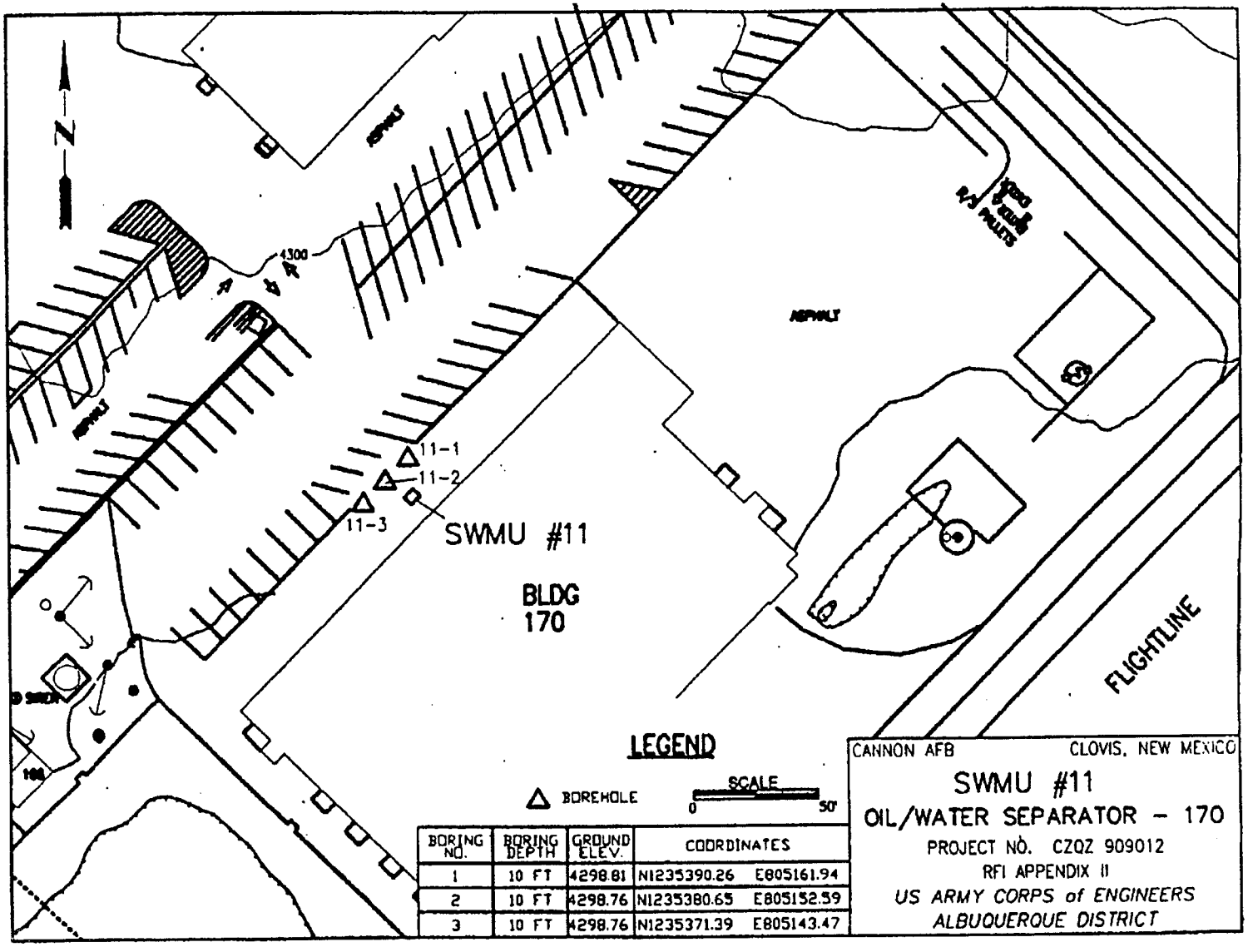
BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT	4301.44	N1235925.52	E805636.13
2	10 FT	4301.13	N1235922.31	E805655.32
3	10 FT	4301.32	N1235931.06	E805652.08

Figure 8-1
SWMU 32A
Source: LRL Sciences, Inc., 1993



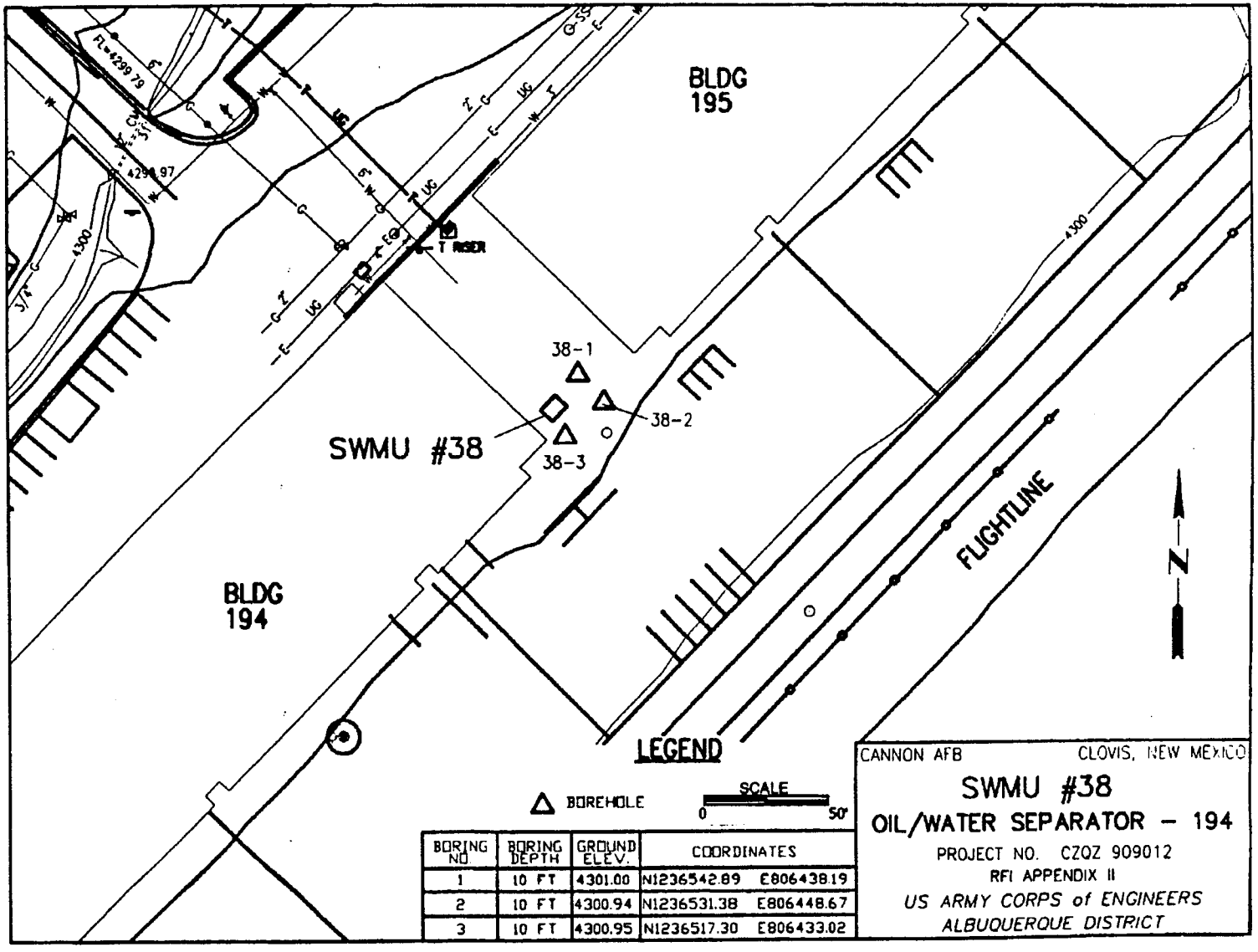
BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT	4302.69	N1236059.51	E805496.19
2	10 FT	4302.72	N1236072.39	E805502.90
3	10 FT	4302.82	N1236069.38	E805505.61

Figure 9-1
SWMU 33B
Source: LRL Sciences, Inc., 1993



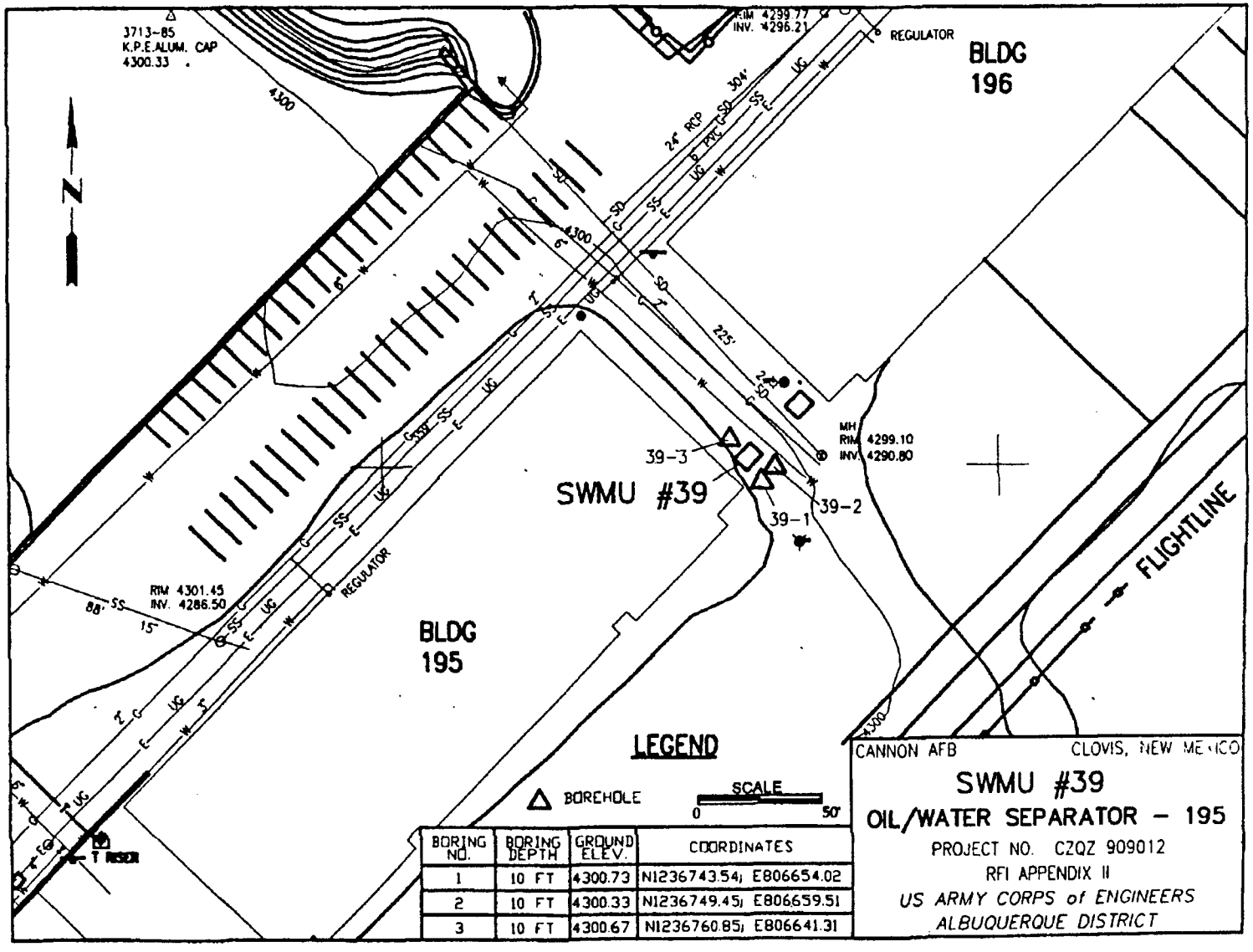
BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT	4298.81	N1235390.26	E805161.94
2	10 FT	4298.76	N1235380.65	E805152.59
3	10 FT	4298.76	N1235371.39	E805143.47

Figure 10-1
SWMU 11
Source: LRL Sciences, Inc., 1993



BORING NO	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT	4301.00	N1236542.89	E806438.19
2	10 FT	4300.94	N1236531.38	E806448.67
3	10 FT	4300.95	N1236517.30	E806433.02

Figure 11-1
SWMU 38
Source: LRL Sciences, Inc., 1993



BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES
1	10 FT	4300.73	N1236743.54, E806654.02
2	10 FT	4300.33	N1236749.45, E806659.51
3	10 FT	4300.67	N1236760.85, E806641.31

Figure 12-1
SWMU 39
Source: LRL Sciences, Inc., 1993

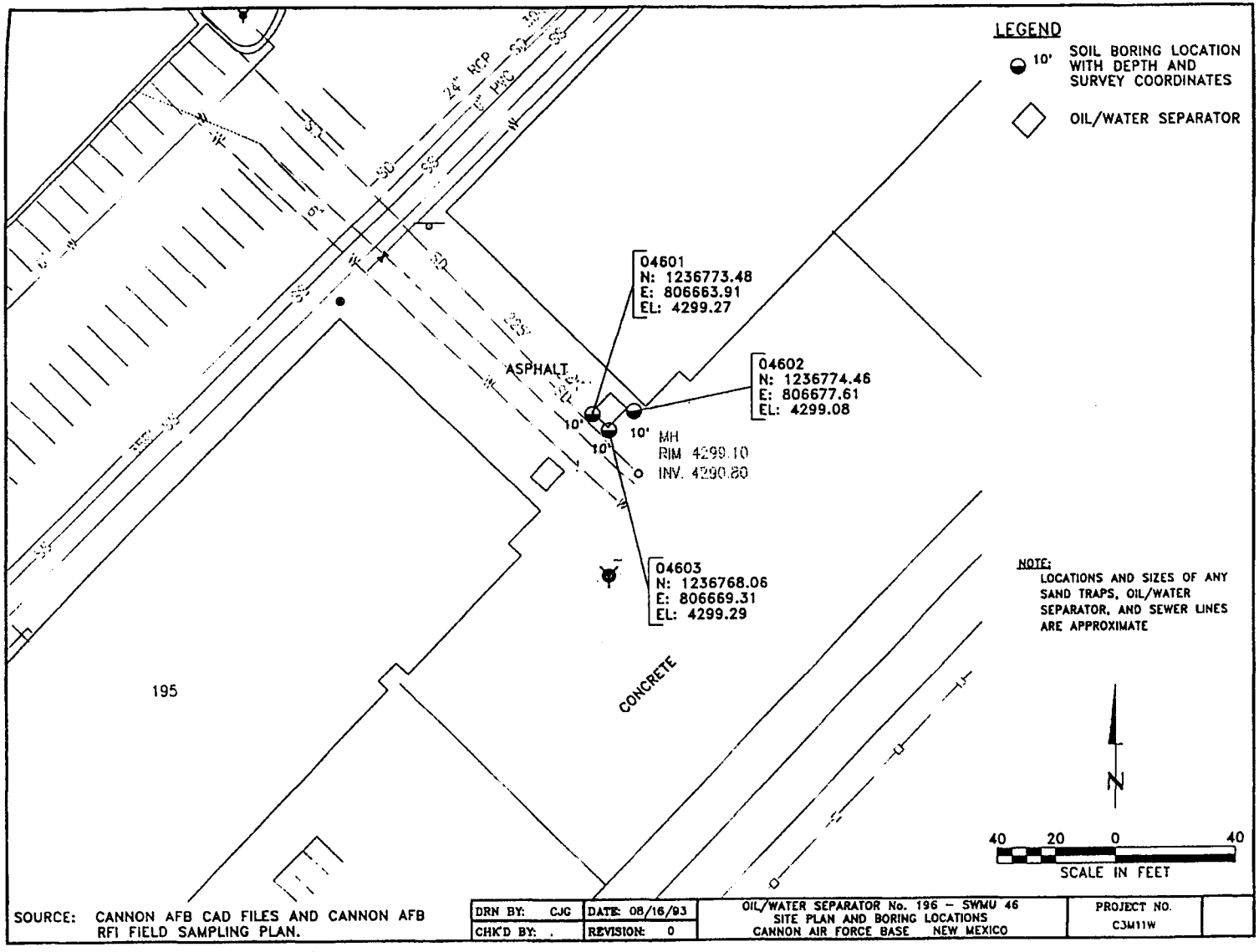


Figure 13-1
SWMU 46
Source: Woodward-Clyde, 1994

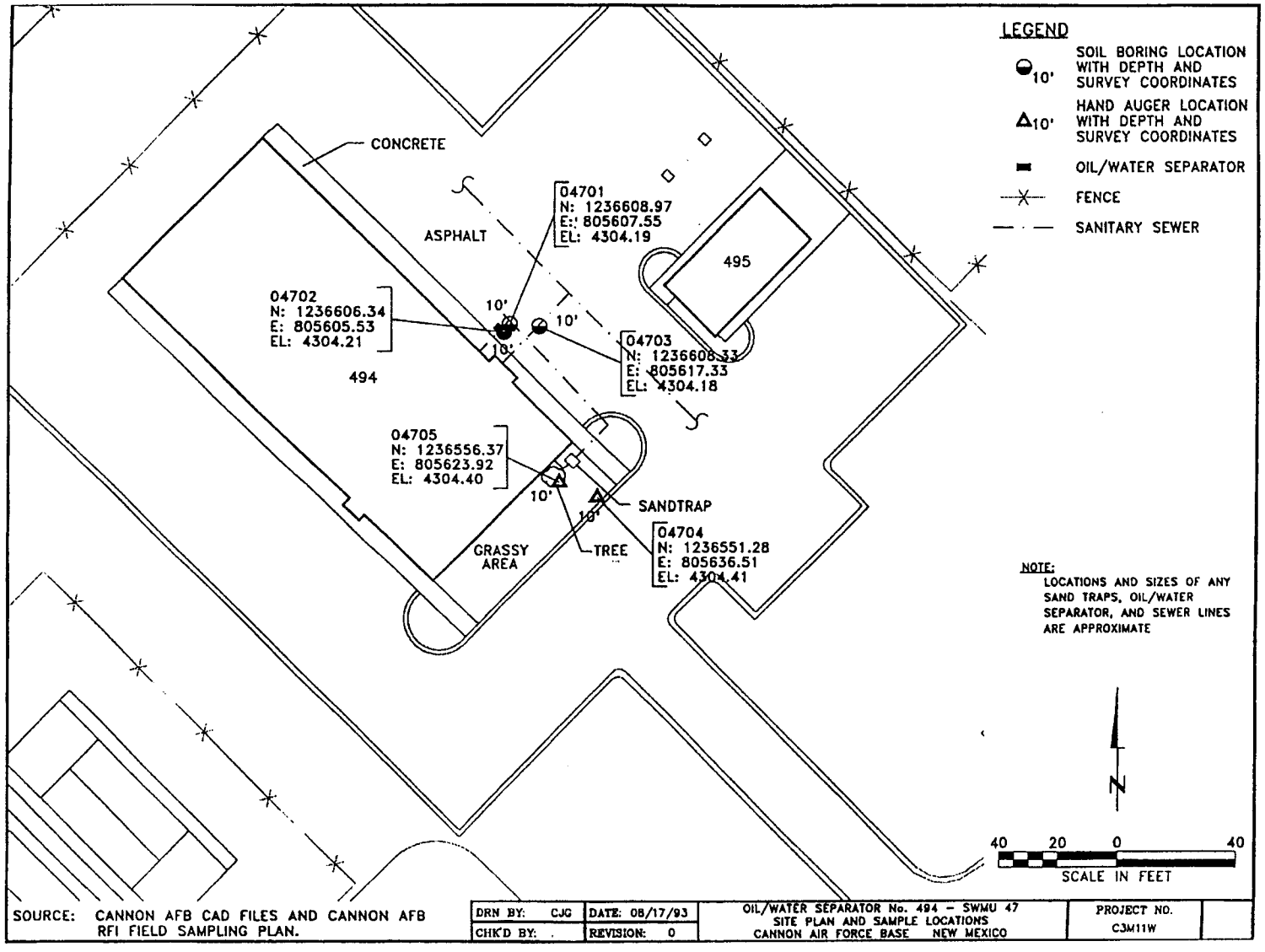


Figure 14-1
SWMU 47
Source: Woodward-Clyde, 1994

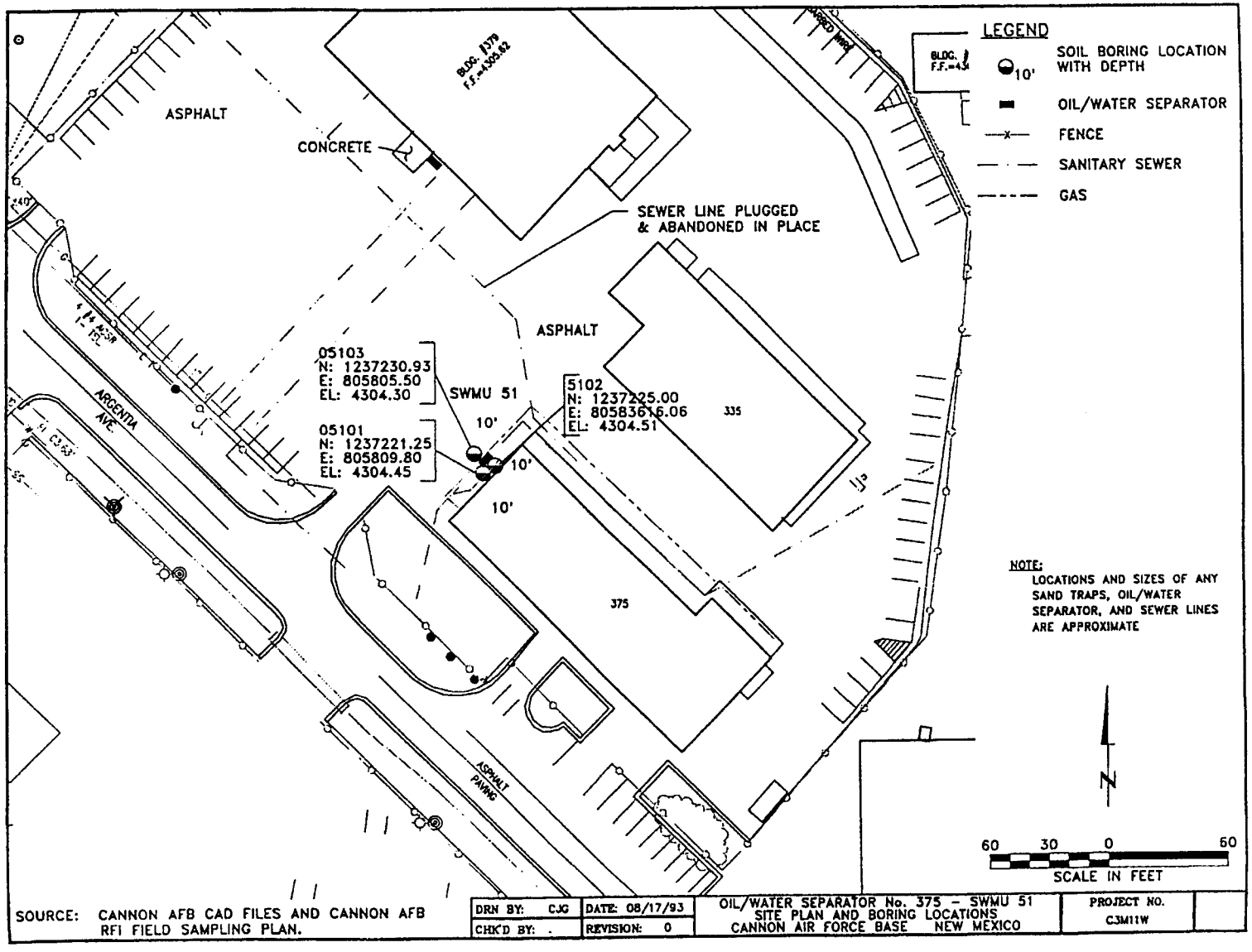


Figure 15-1
SWMU 51
Source: Woodward-Clyde, 1994

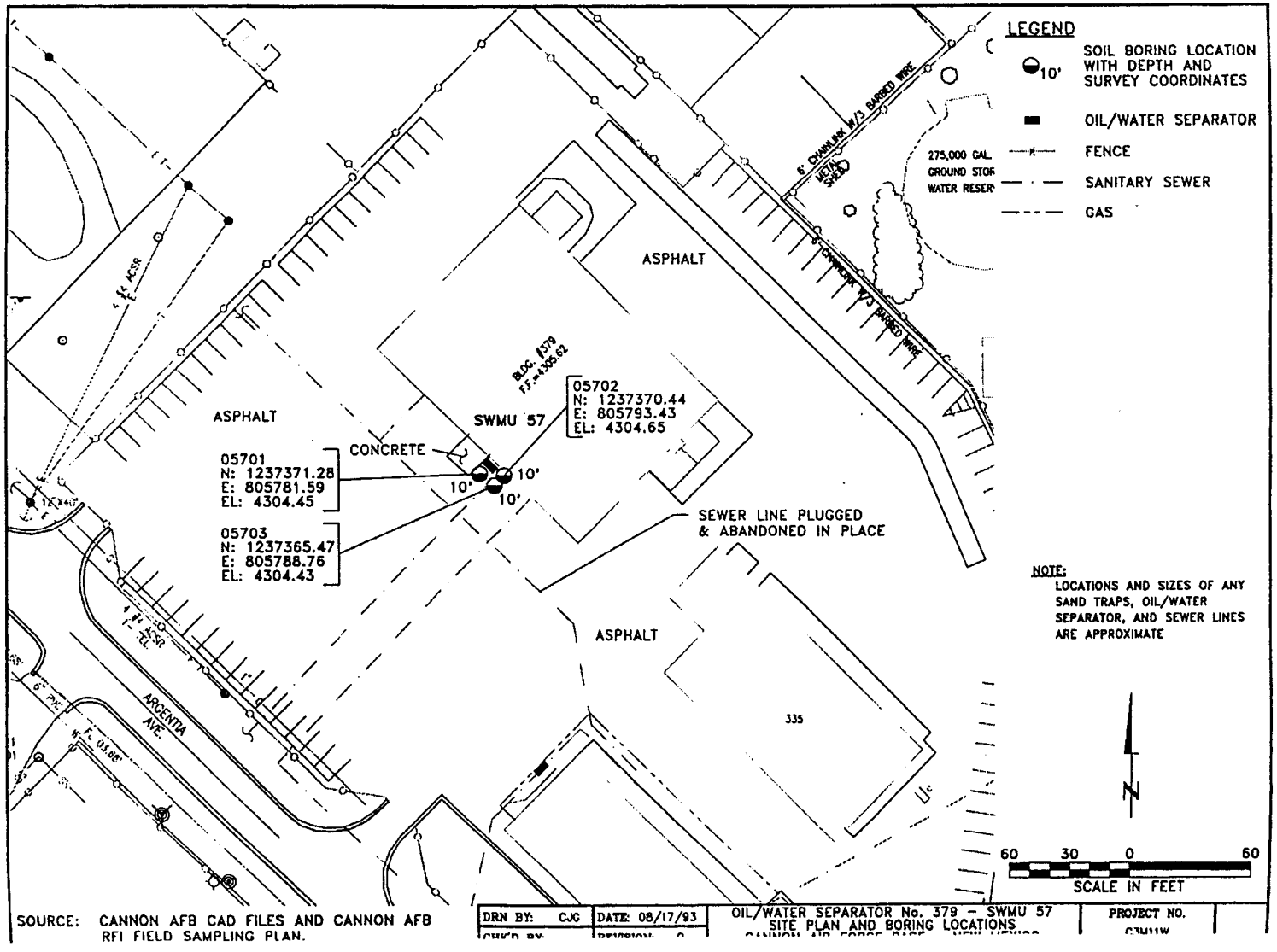


Figure 16-1
SWMU 57
Source: Woodward-Clyde, 1994

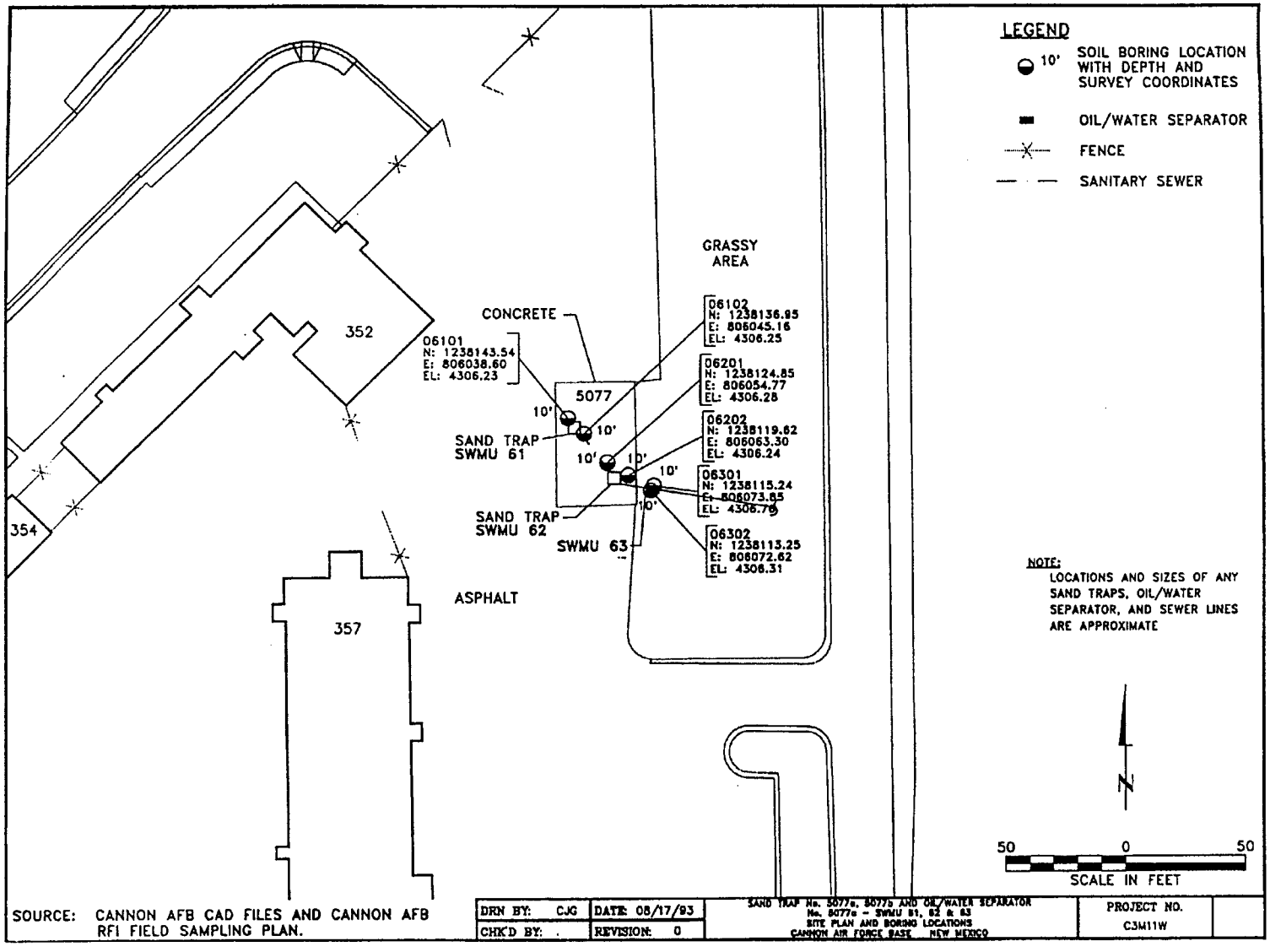


Figure 17-1

SWMUs 61, 62 and 63

Source: Woodward-Clyde, 1994

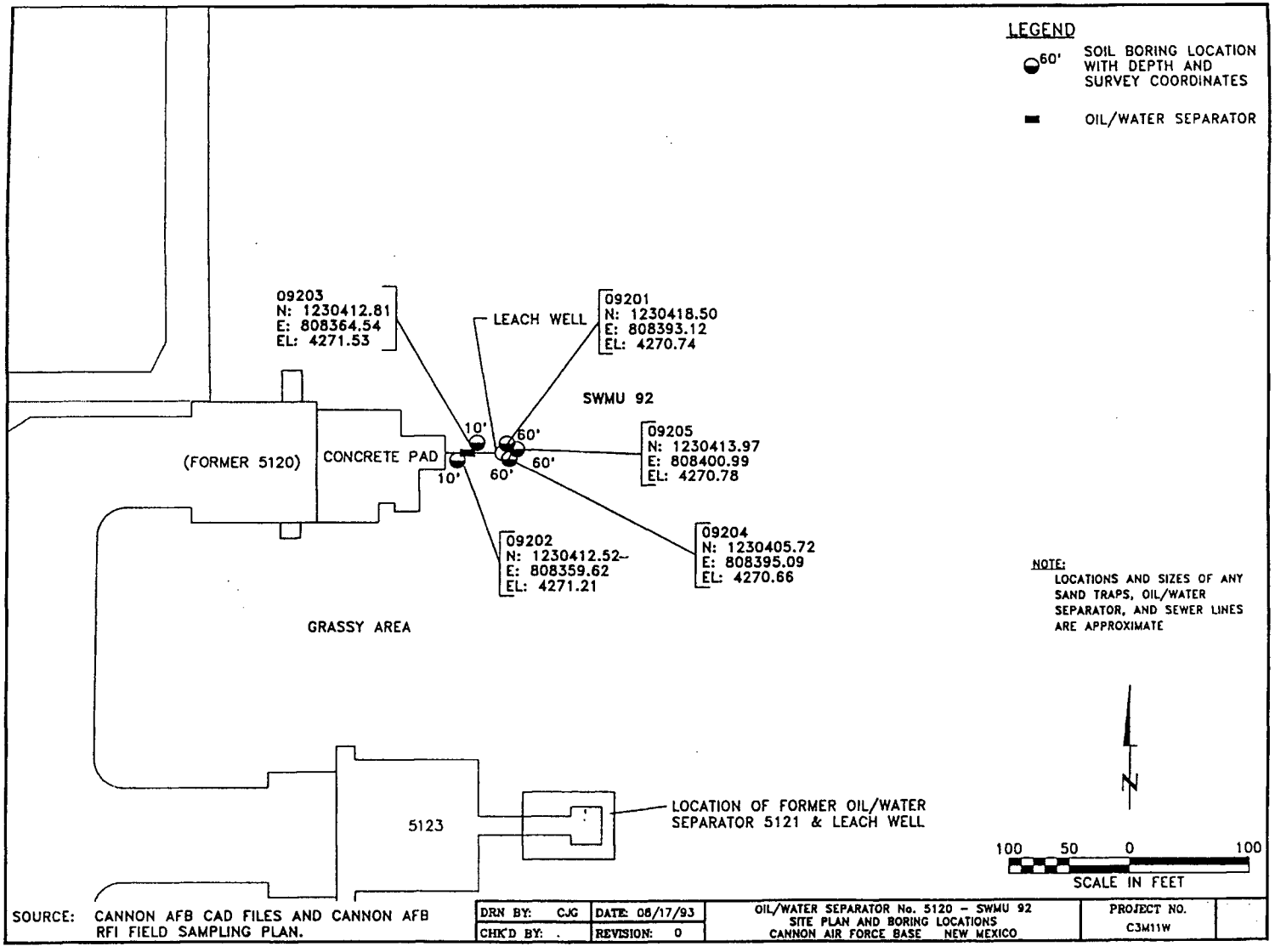


Figure 18-1
SWMU 92
Source: Woodward-Clyde, 1994

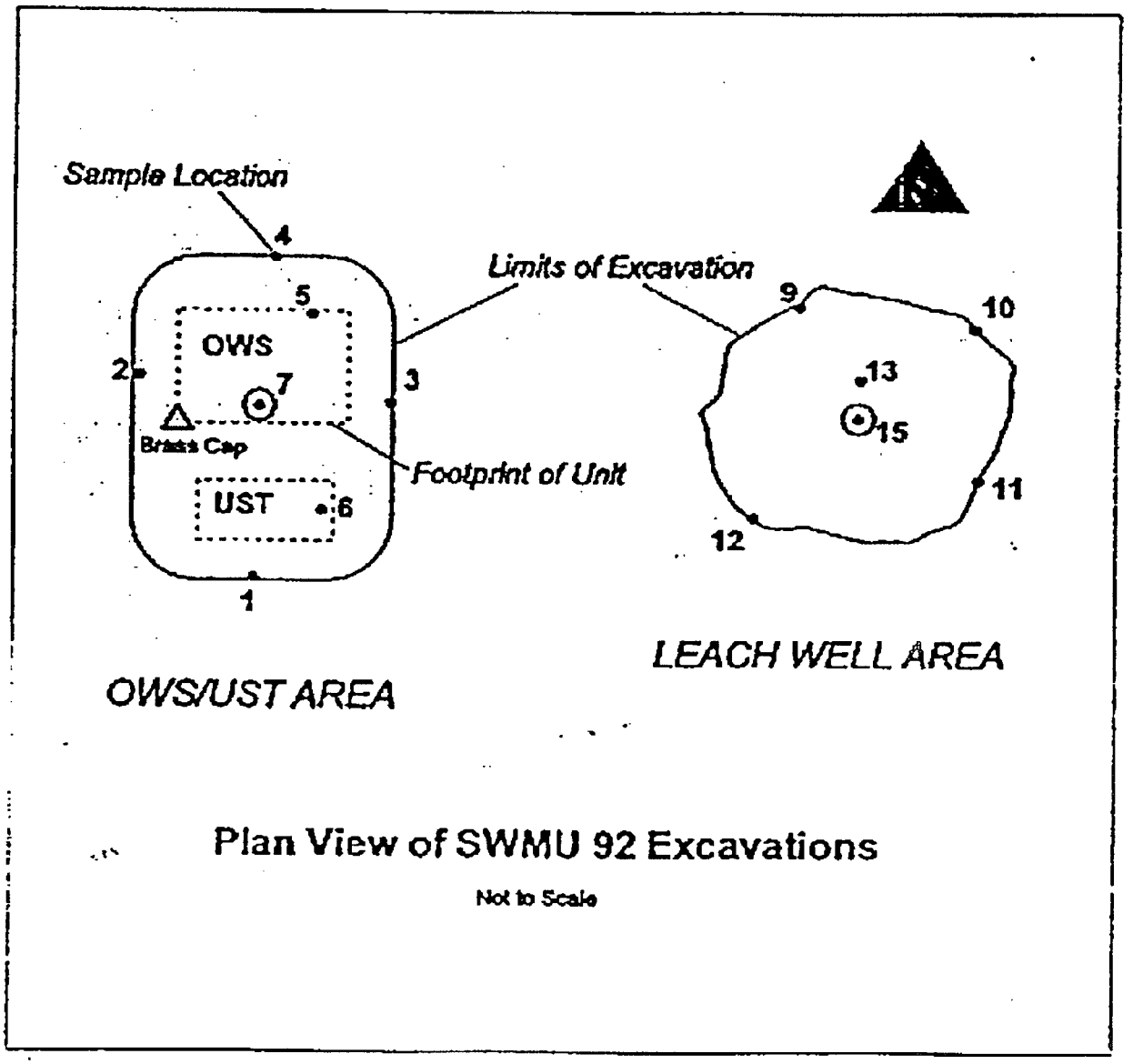


Figure 18-3

SWMU 92

Source: U.S. Army Corps of Engineers, 1999

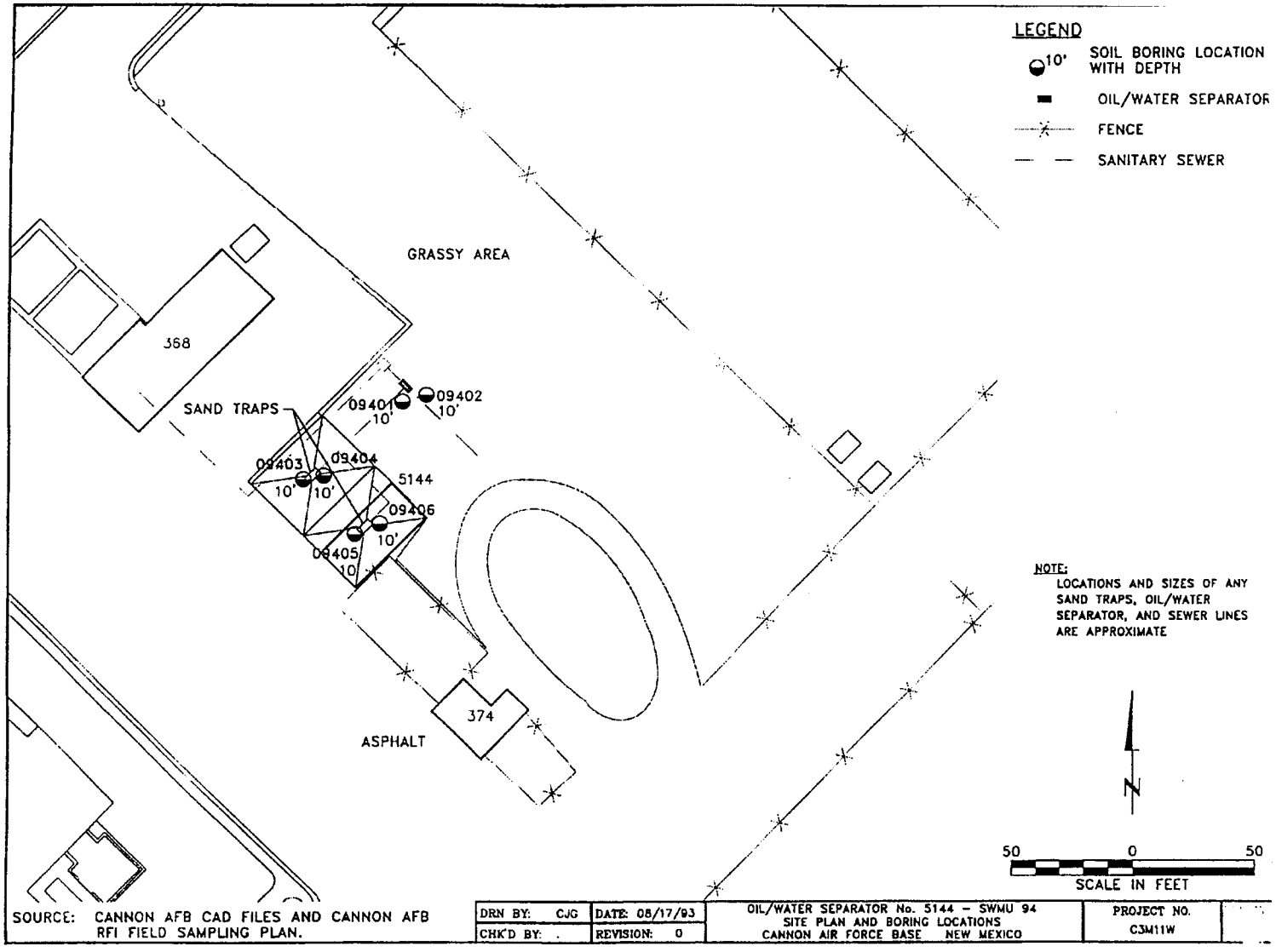


Figure 19-1
SWMU 94
Source: Woodward-Clyde, 1994

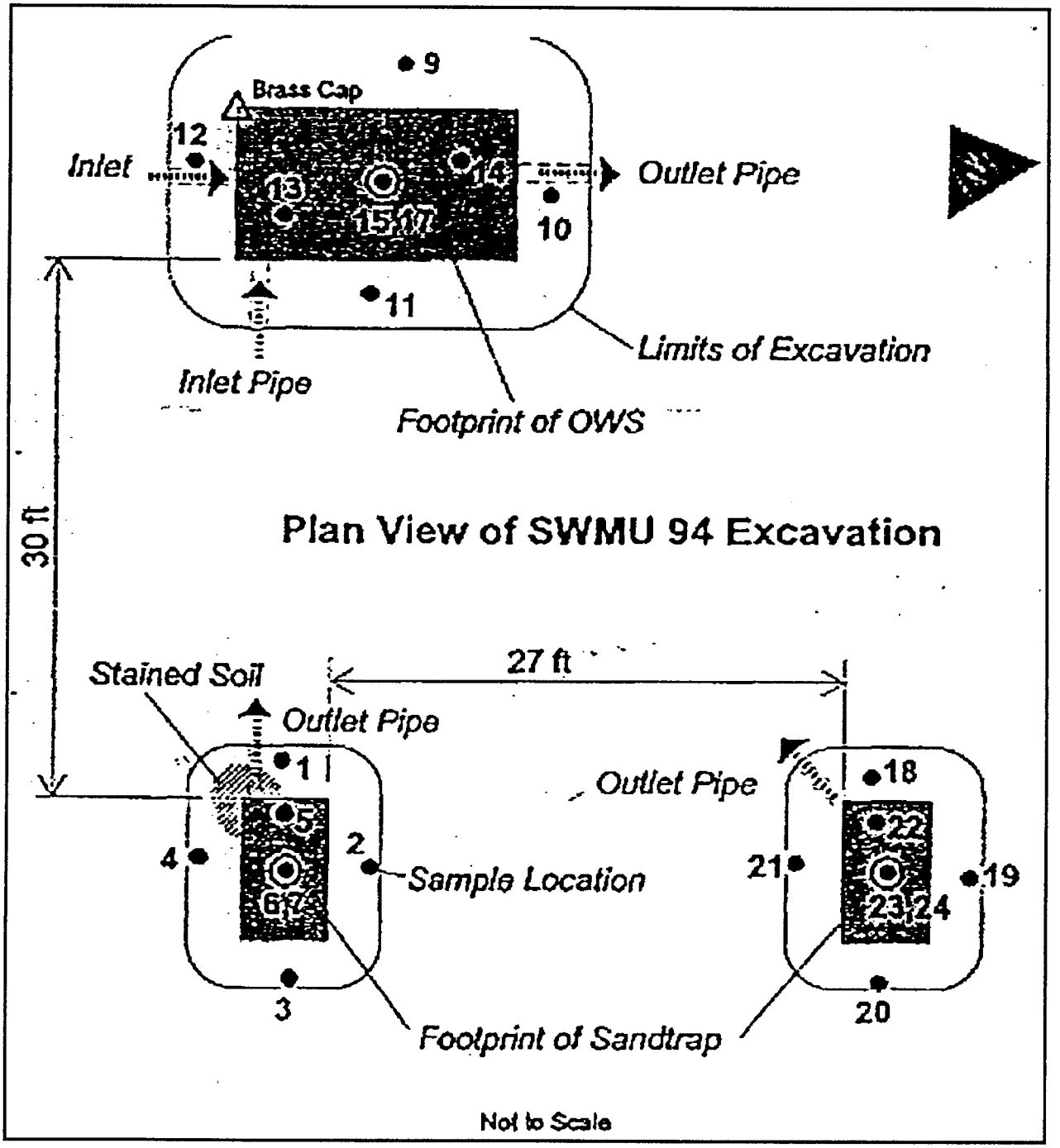
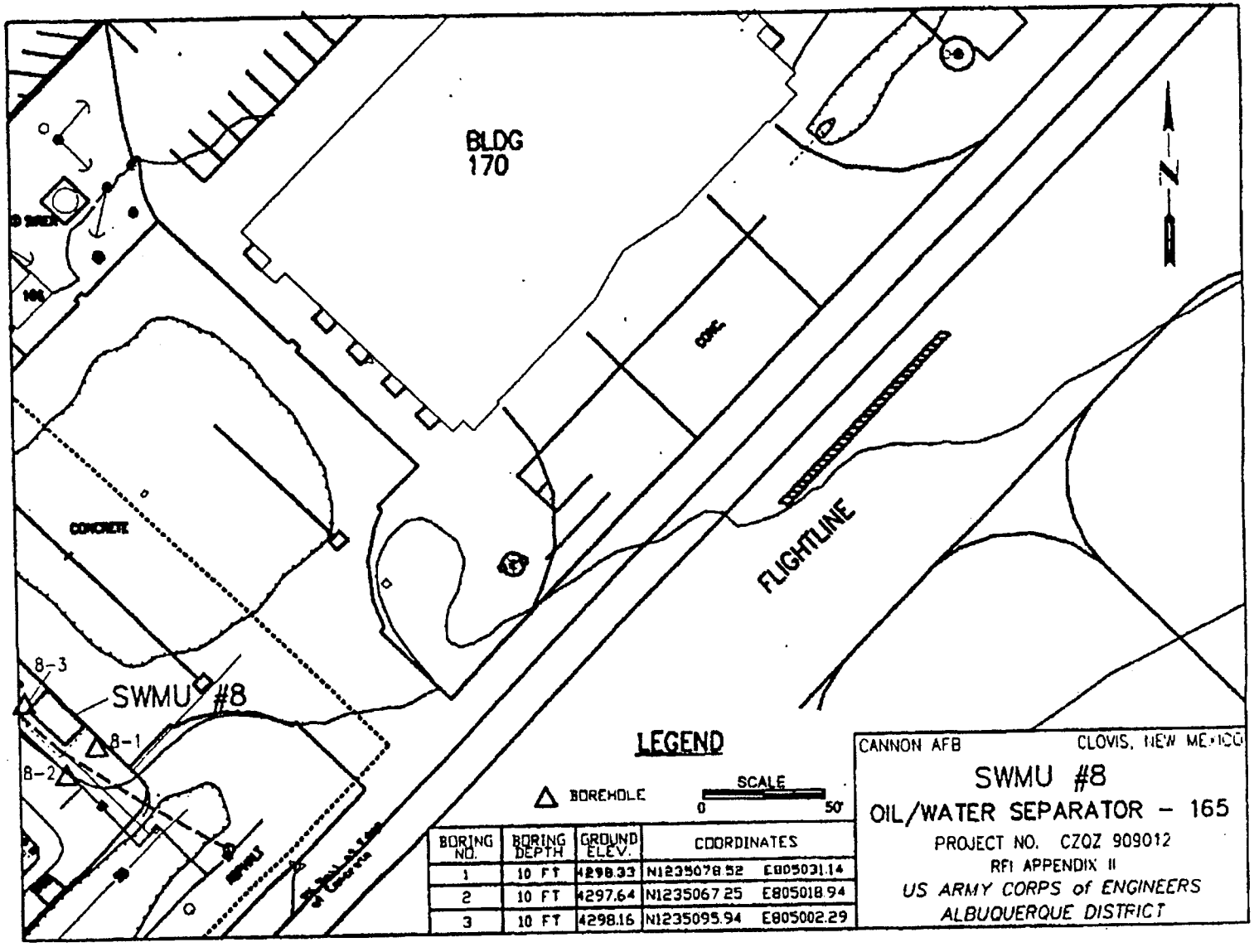


Figure 19-3

SWMU 94

Source: U.S. Army Corps of Engineers, 1999



BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT	4298.33	N1235078.52	E805031.14
2	10 FT	4297.64	N1235067.25	E805018.94
3	10 FT	4298.16	N1235095.94	E805002.29

Figure 20-1
SWMU 8
Source: LRL Sciences, Inc., 1993

Table 1-1
Summary of Background Elemental Concentrations[1] in Soil Samples[2] at Cannon AFB, New Mexico
Introduction

	Mean (x)		Standard Deviation (s)		95% Upper Tolerance Limit of Background Concentrations (UTLs)	
Element	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil
Aluminum	5,508	5,932	1,964	2,183	8,950	12,214
Antimony	ND (3)	ND (3)	ND (3)	ND (3)	3.15 (3)	16 (3)
Arsenic	2.1	2.1 (4)	0.48	0.96 (4)	3.6	4.3 (4)
Barium	100	210	165	199	670	890
Beryllium	0.35 (4)	0.35 (4)	0.13 (4)	0.17 (4)	0.78 (4)	0.73 (4)
Cadmium	ND (3)	ND (3)	ND (3)	ND (3)	0.435 (3)	1.3 (3)
Calcium	5,645	89,410	11,366	64,611	44,800	237,498
Chromium (total)	7.1	5.6	1.3	2.33	10.5	13.3
Cobalt	2.9	2.6 (4)	1.0	1.4 (4)	6.6	4.7 (4)
Copper	6.8	3.8 (4)	4.6	1.97 (4)	18.3	8.3 (4)
Iron	6,458	5,148	1,349	2,262	10,100	13,148
Lead	6.8	4.7	1.6	1.7	12	8.7
Magnesium	1,066	4,260	390	3,856	1,930	19,300
Manganese	139	83	51	50	307	333
Mercury	0.025 (4)	ND (3)	0.016 (4)	ND (3)	0.056 (4)	0.019 (3)
Nickel	5.5	5.9 (4)	1.6	2.41 (4)	11	14.9 (4)
Potassium	1,345	1,222	413	417	2,691	2,512
Selenium	ND (3)	0.47 (4)	ND (3)	0.31 (4)	0.26 (3)	1.1 (4)
Silver	--- (5)	ND (3)	--- (5)	ND (3)	0.4 (5)	2.65 (3)
Sodium	91	351 (4)	10	253 (4)	102	1,227 (4)
Thallium	ND (3)	ND (3)	ND (3)	ND (3)	0.6 (3)	2.65 (3)
Vanadium	14.9	16	2.8	5.2	23.3	32.8
Zinc	15.4	12.1	5.2	4.8	32.2	30.6

(1) All concentrations are in milligrams per kilogram (mg/kg).

(2) From report entitled "Naturally Occurring Concentrations of Inorganics and Background Concentrations of Pesticides at Cannon Air Force Base, New Mexico" (W-C 1997).

(3) Analytical data were reported as nondetect; therefore, a mean and standard deviation was not calculated. One-half the highest reporting limit is used as the 95% UTL. The actual mean, standard deviation, and UTL may be less than these values.

(4) Values determined from a data set including one-half of the reporting limits for nondetects.

(5) Silver was detected in only one sample; therefore, a mean and standard deviation was not calculated. The single detected concentration is used as the 95% UTL.

Table 1-2
Federal- and State-Protected Animals Potentially Occurring in the Vicinity of Cannon AFB (Curry County)
Introduction

Common Name	Scientific Name	Federal Status	State Status
Birds			
Mississippi kite	*Ictinia mississippiensis*		Endangered (Group 2)
Baird's sparrow	*Ammodramus baridii*		Endangered (Group 2)
Bald eagle	*Haliaeetus leucocephalus*	Endangered	Endangered (Group 2)
Peregrine falcon	*Falco perigrinus*	Endangered	Endangered (Group 1)
Mammals			
Black-footed ferret	*Mustela nigripes*	Endangered	Possibly Extinct

Endangered (Group 1): Species whose prospects of survival or recruitment within the state are in jeopardy

Endangered (Group 2): Species whose prospects of survival or recruitment within the state are likely to become jeopardized in the foreseeable future.

Possibly Extinct: Potentially no longer in existence in the state.

Source: Lee Wan and Associates 1990

Table 2-1a
Results for Metals and Other Detected Chemical Compounds
SWMU 74

Chemical	Sample Interval (ft bgs)									Estimated Background Range[1]
	4-6			8-10			12-14			
	Result[2]	Qual[3]	DL	Result[2]	Qual[3]	DL	Result[2]	Qual[3]	DL	
Aluminum	9520		21.2	5410		52.8	5080		52.8	596 - 10,796
Antimony		U	12.7		U	31.7		U	31.7	0 - 29.6
Arsenic	2.3		0.53	2.3		0.53	1.7		0.53	0 - 10.5
Barium	125	J	2.1	**796**	J	5.3	307	J	5.3	0 - 548
Beryllium	**0.67**		0.42		U	1.1		U	1.1	0 - 0.6
Cadmium		U	1.1		U	2.6		U	2.6	0 - 2.1
Calcium	121000		42.4	**274000**		106	**269000**		106	0 - 166,119
Chromium	7.7	J	2.1		UJ	5.3		UJ	5.3	0.8 - 12.0
Cobalt	**4.4**		2.1	2.8	J	5.3	2.7	J	5.3	0 - 4.0
Copper	4.6		4.2	2.1	J	10.6		U	10.6	0 - 10.1
Iron	8420		21.2	3690		52.8	3660		52.8	0 - 8,564
Lead	4.9	J	10.6	2.3		1.1	1.8		0.53	0 - 18.4
Magnesium	2710		42.4	4400		106	5060		106	0 - 9,912
Manganese	**188**		2.1	37.3		5.3	32.7		5.3	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	7.1	J	8.5	7.2	J	21.1	6.8	J	21.1	0 - 9.7
Potassium	1710		1060	1150	J	2640	1010	J	2640	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	2.1		U	5.3		U	5.3	0 - 1.8
Sodium		U	1060		U	2640		U	2640	0 - 834
Thallium		UJ	1.1		UJ	1.1		UJ	1.1	0 - 6.2
Vanadium	24.4		2.1	12.3		5.3	11.2		5.3	1.7 - 25.0
Zinc	18.8		4.2	9.8	J	10.6	8.4	J	10.6	0 - 20.7
SVOC-TIC - Hexanedioic acid, bis(2-ethylhexyl)ester				670	NJ					

(1) Background mean plus or minus two standard deviations. Table 2-6 in Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico (W-C 1994).
(2) Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)
(3) U = Not Detected J = Estimated Value UJ = Not Detected, Estimated Reporting Limit
Results that are shaded and in bold are concentrations above the estimated background range.
SVOC = semivolatile organic compound TIC = tentatively identified compound

Source: Woodward-Clyde, 1997

Table 2-1b
Summary of Organic Compounds
SWMU 74

Chemical Group	Chemical	74-07	74-08			74-09			74-10		
		18 ft	6 ft	10 ft	14 ft	10 ft	14 ft	44 ft	10 ft	16 ft	20 ft
VOC	Toluene	9.2									
SVOC	Pentachlorophenol										42 J
SVOC	Phenanthrene									42 J	
SVOC	Pyrene								43 J	73 J	
HERBICIDE	MCPP										
PEST/PCB	4,4'-DDT								3.2 J		
TPH	Total Petroleum Hydrocarbons		62.9	48.6	46.9						
VOC-TIC	Ethylenediamine										6.5 NJ
VOC-TIC	Nonanal										
VOC-TIC	Unknown							7.2 NJ			
SVOC-TIC	1,3-Propanediol, 2,2-dimethyl-										
SVOC-TIC	Hexadecanoic acid, butyl ester										
SVOC-TIC	Hexanedioic acid, bis(2-ethylhexyl)ester										
SVOC-TIC	Octadecanoic acid, butyl ester						240 NJ				220 NJ
SVOC-TIC	Saturated Hydrocarbon: C10-C20					200 NJ					

VOC = volatile organic compound
SVOC = semivolatile organic compound
TIC = tentatively identified compound
MCPP = 2-(2-Methy-4-Chlorophenoxy) propionic acid
All results are reported in µg/kg, except for total petroleum hydrocarbons, which are reported in mg/kg.

Page 1 of 2
Source: Woodward-Clyde, 1997

Table 2-1b
Summary of Organic Compounds
SWMU 74

Chemical Group	Chemical	74-13	74-14			74-15	74-18			74-23
		12 ft	6 ft	10 ft	14 ft	8 ft	5 ft	9 ft	15 ft	8 ft
VOC	Toluene				1.3J	1.9J				
SVOC	Pentachlorophenol									
SVOC	Phenanthrene									
SVOC	Pyrene									
HERBICIDE	MCPP						12000			
PEST/PCB	4,4'-DDT									
TPH	Total Petroleum Hydrocarbons								42.2	
VOC-TIC	Ethylenediamine									
VOC-TIC	Nonanal			6.8 NJ	7.3 NJ					
VOC-TIC	Unknown									
SVOC-TIC	1,3-Propanediol, 2,2-dimethyl-							200 NJ		
SVOC-TIC	Hexadecanoic acid, butyl ester	500 NJ	230 NJ	170 NJ	280 NJ		370 NJ		320 NJ	
SVOC-TIC	Hexanedioic acid, bis(2-ethylhexyl)ester									670 NJ
SVOC-TIC	Octadecanoic acid, butyl ester	330 NJ			150 NJ	200 NJ	200 NJ		190 NJ	
SVOC-TIC	Saturated Hydrocarbon: C10-C20									

VOC = volatile organic compound
SVOC = semivolatile organic compound
TIC = tentatively identified compound
MCPP = 2-(2-Methy-4-Chlorophenoxy) propionic acid
All results are reported in µg/kg, except for total petroleum hydrocarbons, which are reported in mg/kg.

Page 2 of 2

Source: Woodward-Clyde, 1997

Table 3-1a
Organic Analytical Results
AOC D

ANALYTES	SB08-12	SB08-13	SB08-22
VOLATILE ORGANICS (mg/kg) (Method 8260)	ND	ND	ND
SEMIVOLATILE ORGANICS (mg/kg) (Method 8270)	ND	ND	ND
TRPH (mg/kg) (Method 9071	ND	ND	ND

Page 1 of 1
Source: IMS, P.C., 1997

Table 3-1b
Analytical Data Summary of Detected Metals
AOC D

ANALYTES	CAN-D-SB08-07			CAN-D-SB08-15			CAN-D-SB08-25		
	Results	RL	Qual	Results	RL	Qual	Results	RL	Qual
METALS (mg/kg)									
Aluminum	2960	20	J	1920	20	J	7710	20	J
Antimony	<	10	UJ	<	10	UJ	<	10	UJ
Arsenic	0.509	0.5	J	1.42	0.5	J	0.679	0.5	J
Barium	43.5	2	J	206	2	J	81.3	2	J
Calcium	84200	50		277000	500		7610	50	
Chromium	3.92	2		<	2		5.97	2	
Cobalt	2.63	2		4.48	2		3.17	2	
Copper	3.14	1		2.52	1		5.86	1	
Iron	2120	10		1590	10		7060	10	
Lead	2.6	1	J	1.2	0.2	J	7.6	1	J
Magnesium	2830	10	J	5830	10	J	2010	10	J
Manganese	70	1		78.5	1		45	1	
Nickel	5.1	2		3.53	2		8.59	2	
Potassium	1010	100	J	404	100	J	2460	100	J
Sodium	127	100		147	100		152	100	
Vanadium	4.96	2		10.8	2		11.5	2	
Zinc	5.51	3		4.05	3		28.4	3	

RL Reporting Limit
< Less than the Reporting Limit
J Estimated
UJ Analyte below RL. The RL is approximate.

Page 1 of 1

Source: IMS, P.C., 1997

Table 3-1c
Asbestos Analytical Results
AOC D

Description	Color	Asbestos %	Asbestos Type	Non-Asbestos %	Non-Asbestos Type
CAN-D-SB08-AB	Brown	20.0	Chrysotile	60.0 20.0	Gypsum Other Non-fibrous
CAN-D-AB01	Brown	5.0	Chrysotile	55.0 20.0 20.0	Gypsum Quartz Other Non-fibrous

Page 1 of 1
Source: IMS, P.C., 1997

Table 3-1d
Detected Metal Concentrations Compared to USEPA Region 6 Screening Levels
AOC D

Analyte	SB08-7 mg/kg	SB08-15 mg/kg	SB08-24 mg/kg	USEPA Region 6 Soil Screening Levels Residential mg/kg	Industrial mg/kg
Aluminum	2,960 J	1,920 J	7,710 J	77,000 N	SAT
Arsenic	0.509 J	1.42 J	0.679 J	22 N 0.32 C	610 N I 2.0 C
Barium	43.5 J	206 J	81.3 J	5,300 N	SAT
Calcium	84,200	277,000	7,610	-	-
Cobalt	2.63	4.48	3.17	4,700 N I	SAT
Chromium	3.92	< 2.0	5.97	210 N	1,600 N
Copper	3.14	2.52	5.86	2,800 N	63,000 N
Iron	2,120	1,590	7,060	23,000 N I	SAT
Lead	2.6 J	1.2 J	7.6 J	400 N	2,000 N
Magnesium	2,830 J	5,830 J	2,010 J	-	-
Manganese	70	78.5	45	380 N	8,300 N
Nickel	5.10	3.53	8.59	1,500 N	34,000 N
Potassium	1,010 J	404 J	2,460 J	-	-
Sodium	127	147	152	-	-
Vanadium	4.96	10.8	11.5	540 N	12,000 N
Zinc	5.51	4.05	28.4	23,000 N	SAT

C Carcinogenic effects
I Ingestion route only
J Estimated
N Non-carcinogenic effects
SAT Risk based value above expected saturation point
1 . USEPA Region 6, Human Health Media-Specific Screening Levels, October 30, 1996.

Page 1 of 1

Source: IMS, P.C., 1997

Table 4-1
Results of Water Samples
SWMU 113

Parameter	Well A*	Well B	Well C	Well D
Ag	ND	ND	ND	ND
As	0.0060	ND	0.0004	0.0005
Ba	0.074	0.320	0.079	0.150
Ca	37.0	55.0	44.0	45.0
Cd	ND	0.003	0.002	ND
Cl	53.0	50.0	50.0	51.0
Cr	0.001	0.002	ND	0.004
Cu	ND	ND	ND	0.002
Fe	0.020	0.34	0.020	0.047
F	2.6	2.7	2.6	2.4
Hg	0.0004	0.0006	0.0004	0.0006
K	3.7	4.7	3.7	4.1
Mg	37.0	38.0	40.0	36.0
Mn	0.021	0.760	0.330	0.520
Na	60.0	62.0	57.0	53.0
Ni	0.032	0.035	0.035	0.030
NO_3	0.81	0.81	0.82	0.88
Pb	ND	ND	ND	ND
Phenol	ND	0.041	ND	ND
Se	ND	ND	ND	ND
SO_4	120.0	130.0	120.0	110.0
TDS	490.0	440.0	450.0	430.0
TOC	ND	2.0	1.0	ND
TOX	ND	ND	ND	ND
TPO_4	0.06	0.05	0.04	0.05
Zn	0.015	0.010	0.010	ND
601**	2.1	ND	ND	ND
602***	ND	ND	ND	ND
Cond.	740/750/750/750*	810	740	720
pH	7.6/7.5/7.4/7.4*	7.6	7.2	8.2

(all units mg/L (equivalent to ug/ml default values in Appendix A) except pH, which is expressed in pH units, and conductivity (Cond.), which is in umhos, and 601/602 results which are reported in ug/L)

*Quadruplicate analyses for up-gradient well only
**601 = purgeable halocarbons (Trichlorofluoromethane)
***602 = purgeable aromatics
ND = not detected, detection limits and analytical techniques are listed in Appendix A.

Page 1 of 1

Source: Radian, 1986

Table 4-2
Dissolved Metal Concentrations[1] in Groundwater Samples
SWMU 113

Element	Upgradient	Downgradient				MCL[2]
	Well 113A	Well 113B	Well 113C	Well 113D	Well 113I	
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.01/0.005[3]
Arsenic	0.005 U	0.005 U	0.005 U	0.0039 J	0.0033 J	0.051
Barium	0.029 J	0.026 J	0.022 J	0.029 J	0.03 J	1.0
Beryllium	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.01[3]
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005[3]
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01
Cobalt	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	*
Copper	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	1.0[4]
Lead	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.05
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.002
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	1.0[3]
Selenium	0.0049 J	0.01 UJ	0.01 UJ	0.0047 UJ	0.0047 UJ	0.05
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1.0[4]
Thallium	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.022/0.001[3]
Tin	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	*
Vanadium	0.031	0.017	0.026	0.036	0.027	*
Zinc	0.0049 J	0.02 U	0.02 U	0.02 U	0.0059 U	5.0

MCL = Maximum contaminant level
UJ = Estimated as non-detect at the CRQL
J = Estimated value
U = Not detected

[1] All concentrations are in milligrams per liter (mg/L)
[2] Primary MCL in effect as of July 30, 1992
[3] Proposed primary MCL
[4] Secondary MCL in effect as of July 30, 1992
* No primary or secondary MCL or proposed MCL as of March 1992

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-01

Chemical	Sample Interval (ft bgs)																		Background Range[1]
	0-.5			28-30			34-36			45-47			55-56.9			63-64.8			
	Results	ual	R.L.	Results	Qual	R.L.	Results	Qual	R.L.	Results	Qual	R.L.	Results	Qual.	R.L.	Results	Qual.	R.L.	
Aluminum	4430		10.9	2240		21.8	3070		22.1	3220		10.8	2930		10.5	3200		10.8	596 - 10,796
Antimony		R			R			R			R			R			R		0 - 29.6
Arsenic	1.6		0.54	0.99		0.55	1.4		0.55	0.82		0.54	0.44	J	0.53	0.65		0.54	0 - 10.5
Barium	236	J	1.1	74	J	2.2	98.7	J	2.2	**5050**	J	1.1	83.2	J	1.1	119	J	1.1	0 - 548
Beryllium	0.34		0.22		U	0.44		U	0.44	0.15	J	0.22	0.12	J	0.21	0.13	J	0.22	0 - 0.6
Cadmium		U	0.54		UJ	1.1		UJ	1.1		U	0.54		U	0.53		U	0.54	0 - 2.1
Calcium	88300		21.7	**167000**		43.6	150000		44.2	71300		21.5	30900		21.1	75000		21.6	0 - 166,119
Chromium	3.3		1.1	2.6		2.2	1.8	J	2.2	2.2		1.1	3.7		1.1	5		1.1	0.8 - 12.0
Cobalt	2.1		1.1		U	2.2		U	2.2	2.7	J	1.1		UJ	1.1	1.3	J	1.1	0 - 4.0
Copper	3.8		2.2	2.2	J	4.4	2.4	J	4.4	1.1	J	2.2	1.5	J	2.1	**63.6**		2.2	0 - 10.1
Iron	3780		10.9	1410		21.8	1830		22.1	1780		10.8	1840		10.5	2150		10.8	0 - 8,564
Lead	6.1		1.1	2		0.55	2.2		0.55	1.6		0.54	1.3		0.53	1.8		0.54	0 - 18.4
Magnesium	2320		21.7	2300		43.6	4150		44.2	4890		21.5	4550		21.1	6280		21.6	0 - 9,912
Manganese	89.6	J	1.1	21.5	J	2.2	29.3	J	2.2	81.3	J	1.1	27.7	J	1.1	37.7	J	1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	5.2		4.3	2.9	J	8.7	4.9	J	8.8	3.3	J	4.3	3.5	J	4.2	3.7	J	4.3	0 - 9.7
Potassium	1160		543	652	J	1090	686	J	1110	779		538	644		526	580		541	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	1.1		U	2.2		U	2.2		U	1.1		U	1.1	0.41	J	1.1	0 - 1.8
Sodium		U	543		U	1090		U	1110		U	538		U	526		U	541	0 - 834
Thallium	0.14	J	1.1	0.15	J	1.1	0.15	J	1.1	0.23	J	1.1		U	0.53	0.15	J	1.1	0 - 6.2
Tin	NA			NA			NA			NA			NA			10.7	J	10.8	NA
Vanadium	13.4		1.1	7.9		2.2	18.3		2.2	5.7		1.1	5.7		1.1	10.1		1.1	1.7 - 25.0
Zinc	11.2		2.2	6.6		4.4	7.4		4.4	6		2.2	6		2.1	10.1		2.2	0 - 20.7
Acenaphthene		U	360		U	360		U	370		U	350		U	350	39	J	360	
bis(2-		U	360		U	360		U	370		U	350		U	350	57	J	360	
Butyl benzyl phthalate		U	360		U	360	38	J	370		U	350		U	350		U	360	
Fluoranthene		U	360		U	360		U	370		U	350		U	350	67	J	360	
Fluorene		U	360		U	360		U	370		U	350		U	350	41	J	360	
Phenanthrene		U	360		U	360		U	370		U	350		U	350	130	J	360	
Phenol		U	360	360		360		U	370		U	350		U	350		U	360	
Pyrene		U	360		U	360		U	370		U	350		U	350	88	J	360	
Acetone		U	11	5.9	J	11		U	11		U	11		U	11	14		11	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 1 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-02

Chemical	Sample Interval (ft bgs)															Background Range
	14-16			20-22			30-31.5			40-41.8			49-51			
	Results	Qual.	R.L.	Results	Qual.	R.L.	Results	Qual.	R.L.	Results	Qual.	R.L.	Results	Qual.	R.L.	
Aluminum	4630		22.9	11100		11.2	5560		22.2	4480		10.8	2480		10.5	596 - 10,796
Antimony		R			R			R			R			R		0 - 29.6
Arsenic	1.4		0.57	1.1		0.56	1		0.55	0.88		0.54	0.48	J	1	0 - 10.5
Barium	180	J	2.3	106	J	1.1	88.2	J	2.2	68.9	J	1.1	22.4	J	1	0 - 548
Beryllium	0.33	J	0.46	0.41		0.22		U	0.44	0.18	J	0.22		U	0.21	0 - 0.6
Cadmium		UJ	1.1		U	0.56		UJ	1.1		U	0.54		U	0.52	0 - 2.1
Calcium	172000		45.8	65200		22.3	121000		44.3	50600		21.6	22100		21	0 - 166,119
Chromium	2.8		2.3	7.2		1.1	3.9		2.2	4.9		1.1	1.5		1	0.8 - 12.0
Cobalt		U	2.3	2.3	J	1.1		U	2.2	1.3	J	1.1		UJ	1	0 - 4.0
Copper	3.3	J	4.6	3.7		2.2	2.1	J	4.4	1.8	J	2.2	0.98	J	2.1	0 - 10.1
Iron	3530		22.9	7060		11.2	3430		22.2	2950		10.8	1600		10.5	0 - 8,564
Lead	4.3		0.57	3.5		0.56	1.9		0.55	1.9		0.54	1.5		0.52	0 - 18.4
Magnesium	4970		45.8	4150		22.3	4480		44.3	3980		21.6	2950		21	0 - 9,912
Manganese	46.3	J	2.3	53.8	J	1.1	35.8	J	2.2	34.8	J	1.1	28.8	J	1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.1	0 - 0.2
Nickel	6	J	9.2	8.5		4.5	6.4	J	8.9	4.8		4.3	2.3	J	4.2	0 - 9.7
Potassium	1530		1140	2550		558	977	J	1110	912		539	689		524	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1	0 - 36.8
Silver		U	2.3		U	1.1		U	2.2		U	1.1		U	1	0 - 1.8
Sodium		U	1140		U	558		U	1110		U	539		U	524	0 - 834
Thallium	0.19	J	1.1	0.17	J	1.1	0.12	J	1.1	0.16	J	1.1	0.18	J	0.52	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.5	NA
Vanadium	14.3		2.3	13.9		1.1	12		2.2	14.8		1.1	4.8		1	1.7 - 25.0
Zinc	10.4		4.6	18		2.2	10.8		4.4	8.9		2.2	5.6		2.1	0 - 20.7
Acetone		U	11	5.1	J	11		U	11		U	11		U	10	

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 2 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-03

Chemical	Sample Interval (ft bgs)															Background Range[1]
	23-25			28-30			40-42			50-51.4			58-59.9			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	6910		52.5	5430		21.2	3970		10.7	2040		10.3	2340		10.4	596 - 10,796
Antimony		U	31.5		U	12.7		U	6.4		U	6.2		U	6.2	0 - 29.6
Arsenic	1.4		0.52	1.1		0.53	0.9		0.53	0.58		0.52	0.27	J	0.52	0 - 10.5
Barium	167		5.2	104		2.1	45.4		1.1	130		1	25.3		1	0 - 548
Beryllium		U	1		U	0.42		U	0.21		U	0.21		U	0.21	0 - 0.6
Cadmium		U	2.6		U	1.1		U	0.53		U	0.52		U	0.52	0 - 2.1
Calcium	**222000**	J	105	**177000**	J	42.5	63200	J	21.4	68900	J	20.7	31300	J	20.8	0 - 166,119
Chromium	5.5		5.2	2.6		2.1	3.1		1.1	1.7		1	1.8		1	0.8 - 12.0
Cobalt		U	5.2		U	2.1	1.1		1.1	0.73	J	1	0.7	J	1	0 - 4.0
Copper	3.9	J	10.5	2.2	J	4.2	1.1	J	2.1	0.84	J	2.1	0.56	J	2.1	0 - 10.1
Iron	4890		52.5	3330		21.2	2360		10.7	1190		10.3	1430		10.4	0 - 8,564
Lead	2.8		0.52	2.4		0.53	2		0.53	1.3		0.52	1.4		0.52	0 - 18.4
Magnesium	5210	J	105	3860	J	42.5	4200	J	21.4	4050	J	20.7	4120	J	20.8	0 - 9,912
Manganese	52.7		5.2	37.4		2.1	25.1		1.1	21.6		1	25.5		1	0 - 151.8
Mercury		U	0.1		U	0.11		U	0.11		U	0.1		U	0.1	0 - 0.2
Nickel	**22.4**	J	21	5.2	J	8.5	3.9	J	4.3	3.5	J	4.1	2.7	J	4.2	0 - 9.7
Potassium	1460	J	2620	1160		1060	753		534	526		517	518	J	520	0 - 2,531
Selenium		UJ	1		UJ	1.1		UJ	2.1		UJ	1		UJ	1	0 - 36.8
Silver		UJ	5.2		UJ	2.1		UJ	1.1		UJ	1		UJ	1	0 - 1.8
Sodium		U	2620		U	1060		U	534		U	517		U	520	0 - 834
Thallium	0.15	J	1		UJ	1.1	0.16	J	1.1		UJ	1		UJ	0.52	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.4	NA
Vanadium	11.9		5.2	14.7		2.1	16.3		1.1	5		1	5.7		1	1.7 - 25.0
Zinc	13.9		10.5	9.9		4.2	6.3		2.1	3.6		2.1	4.2		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	350		U	350		U	350		U	340	160	J	340	
Acetone		U	10		U	11	4.7	J	11		U	10		U	10	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 3 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-04

Chemical	Sample Interval (ft bgs) 0-.5			20-22			25-27			35-36.3			45-47			55-57			Backgroun Range
	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	Result	ual	R.L.	
Aluminum	10100		10.7	4960		21.7	4680		21.6	5080		22.9	4460		10.6	3980		10.7	596 - 10,79
Antimony		R		13	J	13	11.8	J	13		UJ	13.7		UJ	6.4		UJ	6.4	0 - 29.6
Arsenic	2.9		1.1	2.1		0.54	1.8		0.54	1.5		0.57	0.78		0.53	0.59		0.54	0 - 10.5
Barium	146	J	1.1	92.4		2.2	134		2.2	258		2.3	175		1.1	48.2		1.1	0 - 548
Beryllium	0.7		0.21	0.27	J	0.43	0.23	J	0.43		U	0.46	0.18	J	0.21	0.17	J	0.21	0 - 0.6
Cadmium		U	0.53		U	1.1		U	1.1		U	1.1		U	0.53		U	0.54	0 - 2.1
Calcium	30200		21.4	129000	J	43.4	135000	J	43.3	2E+05	J	45.8	50100	J	21.3	54700		21.3	0 - 166,119
Chromium	9.8		1.1	6.2		2.2	3.8		2.2	4.9		2.3	2.7		1.1	3		1.1	0.8 - 12.0
Cobalt	5		1.1		U	2.2		U	2.2		U	2.3	1.3		1.1		U	1.1	0 - 4.0
Copper	10		2.1	2.8	J	4.3	2.2	J	4.3	3.4	J	4.6	1.7	J	2.1	1.7	J	2.1	0 - 10.1
Iron	9610		10.7	4340		21.7	3580		21.6	2830		22.9	2930		10.6	2520		10.7	0 - 8,564
Lead	10		1.1	3	J	0.54	2.9	J	0.54	2.2	J	0.57	2	J	0.53	1.9		0.54	0 - 18.4
Magnesium	2870		21.4	3060	J	43.4	3380	J	43.3	13800	J	45.8	5580	J	21.3	7430		21.5	0 - 9,912
Manganese	275	J	1.1	34		2.2	45.3		2.2	32.5		2.3	33.5		1.1	29		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	9.3		4.3	10.4		8.7	7.2	J	8.7	7.8	J	9.2	2.6	J	4.3	3.5	J	4.3	0 - 9.7
Potassium	2970		535	1330		1080	970	J	1080	770	J	1140	1030		531	744		537	0 - 2,531
Selenium		UJ	5.3		UJ	2.2		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	1.1		U	2.2		U	2.2		U	2.3		U	1.1		U	1.1	0 - 1.8
Sodium		U	535		U	1080	244	J	1080		U	1140		U	531		U	537	0 - 834
Thallium		U	0.53	0.12	J	1.1		U	2.2		U	5.7		U	1.1	0.12	J	1.1	0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.7	NA
Vanadium	24		1.1	16.4		2.2	16		2.2	17		2.3	6.6		1.1	9.3		1.1	1.7 - 25.0
Zinc	28.2		2.1	9.5		4.3	9.3		4.3	7.7		4.6	7.6		2.1	6.9		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	350		U	360	86	J	360	52	J	380		U	350		U	350	
Diethyl phthalate	45	J	350		U	360		U	360		U	380		U	350		U	350	
Acetone	3.7	J	11	6.3	J	11	6.2	J	11		U	11	5.6	J	11	8.3	J	11	
Methylene chloride		U	5.3		U	5.4	1.2	J	5.4	3.3	J	5.7	1.1	J	5.3		U	5.4	
Toluene	1.3	J	5.3		U	5.4		U	5.4		U	5.7		U	5.3		U	5.4	

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 4 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-05

Chemical	Sample Interval (ft bgs)															Backgroun Range
	24.5-26.5			29.5-31.5			39.5-40.3			49.5-51			59.5-60.8			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual.	R.L.	
Aluminum	3400		21.8	3280		21.8	5640		21.6	3530		10.4	3420		10.4	596 - 10,796
Antimony		UJ	13.1		UJ	13.1	11.2	J	12.9		UJ	6.2		UJ	6.2	0 - 29.6
Arsenic	1.6		0.55	1		0.55	1.2		0.54	0.59		0.52	0.67		0.52	0 - 10.5
Barium	194		2.2	501		2.2	520		2.2	47.5		1	103		1	0 - 548
Beryllium	0.22	J	0.44		U	0.44		U	0.43	0.13	J	0.21	0.14	J	0.21	0 - 0.6
Cadmium		U	1.1		U	1.1		U	1.1		U	0.52		U	0.52	0 - 2.1
Calcium	146000	J	43.6	204000	J	43.6	144000	J	43.1	42300	J	20.7	51700		20.8	0 - 166,119
Chromium	9.9		2.2	4.8		2.2	29.4		2.2	5.1		1	10.7		1	0.8 - 12.0
Cobalt	1.9	J	2.2	1.9	J	2.2	1.8	J	2.2	1.3		1	1.4		1	0 - 4.0
Copper	5.3		4.4	2.7	J	4.4	2.8	J	4.3	1.9	J	2.1	3		2.1	0 - 10.1
Iron	4800		21.8	1930	J	21.8	3650		21.6	2630		10.4	2870		10.4	0 - 8,564
Lead	3.5	J	0.55	1.4	J	0.55	1.8	J	0.54	1.9	J	0.52	2.5		0.52	0 - 18.4
Magnesium	3170	J	43.6	5930	J	43.6	8000	J	43.1	4240	J	20.7	5050		20.8	0 - 9,912
Manganese	57		2.2	18.6		2.2	40.9		2.2	35.4		1	42.9		1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.1		U	0.1	0 - 0.2
Nickel	392		8.7	7.2	J	8.7	5.9	J	8.6	4.1		4.1	4.7		4.2	0 - 9.7
Potassium	824	J	1090	428	J	1090	1030	J	1080	868		518	705		520	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	2.2		UJ	1		UJ	2.1	0 - 36.8
Silver		U	2.2		U	2.2		U	2.2		U	1	1.1		1	0 - 1.8
Sodium		U	1090		U	1090		U	1080		U	518		U	520	0 - 834
Thallium		U	1.1		U	1.1		U	1.1		U	1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.4	NA
Vanadium	13		2.2	16.5		2.2	10.9		2.2	6.6		1	9.2		1	1.7 - 25.0
Zinc	46.7		4.4	6.5		4.4	9.4		4.3	6.7		2.1	7.4		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate	260	J	360	76	J	360	78	J	360		U	340		U	340	
Butyl benzyl phthalate	170	J	360		U	360	36	J	360		U	340		U	340	
Di-n-octyl phthalate	160	J	360		U	360		U	360		U	340		U	340	
2-Butanone (MEK)		U	11	21		11		U	11		U	10		U	10	
2-Hexanone		U	11	1.9	J	11		U	11		U	10		U	10	
Acetone	12		11	98		11	34		11	8.1	J	10	18		10	
Acetonitrile													16	J	210	
Total Petroleum Hydrocarbons	79.1		43.6		U	43.6		U	43.1		U	41.5		U	41.6	

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 5 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-06

Chemical	Sample Interval (ft bgs) 2-21.9			25-27			35-37			45-47			55-57.5			Background Range[1]
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual.	R.L.	
Aluminum	5310	J	56.6	6210	J	10.9	5190	J	10.8	3640	J	10.5	2310	J	10.5	596 - 10,796
Antimony		UJ	33.9		UJ	6.5		UJ	638		UJ	6.3		UJ	6.3	0 - 29.6
Arsenic	2.8		0.57	2.4		0.54	2.2		0.54	1.8		0.53	0.82		0.53	0 - 10.5
Barium	177	J	5.7	141	J	1.1	15.8	J	1.1	58.4	J	1.1	58.8	J	1.1	0 - 548
Beryllium		U	1.1	0.37		0.22	0.25		0.22	0.14	J	0.21	0.12	J	0.21	0 - 0.6
Cadmium		U	2.8		U	0.54		U	0.54		U	0.53		U	0.53	0 - 2.1
Calcium	**251000**	J	113	33500	J	21.7	37100	J	21.5	53900	J	21.1	47900	J	21	0 - 166,119
Chromium		U	5.7	4.7		1.1	3.6		1.1	6.4		1.1	11.4		1.1	0.8 - 12.0
Cobalt		U	5.7	1.5		1.1	1.1		1.1	0.88	J	1.1		U	1.1	0 - 4.0
Copper	**27.5**		11.3	4.5		2.2	2.3		2.2	2.5		2.1	2.4		2.1	0 - 10.1
Iron	4420	J	56.6	4650	J	10.9	3270	J	10.8	2420	J	10.5	1680	J	10.5	0 - 8,564
Lead	4.8		1.1	3.7		0.54	2.7		0.54	1.8		0.53	1.5		0.53	0 - 18.4
Magnesium	5940	J	113	3070	J	21.7	2710	J	21.5	2540	J	21.1	2520	J	21	0 - 9,912
Manganese	29.5	J	5.7	8	J	1.1	42.2	J	1.1	30.8	J	1.1	26.7	J	1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	**10.7**	J	22.6	6.3		4.3	4.1	J	4.3	4	J	4.2	3.2	J	4.2	0 - 9.7
Potassium	1860	J	2830	1830		543	1210		538	799		526	564		526	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	5.7	0.35	J	1.1		U	1.1		U	1.1		U	1.1	0 - 1.8
Sodium		U	2830		U	543		U	538		U	526		U	526	0 - 834
Thallium	0.17	J	1.1	0.17	J	0.54	0.19	J	0.54	0.12	J	0.53	0.23	J	0.53	0 - 6.2
Tin														U	10.5	NA
Vanadium	**25.5**		5.7	17.8		1.1	13.9		1.1	10		1.1	7.9		1.1	1.7 - 25.0
Zinc	16.4		11.3	13.9		2.2	9		2.2	7.4		2.1	5.4		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	370		U	360	57	J	350		U	350		U	350	
Di-n-octyl phthalate		U	370		U	360	330	J	350		U	350		U	350	
Acetone		U	11	5.1	J	11		U	11		U	11	7.9	J	11	
Carbon disulfide		U	5.7	2.9	J	5.4		U	5.4		U	5.3		U	5.3	
Methylene chloride		U	5.7		U	5.4	2.1	J	5.4		U	5.3		U	5.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 6 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-07

Chemical	Sample Interval (ft bgs) 0-.5			24-26			29-30.8			39-41			49-51			59-60.9			Backgro Range
	Result	Qual	R.L.	Result	ual	R.L.	Result	ual	R.L.	Result	ual	R.L.	Result	ual	R.L.	Result	ual	R.L.	
Aluminum	7240		10.3	5110		10.8	4610		22	5440		10.9	3010		10.5	2820		10.6	596 - 10,
Antimony		R			U	6.5		U	13.2		U	6.5		U	6.3		UJ	6.3	0 - 29.
Arsenic	2.4		0.51	1.6		0.54	0.41	J	0.55	1.4		0.54	1		0.53	0.49	J	0.53	0 - 10.
Barium	138	J	1	42.1	J	1.1	134	J	2.2	75.2	J	1.1	75.1	J	1.1	82.9		1.1	0 - 54
Beryllium	0.44		0.21	0.33		0.22	0.24	J	0.44	0.25		0.22	0.16	J	0.21		U	0.21	0 - 0.6
Cadmium		U	0.51		U	0.54		U	1.1		U	0.54		U	0.53		U	0.53	0 - 2.1
Calcium	73200		20.6	22900		21.7	158000		44	83800		21.8	59900		21.1	46000		21.2	0 - 166,1
Chromium	6.4		1	6		1.1	4.7		2.2	7.8		1.1	5.7		1.1	11.7		1.1	0.8 - 12
Cobalt	3.5		1	2.3		1.1		U	2.2	1.9		1.1		U	1.1	1.2		1.1	0 - 4.0
Copper	5.7		2.1	3.7		2.2	3.2	J	4.4	2.6		2.2	2	J	2.1	2.1		2.1	0 - 10.
Iron	6600		10.3	4610		10.8	3360		22	4190		10.9	2630		10.5	2680		10.6	0 - 8,56
Lead	6.9		1	3.9		0.54	3.3		0.55	3		0.54	2.3		0.53	1.7		0.53	0 - 18.
Magnesium	2070		20.6	2240		21.7	3770		44	4430		21.8	2500		21.1	3510		21.2	0 - 9,91
Manganese	113	J	1	82.3	J	1.1	37.5	J	2.2	53.4	J	1.1	27.6	J	1.1	43.3		1.1	0 - 151
Mercury		U	0.1		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	7.5		4.1	**46.2**		4.3	6.7	J	8.8	4.9		4.4	3	J	4.2	2.2	J	4.2	0 - 9.7
Potassium	1550		515	1420		542	830	J	1100	980		544	799		527	630		529	0 - 2,53
Selenium		UJ	1		UJ	0.54		UJ	1.1		UJ	0.54		UJ	0.53		UJ	0.53	0 - 36.
Silver		U	1		U	1.1		U	2.2		U	1.1		U	1.1		U	1.1	0 - 1.8
Sodium		U	515	135	J	542		U	1100		U	544		U	527		U	529	0 - 834
Thallium		U	2.1		UJ	1.1	0.22	J	2.2		UJ	2.2		UJ	2.1	0.11	J	1.1	0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	16		1	12.1		1.1	9.4		2.2	18.8		1.1	6.8		1.1	8.2		1.1	1.7 - 25
Zinc	17.7		2.1	**23.4**		2.2	9.1		4.4	9.6		2.2	5.9		2.1	5.9		2.1	0 - 20.
bis(2-Ethylhexyl)phthalate		U	340	500		360	43	J	360	590		360	430		350		U	350	
Acetone		U	10	4.3	J	11	6.3	J	11		U	11	3.9	J	11		U	11	
Acetonitrile																33	J	210	
Methylene chloride		U	5.1		U	5.4		U	5.5		U	5.4		U	5.3	2.2	J	5.3	
Toluene	3.8	J	5.1		U	5.4		U	5.5		U	5.4		U	5.3		U	5.3	
Sulfide, Total																0.57		0.53	
Total Petroleum Hydrocarbons	66.5		41.2		U	43.3		U	44		U	43.5		U	42.2		U	42.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 7 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-08

Chemical	Sample Interval (ft bgs)															Background Range
	20-22			25-27			35-35.9			45-47			55-57			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	5070	J	10.9	4630	J	11.7	4520	J	11.1	4250	J	10.8	3070		10.7	596 - 10,796
Antimony	5.8	J	6.5		UJ	7		UJ	6.6		UJ	6.5		UJ	6.4	0 - 29.6
Arsenic	3.7		0.54	3.3		0.59	1.2		0.55	0.83		0.54	0.66		0.53	0 - 10.5
Barium	274	J	1.1	96.3	J	1.2	147	J	1.1	285	J	1.1	38.2		1.1	0 - 548
Beryllium	0.37		0.22	0.28		0.23	0.16	J	0.22	0.13	J	0.22	0.15	J	0.21	0 - 0.6
Cadmium		U	0.54		U	0.59		U	0.55		U	0.54		U	0.53	0 - 2.1
Calcium	71800		21.8	77700		23.4	105000		22.1	43100		21.6	46500		21.3	0 - 166,119
Chromium	5.8		1.1	5.2		1.2	3.6		1.1	4.1		1.1	2.6		1.1	0.8 - 12.0
Cobalt	2.4		1.1	2.2		1.2	1.5		1.1	1.3		1.1	1.5		1.1	0 - 4.0
Copper	3.8		2.2	2.8		2.3	1.8	J	2.2	2.3		2.2	1.3	J	2.1	0 - 10.1
Iron	5050	J	10.9	4070	J	11.7	2770	J	11.1	2530	J	10.8	1940		10.7	0 - 8,564
Lead	4.5		0.54	3.5		0.59	2		1.1	1.6		1.1	2		0.53	0 - 18.4
Magnesium	2810	J	21.8	2710		23.4	7570		22.1	7230		21.6	5510		21.3	0 - 9,912
Manganese	82.3		1.1	54	J	1.2	29.8	J	1.1	30.6	J	1.1	38.2		1.1	0 - 151.8
Mercury		U	0.11		U	0.12		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	7.4		4.4	7.1		4.7	4.3	J	4.4	5.4		4.3	3.5	J	4.3	0 - 9.7
Potassium	1510		545	1310		586	759		553	975		539	680		533	0 - 2,531
Selenium		UJ	1.1		UJ	1.2		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		UJ	1.1		UJ	1.2		UJ	1.1		UJ	1.1		U	1.1	0 - 1.8
Sodium	218	J	545	159	J	586		U	553		U	539		U	533	0 - 834
Thallium	0.22	J	2.2		UJ	2.3		UJ	2.2		UJ	2.2		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.7	NA
Vanadium	33.3		1.1	22.2		1.2	21.4		1.1	8		1.1	6		1.1	1.7 - 25.0
Zinc	10.8		2.2	9		2.3	7.2		2.2	6.6		2.2	5		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate	400		360	410		390	420		370	440		360		U	350	
Acetone	8.5	J	11	8.2	J	12		U	11		U	11	7.4	J	11	
Acetonitrile													67	J	210	

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 8 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-09

Chemical	Sample Interval (ft bgs) 18-20			25-26.5			35-36.9			45-47			53-54.3			Background Range[1]
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	4450		21.8	3490		21.5	3440		21.5	2250		10.5	3620		10.7	596 - 10,796
Antimony		U	13.1		U	12.9		U	12.9		U	6.3		U	6.4	0 - 29.6
Arsenic	1.9		0.55	1.4		0.54	1.5		0.54	0.44	J	0.53	0.57		0.53	0 - 10.5
Barium	128		2.2	87.8		2.1	121		2.2	240		1.1	48.2		1.1	0 - 548
Beryllium	0.32	J	0.44		U	0.43		U	0.43		U	0.21		U	0.21	0 - 0.6
Cadmium		U	1.1		U	1.1		U	1.1		U	0.53		U	0.53	0 - 2.1
Calcium	152000	J	43.7	98400	J	42.9	114000	J	43.1	49000	J	21	96200	J	21.3	0 - 166,119
Chromium	3.8		2.2	3.1		2.1	2.9		2.2	1.7		1.1	6.1		1.1	0.8 - 12.0
Cobalt		U	2.2		U	2.1		U	2.2	0.84	J	1.1	1.5		1.1	0 - 4.0
Copper	2.4	J	4.4	2.2	J	4.3		U	4.3	0.89	J	2.1	1.7	J	2.1	0 - 10.1
Iron	3540		21.8	2530		21.5	2190		21.5	1710		10.5	2360		10.7	0 - 8,564
Lead	2.8		0.55	6		0.54	2.5		0.54	1.5		0.53	1.7		0.53	0 - 18.4
Magnesium	3910	J	43.7	2440	J	42.9	3460	J	43.1	2040	J	21	4680	J	21.3	0 - 9,912
Manganese	30.3		2.2	31.4		2.1	29.1		2.2	22.2		1.1	32.8		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	4.7	J	8.7	5.7	J	8.6	2.8	J	8.6	3.5	J	4.2	4.2	J	4.3	0 - 9.7
Potassium	1060	J	1090	701	J	1070	541	J	1080	553		526	678		534	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		UJ	2.2	0.61	J	2.1		UJ	2.2		UJ	1.1		UJ	1.1	0 - 1.8
Sodium		U	1090		U	1070		U	1080		U	526		U	534	0 - 834
Thallium		UJ	1.1	0.17	J	0.54	0.15	J	0.54	0.18	J	1.1	0.16	J	1.1	0 - 6.2
Tin	NA			NA			NA			NA			56		10.7	NA
Vanadium	9.9		2.2	8.1		2.1	11		2.2	6.3		1.1	11.7		1.1	1.7 - 25.0
Zinc	8.4		4.4	6.5		4.3	5.6		4.3	4.8		2.1	6.7		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate	73	J	360	75	J	350	190	J	360		U	350		U	350	
2-Butanone (MEK)		U	11		U	11	3.6	J	11		U	11		U	11	
Acetone		U	11		U	11	5	J	11		U	11		U	11	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 9 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-10

Chemical	Sample Interval (ft bgs) 0-.5			29.5-31			34-35.3			44-46			54-55			64-65			Background Range[1]
	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual.	R.L.	
Aluminum	7260		10.4	4650		22	5350		21	4310		10.4	4030		10.2	3620		10.4	596 - 10,796
Antimony		R			UJ	13.2		UJ	12.6		UJ	6.2		UJ	6.1		UJ	6.3	0 - 29.6
Arsenic	1.9		0.52	0.78		0.55	1.3		0.53	0.78		0.52	0.71		0.51	0.84		0.52	0 - 10.5
Barium	169	J	1	110		2.2	**595**		2.1	59.5		1	81		1	70.3		1	0 - 548
Beryllium	0.49		0.21		U	0.44		U	0.42	0.16	J	0.21	0.14	J	0.2	0.14	J	0.21	0 - 0.6
Cadmium		UJ	0.52		UJ	1.1		UJ	1.1		UJ	0.52		UJ	0.51		UJ	0.52	0 - 2.1
Calcium	44600		20.8	130000	J	44.1	149000	J	42	58200	J	20.7	43200	J	20.4	88500		20.9	0 - 166,119
Chromium	6.4		1	8		2.2	**40.7**		2.1	7		1	6.8		1	**30.7**		1	0.8 - 12.0
Cobalt	3.5		1	2	J	2.2	2.5		2.1	1.1		1	0.9	J	1	1.2		1	0 - 4.0
Copper	6.4		2.1	2.2	J	4.4	6.4		4.2	2	J	2.1	1.9	J	2	3.3		2.1	0 - 10.1
Iron	6550		10.4	3090		22	**9580**		21	3140		10.4	2910		10.2	3240		10.4	0 - 8,564
Lead	7.3		0.52	2	J	0.55	2	J	0.53	1.7	J	0.52	1.7	J	0.51	1.8		0.52	0 - 18.4
Magnesium	2080		20.8	4970	J	44.1	7200	J	42	5370	J	20.7	5570	J	20.4	8060		20.9	0 - 9,912
Manganese	142	J	1	33.1		2.2	69.3		2.1	37.4		1	42.1		1	47.6		1	0 - 151.8
Mercury		U	0.1		U	0.11		U	0.11		U	0.1		U	0.1		U	0.1	0 - 0.2
Nickel	7.4		4.2	**18.4**		8.8	**30.2**		8.4	4.1		4.1	4.5		4.1	5.2		4.2	0 - 9.7
Potassium	1700		520	687	J	1100	957	J	1050	966		518	832		511	600		521	0 - 2,531
Selenium		UJ	2.1		UJ	1.1		UJ	5.3		UJ	1		UJ	1		UJ	1	0 - 36.8
Silver		U	1		U	2.2		U	2.1		U	1		U	1	0.45	J	1	0 - 1.8
Sodium		U	520		U	1100		U	1050		U	518		U	511		U	521	0 - 834
Thallium		U	1		U	1.1		U	2.1	0.1	J	1		U	1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.4	NA
Vanadium	16.7		1	17.4		2.2	14.2		2.1	8.8		1	9.7		1	12		1	1.7 - 25.0
Zinc	19.2		2.1	10.1		4.4	14.3		4.2	8.7		2.1	8.6		2	8.1		2.1	0 - 20.7
2-Butanone (MEK)	1.4	J	10		U	11		U	11		U	10		U	10		U	10	
2-Hexanone		U	10		U	11	1.6	J	11		U	10		U	10		U	10	
4-Methyl-2-pentanone		U	10		U	11	6.4	J	11		U	10		U	10		U	10	
Acetone	3.7	J	10		U	11	37		11	7.8	J	10	9.2	J	10	41		10	
Methylene chloride		U	5.2		U	5.5		U	5.3		U	5.2		U	5.1	1.3	J	5.2	
Toluene	4.9	J	5.2		U	5.5		U	5.3		U	5.2	1	J	5.1		U	5.2	
Total Petroleum Hydrocarbons	49		41.6		U	44.1		U	42		U	41.4		U	40.9		U	41.7	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 10 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-11

Chemical	Sample Interval (ft bgs) 31-33			35-35.8			45-47			55-57			65-66.4			Background Range(1)
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	5940		11	7110		21.8	3520		10.5	3740		10.4	4120		10.6	596 - 10,796
Antimony		UJ	6.6		UJ	13.1		UJ	6.3		UJ	6.2		UJ	6.3	0 - 29.6
Arsenic	1.1		0.55	1.3		0.55	0.88		0.52	0.76		0.52	0.6		0.53	0 - 10.5
Barium	132		1.1	512		2.2	66.4		1	48.1		1	193		1.1	0 - 548
Beryllium	0.25		0.22	0.26	J	0.44	0.12	J	0.21	0.12	J	0.21	0.19	J	0.21	0 - 0.6
Cadmium		UJ	0.55		UJ	1.1		UJ	0.52		UJ	0.52		U	0.53	0 - 2.1
Calcium	81800	J	21.9	120000	J	43.7	55200	J	21	30600	J	20.8	51500		21.1	0 - 166,119
Chromium	5.4		1.1	7.8		2.2	2.8		1	3.1		1	5.1		1.1	0.8 - 12.0
Cobalt	1.2		1.1	2.2		2.2	1.2		1	0.93	J	1	1.4		1.1	0 - 4.0
Copper	2	J	2.2	4.7		4.4	1.4	J	2.1	1.5	J	2.1	2.2		2.1	0 - 10.1
Iron	3600		11	5480		21.8	2460		10.5	2750		10.4	3060		10.6	0 - 8,564
Lead	2.7	J	0.55	2.8	J	0.55	1.8	J	0.52	2.3	J	0.52	1.8		0.53	0 - 18.4
Magnesium	6260	J	21.9	8840	J	43.7	3850	J	21	4730	J	20.8	6370		21.1	0 - 9,912
Manganese	30.9		1.1	56.1		2.2	27.5		1	37		1	43.7		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.1		U	0.1		U	0.11	0 - 0.2
Nickel	4.1	J	4.4	**50.7**		8.7	3.5	J	4.2	3.2	J	4.2	4.2		4.2	0 - 9.7
Potassium	901		548	1120		1090	877		524	801		520	712		528	0 - 2,531
Selenium		UJ	5.5		UJ	5.5		UJ	1		UJ	1		UJ	0.53	0 - 36.8
Silver		U	1.1		U	2.2		U	1		U	1		U	1.1	0 - 1.8
Sodium		U	548		U	1090		U	524		U	520		U	528	0 - 834
Thallium		U	1.1		U	1.1		U	1		U	1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	24.5		1.1	**27.2**		2.2	6.9		1	8.3		1	13.2		1.1	1.7 - 25.0
Zinc	10.3		2.2	12.2		4.4	5.9		2.1	6.8		2.1	7.2		2.1	0 - 20.7
2-Butanone (MEK)		U	11	7.9	J	11		U	10		U	10		U	11	
Acetone	12		11	24		11		U	10	3	J	10	11		11	
Methylene chloride		U	5.5		U	5.5		U	5.2		U	5.2	1.2	J	5.3	
Total Petroleum Hydrocarbons		U	43.9	59.1		43.7		U	41.9		U	41.6		U	42.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 11 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-12

Chemical	Sample Interval (ft bgs)															Background Range[1]
	27.5-29.5			34-36			45-47			55-57			65-65.6			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	3920		21.5	3940		21.5	3960		10.4	3980		10.4	3530		10.5	596 - 10,796
Antimony		R			R		4.5	J	6.3		R			UJ	6.3	0 - 29.6
Arsenic	0.89		0.54	1.3		0.54	0.71		0.52	0.62		0.52	0.58		0.52	0 - 10.5
Barium	249	J	2.2	**654**	J	2.1	441	J	1	28.4	J	1	56.1		1	0 - 548
Beryllium		U	0.43		U	0.43	0.17	J	0.21	0.2	J	0.21		U	0.21	0 - 0.6
Cadmium		U	1.1		U	1.1		U	0.52		U	0.52		U	0.52	0 - 2.1
Calcium	**190000**		43.1	**179000**		43	65400		20.9	19800		20.9	69500		21	0 - 166,119
Chromium	1.6	J	2.2		U	2.1	2.6		1	4.9		1	7.2		1	0.8 - 12.0
Cobalt		U	2.2		U	2.1	0.8	J	1	1.6		1	1.3		1	0 - 4.0
Copper	1.7	J	4.3	2.1	J	4.3	2.3		2.1	1.2	J	2.1	2.6		2.1	0 - 10.1
Iron	2540		21.5	2560		21.5	2430		10.4	3100		10.4	2960		10.5	0 - 8,564
Lead	2.5		0.54	1.7		0.54	1.8		0.52	2.2		0.52	1.9		0.52	0 - 18.4
Magnesium	4870		43.1	7850		43	5940		20.9	5640		20.9	6170		21	0 - 9,912
Manganese	26.9	J	2.2	29.3	J	2.1	28.6	J	1	46.9	J	1	48.8		1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.1		U	0.1		U	0.1	0 - 0.2
Nickel	3.8	J	8.6	6	J	8.6	4.8		4.2	8.3		4.2	4.9		4.2	0 - 9.7
Potassium	643	J	1080	668	J	1070	952		522	853		521	652		525	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1		UJ	1		UJ	1	0 - 36.8
Silver		U	2.2		U	2.1		U	1		U	1		U	1	0 - 1.8
Sodium		U	1080		U	1070		U	522		U	521		U	525	0 - 834
Thallium		U	1.1		U	1.1	0.13	J	0.52		U	0.52		UJ	0.52	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.5	NA
Vanadium	14.9		2.2	18.8		2.1	8.1		1	9.1		1	12.6		1	1.7 - 25.0
Zinc	7.5		4.3	7.7		4.3	6.8		2.1	7.4		2.1	6.3		2.1	0 - 20.7
Acetone		UJ	11		UJ	11	7	J	10		U	10	8.1	J	10	
Acetonitrile													24	J	210	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 12 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-13

Chemical	Sample Interval (ft bgs)																		Background Range[1]
	0-.5			27-29			32-34			40-42			50-51.5			62-64.5			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	5310		10.3	3520	J	10.9	3690	J	11	6660	J	10.9	5270	J	10.7	3610	J	10.6	596 - 10,796
Antimony		R			UJ	6.6		UJ	6.6		UJ	6.5		UJ	6.4		UJ	6.4	0 - 29.6
Arsenic	1.8		0.51	0.6		0.55	1.6		0.55	0.97		0.54	0.65		0.53	0.92		0.53	0 - 10.5
Barium	280	J	1	72	J	1.1	20.6	J	1.1	93.2	J	1.1	153	J	1.1	309	J	1.1	0 - 548
Beryllium	0.44		0.21		U	0.22	0.26		0.22	0.21	J	0.22	0.16	J	0.21	0.13	J	0.21	0 - 0.6
Cadmium		U	0.51		U	0.55		U	0.55		U	0.54		U	0.53		U	0.53	0 - 2.1
Calcium	71900		20.6	82100	J	21.8	16100	J	21.9	68100	J	21.7	59200	J	21.4	28100	J	21.3	0 - 166,119
Chromium	4.2		1	2.7		1.1	2.9		1.1	5.4		1.1	9.9		1.1	10.8		1.1	0.8 - 12.0
Cobalt	3		1	1.2		1.1	2		1.1	0.89	J	1.1	0.89	J	1.1	1.1		1.1	0 - 4.0
Copper	4.5		2.1	1.3	J	2.2	2.6		2.2	3.2		2.2	2.7		2.1	2.2		2.1	0 - 10.1
Iron	4190		10.3	2030	J	10.9	2900	J	11	4010	J	10.9	3720	J	10.7	3030	J	10.6	0 - 8,564
Lead	5.3		0.51	2.5		0.55	2.8		0.55	2		0.54	1.9		0.53	1		0.53	0 - 18.4
Magnesium	1890		20.6	3570	J	21.8	2880	J	21.9	10600	J	21.7	6970	J	21.4	3460	J	21.3	0 - 9,912
Manganese	112		1	31.8	J	1.1	65.4	J	1.1	39.7	J	1.1	40.6	J	1.1	38.9	J	1.1	0 - 151.8
Mercury		U	0.1		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	6.2		4.1	3.6	J	4.4	5		4.4	5.2		4.3	6.2		4.3	3	J	4.3	0 - 9.7
Potassium	1220		515	758		546	1240		548	1430		543	1130		534	659		531	0 - 2,531
Selenium		UJ	1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	1		U	1.1		U	1.1		U	1.1		U	1.1		U	1.1	0 - 1.8
Sodium	3920		515		U	546		U	548		U	543		U	534		U	531	0 - 834
Thallium	0.12	J	1	0.19	J	1.1	0.2	J	0.55	0.14	J	1.1	0.12	J	1.1		U	0.53	0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	13.7		1	10.3		1.1	18.2		1.1	13.8		1.1	12.3		1.1	11.2		1.1	1.7 - 25.0
Zinc	11.6		2.1	6		2.2	7.2		2.2	10.3		2.2	8.8		2.1	6.8		2.1	0 - 20.7
2-		U	340		U	360		U	360	85	J	360		U	350		U	350	
Acenaphthene		U	340	37	J	360		U	360	82	J	360		U	350		U	350	
Chrysene		U	340		U	360		U	360	38	J	360		U	350		U	350	
Pyrene		U	340		U	360		U	360	74	J	360		U	350		U	350	
1-										76	NJ								
Acetone		U	10	130		110	7.2	J	11	4.9	J	11		U	11		U	11	
Ethylbenzene	1.3	J	5.1	300		55		U	5.5		U	5.4		U	5.3		U	5.3	
Methylene		U	5.1		U	55		U	5.5	1.2	J	5.4	1.8	J	5.3	1.1	J	5.3	
Styrene	8.2		5.1	1400		55		U	5.5		U	5.4		U	5.3		U	5.3	
Toluene	1.9	J	5.1		U	55		U	5.5		U	5.4		U	5.3		U	5.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 13 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-14

Chemical	Sample Interval (ft bgs)															Background Range[1]
	32-33.9			38-39.1			45-47			57-60.5			67-68.5			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	4370		22.3	4870		22.4	3270		10.5	3350		10.8	2960		10.6	596 - 10,796
Antimony		R			R			R			R			R		0 - 29.6
Arsenic	0.61		0.56	1.1		0.56	0.82		0.53	0.67		0.54	0.68		0.53	0 - 10.5
Barium	107	J	2.2	121	J	2.2	35.2	J	1.1	55.9	J	1.1	59.4	J	1.1	0 - 548
Beryllium		U	0.45		U	0.45		U	0.21		U	0.22		U	0.21	0 - 0.6
Cadmium		U	1.1		U	1.1		U	0.53		U	0.54		U	0.53	0 - 2.1
Calcium	135000		44.6	124000		44.7	50900		21	95300		21.5	39100		21.2	0 - 166,119
Chromium	6		2.2	4.4		2.2	2.4		1.1	6.9		1.1	4.5		1.1	0.8 - 12.0
Cobalt	1.4	J	2.2	1.4	J	2.2	0.74	J	1.1	1.2		1.1	1.2		1.1	0 - 4.0
Copper	1.6	J	4.5	2.6	J	4.5	0.89	J	2.1	1.8	J	2.2	1.4	J	2.1	0 - 10.1
Iron	2430		22.3	2890		22.4	2370		10.5	2720		10.8	2360		10.6	0 - 8,564
Lead	1.8		1.1	3.1		0.56	2		0.53	2		1.1	1.7		0.53	0 - 18.4
Magnesium	**13200**		44.6	**14500**		44.7	4380		21	8180		21.5	5030		21.2	0 - 9,912
Manganese	25.5	J	2.2	31.6	J	2.2	24.1	J	1.1	34	J	1.1	34.1	J	1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	7.8	J	8.9	8	J	8.9	3.2	J	4.2	5		4.3	4.1	J	4.2	0 - 9.7
Potassium	570	J	1120	745	J	1120	868		525	582		538	529	J	530	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	2.2		U	2.2		U	1.1		U	1.1		U	1.1	0 - 1.8
Sodium		U	1120		U	1120		U	525		U	538		U	530	0 - 834
Thallium		U	1.1		U	1.1		U	0.53		U	0.54		U	0.53	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	18.7		2.2	19.3		2.2	7		1.1	15		1.1	14.6		1.1	1.7 - 25.0
Zinc	5.7		4.5	7		4.5	5.5		2.1	5.5		2.2	6.2		2.1	0 - 20.7
2-Butanone (MEK)		U	11	1.8	J	11	2.6	J	11	4.4	J	11		U	11	
Acetone		U	11	5.8	J	11	4.2	J	11		U	11		U	11	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 14 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-15

Chemical	Sample Interval (ft bgs)															Background Range[1]
	20-22			25-27			35-35.8			45-46.8			55-55.8			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	4290		22.2	4490		22.2	5290		22.2	4250		11.2	4340		10.7	596 - 10,796
Antimony		U	13.3		U	13.3		U	13.3		U	6.7		U	6.4	0 - 29.6
Arsenic	0.9		0.55	1.1		0.56	1.6		0.56	0.82		0.56	0.89		0.54	0 - 10.5
Barium	304		2.2	131		2.2	245		2.2	51.3		1.1	43.2		1.1	0 - 548
Beryllium		U	0.44		U	0.44		U	0.44	0.18	J	0.22	0.12	J	0.21	0 - 0.6
Cadmium		U	1.1		U	1.1		U	1.1		U	0.56		U	0.54	0 - 2.1
Calcium	165000	J	44.4	160000	J	44.4	95900	J	44.5	42100	J	22.4	85800	J	21.4	0 - 166,119
Chromium	2.3		2.2	3.2		2.2	4.5		2.2	5.4		1.1	5.2		1.1	0.8 - 12.0
Cobalt	1.7	J	2.2	1.4	J	2.2	1.5	J	2.2	1	J	1.1	1.6		1.1	0 - 4.0
Copper	1.7	J	4.4	1.9	J	4.4	2.3	J	4.4	1.5	J	2.2	1.7	J	2.1	0 - 10.1
Iron	2610		22.2	2960		22.2	3160		22.2	3140		11.2	2930		10.7	0 - 8,564
Lead	2.4		0.55	2.2		0.56	1.9		0.56	4.7		1.1	1.8		0.54	0 - 18.4
Magnesium	4920	J	44.4	6250	J	44.4	**11100**	J	44.5	4690	J	22.4	7950	J	21.4	0 - 9,912
Manganese	29.9		2.2	30.2		2.2	33.9		2.2	38.2		1.1	38.8		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	5.6	J	8.9	5.4	J	8.9	6.6	J	8.9	4.6	J	4.5	3.9	J	4.3	0 - 9.7
Potassium	823	J	1110	726	J	1110	1040	J	1110	1020		561	812		536	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		UJ	2.2		UJ	2.2		UJ	2.2		UJ	1.1		UJ	1.1	0 - 1.8
Sodium		U	1110		U	1110		U	1110	113	J	561		U	536	0 - 834
Thallium		UJ	1.1	0.12	J	1.1	0.11	J	1.1	0.11	J	0.56	0.16	J	0.54	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.7	NA
Vanadium	8.1		2.2	8.2		2.2	14		2.2	10.1		1.1	15		1.1	1.7 - 25.0
Zinc	6.6		4.4	18.9		4.4	7.8		4.4	7.3		2.2	6.7		2.1	0 - 20.7
4-Nitrophenol	49	J	1800	68	J	1800		U	1800		U	1800		U	1700	
bis(2-Ethylhexyl)phthalate	230	J	370	100	J	370	74	J	370	200	J	370		U	350	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 15 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-16

Chemical	Sample Interval (ft bgs) 0-.5			45-46.9			50-50.9			60-60.9			70-70.8			80-81.5			Backgroun Range[1]
	Result	ual	R.L.	Result	Qual.	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	ual	R.L.	
Aluminum	5830		10.2	4080		10.5	4710		10.5	4500		10.6	3200		10.5	1530		10.4	596 - 10,796
Antimony		R			U	6.3		U	6.3		U	6.4	5.4	J	6.3		UJ	6.2	0 - 29.6
Arsenic	1.8		0.51	0.7		0.52	0.78		0.53	0.66		0.53	0.74		0.53	0.39	J	1	0 - 10.5
Barium	194	J	1	184	J	1	213	J	1.1	125	J	1.1	130	J	1.1	36.9		1	0 - 548
Beryllium	0.38		0.2	0.15	J	0.21	0.19	J	0.21	0.19	J	0.21	0.14	J	0.21		U	0.21	0 - 0.6
Cadmium		U	0.51		U	0.52		U	0.53		U	0.53		U	0.53	0.44	J	0.52	0 - 2.1
Calcium	61200		20.4	46500		21	63000		21.1	46200		21.2	46300		21.1	8830		20.7	0 - 166,119
Chromium	**19.2**		1	6.2		1	7.5		1.1	6.4		1.1	6.7		1.1	6.4		1	0.8 - 12.0
Cobalt	3.3		1	1.4		1	1.5		1.1	1.6		1.1	2		1.1		U	1	0 - 4.0
Copper	6.6		2	**12.6**		2.1	**11.6**		2.1	5.7		2.1	**27.5**		2.1	2.9		2.1	0 - 10.1
Iron	5650		10.2	3240		10.5	3520		10.5	3790		10.6	3730		10.5	2240		10.4	0 - 8,564
Lead	**41.1**		5.1	4.6		0.52	2.8		0.53	1.9		1.1	3.3		0.53	1.2		0.52	0 - 18.4
Magnesium	1990		20.4	4940		21	7370		21.1	5980		21.2	3470		21.1	1370		20.7	0 - 9,912
Manganese	138	J	1	33.2	J	1	48	J	1.1	48.6	J	1.1	57.6	J	1.1	26.2		1	0 - 151.8
Mercury		U	0.1		U	0.1		U	0.11		U	0.11		U	0.11		U	0.1	0 - 0.2
Nickel	6.3		4.1	5.1		4.2	5.4		4.2	5.8		4.2	6.2		4.2	3	J	4.1	0 - 9.7
Potassium	1880		510	938		525	1030		527	906		530	708		526	331	J	519	0 - 2,531
Selenium		UJ	1		UJ	1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1	0 - 36.8
Silver		U	1	1.5		1	**3.8**		1.1	1.2		1.1	0.98	J	1.1		U	1	0 - 1.8
Sodium		U	510		U	525		U	527		U	530		U	526		U	519	0 - 834
Thallium		U	1		UJ	1		UJ	1.1		UJ	1.1		UJ	1.1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.4	NA
Vanadium	13.3		1	8.2		1	10.8		1.1	12.9		1.1	11.6		1.1	5.9		1	1.7 - 25.0
Zinc	**25.3**		2	10.6		2.1	15.6		2.1	9.8		2.1	9.2		2.1	4.5		2.1	0 - 20.7
Aroclor 1254		U	34	75		35		U	35		U	35		U	35		U	34	
4-Methylphenol		U	340	100	J	350		U	350		U	350		U	350				
bis(2-Ethylhexyl)phthalate		U	340	230	J	350		U	350		U	350		U	350		U	340	
Di-n-butyl phthalate		U	340		U	350		U	350		U	350	57	J	350		U	340	
Phenol		U	340	40	J	350		U	350		U	350		U	350		U	340	
2-Butanone (MEK)		U	10	180		21	180		21	3.3	J	11		U	11	3.2	J	10	
2-Hexanone		U	10	8.3	J	21	11	J	21		U	11		U	11		U	10	
4-Methyl-2-pentanone (MIBK)		U	10	230		21	220		21	2.5	J	11		U	11		U	10	
Acetone		U	10	370		21	390		21		U	11	5.9	J	11	6	J	10	
Methylene chloride		U	5.1	5.1	J	10	6.3	J	11		U	5.3		U	5.3		U	5.2	
Toluene	1.4	J	5.1		U	10		U	11		U	5.3		U	5.3		U	5.2	
Total Petroleum Hydrocarbons	72.5		40.8		U	42		U	42.2		U	42.4		U	42.1		U	41.5	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 16 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-17

Chemical	Sample Interval (ft bgs)															Background Range[1]
	19-20.3			25-26.5			35-36.3			45-46.9			53-55			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	6020		21.4	6970		21.4	6070		21.3	3560		10.4	3320		10.4	596 - 10,796
Antimony		R			R		12.8	J	12.8		R			R		0 - 29.6
Arsenic	0.92		0.54	1.3		0.53	1.4		0.53	0.79		0.52	0.55		0.52	0 - 10.5
Barium	**1260**	J	2.1	238	J	2.1	**736**	J	2.1	59.1	J	1	22.9	J	1	0 - 548
Beryllium	0.37	J	0.43	0.29	J	0.43	0.24	J	0.43	0.11	J	0.21	0.14	J	0.21	0 - 0.6
Cadmium		U	1.1		U	1.1		U	1.1		U	0.52		U	0.52	0 - 2.1
Calcium	**168000**		42.8	131000		42.8	117000		42.5	50100		20.8	23600		20.8	0 - 166,119
Chromium	7.1		2.1	5.9		2.1	3.1		2.1	4.8		1	2.8		1	0.8 - 12.0
Cobalt	2	J	2.1	2	J	2.1	2.3		2.1	1.3		1	1.2		1	0 - 4.0
Copper	3.2	J	4.3	3.4	J	4.3	2.4	J	4.3	1.9	J	2.1	1.5	J	2.1	0 - 10.1
Iron	4890		21.4	5630		21.4	3920		21.3	2720		10.4	2700		10.4	0 - 8,564
Lead	3.7		0.54	5.5		1.1	3.1		1.1	1.5		0.52	2.2		0.52	0 - 18.4
Magnesium	5120		42.8	5660		42.8	7880		42.5	4830		20.8	4070		20.8	0 - 9,912
Manganese	50.7	J	2.1	66	J	2.1	41.2	J	2.1	39.6	J	1	37.4	J	1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.1		U	0.1	0 - 0.2
Nickel	**20.5**		8.6	8.6		8.6	2.5	J	8.5	3.9	J	4.2	3.4	J	4.2	0 - 9.7
Potassium	1810		1070	1590		1070	1270		1060	826		519	749		519	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1		UJ	1	0 - 36.8
Silver		U	2.1		U	2.1		U	2.1		U	1		U	1	0 - 1.8
Sodium		U	1070		U	1070		U	1060		U	519		U	519	0 - 834
Thallium		U	1.1		U	1.1		U	1.1		U	1		U	1	0 - 6.2
Tin	NA			NA			NA			NA			8.7	J	10.4	NA
Vanadium	11.9		2.1	20.4		2.1	16.9		2.1	7.6		1	8.6		1	1.7 - 25.0
Zinc	14.9		4.3	**24.3**		4.3	13.6		4.3	8.3		2.1	7.4		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	350	3800		350		U	350		U	340		U	340	
Di-n-butyl phthalate	37	J	350	69	J	350	48	J	350		U	340		U	340	
Di-n-octyl phthalate		U	350		U	350		U	350	39	J	340		U	340	
Phenol		U	350	47	J	350		U	350		U	340		U	340	
2-Butanone (MEK)		U	11		U	11		U	11	1.9	J	10		U	10	
2-Hexanone	1.5	J	11		U	11		U	11		U	10		U	10	
4-Methyl-2-pentanone (MIBK)		U	11	10	J	11		U	11		U	10		U	10	
Acetone	8.7	J	11	100		11		U	11	8.3	J	10	7.3	J	10	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 17 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-18

Chemical	Sample Interval (ft bgs)															Background Range[1]
	28-29.9			33-35			45-47			55-56.5			63-63.8			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	4450		21.7	4070		10.8	3120		10.5	3760		10.5	3160		10.6	596 - 10,796
Antimony	14.8	J	13	4.4	J	6.5		R			R			UJ	6.4	0 - 29.6
Arsenic	1.3		0.54	1.6		0.54	0.74		0.53	0.78		0.52	0.71		0.53	0 - 10.5
Barium	104	J	2.2	60.8	J	1.1	106	J	1.1	310	J	1	37.2		1.1	0 - 548
Beryllium	0.25	J	0.43	0.21	J	0.22		U	0.21		U	0.21		U	0.21	0 - 0.6
Cadmium		U	1.1		U	0.54		U	0.53		U	0.52		U	0.53	0 - 2.1
Calcium	144000		43.4	35300		21.6	30700		21.1	32400		21	59700		21.3	0 - 166,119
Chromium	4		2.2	3.2		1.1	2.6		1.1	3.8		1	9.7		1.1	0.8 - 12.0
Cobalt	2.3		2.2	1.8		1.1	1	J	1.1	1.5		1	1.2		1.1	0 - 4.0
Copper	3.2	J	4.3	2.5		2.2	1.2	J	2.1	1.2	J	2.1	1.9	J	2.1	0 - 10.1
Iron	3670		21.7	3460		10.8	2110		10.5	2710		10.5	2990		10.6	0 - 8,564
Lead	3		0.54	3.7		0.54	1.7	J	2.6	2.3		0.52	1.9		0.53	0 - 18.4
Magnesium	3860		43.4	3350		21.6	4170		21.1	4690		21	5830		21.3	0 - 9,912
Manganese	46.3	J	2.2	59.7	J	1.1	26.9	J	1.1	46.1	J	1	37.5		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.1		U	0.11	0 - 0.2
Nickel	6.3	J	8.7	6.5		4.3	3.7	J	4.2	4.1	J	4.2	4.4		4.3	0 - 9.7
Potassium	1160		1080	1170		540	859		527	881		524	553		532	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	0.52		UJ	1.1	0 - 36.8
Silver		U	2.2		U	1.1		U	1.1		U	1		U	1.1	0 - 1.8
Sodium		U	1080		U	540		U	527		U	524		U	532	0 - 834
Thallium		U	1.1		U	1.1		U	0.53		U	0.52	0.19	J	0.53	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	14.2		2.2	17.8		1.1	6.6		1.1	9.5		1	11		1.1	1.7 - 25.0
Zinc	9.4		4.3	8.3		2.2	5.1		2.1	6.5		2.1	5.8		2.1	0 - 20.7
2-Butanone (MEK)		U	11		U	11		U	11	3.5	J	10		U	11	
Acetone		U	11		U	11		U	11		U	10	5.5	J	11	
Toluene	1.4	J	5.4		U	5.4		U	5.3		U	5.2	1.1	J	5.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 18 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-19

Chemical	Sample Interval (ft bgs) 0-.5			18-20			25-27			35-35.9			45-47			53-56.5			Backgroun Range[1]
	Result	Qual.	R.L.	Result	ual	R.L.	Result	Qual	R.L.	Result	Qual.	R.L.	Result	Qual	R.L.	Result	Qual.	R.L.	
Aluminum	5530		10.1	5760		10.8	8250		11.2	3880		10.7	3170		10.5	4220		10.5	596 - 10,79
Antimony		R			UJ	6.5		UJ	6.7		UJ	6.4		UJ	6.3		UJ	6.3	0 - 29.6
Arsenic	2.7		0.5	2.2		0.54	5.8		0.56	1.1		0.54	0.84	J	2.1	0.86	J	2.1	0 - 10.5
Barium	145	J	1	61.3		1.1	54.2		1.1	207		1.1	37.5		1	72.9		1.1	0 - 548
Beryllium		U	0.39		U	0.23	0.59		0.22		U	0.21		U	0.21		U	0.21	0 - 0.6
Cadmium		U	0.5		U	0.54		U	0.56		U	0.54		U	0.52		U	0.53	0 - 2.1
Calcium	33400		20.2	78800		21.6	6740		22.4	85100		21.4	55900		21	54200		21.1	0 - 166,119
Chromium	6.7		1	5.5		1.1	9.3		1.1	4.1		1.1	2.8		1	4.4		1.1	0.8 - 12.0
Cobalt	2.9		1	2.2		1.1	2.1		1.1	1.3		1.1	1.1		1	1.4		1.1	0 - 4.0
Copper	5.2		2	3.4		2.2	5		2.2	1.5	J	2.1	1.1	J	2.1	1.6	J	2.1	0 - 10.1
Iron	5990		10.1	4840		10.8	**8810**		11.2	2710		10.7	2420		10.5	2890		10.5	0 - 8,564
Lead	9.2		1	5.1		0.54	7.3		0.56	2.1		0.54	1		0.52	1.9		0.53	0 - 18.4
Magnesium	1490		20.2	3710		21.6	2730		22.4	3550		21.4	2880		21	5600		21.1	0 - 9,912
Manganese	108	J	1	65.8		1.1	56.2		1.1	35		1.1	28.7		1	40.1		1.1	0 - 151.8
Mercury		U	0.1		U	0.11		U	0.11		U	0.11		U	0.1		U	0.11	0 - 0.2
Nickel	7.2		4	7.3		4.3	8.9		4.5	4.5		4.3		U	4.2	4.4		4.2	0 - 9.7
Potassium	1260		505	1720		540	**2550**		560	706		536	803		525	889		527	0 - 2,531
Selenium		UJ	1		R			R			R			R			UJ	1.1	0 - 36.8
Silver		U	1		U	1.1		U	1.1		U	1.1		U	1	0.32	J	1.1	0 - 1.8
Sodium		U	505	157	J	540	253	J	560		U	536		U	525		U	527	0 - 834
Thallium	0.13	J	0.5	0.16	J	1.1	0.21	J	0.56	0.19	J	0.54		U	0.52	0.19	J	0.53	0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.5	NA
Vanadium	15.9		1	15.6		1.1	**35.6**		1.1	12		1.1	6.7		1	8.5		1.1	1.7 - 25.0
Zinc	17		2	10.6		2.2	16.2		2.2	6.9		2.1	5.8		2.1	7.6		2.1	0 - 20.7
Aroclor 1254	25	J	33		U	36		U	37		U	35		U	35		U	35	
2-Butanone (MEK)	2.7	J	10		U	11	1.9	J	11		U	11		U	10		U	11	
Acetone	13		10		U	11		U	11	6.5	J	11	3.3	J	10	3	J	11	
Toluene	4.4	J	5		U	5.4		U	5.6		U	5.4		U	5.2		U	5.3	
Total Petroleum	43.5		40.4		U	43.2		U	44.8		U	42.9		U	42		U	42.2	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-20

Chemical	Sample Interval (ft bgs)															Background Range[1]
	16-17.5			20-22			30-32			40-41.8			52-53			
	Result	Qual.	R.L	Result	Qual.	R.L	Result	Qual.	R.L	Result	Qual.	R.L	Result	Qual.	R.L	
Aluminum	6210		11.2	4140		22.1	3710		11.5	5090		10.8	3740		10.5	596 - 10,796
Antimony		UJ	6.7		UJ	13.2		R			R			UJ	6.3	0 - 29.6
Arsenic	2.3		0.56	1.8		0.55	2		0.58	1.1		0.54	0.5	J	0.52	0 - 10.5
Barium	69.4		1.1	427		2.2	50.7	J	1.2	64.3	J	1.1	88.1		1	0 - 548
Beryllium	0.47		0.22	0.28	J	0.44	0.21	J	0.23	0.14	J	0.22	0.14	J	0.21	0 - 0.6
Cadmium		UJ	0.56		UJ	1.1		UJ	0.58		UJ	0.54		U	0.52	0 - 2.1
Calcium	83400		22.3	**197000**		44.2	44000		23	74600		21.5	31800		20.9	0 - 166,119
Chromium	7.4		1.1	3.8		2.2	4.1		1.2	4		1.1	4.5		1	0.8 - 12.0
Cobalt	2.9		1.1	2	J	2.2	2		1.2	1.2		1.1	1.4		1	0 - 4.0
Copper	**23.5**		2.2	3	J	4.4	2.9		2.3	2.7		2.2	2.6		2.1	0 - 10.1
Iron	6000		11.2	3200		22.1	3120		11.5	3010		10.8	3130		10.5	0 - 8,564
Lead	9.3		1.1	3.9		0.55	3.6		0.58	1.7		0.54	2.1		0.52	0 - 18.4
Magnesium	4080		22.3	5660		44.2	2430		23	9300		21.5	4950		20.9	0 - 9,912
Manganese	40.2		1.1	38.3		2.2	56.7	J	1.2	28.1	J	1.1	42.6		1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.12		U	0.11		U	0.1	0 - 0.2
Nickel	7.4		4.5	5.6	J	8.8	5.4		4.6	4.3		4.3	4.1	J	4.2	0 - 9.7
Potassium	1920		559	1040	J	1100	964		575	973		538	767		523	0 - 2,531
Selenium		R			R			UJ	1.2		UJ	1.1		UJ	1	0 - 36.8
Silver		U	1.1		U	2.2		U	1.2		U	1.1		U	1	0 - 1.8
Sodium	233	J	559		U	1100		U	575		U	538		U	523	0 - 834
Thallium		U	1.1		U	2.2		U	1.2		U	1.1		R		0 - 6.2
Tin	NA			NA			NA			NA			9.8	J	10.5	NA
Vanadium	21.8		1.1	12.4		2.2	13.3		1.2	12.4		1.1	9		1	1.7 - 25.0
Zinc	12.1		2.2	10.3		4.4	8.1		2.3	7.3		2.2	7.4		2.1	0 - 20.7

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 20 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-21

Chemical	Sample Interval (ft bgs)														
	22-22.9			27-29			35-35.8			45-46.8			57-58.8		
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.
Aluminum	2730	J	10.7	3220		22.6	3870		21.8	4940		10.4	4340		10.7
Antimony		UJ	6.4		U	13.5		U	13.1		U	6.2		U	6.4
Arsenic	0.97		0.54	0.65		0.56	0.91		0.54	0.39	J	0.52	0.34	J	0.53
Barium	377	J	1.1	180		2.3	293		2.2	91.5		1	277		1.1
Beryllium	0.17	J	0.21		U	0.45		U	0.44		U	0.21	0.13	J	0.21
Cadmium	0.69		0.54		U	1.1		U	1.1		U	0.52		U	0.53
Calcium	**254000**	J	21.4	**173000**	J	45.1	164000		43.5	39200	J	20.8	35800	J	21.4
Chromium	3	J	1.1	2.1	J	2.3	5.4		2.2	10.9		1	6.4		1.1
Cobalt	0.9	J	1.1		U	2.3	1.6	J	2.2	1		1	1.3		1.1
Copper	0.91	J	2.1	1.2	J	4.5	6.4		4.4	1.5	J	2.1	1.6	J	2.1
Iron	2220	J	10.7	1660		22.6	2340		21.8	3740		10.4	3040		10.7
Lead	2.7		0.54	2		0.56	2.6		0.54	1.7		0.52	1.4		0.53
Magnesium	3660	J	21.4	5870	J	45.1	8910	J	43.5	3960	J	20.8	5490	J	21.4
Manganese	20.8	J	1.1	20.3		2.3	26.7		2.2	35.9		1	37.7		1.1
Mercury		U	0.11		U	0.11		U	0.11		U	0.1		U	0.11
Nickel	2.6	J	4.3	5.2	J	9		UJ	8.7		UJ	4.2		UJ	4.3
Potassium	775		535	504	J	1130	615	J	1090	1140		520	764		534
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1		UJ	1.1
Silver	1.2		1.1		UJ	2.3		UJ	2.2		UJ	1		UJ	1.1
Sodium		U	535		U	1130		U	1090		U	520		U	534
Thallium	0.12	J	1.1	0.14	J	1.1		UJ	1.1	0.17	J	1	0.17	J	0.53
Tin	NA			NA			NA			NA			NA	U	10.7
Vanadium	10.6		1.1	20.2		2.3	15		2.2	9.2		1	12.8		1.1
Zinc	6.5	J	2.1	5.1		4.5	6.8		4.4	7.4		2.1	6.5		2.1
bis(2-Ethylhexyl)phthalate	110	J	350	240	J	370	100	J	360		U	340		U	350
1,1,2,2-Tetrachloroethane	2.3	J	5.4	8.2		5.6		U	5.4	3.5	J	5.2	3.1	J	5.3
Acetone	5.6	J	11		U	11	16		11	7	J	10		U	11
Methylene chloride		U	5.4		U	5.6		U	5.4		U	5.2	2.8	J	5.3

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 21 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-22

Chemical	Sample Interval (ft bgs) 0-.5			18-20			25-25.5			35-36.2			45-45.9			56.5-58.5			Backgrou Range[1]
	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	Result	ual	R.L.	Result	ual	R.L.	Result	ual	R.L.	
Aluminum	6010		10.2	5360		10.3	7190		21.8	5090		21.2	3880		10.4	4380		10.6	596 - 10,79
Antimony	5.2	J	6.1		U	6.2	11	J	13.1		U	12.7		U	6.3		UJ	6.4	0 - 29.6
Arsenic	2.3		0.51	1.1		0.51	0.75		0.55	0.97		0.53	0.68		0.52	0.75		0.53	0 - 10.5
Barium	226	J	1	115	J	1	137	J	2.2	94.3	J	2.1	84.2	J	1	32.7		1.1	0 - 548
Beryllium	0.45		0.2	0.29		0.21	0.33	J	0.44		U	0.42	0.12	J	0.21	0.17	J	0.21	0 - 0.6
Cadmium		U	0.51		U	0.51		U	1.1		U	1.1		U	0.52		U	0.53	0 - 2.1
Calcium	83300		20.5	36900		20.6	207000		43.7	150000		42.4	59000		20.9	53300		21.2	0 - 166,11
Chromium	5		1	4.2		1	6.4		2.2	2.2		2.1	2.3		1	3.6		1.1	0.8 - 12.0
Cobalt	3.1		1	2		1	2.4		2.2		U	2.1	0.87	J	1	1.2		1.1	0 - 4.0
Copper	5.5		2	2.3		2.1	3.1	J	4.4	2	J	4.2	1.4	J	2.1	1.5	J	2.1	0 - 10.1
Iron	5510		10.2	4250		10.3	4090		21.8	3180		21.2	2860		10.4	3090		10.6	0 - 8,564
Lead	78.2		5.1	3.7		0.51	2.6		0.55	2.3		0.53	1.9		0.52	2.4	J	0.53	0 - 18.4
Magnesium	2270		20.5	3140		20.6	10200		43.7	6560		42.4	4430		20.9	6800		21.2	0 - 9,912
Manganese	129	J	1	41.8	J	1	44.1	J	2.2	27.9	J	2.1	31	J	1	39.6		1.1	0 - 151.8
Mercury		U	0.1		U	0.1		U	0.11		U	0.11		U	0.1		U	0.11	0 - 0.2
Nickel	7.1		4.1	8.1		4.1	9		8.7	5.9	J	8.5	3.8	J	4.2	3.7	J	4.2	0 - 9.7
Potassium	1390		512	1540		514	1280		1090	976	J	1060	816		522	760		530	0 - 2,531
Selenium		UJ	1		UJ	1		UJ	1.1		UJ	1.1		UJ	1		UJ	1.1	0 - 36.8
Silver		U	1		U	1		U	2.2		U	2.1		U	1		U	1.1	0 - 1.8
Sodium		U	512		U	514		U	1090		U	1060		U	522		U	530	0 - 834
Thallium		UJ	1	0.13	J	1		UJ	2.2		UJ	2.1		UJ	1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	15.8		1	11.9		1	16.5		2.2	11		2.1	7.4		1	13.9		1.1	1.7 - 25.0
Zinc	22.1		2	10.8		2.1	14.4		4.4	9.9		4.2	7.9		2.1	8		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	340		U	340		U	360		U	350		U	340	42	J	350	
2-Butanone (MEK)		U	10		U	10	6.6	J	11		U	11		U	10		U	11	
Acetone		U	10	7	J	10	31	J	11	5.7	J	11	7.1	J	10		U	11	
Toluene		U	5.1		U	5.1		U	5.5		U	5.3	4.8	J	5.2		U	5.3	
Total Petroleum	51		41		U	41.1		U	43.7		U	42.4		U	41.8		U	42.4	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 22 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-23

Chemical	Sample Interval (ft bgs)															Background Range[1]
	19-20.5			24-26			35-36.3			45-47			54-55.1			
	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	
Aluminum	5530		55.8	6410		22.3	5380		22	5170		10.5	4990		10.5	596 - 10,796
Antimony		U	33.5		U	13.4		U	13.2		U	6.3		UJ	6.3	0 - 29.6
Arsenic	1.3		0.56	1.2		0.56	1.5		0.55	0.76		0.52	0.75		0.53	0 - 10.5
Barium	194	J	5.6	**608**	J	2.2	113	J	2.2	41.1	J	1	47.1		1.1	0 - 548
Beryllium		U	1.1	0.31	J	0.45	0.24	J	0.44	0.15	J	0.21	0.15	J	0.21	0 - 0.6
Cadmium		U	2.8		U	1.1		U	1.1		U	0.52		U	0.53	0 - 2.1
Calcium	**251000**		112	129000		44.7	**174000**		44	28400		21	32800		21.1	0 - 166,119
Chromium		U	5.6	5.3		2.2	7.5		2.2	4.2		1	7.9		1.1	0.8 - 12.0
Cobalt		U	5.6	1.8	J	2.2	2	J	2.2	1.4		1	1.7		1.1	0 - 4.0
Copper	6.2	J	11.2	7.4		4.5	3.6	J	4.4	1.7	J	2.1	3		2.1	0 - 10.1
Iron	3430		55.8	4160		22.3	3620		22	3870		10.5	4080		10.5	0 - 8,564
Lead	3.1		0.56	3.7		0.56	2.3		0.55	2.2		0.52	2.4		0.53	0 - 18.4
Magnesium	7100		112	7660		44.7	8950		44	4160		21	4630		21.1	0 - 9,912
Manganese	56.1	J	5.6	32.6	J	2.2	39.9	J	2.2	44.2	J	1	47.4		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.1		U	0.11	0 - 0.2
Nickel	6.5	J	22.3	7.2	J	8.9	4	J	8.8	3.6	J	4.2	4.2		4.2	0 - 9.7
Potassium	1410	J	2790	1290		1120	906	J	1100	1100		524	1010		526	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1		UJ	1.1	0 - 36.8
Silver		U	5.6		U	2.2		U	2.2		U	1		U	1.1	0 - 1.8
Sodium		U	2790		U	1120		U	1100		U	524		U	526	0 - 834
Thallium		UJ	2.2		UJ	1.1		UJ	2.2		UJ	0.52		R		0 - 6.2
Tin	NA			NA			NA			NA			8.9	J	10.5	NA
Vanadium	14		5.6	22.3		2.2	20.1		2.2	9.7		1	10.7		1.1	1.7 - 25.0
Zinc	13.3		11.2	13		4.5	9		4.4	8.5		2.1	9.1		2.1	0 - 20.7
Acetone	6.7	J	11		U	11	24		11		U	10		U	11	
Methylene chloride		U	5.6	1.2	J	5.6		U	5.5		U	5.2	1.1	J	5.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 23 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-24

Chemical	Sample Interval (ft bgs) 24-26			29-29.8			40-42			50-50.8			59-60			Background Range[1]
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	3310		22.1	4490		21.7	4230		10.8	3500		10.5	3600		10.8	596 - 10,796
Antimony		UJ	13.3		UJ	13		UJ	6.5		UJ	6.3		UJ	6.5	0 - 29.6
Arsenic	0.7		0.55	0.74		0.54	0.12	J	0.54	0.73		0.52	0.68		0.54	0 - 10.5
Barium	103		2.2	367		2.2	56.2		1.1	147		1	251		1.1	0 - 548
Beryllium		U	0.44		U	0.43	0.13	J	0.22		U	0.21		U	0.22	0 - 0.6
Cadmium		U	1.1		U	1.1		U	0.54		U	0.52		U	0.54	0 - 2.1
Calcium	**185000**		44.2	145000		43.4	49200		21.6	69000		21	71800		21.5	0 - 166,119
Chromium	2.2	J	2.2	3.7	J	2.2	3.5	J	1.1	4.6	J	1	6.7	J	1.1	0.8 - 12.0
Cobalt	2	J	2.2	1.8	J	2.2	1.4		1.1	1.1		1	1.5		1.1	0 - 4.0
Copper	2.3	J	4.4	**41.9**		4.3	2.1	J	2.2	2.1		2.1	7.9		2.2	0 - 10.1
Iron	2000	J	22.1	3040	J	21.7	2880	J	10.8	2330	J	10.5	2370	J	10.8	0 - 8,564
Lead	2.2	UJ	1.1	12.2	J	1.1	1.9	J	1.1	2	J	1	2.2	J	0.54	0 - 18.4
Magnesium	3910	J	44.2	4370	J	43.4	5190	J	21.6	5440	J	21	9230	J	21.5	0 - 9,912
Manganese	30.2	J	2.2	32.3	J	2.2	47.7	J	1.1	29.1	J	1	39.7	J	1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.1		U	0.11	0 - 0.2
Nickel	3.4	J	8.8	6.1	J	8.7	4.9	J	4.3	3.4	J	4.2	4	J	4.3	0 - 9.7
Potassium	547	J	1110	631	J	1090	1090		539	788		524	648		538	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1		UJ	1.1	0 - 36.8
Silver		U	2.2		U	2.2		U	1.1		U	1		U	1.1	0 - 1.8
Sodium		U	1110		U	1090		U	539		U	524		U	538	0 - 834
Thallium		UJ	1.1	0.12	J	1.1		UJ	0.54		UJ	1		UJ	0.54	0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.8	NA
Vanadium	9.1		2.2	12.8		2.2	11.6		1.1	9.3		1	14.1		1.1	1.7 - 25.0
Zinc	6.9	J	4.4	11.9	J	4.3	8.9	J	2.2	5.8	J	2.1	5.8	J	2.2	0 - 20.7
4-Methylphenol		U	370	68	J	360		U	360		U	350				
bis(2-Ethylhexyl)phthalate		U	370	65	J	360		U	360		U	350		U	360	
Butyl benzyl phthalate		U	370	40	J	360		U	360		U	350		U	360	
2-Butanone (MEK)	2.5	J	11	22		11		U	11	4.7	J	10	5.6	J	11	
2-Hexanone		U	11	3.4	J	11		U	11		U	10		U	11	
4-Methyl-2-pentanone		U	11		U	11		U	11		U	10		U	11	
Acetone	4.4	J	11	57		11		U	11	9.3	J	10	9.9	J	11	
Toluene		U	5.5		U	5.4	1.8	J	5.4		U	5.2		U	5.4	
Total Petroleum Hydrocarbons		U	44.2	164		43.4		U	43.1		U	41.9		U	43.1	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-25

Chemical	Sample Interval (ft bgs)																		Backgroun Range[1]
	0-.5			24-26			30-30.9			40-42			50-50.5			60-62			
	Result	Qual	R.L.	Result	Qual.	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	
Aluminum	7950		20.6	7690		11.3	7740		24.2	5570		10.8	4880		11.1	4070		10.7	596 - 10,79
Antimony		UJ	12.4	5.2	J	6.8		UJ	14.5		UJ	6.5		UJ	6.6		UJ	6.4	0 - 29.6
Arsenic	1.7		0.52	0.84		0.56	1.1		0.6	0.82		0.54	0.91		0.55	0.79		0.54	0 - 10.5
Barium	281	J	2.1	103		1.1	386		2.4	56.3		1.1	263		1.1	42.1		1.1	0 - 548
Beryllium	0.45		0.41	0.35		0.23	0.28	J	0.48	0.19	J	0.22	0.18	J	0.22	0.16	J	0.21	0 - 0.6
Cadmium		U	1		U	0.56		U	1.2		U	0.54		U	0.55		U	0.54	0 - 2.1
Calcium	118000		41.3	74700		22.5	143000		48.4	48900		21.7	81200		22.2	52500		21.4	0 - 166,119
Chromium	5.2		2.1	5.1	J	1.1	141	J	2.4	3.4	J	1.1	5.8	J	1.1	3		1.1	0.8 - 12.0
Cobalt	3.2		2.1	2.3		1.1	2.4		2.4	1.6		1.1	1.5		1.1	1.2		1.1	0 - 4.0
Copper	4.3		4.1	2.2	J	2.3	4.3	J	4.8	1.7	J	2.2	2.3		2.2	1.5	J	2.1	0 - 10.1
Iron	6140		20.6	5650	J	11.3	6290	J	24.2	3310	J	10.8	3310	J	11.1	2600		10.7	0 - 8,564
Lead	5.2		0.52	3.9	J	0.56	4.4	J	0.6	3.3	J	0.54	2.9	J	0.55	2.1		0.54	0 - 18.4
Magnesium	4090		41.3	5290	J	22.5	13000	J	48.4	7440	J	21.7	7540	J	22.2	5980		21.4	0 - 9,912
Manganese	81.8	J	2.1	52.2	J	1.1	55.9	J	2.4	33.8	J	1.1	37.4	J	1.1	41		1.1	0 - 151.8
Mercury		U	0.1		U	0.11		U	0.12		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	6.6	J	8.3	7.1	J	4.5	68.6	J	9.7	5.4	J	4.3	5.5	J	4.4	3.7	J	4.3	0 - 9.7
Potassium	2100		1030	1470		563	1300		1210	1160		542	1030		554	758		535	0 - 2,531
Selenium		UJ	1		UJ	1.1		UJ	1.2		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	2.1		U	1.1		U	2.4		U	1.1		U	1.1		U	1.1	0 - 1.8
Sodium		U	1030		U	563		U	1210		U	542		U	554		U	535	0 - 834
Thallium		UJ	1		UJ	1.1		UJ	2.4		UJ	1.1		UJ	1.1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.7	NA
Vanadium	17.1		2.1	15.2		1.1	19.4		2.4	11.8		1.1	11.2		1.1	11.9		1.1	1.7 - 25.0
Zinc	17.6		4.1	14	J	2.3	59	J	4.8	9.2	J	2.2	8.9	J	2.2	7.7		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	340		U	370		U	400		U	360		U	370	160	J	350	
Acetone		U	10		UJ	11		UJ	12		UJ	11	4.1	J	11	4.9	J	11	
Toluene		U	5.2		U	5.6		U	6		U	5.4		U	5.5	1.7	J	5.4	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 25 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-26

Chemical	Sample Interval (ft bgs)															Background Range[1]
	21.5-23			27-29			37-39			47-47.5			55-56.5			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	7090		21.9	6720		22.1	3520		10.8	4340		11.1	3210		10.6	596 - 10,796
Antimony		UJ	13.1		UJ	13.2		UJ	6.5		UJ	6.7		UJ	6.3	0 - 29.6
Arsenic	0.95		0.55	1.3		0.55	0.73		0.54	0.49	J	1.1	0.43	J	0.53	0 - 10.5
Barium	187		2.2	342		2.2	43.9		1.1	94.6		1.1	93.6		1.1	0 - 548
Beryllium		U	0.44		U	0.44		U	0.22		U	0.22		U	0.21	0 - 0.6
Cadmium		UJ	1.1		UJ	1.1		UJ	0.54		UJ	0.56		UJ	0.53	0 - 2.1
Calcium	163000		43.8	**167000**		44.1	62600		21.5	99300		22.2	32600		21.1	0 - 166,119
Chromium	11.1	J	2.2	11.6	J	2.2	3.4	J	1.1	**15.6**	J	1.1	10.2		1.1	0.8 - 12.0
Cobalt	2.2		2.2	2.2		2.2	1.5		1.1	2.1		1.1	1.4		1.1	0 - 4.0
Copper	2.4	J	4.4	2.7	J	4.4	1.5	J	2.2	4.3		2.2	2.3		2.1	0 - 10.1
Iron	4560	J	21.9	4600	J	22.1	2560	J	10.8	3370	J	11.1	2640		10.6	0 - 8,564
Lead	3	J	0.55	4.2	J	0.55	1.7	J	0.54	1.6	J	0.56	1.3		0.53	0 - 18.4
Magnesium	5700	J	43.8	5390	J	44.1	4180	J	21.5	**16300**	J	22.2	3980		21.1	0 - 9,912
Manganese	48.5	J	2.2	51.9	J	2.2	24.1	J	1.1	52.8	J	1.1	46.6		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	7.1	J	8.8	7	J	8.8	4.3	J	4.3	5	J	4.4	3.2	J	4.2	0 - 9.7
Potassium	1090		1090	1160		1100	735		538	679		555	585		528	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		U	2.2		U	2.2		U	1.1		U	1.1		U	1.1	0 - 1.8
Sodium		U	1090		UJ	1100		U	538		U	555		U	528	0 - 834
Thallium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	2.2		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	16.3		2.2	15.7		2.2	10.6		1.1	18.7		1.1	9.4		1.1	1.7 - 25.0
Zinc	11.8	J	4.4	11.8	J	4.4	5.7	J	2.2	6.6	J	2.2	6.1		2.1	0 - 20.7
bis(2-Ethylhexyl)phthalate		U	360	43	J	360		U	360		U	370		U	350	
2-Butanone (MEK)	17		11		U	11		U	11		U	11		U	11	
Acetone	130	J	11	11	J	11		UJ	11	26	J	11		U	11	
Methylene chloride	1.3	J	5.5		U	5.5		U	5.4		U	5.6		U	5.3	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 26 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-27

Chemical	Sample Interval (ft bgs)															Background Range[1]
	21-23			24.5-26.5			34.5-36.5			44.5-46			57.5-58.1			
	Result	ual	R.L.	Result	ual	R.L.	Result	Qual	R.L.	Result	Qual	R.L.	Result	Qual.	R.L.	
Aluminum	4410		10.8	5030		10.7	6270		10.9	3460		10.6	3060		10.4	596 - 10,796
Antimony		UJ	6.5		UJ	6.4		UJ	6.5		UJ	6.3		UJ	6.3	0 - 29.6
Arsenic	3.9		0.54	4.4		0.53	1.2		0.54	0.32	J	1.1	0.49	J	1	0 - 10.5
Barium	92		1.1	225		1.1	164		1.1	135		1.1	31		1	0 - 548
Beryllium	0.31		0.22	0.3		0.21	0.25		0.22		U	0.21		U	0.21	0 - 0.6
Cadmium		UJ	0.54		UJ	0.53		UJ	0.54		UJ	0.53		UJ	0.52	0 - 2.1
Calcium	43800		21.6	48200		21.4	57900		21.8	51900		21.1	68700		20.9	0 - 166,119
Chromium	7.1	J	1.1	8.5	J	1.1	5.5	J	1.1	3.5	J	1.1	5.2		1	0.8 - 12.0
Cobalt	1.9		1.1	2.3		1.1	0.98	J	1.1	1.5		1.1	1.3		1	0 - 4.0
Copper	3.4		2.2	4.2		2.1	2.6		2.2	1.9	J	2.1	1.8	J	2.1	0 - 10.1
Iron	5230	J	10.8	5230	J	10.7	4150	J	10.9	2340	J	10.6	2180		10.4	0 - 8,564
Lead	4.2	J	0.54	4	J	0.53	2.1	J	0.54	0.63	J	0.53	1.4		1	0 - 18.4
Magnesium	2240	J	21.6	3200	J	21.4	9100	J	21.8	6340	J	21.1	5060		20.9	0 - 9,912
Manganese	40.7	J	1.1	95.6	J	1.1	38	J	1.1	30.5	J	1.1	36.3		1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.1	0 - 0.2
Nickel	6.3	J	4.3	6.2	J	4.3	4.2	J	4.4	3.6	J	4.2	2.8	J	4.2	0 - 9.7
Potassium	1380		541	1250		534	1100		545	698		528	535		522	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1	0 - 36.8
Silver		U	1.1		U	1.1		U	1.1		U	1.1		U	1	0 - 1.8
Sodium		U	541		U	534		U	545		U	528		U	522	0 - 834
Thallium		UJ	0.54		UJ	1.1		UJ	1.1		UJ	0.53		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.4	NA
Vanadium	**36.7**		1.1	**31.1**		1.1	17.6		1.1	7.4		1.1	8.7		1	1.7 - 25.0
Zinc	12.7	J	2.2	14.3	J	2.1	10.2	J	2.2	6.6	J	2.1	5.3		2.1	0 - 20.7
Acetone	5	J	11		U	11	17		11	4.2	J	11	11		10	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 27 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-28

Chemical	Sample Interval (ft bgs) 0-.5			20-21.5			25-27			35-37			45-47			55-57			Backgrour Range[1]
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	ual	R.L.	
Aluminum	9700		10.4	3720	J	55.5	7070	J	22.4	6250	J	10.9	4600	J	10.4	4340		10.5	596 - 10,75
Antimony		R			UJ	33.3		UJ	13.5		UJ	6.5		UJ	6.2		UJ	6.3	0 - 29.6
Arsenic	1.7		0.52	0.93		0.56	0.81		0.56	0.52	J	1.1	0.43	J	0.52	0.36	J	1	0 - 10.5
Barium	281	J	1	201	J	5.6	170	J	2.2	95	J	1.1	49.7	J	1	30.6		1	0 - 548
Beryllium	0.46		0.21		U	1.1	0.29	J	0.45	0.21	J	0.22	0.13	J	0.21	0.13	J	0.21	0 - 0.6
Cadmium		UJ	0.52		U	2.8		U	1.1		UJ	0.54		UJ	0.52		UJ	0.52	0 - 2.1
Calcium	78500		20.7	**284000**		111	131000		44.8	61100		21.8	27000		20.8	17100		21	0 - 166,11
Chromium	7.4		1		U	5.6	4.4		2.2	4.6		1.1	3.9		1	3.9		1	0.8 - 12.0
Cobalt	3.3		1		U	5.6	3		2.2	1.1		1.1	1.6		1	1.3		1	0 - 4.0
Copper	6.3		2.1	3.3	J	11.1	2.4	J	4.5	1.8	J	2.2	1.5	J	2.1	1.6	J	2.1	0 - 10.1
Iron	7520		10.4	2360	J	55.5	4150	J	22.4	4230	J	10.9	3590	J	10.4	3320		10.5	0 - 8,564
Lead	9.6		1	1.8		0.56	2.7		0.56	2.5		0.54	1.8		0.52	1.8		0.52	0 - 18.4
Magnesium	3050		20.7	4610		111	6380		44.8	5860		21.8	3760		20.8	4060		21	0 - 9,912
Manganese	130	J	1	22.1	J	5.6	39.1	J	2.2	38.1	J	1.1	44.3	J	1	42.6		1	0 - 151.8
Mercury		U	0.1		U	0.11		U	0.11		U	0.11		U	0.1		U	0.1	0 - 0.2
Nickel	7.5		4.1		U	22.2	6.9	J	9	3.5	J	4.4	3.7	J	4.2	2.5	J	4.2	0 - 9.7
Potassium	2210		518	855	J	2780	1100	J	1120	1120		544	963		521	853		524	0 - 2,531
Selenium		UJ	1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1		UJ	0.52	0 - 36.8
Silver		U	1		UJ	5.6		UJ	2.2		UJ	1.1		UJ	1		U	1	0 - 1.8
Sodium		U	518		U	2780		U	1120		U	544		U	521		U	524	0 - 834
Thallium		U	1		UJ	2.2		UJ	1.1		UJ	1.1		UJ	0.52		R		0 - 6.2
Tin	NA			NA			NA			NA			NA			NA	U	10.5	NA
Vanadium	17.3		1	9.4		5.6	13.5		2.2	15.9		1.1	9.1		1	9.7		1	1.7 - 25.0
Zinc	**21.8**		2.1	10.3	J	11.1	10.5		4.5	10		2.2	8		2.1	7.7		2.1	0 - 20.7
Acetone		U	10		U	11	6	J	11	3	J	11	1.9	J	10		U	10	
Total Organic Carbon	0.57		0.2																
Total Petroleum Hydrocarbons	85.6		41.4		U	44.4		U	44.8		U	43.5		U	41.6		U	41.9	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 28 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-29

Chemical	Sample Interval (ft bgs)															Background Range[1]
	14-16			20-22			30-32			40-42			50-51.8			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	7560	J	11.3	6030	J	22.6	5290	J	10.9	4540	J	22	4080		11	596 - 10,796
Antimony		UJ	6.8		UJ	13.5		UJ	6.5		UJ	13.2		UJ	6.6	0 - 29.6
Arsenic	1.7		0.56	0.89		0.56	0.74		0.54	0.84		0.55	0.56		0.55	0 - 10.5
Barium	1920	J	1.1	922	J	2.3	130	J	1.1	90.1	J	2.2	50.9		1.1	0 - 548
Beryllium	0.49		0.23	0.31	J	0.45	0.16	J	0.22		U	0.44	0.14	J	0.22	0 - 0.6
Cadmium		U	0.56		U	1.1		UJ	0.54		U	1.1		UJ	0.55	0 - 2.1
Calcium	74700		22.6	186000		45.1	78500		21.8	124000		44	62000		21.9	0 - 166,119
Chromium	6.1		1.1	3.6		2.3	4.7		1.1	3.9		2.2	5.3		1.1	0.8 - 12.0
Cobalt	2.2		1.1	1.9	J	2.3	1.4		1.1	2.2		2.2	1	J	1.1	0 - 4.0
Copper	3.8		2.3	2.7	J	4.5	1.7	J	2.2	2.1	J	4.4	1.6	J	2.2	0 - 10.1
Iron	5590	J	11.3	3570	J	22.6	3610	J	10.9	3320	J	22	3440		11	0 - 8,564
Lead	5.8		0.56	2.9		0.56	2.3		0.54	1.8		0.55	2		0.55	0 - 18.4
Magnesium	3650		22.6	5330		45.1	5800		21.8	5150		44	5410		21.9	0 - 9,912
Manganese	74.3	J	1.1	33.7	J	2.3	36.3	J	1.1	41.8	J	2.2	36.7		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	8.3		4.5	5.6	J	9	4.6		4.4	4.5	J	8.8	4.1	J	4.4	0 - 9.7
Potassium	2040		565	1290		1130	886		544	757	J	1100	679		548	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1		UJ	1.1	0 - 36.8
Silver		UJ	1.1		UJ	2.3		UJ	1.1		UJ	2.2		U	1.1	0 - 1.8
Sodium		U	565		U	1130		U	544		U	1100		U	548	0 - 834
Thallium	0.12	J	1.1		UJ	2.3		UJ	1.1	0.13	J	1.1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	11	NA
Vanadium	16.3		1.1	10.9		2.3	13.7		1.1	9		2.2	9.7		1.1	1.7 - 25.0
Zinc	13.4		2.3	10.2		4.5	8		2.2	8.6		4.4	7.8		2.2	0 - 20.7
Acetone	6.3	J	11		UJ	11		U	11		U	11	4.3	J	11	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 29 of 30

Source: Woodward-Clyde, 1998

Table 4-3
Metals Results and Detected Concentrations for Other Chemical Compounds
SWMU 113

BORING 113-30

Chemical	Sample Interval (ft bgs)															Background[1] Range
	14.5-16.5			20-21.3			30-32			40-42			50-52			
	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	Result	Qual.	R.L.	
Aluminum	7330	J	11.2	3690	J	54.6	4680	J	11	4240	J	10.7	3450		10.6	596 - 10,796
Antimony		UJ	6.7		UJ	32.8		UJ	6.6		UJ	6.4		UJ	6.3	0 - 29.6
Arsenic	1.6		0.56	0.82		0.55	0.54	J	1.1	0.55		0.54	0.34	J	1.1	0 - 10.5
Barium	279	J	1.1	**3470**	J	5.5	168	J	1.1	125	J	1.1	26.8		1.1	0 - 548
Beryllium	0.48		0.22		U	1.1		U	0.22		U	0.21		U	0.21	0 - 0.6
Cadmium		UJ	0.56		UJ	2.7		UJ	0.55		UJ	0.54		UJ	0.53	0 - 2.1
Calcium	69200		22.3	**229000**		109	100000		22	45100		21.4	14900		21.2	0 - 166,119
Chromium	7.6		1.1		U	5.5	4.9		1.1	4.1		1.1	4.1		1.1	0.8 - 12.0
Cobalt	2.9		1.1		U	5.5	1.4		1.1	1.4		1.1	1.3		1.1	0 - 4.0
Copper	4.3		2.2		U	10.9	1.8	J	2.2	2.3		2.1	1.5	J	2.1	0 - 10.1
Iron	6560	J	11.2	2690	J	54.6	2960	J	11	2830	J	10.7	2710		10.6	0 - 8,564
Lead	5.4		2.8	1.9		0.55	2.1		0.55	1.4		0.54	1.2		0.53	0 - 18.4
Magnesium	4500		22.3	4450		109	7580		22	5720		21.4	4400		21.2	0 - 9,912
Manganese	81	J	1.1	22.6	J	5.5	28.3	J	1.1	34.8	J	1.1	33.4		1.1	0 - 151.8
Mercury		U	0.11		U	0.11		U	0.11		U	0.11		U	0.11	0 - 0.2
Nickel	**23.9**		4.5		U	21.8	3.7	J	4.4	3.8	J	4.3	3.1	J	4.2	0 - 9.7
Potassium	2200		559	683	J	2730	729		550	887		535	707		529	0 - 2,531
Selenium		UJ	1.1		UJ	1.1		UJ	11		UJ	1.1		UJ	1.1	0 - 36.8
Silver		UJ	1.1		UJ	5.5		UJ	1.1		UJ	1.1		U	1.1	0 - 1.8
Sodium		U	559		UJ	2730		U	550		U	535		U	529	0 - 834
Thallium		UJ	1.1		UJ	2.2		UJ	1.1		UJ	1.1		R		0 - 6.2
Tin	NA			NA			NA			NA			NA	U	10.6	NA
Vanadium	18.1		1.1	9.9		5.5	17.1		1.1	7.5		1.1	7.9		1.1	1.7 - 25.0
Zinc	13.7		2.2	8.5	J	10.9	7.1		2.2	7.8		2.1	6.1		2.1	0 - 20.7
Acetone		U	11	55		11		U	11	7.2	J	11	5.2	J	11	

(1) Woodward-Clyde. 1994. Concentrations of Selected Naturally Occurring Chemical Constituents in Soil and Groundwater, Cannon AFB, New Mexico.

U = Not Detected J = Estimated Value UJ = Estimated Reporting Limit NA = Not Analyzed

Results that are shaded and in bold are concentrations above the maximum background range.

* Metals concentrations are in milligrams per kilogram (mg/kg), organic concentrations are in micrograms per kilogram (µg/kg)

Page 30 of 30

Source: Woodward-Clyde, 1998

Table 5-1a
Confirmation and Backfill Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION CAFB1	CAFB2	CAFB3	CAFB4	CAFB5	CAFB6	CAFB7	CAFB8	CAFB9	CAFB10	CAFB13	CAFB14
Volatile Organic Compounds (EPA Method 8240) (ug/kg)												
Chloromethane	11 U	10 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
Bromomethane	11 U	10 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
Vinyl Chloride	11 U	10 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
Chloroethane	11 U	10 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
Methylene Chloride	14 B	17 B	10 B	13 B	15 B	22 B	13 B	12 B	16 B	21 B	15 B	16 B
Acetone	9 BJ	43 B	9 BJ	18 B	25 B	12 B	25 B	10 BJ	13 B	11 U	11 U	2 BJ
Carbon Disulfide	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Chloroform	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
2-Butanone	11 U	10 J	11 U	1 J	1 J	11 U	11 U	11 U	12 U	1 J	11 U	11 U
1,1,1-Trichloroethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Vinyl Acetate	11 U	10 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
Bromodichloromethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Trichloroethene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Dibromochloromethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Benzene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Bromoform	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
4-Methyl-2-Pentanone	11 U	10 U	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	1 J	11 U
2-Hexanone	11 U	3 BJ	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	2 BJ	11 U
Tetrachloroethene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Toluene	1 J	3 J	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Chlorobenzene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Ethylbenzene	2 J	4 J	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Styrene	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 U	5 U
Xylene (total)	3 J	12 +	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	2 J	5 U

Page 1 of 5

Source: IT Corp., 1995

Table 5-1a
Confirmation and Backfill Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION											
	CAFB1	CAFB2	CAFB3	CAFB4	CAFB5	CAFB6	CAFB7	CAFB8	CAFB9	CAFB10	CAFB13	CAFB14
Semivolatile Organic Compounds (EPA Method 8270) (ug/kg)												
Phenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
bis (2-Chloroethyl) Ether	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2-Chlorophenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
1,3-Dichlorobenzene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
1,4-Dichlorobenzene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Benzyl Alcohol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
1,2-Dichlorobenzene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2-Methylphenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2,2'-oxybis (1-Chloropropane)	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
4-Methylphenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
N-Nitroso-Di-n-Propylamine	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Hexachloroethane	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Nitrobenzene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Isophorone	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2-Nitrophenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2,4-Dimethylphenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Benzoic Acid	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
bis (2-Chloroethoxy) Methane	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2,4-Dichlorophenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
1,2,4-Trichlorobenzene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Naphthalene	350 U	45 J	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
4-Chloroaniline	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Hexachlorobutadiene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
4-Chloro-3-Methylphenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2-Methylnaphthalene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Hexachlorocyclopentadiene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2,4,6-Trichlorophenol	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2,4,5-Trichlorophenol	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
2-Chloronaphthalene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2-Nitroaniline	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
Dimethylpthalate	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Acenaphthylene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U

Page 2 of 5

Source: IT Corp., 1995

Table 5-1a
Confirmation and Backfill Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION											
	CAFB1	CAFB2	CAFB3	CAFB4	CAFB5	CAFB6	CAFB7	CAFB8	CAFB9	CAFB10	CAFB13	CAFB14
2,6-Dinitrotoluene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
3-Nitroaniline	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
Acenaphthene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	86 J	1700 U	1700 U
2,4-Dinitrophenol	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
4-Nitrophenol	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
Dibenzofuran	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
2,4-Dinitrotoluene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Diethylphthalate	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
4-Chlorophenyl-phenylether	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Fluorene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
4-Nitroaniline	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
4,6-Dinitro-2-Methylphenol	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
N-Nitrosodiphenylamine (1)	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
4-Bromophenyl-phenylether	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Hexachlorobenzene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Pentachlorophenol	1700 U	1700 U	1800 U	1700 U	1800 U	1800 U	1800 U	1800 U	1900 U	3600 U	8500 U	8400 U
Phenanthrene	350 U	340 U	370 U	360 U	120 J	370 U	360 U	360 U	380 U	760	1700 U	1700 U
Anthracene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	230 J	1700 U	1700 U
Di-n-Butylphthalate	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Fluoranthene	350 U	340 U	370 U	360 U	140 J	370 U	360 U	360 U	380 U	1100	1700 U	1700 U
Pyrene	350 U	340 U	370 U	360 U	120 J	370 U	360 U	360 U	380 U	1400	250 J	1700 U
Butylbenzylphthalate	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
3,3'-Dichlorobenzidine	710 U	690 U	740 U	720 U	730 U	730 U	730 U	730 U	770 U	1500 U	3500 U	3500 U
Benzo(a)Anthracene	350 U	340 U	370 U	360 U	60 J	370 U	360 U	360 U	380 U	740	1700 U	1700 U
Chrysene	350 U	340 U	370 U	360 U	61 J	370 U	360 U	360 U	380 U	640 J	1700 U	1700 U
bis(2-Ethylhexyl)Phthalate	38 U	340 U	45 J	49 J	370 U	52 J	42 J	70 J	380 U	730 U	1700 U	1700 U
Di-n-Octyl Phthalate	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	41 J	730 U	1700 U	1700 U
Benzo(b)Fluoranthene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	440 J	1700 U	1700 U
Benzo(k)Fluoranthene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	470 J	220 J	1700 U
Benzo(a)Pyrene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Indeno(1,2,3-cd)Pyrene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	230 J	1700 U	1700 U
Dibenz(a,h)Anthracene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U
Benzo(g,h,i)Perylene	350 U	340 U	370 U	360 U	370 U	370 U	360 U	360 U	380 U	730 U	1700 U	1700 U

Page 3 of 5

Source: IT Corp., 1995

Table 5-1a
Confirmation and Backfill Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION CAFB1	CAFB2	CAFB3	CAFB4	CAFB5	CAFB6	CAFB7	CAFB8	CAFB9	CAFB10	CAFB13	CAFB14
Pesticides/PCBs (EPA Method 8080) (ug/kg)												
alpha-BHC	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
gamma-BHC (lindane)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	15 U*	1 U	1 U
beta-BHC	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	35 U*	2 U	2 U
heptachlor	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U*	1 U	1 U
delta-BHC	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
aldrin	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4 U*	1 U	1 U
heptachlor epoxide	32 U	31 U	33 U	32 U	33 U	33 U	33 U	33 U	35 U	33 U	32 U	32 U
endosulfan I	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	6 U	5 C	5 U
DDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3.7 C	2.3 U	1 U
dieldrin	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
endrin	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	4 U*	2 U	2 U
DDD	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	5 U	4 U	4 U	4 U
endosulfan II	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U*	1 U	1 U
DDT	4 U	5.2 C	4 U	4 U	4 U	4 U	4 U	4.2 U	5 U	4 U	8.8 C	4 U
endrin aldehyde	8 U	8 U	9 U	9 U	9 U	9 U	9 U	9 U	9 U	9 U	8 U	8 U
endosulfan sulfate	21 U	21 U	22 U	22 U	22 U	22 U	22 U	22 U	23 U	22 U	21 U	21 U
methoxychlor	64 U	62 U	67 U	65 U	66 U	66 U	65 U	65 U	69 U	67 U	64 U	63 U
chlordane (technical)	5 U	5 U	6 U	5 U	6 U	6 U	5 U	5 U	6 U	33 U*	14 +	5 U
toxaphene	85 U	82 U	89 U	86 U	88 U	88 U	87 U	87 U	92 U	89 U	85 U	84 U
PCB-(Aroclor)-1221	21 U	21 U	22 U	22 U	22 U	22 U	22 U	22 U	23 U	22 U	21 U	21 U
PCB-(Aroclor)-1016	21 U	21 U	22 U	22 U	22 U	22 U	22 U	22 U	23 U	22 U	21 U	21 U
PCB-(Aroclor)-1232	21 U	21 U	22 U	22 U	22 U	22 U	22 U	22 U	23 U	22 U	21 U	21 U
PCB-(Aroclor)-1242	21 U	21 U	22 U	22 U	22 U	22 U	22 U	22 U	23 U	22 U	21 U	21 U
PCB-(Aroclor)-1248	21 U	21 U	22 U	22 U	22 U	22 U	22 U	22 U	23 U	22 U	21 U	21 U
PCB-(Aroclor)-1254	42 U	41 U	44 U	43 U	44 U	44 U	44 U	44 U	46 U	44 U	42 U	42 U
PCB-(Aroclor)-1260	42 U	41 U	44 U	43 U	44 U	44 U	44 U	44 U	46 U	44 U	42 U	42 U

Page 4 of 5

Source: IT Corp., 1995

Table 5-1a
Confirmation and Backfill Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION											
	CAFB1	CAFB2	CAFB3	CAFB4	CAFB5	CAFB6	CAFB7	CAFB8	CAFB9	CAFB10	CAFB13	CAFB14
Metals (EPA Methods 6010 & 7471) (mg/kg)												
Antimony	8 +	7 +	6 U	6 +	6 U	8 +	6 +	5 U	6 U	6 U	5 U	26 U
Arsenic	9 U	8 U	9 U	9 U	9 U	9 U	9 U	9 U	9 U	9 U	9 U	42 U
Barium	98.5 +	164 +	179 +	73.8 +	74.6 +	60.7 +	122 +	83.7 +	524 +	136 +	388 +	225 +
Beryllium	0.9 +	0.8 +	0.7 +	0.7 +	0.8 +	0.8 +	0.8 +	0.8 +	0.4 +	0.7 +	0.6 +	0.7 +
Cadmium	0.5 U	0.5 U	0.6 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 +	0.6 U	0.7 +	0.5 +	2.6 +
Chromium	17 +	14 +	11 +	13 +	13 +	14 +	21 +	15 +	8 +	13 +	12 +	13 +
Copper	16 +	10 +	8 +	13 +	10 +	9 +	10 +	9 +	4 +	12 +	9 +	5 U
Iron	15500 +	13500 +	11000 +	12400 +	12300 +	13400 +	12800 +	13400 +	4700 +	11200 +	10200 +	10600 +
Manganese	177 +	226 +	200 +	177 +	194 +	217 +	194 +	198 +	54.8 +	185 +	198 +	174 +
Nickel	11 +	11 +	10 +	17 +	12 +	11 +	12 +	12 +	6 +	10 +	8 +	11 +
Potassium	2540 +	2340 +	1940 +	2410 +	2380 +	2400 +	2700 +	2700 +	1150 +	2180 +	1900 +	2160 +
Selenium	9 U	9 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	48 U
Silver	0.5 U	0.5 U	0.8 +	0.5 U	0.6 +	0.6 +	0.8 +	0.5 U	3.2 +	1.1 +	1 U	2.6 U
Sodium	134 +	99 +	116 +	143 +	107 +	92 +	124 +	175 +	109 +	75 +	131 +	118 +
Thallium	24 +	32 +	19 +	17 +	22 +	16 +	21 +	21 +	14 U	13 U	20 +	63 U
Vanadium	30 +	25 +	21 +	21 +	21 +	23 +	26 +	24 +	15 +	23 +	21 +	25 +
Zinc	76.6 +	50.9 +	20.9 +	111 +	22.7 +	24.2 +	91.9 +	30.2 +	11.6 +	47.6 +	31.5 +	27.4 +
Molybdenum	1 U	1 +	1 U	1 U	1 U	1 U	1 U	1 U	6 U	1 U	1 U	5 U
Mercury	0.14 +	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.1 U
Lead	22 +	25 +	21 +	12 +	13 +	15 +	35 +	14 +	29 U*	52 +	21 +	26 U*
Total Petroleum Hydrocarbons (EPA Methods 8015 Modified & 418.1) (mg/kg)												
TPH (diesel fuel)	5 U	11 +	5 U	5 U	5 U	5 U	5 U	5 U	5 U	12 +	5 U	5 U
TPH (JP-4)	5 U	16 +	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRPH	408 +	181 +	295 +	162 +	50 U	495 +	332 +	311 +	1380 +	162 +	577 +	177 +

Page 5 of 5

Source: IT Corp., 1995

TABLE 3-3

GROUNDWATER ELEVATIONS
DURING STATIC, INTERMEDIATE DRAWDOWN, AND STEADY STATE CONDITIONS

		STATIC CONDITION June 29,2000 (11:30)		INTERMEDIATE DRAWDOWN June 30,2000 (08:30)			MAXIMUM DRAWDOWN July 02,2000 (17:15)		
Monitoring Well	TOC Elevation (ft, MSL)	Depth to Water (ft, BTOC)	Groundwater Elev. (ft, MSL)	Depth to Water (ft, BTOC)	Groundwater Elev. (ft, MSL)	Drawdown (ft)	Depth to Water (ft, BTOC)	Groundwater Elev. (ft, MSL)	Drawdown (ft)
EXW 1	85.74	8.75	76.99	9.50	76.24	-0.75	10.96	74.78	-2.21
ETMW 1	87.64	10.98	76.66	11.67	75.97	-0.69	12.43	75.21	-1.45
ETMW 2	88.09	11.43	76.66	12.10	75.99	-0.67	12.30	75.79	-0.87
ETMW 3	91.28	13.80	77.48	13.87	77.41	-0.07	13.98	77.3	-0.18
ETMW 4	90.63	13.53	77.1	13.69	76.94	-0.16	13.83	76.8	-0.30
ETMW 5	86.87	10.51	76.36	10.71	76.16	-0.20	10.89	75.98	-0.38
PZ 1	88.61	12.16	76.45	12.50	76.11	-0.34	12.65	75.96	-0.49
PZ 2	86.27	9.04	77.23	9.18	77.09	-0.14	9.26	77.01	-0.22
MW1	85.88	9.39	76.49	9.62	76.26	-0.23	9.51	76.37	-0.12
MW6	85.73	9.57	76.16	9.68	76.05	-0.11	9.77	75.96	-0.20
MW 9D	90.98	13.38	77.6	13.45	77.53	-0.07	13.58	77.4	-0.20
MW 10D	91.79	11.88	79.91	11.83	79.96	0.05	11.97	79.82	-0.09
ASMW 1	94.98	17.35	77.63	17.39	77.59	-0.04	17.46	77.52	-0.11
SG1	82.16	5.52	76.64	5.66	76.5	-0.14	5.55	76.61	-0.03
SG2	80.64	5.42	75.22	5.53	75.11	-0.11	5.45	75.19	-0.03

NOTES:
TOC = top of casing
MSL = mean sea level
ft = feet
BTOC = below top of casing
TOC elevations taken from ?

Table 5-1b
Profile Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION CAFB11	CAFB12
TCLP Volatile Organic Compounds (EPA Method 8240) (mg/L)		
Benzene	0.025 U	0.025 U
Carbon Tetrachloride	0.025 U	0.025 U
Chlorobenzene	0.025 U	0.025 U
Chloroform	0.025 U	0.025 U
1,2–dichloroethane	0.025 U	0.025 U
1,1–dichloroethene	0.025 U	0.025 U
Methyl ethyl ketone	0.050 U	0.050 U
Tetrachloroethene	0.025 U	0.025 U
Trichloroethene	0.025 U	0.025 U
Vinyl chloride	0.025 U	0.025 U
TCLP Semivolatile Organic Compounds (EPA Method 8270) (mg/L)		
Total Cresols	0.04 U	0.04 U
1,4–dichlorobenzene	0.04 U	0.04 U
2,4–dinitrotoluene	0.04 U	0.04 U
hexachlorobenzene	0.04 U	0.04 U
hexachloro–1,3–butadiene	0.04 U	0.04 U
hexachloroethane	0.04 U	0.04 U
nitrobenzene	0.04 U	0.04 U
pentachlorophenol	0.20 U	0.20 U
pyridine	0.40 U	0.40 U
2,4,5–trichlorophenol	0.20 U	0.20 U
2,4,6–trichlorophenol	0.04 U	0.04 U
TCLP Pesticides (EPA Method 8080) (mg/L)		
Lindane	0.008 U	0.008 U
Heptachlor	0.001 U	0.001 U
Heptachlor epoxide	0.001 U	0.001 U
Endrin	0.004 U	0.004 U
Methoxychlor	0.08 U	0.08 U
Chlordane	0.006 U	0.006 U
Toxaphene	0.1 U	0.1 U

U – Not detected (conc. is detection limit) * – Elevated detection limit + – positive result

Page 1 of 2

Source: IT Corp., 1995

Table 5-1b
Profile Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION CAFB11	CAFB12
TCLP Metals (EPA Method 6010) (mg/L)		
Antimony	0.25 U	0.25 U
Arsenic	0.08 U	0.08 U
Barium	1.3 +	1.2 +
Beryllium	0.002 +	0.003 +
Cadmium	0.005 U	0.006 +
Chromium	0.03 +	0.03 +
Copper	0.02 +	0.02 +
Iron	0.26 +	0.32 +
Manganese	1.7 +	2 +
Nickel	0.1 U	0.1 U
Potassium	4 +	4 +
Selenium	0.45 U	0.45 U
Silver	0.034 +	0.028 +
Sodium	115 +	207 +
Thallium	0.6 U	0.6 U
Vanadium	0.01 U	0.05 U
Zinc	0.29 +	0.24 +
Molybdenum	0.05 U	0.05 U
Mercury	0.0002 U	0.0002 U
TCLP Total Petroleum Hydrocarbons (EPA Methods 8015 Mod. & 418.1)		
TPH (diesel fuel) (ug/L)	125 U	125 U
TPH (JP-4) (ug/L)	125 U	125 U
TRPH (mg/L)	3 +	2 +

Page 1 of 2

Source: IT Corp., 1995

Table 5-1c
Confirmation and Profile Samples
DP-33

COMPOUND	SAMPLE CONCENTRATION CAFB15	CAFB16	CAFB17
Total Petroleum Hydrocarbons (EPA Method 418.1)			
TRPH (mg/L)	54 U	893 +	54110 +

Page 1 of 1
Source: IT Corp., 1995

Table 5-1d
Backfill Sample
DP-33

Volatile Organic Compounds (EPA Method 8240) (ug/kg)	
Chloromethane	10 U
Bromomethane	10 U
Vinyl Chloride	10 U
Chloroethane	10 U
Methylene Chloride	5 U
Acetone	6 BJ
Carbon Disulfide	5 U
1,1-Dichloroethene	5 U
1,1-Dichloroethane	5 U
1,2-Dichloroethene (total)	5 U
Chloroform	5 U
1,2-Dichloroethane	5 U
2-Butanone	10 U
1,1,1-Trichloroethane	5 U
Carbon Tetrachloride	5 U
Vinyl Acetate	10 U
Bromodichloromethane	5 U
1,2-Dichloropropane	5 U
cis-1,3-Dichloropropene	5 U
Trichloroethene	5 U
Dibromochloromethane	5 U
1,1,2-Trichloroethane	5 U
Benzene	5 U
trans-1,3-Dichloropropene	5 U
Bromoform	5 U
4-Methyl-2-Pentanone	10 U
2-Hexanone	10 U
Tetrachloroethene	5 U
1,1,2,2-Tetrachloroethane	5 U
Toluene	5 U
Chlorobenzene	5 U
Ethylbenzene	5 U
Styrene	5 U
Xylene (total)	5 U

Semivolatile Organic Compounds (EPA Method 8270) (ug/kg)	
Phenol	340 U
bis (2-Chloroethyl) Ether	340 U
2-Chlorophenol	340 U
1,3-Dichlorobenzene	340 U
1,4-Dichlorobenzene	340 U
Benzyl Alcohol	340 U
1,2-Dichlorobenzene	340 U
2-Methylphenol	340 U
2,2'-oxybis (1-Chloropropane)	340 U
4-Methylphenol	340 U
N-Nitroso-Di-n-Propylamine	340 U
Hexachloroethane	340 U
Nitrobenzene	340 U
Isophorone	340 U
2-Nitrophenol	340 U
2,4-Dimethylphenol	340 U
Benzoic Acid	1600 U
bis (2-Chloroethoxy) Methane	340 U
2,4-Dichlorophenol	340 U
1,2,4-Trichlorobenzene	340 U
Naphthalene	340 U
4-Chloroaniline	340 U
Hexachlorobutadiene	340 U
4-Chloro-3-Methylphenol	340 U
2-Methylnaphthalene	340 U
Hexachlorocyclopentadiene	340 U
2,4,6-Trichlorophenol	340 U
2,4,5-Trichlorophenol	1600 U
2-Chloronaphthalene	340 U
2-Nitroaniline	1600 U
Dimethylphthalate	340 U
Acenaphthylene	340 U

2,6-Dinitrotoluene	340 U
3-Nitroaniline	1600 U
Acenaphthene	340 U
2,4-Dinitrophenol	1600 U
4-Nitrophenol	1600 U
Dibenzofuran	340 U
2,4-Dinitrotoluene	340 U
Diethylphthalate	340 U
4-Chlorophenyl-phenylether	340 U
Fluorene	340 U
4-Nitroaniline	1600 U
4,6-Dinitro-2-Methylphenol	1600 U
N-Nitrosodiphenylamine (1)	340 U
4-Bromophenyl-phenylether	340 U
Hexachlorobenzene	340 U
Pentachlorophenol	1600 U
Phenanthrene	340 U
Anthracene	340 U
Di-n-Butylphthalate	100 J
Fluoranthene	340 U
Pyrene	340 U
Butylbenzylphthalate	340 U
3,3'-Dichlorobenzidine	340 U
Benzo(a)Anthracene	340 U
Chrysene	340 U
bis(2-Ethylhexyl)Phthalate	340 U
Di-n-Octyl Phthalate	340 U
Benzo(b)Fluoranthene	340 U
Benzo(k)Fluoranthene	340 U
Benzo(a)Pyrene	340 U
Indeno(1,2,3-cd)Pyrene	340 U
Dibenz(a,h)Anthracene	340 U
Benzo(g,h,i)Perylene	340 U

Page 1 of 2

Source: IT Corp., 1995

Table 5-1d
Backfill Sample
DP-33

Pesticides/PCBs (EPA Method 8080) (ug/kg)	
alpha-BHC	1 U
gamma-BHC (lindane)	1 U
beta-BHC	2 U
heptachlor	1 U
delta-BHC	3 U
aldrin	1 U
heptachlor epoxide	30 U
endosulfan I	5 U
DDE	1 U
dieldrin	1 U
endrin	2 U
DDD	4 U
endosulfan II	1 U
DDT	4 U
endrin aldehyde	8 U
endosulfan sulfate	20 U
methoxychlor	60 U
chlordane (technical)	5 U
toxaphene	80 U
PCB-(Aroclor)-1221	20 U
PCB-(Aroclor)-1016	20 U
PCB-(Aroclor)-1232	20 U
PCB-(Aroclor)-1242	20 U
PCB-(Aroclor)-1248	20 U
PCB-(Aroclor)-1254	40 U
PCB-(Aroclor)-1260	40 U

Metals (EPA Methods 6010 & 7471) (mg/kg)	
Antimony	25 U
Arsenic	40 U
Barium	450 +
Beryllium	0.6 +
Cadmium	2.5 U
Chromium	14 +
Copper	5 U
Iron	6760 +
Manganese	86.2 +
Nickel	13 +
Potassium	1990 +
Selenium	45 U
Silver	2.5 U
Sodium	156 +
Thallium	60 U
Vanadium	16 +
Zinc	21.6 +
Molybdenum	5 U
Mercury	0.1 U
Lead	27 U

Total Petroleum Hydrocarbons (EPA Methods 8015 Mod. & 418.1) (mg/kg)	
TPH (diesel fuel)	5 U
TPH (JP-4)	5 U
TRPH	54 U

Page 2 of 2

Source: IT Corp., 1995

Table 6-1a
Concentration (µg/kg) of VOCs
SWMU 7

Borehole Number	Cannon Number	Depth (ft.)	Chemical: Toluene	Acetone	1,1,1-Trichloroethane	Xylene
1	CAN007-1291-031A	Surface	15J	10UJ	5J	7J
	CAN007-1291-032C	5.0	20J (RE)	40 (RE)	11U	11J (RE)
	CAN007-1291-032C	5.0	11J	11U		11U
2	CAN007-1292-031A	Surface	11U	11U	11U	11U
	CAN007-1292-032C	5.0	11U	11U	11U	11U
3	CAN007-1293-031A	Surface	6J	10UJ	10U	10U
	CAN007-1293-032C	5.0	11U	24J	11U	11U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
RE = laboratory repeat
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Sciences, Inc., 1993

Table 6-1b
Concentration (mg/kg) of Total Metals
SWMU 7

Borehole Number	Sample Number (CAN007-129)	Sample Depth (feet)	Arsenic		Chromium		Mercury		Nickel
1	1-021A	0	5.2	J	38.7	J	0.01	U	8.1
	1-022B	2.5	2.7	J	8.1	J	0.02	U	8.2
	1-023C	5	2.1	J	5.5	J	0.01	U	7.3
(QAD)	1-721C	5	3.1	UJ	8		0.2		
(QCD)	1-821C	5	2.2	J	5.5	J	0.01	U	7.1
	1-024D	10	0.98	J	6.5	J	0.01	U	7.5
2	2-021A	0	31.8	J	20.6	J	0.01	U	7.5
	2-022B	2.5	13.6	J	7.6	J	0.02	U	8.2
	2-023C	5	3.1	J	8		0.02	U	9.8
	2-024D	10	4.3	J	5.2	J	0.02	U	7.8
3	3-021A	0	4.8	J	15.6	J	0.01	U	7.5
	3-022B	2.5	2.8	J	6.3	J	0.07	U	6.3
	3-023C	5	3.3	J	3.6	J	0.02	U	6.4
	3-024D	10	4.4	J	5.3	J	0.01	U	7
Background (95% UCL) (1)			15.50		12.50		0.13		9.00

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 6-2a
Summary of Soil Sample Results
SWMU 7

SUMMARY OF SWMU 7 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals >bkgd* mg/Kg
1	8	OWS	ND	<20	10	NT	NT	NT	NT	NT
2	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
3	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
4	8	OWS	ND	<20	<50	ND	ND	NT	NT	NT
5	8	OWS	ND	<20	<50	NT	NT	NT	NT	NT
6	8	OWS	ND	<20	<50	ND	ND	NT	NT	NT
7	8	OWS	NT	NT	NT	NT	ND	ND	ND[1]	< bkgd
8	n/a	excavated material	NT	NT	NT	ND	ND	NT	NT	NT
9	NOT	USED	NT	NT	NT	NT	NT	NT	NT	NT
10	n/a	excavated material	NT	NT	NT	NT	NT	NT	NT	NT

[1] Di-n-butylphthalate at 10 mg/Kg
ND indicates non-detect
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 6-2b
Maximum Soil Sample Concentrations
SWMU 7

SWMU 7 Maximum Soil Sample Concentrations						
Sample No.	Total Metals mg/Kg		TCLP Metals mg/L	Background Conc. Region VI/ Cannon AFB' mg/Kg		Region VI Residential RBSL mg/Kg
7	Arsenic	< 3.0	< 0.40	1.1-16.7	3.6	0.32 C
	Barium	215	0.7	430	805	5300 N
	Chromium	6.8	0.04	38	13.3	31 C
	Nickel	8.4	NT	16	11.4	1500 N
	Lead	6.7	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C – carcinogenic
'CAFB Background Investigation, 1997
NT – not tested

Source: US Army Corps of Engineers, 1999

Table 7-1a
Concentration (µg/kg) of VOCs
SWMU 9

Borehole Number	Cannon Number	Depth (ft.)	Chemical			
			Toluene	Acetone	Xylene	Tetrachloro ethene
1	CAN009-AWD1-031A	Surface	11U	28	R	14
	CAN009-AWD1-032D	10.0	12U	12U	12U	12U
2	CAN009-AWD2-031A	Surface	56U	56U	56U	56U
	CAN009-AWD2-032D	10.0	11U	16	11U	11U
	CAN009-AWD2-831D			11U (QCD)		
3	CAN009-AWD3-031A	Surface	58U	250	58U	58U
	CAN009-AWD3-032D	10.0	11U	R	11U	11U
4	CAN009-AWD4-031A	Surface	43J	170	52J	58U
	CAN009-AWD4-032D	10.0	11U	11U	11U	11U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QCD = duplicate analyzed at the same lab as the normal sample.

Source: LRL Sciences, Inc., 1993

Table 7-1b
Concentration (mg/kg) of Total Metals
SWMU 9

Borehole Number	Sample Number (CAN009-AWD)	Sample Depth (feet)	Barium		Chromium		Nickel
1	1-021A	0	**840**	J	**19.5**	J	5.9
	1-022C	5	161	J	8.1	J	7.3
	1-023D	10	**1380**	J	3.2	J	3.6
(QAD)	1-721D	10	**1240**		5		4.5
(QCD)	1-821D	10	181	J	5.8	J	5.1
	1-024E	15	100	J	7.3	J	6.8
	1-025F	20	97.7	J	4.3	J	3
2	2-021A	0	623	J	**22.3**	J	7.7
	2-022C	5	149	J	11.3	J	8.4
	2-023D	10	256	J	5.6	J	5.9
(QAD)	2-721D	10	207		7.5		5.8
(QCD)	2-821D	10	171	J	6.1	J	6.4
	2-024E	15	99.4	J	8	J	6.5
	2-025F	20	532	J	5.8	J	4.8
3	3-021A	0	603	J	**17.7**	J	**10.5**
	3-022C	5	220	J	5.1	J	6.1
	3-023D	10	274	J	5.3	J	5.7
	3-024E	15	184	J	7.2	J	6.7
	3-025F	20	253	J	5.9	J	4.3
4	4-021A	0	457	J	**26.9**	J	10
	4-022C	5	215	J	**13.1**	J	8.5
	4-023D	10	**820**	J	5.1	J	4.4
	4-024E	15	86.7	J	8	J	7.4
	4-025F	20	55.6	J	6.1		4.3
Background (95% UCL) (1)			642.00		12.50		9.00

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 7-2a
Summary of Soil Sample Results
SWMU 9

SUMMARY OF SWMU 9 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals >bkgd* mg/Kg
1	8	Sandtrap	ND	<20	<10	NT	NT	NT	NT	NT
2	8	Sandtrap	ND	<20	<10	NT	NT	NT	NT	NT
3	8	Sandtrap	0.8	<100	<10	ND	ND	NT	NT	NT
4	8	Sandtrap	ND	20	<10	NT	NT	NT	NT	NT
5	8	Sandtrap	ND	<100	<10	NT	NT	NT	NT	NT
6	8	Sandtrap	0.4	<20	<10	NT	NT	NT	NT	NT
7	4	Sandtrap	1.3	<100	<50	ND	ND	NT	NT	NT
8	4	Sandtrap	1.7	<100	<50	NT	NT	NT	NT	NT
9	8	Sandtrap	NT	NT	NT	NT	ND	ND	ND[1]	< bkgd
10	n/a	excavated soil	NT	NT	NT	ND	ND	NT	NT	NT
11	6	trench floor	NT	NT	NT	NT	NT	NT	NT	NT
12	6	trench floor	0.3	<100	<50	ND	ND	NT	NT	NT
13	6	trench floor	0.2	<100	<10	NT	NT	NT	NT	NT
14	6	trench floor	1.4	<100	<10	NT	NT	NT	NT	NT
15	6	trench floor	2.1	<100	<10	NT	NT	NT	NT	NT
16	n/a	excavated soil	NT	NT	NT	ND	ND	NT	NT	NT
17	3	trench sidewall	22.3	<100	<300	ND	ND	NT	NT	NT
18	3	trench sidewall	0.3	<100	<10	NT	NT	NT	NT	NT
19	3	trench sidewall	ND	<100	<50	NT	NT	NT	NT	NT
20	3	trench sidewall	ND	<100	<10	NT	NT	NT	NT	NT

[1] Only contaminant identified: Di-n-butylphalate at 15 mg/Kg. ND indicates non-detect
ND indicates non-detect
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 7-2b
Maximum Soil Sample Concentrations
SWMU 9

SWMU 9 Maximum Soil Sample Concentrations						
Sample No.	Total Metals mg/Kg		TCLP Metals mg/L	Background Conc. Region V1/ Cannon AFB' mg/Kg		Region VI Residential RBSL mg/Kg
9	Arsenic	< 3.0	< 0.40	1.1-16.7	3.6	0.32 C
	Barium	155	1.2	430	805	5300 N
	Chromium	4.4	< 0.02	38	13.3	31 C
	Nickel	4.5	NT	16	11.4	1500 N
	Selenium	2.5	< 0.05	10-18	1.1	380 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

'CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 8-1a
Concentration (µg/kg) of VOCs
SWMU 32A

Borehole Number	Cannon Number	Depth (ft.)	Chemical	
			Acetone	Xylene
1	CAN32A-1861-031A	Surface	11UJ	11U
	CAN32A-1861-032C	5.0	12UJ	12U
	CAN321-1861-831C		12J (QCD)	
2	CAN32A-1862-031A	Surface	12UJ	34
	CAN32A-1862-032C	5.0	12UJ	12U
3	CAN32A-1863-031A	Surface	11UJ	11U
	CAN321-1863-032C	5.0	12UJ	12U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected

U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QAD = duplicate analyzed at the same lab as the normal sample.

Source: LRL Sciences, Inc., 1993

Table 8-1b
Concentration (mg/kg) of Total Metals
SWMU 32A

Borehole Number	Sample Number (CAN32A-186)	Sample Depth (feet)	Barium		Mercury		Nickel	
1	1-021A	0	140	J	0.01	U	5.5	
	1-022B	2.5	84.4	J	0.02	U	**10.3**	
	1-023C	5	122	J	0.1	U	4.6	J
(QAD)	1-721C	5	161		**0.27**		6.5	
(QCD)	1-821C	5	82.2	J	0.01	U	5	J
	1-024D	10	81.9	J	0.01	U	4.6	J
2	2-012A	0	505	J	0.01	U	4.6	J
	2-022B	2.5	83.1	J	0.02	U	8.4	J
	2-023C	5	91	J	0.01	U	5.3	J
	2-024D	10	38.3	J	0.01	U	5.1	J
3	3-021A	0	346	J	0.01	U	4.8	J
	3-022B	2.5	121	J	0.02	U	4.6	J
	3-023C	5	123	J	0.01	U	4.7	J
	3-024D	10	**1480**	J	0.01	U	6	J
Background (95% UCL) (1)			642.00		0.13		9.00	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 8-2a
Summary of Soil Sample Results
SWMU 32A

SUMMARY OF SWMU 32a SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	9	OWS	ND	<20	<10	NT	NT	NT	NT	NT
2	9	OWS	ND	<20	<10	ND	ND	NT	NT	NT
3	9	OWS	ND	<20	<10	NT	NT	NT	NT	NT
4	9	OWS	ND	<20	<10	NT	NT	NT	NT	NT
5	9.5	OWS	ND	<20	<10	ND	ND	NT	NT	NT
6	9.5	OWS	ND	<20	<10	NT	NT	NT	NT	NT
7	10	OWS	NT	NT	NT	NT	ND	ND	ND	< bkgd
8	n/a	excavated material	NT	NT	NT	ND	ND	NT	NT	NT

ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 8-2b
Maximum Soil Sample Concentration of Metals
SWMU 32A

SWMU 11 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Arsenic	< 3.0	< 0.4	1.12-16.7	3.6	0.32 C
	Barium	125	1.4	430	805	5300 N
	Chromium	9.3	<0.02	38	13.3	31 C
	Nickel	6.5	NT	16	11.4	1500 N
	Lead	4.8	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Note: The above table header should have read "SWMU 32A," not "SWMU 11."

Source: US Army Corps of Engineers, 1999

Table 9-1a
Concentration (µg/kg) of VOCs
SWMU 33B

BOREHOLE NUMBER	CANNON NUMBER	DEPTH (ft.)	CHEMICAL	
			ACETONE	XYLENE
1	CAN33B-1861-031A	Surface	8J	11U
	CAN33B-1861-032D	10.0	12J	13U
2	CAN33B-1862-031A	Surface	15J	12U
	CAN33B-1862-032D	10.0	12UJ	12U
	CAN33B-1862-831D		13 (QCD)	
3	CAN33B-1863-031A	Surface	7J	6J
	CAN3B-1863-032D	10.0	7J	12U
	CAN33B-1863-831D		15 (QCD)	

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QCD = duplicate analyzed at the same laboratory as the normal sample

Source: LRL Sciences, Inc, 1993

Table 9-1b
Concentration (µg/kg) of BTEX
SWMU 33B

Borehole Number	Cannon Number	Depth (ft.)	Chemical				
			Benzene	Ethly Benzene	Toluene	Xylene	BTEX Total
1	CAN33B-1861-011B	2.5	2U	2U	2U	2U	2U
	CAN33B-1861-012C	5.0	2U	2U	7	2U	7
2	CAN33B-1862-011B	2.5	2U	2U	2U	2U	2U
	CAN33B-1862-012C	5.0	2U	2U	2U	2U	2U
3	CAN33B-1863-011B	2.5	2U	2U	2U	2U	2U
	CAN33B-1863-012C	5.0	2U	2U	2U	2U	2U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Sciences, Inc, 1993

Table 9-1c
Concentration (mg/kg) of Total Metals
SWMU 33B

Borehole Number	Sample Number (CAN33B-186)	Sample Depth (feet)	Arsenic		Barium		Chromium		Nickel	
1	1-021A	0	4.9	J	270	J	6.2		6.1	J
	1-022B	2.5	2.2	J	79.9	J	7		7.4	J
	1-023C	5	2.7	J	80.4	J	7.2		5.8	J
	1-024D	10	2.7	J	108	J	6.3		5.1	J
2	2-021A	0	4.4	J	435	J	53.5		7.6	J
	2-022B	2.5	3.3	J	99.5	J	6		7	J
	2-023C	5	2.9	J	139	J	3.6		3.3	J
	2-024D	10	3.1	J	336	J	3.3		2.7	J
(QAD)	2-721D	10	2.5		423		3.6		4	
(QCD)	2-821D	10	2.7	J	234	J	3.1	U	3.6	J
3	3-021A	0	5.2	J	560	J	41.3		9.4	J
	3-022B	2.5	32.4	J	53.2	J	5.8		5.9	J
	3-023C	5	2.1	J	306	J	4.9		3.6	J
	3-024D	10	1.7	J	654	J	3.2	U	3.2	J
	3-721D	10	2.8		1130		3		3.2	
	3-821D	10	3.6	J	754	J	5.2		3.4	J
Background (95% UCL) (1)			15.50		642.00		12.50		9.00	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc, 1993

Table 9-2a
Summary of Soil Sample Results
SWMU 33B

SUMMARY OF SWMU 33b SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
2	8	OWS	0.1	<20	<10	ND	ND	NT	NT	NT
3	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
4	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
5	9	OWS	ND	ND	ND	NT	NT	NT	NT	NT
6	9	OWS	0.3	<20	<10	ND	ND	NT	NT	NT
7	9	OWS	NT	NT	NT	NT	ND	ND	ND	< bkgd
8	n/a	excavated material	ND	<20	10	NT	NT	NT	NT	NT

ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 9-2b
Maximum Soil Sample Concentration of Metals
SWMU 33B

SWMU 33b Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Arsenic	< 3.0	< 0.40	1.12-16.7	3.6	0.32 C
	Barium	125	1.1	430	805	5300 N
	Cadmium	0.22	< 0.05	0.01-1.0	1.3	38 N
	Chromium	6.1	< 0.02	38	13.3	31 C
	Nickel	5.8	NT	16	11.4	1500 N
	Lead	4.6	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 10-1a
Concentration (µg/kg) of VOCs
SWMU 11

Borehole Number	Cannon Number	Depth (ft.)	Chemical	
			Toluene	Methylene Chloride
1	CAN011-1701-031A	Surface	58U	58U
	CAN011-1701-032D	10.0	11U	11U
2	CAN011-1702-031A	Surface	11U	6J
	CAN011-1702-032D	10.0	10U	6J
3	CAN011-1703-031A	Surface	13	11U
	CAN011-1703-032D	10.0	11U	11U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Sciences, Inc., 1993

Table 10-1b
Concentration (mg/kg) of Total Metals
SWMU 11

Borehole Number	Sample Number (CAN011-170)	Sample Depth (feet)	Chromium		Mercury		Nickel	
1	1-021A	0	14.3	UJ	0.02	U	4.9	J
	1-022B	2.5	11.1	UJ	0.02	U	**9.6**	
	1-023C	5	5.3	UJ	0.02	U	4.5	J
	1-024D	10	6.7	UJ	0.1	U	4.6	J
(QAD)	1-721D	10	5.3		**0.26**		4.7	
(QCD)	1-821D	10	5.1	UJ	0.01	U	4.2	J
2	2-021A	0	9.2	UJ	0.03	U	5.2	J
	2-022B	2.5	8.4	UJ	0.02	U	**9.6**	J
	2-023C	5	5.6	UJ	0.02	U	3.6	J
	2-024D	10	3.7	UJ	0.03	U	3.2	
3	3-021A	0	15.1	UJ+	0.02	U	7.3	J
	3-022B	2.5	8	UJ	0.1	U	**10.6**	J
	3-023C	5	3.1	UJ	0.01	U	5.1	J
	3-024D	10	1.1	UJ	0.01	U	3.8	J
Background (95% UCL) (1)			12.50		0.13		9.00	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 10-2a
Summary of Soil Sample Results
SWMU 11

SUMMARY OF SWMU 11 SOIL SAMPLE RESULTS										
No.	Depth	Location	PID units	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
2	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
3	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
4	8	OWS	ND	<20	10	ND	ND	NT	NT	NT
5	9	OWS	ND	<20	<50	ND	ND	NT	NT	NT
6	9	OWS	ND	ND	<50	ND	NT	NT	NT	NT
7	9	OWS	NT	NT	NT	NT	ND	ND	ND	< bkgd
8	N/A	excavated material	NT	NT	NT	ND	ND	NT	NT	NT

ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 10-2b
Maximum Soil Sample Concentrations
SWMU 11

SWMU 11 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Barium	456	1.8	430	805	5300 N
	Chromium	5.4	<0.02	38	13.3	31 C
	Nickel	6.6	NT	16	11.4	1500 N
	Lead	7.6	<0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 11-1a
Concentration (µg/kg) of VOCs
SWMU 38

Borehole Number	Cannon Number	Depth (ft.)	Chemical		
			Acetone	Toluene	1,1,1-Trichloroethane
1	CAN038-1941-031A	Surface	13J	11U	11U
	CAN038-1941-032B	2.5	13	12U	12U
	CAN038-1941-831B		11U (QC)		
2	CAN038-1942-031A	Surface	11UJ	11U	11U
	CAN038-1942-032B	2.5	17J	12U	12U
3	CAN038-1943-031A	Surface	10UJ	5J	8J
	CAN038-1943-032B	2.5	11UJ	11U	11U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Sciences, Inc, 1993

Table 11-1b
Concentration (mg/kg) of Total Metals
SWMU 38

Borehole Number	Sample Number (CAN038-194)	Sample Depth (feet)	Chromium		Nickel	
1	1-021A	0	10.6	UJ	7.8	J
	1-022B	2.5	10.4	UJ	9.2	
(QAD)	1-721B	2.5	**13.9**		**10.6**	
(QCD)	1-821B	2.5	10.2	UJ	9	J
	1-023C	5	12.1	UJ	11	J
	1-024D	10	3	UJ	3.7	J
2	2-021A	0	6.6	UJ	6.9	J
	2-022B	2.5	9.8	UJ	9	J
	2-023C	5	9.2	UJ	9.7	J
	2-024D	10	6.8	UJ	6.6	J
3	3-021A	0	12	UJ	7.3	J
	3-022B	2.5	8.6	UJ	6.2	J
	3-023C	5	11	UJ	**10.4**	J
	3-024D	10	3.4	UJ	3.9	J
Background (95% UCL) (1)			12.50		9.00	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc, 1993

Table 11-2a
Summary of Soil Sample Results
SWMU 38

SUMMARY OF SWMU 38 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	n/a	excavated soils	ND	<20	<10	NT	NT	NT	NT	NT
2	12	OWS	ND	ND	<10	NT	NT	NT	NT	NT
3	12	OWS	ND	ND	<10	NT	NT	NT	NT	NT
4	12	OWS	0.1	<20	<10	ND	ND	NT	NT	NT
5	12	OWS	ND	<20	ND	ND	ND	NT	NT	NT
6	14	OWS	ND	<20	ND	NT	NT	NT	NT	NT
7	7	OWS	ND	<20	<10	NT	NT	NT	NT	NT
8	12	OWS	NT	NT	NT	NT	ND	ND	ND[1]	< bkgd

[1] Only contaminant identified: Di-n-butylphthalate at 13.0 mg/Kg, which was also found in the laboratory method blank.
ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 11-2b
Maximum Soil Sample Concentration of Metals
SWMU 38

SWMU 38 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Barium	54.4	1.2	430	642	5300 N
	Chromium	8	< 0.02	38	13.3	31 C
	Nickel	6.5	NT	16	11.4	1500 N
	Lead	4.2	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 12-1a
Concentration (µg/kg) of VOCs
SWMU 39

BOREHOLE NUMBER	CANNON NUMBER	DEPTH (ft.)	CHEMICAL	
			ACETONE	TOLUENE
1	CAN039-1951-031A	Surface	R	12J
	CAN039-1951-032C	5.0	R	12U
2	CAN039-1952-031A	Surface	5J	10U
	CAN039-1952-032C	5.0	38	12U
3	CAN039-1953-031A	Surface	10U	10U
	CAN039-1953-032C	5.0	9J	12U
	CAN039-1953-831C		11U (QCD)	

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QCD = duplicate analyzed at the same laboratory as the normal sample.

Source: LRL Sciences, Inc, 1993

Table 12-1b
Concentration (mg/kg) of Total Metals
SWMU 39

Borehole Number	Sample Number (CAN039-195)	Sample Depth (feet)	Barium		Chromium		Lead		Nickel
1	1-021A	0	341	J	6.4	J	5.2	J	5.8
	1-022B	2.5	81.5	J	9.9	J	8.1	J	8.3
	1-023C	5	89.7	J	10.2	J	163	J	9.3
	1-024D	10	530	J	3.6	J	4.2	J	5.2
2	2-021A	0	464	J	10.5	J	4.2	J	4.3
	2-022B	2.5	79.8	J	12.5	J	6.7	J	9.7
	2-023C	5	66.4	J	8.8	J	52	J	8.7
	2-024D	10	187	J	4.9	J	5.2	J	5.2
3	3-021A	0	589	J	10.9	J	5.5	J	5.5
	3-022B	2.5	79.1	J	11.8	J	7.5	J	9.1
	3-023C	5	93.2	J	9.9	J	8.4	J	8.5
(QAD)	3-721C	5	113		**14.9**		9		**11.8**
(QCD)	3-821C	5	102	J	11.2	J	9.1	J	**10.2**
	3-024D	10	**2200**	J	3.7	J	3.6	J	4.3
Background (95% UCL) (1)			642.00		12.50		25.80		9.00

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc, 1993

Table 12-2a
Summary of Soil Sample Results
SWMU 39

SUMMARY OF SWMU 39 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX pprn	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	8.5	OWS	ND	<15	<50	NT	NT	NT	NT	NT
2	8.5	OWS	ND	<15	<10	NT	NT	NT	NT	NT
3	8.5	OWS	ND	<15	<50	NT	NT	NT	NT	NT
4	8.5	OWS	ND	<15	<10	NT	NT	NT	NT	NT
5	9	OWS	0.3	<15	<10	ND	ND	NT	NT	NT
6	9	OWS	0.1	<15	<10	NT	NT	NT	NT	NT
7	9	OWS	NT	NT	NT	NT	ND	ND	ND[1]	Cr, Pb[2]
8	n/a	OWS	ND	<100	<10	NT	NT	NT	NT	NT

[1] Only contaminant identified: Di-n-butylphthalate at 27 mg/Kg, which was also found in the laboratory method blank.
[2] Chromium at 11.2 mg/Kg, Lead at 15.4 mg/Kg.
ND indicates non-detect, or below detection limit
NT indicates not tested

Source: US Army Corps of Engineers, 1999

Table 12-2b
Maximum Soil Sample Concentration of Metals
SWMU 39

SWMU 39 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Barium	99.6	1.2	430	805	5300 N
	Chromium	11.2	< 0.02	38	13.3	31 C
	Nickel	8.9	NT	16	11.4	1500 N
	Lead	15.4	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 13-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 46

LOCATOR	CAN846-0461-0000			CAN846-0461-0002			CAN846-0462-0000			CAN846-0463-0002			CAN846-0463-0000			CAN846-0463-0002		
LAB SAMPLE NUMBER	0314030010SA			0314030011SA			0314010013SA			0314010014SA			0314030015SA			0314030016SA		
COLLECT DATE	09/24/93			09/24/93			09/23/93			09/23/93			09/24/93			09/24/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Ethylbenzene	1.5	5.9	J	<	6	U	<	5.7	U	<	5.9	U	<	5.3	U	<	5.8	U
Toluene	2.6	5.9	J	1.5	6	J	<	5.7	U	<	5.9	U	1.2	5.3	J	15	5.8	
1,1,1-Trichloroethane	<	5.9	U	<	6	U	<	5.7	U	4.3	5.9	J	<	5.3	U	<	5.8	U
Xylenes (total)	5.4	5.9	J	2.5	6	J	<	5.7	U	<	5.9	U	2.6	5.3	J	<	5.8	U
Semivolatile Organics (ug/kg)																		
Benzo(b)fluoranthene	<	390	J										46	350	J			
Fluoranthene	47	390	J										48	350	J			
Fluorene	40	390	J										<	350	U			
Pyrene	<	390	U										70	350	J			
Metals (mg/kg)																		
Aluminum	9270	11.9		10200	11.9		5210	11.4		6250	23.4		9290	10.6	J	9300	11.6	
Antimony	6.7	7.1	J	6.7	7.2	J	<	6.8	U	<	14.1	U	<	6.4	U	<	7	U
Arsenic	2.5	0.59		2.9	0.6		1.6	0.57		1.3	0.59		2.2	0.53		2.8	0.58	
Barium	188	1.2		587	1.2		77.3	1.1		632	2.3		144	1.1	J	381	1.2	
Beryllium	0.56	0.24		0.51	0.24		0.52	0.23		0.6	0.47		0.49	0.21		0.54	0.23	
Calcium	66400	23.8		85200	23.9		2290	22.8		129000	46.8		26200	21.2		61200	23.2	
Chromium	7.3	1.2		6.2	1.2		6.2	1.1		3.5	2.3		8.1	1.1	J	7.7	1.2	
Cobalt	3.6	1.2		3.7	1.2		3.5	1.1		3.5	2.3		3.3	1.1		3.7	1.2	
Copper	7.4	2.4		6.1	2.4		5.7	2.3		6.1	4.7		6.7	2.1	J	8.1	2.3	
Iron	8300	11.9		8040	11.9		6650	11.4		5880	23.4		8490	10.6		9140	11.6	
Lead	23.1	3		29.4	6		5.8	0.57		3.5	0.59		20.2	2.7		17.1	2.9	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 13-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 46

LOCATOR	CAN046-0461-0000			CAN046-0461-0002			CAN046-0462-0000			CAN046-0462-0002			CAN046-0463-0000			CAN046-0463-0002		
LAB SAMPLE NUMBER	0314030010SA			0314030011SA			0314010013SA			0314010014SA			0314030015SA			0314030016SA		
COLLECT DATE	09/24/93			09/24/93			09/23/93			09/23/93			09/24/93			09/24/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Magnesium	2370	23.8		2740	23.9		977	22.8		2180	46.8		1900	21.2		2580	23.2	
Manganese	153	1.2		132	1.2		224	1.1		118	2.3		172	1.1		172	1.2	
Nickel	8.4	4.8		8.5	4.8		6.6	4.6		<	9.4	U	8.1	4.2		9.2	4.6	
Potassium	1680	595		1890	597		1150	569		1340	1170		1800	531	J	1890	579	
Thallium	<	0.59	U	0.12	0.6	J	<	0.57	U	<	1.2	J	<	0.53	U	0.13	0.58	J
Vanadium	17.8	1.2		18.9	1.2		16.9	1.1		14.4	2.3		18.5	1.1		22.2	1.2	
Zinc	22	2.4		20.9	2.4		14.1	2.3		14.9	4.7		22.1	2.1	J	23.9	2.3	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	225	47.6		91	47.8		<	45.5	U	<	46.8	U	326	42.4		295	46.3	
Water Quality (percent)																		
Water	16	0.1		16	0.1		12	0.1		15	0.1		5.8	0.1		14	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 13-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 46

LOCATOR	CAN046-0461-0004			CAN046-0461-0008			CAN046-0462-0004			CAN046-0462-0008			CAN046-0463-0004			CAN046-0463-0008		
LAB SAMPLE NUMBER	0314030012SA			0314030013SA			0314010015SA			0314010016SA			0314030017SA			0314030018RA		
COLLECT DATE	09/24/93			09/24/93			09/23/93			09/23/93			09/24/93			09/24/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	3.7	5.8	J	<	6	U	<	6.1	U	<	5.8	U	2.1	5.8	J	2.4	5	J
Xylenes (total)	<	5.8	U	<	6	U	<	6.1	U	<	5.8	U	3.3	5.8	J	<	5	U
Semivolatile Organics (ug/kg)																		
Fluoranthene				<	390	U												
Phenanthrene				<	390	U												
Metals (mg/kg)																		
Aluminum	10200	11.5		4210	59.8		2580	61.2		1970	57.5		9190	11.6				
Antimony	<	6.9	U	<	35.9	U	<	36.7	U	<	34.5	U	6.3	7	J			
Arsenic	2.6	0.58		2.2	0.6		1.8	0.61		1.5	0.58		2.5	0.58				
Barium	163	1.2		1290	6		140	6.1		275	5.8		132	1.2				
Beryllium	0.54	0.23		<	1.2	U	<	1.2	U	<	1.2	U	0.59	0.23				
Calcium	46200	23		204000	120		255000	122		243000	115		25800	23.2				
Chromium	8.1	1.2		<	6	U	<	6.1	U	<	5.8	U	8.7	1.2				
Cobalt	3.6	1.2		<	6	U	<	6.1	U	<	5.8	U	4	1.2				
Copper	7.2	2.3		4	12	J	<	12.2	U	<	11.5	U	7.6	2.3				
Iron	8810	11.5		3580	59.8		2490	61.2		1590	57.5		9210	11.6				
Lead	20.5	2.9		3.1	0.6		2.8	1.2		1.8	0.58		18.5	2.9				
Magnesium	2220	23		3820	120		3180	122		3050	115		2010	23.2				
Manganese	171	1.2		39.6	6		30.8	6.1		22.1	5.8		206	1.2				
Nickel	8.9	4.6		<	23.9	U	<	24.5	U	<	23	U	8.4	4.6				
Potassium	1880	575		1260	2990	J	<	3060	U	447	2880	J	1990	580				

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 13-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 46

LOCATOR	CAN046-0461-0004			CAN046-0461-0008			CAN046-0462-0004			CAN046-0462-0008			CAN046-0463-0004			CAN046-0463-0008		
LAB SAMPLE NUMBER	0314030012SA			0314030013SA			0314010015SA			0314010016SA			0314030017SA			0314030018RA		
COLLECT DATE	09/24/93			09/24/93			09/23/93			09/23/93			09/24/93			09/24/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Thallium	0.13	0.58	J	<	1.2	U	<	1.2	J	<	1.2	J	<	0.58	U			
Vanadium	19.2	1.2		14.4	6		9.8	6.1		6	5.8		20	1.2				
Zinc	23.3	2.3		8.1	12	J	<	12.2	U	4.3	11.5	J	22.4	2.3				
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	146	46		<	47.9	U	<	49	U	<	46	U	155	46.4				
Water Quality (percent)																		
Water	13	0.1		16	0.1		18	0.1		13	0.1		14	0.1				

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 13-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 46

LOCATOR	CAN046-0463-0008		
LAB SAMPLE NUMBER	0314030018SA		
COLLECT DATE	09/24/93		
	Result	RL	Qual
Volatile Organics (ug/kg)			
Toluene	<	580	U
Xylenes (total)	<	580	U
Semivolatile Organics (ug/kg)			
Fluoranthene	45	380	J
Phenanthrene	39	380	J
Metals (mg/kg)			
Aluminum	4030	57.6	
Antimony	<	34.6	U
Arsenic	1.7	0.58	
Barium	165	5.8	
Beryllium	<	1.2	U
Calcium	224000	115	
Chromium	<	5.8	U
Cobalt	<	5.8	U
Copper	4.4	11.5	J
Iron	3330	57.6	
Lead	2.2	0.58	
Magnesium	3530	115	
Manganese	39.7	5.8	
Nickel	<	23	U
Potassium	977	2880	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 13-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 46

LOCATOR	CAN046-0463-0008		
LAB SAMPLE NUMBER	0314030018SA		
COLLECT DATE	09/24/93		
	Result	RL	Qual
Thallium	<	1.2	U
Vanadium	13.9	5.8	
Zinc	<	11.5	U
TPH (mg/kg)			
Total Petroleum Hydrocarbons	<	46.1	U
Water Quality (percent)			
Water	13	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix ___.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 13-1c
Comparison of Maximum Concentrations with RBCs
SWMU 46

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN046-0462-0002	1,1,1-Trichloroethane	0.0043	700	N
CAN046-0461-0002	**Antimony**	**6.7**	**3**	**Y**
CAN046-0461-0008	**Barium**	**1290**	**600**	**Y**
CAN046-0463-0000	Benzo(b)fluoranthene	0.046	0.07	N
CAN046-0463-0002	Copper	8.1	300	N
CAN046-0461-0000	Ethylbenzene	0.0015	800	N
CAN046-0463-0000	Fluoranthene	0.048	300	N
CAN046-0461-0000	Fluorene	0.04	300	N
CAN046-0461-0002	Lead (3)	29.4	500	N
CAN046-0463-0002	Nickel	9.2	200	N
CAN046-0463-0008	Phenanthrene	0.039	NTF	N
CAN046-0463-0000	Pyrene	0.07	200	N
CAN046-0463-0002	Thallium	0.13	6	N
CAN046-0463-0002	Toluene	0.015	2000	N
CAN046-0463-0000	Total Petroleum Hydrocarbons (4)	326	1000	N
CAN046-0461-0000	Xylenes (total)	0.0054	20000	N
CAN046-0463-0002	Zinc	23.9	2000	N

NTF = No EPA Established Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) EPA suggests 500-1,000 mg/kg as allowable concentration for residential soils based on EPA's IUBK Lead Model (EPA 1990)

(4) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 13-2a
Summary of Soil Sample Results
SWMU 46

SUMMARY OF SWMU 46 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	4	OWS	ND	<15	<50	NT	NT	NT	NT	NT
2	4	OWS	ND	<15	<10	NT	NT	NT	NT	NT
3	4	OWS	0.1	<100	<10	NT	NT	NT	NT	NT
4	4	OWS	ND	<100	<50	ND	ND	NT	NT	NT
5	10	OWS	ND	<15	<50	NT	NT	NT	NT	NT
6	10	OWS	ND	<100	<50	ND	NT	NT	NT	NT
7	10	OWS	NT	NT	NT	NT	ND	ND	ND	Pb[1]
8	n/a	OWS	ND	<15	<50	NT	NT	NT	NT	< bkgd

ND indicates non-detect, or below detection limit
NT indicates not tested
[1] Lead at 13.8 mg/Kg.
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 13-2b
Maximum Soil Sample Concentration of Metals
SWMU 46

SWMU 46 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Barium	163	1.4	430	805	5300 N
	Chromium	7.2	< 0.02	38	13.3	31 C
	Nickel	7.1	NT	16	11.4	1500 N
	Lead	13.8	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 14-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 47

LOCATOR	CAN047-0471-0000			CAN047-0471-0002			CAN047-0472-0000			CAN047-0472-0002			CAN047-0473-0000			CAN047-0473-0001		
LAB SAMPLE NUMBER	0312760009SA			0312760010SA			0312780001SA			0312780002SA			0312790003SA			0312790004SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.9	J	<	5.7	U	<	5.6	U	1.6	5.8	J	1.8	5.5	J	<	5.6	U
Xylenes (total)	<	5.9	U	<	5.7	U	<	5.6	U	<	5.8	U	2.8	5.5	J	<	5.6	U
Semivolatile Organics (ug/kg)																		
Benzo(b)fluoranthene	<	390	U				<	370	U									
Butyl benzyl phthalate	<	390	U				<	370	U									
Fluoranthene	<	390	U				<	370	U									
Pyrene	<	390	U				<	370	U									
Metals (mg/kg)																		
Aluminum	9090	11.8		6390	11.3		4150	11.2	J	4730	11.5		4810	11		5680	11.1	
Antimony	<	7.1	U	1.5	6.8	J	<	6.7	U	<	6.9	U	<	6.6	U	<	6.7	U
Arsenic	2.7	0.59		1.9	0.57		2.5	0.56		2.2	0.58		2.5	0.55		2.3	0.56	
Barium	97.5	1.2	J	172	1.1	J	123	1.1	J	127	1.2	J	118	1.1	J	107	1.1	J
Beryllium	0.67	0.24		0.51	0.23		0.47	0.22		0.45	0.23		0.39	0.22		0.56	0.22	
Cadmium	<	0.59	U	0.61	0.57		<	0.56	U	<	0.58	U	0.69	0.55		0.57	0.56	
Calcium	4560	23.6		33300	22.6		23500	22.4		76900	23		25200	22		47000	22.3	
Chromium	10.8	1.2		7.2	1.1		4.8	1.1	J	4.5	1.2		7.2	1.1		7.1	1.1	
Cobalt	5.4	1.2		4.3	1.1		2.6	1.1		3.2	1.2		2.5	1.1		3.6	1.1	
Copper	9.3	2.4		8.3	2.3		4.9	2.2		6	2.3		6.5	2.2		7.3	2.2	
Iron	9720	11.8		6570	11.3		5140	11.2		4850	11.5		5900	11		6790	11.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 14-1a
Summary of Chemicals Reported for Near-Surface Soil Samples Collected
SWMU 47

LOCATOR	CAN047-0471-0000			CAN047-0471-0002			CAN047-0472-0000			CAN047-0472-0002			CAN047-0473-0000			CAN047-0473-0002		
LAB SAMPLE NUMBER	0312760009SA			0312760010SA			0312780001SA			0312780002SA			0312790003SA			0312790004SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Lead	9	0.59		6.7	0.57		7.2	0.56		4.6	0.58		9.4	1.1		7.9	2.8	
Magnesium	1910	23.6		1870	22.6		1310	22.4	J	1760	23		1510	22		1990	22.3	
Manganese	240	1.2	J	162	1.1	J	147	1.1	J	118	1.2	J	180	1.1	J	135	1.1	J
Nickel	9.6	4.7		8.3	4.5		5.3	4.5	J	6.4	4.6		5.8	4.4		8	4.5	
Potassium	1860	589		1420	566		997	561	J	1140	576		1120	550		1390	557	
Selenium	<	0.59	U	<	1.1	J	<	0.56	U	<	1.2	J	<	0.55	U	<	1.1	J
Silver	0.53	1.2	J	0.62	1.1	J	<	1.1	U	<	1.2	U	0.33	1.1	J	<	1.1	U
Sodium	347	589	J	609	566		<	561	U	<	576	U	363	550	J	294	557	J
Vanadium	24.6	1.2		16.4	1.1		14.5	1.1		13.4	1.2		15.4	1.1		16.4	1.1	
Zinc	21.7	2.4		15.3	2.3		12.5	2.2		12	2.3		15.8	2.2		15.4	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	47.1	U	<	45.2	U	56.2	44.8		<	46.1	U	46.2	44		<	44.6	U
Water Quality (percent)																		
Water	15	0.1		12	0.1		11	0.1		13	0.1		9.2	0.1		10	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 14-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 47

LOCATOR	CAN047-0474-0000			CAN047-0474-0002			CAN047-0475-0000			CAN047-0475-0002		
LAB SAMPLE NUMBER	0311900001SA			0311900002SA			0311900005SA			0311900006SA		
COLLECT DATE	09/10/93			09/10/93			09/10/93			09/10/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)												
Toluene	2.4	5.3	J	2.6	5.5	J	1.2	5.2	J	4.8	5.5	J
Xylenes (total)	2.6	5.3	J	2	5.5	J	6.4	5.2		6.2	5.5	
Semivolatile Organics (ug/kg)												
Benzo(b)fluoranthene	46	350	J				48	340	J			
Butyl benzyl phthalate	100	350	J				210	340	J			
Fluoranthene	41	350	J				39	340	J			
Pyrene	44	350	J				35	340	J			
Metals (mg/kg)												
Aluminum	5180	10.6		8670	11		5220	10.4		7530	10.9	
Antimony	<	6.4	U	<	6.6	U	<	6.3	U	<	6.6	U
Arsenic	2	0.53		3	0.55		2.5	0.52		2.8	0.55	
Barium	110	1.1	J	89.7	1.1	J	89	1	J	145	1.1	J
Beryllium	0.38	0.21		0.64	0.22		0.34	0.21		0.39	0.22	
Cadmium	<	0.53	U	<	0.55	U	<	0.52	U	<	0.55	U
Calcium	17000	21.2		6680	22.1		8040	20.8		38300	21.9	
Chromium	6.4	1.1		9.3	1.1		7	1		8.2	1.1	
Cobalt	2.6	1.1		4.6	1.1		2.6	1		3.8	1.1	
Copper	8.2	2.1		8.3	2.2		7.6	2.1		8.6	2.2	
Iron	5880	10.6		9970	11		5990	10.4		8240	10.9	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. QUAL=Qualification

U = Nondetected value. RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 14-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 47

LOCATOR	CAN047-0474-0000			CAN047-0474-0002			CAN047-0475-0000			CAN047-0475-0002		
LAB SAMPLE NUMBER	0311900001SA			0311900002SA			0311900005SA			0311900006SA		
COLLECT DATE	09/10/93			09/10/93			09/10/93			09/10/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Lead	15.4	1.1		9.7	1.1		15	2.6		9.8	1.1	
Magnesium	1430	21.2		1740	22.1		1340	20.8		2190	21.9	
Manganese	141	1.1	J	211	1.1	J	133	1	J	198	1.1	J
Nickel	5.9	4.2		8	4.4		5.8	4.2		7.7	4.4	
Potassium	1240	530		1730	551		1430	521		1450	547	
Selenium	0.24	1.1	J	<	1.1	J	<	1	J	<	1.1	J
Silver	<	1.1	U	<	1.1	U	<	1	U	<	1.1	U
Sodium	<	530	U	<	551	U	<	521	U	<	547	U
Vanadium	13.8	1.1		21.8	1.1		13.7	1		18.7	1.1	
Zinc	32.2	2.1		24.8	2.2		29.1	2.1		18.9	2.2	
TPH (mg/kg)												
Total Petroleum Hydrocarbons	74.2	42.4		56.5	44.1		76.6	41.7		198	43.7	
Water Quality (percent)												
Water	5.7	0.1		9.3	0.1		4.1	0.1		8.5	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. QUAL=Qualification

U = Nondetected value. RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 14-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 47

LOCATOR	CAN047-0471-0004			CAN047-0471-0008			CAN047-0472-0004			CAN047-0472-0008			CAN047-0473-0004			CAN047-0473-0008		
LAB SAMPLE NUMBER	0312760011SA			0312760012SA			0312780003SA			0312780004SA			0312790005SA			0312790006SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	3410	23		4210	11.1		2540	59.8		2970	22.4	J	3300	22.2		5130	11.2	
Antimony	<	13.8	U	1.5	6.7	J	<	35.9	U	<	13.4	U	<	13.3	U	<	6.7	U
Arsenic	2.2	0.58		1.3	0.56		1.7	0.6		1.2	0.56		2	0.56		2.1	0.56	
Barium	428	2.3	J	398	1.1	J	133	6	J	205	2.2	J	132	2.2	J	325	1.1	J
Beryllium	0.26	0.46	J	0.36	0.22		<	1.2	U	0.25	0.45	J	0.27	0.44	J	0.58	0.22	
Cadmium	3.3	1.2		1.3	0.56		<	3	U	<	1.1	U	1.5	1.1		1.4	0.56	
Calcium	201000	46.1		109000	22.2		255000	120		138000	44.8		134000	44.4		107000	22.5	
Chromium	2.3	2.3		3.1	1.1		<	6	U	<	2.2	U	<	2.2	U	4.6	1.1	
Cobalt	2.9	2.3		1.8	1.1		<	6	U	<	2.2	U	1.3	2.2	J	2.8	1.1	
Copper	<	4.6	U	3	2.2		<	12	U	1.5	4.5	J	3.5	4.4	J	3.7	2.2	
Iron	3330	23		2640	11.1		2420	59.8		2060	22.4		3630	22.2		5200	11.2	
Lead	3	2.9		5.8	1.1		2.9	1.2		4.4	0.56		5.3	2.8		5.1	1.1	
Magnesium	3050	46.1		4110	22.2		2940	120		2770	44.8		2260	44.4		3580	22.5	
Manganese	54.2	2.3	J	48.9	1.1	J	27.7	6	J	38	2.2	J	40.3	2.2	J	106	1.1	J
Nickel	<	9.2	U	4.3	4.4	J	<	23.9	U	<	9	U	4.5	8.9	J	5.8	4.5	
Potassium	<	1150	U	1010	556		558	2990	J	703	1120	J	803	1110	J	1310	562	
Silver	<	2.3	U	0.64	1.1	J	<	6	U	<	2.2	U	<	2.2	U	<	1.1	U
Sodium	458	1150	J	163	556	J	<	2990	U	<	1120	U	496	1110	J	252	562	J
Vanadium	14.7	2.3		8.7	1.1		9.4	6		6.6	2.2		11.3	2.2		20.2	1.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 14-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 47

LOCATOR	CAN047-0471-0004			CAN047-0471-0005			CAN047-0472-0004			CAN047-0472-0005			CAN047-0473-0004			CAN047-0473-0005		
LAB SAMPLE NUMBER	0312760011SA			0312760012SA			0312780003SA			0312780004SA			0312790005SA			0312790006SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Zinc	8.7	4.6		7.5	2.2		10	12	J	6.3	4.5		9.6	4.4		11.9	2.2	
Water Quality (percent)																		
Water	13	0.1		10	0.1		16	0.1		11	0.1		10	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 14-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 47

LOCATOR	CAN047-0474-0004			CAN047-0474-0008			CAN047-0475-0004			CAN047-0475-0008		
LAB SAMPLE NUMBER	0311900003SA			0311900004SA			0311900007SA			0311900008SA		
COLLECT DATE	09/10/93			09/10/93			09/10/93			09/10/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)												
Aluminum	4270	22.6		4570	22.6		4370	11.2		6660	11.2	
Antimony	<	13.6	U	<	13.6	U	<	6.7	U	<	6.7	U
Arsenic	2.3	0.57		2	0.56		2.1	0.56		2.5	0.56	
Barium	155	2.3	J	341	2.3	J	157	1.1	J	426	1.1	J
Beryllium	<	0.45	U	0.23	0.45	J	0.15	0.22	J	0.48	0.22	
Cadmium	<	1.1	U	<	1.1	U	<	0.56	U	<	0.56	U
Calcium	196000	45.3		215000	45.2		176000	22.4		166000	22.3	
Chromium	4.2	2.3		5.2	2.3		4.7	1.1		6.6	1.1	
Cobalt	2.5	2.3		2.1	2.3	J	2	1.1		2.1	1.1	
Copper	3.8	4.5	J	3	4.5	J	5.5	2.2		3.5	2.2	
Iron	3980	22.6		3720	22.6		4090	11.2		5440	11.2	
Lead	3.5	1.1		3.4	1.1		3.6	1.1		5.1	1.1	
Magnesium	2690	45.3		3940	45.2		2370	22.4		4270	22.3	
Manganese	53.4	2.3	J	43.2	2.3	J	63	1.1	J	74.2	1.1	J
Nickel	5.1	9.1	J	5.6	9	J	6.7	4.5		6.3	4.5	
Potassium	806	1130	J	830	1130	J	833	559		1190	558	
Silver	<	2.3	U	<	2.3	U	0.38	1.1	J	<	1.1	U
Sodium	528	1130	J	<	1130	U	207	559	J	<	558	U
Vanadium	13	2.3		14.8	2.3		10.6	1.1		19.4	1.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 14-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 47

LOCATOR	CAN047-0474-0004			CAN047-0474-0008			CAN047-0475-0004			CAN047-0475-0008		
LAB SAMPLE NUMBER	0311900003SA			0311900004SA			0311900007SA			0311900008SA		
COLLECT DATE	09/10/93			09/10/93			09/10/93			09/10/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Zinc	10.9	4.5		11.7	4.5		16	2.2		27.4	2.2	
Water Quality (percent)												
Water	12	0.1		11	0.1		11	0.1		10	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. QUAL=Qualification

U = Nondetected value. RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 14-1c
Comparison of Maximum Concentrations with RBCs
SWMU 47

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN047-0475-0000	Benzo(b)fluoranthene	0.048	0.07	N
CAN047-0475-0000	Butyl benzyl phthalate	0.21	2000	N
CAN047-0471-0000	Cobalt	5.4	NTF	N
CAN047-0471-0000	Copper	9.3	300	N
CAN047-0475-0000	Di-n-butyl phthalate	0.051	800	N
CAN047-0474-0000	Fluoranthene	0.041	300	N
CAN047-0471-0000	Nickel	9.6	200	N
CAN047-0474-0000	Pyrene	0.044	200	N
CAN047-0471-0008	Silver	0.64	20	N
CAN047-0471-0002	Sodium	609	NTF	N
CAN047-0475-0002	Toluene	0.0048	2000	N
CAN047-0475-0002	Total Petroleum Hydrocarbons (3)	198	1000	N
CAN047-0475-0000	Xylenes (total)	0.0064	20000	N
CAN047-0474-0000	Zinc	32.2	2000	N

NTF = No EPA Established Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 14-2a
Summary of Soil Sample Results
SWMU 47

SUMMARY OF SWMU 47 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
A/1	7.5	Sandtrap	0.0	<20	<50	NT	NT	NT	NT	NT
A/2	7.5	Sandtrap	0.0	<20	<50	NT	NT	NT	NT	NT
A/3	7.5	Sandtrap	0.2	<20	<50	ND	ND	NT	NT	NT
A/4	7.5	Sandtrap	0.1	<20	<50	NT	NT	NT	NT	NT
A/5	7.5	Sandtrap	0.3	<100	<50	ND	0.0266	NT	NT	NT
A/6	7.5	Sandtrap	0.1	<20	<50	NT	NT	NT	NT	NT
A/7	7.5	Sandtrap	NT	NT	NT	NT	ND	ND	ND[1]	< bkgd
A/8	n/a	excavated material	NT	NT	NT	ND	ND	NT	NT	NT
B/1	6	OWS	0.0	<20	<10	ND	ND	NT	NT	NT
B/2	6	OWS	0.0	<20	<10	NT	NT	NT	NT	NT
B/3	6	OWS	0.0	<20	<10	NT	NT	NT	NT	NT
B/4	6	OWS	0.0	<20	<10	NT	NT	NT	NT	NT
B/5	6	OWS	0.0	<20	<10	ND	ND	NT	NT	NT
B/6	6	OWS	0.0	<20	<10	NT	NT	NT	NT	NT
B/7	6	OWS	NT	NT	NT	NT	ND	ND	ND	Ag[3]
B/7QC	6	OWS	NT	NT	NT	NT	ND	ND	ND[2]	Ag[4]
B/8	n/a	excavated material	NT	NT	NT	ND	NT	NT	NT	NT

[1] Only contaminant identified: Di-n-butylphthalate at 22.0 mg/Kg, which was also found in the method blank.
[2] Only contaminant identified: Di-n-butylphthalate at 12.0 mg/Kg, which was also found in the method blank.
3 Silver at 3.1 mg/Kg.
[4] Silver at 2.9 mg/Kg.
ND indicates non-detect, or below detection limit

Source: US Army Corps of Engineers, 1999

Table 14-2b
Maximum Soil Sample Concentration of Metals
SWMU 47

SWMU 47 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
B/7QC	Silver	2.9	< 0.04	0.01-5	2.65	380 N
	Arsenic	1.63	< 0.40	1.1-16.7	3.6	0.32 C/2.2 N
	Cadmium	0.31	0.01	0.01-1.0	1.3	38 N
B/7	Barium	367	1.6	430	805	5300 N
	Lead	2.2	< 0.05	10-18	7.1	400 N
	Selenium	< 2.5	0.06	0.2	1.1	380 N
	Chromium	8.8	0.02	38	13.3	31 C
	Nickel	6.3	NT	16	11.4	1500 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 15-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 51

LOCATOR	CAN051-0511-0000			CAN051-0511-0002			CAN051-0512-0000			CAN051-0512-0002			CAN051-0513-0000			CAN051-0513-0002		
LAB SAMPLE NUMBER	0312760001SA			0312760002SA			0312790007SA			0312790016SA			0312760005SA			0312760006SA		
COLLECT DATE	09/14/93			09/14/93			09/15/93			09/15/93			09/14/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	6.6	5.9		<	5.7	U	<	5.3	U	4.8	5.9	J	2.3	5.8	J	3.6	5.5	J
Xylenes (total)	1.3	5.9	J	<	5.7	U	1.6	5.3	J	<	5.9	U	<	5.8	U	1.4	5.5	J
Semivolatile Organics (ug/kg)																		
Anthracene							<	350	U				<	380	U	47	370	J
Benzo(a)anthracene							<	350	U				<	380	U	600	370	
Benzo(a)pyrene							<	350	U				<	380	U	830	370	
Benzo(b)fluoranthene							<	350	U				<	380	U	1700	370	
Benzo(g,h,i)perylene							<	350	U				<	380	U	520	370	
Carbazole							<	350	U				<	380	U	79	370	J
Chrysene							<	350	U				<	380	U	970	370	
Fluoranthene							<	350	U				<	380	U	2000	370	
Indeno(1,2,3-cd)pyrene							<	350	U				<	380	U	510	370	
Phenanthrene							<	350	U				<	380	U	800	370	
Pyrene							<	350	U				<	380	U	2000	370	
Metals (mg/kg)																		
Aluminum	8120	11.7		5180	11.5		4910	10.5		5260	23.4		7120	11.5		4010	11.1	
Antimony	<	7	U	1.7	6.9	J	<	6.3	U	<	14	U	<	6.9	U	1.8	6.6	J
Arsenic	2.3	0.59		2.1	0.57		2.1	0.53		2	0.59		2.3	0.58		4.5	0.55	
Barium	115	1.2	J	105	1.1	J	433	1.1		118	2.3		84.7	1.2	J	495	1.1	J
Beryllium	0.62	0.23		0.4	0.23		0.29	0.21	J	0.4	0.47	J	0.56	0.23		0.35	0.22	
Calcium	5360	23.4		43400	22.9		17400	21.1		137000	46.8		7630	23.1		48100	22.1	
Chromium	9.7	1.2		5.6	1.1		7.4	1.1	J	6	2.3		9.2	1.2		7.1	1.1	
Cadmium	<	0.59	J	0.81	0.57	J	<	0.53	U	1.6	1.2		<	0.58	J	0.99	0.55	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 15-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 51

LOCATOR	CAN051-0511-0000			CAN051-0511-0002			CAN051-0512-0000			CAN051-0512-0002			CAN051-0513-0000			CAN051-0513-0002		
LAB SAMPLE NUMBER	0312760001SA			0312760002SA			0312790007SA			0312790016SA			0312760005SA			0312760006SA		
COLLECT DATE	09/14/93			09/14/93			09/15/93			09/15/93			09/14/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Cobalt	4.3	1.2		3.1	1.1		2.5	1.1		1.3	2.3	J	4.5	1.2		3.4	1.1	
Copper	9.4	2.3		6.2	2.3		5.2	2.1	J	5.1	4.7		8.1	2.3		5.7	2.2	
Iron	9120	11.7		5380	11.5		6900	10.5		5320	23.4		7720	11.5		5710	11.1	
Lead	9.1	0.59		5.6	1.1		6.5	0.53		3.9	1.2		9	0.58		5.9	1.1	
Magnesium	1680	23.4		1570	22.9		1440	21.1		1940	46.8		1520	23.1		1460	22.1	
Manganese	228	1.2		124	1.1		197	1.1		87.2	2.3		246	1.2		272	1.1	
Nickel	8.9	4.7		6.7	4.6		5.3	4.2		5.1	9.4	J	8.3	4.6		5.8	4.4	
Potassium	1510	585		1100	573		773	527		1100	1170	J	1440	577		782	554	
Silver	0.62	1.2	J	0.71	1.1	J	0.53	1.1	J	1.9	2.3	J	0.62	1.2	J	0.7	1.1	J
Sodium	203	585	J	304	573	J	309	527	J	630	1170	J	190	577	J	167	554	J
Vanadium	21.7	1.2		15.4	1.1		13.8	1.1		12.4	2.3		19.1	1.2		16.3	1.1	
Zinc	22.2	2.3		15.1	2.3		15.9	2.1		14.1	4.7		19.3	2.3		13.7	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	46.8	U	<	45.9	U	173	42.2	J	551	46.8		<	46.2	U	2690	221	
Water Quality (percent)																		
Water	15	0.1		13	0.1		5.1	0.1		15	0.1		13	0.1		9.7	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 15-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 51

LOCATOR	CAN051-0511-0004			CAN051-0511-0008			CAN051-0512-0004			CAN051-0512-0004			CAN051-0512-0008			CAN051-0512-0004		
LAB SAMPLE NUMBER	0312760003SA			0312760004SA			0312790017SA			0316040001SA			0312790018SA			0312760007SA		
COLLECT DATE	09/14/93			09/14/93			09/15/93			09/15/93			09/15/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.8	U	<	5.7	U	4.2	6.2	J				<	5.5	U	<	5.9	U
1,2-Dichloropropane	<	5.8	U	<	5.7	U	2.4	6.2	J				<	5.5	U	<	5.9	U
Tetrachloroethene	<	5.8	U	<	5.7	U	26	6.2					<	5.5	U	<	5.9	U
Toluene	<	5.8	U	<	5.7	U	3.5	6.2	J				1.7	5.5	J	<	5.9	U
Semivolatile Organics (ug/kg)																		
Chrysene							56	410	J	<	410	U						
Metals (mg/kg)																		
Aluminum	3050	23.3		3830	11.4		2310	24.9					2690	55		2960	23.6	
Arsenic	2.2	0.58		2.4	0.57		2	0.62					2.4	0.55		2	0.59	
Barium	330	2.3	J	190	1.1	J	1100	2.5					1150	5.5		1370	2.4	J
Beryllium	0.26	0.47	J	0.34	0.23		0.29	0.5	J				<	1.1	U	<	0.47	U
Cadmium	2.3	1.2	J	1.6	0.57	J	2.7	1.2					3.4	2.8		2.4	1.2	J
Calcium	198000	46.5		97900	22.8		236000	49.7					263000	110		202000	47.2	
Chromium	<	2.3	U	3.7	1.1		<	2.5	U				<	5.5	U	3.2	2.4	
Cobalt	2.8	2.3		3	1.1		<	2.5	U				<	5.5	U	2.9	2.4	
Copper	2.6	4.7	J	4	2.3		3.3	5	J				2.7	11	J	2.1	4.7	J
Iron	2810	23.3		3980	11.4		1920	24.9					2110	55		2710	23.6	
Lead	2.6	2.9	J	5.8	1.1		5.1	12.4	J				1.4	5.5	J	1.9	3	J
Magnesium	2290	46.5		2540	22.8		2810	49.7					3830	110		3070	47.2	
Manganese	42.3	2.3		90.7	1.1		29	2.5					36.5	5.5		47.6	2.4	
Nickel	4.6	9.3	J	5.5	4.6		2.7	9.9	J				<	22	U	3.6	9.4	J
Potassium	725	1160	J	896	570		462	1240	J				611	2750	J	<	1180	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 15-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 51

LOCATOR	CAN051-0511-0004			CAN051-0511-0008			CAN051-0512-0004			CAN051-0512-0004			CAN051-0512-0008			CAN051-0513-0004		
LAB SAMPLE NUMBER	0312760003SA			0312760004SA			0312790017SA			0316040001SA			0312790018SA			0312760007SA		
COLLECT DATE	09/14/93			09/14/93			09/15/93			09/15/93			09/15/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Silver	1.1	2.3	J	0.62	1.1	J	1.5	2.5	J				2.5	5.5	J	<	2.4	U
Sodium	700	1160	J	543	570	J	824	1240	J				904	2750	J	<	1180	U
Vanadium	14	2.3		17.5	1.1		8.5	2.5					7.5	5.5		14.2	2.4	
Zinc	8.5	4.7		11.5	2.3		8.3	5					6	11	J	8.4	4.7	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	46.5	U	182	45.6		3150	249					664	44		<	47.2	U
Water Quality (percent)																		
Water	14	0.1		12	0.1		20	0.1		20	0.1		9.2	0.1		15	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 15-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 51

LOCATOR	CAN051-0513-0008		
LAB SAMPLE NUMBER	0312760008SA		
COLLECT DATE	09/14/93		
	Result	RL	Qual
Volatile Organics (ug/kg)			
1,2-Dichloroethane	<	5.5	U
1,2-Dichloropropane	<	5.5	U
Tetrachloroethene	<	5.5	U
Toluene	<	5.5	U
Semivolatile Organics (ug/kg)			
Chrysene	<	360	U
Metals (mg/kg)			
Aluminum	3060	21.9	
Arsenic	2.1	0.55	
Barium	1010	2.2	J
Beryllium	<	0.44	U
Cadmium	2	1.1	J
Calcium	196000	43.9	
Chromium	2.9	2.2	
Cobalt	3.2	2.2	
Copper	2.8	4.4	J
Iron	2470	21.9	
Lead	1.8	2.7	J
Magnesium	3840	43.9	
Manganese	65.1	2.2	
Nickel	5.2	8.8	J
Potassium	785	1100	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 15-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 51

LOCATOR	CAN051-0513-0008		
LAB SAMPLE NUMBER	0312760008SA		
COLLECT DATE	09/14/93		
	Result	RL	Qual
Silver	1.1	2.2	J
Sodium	<	1100	U
Vanadium	12.3	2.2	
Zinc	8	4.4	
TPH (mg/kg)			
Total Petroleum Hydrocarbons	<	43.9	U
Water Quality (percent)			
Water	8.8	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 15-1c
Comparison of Maximum Concentrations with RBCs
SWMU 51

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN051-0512-0004	1,2-Dichloroethane	0.0042	0.8	N
CAN051-0512-0004	1,2-Dichloropropane	0.0024	30	N
CAN051-0513-0002	Anthracene	0.047	2000	N
CAN051-0513-0002	Antimony	1.8	3	N
CAN051-0513-0004	**Barium**	**1370**	**600**	**Y**
CAN051-0513-0002	**Benzo(a)anthracene**	**0.6**	**0.07**	**Y**
CAN051-0513-0002	**Benzo(a)pyrene**	**0.83**	**0.01**	**Y**
CAN051-0513-0002	**Benzo(b)fluoranthene**	**1.7**	**0.07**	**Y**
CAN051-0513-0002	Benzo(g,h,i)perylene	0.52	NTF	N
CAN051-0512-0008	Cadmium	3.4	8	N
CAN051-0513-0002	Carbazole	0.079	4	N
CAN051-0513-0002	Chrysene	0.97	2	N
CAN051-0511-0000	Copper	9.4	300	N
CAN051-0513-0002	Fluoranthene	2	300	N
CAN051-0513-0002	**Indeno(1,2,3-cd)pyrene**	**0.51**	**0.04**	**Y**
CAN051-0513-0002	Phenanthrene	0.8	NTF	N
CAN051-0513-0002	Pyrene	2	200	N
CAN051-0512-0008	Silver	2.5	20	N
CAN051-0512-0004	Tetrachloroethene	0.026	1	N
CAN051-0511-0000	Toluene	0.0066	2000	N
CAN051-0512-0004	**Total Petroleum Hydrocarbons (3)**	**3150**	**1000**	**Y**
CAN051-0512-0000	Xylenes (total)	0.0016	20000	N
CAN051-0511-0000	Zinc	22.2	2000	N

NTF = No EPA Established Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 15-2
Summary of Human Health Risks
SWMU 51

Receptor/Pathway	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic H.I.	Chronic H.I.	Cancer Risk	Subchronic H.I.	Chronic H.I.
Occupational Worker (Surface Soil)*						
– Dermal Contact	0.00		3×10^{-10}	0.00		3×10^{-8}
– Ingestion	0.00		7×10^{-7}	0.00		6×10^{-5}
– Inhalation of VOCs	0.00		1×10^{-7}	0.00		2×10^{-6}
– Inhalation of Particulates	0.00		0.00	0.00		0.00
	0.00		8×10^{-7}	0.00		6×10^{-5}
Construction Worker (Total Soil)						
– Dermal Contact	8×10^{-13}	3×10^{-10}		1×10^{-11}	5×10^{-9}	
– Ingestion	9×10^{-10}	2×10^{-4}		1×10^{-8}	4×10^{-3}	
– Inhalation of VOCs	1×10^{-11}	1×10^{-6}		6×10^{-11}	5×10^{-6}	
– Inhalation of Particulates	6×10^{-13}	2×10^{-6}		3×10^{-12}	7×10^{-6}	
	9×10^{-10}	2×10^{-4}		1×10^{-8}	4×10^{-3}	
Trespasser (Surface Soil)*						
– Dermal Contact	0.00	9×10^{-12}		0.00	2×10^{-9}	
– Ingestion	0.00	2×10^{-7}		0.00	2×10^{-5}	
– Inhalation of VOCs	0.00	3×10^{-8}		0.00	5×10^{-7}	
– Inhalation of Particulates	0.00	0.00		0.00	0.00	
	0.00	2×10^{-7}		0.00	2×10^{-5}	

Note: Apparent inconsistencies in summation of risks are due to rounding of risk values. See Appendix C for nonrounded risk values.

* No carcinogenic contaminants were found in the surface soil at SWMU 51.

Source: Woodward-Clyde, 1994

Table 15-3a
Summary of Soil Sample Results
SWMU 51

SUMMARY OF SWMU 51 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	10	OWS	0.4	ND	<10	ND	ND	NT	NT	NT
2	9	OWS	0.0	ND	ND	ND	ND	NT	NT	NT
3	9	OWS	0.0	ND	ND	NT	NT	NT	NT	NT
4	9	OWS	0.0	ND	ND	NT	NT	NT	NT	NT
5	5.5	OWS	127	>600	>300	ND	7200	NT	NT	NT
6	10	OWS	ND	<20	<10	ND	ND	NT	NT	NT
7	10	OWS	NT	NT	NT	NT	ND	ND	ND[1]	< bkgd
8	n/a	excavated material	NT	NT	NT	ND	ND	NT	NT	NT
9	5.5	OWS	1	<20	<10	NT	NT	NT	NT	NT
10	6	OCV	0.1	<20	<10	ND	ND	NT	NT	NT
11	8	OCV	ND	<20	<10	NT	NT	NT	NT	NT
12	6	OCV	ND	<20	<10	NT	NT	NT	NT	NT
13	8	OCV	ND	<20	<10	NT	NT	NT	NT	NT
14	8	OCV	NT	NT	NT	NT	ND	ND	ND	Ba, Cr, Ni[3]
15QA	8	OCV	NT	NT	NT	NT	ND	ND[2]	ND	Se[4]

1 Only contaminant identified: bis(2-Ethylhexyl)phthalate at 4.0 mg/Kg.
2 Only contaminant identified: naphthalene at 0.0154 mg/Kg, and 1, 2, 4-trimethlbenzene at 0.0033 mg/Kg.
3 Barium at 1,070 mg/Kg, Chromium at 26.3 mg/Kg, Nickel at 14.4 mg/Kg.
4 Selenium at 0.838 mg/Kg.
ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 15-3b
Maximum Soil Sample Concentration of Metals
SWMU 51

SWMU 51 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
15	Arsenic	3.5	< 0.40	1.1-16.7	3.6	0.32 C
	Mercury	0.014	< 0.0010	0.10	0.019	23 N
	Selenium	0.838	< 1.0	0.2	1.1	380 N
14	Barium	1070	0.8	430	805	5300 N
	Chromium	26.3	< 0.02	38	13.3	31 C
	Nickel	14.4	NT	16	11.4	1500 N
7	Lead	7.6	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 16-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 57

LOCATOR	CAN057-0571-0000			CAN057-0571-0002			CAN057-0572-0000			CAN057-0572-0002			CAN057-0573-0000			CAN057-0573-0002		
LAB SAMPLE NUMBER	0312740017SA			0312740018SA			0312790012SA			0312790013SA			0312790008SA			0312790009SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Ethylbenzene	<	5.6	U	<	5.6	U	1.7	5.6	J	<	5.6	U	<	5.5	U	<	5.6	U
Toluene	3.8	5.6	J	<	5.6	U	4.5	5.6	J	<	5.6	U	<	5.5	U	<	5.6	U
Xylenes (total)	7.5	5.6		<	5.6	U	9	5.6		<	5.6	U	<	5.5	U	<	5.6	U
Metals (mg/kg)																		
Aluminum	4790	11.1		7530	11.3		9450	11.2		6780	11.1		8100	11.1		8420	11.2	
Arsenic	2	0.56		1.6	0.56		2.7	0.56		2.1	0.56		2.2	0.55		2	0.56	
Barium	180	1.1		93.7	1.1		106	1.1	J	56.9	1.1	J	71.7	1.1	J	82.7	1.1	J
Beryllium	0.33	0.22		0.58	0.23		0.6	0.22		0.54	0.22		0.52	0.22		0.58	0.22	
Cadmium	0.95	0.56		0.62	0.56				R			R			R			R
Calcium	63800	22.2	J	23700	22.5		19700	22.5		3740	22.3		4730	22.2		38900	22.4	
Chromium	4.4	1.1		7.9	1.1		9.7	1.1	J	7.9	1.1	J	9.5	1.1	J	7.6	1.1	J
Cobalt	2.4	1.1		4.2	1.1		3.7	1.1		3.8	1.1		3.1	1.1		3.7	1.1	
Copper	4.5	2.2		7.9	2.3		7.3	2.2		6.3	2.2		7.2	2.2		7.3	2.2	
Iron	4360	11.1		7210	11.3		9390	11.2		7770	11.1		8720	11.1		8010	11.2	
Lead	6.4	0.56		6.2	0.56		9.2	0.56	J	7.2	0.56	J	7.8	0.55	J	5.9	0.56	J
Magnesium	2520	22.2		1810	22.5		1980	22.5		1680	22.3		1550	22.2		2260	22.4	
Manganese	106	1.1		177	1.1		178	1.1		156	1.1		162	1.1		138	1.1	
Nickel	6	4.4		8.9	4.5		8	4.5		8.1	4.5		7.1	4.4		8.9	4.5	
Potassium	937	556		1460	563		1700	562		1420	557		1520	554		1760	559	
Silver	0.66	1.1	J	0.63	1.1	J	0.53	1.1	J	0.59	1.1	J	0.61	1.1	J	<	1.1	UJ
Sodium	<	556	U	<	563	U	309	562	J	291	557	J	365	554	J	220	559	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 16-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 57

LOCATOR	CAN057-0571-0000			CAN057-0571-0002			CAN057-0572-0000			CAN057-0572-0002			CAN057-0573-0000			CAN057-0573-0002		
LAB SAMPLE NUMBER	0312740017SA			0312740018SA			0312790012SA			0312790013SA			0312790008SA			0312790009SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Vanadium	13.5	1.1		17	1.1		19	1.1		16	1.1		18.3	1.1		15.5	1.1	
Zinc	14.1	2.2		18.4	2.3		20.1	2.2		16.1	2.2		22.5	2.2		21	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	144	44.4		78.4	45		160	44.9		<	44.5	U	<	44.3	U	<	44.8	U
Water Quality (percent)																		
Water	10	0.1		11	0.1		11	0.1		10	0.1		9.8	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 16-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 57

LOCATOR	CAN057-0571-0004			CAN057-0571-0008			CAN057-0572-0004			CAN057-0572-0008			CAN057-0573-0004		
LAB SAMPLE NUMBER	0312740019SA			0312740020SA			0312790014SA			0312790015SA			0312790010SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)															
Toluene	1.6	5.9	J	<	5.7	U	<	5.8	U	9.2	5.6		<	6	U
Xylenes (total)	1.7	5.9	J	<	5.7	U	<	5.8	U	<	5.6	U	<	6	U
Metals (mg/kg)															
Aluminum	3860	23.8		4740	22.9		5050	23.1		5590	22.3		2700	59.7	
Arsenic	1.7	0.59		1.6	0.57		1.9	0.58		1.9	0.56		1.7	0.6	
Barium	167	2.4		192	2.3		126	2.3	J	303	2.2	J	165	6	J
Beryllium	<	0.48	U	<	0.46	U	0.38	0.46	J	0.4	0.45	J	<	1.2	U
Cadmium	3.1	1.2		1.9	1.1	J			R			R			R
Calcium	228000	47.5		127000	45.7	J	179000	46.3		123000	44.6		254000	119	
Chromium	<	2.4	U	2.8	2.3		2.6	2.3	J	3.5	2.2	J	<	6	UJ
Cobalt	2.4	2.4		<	2.3	U	2.2	2.3	J	2.8	2.2		<	6	U
Copper	<	4.8	U	<	4.6	U	3.9	4.6	J	3.6	4.5	J	4.2	11.9	J
Iron	3260	23.8		4140	22.9		4070	23.1		4890	22.3		2430	59.7	
Lead	3	0.59		5.7	0.57	J	2.2	2.9	J	3.6	2.8	J	2.2	3	J
Magnesium	2860	47.5		3450	45.7		2440	46.3		3170	44.6		2860	119	
Manganese	47.1	2.4		82.4	2.3	J	49.6	2.3		93.4	2.2		28.7	6	
Nickel	4.7	9.5	J	<	9.1	U	5	9.3	J	5.6	8.9	J	<	23.9	U
Potassium	<	1190	U	<	1140	U	951	1160	J	1220	1120		704	2990	J
Silver	<	2.4	U	<	2.3	U	0.95	2.3	J	1.6	2.2	J	<	6	UJ
Sodium	<	1190	U	418	1140	J	346	1160	J	326	1120	J	1450	2990	J
Vanadium	10.5	2.4		18.9	2.3	J	9	2.3		12.6	2.2		6.8	6	
Zinc	9	4.8		14	4.6		10.9	4.6		11.9	4.5		10.6	11.9	J
TPH (mg/kg)															
Total Petroleum Hydrocarbons	<	47.5	U	49.4	45.7		<	46.3	U	<	44.6	U	<	47.8	U
Water Quality (percent)															
Water	16	0.1		12	0.1		14	0.1		10	0.1		16	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 16-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 57

LOCATOR	CAN057-0573-0008		
LAB SAMPLE NUMBER	0312790011SA		
COLLECT DATE	09/15/93		
	Result	RL	Qual
Volatile Organics (ug/kg)			
Toluene	2.5	5.4	J
Xylenes (total)	2.3	5.4	J
Metals (mg/kg)			
Aluminum	2870	54.1	
Arsenic	2.4	0.54	
Barium	457	5.4	J
Beryllium	<	1.1	U
Cadmium			R
Calcium	261000	108	
Chromium	<	5.4	UJ
Cobalt	<	5.4	U
Copper	1.8	10.8	J
Iron	2180	54.1	
Lead	0.91	1.1	J
Magnesium	3330	108	
Manganese	38.1	5.4	
Nickel	<	21.7	U
Potassium	707	2710	J
Silver	2.7	5.4	J
Sodium	1150	2710	J
Vanadium	5.9	5.4	
Zinc	11.1	10.8	
TPH (mg/kg)			
Total Petroleum Hydrocarbons	<	43.3	U
Water Quality (percent)			
Water	7.7	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 16-1c
Comparison of Maximum Concentrations with RBCs
SWMU 57

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN057-0571-0004	Cadmium	3.1	8	N
CAN057-0571-0002	Copper	7.9	300	N
CAN057-0572-0000	Ethylbenzene	0.0017	800	N
CAN057-0573-0008	Silver	2.7	20	N
CAN057-0572-0008	Toluene	0.0092	2000	N
CAN057-0572-0000	Total Petroleum Hydrocarbons (3)	160	1000	N
CAN057-0572-0000	Xylenes (total)	0.009	20000	N
CAN057-0573-0000	Zinc	22.5	2000	N

(1) All units in mg/kg

(2) Risk-based concentration

(3) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 16-2a
Summary of Soil Sample Results
SWMU 57

SUMMARY OF SWMU 57 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	8	OWS	ND	<20	<10	ND	ND	NT	NT	NT
2	8	OWS	ND	<20	ND	NT	NT	NT	NT	NT
3	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
4	8	OWS	ND	<20	<10	NT	NT	NT	NT	NT
5	8	OWS	ND	<20	<10	ND	ND	NT	NT	NT
6	8	OWS	ND	<20	ND	ND	NT	NT	NT	NT
7	8	OWS	NT	NT	NT	NT	ND	ND	ND[1]	Ag[2]
8	N/A	OWS	NT	NT	NT	ND	ND	NT	NT	NT

[1] Only contaminant identified: Di-n-butylphthalate found in sample (13 mg/Kg) and laboratory method blank.
[2] Silver at 1.4 mg/Kg.
ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 16-2b
Maximum Soil Sample Concentration of Metals
SWMU 57

SWMU 57 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Silver	1.4	<0 0.04	0.01-5	2.65	380 N
	Arsenic	0.78	< 0.40	1.1-16.7	3.6	0.32 C
	Barium	162.8	0.8	430	805	5300 N
	Cadmium	0.21	< 0.005	0.01-1	1.3	38 N
	Chromium	8.7	0.02	38	13.3	31 C
	Nickel	6.4	NT	16	11.4	1500 N
	Lead	9.3	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 17-1a
Summary of Chemicals Reported for Subsurface Soil
SWMUs 61-63

LOCATOR	CAN061-0611-0004			CAN061-0611-0008			CAN061-0612-0004			CAN061-0612-0008			CAN062-0621-0004			CAN062-0621-0008		
LAB SAMPLE NUMBER	03137900009SA			03137900010SA			03137900013SA			03137900014SA			03140200011SA			03140200012SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93			09/22/93			09/24/93			09/24/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.7	U	<	5.7	U	<	5.6	U	<	5.9	U	<	5.5	U	<	5.6	U
Chlorobenzene	<	5.7	U	<	5.7	U	<	5.6	U	<	5.9	U	<	5.5	U	<	5.6	U
1,1-Dichloroethene	<	5.7	U	<	5.7	U	<	5.6	U	<	5.9	U	<	5.5	U	<	5.6	U
Toluene	<	5.7	U	2.1	5.7	J	<	5.6	U	<	5.9	U	<	5.5	U	<	5.6	U
Trichloroethene	<	5.7	U	<	5.7	U	<	5.6	U	<	5.9	U	<	5.5	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Acenaphthene	<	380	U							<	390	U				<	370	U
4-Chloro-3-methylphenol	<	380	U							<	390	U				<	370	U
2-Chlorophenol	<	380	U							<	390	U				<	370	U
1,4-Dichlorobenzene	<	380	U							<	390	U				<	370	U
2,4-Dinitrotoluene	<	380	U							<	390	U				<	370	U
4-Nitrophenol	<	1800	U							<	1900	U				<	1800	U
N-Nitroso-di-n-propylamine	<	380	U							<	390	U				<	370	U
Pentachlorophenol	<	1800	U							<	1900	U				<	1800	U
Phenol	<	380	U							<	390	U				<	370	U
Pyrene	<	380	U							<	390	U				<	370	U
1,2,4-Trichlorobenzene	<	380	U							<	390	U				<	370	U
Metals (mg/kg)																		
Aluminum	4480	11.5		4970	22.7		5350	11.2		3650	23.6		4260	10.9		3670	11.2	
Antimony	<	6.9	U	<	13.6	U	<	6.7	U	<	14.2	U	<	6.6	U	<	6.7	U
Arsenic	1.8	0.57		1.5	0.57		1.3	0.56		1.7	0.59		1.9	0.55		2.4	0.56	
Barium	82.7	1.1		316	2.3		54.8	1.1		727	2.4		28.4	1.1		158	1.1	
Beryllium	0.31	0.23		0.33	0.45	J	0.36	0.22		0.35	0.47	J	0.4	0.22		0.39	0.22	
Cadmium	1.7	0.57		3	1.1		0.69	0.56		2.6	1.2		<	0.55	U	1.3	0.56	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 17-1a
Summary of Chemicals Reported for Subsurface Soil
SWMUs 61-63

LOCATOR	CAN061-0611-0004			CAN061-0611-0008			CAN061-0612-0004			CAN061-0612-0008			CAN062-0621-0004			CAN062-0621-0008		
LAB SAMPLE NUMBER	03137900009SA			03137900010SA			03137900013SA			03137900014SA			03140200011SA			03140200012SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93			09/22/93			09/24/93			09/24/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Calcium	101000	22.9		151000	45.4		30400	22.4		183000	47.3		1570	21.8		82500	22.4	
Chromium	3.6	1.1		2.3	2.3		5.5	1.1		2.6	2.4		5.9	1.1		3	1.1	
Cobalt	2.4	1.1		1.7	2.3	J	2.6	1.1		<	2.4	U	1.9	1.1		1.8	1.1	
Copper	3.2	2.3		1.6	4.5	J	3.8	2.2		2.5	4.7	J	4.2	2.2		2.8	2.2	
Iron	4010	11.5		2490	22.7		5320	11.2		2640	23.6		4930	10.9		3460	11.2	
Lead	3.4	2.9		3.3	5.7	J	3.4	1.1		3.6	0.59		4.6	0.55		4.8	0.56	
Magnesium	1970	22.9		3210	45.4		1470	22.4		3510	47.3		1470	21.8		2860	22.4	
Manganese	52.1	1.1	J	53.8	2.3	J	54.6	1.1	J	44.2	2.4	J	62.3	1.1		78.3	1.1	
Mercury	<	0.11	U	<	0.11	U	<	0.11	U	<	0.12	U	<	0.11	U	<	0.11	U
Nickel	5.2	4.6		3	9.1	J	6.3	4.5		4.6	9.5	J	5.8	4.4		4.7	4.5	
Potassium	838	573		734	1130	J	998	561		616	1180	J	1300	546		1100	560	
Selenium	<	1.1	J	<	1.1	J	<	1.1	J	<	1.2	J	<	0.55	U	<	0.56	J
Silver	0.64	1.1	J	1.2	2.3	J	0.58	1.1	J	1.7	2.4	J	0.34	1.1	J	<	1.1	U
Sodium	<	573	U	<	1130	U	<	561	U	<	1180	U	223	546	J	173	560	J
Thallium	<	1.1	J	<	1.1	J	<	0.56	U	<	1.2	J	<	0.55	U	<	1.1	J
Vanadium	10.5	1.1		5.6	2.3		12.3	1.1		8.8	2.4		13.4	1.1		15.4	1.1	
Zinc	9.7	2.3		7.4	4.5		17.2	2.2		6.6	4.7		10.3	2.2		9.4	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	45.8	U	<	45.4	U	<	44.8	U	<	47.3	U	<	43.7	U	<	44.8	U
Water Quality (percent)																		
Water	13	0.1		12	0.1		11	0.1		15	0.1		8.4	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 17-1a
Summary of Chemicals Reported for Subsurface Soil
SWMUs 61-63

LOCATOR	CAN062-0622-0004			CAN062-0622-0008		
LAB SAMPLE NUMBER	0314010003SA			0314010004SA		
COLLECT DATE	09/23/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)						
Benzene	<	5.4	U	<	5.7	U
Chlorobenzene	<	5.4	U	<	5.7	U
1,1-Dichloroethene	<	5.4	U	<	5.7	U
Toluene	<	5.4	U	<	5.7	U
Trichloroethene	<	5.4	U	<	5.7	U
Semivolatile Organics (ug/kg)						
Acenaphthene				<	380	U
4-Chloro-3-methylphenol				<	380	U
2-Chlorophenol				<	380	U
1,4-Dichlorobenzene				<	380	U
2,4-Dinitrotoluene				<	380	U
4-Nitrophenol				<	1800	U
N-Nitroso-di-n-propylamine				<	380	U
Pentachlorophenol				<	1800	U
Phenol				<	380	U
Pyrene				<	380	U
1,2,4-Trichlorobenzene				<	380	U
Metals (mg/kg)						
Aluminum	3930	10.8		3040	22.9	
Antimony	<	6.5	U	<	13.7	U
Arsenic	1.2	0.54		1.1	0.57	
Barium	45	1.1	J	334	2.3	J
Beryllium	0.41	0.22		0.59	0.46	
Cadmium	<	0.54	U	<	1.1	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 17-1a
Summary of Chemicals Reported for Subsurface Soil
SWMUs 61-63

LOCATOR	CAN062-0622-0004			CAN062-0622-0008		
LAB SAMPLE NUMBER	0314010003SA			0314010004SA		
COLLECT DATE	09/23/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual
Calcium	2160	21.5		136000	45.8	
Chromium	5.3	1.1		<	2.3	U
Cobalt	2.1	1.1		2.1	2.3	J
Copper	3.5	2.2		2.1	4.6	J
Iron	4610	10.8		2470	22.9	
Lead	4.2	0.54		4	0.57	
Magnesium	1300	21.5		3510	45.8	
Manganese	75	1.1		56.3	2.3	
Mercury	<	0.11	U	<	0.11	U
Nickel	5.5	4.3		4.5	9.2	J
Potassium	938	538		740	1140	J
Selenium	<	0.54	U	<	1.1	J
Silver	<	1.1	J	<	2.3	J
Sodium	295	538	J	<	1140	U
Thallium	<	0.54	U	<	1.1	J
Vanadium	12.9	1.1		9.5	2.3	
Zinc	9.7	2.2		7.9	4.6	
TPH (mg/kg)						
Total Petroleum Hydrocarbons	<	43	U	<	45.8	U
Water Quality (percent)						
Water	7.1	0.1		13	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 17-1b
Summary of Chemicals Reported for Near-Surface Soil
SWMUs 61-63

LOCATOR	CAN063-0631-0000			CAN063-0631-0008			CAN063-0631-0002			CAN063-0632-0000			CAN063-0632-0000			CAN063-0632-0002		
LAB SAMPLE NUMBER	0312140001SA			0314020007SA			0312140002SA			0312140005SA			0314020013SA			0312140006SA		
COLLECT DATE	09/13/93			09/13/93			09/13/93			09/13/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane				1.5	5.2	J	<	5.5	U				<	5.3	U	<	5.6	U
Toluene				2.7	5.2	J	<	5.5	U				<	5.3	U	<	5.6	U
Xylenes (total)				1.1	5.2	J	<	5.5	U				<	5.3	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Acenaphthene	58	340	J							120	340	J						
Anthracene	96	340	J							210	340	J						
Benzo(a)anthracene	370	340								1000	340							
Benzo(a)pyrene	460	340								900	340							
Benzo(b)fluoranthene	990	340	J							1800	340							
Benzo(g,h,i)perylene	280	340	J							390	340							
Butyl benzyl phthalate	120	340	J							50	340	J						
Carbazole	66	340	J							100	340	J						
Chrysene	720	340	J							1100	340							
Dibenzofuran	51	340	J							53	340	J						
Fluoranthene	900	340	J							1700	340							
Fluorene	59	340	J							100	340	J						
Indeno(1,2,3-cd)pyrene	250	340	J							400	340							
2-Methylnaphthalene	120	340	J							<	340	U						
Naphthalene	80	340	J							<	340	U						
Phenanthrene	670	340	J							1400	340							
Pyrene	1100	340	J							2200	340							

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 17-1b
Summary of Chemicals Reported for Near-Surface Soil
SWMUs 61-63

LOCATOR	CAN063-0631-0000			CAN063-0631-0000			CAN063-0631-0002			CAN063-0632-0008			CAN063-0632-0000			CAN063-0632-0002		
LAB SAMPLE NUMBER	0312140001SA			03140200007SA			0312140002SA			0312140005SA			0314020013SA			0312140006SA		
COLLECT DATE	09/13/93			09/13/93			09/13/93			09/13/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	3430	10.4					8910	11		3790	10.3					7150	11.1	
Arsenic	2.2	0.52					2.6	0.55		4.1	0.52					2	0.56	
Barium	717	1					96.9	1.1		279	1					74.8	1.1	
Beryllium	0.27	0.21					0.61	0.22		0.28	0.21					0.5	0.22	
Cadmium	0.85	0.52					<	0.55	U	0.81	0.52					<	0.56	U
Calcium	44500	20.8	J				2690	22		65700	20.6					2440	22.2	
Chromium	11.9	1	J				9.7	1.1		16.1	1					8.3	1.1	
Cobalt	2.4	1					4	1.1		2.2	1					3.6	1.1	
Copper	11.6	2.1					7.4	2.2		10.2	2.1					5.5	2.2	
Iron	5120	10.4					8920	11		4580	10.3					7250	11.1	
Lead	84.4	5.2	J				12	1.1		82.6	5.2					6.2	1.1	
Magnesium	1970	20.8					1770	22		1940	20.6					1300	22.2	
Manganese	383	1	J				177	1.1		156	1					144	1.1	
Mercury	0.25	0.1					<	0.11	U	0.18	0.1					<	0.11	U
Nickel	8.2	4.2					8.3	4.4		5.6	4.1					7.6	4.4	
Potassium	898	519					1640	549		1150	516					1260	555	
Sodium	<	519	U				<	549	U	<	516	U				375	555	J
Vanadium	14.2	1					19.2	1.1		11.5	1					15.1	1.1	
Zinc	54.9	2.1					20.7	2.2		54.2	2.1					15.2	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	649	41.6					<	43.9	U	610	41.2					<	44.4	U
Water Quality (percent)																		
Water	3.8	0.1		4.2	0.1		8.9	0.1		3	0.1		4.9	0.1		10	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 17-1c
Comparison of Maximum Concentrations with RBCs (1)
SWMUs 61-63

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN061-0612-0008	Barium	727	600	Y
CAN061-0611-0008	Cadmium	3	8	N
CAN061-0611-0008	Copper	7.2	300	N
CAN061-0612-0008	Silver	1.7	20	N
CAN061-0612-0000	Toluene	0.005	2000	N
CAN061-0612-0000	Xylenes (total)	0.0028	20000	N

(1) All units in mg/kg

(2) Risk based concentration

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 17-1d
Comparison of Maximum Concentrations with RBCs (1)
SWMUs 61-63

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN062-0622-0000	1,1,2,2-Tetrachloroethane	0.0014	0.4	N
CAN062-0622-0000	2-Hexanone	0.0096	NTF	N
CAN062-0622-0000	4-Methyl-2-pentanone (MIBK)	0.0055	400	N
CAN062-0622-0000	Bromoform	0.0012	200	N
CAN062-0621-0008	Cadmium	1.3	8	N
CAN062-0621-0000	Copper	6.9	300	N
CAN062-0622-0000	Silver	0.59	20	N
CAN062-0621-0002	Toluene	0.0034	2000	N

NTF = No Established EPA Toxicity Factor

(1) All units in mg/kg

(2) Risk based concentration

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 17-1e
Comparison of Maximum Concentrations with RBCs (1)
SWMUs 61-63

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN063-0631-0000	1,2-Dichloroethane	0.0015	0.8	N
CAN063-0631-0000	2-Methylnaphthalene	0.12	NTF	N
CAN063-0632-0000	Acenaphthene	0.12	500	N
CAN063-0632-0000	Anthracene	0.21	2000	N
CAN063-0632-0008	Barium	751	600	Y
CAN063-0632-0000	Benzo(a)anthracene	1	0.07	Y
CAN063-0632-0000	Benzo(a)pyrene	0.9	0.01	Y
CAN063-0632-0000	Benzo(b)fluoranthene	1.8	0.07	Y
CAN063-0632-0000	Benzo(g,h,i)perylene	0.39	NTF	N
CAN063-0631-0000	Butyl benzyl phthalate	0.12	2000	N
CAN063-0631-0000	Cadmium	0.85	8	N
CAN063-0632-0000	Carbazole	0.1	4	N
CAN063-0632-0000	Chromium	16.1	40	N
CAN063-0632-0000	Chrysene	1.1	2	N
CAN063-0631-0000	Copper	11.6	300	N
CAN063-0632-0000	Dibenzofuran	0.053	NTF	N
CAN063-0632-0000	Fluoranthene	1.7	300	N
CAN063-0632-0000	Fluorene	0.1	300	N
CAN063-0632-0000	Indeno(1,2,3-cd)pyrene	0.4	0.04	Y
CAN063-0631-0000	Lead (3)	84.4	500	N
CAN063-0631-0000	Mercury	0.25	2	N
CAN063-0631-0000	Naphthalene	0.08	300	N
CAN063-0632-0000	Phenanthrene	1.4	NTF	N
CAN063-0632-0000	Pyrene	2.2	200	N
CAN063-0631-0000	Toluene	0.0027	2000	N
CAN063-0631-0000	Total Petroleum Hydrocarbons (4)	649	1000	N
CAN063-0631-0000	Xylenes (total)	0.0011	20000	N
CAN063-0631-0000	Zinc	54.9	2000	N

NTF = No EPA Established Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) EPA suggests 500-1,000 mg/kg as allowable concentration for residential soils based on EPA's IUBK Lead Model (EPA 1990)

(4) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 17-2a
Concentrations of COCs in Surface Soils
SWMUs 61-63

Field ID	1,2-Dichloroethane (µg/kg)			Toluene (µg/kg)			Xylenes (total) (µg/kg)			Acenaphthene (µg/kg)			Anthracene (µg/kg)		
	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
CAN063-0631-0000	1.5	J	5.2	2.7	J	5.2	1.1	J	5.2	58	J	340	96	J	340
CAN063-0632-0000		U	5.3		U	5.3		U	5.3	120	J	340	210	J	340
Number	1			1			1			2			2		
Minimum detected	1.50			2.70			1.10			58.0			96.0		
Maximum detected	1.50			2.70			1.10			120			210		
Average	1.50			2.70			1.10			89.0			153		
RME	1.50			2.70			1.10			120			210		

RL = Laboratory reporting limit
RME = Maximum detected
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected.. Value shown is one-half RL

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 17-2a
Concentrations of COCs in Surface Soils
SWMUs 61-63

Field ID	Benzo(a)anthracene (µg/kg)			Benzo(a)pyrene (µg/kg)			Benzo(b)fluoranthene (µg/kg)			Butyl benzyl phthalate (µg/kg)		
	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
CAN063-0631-0000	370		340	460		340	990		340	120	J	340
CAN063-0632-0000	1000		340	900		340	1800		340	50	J	340
Number	2			2			2			2		
Minimum detected	370			460			990			50.0		
Maximum detected	1000			900			1800			120		
Average	685			680			1395			85.0		
RME	1000			900			1800			120		

RL = Laboratory reporting limit
RME = Maximum detected
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected.. Value shown is one-half RL

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 17-2a
Concentrations of COCs in Surface Soils
SWMUs 61-63

Field ID	Carbazole (µg/kg)			Chrysene (µg/kg)			Fluoranthene (µg/kg)			Fluorene (µg/kg)			Indeno(1,2,3-cd)pyrene (µg/kg)			Naphthalene (µg/kg)		
	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
CAN063-0631-0000	66	J	340	720		340	900		340	59	J	340	250	J	340	80	J	340
CAN063-0632-0000	100	J	340	1100		340	1700		340	100	J	340	400		340		U	340
Number	2			2			2			2			2			1		
Minimum detected	66.0			720			900			59			250			80		
Maximum detected	100			1100			1700			100			400			80		
Average	83.0			910			1300			80			325			80		
RME	100			1100			1700			100			400			80		

RL = Laboratory reporting limit
RME = Maximum detected
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected.. Value shown is one-half RL

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 17-2a
Concentrations of COCs in Surface Soils
SWMUs 61-63

	Pyrene (µg/kg)			TPH (µg/kg)			Barium (mg/kg)			Cadmium (mg/kg)			Lead (mg/kg)			Mercury (mg/kg)			Zinc (mg/kg)		
Field ID	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL
CAN063-0631-0000	1100		340	649		42	717		1	0.85		0.5	84.4	J	5.2	0.25		0.1	54.9		2.1
CAN063-0632-0000	2200		340	610		41	279		1	0.81		0.5	82.6		5.2	0.18		0.1	54.2		2.1
Number	2			2			2			2			2			2			2		
Minimum detected	1100			610			279			0.81			82.6			0.18			54.2		
Maximum detected	2200			649			717			0.85			84.4			0.25			54.9		
Average	1650			630			498			0.83			83.5			0.22			54.6		
RME	2200			649			717			0.85			84.4			0.25			54.9		

RL = Laboratory reporting limit
RME = Maximum detected
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected.. Value shown is one-half RL

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 17-2b
Concentrations of COCs in Total Soils
SWMUs 61-63

	1,2-Dichloroethane (µg/kg)			Toluene (µg/kg)			Xylenes (total) (µg/kg)			Acenaphthene (µg/kg)			Anthracene (µg/kg)			
Field ID	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	Qual	RL	Result	log Result	Qual	RL
CAN063-0631-0000	1.5	J	5.2	2.7	J	5.2	1.1	J	5.2	58	J	340	96	4.564	J	340
CAN063-0631-0002		U	5.5		U	5.5		U	5.5							
CAN063-0631-0004		U	5.6		U	5.6		U	5.6							
CAN063-0631-0008		U	5.6		U	5.6		U	5.6		U	370	185	5.220	U	370
CAN063-0632-0000		U	5.3	2.65	U	5.3		U	5.3	120	J	340	210	5.347	J	340
CAN063-0632-0002		U	5.6		U	5.6		U	5.6							
CAN063-0632-0004		U	5.6		U	5.6		U	5.6							
CAN063-0632-0008		U	5.6		U	5.6		U	5.6		U	370	185	5.220	U	370
Number	1			2			1			2			4	4		
Minimum detected	1.50			2.70			1.10			58.0			96.0			
Maximum detected	1.50			2.70			1.10			120			210			
Average	1.50			2.68			1.10			89.0			169	5.09		
H Statistic														2.99		
Standard Deviation													50.07	0.35		
95% UCL													318	318		
RME	1.5			2.70			1.10			120			210			

RL = Laboratory reporting limit
RME = Lower of 95% UCL or maximum detected.
95% UCL concentrations have not been calculated for sample sets with N <3
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected. Value shown is one-half RL
Where no RL is shown, no analysis was performed

Page 1 of 6

Source: Woodward-Clyde, 1994

Table 17-2b
Concentrations of COCs in Total Soils
SWMUs 61-63

	Benzo(a)anthracene (µg/kg)				Benzo(a)pyrene (µg/kg)				Benzo(b)fluoranthene (µg/kg)				Butyl benzyl phthalate (µg/kg)		
Field ID	Result	log Result	Qual	RL	Result	log Result	Qual	RL	Result	log Result	Qual	RL	Result	Qual	RL
CAN063-0631-0000	370	5.914		340	460	6.131		340	990	6.898		340	120	J	340
CAN063-0631-0002															
CAN063-0631-0004															
CAN063-0631-0008	185	5.220	U	370	185	5.220	U	370	185	5.220	U	370		U	370
CAN063-0632-0000	1000	6.908		340	900	6.802		340	1800	7.496		340	50	J	340
CAN063-0632-0002															
CAN063-0632-0004															
CAN063-0632-0008	185	5.220	U	370	185	5.220	U	370	185	5.220	U	370		U	370
Number	4	4			4	4			4	4			2		
Minimum detected	370				460				990				50.0		
Maximum detected	1000				900				1800				120		
Average	435	5.82			433	5.84			790	6.21			85.0		
H Statistic		5.40				5.40				8.32					
Standard Deviation	386.6	0.80			337.6	0.77			772.9	1.17					
95% UCL	5554	5554			5119	5119			2.67E+05	2.67E+05					
RME	1000				900				1800				120		

RL = Laboratory reporting limit
RME = Lower of 95% UCL or maximum detected.
95% UCL concentrations have not been calculated for sample sets with N <3
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected. Value shown is one-half RL
Where no RL is shown, no analysis was performed

Page 2 of 6

Source: Woodward-Clyde, 1994

Table 17-2b
Concentrations of COCs in Total Soils
SWMUs 61-63

	Carbazole (µg/kg)			Chrysene (µg/kg)				Fluoranthene (µg/kg)				Fluorene (µg/kg)		
Field ID	Result	Qual	RL	Result	log Result	Qual	RL	Result	log Result	Qual	RL	Result	Qual	RL
CAN063-0631-0000	66	J	340	720	6.579		340	900	6.802		340	59	J	340
CAN063-0631-0002														
CAN063-0631-0004														
CAN063-0631-0008		U	370	185	5.220	U	370	185	5.220	U	370		U	370
CAN063-0632-0000	100	J	340	1100	7.003		340	1700	7.438		340	100	J	340
CAN063-0632-0002														
CAN063-0632-0004														
CAN063-0632-0008		U	370	185	5.220	U	370	185	5.220	U	370		U	370
Number	2			4	4			4	4			2		
Minimum detected	66.0			720				900				59.0		
Maximum detected	100			1100				1700				100		
Average	83.0			548	6.01			743	6.17			79.5		
H Statistic					6.244				7.443					
Standard Deviation				446.4	0.92			721.9	1.13					
95% UCL				17332	17332			1.15E+05	1.15E+05					
RME	100			1100				1700				100		

RL = Laboratory reporting limit
RME = Lower of 95% UCL or maximum detected.
95% UCL concentrations have not been calculated for sample sets with N <3
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected. Value shown is one-half RL
Where no RL is shown, no analysis was performed

Page 3 of 6

Source: Woodward-Clyde, 1994

Table 17-2b
Concentrations of COCs in Total Soils
SWMUs 61-63

	Ideno(1,2,3-cd)pyrene (µg/kg)				Naphthalene (µg/kg)			Pyrene (µg/kg)				TPH (mg/kg)			
Field ID	Result	Log Result	Qual	RL	Result	Qual	RL	Result	log Result	Qual	RL	Result	log Result	Qual	RL
CAN063-0631-0000	250	5.521	J	340	80	J	340	1100	7.003		340	649	6.475		41.6
CAN063-0631-0002												21.95	3.089	U	43.9
CAN063-0631-0004												140	4.942		44.9
CAN063-0631-0008	185	5.220	U	370		U	370	185	5.220	U	370	22.5	3.114	U	45
CAN063-0632-0000	400	5.991		340		U	340	2200	7.696		340	610	6.413		41.2
CAN063-0632-0002												22.2	3.100	U	44.4
CAN063-0632-0004												11.45	2.438	U	44.9
CAN063-0632-0008	185	5.220	U	370		U	370	185	5.220	U	370	22.45	3.111	U	44.9
Number	4	4			1			4	4			8	8		
Minimum detected	250				80.0			1100				140			
Maximum detected	400				80.0			2200				649			
Average	255	5.49			80.0			918	6.28			187	4.09		
H Statistic		3.184							9.124				5.117		
Standard Deviation	101.4	0.36						957.6	1.26			276.2	1.62		
95% UCL	505	505						9.14E+05	9.14E+05			5120	5120		
RME	400				80.0			2200				649			

RL = Laboratory reporting limit
RME = Lower of 95% UCL or maximum detected.
95% UCL concentrations have not been calculated for sample sets with N <3
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected. Value shown is one-half RL
Where no RL is shown, no analysis was performed

Page 4 of 6

Source: Woodward-Clyde, 1994

Table 17-2b
Concentrations of COCs in Total Soils
SWMUs 61-63

Field ID	Barium (mg/kg) Result	log Result	Qual	RL	Cadmium (mg/kg) Result	log Result	Qual	RL	Lead (mg/kg) Result	log Result	Qual	RL
CAN063-0631-0000	717	6.575		1	0.85	-0.163		0.52	84.4	4.436	J	5.2
CAN063-0631-0002	96.9	4.574		1.1	0.275	-1.291	U	0.55	12	2.485		1.1
CAN063-0631-0004	45.3	3.813		1.1	0.28	-1.273	U	0.56	15	2.708		1.1
CAN063-0631-0008	612	6.417		2.2	0.55	-0.598	U	1.1	3.9	1.361		0.56
CAN063-0632-0000	279	5.631		1	0.81	-0.211		0.52	82.6	4.414		5.2
CAN063-0632-0002	74.8	4.315		1.1	0.28	-1.273	U	0.56	6.2	1.825		1.1
CAN063-0632-0004	61	4.111		1.1	0.28	-1.273	U	0.56	4	1.386		0.56
CAN063-0632-0008	751	6.621		1.1	0.28	-1.273	U	0.56	3.9	1.361		1.1
Number	8	8			8	8			8	8		
Minimum detected	45.3				0.81				3.90			
Maximum detected	751				0.85				84.4			
Average	330	5.26			0.45	-0.92			26.5	2.50		
H Statistic		4.091				2.45				4.428		
Standard Deviation	312.1	1.19			0.25	0.51			35.42	1.30		
95% UCL	2423	2423			0.73	0.73			246	246		
RME	751				0.73				84.4			

RL = Laboratory reporting limit
RME = Lower of 95% UCL or maximum detected.
95% UCL concentrations have not been calculated for sample sets with N <3
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected. Value shown is one-half RL
Where no RL is shown, no analysis was performed

Page 5 of 6

Source: Woodward-Clyde, 1994

Table 17-2b
Concentrations of COCs in Total Soils
SWMUs 61-63

	Mercury (mg/kg)				Zinc (mg/kg)			
Field ID	Result	log Result	Qual	RL	Result	log Result	Qual	RL
CAN063-0631-0000	0.25	-1.386		0.1	54.9	4.006		2.1
CAN063-0631-0002	0.055	-2.900	U	0.11	20.7	3.030		2.2
CAN063-0631-0004	0.055	-2.900	U	0.11	14.5	2.674		2.2
CAN063-0631-0008	0.055	-2.900	U	0.11	10.7	2.370		4.5
CAN063-0632-0000	0.18	-1.715		0.1	54.2	3.993		2.1
CAN063-0632-0002	0.055	-2.900	U	0.11	15.2	2.721		2.2
CAN063-0632-0004	0.055	-2.900	U	0.11	14.8	2.695		2.2
CAN063-0632-0008	0.055	-2.900	U	0.11	11	2.398		2.2
Number	8	8			8	8		
Minimum detected	0.18				10.7			
Maximum detected	0.25				54.9			
Average	0.10	-2.56			24.5	2.99		
H Statistic		2.642				2.745		
Standard Deviation	0.08	0.63			18.8	0.66		
95% UCL	0.18	0.18			48.7	48.7		
RME	0.18				48.7			

RL = Laboratory reporting limit
RME = Lower of 95% UCL or maximum detected.
95% UCL concentrations have not been calculated for sample sets with N <3
J = Estimated value below reporting limit or estimated based on data quality criteria
U = Not detected. Value shown is one-half RL
Where no RL is shown, no analysis was performed

Page 6 of 6
Source: Woodward-Clyde, 1994

Table 17-2c
Summary of Human Health Risks
SWMUs 61-63

Receptor/Pathway	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic H.I.	Chronic H.I.	Cancer Risk	Subchronic H.I.	Chronic H.I.
Occupational Worker (Surface Soil)						
– Dermal Contact	1×10^{-11}		3×10^{-6}	2×10^{-9}		2×10^{-4}
– Ingestion	5×10^{-9}		5×10^{-5}	2×10^{-6}		6×10^{-3}
– Inhalation of VOCs	9×10^{-11}		4×10^{-8}	4×10^{-9}		8×10^{-7}
– Inhalation of Particulates	2×10^{-12}		1×10^{-5}	1×10^{-10}		2×10^{-4}
	5×10^{-9}		7×10^{-5}	2×10^{-6}		6×10^{-3}
Construction Worker (Total Soil)						
– Dermal Contact	7×10^{-13}	1×10^{-6}		1×10^{-11}	3×10^{-5}	
– Ingestion	1×10^{-9}	1×10^{-4}		2×10^{-8}	2×10^{-3}	
– Inhalation of VOCs	6×10^{-12}	3×10^{-8}		3×10^{-11}	1×10^{-7}	
– Inhalation of Particulates	2×10^{-13}	8×10^{-7}		7×10^{-13}	4×10^{-6}	
	1×10^{-9}	1×10^{-4}		2×10^{-8}	2×10^{-3}	
Trespasser (Surface Soil)						
– Dermal Contact	2×10^{-12}	1×10^{-6}		3×10^{-10}	1×10^{-4}	
– Ingestion	1×10^{-9}	1×10^{-5}		1×10^{-7}	2×10^{-3}	
– Inhalation of VOCs	2×10^{-11}	1×10^{-8}		3×10^{-10}	2×10^{-7}	
– Inhalation of Particulates	4×10^{-13}	4×10^{-7}		8×10^{-12}	6×10^{-6}	
	1×10^{-9}	2×10^{-5}		1×10^{-7}	2×10^{-3}	

Note: Apparent inconsistencies in summation of risks are due to rounding of risk values.

Source: Woodward-Clyde, 1994

Table 18-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 92

LOCATOR	CAN092-0921-0000			CAN092-0921-0002			CAN092-0922-0000			CAN092-0922-0090			CAN092-0923-0002			CAN092-0923-0080		
LAB SAMPLE NUMBER	0313810001SA			03138100025A			0312140010SA			0314020018SA			0312140011SA			0312140014SA		
COLLECT DATE	09/22/93			09/22/93			09/13/93			09/13/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.3	U	<	5.3	U				<	5.4	U	<	5.6	U			
Ethylbenzene	1.5	5.3	J	<	5.3	U				<	5.4	U	<	5.6	U			
Toluene	7.5	5.3		<	5.3	U				<	5.4	U	1.1	5.6	J			
Xylenes (total)	7.2	5.3		<	5.3	U				<	5.4	U	1.6	5.6	J			
Semivolatile Organics (ug/kg)																		
Anthracene							<	360	U							<	350	U
Benzo(a)anthracene							190	360	J							180	350	J
Benzo(a)pyrene							210	360	J							220	350	J
Benzo(b)fluoranthene							460	360								490	350	
Benzo(g,h,i)perylene							130	360	J							120	350	J
Butyl benzyl phthalate							140	360	J							110	350	J
Carbazole							<	360	U							<	350	U
Chrysene							300	360	J							280	350	J
Di-n-butyl phthalate							73	360	J							<	350	U
Fluoranthene							490	360								540	350	
Indeno(1,2,3-cd)pyrene							130	360	J							120	350	J
Phenanthrene							220	360	J							340	350	J
Pyrene							450	360								500	350	
Metals (mg/kg)																		
Aluminum	6080	10.6		5670	10.6		5070	10.8					8100	11.2		6040	10.6	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 18-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 92

LOCATOR	CAN092-0921-0000			CAN092-0921-0002			CAN092-0922-0000			CAN092-0922-0000			CAN092-0922-0002			CAN092-0923-0000		
LAB SAMPLE NUMBER	0313810001SA			0313810002SA			0312140010SA			0314020018SA			0312140011SA			0312140014SA		
COLLECT DATE	09/22/93			09/22/93			09/13/93			09/13/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Antimony	<	6.4	U	<	6.4	U	<	6.5	U				<	6.7	U	<	6.4	U
Arsenic	2.3	0.53		2	0.53		2.2	0.54					2.4	0.56		2.5	0.53	
Barium	<		R	<		R	198	1.1					83.6	1.1		96.6	1.1	
Beryllium	0.46	0.21		0.46	0.21		0.29	0.22					0.63	0.22		0.47	0.21	
Cadmium	1.6	0.53		0.59	0.53		1	0.54					<	0.56	U	<	0.53	U
Calcium	58200	21.2		58300	21.3		72500	21.6					6450	22.5		17000	21.2	
Chromium	12.3	1.1		5.9	1.1		13.8	1.1					8.7	1.1		9.3	1.1	
Cobalt	3.4	1.1		3	1.1		2.9	1.1					4.5	1.1		3.3	1.1	
Copper	14.2	2.1		5.7	2.1		6.9	2.2					6.7	2.2		6.7	2.1	
Iron	6470	10.6		6020	10.6		12000	10.8					8560	11.2		7960	10.6	
Lead	502	53		4.6	0.53		64.3	5.4	J				8.4	0.56		12.5	1.1	
Magnesium	2100	21.2		1890	21.3		2810	21.6					1640	22.5		1470	21.2	
Manganese	216	1.1		122	1.1		135	1.1					210	1.1		199	1.1	
Nickel	7.5	4.2		6.6	4.3		8.2	4.3					8.4	4.5		8.5	4.2	
Potassium	1480	530		1130	531		1490	540					1630	561		1290	531	
Silver	0.76	1.1	J	0.73	1.1	J	<	1.1	U				<	1.1	U	<	1.1	U
Vanadium	18.1	1.1		16	1.1		13.1	1.1					18.5	1.1		17.3	1.1	
Zinc	39.3	2.1		13.6	2.1		72.6	2.2					19.3	2.2		44.9	2.1	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	674	42.4		47.6	42.5		278	43.2					<	44.9	U	58.2	42.5	
Water Quality (percent)																		
Water	5.6	0.1		5.9	0.1		7.4	0.1		7.6	0.1		11	0.1		5.8	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 18-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 92

LOCATOR	CAN092-0923-0000			CAN092-0923-0002			CAN092-0924-0000			CAN092-0924-0002			CAN092-0925-0000			CAN092-0925-0002		
LAB SAMPLE NUMBER	03140200195A			0312140015SA			0314170001SA			0314170002SA			0313810014SA			0313810015SA		
COLLECT DATE	09/13/93			09/13/93			09/23/93			09/23/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.3	U	<	5.4	U	<	5.4	U	<	5.4	U	1.3	5.3	J	<	5.3	U
Ethylbenzene	<	5.3	U	<	5.4	U	<	5.4	U	<	5.4	U	<	5.3	U	<	5.3	U
Toluene	<	5.3	U	<	5.4	U	1.6	5.4	J	<	5.4	U	4.9	5.3	J	1.5	5.3	J
Xylenes (total)	1.4	5.3	J	1.7	5.4	J	2.5	5.4	J	<	5.4	U	5.3	5.3		<	5.3	U
Semivolatile Organics (ug/kg)																		
Anthracene				<	360	U	<	350	U				70	350	J	<	350	U
Benzo(a)anthracene				<	360	U	440	350					800	350		<	350	U
Benzo(a)pyrene				<	360	U	640	350					940	350		<	350	U
Benzo(b)fluoranthene				<	360	U	1400	350					2100	350		<	350	U
Benzo(g,h,i)perylene				<	360	U	330	350	J				450	350		<	350	U
Butyl benzyl phthalate				<	360	U	<	350	U				<	350	U	<	350	U
Carbazole				<	360	U	38	350	J				89	350	J	<	350	U
Chrysene				<	360	U	560	350					940	350		<	350	U
Di-n-butyl phthalate				<	360	U	<	350	U				<	350	U	<	350	U
Fluoranthene				<	360	U	600	350					1100	350		<	350	U
Indeno(1,2,3-cd)pyrene				<	360	U	340	350	J				470	350		<	350	U
Phenanthrene				<	360	U	280	350	J				470	350		<	350	U
Pyrene				<	360	U	1200	350					2000	350		<	350	U
Metals (mg/kg)																		
Aluminum				7610	10.8		5420	10.8		6570	10.8		6100	10.6		6260	10.6	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 18-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 92

LOCATOR	CAN092-0923-0000			CAN092-0923-0002			CAN092-0924-0000			CAN092-0924-0002			CAN092-0925-0000			CAN092-0925-0002		
LAB SAMPLE NUMBER	0314020019SA			0312140015SA			0314170001SA			0314170002SA			0313810014SA			0313810015SA		
COLLECT DATE	09/13/93			09/13/93			09/23/93			09/23/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Antimony				<	6.5	U	5.7	6.5	J	5.3	6.5	J	<	6.4	U	<	6.4	U
Arsenic				2.6	0.54		2.7	0.54		2.4	0.54		2.1	0.53		2.1	0.53	
Barium				101	1.1		228	1.1		184	1.1		<		R	<		R
Beryllium				0.54	0.22		0.5	0.22		0.51	0.22		0.42	0.21		0.4	0.21	
Cadmium				<	0.54	U	0.44	0.54	J	<	0.54	U	1.9	0.53		0.89	0.53	
Calcium				12700	21.6		78400	21.5		58700	21.7		53000	21.2		56800	21.2	
Chromium				8.1	1.1		9.1	1.1		5.7	1.1		13.9	1.1		5.3	1.1	
Cobalt				4.4	1.1		2.8	1.1		3.3	1.1		3.4	1.1		2.8	1.1	
Copper				6.9	2.2		7.5	2.2		6.2	2.2		9.8	2.1		5.7	2.1	
Iron				7890	10.8		5910	10.8		6650	10.8		6300	10.6		5800	10.6	
Lead				8.3	0.54		20.9	2.7		5.8	0.54		37.5	5.3		5.7	0.53	
Magnesium				1700	21.6		2650	21.5		2050	21.7		2220	21.2		2030	21.2	
Manganese				195	1.1		130	1.1		149	1.1		182	1.1		122	1.1	
Nickel				8	4.3		7.1	4.3		8	4.3		7.5	4.2		6.1	4.2	
Potassium				1520	540		1550	538		1570	542		1740	531		1270	531	
Silver				<	1.1	U	<	1.1	U	<	1.1	U	1	1.1	J	0.92	1.1	J
Vanadium				17.7	1.1		16.9	1.1		17.2	1.1		17	1.1		14.3	1.1	
Zinc				17.5	2.2		48.4	2.2		14.3	2.2		43.6	2.1		15.7	2.1	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons				49	43.2		159	43		61.5	43.3		295	42.5		120	42.5	
Water Quality (percent)																		
Water	5.6	0.1		7.4	0.1		7	0.1		7.7	0.1		5.8	0.1		5.8	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0921-0004			CAN092-0921-0008			CAN092-0921-0018			CAN092-0921-0028			CAN092-0921-0038			CAN092-0921-0048		
LAB SAMPLE NUMBER	0313810003SA			0313810004SA			0313810005SA			0313810006SA			0313810007SA			0313810008SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.3	U	1.8	5.5	J	<	5.7	U	3.3	5.7	J	4.1	5.4	J	2.8	5.7	J
Semivolatile Organics (ug/kg)																		
Benzo(g,h,i)perylene																		
Metals (mg/kg)																		
Aluminum	6440	10.6		5160	11.1		4520	11.5		4540	11.4		2140	10.8		2320	22.7	
Antimony	<	6.4	U	<	6.6	U	<	6.9	U	<	6.9	U	<	6.5	U	<	13.6	U
Arsenic	1.9	0.53		2.2	0.55		1.4	0.57		0.56	1.1	J	0.58	0.54		0.53	1.1	J
Barium			R			R			R			R			R			R
Beryllium	0.44	0.21		0.43	0.22		0.36	0.23		0.27	0.23		<	0.22	U	<	0.45	U
Cadmium	1.3	0.53		1.2	0.55		1.6	0.57		0.67	0.57		1.1	0.54		2.3	1.1	
Calcium	79800	21.3		89200	22.1		103000	23		62800	22.9		72900	21.6		162000	45.4	
Chromium	6.8	1.1		5.7	1.1		3.4	1.1		3.5	1.1		1.3	1.1		4.8	2.3	
Cobalt	3.2	1.1		2.5	1.1		3	1.1		1.8	1.1		1	1.1	J	<	2.3	U
Copper	5.7	2.1		4.6	2.2		3.3	2.3		2.3	2.3		1.2	2.2	J	2.6	4.5	J
Iron	5980	10.6		4710	11.1		3540	11.5		3210	11.4		1640	10.8		1280	22.7	
Lead	5.5	0.53		5.4	0.55		4.3	0.57		3	0.57		1.9	0.54		2.4	0.57	
Magnesium	2570	21.3		2270	22.1		3350	23		4020	22.9		3180	21.6		12600	45.4	
Manganese	127	1.1		196	1.1		94.2	1.1		49.7	1.1		26.2	1.1		19.7	2.3	
Nickel	6	4.3		5.9	4.4		4.8	4.6		4.1	4.6	J	2.1	4.3	J	<	9.1	U
Potassium	1180	532		1060	553		1430	575		1080	571		498	540	J	221	1130	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0921-0004			CAN092-0921-0008			CAN092-0921-0018			CAN092-0921-0028			CAN092-0921-0038			CAN092-0921-0048		
LAB SAMPLE NUMBER	0313810003SA			0313810004SA			0313810005SA			0313810006SA			0313810007SA			0313810008SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Silver	0.63	1.1	J	0.74	1.1	J	0.91	1.1	J	1.1	1.1		0.73	1.1	J	1.5	2.3	J
Sodium	164	532	J	<	553	U	<	575	U	<	571	U	<	540	U	<	1130	U
Vanadium	15.5	1.1		15.5	1.1		13.1	1.1		10.5	1.1		5.3	1.1		11.2	2.3	
Zinc	13.8	2.1		15	2.2		10.4	2.3		8.7	2.3		7.3	2.2		3.3	4.5	J
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	64.2	42.6		<	44.3	U	<	46	U	<	45.7	U	<	43.2	U	<	45.4	U
Water Quality (percent)																		
Water	6	0.1		9.6	0.1		13	0.1		12	0.1		7.5	0.1		12	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0921-0058			CAN092-0922-0004			CAN092-0922-0008			CAN092-0923-0004			CAN092-0923-0008			CAN092-0924-0004		
LAB SAMPLE NUMBER	0313810009SA			0312140012SA			0312140013SA			0312140016SA			0312140017SA			0314170003SA		
COLLECT DATE	09/22/93			09/13/93			09/13/93			09/13/93			09/13/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.7	U	28	5.6		<	5.4	U	<	5.4	U	<	5.6	U	<	5.4	U
Semivolatile Organics (ug/kg)																		
Benzo(g,h,i)perylene							<	360	U							37	360	J
Metals (mg/kg)																		
Aluminum	1890	11.4		8470	11.2		3370	10.8		7020	10.8		3850	22.3		6230	10.8	
Antimony	<	6.9	U	<	6.7	U	<	6.5	U	<	6.5	U	<	13.4	U	9.4	6.5	
Arsenic	0.31	0.57	J	2.3	0.56		1.9	0.54		2.1	0.54		2.2	0.56		2.5	0.54	
Barium			R	120	1.1		115	1.1		90.3	1.1		310	2.2		171	1.1	
Beryllium	<	0.23	U	0.6	0.22		0.3	0.22		0.54	0.22		0.3	0.45	J	0.41	0.22	
Cadmium	0.7	0.57		<	0.56	U	<	0.54	U	<	0.54	U	<	1.1	U	<	0.54	U
Calcium	52400	22.9		21100	22.3		54700	21.5		19400	21.6		131000	44.5		80400	21.6	
Chromium	2.6	1.1		8.5	1.1		2.8	1.1		7.4	1.1		2.1	2.2	J	5	1.1	
Cobalt	0.87	1.1	J	3.9	1.1		1.7	1.1		3.8	1.1		2.9	2.2		2.7	1.1	
Copper	1.2	2.3	J	6.2	2.2		2.2	2.2		6.4	2.2		2.8	4.5	J	5.5	2.2	
Iron	1700	11.4		8270	11.2		3460	10.8		7460	10.8		3800	22.3		6200	10.8	
Lead	2.1	0.57		7.4	1.1		2.5	0.54		6.3	1.1		3.1	0.56		5.5	0.54	
Magnesium	2300	22.9		1750	22.3		1530	21.5		1580	21.6		2550	44.5		2320	21.6	
Manganese	38.4	1.1		185	1.1		49.3	1.1		176	1.1		58.4	2.2		114	1.1	
Nickel	1.6	4.6	J	8.1	4.5		4.4	4.3		7.9	4.3		5.8	8.9	J	7.7	4.3	
Potassium	319	571	J	1610	559		785	538		1380	540		952	1110	J	1420	539	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 3 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0921-0058			CAN092-0922-0004			CAN092-0922-0008			CAN092-0923-0004			CAN092-0923-0008			CAN092-0924-0004		
LAB SAMPLE NUMBER	03138100009SA			03121400012SA			03121400013SA			03121400016SA			03121400017SA			03141700003SA		
COLLECT DATE	09/22/93			09/13/93			09/13/93			09/13/93			09/13/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Silver	0.96	1.1	J	<	1.1	U	<	1.1	U	<	1.1	U	<	2.2	U	<	1.1	U
Sodium	<	571	U	<	559	U	<	538	U	<	540	U	<	1110	U	<	539	U
Vanadium	6.3	1.1		16.6	1.1		12.3	1.1		16.6	1.1		14.6	2.2		17.8	1.1	
Zinc	4.4	2.3		18.5	2.2		8.3	2.2		16.3	2.2		9.1	4.5		13.6	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	45.7	U	<	44.7	U	<	43	U	<	43.2	U	<	44.5	U	44.8	43.1	
Water Quality (percent)																		
Water	12	0.1		11	0.1		7	0.1		7.3	0.1		10	0.1		7.2	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 4 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0924-0008			CAN092-0924-0018			CAN092-0924-0028			CAN092-0924-0038			CAN092-0924-0048			CAN092-0924-0058		
LAB SAMPLE NUMBER	0314170004SA			0314170006SA			0314170007SA			0314170008SA			0314170009SA			0314170010SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/23/93			09/23/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.7	U	<	5.6	U	<	5.9	U	<	5.5	U	<	5.6	U	<	5.5	U
Semivolatile Organics (ug/kg)																		
Benzo(g,h,i)perylene																		
Metals (mg/kg)																		
Aluminum	3840	22.8		3930	11.1		4470	23.6		2730	11		3300	22.4		2780	11	
Antimony	12.2	13.7	J	6.2	6.7	J	<	14.1	U	<	6.6	U	<	13.4	U	6.2	6.6	J
Arsenic	1.8	0.57		1.7	0.56		1.1	0.59		0.96	0.55		0.93	0.56		0.59	0.55	
Barium	226	2.3		80.7	1.1		61.2	2.4		39.8	1.1		116	2.2		123	1.1	
Beryllium	0.38	0.46	J	0.23	0.22		<	0.47	U	<	0.22	U	<	0.45	U	<	0.22	U
Cadmium	<	1.1	U	<	0.56	U	<	1.2	U	<	0.55	U	<	1.1	U	<	0.55	U
Calcium	156000	45.5		62000	22.3		150000	47.1		71600	22.1		145000	44.7		77600	22	
Chromium	<	2.3	U	3	1.1		<	2.4	U	<	1.1	U	<	2.2	U	7.2	1.1	
Cobalt	2.4	2.3		1.5	1.1		<	2.4	U	<	1.1	U	1.6	2.2	J	0.78	1.1	J
Copper	3.7	4.6	J	2.5	2.2		2.8	4.7	J	1.8	2.2	J	5	4.5	J	3.1	2.2	
Iron	3740	22.8		3700	11.1		2740	23.6		2110	11		2190	22.4		2190	11	
Lead	4.4	0.57		3.8	0.56		2.1	0.59		1.5	0.55		1.8	0.56		1.3	0.55	
Magnesium	3470	45.5		2540	22.3		10100	47.1		5430	22.1		8960	44.7		6890	22	
Manganese	68.2	2.3		54.3	1.1		23.9	2.4		18.8	1.1		26.2	2.2		27.7	1.1	
Nickel	7.7	9.1	J	5.5	4.5		4.5	9.4	J	3.7	4.4	J	5.1	8.9	J	3.4	4.4	J
Potassium	1190	1140		1360	557		667	1180	J	628	552		611	1120	J	455	550	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 5 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0924-0008			CAN092-0924-0018			CAN092-0924-0028			CAN092-0924-0038			CAN092-0924-0048			CAN092-0924-0058		
LAB SAMPLE NUMBER	0314170004SA			0314170006SA			0314170007SA			0314170008SA			0314170009SA			0314170010SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/23/93			09/23/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Silver	<	2.3	U	<	1.1	U	<	2.4	U	<	1.1	U	<	2.2	U	<	1.1	U
Sodium	<	1140	U	<	557	U	<	1180	U	<	552	U	<	1120	U	<	550	U
Vanadium	15.9	2.3		14.1	1.1		18.8	2.4		6.9	1.1		11.7	2.2		10.4	1.1	
Zinc	10	4.6		8.1	2.2		6	4.7		6.5	2.2		6.4	4.5		5.7	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	45.5	U	<	44.6	U	<	47.1	U	<	44.2	U	<	44.7	U	<	44	U
Water Quality (percent)																		
Water	12	0.1		10	0.1		15	0.1		9.5	0.1		11	0.1		9.1	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 6 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0925-0008			CAN092-0925-0018			CAN092-0925-0028			CAN092-0925-0038			CAN092-0925-0048			CAN092-0925-0058		
LAB SAMPLE NUMBER	0313810017SA			0313740015SA			0313740016SA			0313740017SA			0313740018SA			0313740019SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.7	U	<	5.7	U	<	5.8	U	<	5.5	U	<	5.6	U	<	5.4	U
Semivolatile Organics (ug/kg)																		
Benzo(g,h,i)perylene																		
Metals (mg/kg)																		
Aluminum	4730	22.9		4540	11.4		3640	11.6		3340	11		3180	11.2		2490	10.7	
Antimony	<	13.8	U	<	6.8	U	<	6.9	U	<	6.6	U	<	6.7	U	<	6.4	U
Arsenic	2.2	0.57		1.1	0.57		0.45	0.58	J	0.69	0.55		0.52	1.1	J	0.41	0.54	J
Barium			R	391	1.1		71	1.2		61.1	1.1		69	1.1	J	28.9	1.1	
Beryllium	0.46	0.46		0.43	0.23		0.19	0.23	J	0.2	0.22	J	0.21	0.22	J	0.14	0.21	J
Cadmium	1.9	1.1		0.98	0.57		1.3	0.58		0.63	0.55		0.97	0.56		<	0.54	U
Calcium	126000	45.9		59900	22.8		93100	23.1		89900	22		87100	22.5		32800	21.4	
Chromium	3.4	2.3		4.7	1.1		3.8	1.2		3.1	1.1		4.3	1.1		2.5	1.1	
Cobalt	2.6	2.3		1.8	1.1		1.4	1.2		0.58	1.1	J	1.1	1.1		0.97	1.1	J
Copper	3.4	4.6	J	3.5	2.3		1.9	2.3	J	1.2	2.2	J	1.7	2.2	J	1.2	2.1	J
Iron	3900	22.9		4450	11.4		2260	11.6		2370	11		2280	11.2		2550	10.7	
Lead	5.4	0.57		4.8	2.8		1.4	0.58		1.4	2.7	J	1.5	0.56		1.6	0.54	
Magnesium	3590	45.9		2880	22.8		9390	23.1		3880	22		8140	22.5		3130	21.4	
Manganese	81.1	2.3		76.3	1.1		22	1.2		21.4	1.1		26.1	1.1		32.5	1.1	
Nickel	5.5	9.2	J	5	4.6		3.5	4.6	J	2.6	4.4	J	2.8	4.5	J	2.3	4.3	J
Potassium	1100	1150	J	1360	569		601	579		669	549		463	562	J	428	536	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 7 of 8

Source: Woodward-Clyde, 1994

Table 18-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 92

LOCATOR	CAN092-0925-0008			CAN092-0925-0018			CAN092-0925-0028			CAN092-0925-0038			CAN092-0925-0048			CAN092-0925-0058		
LAB SAMPLE NUMBER	0313810017SA			0313740015SA			0313740016SA			0313740017SA			0313740018SA			0313740019SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Silver	2.3	2.3		0.65	1.1	J	0.64	1.2	J	0.78	1.1	J	0.41	1.1	J	0.75	1.1	J
Sodium	<	1150	U	<	569	U	<	579	U	<	549	U	<	562	U	<	536	U
Vanadium	15.9	2.3		15.1	1.1		10.9	1.2		6.5	1.1		12.4	1.1		8.1	1.1	
Zinc	10.5	4.6		10.6	2.3		5.8	2.3		6	2.2		5.8	2.2		5.1	2.1	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	45.9	U	<	45.6	U	<	46.3	U	<	43.9	U	<	45	U	<	42.8	U
Water Quality (percent)																		
Water	13	0.1		12	0.1		14	0.1		9	0.1		11	0.1		6.6	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 8 of 8

Source: Woodward-Clyde, 1994

Table 18-2a
Comparison of Maximum Concentrations with RBCs (1)
SWMU 92

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN092-0925-0000	1,2-Dichloroethane	0.0013	0.8	N
CAN092-0925-0000	Anthracene	0.07	2000	N
CAN092-0925-0000	Benzo(a)anthracene	0.8	0.07	Y
CAN092-0925-0000	Benzo(a)pyrene	0.94	0.01	Y
CAN092-0925-0000	Benzo(b)fluoranthene	2.1	0.07	Y
CAN092-0925-0000	Benzo(g,h,i)perylene	0.45	NTF	N
CAN092-0922-0000	bis(2-Ethylhexyl)phthalate	0.42	5	N
CAN092-0922-0000	Butyl benzyl phthalate	0.14	2000	N
CAN092-0921-0048	Cadmium	2.3	8	N
CAN092-0925-0000	Carbazole	0.089	4	N
CAN092-0925-0000	Chromium	13.9	40	N
CAN092-0925-0000	Chrysene	0.94	2	N
CAN092-0921-0000	Copper	14.2	300	N
CAN092-0921-0000	Ethylbenzene	0.0015	800	N
CAN092-0925-0000	Fluoranthene	1.1	300	N
CAN092-0925-0000	Indeno(1,2,3-cd)pyrene	0.47	0.04	Y
CAN092-0921-0000	Lead (3)	502	500	Y
CAN092-0925-0000	Phenanthrene	0.47	NTF	N
CAN092-0925-0000	Pyrene	2	200	N
CAN092-0925-0008	Silver	2.3	20	N
CAN092-0922-0004	Toluene	0.028	2000	N
CAN092-0921-0000	Total Petroleum Hydrocarbons (4)	674	1000	N
CAN092-0921-0000	Xylenes (total)	0.0072	20000	N
CAN092-0922-0000	Zinc	72.6	2000	N

NTF = No EPA Established Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) EPA suggests 500-1,000 mg/kg as allowable concentration for residential soils based on EPA's IUBK Lead Model (EPA 1990)

(4) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 18-2b
Summary of Human Health Risks
SWMU 92

Receptor/Pathway	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic H.I.	Chronic H.I.	Cancer Risk	Subchronic H.I.	Chronic H.I.
Occupational Worker (Surface Soil)						
-- Dermal Contact	8×10^{-12}		3×10^{-8}	2×10^{-9}		2×10^{-6}
-- Ingestion	4×10^{-9}		6×10^{-5}	2×10^{-6}		7×10^{-3}
-- Inhalation of VOCs	7×10^{-11}		1×10^{-7}	4×10^{-9}		2×10^{-6}
-- Inhalation of Particulates	6×10^{-12}		0.00	3×10^{-10}		0.00
	4×10^{-9}		6×10^{-5}	2×10^{-6}		7×10^{-3}
Construction Worker (Total Soil)						
-- Dermal Contact	6×10^{-13}	2×10^{-9}		1×10^{-11}	5×10^{-7}	
-- Ingestion	9×10^{-10}	2×10^{-4}		2×10^{-8}	2×10^{-3}	
-- Inhalation of VOCs	6×10^{-12}	4×10^{-8}		2×10^{-11}	2×10^{-7}	
-- Inhalation of Particulates	3×10^{-13}	0.00		1×10^{-12}	0.00	
	9×10^{-10}	2×10^{-4}		2×10^{-8}	2×10^{-3}	
Trespasser (Surface Soil)						
-- Dermal Contact	2×10^{-12}	9×10^{-10}		2×10^{-10}	1×10^{-7}	
-- Ingestion	8×10^{-10}	2×10^{-5}		1×10^{-9}	2×10^{-3}	
-- Inhalation of VOCs	1×10^{-11}	4×10^{-8}		3×10^{-10}	6×10^{-7}	
-- Inhalation of Particulates	1×10^{-12}	0.00		2×10^{-11}	0.00	
	8×10^{-10}	2×10^{-5}		1×10^{-7}	2×10^{-3}	

Note: Apparent inconsistencies in summation of risks are due to rounding of risk values.

Source: Woodward-Clyde, 1994

Table 18-2c
Risk Characterization Summary
SWMU 92

Chemical	Sample Number CAN092-0921-0000	CAN092-0921-0002	CAN092-0922-0000	CAN092-0922-0002	CAN092-0923-0000	CAN092-0923-0002	CAN092-0924-0000	CAN092-0924-0002	CAN092-0925-0000	CAN092-0925-0002
Volatile Organics										
1,2-Dichloroethane	0.0027 U	0.0027 U	0.0027 U	0.0028 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0013 J	0.0027 U
Ethylbenzene	0.0015 J	0.0027 U	0.0027 U	0.0028 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U
Toluene	0.0075	0.0027 U	0.0027 U	0.0011 J	0.0027 U	0.0027 U	0.0016 J	0.0027 U	0.0049 J	0.0015 J
Xylenes (total)	0.0072	0.0027 U	0.0027 U	0.0016 J	0.0014 J	0.0017 J	0.0025 J	0.0027 U	0.0053	0.0027 U
Semivolatile Organics										
Anthracene			0.18 U		0.175 U	0.18 U	0.175 U		0.07 J	0.175 U
Benzo(a)anthracene			0.19 J		0.18 J	0.18 U	0.44		0.8	0.175 U
Benzo(a)pyrene			0.21 J		0.22 J	0.18 U	0.64		0.94	0.175 U
Benzo(b)fluoranthene			0.46		0.49	0.18 U	1.4		2.1	0.175 U
Benzo(g,h,i)perylene			0.13 J		0.12 J	0.18 U	0.33 J		0.45	0.175 U
Butyl benzyl phthalate			0.14 J		0.11 J	0.18 U	0.175 U		0.175 U	0.175 U
Carbazole			0.18 U		0.175 U	0.18 U	0.038 J		0.089 J	0.175 U
Chrysene			0.3 J		0.28 J	0.18 U	0.56		0.94	0.175 U
Di-n-butyl phthalate			0.073 J		0.175 U	0.18 U	0.175 U		0.175 U	0.175 U
Fluoranthene			0.49		0.54	0.18 U	0.6		1.1	0.175 U
Ideno(1,2,3-cd)pyrene			0.13 J		0.12 J	0.18 U	0.34 J		0.47	0.175 U
Pentachlorophenol										
Phenanthrene			0.22 J		0.34 J	0.18 U	0.28 J		0.47	0.175 U
Pyrene			0.45		0.5	0.18 U	1.2		2	0.175 U
Metals										
Antimony	3.2 U	3.2 U	3.3 U	3.4 U	3.2 U	3.3 U	5.7 J	5.3 J	3.2 U	3.2 U
Cadmium	1.6	0.59	1	0.28 U	0.27 U	0.27 U	0.44 J	0.27 U	1.9	0.89
Chromium	12.3	5.9	13.8	8.7	9.3	8.1	9.1	5.7	13.9	5.3
Copper	14.2	5.7	6.9	6.7	6.7	6.9	7.5	6.2	9.8	5.7
Lead	502	4.6	64.3 J	8.4	12.5	8.3	20.9	5.8	37.5	5.7
Manganese	216	122	135	210	199	195	130	149	182	122
Selenium										
Zinc	39.3	13.6	72.6	19.3	44.9	17.5	48.4	14.3	43.6	15.7
TPH	674	47.6	278	22.5 U	58.2	49	159	61.5	295	120

* Between 0 and 2 feet deep

** Mean soil concentration multiplied by BAF of 4.6 (Cd).

R Rejected

J Estimated value below reporting limit or estimated based on data quality criteria

U Non-detect, value shown is one-half the reporting limit

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 18-2c
Risk Characterization Summary
SWMU 92

Chemical	Sample Number CAN093-0931-0000	CAN093-0931-0002	CAN093-0932-0000	CAN093-0932-0002	CAN093-0933-0000	CAN093-0933-0002	N	Arithmetic Mean (mg/kg)	Robin Threshold Dietary Level (mg/kg)	Risk?	Deer Mouse Threshold Dietary Level (mg/kg)	Risk?
Volatile Organics												
1,2-Dichloroethane							10	0.0026	312.5	--	520.8	--
Ethylbenzene							10	0.0026	485.5	--	809.2	--
Toluene	0.0026 J	0.0027 U	0.0027 U	0.008	0.0049 J	0.0029 U	16	0.0034	12500	--	20800	--
Xylenes (total)	0.0018 J	0.0027 U	0.0027 U	0.0028 U	0.0018 J	0.0029 U	16	0.0028	5000	--	8300	--
Semivolatile Organics												
Anthracene							6	0.16	5000	--	8333.3	--
Benzo(a)anthracene	0.21 U		0.074 J	0.185 U	0.077 J		10	0.25	0.4	--	0.67	--
Benzo(a)pyrene	0.21 U		0.062 J	0.185 U	0.084 J		10	0.29	0.002	Possible	0.003	Possible
Benzo(b)fluoranthene	0.21 U		0.073 J	0.185 U	0.14 J		10	0.54	8	--	13.3	--
Benzo(g,h,i)perylene	0.21 U		0.073 J	0.185 U	0.056 J		10	0.19	375	--	625	--
Butyl benzyl phthalate							6	0.16	470	--	780	--
Carbazole							6	0.14	250	--	417	--
Chrysene	0.21 U		0.095 J	0.185 U	0.12 J		10	0.30	12	--	20	--
Di-n-butyl phthalate							6	0.16	10500	--	17500	--
Fluoranthene	0.21 U		0.15 J	0.185 U	0.1 J		10	0.37	625	--	1041.7	--
Ideno(1,2,3-cd)pyrene	0.21 U		0.055 J	0.185 U	0.038 J		10	0.19	14.4	--	24	--
Pentachlorophenol	0.045 J		0.85 U	0.9 U	0.85 U		4	0.66	190	--	83.3	--
Phenanthrene	0.21 U		0.13 J	0.185 U	0.1 J		10	0.23	150	--	250	--
Pyrene	0.21 U		0.19 J	0.185 U	0.12 J		10	0.52	375	--	625	--
Metals												
Antimony							10	3.70	16.5	--	27.5	--
Cadmium	0.32 U	0.27 U	1.9	1.2	1	1	16	3.82**	10.5	--	166.7	--
Chromium	9.5 J	5.3	7.7	8.1	12.9	11.8	16	9.21	87.5 (VI)	--	92 (VI)	--
Copper	8.6	4.5	158	7.4	8.4	8.5	16	16.98	260	--	50	--
Lead	7.3	5.2	32.4	5.8	10	11.8	16	46.41	87.5	--	150	--
Manganese	155 J	102 J	183	161	146	162	16	160.56	1750	--	166	--
Selenium	0.32 U	0.27 U	0.25 J	0.6 U	0.27 U	0.6 UJ	6	4.68**	5	--	0.125	Possible
Zinc	25.4	13.1	77.2	18.1	53.3	38	16	34.64	875	--	625	--
TPH	77.4	21.6 U	255	311	325	294	16	190.55	241	--	401.7	--

* Between 0 and 2 feet deep

** Mean soil concentration multiplied by BAF of 4.6 (Cd).

R Rejected

J Estimated value below reporting limit or estimated based on data quality criteria

U Non-detect, value shown i s one-half the reporting limit

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 18-3a
Summary of Soil Sample Results
SWMU 92

SUMMARY OF SWMU 92 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	9	UST/OWS	ND	<15	<10	NT	NT	NT	NT	NT
2	9	OWS	ND	<15	<50	ND	ND	NT	NT	NT
3	9	OWS	ND	<15	<10	NT	NT	NT	NT	NT
4	9	OWS	ND	<15	<50	NT	NT	NT	NT	NT
5	9	OWS	ND	<15	<50	NT	NT	NT	NT	NT
6	10	UST	ND	<15	<50	ND	ND	NT	NT	NT
7	10	OWS	NT	NT	NT	NT	ND	ND	ND[1]	Ba[3]
8	n/a	excavated soils	ND	<15	<10	NT	NT	NT	NT	NT
9	11	leach well	ND	<15	<10	NT	NT	NT	NT	NT
10	11	leach well	ND	<15	<10	NT	NT	NT	NT	NT
11	11	leach well	ND	<15	<10	NT	NT	NT	NT	NT
12	11	leach well	ND	<15	<10	NT	NT	NT	NT	NT
13	12	leach well	ND	<15	<10	NT	NT	NT	NT	NT
14	n/a	excavated soils	ND	<15	<10	NT	NT	NT	NT	NT
15	10	leach well	NT	NT	NT	NT	ND	ND	ND[2]	< bkgd

[1] Contaminants identified: Di-n-butylphthalate at 25 mg/Kg found in sample and laboratory method blank.
[2] Contaminants identified: Di-n-butylphthalate at 30 mg/Kg found in sample and laboratory method blank.
[3] Barium at 680 mg/Kg.
ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration.

Source: U.S. Army Corps of Engineers, 1999

Table 18-3b
Maximum Soil Sample Concentration of Metals
SWMU 92

SWMU 92 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Arsenic	< 3.0	< 0.40	1.1-16.7	3.6	0.32 C
	Barium	680	1.6	430	805	5300 N
	Chromium	5.9	NT	38	13.3	31 C
	Nickel	6.8	NT	16	11.4	1500 N
	Lead	5	NT	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: U.S. Army Corps of Engineers, 1999

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0941-0000			CAN094-0941-0002			CAN094-0942-0000			CAN094-0942-0000			CAN094-0942-0002			CAN094-0943-0000		
LAB SAMPLE NUMBER	0314020002SA			0314020003SA			0312160017SA			0314020006SA			0312160018SA			0314010009SA		
COLLECT DATE	09/24/93			09/24/93			09/24/93			09/24/93			09/13/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.1	U	2	5.3	J				<	5.3	U	<	5.6	U	<	5.9	U
Ethylbenzene	<	5.1	U	1.2	5.3	J				<	5.3	UJ	<	5.6	U	<	5.9	U
Tetrachloroethene	<	5.1	U	25	5.3	J				<	5.3	UJ	<	5.6	U	<	5.9	U
Toluene	6.1	5.1	J	49	5.3	J				10	5.3	J	<	5.6	U	1.4	5.9	J
Xylenes (total)	9.4	5.1		4.2	5.3	J				4.7	5.3	J	<	5.6	U	<	5.9	U
Semivolatile Organics (ug/kg)																		
Anthracene	<	340	U				37	360	J							<	390	U
Benzo(a)anthracene	110	340	J				230	360	J							<	390	U
Benzo(a)pyrene	170	340	J				340	360	J							<	390	U
Benzo(b)fluoranthene	230	340	J				550	360								<	390	U
Benzo(g,h,i)perylene	160	340	J				160	360	J							<	390	U
Butyl benzyl phthalate	48	340	J				<	360	U							<	390	U
Chrysene	180	340	J				350	360	J							<	390	U
Dibenzofuran	<	340	U				<	360	U							<	390	U
Fluoranthene	200	340	J				440	360								<	390	U
Fluorene	<	340	U				<	360	U							<	390	U
Indeno(1,2,3-cd)pyrene	110	340	J				140	360	J							<	390	U
2-Methylnaphthalene	<	340	U				<	360	U							<	390	U
Pentachlorophenol	<	1600	U				<	1800	U							74	1900	J
Naphthalene	<	340	U				<	360	U							<	390	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 1 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0941-0000			CAN094-0941-0002			CAN094-0942-0000			CAN094-0942-0000			CAN094-0942-0002			CAN094-0943-0000		
LAB SAMPLE NUMBER	0314020002SA			0314020003SA			0312160017SA			0314020006SA			0312160018SA			0314010009SA		
COLLECT DATE	09/24/93			09/24/93			09/24/93			09/24/93			09/13/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Phenanthrene	150	340	J				240	360	J							<	390	U
Pyrene	410	340	J				360	360								<	390	U
Metals (mg/kg)																		
Aluminum	3630	10.3		3060	21.1		3830	11					8990	11.3		8670	11.8	
Arsenic	2.7	0.51		3.3	0.53		2.4	0.55					1.9	0.56		2.6	0.59	
Barium	246	1	J	511	2.1		166	1.1					131	1.1		104	1.2	
Beryllium	0.32	0.21		0.23	0.42	J	<	0.22	U				0.44	0.23		0.58	0.24	
Cadmium	1.8	0.51		2	1.1		0.91	0.55					<	0.56	U	<	0.59	U
Calcium	59100	20.5		106000	42.2		61000	22					70200	22.5		26400	23.5	
Chromium	11.5	1	J	3.7	2.1		5.9	1.1					6	1.1		7.9	1.2	
Cobalt	2.3	1		2.1	2.1		2.6	1.1					3.5	1.1		4.4	1.2	
Copper	11.2	2.1		7.7	4.2		10.1	2.2					6.6	2.3		8	2.4	
Iron	5200	10.3		3280	21.1		4510	11					6480	11.3		8290	11.8	
Lead	61.5	5.1		14.6	2.6		99.2	11					5.6	1.1		6.7	0.59	
Magnesium	2000	20.5		3290	42.2		1780	22					2540	22.5		1960	23.5	
Manganese	189	1	J	184	2.1		142	1.1					134	1.1		165	1.2	
Mercury	0.48	0.1		0.26	0.11		0.3	0.11					0.12	0.11		<	0.12	U
Nickel	5.6	4.1		6.3	8.4	J	5.8	4.4					7.9	4.5		8.9	4.7	
Potassium	1430	513	J	997	1060	J	1360	550					1790	564		1660	588	
Selenium	<	0.51	U	<	1.1	UJ	<	0.55	U				<	1.1	UJ	<	0.59	U
Silver	0.54	1	J	<	2.1	U	<	1.1	U				<	1.1	U	<	1.2	U
Sodium	210	513	J	332	1060	J	<	550	U				<	564	U	<	588	U
Thallium	<	0.51	U	<	1.1	UJ	<	0.55	U				<	1.1	UJ	<	0.59	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0941-0000			CAN094-0941-0002			CAN094-0942-0000			CAN094-0942-0000			CAN094-0942-0002			CAN094-0943-0000		
LAB SAMPLE NUMBER	0314020002SA			0314020003SA			0312160017SA			0314020006SA			0312160018SA			0314010009SA		
COLLECT DATE	09/24/93			09/24/93			09/24/93			09/24/93			09/13/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Vanadium	13.5	1		12.8	2.1		11.1	1.1					13.4	1.1		23.9	1.2	
Zinc	56.3	2.1	J	21.5	4.2		84.8	2.2					18.9	2.3		19	2.4	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	862	82.1		3250	422		247	44					<	45.1	U	<	47	U
Water Quality (percent)																		
Water	2.6	0.1		5.2	0.1		9.1	0.1		5.2	0.1		11	0.1		15	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 3 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0943-0002			CAN094-0944-0000			CAN094-0944-0002			CAN094-0945-0000			CAN094-0945-0002			CAN094-0946-0000		
LAB SAMPLE NUMBER	0314010010SA			0314040007SA			0314040008SA			0311810017SA			0311810018SA			0311810013SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.8	U	<	5.9	U	<	5.9	U	<	6	U	<	5.8	U	<	6	U
Ethylbenzene	<	5.8	U	2.7	5.9	J	<	5.9	U	<	6	U	<	5.8	U	<	6	U
Tetrachloroethene	<	5.8	U	<	5.9	U	<	5.9	U	<	6	U	<	5.8	U	<	6	U
Toluene	<	5.8	U	<	5.9	U	1.2	5.9	J	<	6	U	<	5.8	U	1.4	6	J
Xylenes (total)	<	5.8	U	6.4	5.9		<	5.9	U	4	6	J	<	5.8	U	<	6	U
Semivolatile Organics (ug/kg)																		
Anthracene										<	400	U						
Benzo(a)anthracene										<	400	U						
Benzo(a)pyrene										<	400	U						
Benzo(b)fluoranthene										<	400	U						
Benzo(g,h,i)perylene										<	400	UJ						
Butyl benzyl phthalate										<	400	U						
Chrysene										<	400	UJ						
Dibenzofuran										160	400	J						
Fluoranthene										<	400	U						
Fluorene										320	400	J						
Indeno(1,2,3-cd)pyrene										<	400	UJ						
2-Methylnaphthalene										3800	400							
Pentachlorophenol										<	1900	U						
Naphthalene										430	400							

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 4 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0943-0002			CAN094-0944-0000			CAN094-0944-0002			CAN094-0945-0000			CAN094-0945-0002			CAN094-0946-0000		
LAB SAMPLE NUMBER	0314010010SA			0314040007SA			0314040008SA			0311810017SA			0311810018SA			0311810013SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Phenanthrene										240	400	J						
Pyrene										<	400	U						
Metals (mg/kg)																		
Aluminum	4500	23.1		7820	11.7		3710	58.9		8400	12		10500	11.5		7160	12	
Arsenic	2	0.58		2.6	0.59		1.8	0.59		2.9	0.6		2.3	0.58		2.6	0.6	
Barium	185	2.3		218	1.2	J	146	5.9	J			R			R			R
Beryllium	0.49	0.46		0.45	0.23		<	1.2	U	0.44	0.24		0.74	0.23		0.45	0.24	
Cadmium	<	1.2	U	0.8	0.59		2.9	2.9		<	0.6	U	<	0.58	U	<	0.6	U
Calcium	125000	46.2		38700	23.4		216000	118		12400	24		4840	23		7840	23.9	
Chromium	<	2.3	U	9.2	1.2		<	5.9	U	9.5	1.2		11.3	1.2		7.9	1.2	
Cobalt	3.1	2.3		1.7	1.2		<	5.9	U	3.2	1.2		5.4	1.2		2.5	1.2	
Copper	4.9	4.6		9.9	2.3		2.2	11.8	J	6.7	2.4		8.2	2.3		5.2	2.4	
Iron	4420	23.1		6280	11.7		3500	58.9		8890	12		10800	11.5		6680	12	
Lead	5.3	0.58		15.2	1.2		3.5	0.59		12.5	1.2	J	7.7	0.58	J	7.5	0.6	J
Magnesium	1880	46.2		2640	23.4		2480	118		1510	24		2250	23		1270	23.9	
Manganese	98.6	2.3		106	1.2		39.7	5.9		86.3	1.2	J	233	1.2	J	61.6	1.2	J
Mercury	<	0.12	U	<	0.12	U	<	0.12	U	<	0.12	U	<	0.12	U	<	0.12	U
Nickel	7.1	9.2	J	5.8	4.7		<	23.5	U	7.1	4.8		11.3	4.6		5.4	4.8	
Potassium	1040	1150	J	1750	585		694	2940	J	1350	600		1830	575		1170	598	
Selenium	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ	0.34	0.6	J	0.26	0.58	J	0.27	0.6	J
Silver	<	2.3	U	0.52	1.2	J	3	5.9	J	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ
Sodium	<	1150	U	<	585	U	<	2940	U	<	600	U	<	575	U	<	598	U
Thallium	<	1.2	UJ	<	0.59	U	<	1.2	UJ	<	1.2	UJ	0.13	1.2	J	<	1.2	UJ

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 5 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0943-0002			CAN094-0944-0000			CAN094-0944-0002			CAN094-0945-0000			CAN094-0945-0002			CAN094-0946-0000		
LAB SAMPLE NUMBER	0314010010SA			0314040007SA			0314040008SA			0311810017SA			0311810018SA			0311810013SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Vanadium	12.9	2.3		13.4	1.2		11.7	5.9		18.5	1.2		21.4	1.2		15.3	1.2	
Zinc	12.9	4.6		23.6	2.3		11.2	11.8	J	27.2	2.4		23.6	2.3		17.3	2.4	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	61.3	46.2		221	46.8		<	47.1	U	3600	480		<	46	U	251	47.8	
Water Quality (percent)																		
Water	13	0.1		15	0.1		15	0.1		17	0.1		13	0.1		16	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 6 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0946-0002		
LAB SAMPLE NUMBER	0311810014SA		
COLLECT DATE	09/11/93		
	Result	RL	Qual
Volatile Organics (ug/kg)			
1,2-Dichloroethane	<	5.9	UJ
Ethylbenzene	<	5.9	U
Tetrachloroethene	<	5.9	U
Toluene	9	5.9	
Xylenes (total)	<	5.9	U
Semivolatile Organics (ug/kg)			
Anthracene			
Benzo(a)anthracene			
Benzo(a)pyrene			
Benzo(b)fluoranthene			
Benzo(g,h,i)perylene			
Butyl benzyl phthalate			
Chrysene			
Dibenzofuran			
Fluoranthene			
Fluorene			
Indeno(1,2,3-cd)pyrene			
2-Methylnaphthalene			
Pentachlorophenol			
Naphthalene			

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 7 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0946-0002		
LAB SAMPLE NUMBER	0311810014SA		
COLLECT DATE	09/11/93		
	Result	RL	Qual
Phenanthrene			
Pyrene			
Metals (mg/kg)			
Aluminum	8090	11.7	
Arsenic	2.6	0.59	
Barium			R
Beryllium	0.63	0.23	
Cadmium	<	0.59	U
Calcium	14800	23.5	
Chromium	9	1.2	
Cobalt	4.6	1.2	
Copper	7.3	2.3	
Iron	8870	11.7	
Lead	8.2	0.59	J
Magnesium	2070	23.5	
Manganese	198	1.2	J
Mercury	<	0.12	U
Nickel	10	4.7	
Potassium	1530	587	
Selenium	<	0.59	U
Silver	<	1.2	UJ
Sodium	<	587	U
Thallium	0.14	1.2	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 8 of 9

Source: Woodward-Clyde, 1994

Table 19-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 94

LOCATOR	CAN094-0946-0002		
LAB SAMPLE NUMBER	0311810014SA		
COLLECT DATE	09/11/93		
	Result	RL	Qual
Vanadium	18	1.2	
Zinc	20.2	2.3	
TPH (mg/kg)			
Total Petroleum Hydrocarbons	<	46.9	U
Water Quality (percent)			
Water	15	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review

J = Estimated value.
R = Rejected value.

QUAL=Qualification

Page 9 of 9

Source: Woodward-Clyde, 1994

Table 19-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 94

LOCATOR	CAN094-0941-0004			CAN094-0941-0008			CAN094-0942-0004			CAN094-0942-0008			CAN094-0943-0004			CAN094-0943-0008		
LAB SAMPLE NUMBER	0314020004SA			0314020005SA			0312160019SA			0312160020SA			0314010011SA			0314010012SA		
COLLECT DATE	09/24/93			09/24/93			09/13/93			09/13/93			09/23/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloropropane	<	5.8	U	<	5.6	U	<	6	U	<	6.3	U	<	5.7	U	<	5.6	U
Toluene	11	5.8		1.3	5.6	J	<	6	U	<	6.3	U	<	5.7	U	<	5.6	U
Metals (mg/kg)																		
Aluminum	2900	23.4		3250	22.5		3510	60.4		3400	25.1	J	6120	22.8		3950	11.3	
Antimony	<	14	U	<	13.5	U	<	36.2	U	<	15	U	<	13.7	U	<	6.8	U
Arsenic	1.9	0.58		1.5	0.56		1.4	0.6		1.5	0.63		1.9	0.57		1.6	0.56	
Barium	133	2.3		233	2.2		1640	6		296	2.5	J	117	2.3		472	1.1	
Beryllium	0.31	0.47	J	0.25	0.45	J	0.88	1.2	J	<	0.5	U	0.58	0.46		0.47	0.23	
Cadmium	2.4	1.2		1.4	1.1		<	3	U	<	1.3	U	<	1.1	U	<	0.56	U
Calcium	213000	46.7		118000	44.9		233000	121		178000	50.1	J	102000	45.7		83400	22.5	
Chromium	3.9	2.3		<	2.2	U	<	6	U	<	2.5	UJ	5.6	2.3		2.7	1.1	
Cobalt	2.4	2.3		<	2.2	U	<	6	U	2	2.5	J	3.7	2.3		2.6	1.1	
Copper	4.5	4.7	J	2.3	4.5	J	<	12.1	U	2.8	5	J	5.5	4.6		3.1	2.3	
Iron	2490	23.4		2940	22.5		2790	60.4		2900	25.1	J	6260	22.8		3650	11.3	
Lead	2.8	0.58		3.3	0.56		3.1	3		3	0.63		5.8	0.57		4.8	0.56	
Magnesium	2230	46.7		3160	44.9		3290	121		2780	50.1		2540	45.7		2880	22.5	
Manganese	37.7	2.3		48.5	2.2		31.2	6		38.4	2.5	J	141	2.3		113	1.1	
Nickel	4.3	9.3	J	4.7	9	J	<	24.2	U	4.8	10	J	9.3	9.1		6.4	4.5	
Potassium	533	1170	J	1010	1120	J	499	3020	J	842	1250	J	1310	1140		938	563	
Silver	1.2	2.3	J	<	2.2	U	<	6	U	<	2.5	U	<	2.3	U	<	1.1	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 1 of 4

Source: Woodward-Clyde, 1994

Table 19-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 94

LOCATOR	CAN094-0941-0004			CAN094-0941-0008			CAN094-0942-0004			CAN094-0942-0008			CAN094-0943-0004			CAN094-0943-0008		
LAB SAMPLE NUMBER	0314020004SA			0314020005SA			0312160019SA			0312160020SA			0314010011SA			0314010012SA		
COLLECT DATE	09/24/93			09/24/93			09/13/93			09/13/93			09/23/93			09/23/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Sodium	<	1170	U	316	1120	J	<	3020	U	<	1250	U	<	1140	U	<	563	U
Vanadium	9.4	2.3		13.8	2.2		10.8	6		9.6	2.5		16.9	2.3		14.3	1.1	
Zinc	8.6	4.7		8.5	4.5		7.4	12.1	J	9	5	J	16.1	4.6		10	2.3	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	46.7	U	<	44.9	U	<	48.3	U	51.4	50.1		86.2	45.7		91.7	45	
Water Quality (percent)																		
Water	14	0.1		11	0.1		17	0.1		20	0.1		12	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 4

Source: Woodward-Clyde, 1994

Table 19-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 94

LOCATOR	CAN094-0944-0004			CAN094-0944-0008			CAN094-0945-0004			CAN094-0945-0008			CAN094-0946-0004			CAN094-0946-0008		
LAB SAMPLE NUMBER	0314040009SA			0314040010SA			0311810019SA			0311810020SA			0311810015SA			0311810016SA		
COLLECT DATE	09/23/93			09/23/93			09/11/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloropropane	<	5.9	U	<	5.5	U	<	5.6	U	<	5.7	U	27	5.9		<	5.6	U
Toluene	4.3	5.9	J	<	5.5	U	<	5.6	U	<	5.7	U	1.9	5.9	J	6.2	5.6	
Metals (mg/kg)																		
Aluminum	4390	23.5		6090	10.9		3970	22.6		3930	22.6		3330	59.4		4880	11.2	
Antimony	<	14.1	U	<	6.6	U	<	13.6	U	10.6	13.6	J	<	35.6	U	<	6.7	U
Arsenic	1.9	0.59		1.8	0.55		1.5	0.56		1.3	0.57		1.7	0.59		2.2	0.56	
Barium	325	2.3	J	137	1.1	J			R			R			R			R
Beryllium	0.28	0.47	J	0.41	0.22		<	0.45	U	0.24	0.45	J	<	1.2	U	0.35	0.22	
Cadmium	2.2	1.2		1.4	0.55		<	1.1	U	<	1.1	U	<	3	U	<	0.56	U
Calcium	168000	46.9		65800	21.9		130000	45.2		105000	45.2		207000	119		58200	22.3	
Chromium	3.1	2.3		5.6	1.1		1.9	2.3	J	2.8	2.3		<	5.9	U	3.9	1.1	
Cobalt	1.8	2.3	J	2.4	1.1		1.9	2.3	J	2.5	2.3		<	5.9	U	2.4	1.1	
Copper	2.5	4.7	J	4.2	2.2		2.7	4.5	J	1.8	4.5	J	<	11.9	U	2.4	2.2	
Iron	3770	23.5		5720	10.9		4120	22.6		3990	22.6		3200	59.4		4760	11.2	
Lead	3.5	0.59		3.5	0.55	J	3.3	0.56	J	4.1	1.1	J	2.6	0.59	J	4.8	1.1	J
Magnesium	2690	46.9		3210	21.9		2030	45.2		3000	45.2		2190	119		2490	22.3	
Manganese	43.3	2.3		107	1.1		51	2.3	J	70.2	2.3	J	34	5.9	J	81.1	1.1	J
Nickel	4.7	9.4	J	6.2	4.4		4.2	9	J	5.6	9	J	<	23.8	U	4.9	4.5	
Potassium	813	1170	J	1400	547		700	1130	J	910	1130	J	<	2970	U	885	558	
Silver	0.51	2.3	J	<	1.1	J	<	2.3	UJ	<	2.3	UJ	<	5.9	UJ	<	1.1	UJ

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 3 of 4

Source: Woodward-Clyde, 1994

Table 19-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 94

LOCATOR	CAN094-0944-0004			CAN094-0944-0008			CAN094-0945-0004			CAN094-0945-0008			CAN094-0946-0004			CAN094-0946-0008		
LAB SAMPLE NUMBER	0314040009SA			0314040010SA			0311810019SA			0311810020SA			0311810015SA			0311810016SA		
COLLECT DATE	09/23/93			09/23/93			09/11/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Sodium	<	1170	U	<	547	U	<	1130	U	<	1130	U	<	2970	U	<	558	U
Vanadium	13.5	2.3		19.4	1.1		10.6	2.3		10.7	2.3		8.7	5.9		17.5	1.1	
Zinc	9.3	4.7		14.4	2.2		9.4	4.5		22	4.5		<	11.9	U	10.8	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	46.9	U	<	43.8	U	<	45.2	U	<	45.2	U	<	47.5	U	<	44.7	U
Water Quality (percent)																		
Water	15	0.1		8.7	0.1		11	0.1		12	0.1		16	0.1		10	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 4 of 4

Source: Woodward-Clyde, 1994

Table 19-2a
Comparison of Detected Concentrations with RBCs (1)
SWMU 94

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN094-0941-0002	1,2-Dichloroethane	0.002	0.8	N
CAN094-0946-0004	1,2-Dichloropropane	0.027	30	N
CAN094-0945-0000	2-Methylnaphthalene	3.8	NTF	N
CAN094-0942-0000	Anthracene	0.037	2000	N
CAN094-0945-0008	**Antimony**	**10.6**	**3**	**Y**
CAN094-0942-0004	**Barium**	**1640**	**600**	**Y**
CAN094-0942-0000	**Benzo(a)anthracene**	**0.23**	**0.07**	**Y**
CAN094-0942-0000	**Benzo(a)pyrene**	**0.34**	**0.01**	**Y**
CAN094-0942-0000	**Benzo(b)fluoranthene**	**0.55**	**0.07**	**Y**
CAN094-0941-0000	Benzo(g,h,i)perylene	0.16	NTF	N
CAN094-0942-0004	**Beryllium**	**0.88**	**0.02**	**Y**
CAN094-0941-0000	Butyl benzyl phthalate	0.048	2000	N
CAN094-0944-0002	Cadmium	2.9	8	N
CAN094-0942-0000	Chrysene	0.35	2	N
CAN094-0945-0002	Cobalt	5.4	NTF	N
CAN094-9441-0000	Copper	11.2	300	N
CAN094-0945-0000	Dibenzofuran	0.16	NTF	N
CAN094-0944-0000	Ethylbenzene	0.0027	800	N
CAN094-0942-0000	Fluoranthene	0.44	300	N
CAN094-0945-0000	Fluorene	0.32	300	N
CAN094-0942-0000	**Indeno(1,2,3-cd)pyrene**	**0.14**	**0.04**	**Y**
CAN094-0942-0000	Lead (3)	99.2	500	N
CAN094-0941-0000	Mercury	0.48	2	N
CAN094-0945-0000	Naphthalene	0.43	300	N
CAN094-0945-0002	Nickel	11.3	200	N
CAN094-0943-0000	Pentachlorophenol	0.074	0.6	N
CAN094-0942-0000	Phenanthrene	0.24	NTF	N
CAN094-0941-0000	Pyrene	0.41	200	N
CAN094-0944-0002	Silver	3	20	N
CAN094-0941-0002	Tetrachloroethene	0.025	1	N
CAN094-0946-0002	Thallium	0.14	6	N
CAN094-0941-0002	Toluene	0.049	200	N
CAN094-0945-0000	**Total Petroleum Hydrocarbons (4)**	**3600**	**1000**	**Y**
CAN094-0941-0000	Xylenes (total)	0.0094	20000	N
CAN094-0942-0000	Zinc	84.8	2000	N

NTF = No EPA Established Toxicity Factor
(1) All units in mg/kg
(2) Risk-based concentration
(3) EPA suggests 500-1,000 mg/kg as allowable concentration for residential soils based on EPA's IUBK Lead Model (EPA 1990)
(4) New Mexico recommended soil cleanup level for fuel contaminated soil.
Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 19-2b
Summary of Human Health Risks
SWMU 94

Receptor/Pathway	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic H.I.	Chronic H.I.	Cancer Risk	Subchronic H.I.	Chronic H.I.
Occupational Worker (Surface Soil)						
-- Dermal Contact	0.00		3×10^{-6}	0.00		4×10^{-4}
-- Ingestion	2×10^{-9}		9×10^{-6}	6×10^{-7}		2×10^{-3}
-- Inhalation of VOCs	0.00		2×10^{-7}	0.00		3×10^{-6}
-- Inhalation of Particulates	4×10^{-12}		1×10^{-8}	2×10^{-10}		2×10^{-7}
	2×10^{-9}		1×10^{-5}	6×10^{-7}		2×10^{-3}
Construction Worker (Total Soil)						
-- Dermal Contact	4×10^{-14}	1×10^{-6}		5×10^{-13}	2×10^{-5}	
-- Ingestion	5×10^{-10}	4×10^{-4}		5×10^{-9}	4×10^{-3}	
-- Inhalation of VOCs	0.00	2×10^{-7}		0.00	9×10^{-6}	
-- Inhalation of Particulates	3×10^{-13}	5×10^{-7}		1×10^{-12}	2×10^{-6}	
	5×10^{-10}	4×10^{-4}		5×10^{-9}	5×10^{-3}	
Trespasser (Surface Soil)						
-- Dermal Contact	0.00	8×10^{-7}		0.00	2×10^{-4}	
-- Ingestion	3×10^{-10}	2×10^{-6}		4×10^{-8}	3×10^{-4}	
-- Inhalation of VOCs	0.00	5×10^{-8}		0.00	8×10^{-7}	
-- Inhalation of Particulates	8×10^{-13}	4×10^{-9}		1×10^{-11}	7×10^{-8}	
	4×10^{-10}	2×10^{-6}		4×10^{-8}	5×10^{-4}	

Note: Apparent inconsistencies in summation of risks are due to rounding of risk values.

Source: Woodward-Clyde, 1994

Table 19-2c
Risk Characterization Summary
SWMU 94

Chemical	Sample Number CAN094-0941-0000	CAN094-0941-0002	CAN094-0942-0000	CAN094-0942-0002	CAN094-0943-0000	CAN094-0944-0000	CAN094-0945 0000	CAN094-0946-0000	N	Arithmetic Mean (mg/kg)	Robin Benchmark Dietary Threshold (mg/kg)	Risk?
Volatile Organics												
1,2-Dichloroethane	0.0026 U	0.002 J	0.0027 U	0.0028 U	0.003 U	0.003 U	0.003 U	0.003 U	8	0.00	312.5	--
Ethylbenzene	0.0026 U	0.001 J	0.0027 UJ	0.0028 U	0.003 U	0.0027 J	0.003 U	0.003 U	8	0.00	485.5	--
Tetrachloroethene	0.0026 U	0.025 J	0.0027 UJ	0.0028 U	0.003 U	0.003 U	0.003 U	0.003 U	8	0.01	5000	--
Toluene	0.0061 J	0.049 J	0.01 J	0.0028 U	0.0014 J	0.003 U	0.003 U	0.0014 J	8	0.01	12500	--
Xylenes (total)	0.0094	0.004 J	0.0047 J	0.0028 U	0.003 U	0.0032	0.004 J	0.003 U	8	0.00	5000	--
Semivolatile Organics												
Anthracene	0.17 U		0.037 J		0.195 U		0.2 U		4	0.15	5000	--
Benzo(a)anthracene	0.11 J		0.23 J		0.195 U		0.2 U		4	0.18	0.4	--
Benzo(a)pyrene	0.17 J		0.34 J		0.195 U		0.2 U		4	0.23	0.002	Possible
Benzo(b)fluoranthene	0.23 J		0.55		0.195 U		0.2 U		4	0.29	8	--
Benzo(g,h,i)perylene	0.16 J		0.16 J		0.195 U		0.2 UJ		4	0.18	375	--
Butyl benzyl phthalate	0.048 J		0.18 U		0.195 U		0.2 U		4	0.16	470	--
Chrysene	0.18 J		0.35 J		0.195 U		0.2 UJ		4	0.23	12	--
Dibenzofuran	0.17 U		0.18 U		0.195 U		0.16 J		4	0.18	3.3	--
Fluoranthene	0.2 J		0.44		0.195 U		0.2 U		4	0.26	625	--
Fluorene	0.17 U		0.18 U		0.195 U		0.32 J		4	0.22	625	--
Indeno(1,2,3-cd)pyrene	0.11 J		0.14 J		0.195 U		0.2 UJ		4	0.16	14.4	--
2-Methylnaphthalene	0.17 U		0.18 U		0.195 U		3.8		4	1.09	815	--
Naphthalene	0.17 U		0.18 U		0.195 U		0.43		4	0.37	267.5	--
Pentachlorophenol	0.8 U		0.9 U		0.074 J		0.95 U		3	0.68	190	--
Phenanthrene	0.15 J		0.24 J		0.195 U		0.24 J		4	0.21	150	--
Pyrene	0.41 J		0.36		0.195 U		0.2 U		4	0.29	375	--
Metals												
Cadmium	1.8	2	0.91	0.28 U	0.3 U	0.8	0.3 U	0.3 U	8	3.87**	10.5	--
Lead	61.5	14.6	99.2	5.6	6.7	15.2	12.5 J	7.5 J	8	27.85	87.5	--
Mercury	0.48	0.26	0.3	0.12	0.06 U	0.06 U	0.06 U	0.06 U	8	0.18	0.3	--
Selenium	0.26 U	0.6 J	0.28 U	0.6 J	0.3 U	0.6 J	0.34 J	0.27 J	8	4.92**	5	--
Silver	0.54 J	1.1 U	0.6 U	0.6 U	0.6 U	0.52 J	0.6 UJ	0.6 UJ	8	0.65	41	--
Thallium	0.26 U	0.6 J	0.28 U	0.6 U	0.3 U	0.3 U	0.6 UJ	0.6 UJ	8	0.44	2.6	--
Zinc	56.3 J	21.5	84.8	18.9	19	23.6	27.2	17.3	8	33.58	875	--
TPH	862	3250	247	22.6 U	24 U	221	3600	251	8	1059.70	241	Possible

* Between 0 and 2 feet deep

** Mean soil concentration multiplied by BAF of 4.6 for Cd and 12 for Se.

J Estimated value below limit or estimated based on data quality criteria.

U Non-detect, value shown i s one-half the reporting limit

Source: Woodward-Clyde, 1994

Table 19-3a
Summary of Soil Sample Results
SWMU 94

SUMMARY OF SWMU 94 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
1	6	Sandtrap	ND	<20	<10	ND	ND	NT	NT	NT
2	6	Sandtrap	ND	<20	<10	ND	ND	NT	NT	NT
3	6	Sandtrap	ND	<20	ND	NT	NT	NT	NT	NT
4	6	Sandtrap	ND	ND	ND	NT	NT	NT	NT	NT
5	6.5	Sandtrap	ND	ND	ND	NT	NT	NT	NT	NT
6	6.5	Sandtrap	ND	ND	ND	NT	NT	NT	NT	NT
7	6.5	Sandtrap	NT	NT	NT	NT	ND	ND[1]	ND	As, Ba[3]
8	n/a	excavated materials	NT	NT	NT	ND	NT	NT	NT	NT
9	8.5	OWS	ND	ND	<10	NT	NT	NT	NT	NT
10	8.5	OWS	ND	<20	<10	ND	ND	NT	NT	NT
11	8.5	OWS	ND	ND	<10	NT	NT	NT	NT	NT
12	8.5	OWS	ND	<20	ND	NT	NT	NT	NT	NT

Page 1 of 2

Source: U.S. Army Corps of Engineers, 1999

Table 19-3a
Summary of Soil Sample Results
SWMU 94

No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals > bkgd mg/Kg
13	9	OWS	ND	<20	ND	NT	NT	NT	NT	NT
14	9	OWS	ND	ND	<10	NT	NT	NT	NT	NT
15	9	OWS	NT	NT	NT	NT	ND	ND	ND	As[4]
16	n/a	excavated soils	NT	NT	NT	ND	ND	NT	NT	NT
17	6	OWS	NT	NT	NT	NT	NT	ND	ND	< bkgd
18	6	Sandtrap	ND	<20	<10	NT	NT	NT	NT	NT
19	6	Sandtrap	ND	ND	<10	ND	ND	NT	NT	NT
20	6	Sandtrap	ND	ND	<10	NT	NT	NT	NT	NT
21	6	Sandtrap	ND	ND	<10	NT	NT	NT	NT	NT
22	6.5	Sandtrap	ND	ND	<10	NT	NT	NT	NT	NT
23	6.5	Sandtrap	ND	ND	<10	ND	ND	NT	NT	NT
24	6.5	Sandtrap	NT	NT	NT	NT	ND	ND	ND	< bkgd
25	n/a	excavated materials	NT	NT	NT	ND	NT	NT	NT	NT
26	n/a	excavated materials	NT	NT	NT	0.58[2]	2300	NT	NT	NT

1 Only contaminant identified: Methylene Chloride at 0.06 mg/Kg.
2 Ethylbenzene at 0.070 mg/Kg, O-Xylene at 0.51 mg/Kg.
3 Arsenic at 6.4 mg/Kg, Barium at 812 mg/Kg.
4 Arsenic at 5.6 mg/Kg.
ND indicates non-detect, or below detection limit
NT indicates not tested
* Upper threshold limit of background concentration

Page 2 of 2

Source: U.S. Army Corps of Engineers, 1999

Table 19-3b
Maximum Soil Sample Concentration of Metals
SWMU 94

SWMU 94 Maximum Soil Sample Concentration of Metals						
Sample No.	Total Metals mg/Kg		TLCP Metals mg/L	Background Conc. Region VI / Cannon AFB [1] Mg/Kg		Region IV Residential RBSL mg/Kg
7	Arsenic	6.4	< 0.40	1.1-16.7	3.6	0.32 C
	Barium	812	1.6	430	805	5300 N
	Cadmium	0.29	< 0.0050	0.01-1.0	1.3	38 N
	Chromium	9.2	NT	38	13.3	31 C
	Nickel	6.9	NT	16	11.4	1500 N
24	Lead	4.4	NT	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

[1]CAFB Background Investigation, 1997

Source: U.S. Army Corps of Engineers, 1999

Table 20-1a
Concentration (µg/kg) of BTEX
SWMU 8

Borehole Number	Cannon Number	Depth (ft.)	Chemical				
			Benzene	Ethly Benzene	Toluene	Xylene	BTEX Total
1	CAN008-1651-011C	5.0	2U	2U	2U	2U	2U
	CAN008-1651-012D	10.0	2U	2U	2U	2U	2U
2	CAN008-1652-011C	5.0	2U	2U	2U	2U	2U
	CAN008-1652-012D	10.0	2U	2U	2U	2U	2U
3	CAN008-1653-011C	5.0	2UJ	2UJ	2UJ	2J	2J
	CAN008-1653-012D	10.0	2U	2U	2U	2U	2U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Sciences, Inc., 1993

Table 20-1b
Concentration (mg/kg) of Total Metals
SWMU 8

Borehole Number	Sample Number (CAN008-165)	Sample Depth (feet)	Barium		Chromium	Nickel	
1	1-021A	0	203	J	12.2	8.9	U
	1-022B	2.5	194	J	9.3	**13.6**	
(QAD)	1-721B	2.5	204		12.3	**9.7**	
(QCD)	1-821B	2.5	155	J	11.3	**9.1**	
	1-023C	5	107	J	**13.2**	**11.4**	
	1-024D	10	423	J	5.7	8.3	
2	2-021A	0	198	J	11.2	7.9	
	2-022B	2.5	100	J	12.5	**11**	
	2-023C	5	71.1	J	**12.9**	**12.2**	
	2-022D	10	712	J	4.3	4.9	
3	3-021A	0	250	J	8.3	7.7	
	3-022B	2.5	196	J	8.3	7.4	
(QAD)	3-721B	2.5	195		12.5	8.4	
(QCD)	3-821B	2.5	208	J	8.6	7.3	
	3-023C	5	209	J	8.3	7.7	
	3-022D	10	**812**	J	2.1	2	
Background (95% UCL) (1)			642.00		12.50	9.00	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 20-2a
Summary of Soil Sample Results
SWMU 8

SUMMARY OF SWMU 8 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals >bkgd* mg/Kg
1	12	OWS	ND	<20	<10	ND	ND	NT	NT	NT
2	12	OWS	ND	ND	<10	NT	NT	NT	NT	NT
3	12	OWS	ND	ND	<10	NT	NT	NT	NT	NT
4	12	OWS	ND	<20	<10	NT	NT	NT	NT	NT
5	12	OWS	ND	<20	ND	NT	NT	NT	NT	NT
6	7	OWS	ND	<20	ND	ND	ND	NT	NT	NT
7	7	OWS	ND	<20	<10	NT	NT	NT	NT	NT
7QA	7	OWS	NT	NT	NT	NT	NT	ND	ND	As[4], Se[5]
8	12	OWS	NT	NT	NT	NT	ND	ND	ND[1]	Cr[3]
9	12	OWS	NT	NT	NT	NT	ND	ND	ND[2]	< bkgd
10	n/a	SWMU 8 & 9	NT	NT	NT	NT	ND	ND	ND	NT

[1] Di-n-butylphthalate at 17 mg/Kg found in sample and laboratory method blank
[2] Di-n-butylphthalate at 9.1 mg/Kg found in sample and laboratory method blank
[3] Chromium at 10.7 mg/Kg.
[4] Arsenic at 3.6 mg/Kg.
[5] Selenium at 0.6 mg/Kg.
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

ND indicates non-detect
NT indicates not tested

Source: US Army Corps of Engineers, 1999

Table 20-2b
Maximum Soil Sample Concentrations
SWMU 8

SWMU 8 Maximum Soil Sample Concentrations						
Sample No.	Total Metals mg/Kg		TCLP Metals mg/L	Background Conc. Region VI/ Cannon AFB' mg/Kg		Region VI Residential RBSL mg/Kg
7QA	Arsenic	3.61	< 0.40	1.1-16.7	3.6	0.32 C
	Barium	202	0.84	430	805	5300 N
8	Chromium	10.7	<0.020	38	13.3	31 C
7QA	Lead	8.04	< 0.05	10-18	7.1	400 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

'CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

A.T. Kearney, Inc. 1987. Preliminary Review/VSI Report RCRA Facility Assessment. Cannon Air Force Base; Clovis, New Mexico. July.

CH2M Hill. 1983. Installation Restoration Program Records Search for Cannon Air Force Base, New Mexico. August.

Department of the Air Force. 1994. Letter from Brigadier General William M. Guth, Commander to William K. Honker, USEPA Region VI, regarding AOC36. June 29.

Foothill Engineering Consultants, Inc. 1999. Annual Summary Report Assessment Monitoring, Long-Term Monitoring Landfill No. 3 (SWMU 105) and Landfill No. 4 (SWMU 104). Draft. Cannon Air Force Base; Clovis, New Mexico. May.

Geoscience Consultants, Ltd. 1985. Cannon AFB, New Mexico, Landfill Core Drilling Project.

Groundwater Services, Inc. 1999. RBCA Tool Kit for Chemical Releases.

Gutentag, Edwin D., et al. 1984. Geohydrology of the High Plains Aquifer in Parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. USGS Professional Paper 1400-B.

IMS, P.C. 1997. Site Inspection Report, Area of Concern – D. Final. Cannon Air Force Base, New Mexico. June.

IT Corporation. 1995. Final Project Report, Rapid Response Corrective Action, DP-33 Drum Removal. January.

Lee Wan and Associates, Inc. 1990. RCRA Facility Investigation Work Plan, Volumes I & II – Cannon AFB, New Mexico. June.

Lee Wan & Associates, Inc. 1990. RCRA Facility Investigation Field Sampling Plan. Cannon Air Force Base, New Mexico. June.

LRL Sciences, Inc. 1993. Appendix II RCRA Facility Investigation. RFI Report, Volume 1 and Risk Assessment, Volume 2.

Radian Corporation. 1986. Installation Restoration Program Phase II – Confirmation/Quantification Stage I, Cannon Air Force Base, New Mexico. September.

Radian Corporation. 1987. Soil Removal Investigation Report, AGE Drainage Ditch – Site 15, Cannon Air Force Base, NM 88103. June.

Radian Corp. 1994. RCRA Facility Investigation. Final Report, SWMU No. 105, Landfill No. 4, IRP Site LF-3. Cannon AFB, N.M. Vol. I. February.

Remediation Services, Incorporated. 1994. Closure Report: DACA 45-94-B-0100. September.

Salhotra, A.M., P. Mineart, s. Sharp-Hansen, t. Allison, R. Johns, and W. B. Mills. 1995. Multimedia Exposure Assessment Model (MULTIMED 2.0) for Evaluating the land disposal of Wastes – Model Theory. U.S. Environmental Protection Agency. Athens, GA. April.

Schroeder, P.R., T.S. Dozier, P.A. Zappi, B.M. McEnroe, J.W. Sjostrom, and R.L. Peyton. 1994. The Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering Documentation for Version 3. EPA/600/R-94/168b. U.S. Environmental Protection Agency, Risk Reduction Engineering Laboratory, Cincinnati, OH. September.

State of New Mexico Environment Department, Ground Water Protection and Remediation Bureau. 1996. Letter from Julie A. Jacobs to Col. W.P. Ard, Commander 27th Support Group, regarding closure of DP-33 Drum Removal. December 12.

State of New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. 1997. Letter from Robert S. Dinwiddie, Ph.D. to Col. David E. Clary, Commander, regarding Site Inspection Report for AOC-D. November 6.

State of New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. 1998. Letter from Robert S. Dinwiddie, Ph.D. to Col. David E. Clary, Commander, regarding Phase I RCRA Facility Investigation Report for Landfill No. 5. February 17.

United States Air Force (USAF). 1990. Final Environmental Impact Statement, Realignment of Cannon AFB, Curry County, New Mexico. May.

United States Army Corps of Engineers, Albuquerque District. 1999. Corrective Measure Completion Report, Appendices II and III Solid Waste Management Units. Cannon Air Force Base, Clovis, New Mexico. Volume 1. July.

United States Army Corps of Engineers, Tulsa District. 1988. Cannon Air Force Base Oil/Water Separators Sampling and Analytical Report.

United States Department of Agriculture (USDA) Soil Conservation Service. 1958. Soil Survey of Curry County, New Mexico, Soil Survey Series 1953, No. 4. United States Government Printing Office.

United States Environmental Protection Agency. 1979. Water-Related Environmental Fate of 129 Priority Pollutants. EPA-440/4-79-029a.

United States Environmental Protection Agency. 1987. Resource Conservation and Recovery Act Facility Assessment Guidance.

United States Environmental Protection Agency. 1989a. RCRA Facility Assessment Guidance, Volume I. May.

United States Environmental Protection Agency. 1989b. Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual.

United States Environmental Protection Agency. 1991a. Update on OSWER Soil Lead Cleanup Guidance. Memorandum by Don R. Clay, Assistant Administrator. USEPA Office of Solid Waste and Emergency Response. Washington D.C. August 29.

United States Environmental Protection Agency. 1991b. Guidance Manual for Site-Specific Use of USEPA Land Model. USEPA Office of Emergency and Remedial Response. December.

United States Environmental Protection Agency. 1994a. Region III. Risk-Based Concentration Table, Fourth Quarter 1994.

United States Environmental Protection Agency. 1994b. Revised Interim Soil Lead Evidence for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response. July.

United States Environmental Protection Agency. 1996. Region VI. Human Health Media-Specific Screening Levels. October.

United States Geological Survey Water Resources Division. 1993. Geology and Analytical Results for Soils at the Open Burn/Open Detonation Thermal Treatment Facility. Melrose Air Force Range, New Mexico. August.

United States Geological Survey Water Resources Division. 1997. Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326. Cannon Air Force Base, New Mexico. December.

United States Geological Survey Water Resources Division. 1999. Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326. Analytical Results for Samples Collected August 10-11, 1998. Cannon Air Force Base, New Mexico. May.

URS Greiner Woodward Clyde. 1999a. CERCLA Site Inspections at AOCs E, F. G, and H. Cannon AFB, New Mexico. March.

URS Greiner Woodward Clyde. 1999b. Corrective Measures Study, Site SD-11 (SWMUs 86-90). Cannon AFB, New Mexico. July.

URS Greiner Woodward Clyde. 2000. Corrective Measures Study at SWMUs 31, 48A, 77, and 127. Draft. Cannon AFB, New Mexico. January.

Walk, Haydel & Associates, Inc. 1990. Remedial Investigation Report. Final Volume I. Cannon Air Force Base, New Mexico. January.

Woodward-Clyde. 1991. Field Sampling Plan. Remedial Investigation. Phase I (18 SWMUs). Cannon Air Force Base, New Mexico.

Woodward-Clyde. 1992. Remedial Investigation Report for 18 Solid Waste Management Units. Final Volumes Ia and Ib. Cannon Air Force Base; Clovis, New Mexico. October.

Woodward-Clyde. 1993. RCRA Facility Investigation Report for Landfill No. 1 (SWMU No. 74/IRP No. LF-1) and Landfill No. 2 (SWMU 82/IRP No. LF-2). Final Volume I. Cannon Air Force Base; Clovis, New Mexico. January.

Woodward-Clyde. 1994a. RCRA Facility Investigation Report for Appendix III SWMUs – Phase I, Cannon Air Force Base, New Mexico. February.

Woodward-Clyde. 1994b. Baseline Risk Assessment for Appendix III SWMUs – Phase I, Cannon Air Force Base, New Mexico. February.

Woodward-Clyde. 1994c. RCRA Facility Investigation Activities Phase II to Appendix I (Old Entomology Rinse Area Boring). Supplemental RFI Report (19 SWMU Boundary Survey). Final. Cannon Air Force Base, New Mexico. September.

Woodward Clyde. 1995a. Phase II RCRA Facility Investigation Landfills 3 and 4 SWMUs 105 and 104, Cannon Air Force Base, New Mexico. March.

Woodward-Clyde. 1995b. RCRA Facility Investigation Activities Phase II to Appendix I Solid Waste Management Units Supplemental RFI Report. Final (Revised). Cannon Air Force Base, New Mexico. January.

Woodward-Clyde. 1995c. Management Action Plan, Cannon Air Force Base, Clovis, New Mexico. August.

Woodward-Clyde. 1996. Site Inspection Geophysical Survey Report Area of Concern – D, Cannon Air Force Base, Clovis, New Mexico. May.

Woodward-Clyde. 1997a. Naturally Occurring Concentrations of Inorganics and Background Concentrations of Pesticides at Cannon Air Force Base, New Mexico. Final Report. September.

Woodward-Clyde. 1997b. Phase I RCRA Facility Investigation Report for Landfill No. 1. Final Volume I. Cannon Air Force Base; Clovis, New Mexico. September.

Woodward-Clyde. 1997c. RCRA Facility Investigation, Appendix II SWMUs – Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1997d. RCRA Facility Investigation, Appendix III SWMUs – Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1997e. RCRA Facility Investigation, Appendix I SWMUs 86-90 (IRP Site SD-11), Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1998. Final Phase I RCRA Facility Investigation for Landfill No. 5 (SWMU No. 113/ IRP No. LF-5), Cannon Air Force Base, Clovis, New Mexico. Volume I. May.

VOLUME II OF III

LIBRARY COPY

HAZARDOUS AND SOLID WASTE AMENDMENTS / CORRECTIVE ACTION-RELATED PERMIT MODIFICATION REQUEST

NO FURTHER ACTION PROPOSALS

CANNON AFB, NEW MEXICO PERMIT NO. NM7572124454

Prepared for
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau

July 2000

TABLE OF CONTENTS

Volume Breakdown

Volume I of III

Executive Summary ES-1
Section 1 Introduction 1-1
Section 2 SWMU 74, Landfill No. 1 2-1
Section 3 AOC D, Asbestos Burial Pit 3-1
Section 4 SWMU 113, Landfill No. 5 4-1
Section 5 DP-33, Drum Disposal Pit 5-1
Section 6 SWMU 7, Oil/Water Separator No. 129 6-1
Section 7 SWMU 9, Aircraft Washrack Drain System 7-1
Section 8 SWMU 32A, Oil/Water Separator No. 186 (#1 - East) 8-1
Section 9 SWMU 33B, Oil/Water Separator No. 186 (#2 - West) 9-1
Section 10 SWMU 11, Oil/Water Separator No. 170 10-1
Section 11 SWMU 38, Oil/Water Separator No. 194 11-1
Section 12 SWMU 39, Oil/Water Separator No. 195 12-1
Section 13 SWMU 46, Oil/Water Separator No. 196 13-1
Section 14 SWMU 47, Oil/Water Separator No. 494 14-1
Section 15 SWMU 51, Oil/Water Separator No. 375 15-1
Section 16 SWMU 57, Oil/Water Separator No. 379 16-1
Section 17 SWMUs 61,62 and 63, Sand Traps 5077A and 5077B and Oil/Water Separator 5077C 17-1
Section 18 SWMU 92, Oil/Water Separator No. 5120 18-1
Section 19 SWMU 94, Oil/Water Separator No. 5144 19-1
Section 20 SWMU 8, Oil/Water Separator No. 165 20-1

Volume II of III

Section 21 SWMU 1, Oil/Water Separator No. 119 21-1
Section 22 SWMU 2, Recovered Diesel Tank No. 108 22-1
Section 23 SWMU 3, Oil/Water Separator No. 108 23-1
Section 24 SWMU 4, Recovered Oil Tank No. 121 24-1
Section 25 SWMU 5, Oil/Water Separator No. 121 25-1
Section 26 SWMU 6, POL Tank No. 129 26-1
Section 27 SWMU 10, POL Tank No. 170 27-1
Section 28 SWMU 16, Oil/Water Separator No. 680 28-1
Section 29 SWMU 34, AGE Drainage Ditch 29-1
Section 32 SWMU 49, Inactive POL Storage Tank No. 4028a 32-1
Section 33 SWMU 50, Inactive POL Storage Tank No. 4028b 33-1

Volume II of III, cont.

Section 34 SWMU 55, Lead Acid Battery Accumulation Point....34-1
Section 35 SWMU 72, Oil/Water Separator No. 390....35-1
Section 36 SWMU 75, Sanitary Sewage Lift Station Overflow Pit....36-1
Section 37 SWMU 76, Sludge Weathering Pit (WP-14)....37-1
Section 38 SWMU 77, Civil Engineering Container Storage Area....38-1
Section 39 SWMU 78, Fire Department Training Area No. 1....39-1
Section 40 SWMU 79, Underground Storage Tank....40-1
Section 41 SWMU 81, Solvent Disposal Site....41-1
Section 42 SWMU 82, Landfill No. 2....42-1
Section 43 SWMU 83, Sump....43-1
Section 44 SWMU 85, Stormwater Collection Point....44-1

Volume III of III

Section 45 SD-11, Engine Test Cell Area (SWMUs 86, 87, 88, 89, and 90)....45-1
Section 46 SWMU 91, Recovered Fuel Tank No. 5114....46-1
Section 47 SWMU 93, Oil/Water Separator No. 5121....47-1
Section 49 SWMU 96, Old Entomology Rinse Area....49-1
Section 50 SWMU 98, Sanitary Sewer Line....50-1
Section 51 SWMU 104, Landfill No. 4....51-1
Section 52 SWMU 105, Landfill No. 3....52-1
Section 53 SWMU 106, Fire Department Training Area No. 2....53-1
Section 54 SWMU 107, Fire Department Training Area No. 3....54-1
Section 55 SWMU 124, Inactive Underground Storage Tank No. 1....55-1
Section 56 SWMU 125, Inactive Underground Storage Tank No. 2....56-1
Section 57 SWMU 126, Inactive Underground Storage Tank No. 3....57-1
Section 58 SWMU 127, Sand Trap and Leach Field for Facility 4095 (#1)....58-1
Section 59 SWMU 128, Oil/Water Separator Near Tank 4095 (#2) and Leach Field....59-1
Section 62 AOC C, Blown Capacitor Site....62-1
Section 64 AOC F, Calibration Target Berm....64-1
Section 65 AOC G, Disturbed Area - North Housing Site....65-1
Section 66 AOC H, Disturbed Area - South Housing Site....66-1
Section 67 AOC 36, Building #214 Parking Lot....67-1

Vol. 2 - TABLE OF CONTENTS

Section 21 SWMU 1, Oil/Water Separator No. 119 21-1

21.1 Summary 21-1
21.2 Site Description and Operational History 21-1
21.2.1 Site Description 21-1
21.2.2 Operational History 21-1
21.3 Land Use 21-2
21.3.1 Current 21-2
21.3.2 Future/Proposed 21-2
21.4 Investigative Activities 21-2
21.4.1 Summary 21-2
21.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) 21-2
21.4.2.1 Non-Sampling Data Collection 21-2
21.4.2.2 Sampling Data Collection 21-2
21.4.2.3 Data Gaps 21-3
21.4.2.4 Results and Conclusions 21-3
21.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs 21-4
21.4.3.1 Non-Sampling Data Collection 21-4
21.4.3.2 Sampling Data Collection 21-4
21.4.3.3 Data Gaps 21-4
21.4.3.4 Results and Conclusions 21-4
21.5 Site Conceptual Model 21-5
21.5.1 Nature and Extent of Contamination 21-5
21.5.2 Environmental Fate 21-5
21.6 Site Assessments 21-6
21.6.1 Summary 21-6
21.6.2 Screening Assessments 21-6
21.6.2.1 Human Health 21-6
21.6.2.2 Ecological 21-6
21.6.3 Risk Assessments 21-7
21.6.3.1 Human Health 21-7
21.6.3.2 Ecological 21-7
21.6.4 Other Applicable Assessments 21-7
21.6.4.1 Surface Water 21-7
21.6.4.2 Groundwater 21-7
21.6.4.3 Underground Storage Tanks (USTs) 21-7
21.6.4.4 Other 21-7
21.7 No Further Action Proposal 21-8
21.7.1 Rationale 21-8

21.7.2 Criterion 21-8

Section 22 SWMU 2, Recovered Diesel Tank No. 108 22-1

22.1 Summary 22-1
22.2 Site Description and Operational History 22-1
22.2.1 Site Description 22-1
22.2.2 Operational History 22-1
22.3 Land Use 22-1
22.3.1 Current 22-1
22.3.2 Future/Proposed 22-1
22.4 Investigative Activities 22-1
22.5 Site Conceptual Model 22-2
22.6 Site Assessments 22-2
22.6.1 Screening Assessments 22-2
22.6.2 Risk Assessments 22-2
22.6.3 Other Applicable Assessments 22-2
22.6.3.1 Surface Water 22-2
22.6.3.2 Groundwater 22-2
22.6.3.3 Underground Storage Tanks (USTs) 22-2
22.6.3.4 Other 22-2
22.7 No Further Action Proposal 22-2
22.7.1 Rationale 22-2
22.7.2 Criterion 22-3

Section 23 SWMU 3, Oil/Water Separator No. 108 23-1

23.1 Summary 23-1
23.2 Site Description and Operational History 23-1
23.2.1 Site Description 23-1
23.2.2 Operational History 23-1
23.3 Land Use 23-1
23.3.1 Current 23-1
23.3.2 Future/Proposed 23-2
23.4 Investigative Activities 23-2
23.4.1 Summary 23-2
23.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) – Phase I 23-2
23.4.2.1 Non-Sampling Data Collection 23-2
23.4.2.2 Sampling Data Collection 23-2
23.4.2.3 Data Gaps 23-2
23.4.2.4 Results and Conclusions 23-3

23.4.3 Investigation #2 Appendix II RFI – Phase II 23-3
23.4.3.1 Non-Sampling Data Collection 23-3
23.4.3.2 Sampling Data Collection 23-4
23.4.3.3 Data Gaps 23-4
23.4.3.4 Results and Conclusions 23-4
23.5 Site Conceptual Model 23-4
23.5.1 Nature and Extent of Contamination 23-4
23.5.2 Environmental Fate 23-5
23.6 Site Assessments 23-5
23.6.1 Summary 23-5
23.6.2 Screening Assessments 23-5
23.6.2.1 Human Health 23-5
23.6.2.2 Ecological 23-6
23.6.3 Risk Assessments 23-6
23.6.3.1 Human Health 23-6
23.6.3.2 Ecological 23-6
23.6.4 Other Applicable Assessments 23-6
23.6.4.1 Surface Water 23-6
23.6.4.2 Groundwater 23-6
23.6.4.3 Underground Storage Tanks (USTs) 23-6
23.6.4.4 Other 23-7
23.7 No Further Action Proposal 23-7
23.7.1 Rationale 23-7
23.7.2 Criterion 23-7

Section 24 SWMU 4, Recovered Oil Tank No. 121 24-1

24.1 Summary 24-1
24.2 Site Description and Operational History 24-1
24.2.1 Site Description 24-1
24.2.2 Operational History 24-1
24.3 Land Use 24-1
24.3.1 Current 24-1
24.3.2 Future/Proposed 24-1
24.4 Investigative Activities 24-1
24.5 Site Conceptual Model 24-1
24.6 Site Assessments 24-2
24.6.1 Screening Assessments 24-2
24.6.2 Risk Assessments 24-2
24.6.3 Other Applicable Assessments 24-2
24.6.3.1 Surface Water 24-2

24.6.3.2 Groundwater 24-2
24.6.3.3 Underground Storage Tanks (USTs) 24-2
24.6.3.4 Other 24-2
24.7 No Further Action Proposal 24-2
24.7.1 Rationale 24-2
24.7.2 Criterion 24-2

Section 25 SWMU 5, Oil/Water Separator No. 121 25-1

25.1 Summary 25-1
25.2 Site Description and Operational History 25-1
25.2.1 Site Description 25-1
25.2.2 Operational History 25-1
25.3 Land Use 25-1
25.3.1 Current 25-1
25.3.2 Future/Proposed 25-2
25.4 Investigative Activities 25-2
25.4.1 Summary 25-2
25.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) – Phase I 25-2
25.4.2.1 Non-Sampling Data Collection 25-2
25.4.2.2 Sampling Data Collection 25-2
25.4.2.3 Data Gaps 25-2
25.4.2.4 Results and Conclusions 25-3
25.4.3 Investigation #2 Appendix II RFI – Phase II 25-3
25.4.3.1 Non-Sampling Data Collection 25-3
25.4.3.2 Sampling Data Collection 25-3
25.4.3.3 Data Gaps 25-3
25.4.3.4 Results and Conclusions 25-4
25.5 Site Conceptual Model 25-4
25.5.1 Nature and Extent of Contamination 25-4
25.5.2 Environmental Fate 25-4
25.6 Site Assessments 25-5
25.6.1 Summary 25-5
25.6.2 Screening Assessments 25-5
25.6.2.1 Human Health 25-5
25.6.2.2 Ecological 25-5
25.6.3 Risk Assessments 25-5
25.6.3.1 Human Health 25-5
25.6.3.2 Ecological 25-6
25.6.4 Other Applicable Assessments 25-6
25.6.4.1 Surface Water 25-6

25.6.4.2 Groundwater 25-6
25.6.4.3 Underground Storage Tanks (USTs) 25-6
25.6.4.4 Other 25-6
25.7 No Further Action Proposal 25-6
25.7.1 Rationale 25-6
25.7.2 Criterion 25-6

Section 26 SWMU 6, POL Tank No. 129 26-1

26.1 Summary 26-1
26.2 Site Description and Operational History 26-1
26.2.1 Site Description 26-1
26.2.2 Operational History 26-1
26.3 Land Use 26-1
26.3.1 Current 26-1
26.3.2 Future/Proposed 26-1
26.4 Investigative Activities 26-1
26.5 Site Conceptual Model 26-1
26.6 Site Assessments 26-1
26.6.1 Screening Assessments 26-2
26.6.2 Risk Assessments 26-2
26.6.3 Other Applicable Assessments 26-2
26.6.3.1 Surface Water 26-2
26.6.3.2 Groundwater 26-2
26.6.3.3 Underground Storage Tanks (USTs) 26-2
26.6.3.4 Other 26-2
26.7 No Further Action Proposal 26-2
26.7.1 Rationale 26-2
26.7.2 Criterion 26-2

Section 27 SWMU 10, POL Tank No. 170 27-1

27.1 Summary 27-1
27.2 Site Description and Operational History 27-1
27.2.1 Site Description 27-1
27.2.2 Operational History 27-1
27.3 Land Use 27-1
27.3.1 Current 27-1
27.3.2 Future/Proposed 27-1
27.4 Investigative Activities 27-1
27.5 Site Conceptual Model 27-1
27.6 Site Assessments 27-1

27.6.1 Screening Assessments 27-2
27.6.2 Risk Assessments 27-2
27.6.3 Other Applicable Assessments 27-2
27.6.3.1 Surface Water 27-2
27.6.3.2 Groundwater 27-2
27.6.3.3 Underground Storage Tanks (USTs) 27-2
27.6.3.4 Other 27-2
27.7 No Further Action Proposal 27-2
27.7.1 Rationale 27-2
27.7.2 Criterion 27-2

Section 28 SWMU 16, Oil/Water Separator No. 680 28-1

28.1 Summary 28-1
28.2 Site Description and Operational History 28-1
28.2.1 Site Description 28-1
28.2.2 Operational History 28-1
28.3 Land Use 28-1
28.3.1 Current 28-1
28.3.2 Future/Proposed 28-1
28.4 Investigative Activities 28-2
28.4.1 Summary 28-2
28.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) – Phase I 28-2
28.4.2.1 Non-Sampling Data Collection 28-2
28.4.2.2 Sampling Data Collection 28-2
28.4.2.3 Data Gaps 28-2
28.4.2.4 Results and Conclusions 28-2
28.5 Site Conceptual Model 28-3
28.5.1 Nature and Extent of Contamination 28-3
28.5.2 Environmental Fate 28-3
28.6 Site Assessments 28-4
28.6.1 Summary 28-4
28.6.2 Screening Assessments 28-4
28.6.2.1 Human Health 28-4
28.6.2.2 Ecological 28-4
28.6.3 Risk Assessments 28-4
28.6.3.1 Human Health 28-4
28.6.3.2 Ecological 28-4
28.6.4 Other Applicable Assessments 28-4
28.6.4.1 Surface Water 28-4
28.6.4.2 Groundwater 28-5

28.6.4.3 Underground Storage Tanks (USTs) 28-5
28.6.4.4 Other 28-5
28.7 No Further Action Proposal 28-5
28.7.1 Rationale 28-5
28.7.2 Criterion 28-5

Section 29 SWMU 34, AGE Drainage Ditch 29-1

29.1 Summary 29-1
29.2 Site Description and Operational History 29-1
29.2.1 Site Description 29-1
29.2.2 Operational History 29-1
29.3 Land Use 29-2
29.3.1 Current 29-2
29.3.2 Future/Proposed 29-2
29.4 Investigative Activities 29-2
29.4.1 Summary 29-2
29.4.2 Investigation #1: Soil Removal Investigation - AGE Drainage Ditch 29-3
29.4.2.1 Non-Sampling Data Collection 29-3
29.4.2.2 Sampling Data Collection 29-3
29.4.2.3 Data Gaps 29-3
29.4.2.4 Results and Conclusions 29-3
29.4.3 Investigation #2: Remedial Investigation (RI) of 18 IRP/SWMU Sites 29-3
29.4.3.1 Non-Sampling Data Collection 29-3
29.4.3.2 Sampling Data Collection 29-4
29.4.3.3 Data Gaps 29-4
29.4.3.4 Results and Conclusions 29-4
29.4.4 Investigation #3: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites 29-5
29.4.4.1 Non-Sampling Data Collection 29-5
29.4.4.2 Sampling Data Collection 29-5
29.4.4.3 Data Gaps 29-5
29.4.4.4 Results and Conclusions 29-5
29.5 Site Conceptual Model 29-6
29.5.1 Nature and Extent of Contamination 29-6
29.5.2 Environmental Fate 29-6
29.6 Site Assessments 29-6
29.6.1 Summary 29-6
29.6.2 Screening Assessments 29-7
29.6.2.1 Human Health 29-7

29.6.2.2 Ecological 29-7
29.6.3 Risk Assessments 29-7
29.6.3.1 Human Health 29-7
29.6.3.2 Ecological 29-7
29.6.4 Other Applicable Assessments 29-8
29.6.4.1 Surface Water 29-8
29.6.4.2 Groundwater 29-8
29.6.4.3 Underground Storage Tanks (USTs) 29-8
29.6.4.4 Other 29-8
29.7 No Further Action Proposal 29-8
29.7.1 Rationale 29-8
29.7.2 Criterion 29-8

Section 32 SWMU 49, Inactive POL Storage Tank No. 4028a 32-1

32.1 Summary 32-1
32.2 Site Description and Operational History 32-1
32.2.1 Site Description 32-1
32.2.2 Operational History 32-1
32.3 Land Use 32-1
32.3.1 Current 32-1
32.3.2 Future/Proposed 32-1
32.4 Investigative Activities 32-1
32.5 Site Conceptual Model 32-1
32.6 Site Assessments 32-1
32.6.1 Screening Assessments 32-2
32.6.2 Risk Assessments 32-2
32.6.3 Other Applicable Assessments 32-2
32.6.3.1 Surface Water 32-2
32.6.3.2 Groundwater 32-2
32.6.3.3 Underground Storage Tanks (USTs) 32-2
32.6.3.4 Other 32-2
32.7 No Further Action Proposal 32-2
32.7.1 Rationale 32-2
32.7.2 Criterion 32-2

Section 33 SWMU 50, Inactive POL Storage Tank No. 4028b 33-1

33.1 Summary 33-1
33.2 Site Description and Operational History 33-1
33.2.1 Site Description 33-1
33.2.2 Operational History 33-1

33.3 Land Use 33-1
33.3.1 Current 33-1
33.3.2 Future/Proposed 33-1
33.4 Investigative Activities 33-1
33.5 Site Conceptual Model 33-1
33.6 Site Assessments 33-1
33.6.1 Screening Assessments 33-2
33.6.2 Risk Assessments 33-2
33.6.3 Other Applicable Assessments 33-2
33.6.3.1 Surface Water 33-2
33.6.3.2 Groundwater 33-2
33.6.3.3 Underground Storage Tanks (USTs) 33-2
33.6.3.4 Other 33-2
33.7 No Further Action Proposal 33-2
33.7.1 Rationale 33-2
33.7.2 Criterion 33-2

Section 34 SWMU 55, Lead Acid Battery Accumulation Point 34-1

34.1 Summary 34-1
34.2 Site Description and Operational History 34-1
34.2.1 Site Description 34-1
34.2.2 Operational History 34-1
34.3 Land Use 34-1
34.3.1 Current 34-1
34.3.2 Future/Proposed 34-1
34.4 Investigative Activities 34-2
34.4.1 Summary 34-2
34.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 34-2
34.4.2.1 Non-Sampling Data Collection 34-2
34.4.2.2 Sampling Data Collection 34-2
34.4.2.3 Data Gaps 34-2
34.4.2.4 Results and Conclusions 34-2
34.4.3 Investigation #2: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase II 34-3
34.4.3.1 Non-Sampling Data Collection 34-3
34.4.3.2 Sampling Data Collection 34-3
34.4.3.3 Data Gaps 34-3
34.4.3.4 Results and Conclusions 34-3
34.5 Site Conceptual Model 34-4
34.5.1 Nature and Extent of Contamination 34-4

34.5.2 Environmental Fate 34-4
34.6 Site Assessments 34-5
34.6.1 Summary 34-5
34.6.2 Screening Assessments 34-5
34.6.2.1 Human Health 34-5
34.6.2.2 Ecological 34-5
34.6.3 Risk Assessments 34-5
34.6.3.1 Human Health 34-5
34.6.3.2 Ecological 34-5
34.6.4 Other Applicable Assessments 34-6
34.6.4.1 Surface Water 34-6
34.6.4.2 Groundwater 34-6
34.6.4.3 Underground Storage Tanks (USTs) 34-6
34.6.4.4 Other 34-6
34.7 No Further Action Proposal 34-6
34.7.1 Rationale 34-6
34.7.2 Criterion 34-6

Section 35 SWMU 72, Oil/Water Separator No. 390 35-1

35.1 Summary 35-1
35.2 Site Description and Operational History 35-1
35.2.1 Site Description 35-1
35.2.2 Operational History 35-1
35.3 Land Use 35-1
35.3.1 Current 35-1
35.3.2 Future/Proposed 35-1
35.4 Investigative Activities 35-1
35.5 Site Conceptual Model 35-1
35.6 Site Assessments 35-2
35.6.1 Screening Assessments 35-2
35.6.2 Risk Assessments 35-2
35.6.3 Other Applicable Assessments 35-2
35.6.3.1 Surface Water 35-2
35.6.3.2 Groundwater 35-2
35.6.3.3 Underground Storage Tanks (USTs) 35-2
35.6.3.4 Other 35-2
35.7 No Further Action Proposal 35-2
35.7.1 Rationale 35-2
35.7.2 Criterion 35-2

Section 36 SWMU 75, Sanitary Sewage Lift Station Overflow Pit 36-1

36.1 Summary 36-1
36.2 Site Description and Operational History 36-1
36.2.1 Site Description 36-1
36.2.2 Operational History 36-1
36.3 Land Use 36-1
36.3.1 Current 36-1
36.3.2 Future/Proposed 36-1
36.4 Investigative Activities 36-2
36.5 Site Conceptual Model 36-2
36.6 Site Assessments 36-2
36.6.1 Screening Assessments 36-2
36.6.2 Risk Assessments 36-2
36.6.3 Other Applicable Assessments 36-2
36.6.3.1 Surface Water 36-2
36.6.3.2 Groundwater 36-2
36.6.3.3 Underground Storage Tanks (USTs) 36-2
36.6.3.4 Other 36-2
36.7 No Further Action Proposal 36-3
36.7.1 Rationale 36-3
36.7.2 Criterion 36-3

Section 37 SWMU 76, Sludge Weathering Pit (WP-14) 37-1

37.1 Summary 37-1
37.2 Site Description and Operational History 37-1
37.2.1 Site Description 37-1
37.2.2 Operational History 37-1
37.3 Land Use 37-1
37.3.1 Current 37-1
37.3.2 Future/Proposed 37-2
37.4 Investigative Activities 37-2
37.4.1 Summary 37-2
37.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites 37-2
37.4.2.1 Non-Sampling Data Collection 37-2
37.4.2.2 Sampling Data Collection 37-2
37.4.2.3 Data Gaps 37-3
37.4.2.4 Results and Conclusions 37-3
37.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites 37-3
37.4.3.1 Non-Sampling Data Collection 37-3

37.4.3.2 Sampling Data Collection 37-3
37.4.3.3 Data Gaps 37-4
37.4.3.4 Results and Conclusions 37-4
37.5 Site Conceptual Model 37-5
37.5.1 Nature and Extent of Contamination 37-5
37.5.2 Environmental Fate 37-5
37.6 Site Assessments 37-5
37.6.1 Summary 37-5
37.6.2 Screening Assessments 37-5
37.6.2.1 Human Health 37-5
37.6.2.2 Ecological 37-6
37.6.3 Risk Assessments 37-6
37.6.3.1 Human Health 37-6
37.6.3.2 Ecological 37-6
37.6.4 Other Applicable Assessments 37-6
37.6.4.1 Surface Water 37-6
37.6.4.2 Groundwater 37-7
37.6.4.3 Underground Storage Tanks (USTs) 37-7
37.6.4.4 Other 37-7
37.7 No Further Action Proposal 37-7
37.7.1 Rationale 37-7
37.7.2 Criterion 37-7

Section 38 SWMU 77, Civil Engineering Container Storage Area 38-1

38.1 Summary 38-1
38.2 Site Description and Operational History 38-1
38.2.1 Site Description 38-1
38.2.2 Operational History 38-1
38.3 Land Use 38-2
38.3.1 Current 38-2
38.3.2 Future/Proposed 38-2
38.4 Investigative Activities 38-2
38.4.1 Summary 38-2
38.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 38-2
38.4.2.1 Non-Sampling Data Collection 38-2
38.4.2.2 Sampling Data Collection 38-2
38.4.2.3 Data Gaps 38-3
38.4.2.4 Results and Conclusions 38-3
38.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 38-3

38.4.3.1 Non-Sampling Data Collection 38-3
38.4.3.2 Sampling Data Collection 38-3
38.4.3.3 Data Gaps 38-3
38.4.3.4 Results and Conclusions 38-4
38.4.4 Investigation #3: RFI, Appendix III SWMUs – Phase II 38-4
38.4.4.1 Non-Sampling Data Collection 38-4
38.4.4.2 Sampling Data Collection 38-4
38.4.4.3 Data Gaps 38-4
38.4.4.4 Results and Conclusions 38-5
38.4.5 Investigation #4: Corrective Measures Study (CMS) at SWMU 77 38-5
38.4.5.1 Non-Sampling Data Collection 38-5
38.4.5.2 Sampling Data Collection 38-5
38.4.5.3 Data Gaps 38-5
38.4.5.4 Results and Conclusions 38-6
38.5 Site Conceptual Model 38-6
38.5.1 Nature and Extent of Contamination 38-6
38.5.2 Environmental Fate 38-6
38.6 Site Assessments 38-7
38.6.1 Summary 38-7
38.6.2 Screening Assessments 38-7
38.6.2.1 Human Health 38-7
38.6.2.2 Ecological 38-7
38.6.3 Risk Assessments 38-7
38.6.3.1 Human Health 38-7
38.6.3.2 Ecological 38-8
38.6.4 Other Applicable Assessments 38-8
38.6.4.1 Surface Water 38-8
38.6.4.2 Groundwater 38-8
38.6.4.3 Underground Storage Tanks (USTs) 38-8
38.6.4.4 Other 38-8
38.7 No Further Action Proposal 38-8
38.7.1 Rationale 38-8
38.7.2 Criterion 38-9

Section 39 SWMU 78, Fire Department Training Area No. 1 39-1

39.1 Summary 39-1
39.2 Site Description and Operational History 39-1
39.2.1 Site Description 39-1
39.2.2 Operational History 39-1
39.3 Land Use 39-2

39.3.1 Current 39-2
39.3.2 Future/Proposed 39-2
39.4 Investigative Activities 39-2
39.4.1 Summary 39-2
39.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites 39-2
39.4.2.1 Non-Sampling Data Collection 39-2
39.4.2.2 Sampling Data Collection 39-3
39.4.2.3 Data Gaps 39-3
39.4.2.4 Results and Conclusions 39-3
39.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites 39-4
39.4.3.1 Non-Sampling Data Collection 39-4
39.4.3.2 Sampling Data Collection 39-4
39.4.3.3 Data Gaps 39-4
39.4.3.4 Results and Conclusions 39-5
39.5 Site Conceptual Model 39-6
39.5.1 Nature and Extent of Contamination 39-6
39.5.2 Environmental Fate 39-6
39.6 Site Assessments 39-6
39.6.1 Summary 39-6
39.6.2 Screening Assessments 39-7
39.6.2.1 Human Health 39-7
39.6.2.2 Ecological 39-7
39.6.3 Risk Assessments 39-7
39.6.3.1 Human Health 39-7
39.6.3.2 Ecological 39-7
39.6.4 Other Applicable Assessments 39-8
39.6.4.1 Surface Water 39-8
39.6.4.2 Groundwater 39-8
39.6.4.3 Underground Storage Tanks (USTs) 39-8
39.6.4.4 Other 39-8
39.7 No Further Action Proposal 39-8
39.7.1 Rationale 39-8
39.7.2 Criterion 39-8

Section 40 SWMU 79, Underground Storage Tank 40-1

40.1 Summary 40-1
40.2 Site Description and Operational History 40-1
40.2.1 Site Description 40-1
40.2.2 Operational History 40-1

40.3 Land Use 40-1
40.3.1 Current 40-1
40.3.2 Future/Proposed 40-1
40.4 Investigative Activities 40-1
40.5 Site Conceptual Model 40-1
40.6 Site Assessments 40-1
40.6.1 Screening Assessments 40-2
40.6.2 Risk Assessments 40-2
40.6.3 Other Applicable Assessments 40-2
40.6.3.1 Surface Water 40-2
40.6.3.2 Groundwater 40-2
40.6.3.3 Underground Storage Tanks (USTs) 40-2
40.6.3.4 Other 40-2
40.7 No Further Action Proposal 40-2
40.7.1 Rationale 40-2
40.7.2 Criterion 40-2

Section 41 SWMU 81, Solvent Disposal Site 41-1

41.1 Summary 41-1
41.2 Site Description and Operational History 41-1
41.2.1 Site Description 41-1
41.2.2 Operational History 41-1
41.3 Land Use 41-1
41.3.1 Current 41-1
41.3.2 Future/Proposed 41-1
41.4 Investigative Activities 41-1
41.5 Site Conceptual Model 41-1
41.6 Site Assessments 41-2
41.6.1 Screening Assessments 41-2
41.6.2 Risk Assessments 41-2
41.6.3 Other Applicable Assessments 41-2
41.6.3.1 Surface Water 41-2
41.6.3.2 Groundwater 41-2
41.6.3.3 Underground Storage Tanks (USTs) 41-2
41.6.3.4 Other 41-2
41.7 No Further Action Proposal 41-2
41.7.1 Rationale 41-2
41.7.2 Criterion 41-2

Section 42 SWMU 82, Landfill No. 2 42-1

42.1 Summary 42-1
42.2 Site Description and Operational History 42-1
42.2.1 Site Description 42-1
42.2.2 Operational History 42-1
42.3 Land Use 42-1
42.3.1 Current 42-1
42.3.2 Future/Proposed 42-2
42.4 Investigative Activities 42-2
42.4.1 Summary 42-2
42.4.2 Investigation #1: RCRA Facility Investigation Report for Landfill No. 2 (SWMU 82) 42-2
42.4.2.1 Non-Sampling Data Collection 42-2
42.4.2.2 Sampling Data Collection 42-2
42.4.2.3 Data Gaps 42-3
42.4.2.4 Results and Conclusions 42-3
42.5 Site Conceptual Model 42-3
42.5.1 Nature and Extent of Contamination 42-3
42.5.2 Environmental Fate 42-4
42.6 Site Assessments 42-5
42.6.1 Summary 42-5
42.6.2 Screening Assessments 42-5
42.6.2.1 Human Health 42-5
42.6.2.2 Ecological 42-5
42.6.3 Risk Assessments 42-6
42.6.3.1 Human Health 42-6
42.6.3.2 Ecological 42-6
42.6.4 Other Applicable Assessments 42-6
42.6.4.1 Surface Water 42-6
42.6.4.2 Groundwater 42-6
42.6.4.3 Underground Storage Tanks (USTs) 42-6
42.6.4.4 Other 42-6
42.7 No Further Action Proposal 42-6
42.7.1 Rationale 42-6
42.7.2 Criterion 42-7

Section 43 SWMU 83, Sump 43-1

43.1 Summary 43-1
43.2 Site Description and Operational History 43-1
43.2.1 Site Description 43-1
43.2.2 Operational History 43-1

43.3 Land Use 43-1
43.3.1 Current 43-1
43.3.2 Future/Proposed 43-1
43.4 Investigative Activities 43-2
43.4.1 Summary 43-2
43.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix II SWMUs – Phase I 43-2
43.4.2.1 Non-Sampling Data Collection 43-2
43.4.2.2 Sampling Data Collection 43-2
43.4.2.3 Data Gaps 43-2
43.4.2.4 Results and Conclusions 43-2
43.4.3 Investigation #2: RFI, Appendix II SWMUs – Phase II 43-3
43.4.3.1 Non-Sampling Data Collection 43-3
43.4.3.2 Sampling Data Collection 43-3
43.4.3.3 Data Gaps 43-3
43.4.3.4 Results and Conclusions 43-3
43.5 Site Conceptual Model 43-4
43.5.1 Nature and Extent of Contamination 43-4
43.5.2 Environmental Fate 43-4
43.6 Site Assessments 43-4
43.6.1 Summary 43-4
43.6.2 Screening Assessments 43-4
43.6.2.1 Human Health 43-4
43.6.2.2 Ecological 43-4
43.6.3 Risk Assessments 43-5
43.6.3.1 Human Health 43-5
43.6.3.2 Ecological 43-5
43.6.4 Other Applicable Assessments 43-5
43.6.4.1 Surface Water 43-5
43.6.4.2 Groundwater 43-5
43.6.4.3 Underground Storage Tanks (USTs) 43-5
43.6.4.4 Other 43-5
43.7 No Further Action Proposal 43-5
43.7.1 Rationale 43-5
43.7.2 Criterion 43-5

Section 44 SWMU 85, Stormwater Collection Point 44-1

44.1 Summary 44-1
44.2 Site Description and Operational History 44-1
44.2.1 Site Description 44-1
44.2.2 Operational History 44-1

44.3 Land Use 44-2
44.3.1 Current 44-2
44.3.2 Future/Proposed 44-2
44.4 Investigative Activities 44-2
44.4.1 Summary 44-2
44.4.2 Investigation #1: Installation Restoration Program Phase II, the Stormwater Collection Point (SWMU 85) 44-2
44.4.2.1 Non-Sampling Data Collection 44-2
44.4.2.2 Sampling Data Collection 44-2
44.4.2.3 Data Gaps 44-3
44.4.2.4 Results and Conclusions 44-3
44.4.3 Investigation #2: Final Installation Restoration Program Remedial Investigation, the Stormwater Collection Point (SWMU 85) 44-3
44.4.3.1 Non-Sampling Data Collection 44-3
44.4.3.2 Sampling Data Collection 44-3
44.4.3.3 Data Gaps 44-4
44.4.3.4 Results and Conclusions 44-4
44.5 Site Conceptual Model 44-4
44.5.1 Nature and Extent of Contamination 44-4
44.5.2 Environmental Fate 44-5
44.6 Site Assessments 44-5
44.6.1 Summary 44-5
44.6.2 Screening Assessments 44-5
44.6.2.1 Human Health 44-5
44.6.2.2 Ecological 44-5
44.6.3 Risk Assessments 44-6
44.6.3.1 Human Health 44-6
44.6.3.2 Ecological 44-6
44.6.4 Other Applicable Assessments 44-6
44.6.4.1 Surface Water 44-6
44.6.4.2 Groundwater 44-6
44.6.4.3 Underground Storage Tanks (USTs) 44-6
44.6.4.4 Other 44-7
44.7 No Further Action Proposal 44-7
44.7.1 Rationale 44-7
44.7.2 Criterion 44-7

Vol. 2 - TABLE OF CONTENTS

List of Figures

Figure 21-1	SWMU 1
Figure 23-1	SWMU 3
Figure 25-1	SWMU 5
Figure 28-1	SWMU 16
Figure 29-1	SWMU 34
Figure 30-1	SWMU 48A
Figure 31-1	SWMU 48B
Figure 34-1	SWMU 55
Figure 37-1	SWMU 76
Figure 38-1	SWMU 77
Figure 39-1	SWMU 78
Figure 42-1	SWMU 82
Figure 43-1	SWMU 83
Figure 44-1	SWMU 85
Figure 44-2	SWMU 85

Vol. 2 - TABLE OF CONTENTS

List of Tables

Table 21-1a	Concentration (µg/kg) of VOCs, SWMU 1
Table 21-1b	Concentration (mg/kg) of Total Metals, SWMU 1
Table 21-2a	Summary of Soil Sample Results, SWMU 1
Table 21-2b	Maximum Soil Sample Concentrations Results, SWMU 1
Table 23-1a	Concentration (µg/kg) of VOCs, SWMU 3
Table 23-1b	Concentration (mg/kg) of Total Metals, SWMU 3
Table 23-2	Summary of Compounds Detected in Soil Samples, SWMU 3
Table 25-1a	Concentration (µg/kg) of VOCs, SWMU 5
Table 25-1b	Concentration (mg/kg) of Total Metals, SWMU 5
Table 25-2a	Summary of Compounds Detected in Soil, SWMU 5
Table 25-2b	Comparison of Maximum Detected Metal Concentrations in Soil to Residential RBCs, SWMU 5
Table 28-1	Concentration (mg/kg) of Total Metals, SWMU 16
Table 29-1a	Petroleum Hydrocarbons and Total Lead Analytical Results, SWMU 34
Table 29-1b	EP-Toxicity Results and Regulatory Standards, SWMU 34
Table 29-1c	Purgeable Organic Analytical Results of Soil Samples, SWMU 34
Table 29-2a	PAH Concentrations in Soil Samples, SWMU 34
Table 29-2b	TPH Concentrations in Soil Samples, SWMU 34
Table 29-2c	Metal Concentrations in Soil Samples, SWMU 34
Table 30-2	Summary of Compounds Detected in Phase II Soil Samples, SWMU 48A
Table 30-3	Comparison of Maximum Soil Concentrations to MSSLs, SWMU 48A
Table 31-1a	Concentration (µg/kg) of VOCs, SWMU 48B
Table 31-1b	Concentration (µg/kg) of BTEX, SWMU 48B
Table 31-1c	Concentration (mg/kg) of Total TAL Metals, SWMU 48B
Table 31-2a	Summary of Compounds Detected in Soil Samples, SWMU 48B
Table 31-2b	Comparison of Maximum Soil Concentrations to RBCs for Residential Soil, SWMU 48B
Table 34-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 55
Table 34-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 55
Table 34-2a	Summary of Compounds Detected in Phase II Soil Samples, SWMU 55
Table 34-2b	Comparison of Maximum Soil Concentrations to RBCs for Residential Soil, SWMU 55
Table 34-2c	Potential Cumulative Risk, SWMU 55

List of Tables, cont.

Table 37-1a	Ethyl Benzene and Xylenes Concentrations in Soil Samples, SWMU 76
Table 37-1b	Metal Concentrations in Soil Samples, SWMU 76
Table 37-2a	Selection of COCs, SWMU 76
Table 37-2b	Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB – Soil and Groundwater, SWMU 76
Table 37-2c	Proposed Corrective Action Levels and RFI Criteria for Carcinogens Detected at Cannon AFB – Soil and Groundwater, SWMU 76
Table 38-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 77
Table 38-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 77
Table 38-2	Summary of Human Health Risks, SWMU 77
Table 38-3a	Comparison of Phase II Soil Concentrations to Phase I Concentrations and RBCs, SWMU 77
Table 38-3b	Potential Cumulative Risk, SWMU 77
Table 38-4a	Compounds Detected in CMS Surface Soils, SWMU 77
Table 38-4b	Compounds Detected in CMS Subsurface Soils, SWMU 77
Table 38-4c	Model-Predicted Concentrations, SWMU 77
Table 39-1a	Pesticide Concentrations in Soil Samples, SWMU 78
Table 39-1b	TPH Concentrations in Soil Samples, SWMU 78
Table 39-1c	Metal Concentrations in Surface Soil Samples, SWMU 78
Table 39-1d	Metal Concentrations in Soil Samples, SWMU 78
Table 39-2a	Selection of COCs, SWMU 78
Table 39-2b	Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB – Soil and Groundwater, SWMU 78
Table 39-2c	Proposed Corrective Action Levels and RFI Criteria for Carcinogens Detected at Cannon AFB – Soil and Groundwater, SWMU 78
Table 42-1a	Elemental Concentrations (mg/kg) that Exceeded the Estimated Background Range in Surface and Subsurface Soil Samples, SWMU 82
Table 42-1b	Summary of Volatile, Semivolatile, Pesticide/PCB, and Other Analytes Detected in Surface and Subsurface Soil Samples, SWMU 82
Table 43-1a	Concentration (mg/kg) of TRPH, SWMU 83
Table 43-1b	Concentration (mg/kg) of TAL Metals, SWMU 83

List of Tables, cont.

Table 43-2a	Summary of Compounds Detected in Soil Samples, SWMU 83
Table 43-2b	Comparison of Maximum Concentrations to RBCs for Residential Soil, SWMU 83
Table 44-1	Phase II Analytical Results (µg/kg), SWMU 85
Table 44-2a	Remedial Investigation Analytical Results - Barium (µg/kg), SWMU 85
Table 44-2b	Remedial Investigation Analytical Results - Mercury (µg/kg), SWMU 85
Table 44-2c	Remedial Investigation Analytical Results - Selenium (µg/kg), SWMU 85

Vol. 2 - TABLE OF CONTENTS

List of Appendixes

Appendix A Figures
Appendix B Tables
Appendix C References

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
ACM	Asbestos-containing material
AFB	Air Force Base
AOC	Area of Concern
AST	Aboveground Storage Tank
BRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CRQL	Contract Required Quantitation Limit
DPDO	Defense Property Disposal Office
DRO	Diesel-Range Organics
EP	Extraction Procedure
GC	Gas Chromatograph
GIS	Geographical Information System
GRO	Gasoline-Range Organics
HELP	Hydrologic Evaluation of Landfill Performance (Model)
HI	Hazard Index
IRP	Installation Restoration Program
JP-4	Jet Propellant
MCL	Maximum Contaminant Level
MCPP	2-(2-methyl-4-chlorophenoxy) propionic acid
mgd	million gallons per day
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MOGAS	Motor Gasoline
MSSL	Media-Specific Screening Level

MULTIMED	Multimedia Exposure Assessment Model
NFA	No Further Action
NMED	New Mexico Environment Department
OVA	Organic Vapor Analyzer
OWS	Oil/Water Separator
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PLM	Polarized light microscopy
POL	Petroleum, Oil, and Lubricants
ppb	parts per billion
ppm	parts per million
ppm/v	parts per million on a volume to volume basis
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
RBC	Risk-Based Concentration
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RL	Reporting Limit
RME	Reasonable Maximum Exposure
SI	Site Inspection
SSTL	Site-Specific Target Level
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCO	Total Chromatographable Organics
TIC	Tentatively Identified Compound

TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
VOC	Volatile Organic Compound
W-C	Woodward-Clyde
WWTP	Wastewater Treatment Plant

21.1 SUMMARY

SWMU 1, OWS No. 119, has been listed as an Appendix II site. An RFI of the Appendix II sites (LRL 1993) detected two organic compounds (acetone and toluene) and three metals (chromium, mercury, and nickel) at concentrations of potential concern in the area of SWMU 1. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 1, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the partial removal of the OWS at SWMU 1, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 1.

The conclusions reached in the Corrective Measure Completion Report recommended NFA at this site based on the results of a risk evaluation. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

21.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

21.2.1 Site Description

SWMU 1, OWS No. 119, was located at the southwest corner of Building 119 (Figure 21-1 in Appendix A). The OWS was an underground concrete unit, which consisted of two compartments, a 700-gallon main compartment and a 260-gallon oil storage compartment. The OWS measured approximately 12 feet by 6 feet in plan and extended approximately 10 feet below the paved surface. The immediate area above the unit was paved with a layer of asphalt approximately 0.5 feet thick. The unit reportedly received waste wash water generated from aircraft maintenance operations in Building 119, an aircraft maintenance hangar. Recovered oils were stored in the 260-gallon oil storage compartment and wastewaters were discharged to storm water drainage.

21.2.2 Operational History

OWS No. 119 was active from approximately 1963 until the unit was partially removed in 1996 (USACE 1999). The OWS at SWMU 1 has been partially removed and no longer receives wash water. All wash water now enters the sanitary sewer system and is treated at the Cannon AFB wastewater treatment plant (WWTP).

21.3 LAND USE

21.3.1 Current

The current land use of the SWMU location is industrial.

21.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. The site of the OWS has been surveyed and identified by a brass survey marker. The creation of a Geographical Information System (GIS) database identifying the location is being developed. Use classification will continue to remain industrial in nature.

21.4 INVESTIGATIVE ACTIVITIES

21.4.1 Summary

An RFI of the Appendix II sites (LRL 1993) detected two organic compounds and three metals at concentrations of potential concern in the area of SWMU 1. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 1, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

A Corrective Measure Completion Report (USACE 1999) documented the partial removal of the OWS at SWMU 1, discussed the analytical results of soil samples collected from the resultant excavation, and found that no unacceptable human health risks due to chemical releases were expected at this SWMU. Based on this, the Corrective Measure Completion Report recommended NFA for SWMU 1.

21.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI)

21.4.2.1 Non-Sampling Data Collection

The RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

21.4.2.2 Sampling Data Collection

Three borings, drilled to a depth of 10 feet in the area of the OWS, were sampled during the RFI (boring locations are shown in Figure 21-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5 and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed evidence of slight contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

21.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 1. In addition, the data quality was deemed to be sufficient to meet the objectives of the RFI. Therefore, no data gaps existed after the completion of the RFI.

21.4.2.4 Results and Conclusions

One organic (toluene) and one metal (chromium) were detected at low concentrations in the surface soil samples collected from all three borings. However, these compounds were not detected in any of the subsurface samples analyzed. One organic (acetone) and two metals (mercury and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 21-1a and 21-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4.0×10^{-5} at SWMU 1, a level that fell within the U.S. Environmental Protection Agency (USEPA) target risk range of 1.0×10^{-4} to 1.0×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 1, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 1, the RFI recommended that an integrity test be performed on the OWS at this SWMU. As long as the unit passed the integrity test, NFA was recommended.

21.4.3 Investigation #2: Corrective Measure Completion Report, Appendices II and III SWMUs

21.4.3.1 Non-Sampling Data Collection

A risk evaluation was performed using the data collected during the Corrective Measure Completion Report. The results of the risk evaluation are discussed below.

21.4.3.2 Sampling Data Collection

After the OWS had been partially removed, soil samples were collected from the walls and bottom of the resultant excavation and sent for chemical analyses.

21.4.3.3 Data Gaps

It was concluded that the data collected during the Corrective Measure Completion Report was sufficient to complete a risk evaluation. In addition, the data quality was deemed to be sufficient to meet the objectives of the Corrective Measure Completion Report. Therefore, no data gaps existed.

21.4.3.4 Results and Conclusions

The OWS at SWMU 1 was pumped dry and cleaned. Then the determination was made that the unit would only be partially removed, due to the presence of an old high-pressure water line adjacent to the unit. The top 2 feet of the OWS were removed, and the unit's inlet and discharge pipes were disconnected and capped. The partial removal of the OWS effectively rendered the RFI's recommendation for an integrity test moot. The analytical results for this investigation are shown in Tables 21-2a and 21-2b in Appendix B.

After partial removal of the OWS, one soil sample was collected approximately 2 feet beneath both the inlet and discharge pipes, one soil sample was collected from both the east and the west walls of the excavation, and two soil samples were collected from holes drilled through the bottom of the unit each at an approximate depth of 11 feet. A seventh, confirmatory sample was collected from the bottom of the excavation, at approximately 11 feet, and sent for laboratory analysis after field analysis of these samples using immunoassay method 4030 indicated that the TPH content of each sample was less than 100 ppm and that the BTEX content of each sample was less than 50 ppm. This sample was analyzed for VOCs, SVOCs, TPH–DRO, total metals, and TCLP metals. In addition, two duplicate samples were collected from the same locations as one of the pipe and one of the wall samples, and sent for laboratory analysis, which confirmed the field analysis results for TPH and BTEX.

Analytical results for soil samples analyzed by the laboratory were compared to the USEPA Region VI Human Health MSSLs for residential soil to determine if a significant release had occurred in the area of SWMU 1. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the

established background levels (W-C 1997a) for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring.

Because none of the other chemicals exceeded the corresponding MSSLs, the Corrective Measure Completion Report concluded that no chemical releases posing an unacceptable human health risk for any potential exposure pathway had occurred at this SWMU. Therefore, NFA was recommended at this SWMU.

21.5 SITE CONCEPTUAL MODEL

21.5.1 Nature and Extent of Contamination

The RFI conducted at SWMU 1 included the drilling and sampling of a total of three borings to a depth of 10 feet. Two organic compounds and three metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

The Corrective Measure Completion Report documented the partial removal of the OWS from this SWMU. In addition, soil samples were collected from the resultant excavation and sent for laboratory analysis. Arsenic was the only compound that potentially exceeded the corresponding MSSL. However, the maximum possible concentration of arsenic fell below the established background levels (W-C 1997a) for metals at Cannon AFB, so the elevated concentration of arsenic was dismissed as naturally occurring.

Groundwater at SWMU 1 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

21.5.2 Environmental Fate

Contaminants encountered at OWS No. 119 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 1, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

21.6 SITE ASSESSMENTS

21.6.1 Summary

The RFI included a Risk Assessment portion and the Corrective Measure Completion Report included a risk evaluation for SWMU 1. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 1.

21.6.2 Screening Assessments

21.6.2.1 Human Health

The Risk Assessment portion of the RFI did not include a human health risk screening. The results of the RFI's Human Health Risk Assessment are discussed below.

The Corrective Measure Completion Report's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region VI MSSLs for residential soil (USEPA 1996). The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with the Corrective Measure Completion Report posed a significant human health risk. Region VI MSSLs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

Although no arsenic concentrations were detected in any of the soil samples analyzed during the Corrective Measure Completion Report, the laboratory detection limit of 3.0 mg/kg exceeded the Region VI MSSLs (Table 21-2b in Appendix B) for both carcinogenic arsenic (0.32 mg/kg) and noncarcinogenic arsenic (2.2 mg/kg). However, the laboratory detection limit of 3.0 mg/kg lies within the established background levels (W-C 1997a) for arsenic at Cannon AFB. Therefore, any potential arsenic present in any of the samples above the MSSL, but below the detection limit, has been dismissed as naturally occurring. No other COPCs were detected at concentrations exceeding the corresponding MSSLs at SWMU 1.

21.6.2.2 Ecological

An ecological risk screening was not included as part of the RFI or the Corrective Measure Completion Report, but a human health risk screening/evaluation was included in the Corrective Measure Completion Report. The results of the RFI's Ecological Risk Assessment are discussed below. In the Corrective Measure Completion Report, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region VI MSSLs, used as screening criteria, are highly conservative, and as such are protective of ecological health in addition to human health.

21.6.3 Risk Assessments

21.6.3.1 Human Health

The results of the Human Health Risk Assessment found a maximum excess carcinogenic risk of 4.0×10^{-5} at SWMU 1, a level that fell within the USEPA's target risk range of 1.0×10^{-4} to 1.0×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Human Health Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 1, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

21.6.3.2 Ecological

A single Ecological Risk Assessment was included in the RFI for all 15 SWMUs covered by the RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

21.6.4 Other Applicable Assessments

21.6.4.1 Surface Water

SWMU 1 contained no surface water.

21.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

21.6.4.3 Underground Storage Tanks (USTs)

OWS No. 119 included a 260-gallon underground oil storage compartment. This compartment was partially removed along with the unit's other compartments in 1996. There have been no other storage tanks associated with the area of SWMU 1.

21.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this

study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

21.7 NO FURTHER ACTION PROPOSAL

21.7.1 Rationale

Based on the conclusions reached in the Corrective Measure Completion Report, NFA has been recommended for SWMU 1.

21.7.2 Criterion

SWMU 1 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

22.1 SUMMARY

An RFA (A.T. Kearney 1987) described the suspected SWMU 2 location, Hangar 108, as having a Recovered Diesel Tank connected to an OWS. This led to the UST being listed as an Appendix II site.

In 1989, Hangar 108 was demolished and replaced with Hangar 125. During demolition, a 2,000-gallon heating oil UST, not a Recovered Diesel Tank, was removed from the suspected SWMU 2 location, and the former UST location was covered with the concrete floor of the new hangar.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

22.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

22.2.1 Site Description

Refer to summary in Section 22.1 above.

22.2.2 Operational History

Refer to summary in Section 22.1 above.

22.3 LAND USE

22.3.1 Current

Refer to summary in Section 22.1 above.

22.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 2 never existed, and the 2,000-gallon heating oil UST has been removed from the suspected location of SWMU 2. Use classification will continue to remain industrial in nature.

22.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 2 have been performed. However, a 2,000-gallon heating oil UST was removed during the demolition of Hangar 108, and the former UST location was covered with the concrete floor of a new hangar.

22.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 2 has never been the subject of a conceptual model.

22.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 2.

22.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 2.

22.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 2.

22.6.3 Other Applicable Assessments

22.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 2.

22.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 2 contained no means for groundwater discharges to occur.

22.6.3.3 Underground Storage Tanks (USTs)

A 2,000-gallon heating oil UST, located at Hangar 108, was removed from the suspected location of SWMU 2. Hangar 108, which was constructed during World War II, was demolished in 1989 and replaced with Hangar 125. The tank was removed and the former UST location was covered with the concrete floor of the new hangar. This UST was originally listed as an Appendix II site due to its misidentification as a Recovered Diesel Tank.

22.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 2.

22.7 NO FURTHER ACTION PROPOSAL

22.7.1 Rationale

Because SWMU 2 never existed, NFA is recommended for SWMU 2.

22.7.2 Criterion

SWMU 2 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

23.1 SUMMARY

SWMU 3, OWS No. 108, has been listed as an Appendix II site. A Phase I RFI of the Appendix II sites (LRL 1993) detected two organic compounds (acetone and toluene) and four metals (barium, chromium, mercury, and nickel) at concentrations of potential concern in the area of SWMU 3. Based on the results of a limited risk assessment performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 3.

A Phase II RFI of the Appendix II sites (W-C 1997c) detected one organic compound and no metals at concentrations of potential concern at SWMU 3. However, the risk evaluation portion of the Phase II RFI report concluded that the maximum detected concentration of this chemical was within the acceptable excess carcinogenic risk range. Based on this, the Phase II RFI recommended NFA for SWMU 3.

The conclusions reached in the Phase I and Phase II RFIs were consistent in recommending NFA at this site based on the results of a Risk Assessment and a risk evaluation, respectively. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

23.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

23.2.1 Site Description

SWMU 3, OWS No. 108, was located to the west of former Hangar 125 (Figure 23-1 in Appendix A). The precise location of the unit is unknown, but it is believed to have been located approximately 8 feet west and 96 feet south of the northwest corner of what is now Building 108. The size and construction of the OWS is unknown. In fact, it is unknown whether this unit was an OWS or a grease trap. However, because the unit was referred to as an OWS in previous reports, it will also be referred to as an OWS herein. The unit reportedly received wastewater from Building 102 and waste wash water generated from aircraft maintenance operations in Hangar 121. Wastewaters from the unit were discharged to a sanitary sewer line.

23.2.2 Operational History

OWS No. 108 was active until approximately 1990 when the unit was removed during the demolition of Hangar 125 (W-C 1997c). The OWS at SWMU 3 has been removed and no longer receives wastewaters.

23.3 LAND USE

23.3.1 Current

The current land use of the SWMU location is industrial. The suspected former location of this OWS is currently covered with asphalt.

23.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 108 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

23.4 INVESTIGATIVE ACTIVITIES

23.4.1 Summary

The Phase I RFI of the Appendix II sites (LRL 1993) detected two organic compounds and four metals at concentrations of potential concern in the area of SWMU 3. However, the Risk Assessment portion of the Phase I RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 3, the Phase I RFI recommended NFA for this SWMU.

A Phase II RFI of the Appendix II sites (W-C 1997c) detected one organic compound and no metals at concentrations of potential concern at SWMU 3. However, the risk evaluation portion of the Phase II RFI report concluded that the maximum detected concentration of this chemical was within the acceptable excess carcinogenic risk range. Based on this, the Phase II RFI recommended NFA for SWMU 3.

23.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) – Phase I

23.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

23.4.2.2 Sampling Data Collection

Three borings, drilled to a depth of 10 feet in the area of the former OWS unit, were sampled during the Phase I RFI (boring locations are shown in Figure 23-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5, and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed potential evidence of slight contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

23.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 3.

In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

23.4.2.4 Results and Conclusions

One organic (toluene) and two metals (chromium and nickel) were detected at low concentrations in the surface soil samples collected from one or more borings. One organic (acetone) and three metals (barium, mercury, and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 23-1a and 23-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 3, a level that fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 3, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the Phase I RFI for all 15 SWMUs covered by the Phase I RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 3, the Phase I RFI recommended NFA at this SWMU.

23.4.3 Investigation #2 Appendix II RFI – Phase II

23.4.3.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to evaluate whether a release of SWMU-related chemicals had occurred from SWMU 3 that could pose a significant risk to human health or the environment. In addition, the Phase II included a risk screening to verify whether the recommendation for NFA based on the Phase I RFI was appropriate for SWMU 3, and to characterize the vertical extent of contamination in this area.

23.4.3.2 Sampling Data Collection

Three soil borings were drilled to a depth of approximately 20 feet in the area of the former OWS (boring locations are shown in Figure 23-1 in Appendix A), and 15 soil samples were collected and analyzed from these borings. The borings were drilled in a triangular pattern with each boring located approximately 15 feet from the presumed location of the former OWS. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples were collected from the from the 0- to 2.0-foot depth interval in all three borings. Subsurface soil samples were also collected from each boring at the 3- to 5-foot, the 8- to 10-foot, the 13- to 15-foot, and the 18- to 20-foot depth intervals. Target analytes included VOCs, SVOCs, TAL metals, and TRPH.

23.4.3.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and conduct a risk screening at this SWMU. There were no sampling issues associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SWMU 3, and for completing the human health risk screening. Therefore, no data gaps existed.

23.4.3.4 Results and Conclusions

The analytical results of the Phase II RFI are presented in Table 23-2 in Appendix B. The maximum detected concentration of one organic compounds (benzo(a)pyrene) exceeded the corresponding USEPA Region III RBC for residential soil (USEPA 1994). However, the estimated risk from this compound fell within the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic compounds. In addition, the maximum detected concentration did not exceed the RBC for industrial soil.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

Because there were no unacceptable health risks associated with SWMU 3, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

23.5 SITE CONCEPTUAL MODEL

23.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 3 included the drilling and sampling of three borings to a depth of 10 feet. Two organic compounds and four metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the Phase I RFI report concluded

that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

A Phase II RFI of the Appendix II sites (W-C 1997c) detected one organic compound and no metals at concentrations of potential concern at SWMU 3. However, the risk evaluation portion of the Phase II RFI report concluded that the maximum detected concentration of this chemical was within the acceptable excess carcinogenic risk range. Based on this, the Phase II RFI recommended NFA for SWMU 3.

Groundwater at SWMU 3 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

23.5.2 Environmental Fate

Contaminants encountered at OWS No. 108 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air - volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 3, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

23.6 SITE ASSESSMENTS

23.6.1 Summary

The Phase I RFI included a risk assessment portion and the Phase II RFI included a risk evaluation for SWMU 3. Based on the results of the Risk Assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 3.

23.6.2 Screening Assessments

23.6.2.1 Human Health

The risk assessment portion of the Phase I RFI was actually a screening assessment, and included a comparison of data that exceeded the established background levels (W-C 1997a) to accepted risk-based remediation objectives.

The Phase II RFI's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The comparison is shown in Table 23-2b in Appendix B. The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with Phase II RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

No COPCs were detected at concentrations exceeding the corresponding RBCs at SWMU 3.

23.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI or Phase II RFI, but a human health risk screening/evaluation was included in the Phase II RFI. Detected chemical concentrations attributable to SWMU contamination did not significantly exceed the screening criteria. The Region III RBCs, used as screening criteria, are highly conservative, and as such are protective of ecological and human health.

23.6.3 Risk Assessments

23.6.3.1 Human Health

Based on the results of the risk assessment portion of the Phase I RFI and the risk evaluation portion of the Phase II RFI (both of which were actually risk screenings), a full-scale human health risk assessment was not warranted for SWMU 3.

23.6.3.2 Ecological

Based on the results of the risk assessment portion of the Phase I RFI and the risk evaluation portion of the Phase II RFI (both of which were actually risk screenings), a full-scale ecological risk assessment was not warranted for SWMU 3.

23.6.4 Other Applicable Assessments

23.6.4.1 Surface Water

SWMU 3 contained no surface water.

23.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

23.6.4.3 Underground Storage Tanks (USTs)

OWS No. 108 may have included an oil UST as one of the unit's compartments. However, the entire unit and all of its compartments were removed in 1990.

23.6.4.4 Other

In 1987-1988, the Tulsa District of the Army Corps of Engineers collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

23.7 NO FURTHER ACTION PROPOSAL

23.7.1 Rationale

Based on the conclusions reached in the Phase II RFI, NFA has been recommended for SWMU 3.

23.7.2 Criterion

SWMU 3 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

24.1 SUMMARY

An RFA (A.T. Kearney 1987) described the suspected SWMU 4 location, Hangar 121, as having a Recovered Diesel Tank connected to an OWS. This led to the UST being listed as an Appendix II site.

In 1989, Hangar 121 was demolished and replaced with Hangar 126. During demolition, a 2,000-gallon heating oil UST, not a Recovered Diesel Tank, was removed from the suspected SWMU 4 location, and the former UST location was covered with the concrete floor of the new hangar.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

24.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

24.2.1 Site Description

Refer to summary in Section 24.1 above.

24.2.2 Operational History

Refer to summary in Section 24.1 above.

24.3 LAND USE

24.3.1 Current

Refer to summary in Section 24.1 above.

24.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 4 never existed, and the 2,000-gallon heating oil UST has been removed from the suspected location of SWMU 4. Use classification will continue to remain industrial in nature.

24.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 4 have been performed. However, a 2,000-gallon heating oil UST was removed during the demolition of Hangar 121, and the former UST location was covered with the concrete floor of a new hangar.

24.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 4 has never been the subject of a conceptual model.

24.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 4.

24.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 4.

24.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 4.

24.6.3 Other Applicable Assessments

24.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 4.

24.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 4 contained no means for groundwater discharges to occur.

24.6.3.3 Underground Storage Tanks (USTs)

A 2,000-gallon heating oil UST, located at Hangar 121, was removed from the suspected location of SWMU 4. Hangar 121, which was constructed during World War II, was demolished in 1989 and replaced with Hangar 126. The tank was removed and the former UST location was covered with the concrete floor of the new hangar. This UST was originally listed as an Appendix II site due to its misidentification as a Recovered Diesel Tank.

24.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 4.

24.7 NO FURTHER ACTION PROPOSAL

24.7.1 Rationale

Because SWMU 4 never existed, NFA is recommended for SWMU 4.

24.7.2 Criterion

SWMU 4 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

25.1 SUMMARY

SWMU 5, OWS No. 121, has been listed as an Appendix II site. A Phase I RFI of the Appendix II sites (LRL 1993) detected one organic compound (acetone) and three metals (barium, mercury and nickel) at concentrations of potential concern in the area of SWMU 5. Based on the results of a limited risk assessment performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 5.

A Phase II RFI of the Appendix II sites (W-C 1997c) did not detect any chemicals at concentrations of potential concern at SWMU 5. Based on this, the Phase II RFI recommended NFA for SWMU 5.

The conclusions reached in the Phase I and Phase II RFIs were consistent in recommending NFA at this site based on the results of a Risk Assessment and a risk evaluation, respectively. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

25.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

25.2.1 Site Description

SWMU 5, OWS No. 121, was located to the west of former Hangar 121 (Figure 25-1 in Appendix A). The precise location of the unit is unknown, but it is believed to have been located approximately 140 feet southwest of Building 123 and approximately 135 feet southeast of Building 112. The size and construction of the OWS is unknown. In fact, it is unknown whether this unit was an OWS or a grease trap. However, because the unit was referred to as an OWS in previous reports, it will also be referred to as an OWS herein. The unit reportedly received wastewater from Buildings 102 and 125 and waste wash water generated from aircraft maintenance operations in Hangar 121. Wastewaters from the unit were discharged to a sanitary sewer line.

25.2.2 Operational History

OWS No. 121 was active until approximately 1990 when the unit was removed during the demolition of Hangar 121 (W-C 1997c). The OWS at SWMU 5 has been removed and no longer receives wastewaters.

25.3 LAND USE

25.3.1 Current

The current land use of the SWMU location is industrial. The suspected former location of this OWS is currently covered with asphalt.

25.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 121 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

25.4 INVESTIGATIVE ACTIVITIES

25.4.1 Summary

The Phase I RFI of the Appendix II sites (LRL 1993) detected one organic compound and three metals at concentrations of potential concern in the area of SWMU 5. However, the Risk Assessment portion of the Phase I RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 5, the Phase I RFI recommended NFA for this SWMU.

A Phase II RFI of the Appendix II sites (W-C 1997c) did not detect any chemicals at concentrations of potential concern at SWMU 5. Based on this, the Phase II RFI recommended NFA for SWMU 5.

25.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) – Phase I

25.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

25.4.2.2 Sampling Data Collection

Three borings, each drilled to a depth of 10 feet in the area of the former OWS unit, were sampled during the Phase I RFI (boring locations are shown in Figure 25-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5, and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed potential evidence of slight contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

25.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 5. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

25.4.2.4 Results and Conclusions

No organics or metals were detected in the surface soil samples collected from the three borings. One organic (acetone) and three metals (barium, mercury and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Tables 25-1a and 25-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

Based on the results of a limited risk assessment performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 5.

25.4.3 Investigation #2 Appendix II RFI – Phase II

25.4.3.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to evaluate whether a release of SWMU-related chemicals had occurred from SWMU 5 that could pose a significant risk to human health or the environment. In addition, the Phase II included a risk screening to verify whether the recommendation for NFA based on the Phase I RFI was appropriate for SWMU 5, and to characterize the vertical extent of contamination in this area.

25.4.3.2 Sampling Data Collection

Three soil borings were drilled to a depth of approximately 20 feet and a fourth boring was drilled to a depth of approximately 34.5 feet in the area of the former OWS (boring locations are shown in Figure 25-1 in Appendix A), and 17 soil samples were collected and analyzed from these borings. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples were collected from the from the 0- to 2.0-foot depth interval in the three 20-foot borings. Subsurface soil samples were also collected from each of the three 20-foot borings at the 3- to 5-foot, the 8- to 10-foot, the 13- to 15-foot, and the 18- to 20-foot depth intervals. Subsurface soil samples were collected from the 34.5-foot boring at the 28- to 29-foot and the 33- to 34.5-foot depth intervals. Target analytes included VOCs, SVOCs, TAL metals, and TRPH.

25.4.3.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and conduct a risk screening at this SWMU. There were no sampling issues associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SWMU 5, and for completing the human health risk screening. Therefore, no data gaps existed.

25.4.3.4 Results and Conclusions

The analytical results of the Phase II RFI are presented in Table 25-2a in Appendix B. The maximum concentrations of all detected chemicals did not exceed the corresponding USEPA Region III RBC for residential soil (USEPA 1994) (see Table 25-2b in Appendix B).

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

Because there were no unacceptable health risks associated with SWMU 5, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

25.5 SITE CONCEPTUAL MODEL

25.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 5 included the drilling and sampling of three borings to depths of 10 feet. One organic compound and three metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the Phase I RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable excess carcinogenic and noncarcinogenic risk ranges.

A Phase II RFI of the Appendix II sites (W-C 1997c) did not detect any chemicals at concentrations of potential concern at SWMU 5. Based on this, the Phase II RFI recommended NFA for SWMU 5.

Groundwater at SWMU 5 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

25.5.2 Environmental Fate

Contaminants encountered at OWS No. 121 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include:
air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 5, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

25.6 SITE ASSESSMENTS

25.6.1 Summary

The Phase I RFI included a risk assessment portion and the Phase II RFI included a risk evaluation for SWMU 5. Based on the results of the risk assessment and the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 5.

25.6.2 Screening Assessments

25.6.2.1 Human Health

The risk assessment portion of the Phase I RFI was actually a screening assessment, and included a comparison of data that exceeded the established background levels (W-C 1997a) to accepted risk-based remediation objectives.

The Phase II RFI's risk evaluation consisted of a comparison of the maximum detected concentrations to the highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The comparison is shown in Table 25-2b in Appendix B. The purpose of this comparison was to evaluate whether the concentrations of potential contaminants detected during the fieldwork associated with Phase II RFI posed a significant human health risk. Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

No COPCs were detected at concentrations exceeding the corresponding RBCs at SWMU 5.

25.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI or Phase II RFI, but a human health risk screening/evaluation was included in the Phase II RFI. Detected chemical concentrations attributable to SWMU contamination did not significantly exceed the screening criteria. The Region III RBCs, used as screening criteria, are highly conservative, and as such are protective of ecological and human health.

25.6.3 Risk Assessments

25.6.3.1 Human Health

Based on the results of the risk assessment portion of the Phase I RFI and the risk evaluation portion of the Phase II RFI (both of which were actually risk screenings), a full-scale human health risk assessment was not warranted for SWMU 5.

25.6.3.2 Ecological

Based on the results of the risk assessment portion of the Phase I RFI and the risk evaluation portion of the Phase II RFI (both of which were actually risk screenings), a full-scale ecological risk assessment was not warranted for SWMU 5.

25.6.4 Other Applicable Assessments

25.6.4.1 Surface Water

SWMU 5 contained no surface water.

25.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

25.6.4.3 Underground Storage Tanks (USTs)

OWS No. 121 may have included an oil UST as one of the unit's compartments. However, the entire unit and all of its compartments were removed in 1990.

25.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

25.7 NO FURTHER ACTION PROPOSAL

25.7.1 Rationale

Based on the conclusions reached in the Phase II RFI, NFA has been recommended for SWMU 5.

25.7.2 Criterion

SWMU 5 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

26.1 SUMMARY

An RFA (A.T. Kearney 1987) described the suspected SWMU 6 location, Hangar 129, as having an inactive Petroleum, Oil, and Lubricants (POL) Tank connected to an OWS. This led to the UST being listed as an Appendix II site. A 2,000-gallon heating oil UST, not a POL Tank, was removed following NMED UST regulations.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

26.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

26.2.1 Site Description

Refer to summary in Section 26.1 above.

26.2.2 Operational History

Refer to summary in Section 26.1 above.

26.3 LAND USE

26.3.1 Current

Refer to summary in Section 26.1 above.

26.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 6 never existed. Use classification will continue to remain industrial in nature.

26.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 6 have been performed.

26.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 6 has never been the subject of a conceptual model.

26.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 6.

26.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 6.

26.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 6.

26.6.3 Other Applicable Assessments

26.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 6.

26.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 6 contained no means for groundwater discharges to occur.

26.6.3.3 Underground Storage Tanks (USTs)

No storage tanks, underground or aboveground, were ever located in the area misidentified as SWMU 6. This SWMU was originally listed as an Appendix II site due to its misidentification as an Inactive POL Storage Tank.

26.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 6.

26.7 NO FURTHER ACTION PROPOSAL

26.7.1 Rationale

Because SWMU 6 never existed, NFA is recommended for SWMU 6.

26.7.2 Criterion

SWMU 6 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

27.1 SUMMARY

An RFA (A.T. Kearney 1987) described the suspected SWMU 10 location, Hangar 170, as having an inactive POL Tank connected to an OWS. This led to the UST being listed as an Appendix II site. A 2,000-gallon heating oil UST, not a POL Tank, was removed following NMED UST regulations.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

27.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

27.2.1 Site Description

Refer to summary in Section 27.1 above.

27.2.2 Operational History

Refer to summary in Section 27.1 above.

27.3 LAND USE

27.3.1 Current

Refer to summary in Section 27.1 above.

27.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 10 never existed. Use classification will continue to remain industrial in nature.

27.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 10 have been performed.

27.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 10 has never been the subject of a conceptual model.

27.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 10.

27.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 10.

27.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 10.

27.6.3 Other Applicable Assessments

27.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 10.

27.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 10 contained no means for groundwater discharges to occur.

27.6.3.3 Underground Storage Tanks (USTs)

No storage tanks, underground or aboveground, were ever located in the area misidentified as SWMU 10. This SWMU was originally listed as an Appendix II site due to its misidentification as an Inactive POL Storage Tank.

27.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 10.

27.7 NO FURTHER ACTION PROPOSAL

27.7.1 Rationale

Because SWMU 10 never existed, NFA is recommended for SWMU 10.

27.7.2 Criterion

SWMU 10 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

28.1 SUMMARY

SWMU 16, OWS No. 680, has been listed as an Appendix II site. A Phase I RFI of the Appendix II sites (LRL 1993) detected three metals (lead, mercury and nickel) at concentrations of potential concern in the area of SWMU 16. Based on the results of a limited risk assessment performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 16.

A Phase II RFI of the Appendix II sites (W-C 1997c) was planned for SWMU 16, but was not conducted because of the presence of a garage and numerous subsurface utilities in the area of the former location of this SWMU.

The conclusions reached in the Phase I RFI recommended NFA at this site based on the results of a Risk Assessment. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

28.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

28.2.1 Site Description

SWMU 16, OWS No. 680, was formerly located near the southwest of Building 680 (Figure 28-1 in Appendix A). The concrete OWS was a three-compartment unit with a 584-gallon main compartment and a 140-gallon oil storage compartment. The unit reportedly received wastewater generated from aircraft washing and maintenance operations.

28.2.2 Operational History

OWS No. 680 was active from approximately 1965 until approximately 1991 when the unit was removed during building renovations (W-C 1997c). The separator unit was replaced with a new OWS located approximately 15 feet east of this SWMU. The OWS at SWMU 16 has been removed and no longer receives wastewaters.

28.3 LAND USE

28.3.1 Current

The current land use of the SWMU location is industrial. The site of the former separator unit is presently located inside a garage and is covered with concrete pavement.

28.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 680 has been removed and no longer receives waste wash water. Use classification will continue to remain industrial in nature.

28.4 INVESTIGATIVE ACTIVITIES

28.4.1 Summary

The Phase I RFI of the Appendix II sites (LRL 1993) detected three metals at concentrations of potential concern in the area of SWMU 16. However, the Risk Assessment portion of the Phase I RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable risk ranges. Based on the conclusions reached in the Risk Assessment for SWMU 16, the Phase I RFI recommended NFA for this SWMU.

A Phase II RFI of the Appendix II sites (W-C 1997c) did not detect any chemicals at concentrations of potential concern at SWMU 16. Based on this, the Phase II RFI recommended NFA for SWMU 16.

28.4.2 Investigation #1: Appendix II RCRA Facility Investigation (RFI) – Phase I

28.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a Risk Assessment. The results of the Risk Assessment are discussed below.

28.4.2.2 Sampling Data Collection

Three borings, each drilled to a depth of 10 feet in the area of the former OWS unit, were sampled during the Phase I RFI (boring locations are shown in Figure 28-1 in Appendix A). Soil samples were collected at the surface and from depths of 2.5, 5, and 10 feet to characterize the distribution of potential contaminants. Field screening with a PID revealed potential evidence of slight contamination during this investigation.

Target analytes for all borings included TCL VOCs, BTEX, and priority pollutant metals. In total, 12 soil samples were sent for chemical analyses.

28.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a Risk Assessment and to determine that a significant release had not occurred in the area of SWMU 16. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

28.4.2.4 Results and Conclusions

No organics or metals were detected in the surface soil samples collected from the three borings. One organic (acetone) and three metals (barium, mercury, and nickel) were detected in at least one of the subsurface samples at low concentrations. The analytical results from this investigation are shown in Table 28-1 in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the Risk Assessment found a maximum excess carcinogenic risk of 4×10^{-5} at SWMU 16, a level that fell within USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic effects (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at this SWMU.

The results of the Risk Assessment found a maximum excess noncarcinogenic risk of 0.61 at SWMU 16, a level that fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at this SWMU.

A single Ecological Risk Assessment was included in the Phase I RFI for all 15 SWMUs covered by the Phase I RFI. The Ecological Risk Assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). All detected chemicals, except mercury, were considered COCs and discussed in the Ecological Risk Assessment. Potential risk from COCs in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC VOCs or metals poses a risk to small mammalian populations.

Based on the conclusions reached in the Risk Assessment for SWMU 16, the Phase I RFI recommended NFA at this SWMU.

28.5 SITE CONCEPTUAL MODEL

28.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 16 included the drilling and sampling of three borings to depths of 10 feet. Three metals were detected at concentrations of potential concern. However, the Risk Assessment portion of the Phase I RFI report concluded that the detected concentrations of these chemicals were all within or below the acceptable risk ranges.

Groundwater at SWMU 16 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

28.5.2 Environmental Fate

Contaminants encountered at OWS No. 680 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement

within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 16, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

28.6 SITE ASSESSMENTS

28.6.1 Summary

The Phase I RFI included a risk assessment portion for SWMU 16. Based on the results of the risk assessment, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, no further response action was recommended for SWMU 16.

28.6.2 Screening Assessments

28.6.2.1 Human Health

The risk assessment portion of the Phase I RFI was actually a screening assessment, and included a comparison of data that exceeded the established background levels (W-C 1997a) to accepted risk-based remediation objectives.

No COPCs were detected at concentrations exceeding the corresponding RBCs at SWMU 16.

28.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI, but the screening criteria are highly conservative, and as such are protective of ecological and human health.

28.6.3 Risk Assessments

28.6.3.1 Human Health

Based on the results of the risk assessment portion of the Phase I (actually a risk screening), a full-scale human health risk assessment was not warranted for SWMU 16.

28.6.3.2 Ecological

Based on the results of the risk assessment portion of the Phase I (actually a risk screening), a full-scale ecological risk assessment was not warranted for SWMU 16.

28.6.4 Other Applicable Assessments

28.6.4.1 Surface Water

SWMU 16 contained no surface water.

28.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

28.6.4.3 Underground Storage Tanks (USTs)

OWS No. 680 included an oil UST. However, the entire unit and all of its compartments were removed in 1990.

28.6.4.4 Other

In 1987-1988, the Tulsa District of the USACE collected samples of the influent and effluent from a number of OWSs at Cannon AFB and had them analyzed. However, the results of this study pertain more to water treatment issues than hazardous or solid waste issues (USACE 1988).

28.7 NO FURTHER ACTION PROPOSAL

28.7.1 Rationale

Based on the conclusions reached in the Phase I RFI, NFA has been recommended for SWMU 16.

28.7.2 Criterion

SWMU 16 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

29.1 SUMMARY

SWMU 34, the AGE Drainage Ditch, originates on the flightline side of AGE Building No. 186, runs parallel to Building Nos. 191 and 193 in a northeastern direction, and terminates at a culvert inlet near Argentina Avenue. Storm water runoff from the AGE Drainage Ditch flows under Argentina Avenue, via the culvert, to a second drainage ditch that then routes the water to the NE Stormwater Drainage Area (SWMU 95). A Soil Removal Investigation recommended tilling the soil and planting grass in the visually impacted portion of SWMU 34 (Radian 1987). This activity was subsequently completed in October 1988.

The RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended that NFA or investigation was required at SWMU 34.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing analytical data obtained during the RI to risk-based RFI criteria and to proposed RCRA action levels, and by calculating site-specific health risks whenever necessary. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 34.

The conclusions reached in the RI report and the BRA were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

29.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

29.2.1 Site Description

SWMU 34, the AGE Drainage Ditch, is approximately 1,200 feet long, 12 feet wide and 1 foot deep. The sloped sides are grass-covered above the active channel along the majority of the ditch's length. At the time of the RI site visit in 1991, a portion of the ditch behind Building 190 had been recently regraded, and thus was bare, due to activities associated with the construction of this building.

29.2.2 Operational History

SWMU 34 was reportedly formed by a railroad spur's compression of soil into a ditch formation. The railroad tracks were removed in the late 1960s, and storm water runoff has flowed through the ditch since then.

Two deep soil borings were drilled and samples were collected for chemical analyses during a IRP Phase II investigation. Soil samples from this investigation were analyzed for oil and grease, lead, and purgeable halocarbons and aromatics to determine if environmental contamination had resulted from storm water runoff into SWMU 34 (Radian 1986).

Based on the results of the IRP Phase II investigation, a Soil Removal Investigation was conducted (Radian 1987). Following this investigation, the surface soil in the AGE Drainage Ditch was tilled in October 1988 to enhance natural attenuation and encourage new vegetative growth in the area of this SWMU.

The AGE Drainage Ditch was identified as a potential SWMU during the RFA conducted for USEPA at Cannon AFB (A.T. Kearney 1987).

Surface and subsurface samples were collected and analyzed during the RI conducted for 18 IRP/SWMU sites at Cannon AFB in 1991. Surface and subsurface samples were collected for chemical and/or geotechnical analyses to evaluate the nature and extent of any potential contamination in this area (W-C 1992) (Figure 29-1 in Appendix A).

29.3 LAND USE

29.3.1 Current

Storm water runoff continues to flow through the AGE Drainage Ditch to the NE Stormwater Drainage Area (SWMU 95). SWMU 34 is approximately 1,200 feet long, 12 feet wide and one foot deep.

29.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. In addition, it is anticipated that SWMU 34 will continue to receive storm water runoff. Use classification will continue to remain industrial in nature.

29.4 INVESTIGATIVE ACTIVITIES

29.4.1 Summary

Two deep soil borings were drilled and samples were collected for chemical analyses during an IRP Phase II investigation (Radian 1986). Because of the date of the Phase II investigation's completion, the analyses performed (i.e., oil and grease and purgeable organics), and the lack of significant results from the Phase II, this investigation is not discussed in further detail below. Based on the results of this investigation, shallow soil samples were collected and analyzed during a Soil Removal Investigation. The RFA identified AGE Drainage Ditch as a potential SWMU (A.T. Kearney 1987). Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992).

29.4.2 Investigation #1: Soil Removal Investigation - AGE Drainage Ditch

29.4.2.1 Non-Sampling Data Collection

The Soil Removal Investigation was a pure field investigation and data collection effort.

29.4.2.2 Sampling Data Collection

Fifteen shallow soil borings were drilled using a hand auger and samples were collected for chemical analyses during the Soil Removal Investigation. The boring locations are shown in Figure 29-1 in Appendix A. The soil borings were drilled in the most discolored areas of the ditch, and samples were collected from 0- to 1-foot and 1-to 2-foot depth intervals. A total of 22 soil samples were collected and analyzed for total lead, petroleum hydrocarbons, Extraction Procedure (EP)-Toxicity metals, and purgeable organic compounds. The analytical results of this investigation are presented in Tables 29-1a, 29-1b, and 29-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

29.4.2.3 Data Gaps

It was concluded that the data collected during the Soil Removal Investigation was sufficient to meet the objectives of the Soil Removal Investigation. Therefore, no data gaps existed.

29.4.2.4 Results and Conclusions

Elevated concentrations of lead and petroleum hydrocarbons were detected in the top 0.5 feet of soil. However, no elevated concentrations of lead or petroleum hydrocarbons were detected below the 0.5-foot depth interval, indicating that the soil below this depth is largely unaffected by past disposal operations that were conducted in the area of this SWMU. No elevated concentrations of EP-Toxicity metals or purgeable hydrocarbons were detected during this investigation.

The Soil Removal Investigation recommended tilling the soil and planting grass in the visually impacted portion of SWMU 34. This activity was subsequently completed in October 1988.

29.4.3 Investigation #2: Remedial Investigation (RI) of 18 IRP/SWMU Sites

29.4.3.1 Non-Sampling Data Collection

In addition to the field investigation and data collection effort, the RI also included a BRA that used the analytical data collected from SWMU 34. The BRA is addressed as Investigation #3 in Section 29.4.4 below.

29.4.3.2 Sampling Data Collection

Two soil borings were drilled and samples were collected for chemical and geotechnical analyses during the RI. The boring locations are shown in Figure 29-1 in Appendix A. Subsurface soil samples were collected from both borings to maximum depth intervals of 3 and 11 feet. The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area of SWMU 34. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the AGE Drainage Ditch.

Soil samples collected at depths of 0, 1.5, 5, and 9 feet were analyzed for TCL VOCs and SVOCs, TAL metals, and TPH. One sample was also collected at a depth of 9 feet in one boring for geotechnical gradation analysis.

Two additional borings were drilled and sampled because the laboratory missed the holding times for the TCL VOCs. The samples, collected from one boring at a depth of 0 feet and collected from the second boring at depths of 1.5, 5, 8, and 9 feet, were analyzed for TCL VOCs.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

29.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

29.4.3.4 Results and Conclusions

None of the TCL VOCs were detected in any of the samples collected during the RI.

None of the TCL SVOCs were detected at concentratrions exceeding the Contract Required Quantitation Limits (CRQLs) in any of the samples collected during the RI. However, eleven PAH compounds were detected at estimated concentrations below the CRQLs near-surface samples. Based on this, these PAHs were considered COPCs.

TPH was detected in near surface samples to a depth of 3 feet at a maximum concentration of 1,180 mg/kg.

Lead and zinc were detected above background levels (W-C 1997a) in near-surface samples. Based on this, lead and zinc were considered COPCs. All other metals detected were found at concentrations comparable to regional background levels, and were attributed to natural soil conditions in this area. The analytical results of this investigation are presented in Tables 29-2a, 29-2b, and 29-2c in Appendix B.

29.4.4 Investigation #3: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites

29.4.4.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the RI.

29.4.4.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #2 in Section 29.4.3 above.

29.4.4.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

29.4.4.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 34. Potential receptors for human health risks included current and future maintenance workers and future construction workers at the SWMU. Potential residents were eliminated as receptors despite the fact that this SWMU is greater than 0.5 acres in size because the site is a drainage ditch and would be unlikely to become a residential area. In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 34, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil, resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult, general-duty or ground maintenance and construction workers.

The COCs identified for SWMU 34 included metals and toluene. As shown in Table 29-3 in Appendix B, the average exposures RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 34.

Carcinogenic risks were absent (or zero) due to the absence of carcinogenic chemicals identified as COCs at SWMU 34.

The maximum concentration of lead detected at SWMU 34 was 12.6 mg/kg in surficial soil, a concentration that fell below the USEPA interim guidance for residential soil lead cleanup levels (500 to 1,000 mg/kg). Therefore no unacceptable risk was expected due to the presence of lead at this SWMU.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, metals (including lead and zinc) were the only COCs discussed in the ecological risk assessment that were also detected at SWMU 34. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC metals (including lead and zinc) pose a risk to small mammalian populations.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for this SWMU.

29.5 SITE CONCEPTUAL MODEL

29.5.1 Nature and Extent of Contamination

Lead, zinc, PAH compounds, and TPH are of potential concern in surficial soils at this SWMU.

29.5.2 Environmental Fate

Based on site conditions at SWMU 34, applicable exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil, resulting in incidental ingestion or dermal absorption of chemicals from soil. All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 34 was absent. The surface soil lead 95-percent upper confidence limit was calculated at a concentration that fell below the USEPA guidance for residential soil lead. The BRA indicated that no unacceptable risk was expected at SWMU 34.

Potential risks from the COCs lead and zinc in soil to biota were calculated, and it was determined that neither of these COC metals pose a risk to small mammalian populations. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur, and thus no risk of exposure via the groundwater pathway.

29.6 SITE ASSESSMENTS

29.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 34. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 34.

29.6.2 Screening Assessments

29.6.2.1 Human Health

The COPCs identified for SWMU 34 included metals and VOCs. These chemicals were initially screened by comparing their detected concentrations to risk-based RFI criteria and to proposed RCRA action levels.

The comparison identified lead, zinc, selenium, and toluene as COCs. All COCs were subjected to a quantitative characterization of risk.

29.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). Lead and zinc were the only COPCs detected at SWMU 34 that were addressed by the ecological risk assessment. Both lead and zinc were considered ecological COCs based on a comparison to applicable screening criteria.

29.6.3 Risk Assessments

29.6.3.1 Human Health

Potential receptors for human health risks included current and future maintenance workers and future construction workers at the SWMU. Potential residents were eliminated as receptors because this SWMU is a drainage ditch, and as such is unlikely to become the location of a future residential area. In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 34, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil, resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult, general-duty or ground maintenance and construction workers.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 34 was absent. This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 34.

29.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the maximum metal concentrations detected at all 18 SWMUs addressed by the RI, and based on the calculated toxicity values for incidental soil ingestion, none of the COC metals (including lead and zinc)

were considered to pose a significant risk to small mammal populations. Based on the results of the BRA, NFA was recommended for SWMU 34.

29.6.4 Other Applicable Assessments

29.6.4.1 Surface Water

SWMU 34 contained no surface water at the time of the investigations. However, storm water runoff intermittently flows through SWMU 34.

29.6.4.2 Groundwater

Groundwater at SWMU 34 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

29.6.4.3 Underground Storage Tanks (USTs)

There have never been any USTs located at SWMU 34.

29.6.4.4 Other

Two deep soil borings were drilled and samples were collected for chemical analyses during an IRP Phase II investigation (Radian 1986).

The RFA identified AGE Drainage Ditch as a potential SWMU (A.T. Kearney 1987).

No other assessments have been conducted in the area of SWMU 34.

29.7 NO FURTHER ACTION PROPOSAL

29.7.1 Rationale

Based on the conclusions reached in the RI and the BRA, NFA has been recommended for SWMU 34.

29.7.2 Criterion

SWMU 34 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

30.1 SUMMARY

SWMU 48A, Underground Waste Oil Tank, has been listed as an Appendix II site. A Phase I RFI of the Appendix II sites (LRL 1993) found elevated levels of organic compounds and metals in the area of SWMU 48A. Based on the results of a limited risk assessment performed as part of this investigation, the Phase I RFI report recommended NFA for SWMU 48A.

A Phase II RFI of the Appendix II sites (W-C 1997c) also found elevated levels of six metals and TRPH in the area of this SWMU. However, the report documenting this investigation noted that none of the concentrations of the chemicals detected at SWMU 48A pose an unacceptable human health risk. The Phase II RFI report recommended no further investigation at this site.

The results of the human health and ecological risk evaluations conducted during the Corrective Measures Study (CMS) at SWMU 48A indicated that there was minimal risk to human health and the environment. Based on the maximum concentrations of COCs detected, and the results of vadose zone fate and transport modeling at SWMU 48A, an NFA alternative was recommended.

The conclusions reached in the Phase I and Phase II RFIs and the CMS are consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

30.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

30.2.1 Site Description

SWMU 48A, Underground Waste Oil Tank, was a 20,000-gallon UST located approximately 125 feet east of the intersection of Argentina Avenue and Torch Boulevard (Figure 30-1 in Appendix A). The UST had been used to store waste products prior to its removal in 1988. The area currently is paved and used as a parking lot. The depth to the former tank is unknown (W-C 1999).

30.2.2 Operational History

The former UST at SWMU 48A was active from 1941 to 1985. Historically, the site was used as a gas station from 1941 to 1965. From 1965 to 1985, the tank was used to store waste products, including: waste oils, spent solvents, paint thinners, and recovered fuels. These products were removed from the tank periodically. The quantities of each product stored in the tank during its use is unknown. The UST and its associated piping were removed in 1988.

30.3 LAND USE

30.3.1 Current

The area of SWMU 48A has been covered with asphalt pavement and is being used as a parking lot. The UST and its associated piping were removed in 1988.

30.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the UST and its associated piping were removed in 1988. Use classification will continue to remain industrial in nature.

30.4 INVESTIGATIVE ACTIVITIES

30.4.1 Summary

A Phase I RFI of the Appendix II sites (LRL 1993) found elevated levels of organic compounds and metals in the area of SWMU 48A. A Phase II RFI of the Appendix II sites (W-C 1997c) also found elevated levels of six metals and TRPH in the area of this SWMU. The results of the human health and ecological risk evaluations conducted during the CMS at SWMU 48A indicated that there is no unacceptable risk to human health and the environment.

30.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix II SWMUs – Phase I

30.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a limited risk assessment performed using the results of the investigation. The limited risk assessment indicated minimal or no risk to human health or the environment from SWMU 48A (LRL 1993).

30.4.2.2 Sampling Data Collection

A Phase I RFI was performed at SWMU 48A to determine whether a release of SWMU-related chemicals had occurred from the UST. Three borings were advanced to depths of 30 feet below the surface to determine the vertical extent of any potential contamination. Target analytes for samples from the three borings included TCL VOCs, BTEX, cyanide, and TAL metals.

30.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

30.4.2.4 Results and Conclusions

Ethylbenzene, toluene, and xylenes were detected in one Phase I boring at 10- and 20-foot depth intervals. The concentration of xylene was 100 ppm at 20 feet. Metals were detected above background levels (W-C 1997a) in surface and subsurface samples to a maximum depth of 20 feet in all three borings. (Note: No tables presenting the analytical results of this investigation were included in the Phase I RFI report.)

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB.

Although metals were detected above background concentrations during this investigation, the recommendations section of the Phase I RFI report stated that, "The risk assessment associated with this SWMU indicates minimal or no risk to human health or the environment." Therefore, the Phase I RFI report recommended NFA for SWMU 48A.

30.4.3 Investigation #2: RFI, Appendix II SWMUs – Phase II

30.4.3.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to evaluate whether a release of SWMU-related chemicals had occurred as a result of spillage or leakage from the UST that could pose a significant risk to human health or the environment. In addition, the Phase II RFI included a risk screening to verify whether the recommendation for NFA based on the Phase I RFI was appropriate for SWMU 48A, and to characterize the vertical extent of contamination in this area.

30.4.3.2 Sampling Data Collection

Three soil borings were drilled to depths of approximately 40 feet in the area of the former UST (boring locations are shown in Figure 30-1 in Appendix A), and 27 soil samples were collected from these borings during the Phase II RFI. Two of the borings were drilled at each end of the presumed location of the former tank. The third boring was approximately 20 feet northeast of the presumed location of the former UST. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples were collected from the 0- to 0.5-foot depth interval in one boring, from the 0.5- to 2.5-foot depth interval in another boring, and from the 0- to 2.0-foot depth interval in the third boring. Subsurface soil samples were also collected from each boring at the 3- to 5-foot, the 8- to 10-foot, the 13- to 15-foot, the 18- to 20-foot, the 23- to 25-foot, the 28- to 30-foot, the 33- to 35-foot, and the 38- to 40-foot depth intervals. Target analytes included VOCs, SVOCs, TAL metals, and TRPH.

30.4.3.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and conduct a risk screening at this SWMU. There were no sampling issues associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SWMU 48A, and for completing the human health risk screening. Therefore, no data gaps existed.

30.4.3.4 Results and Conclusions

Six metals detected during the Phase II RFI exceeded the background. Several organic compounds, including TRPH, were also detected during the Phase II RFI. Where compounds were detected in multiple samples from the same boring, concentrations decreased with depth. No contaminants were detected in any of the borings below depths of 30 feet. Based on the results of the Phase II RFI, the vertical extent of contamination appeared to be defined, and potential impacts to groundwater were considered low. The results from this investigation are presented in Table 30-2 in Appendix B.

Although a significant release appears to have occurred at this SWMU, the contaminated area was determined to be small and confined to the subsurface. Because there were no unacceptable health risks associated with SWMU 48A, the Phase II RFI recommended that no further investigation was necessary for this SWMU. The soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

30.4.4 Investigation #3: Corrective Measures Study (CMS) at SWMU 48A

30.4.4.1 Non-Sampling Data Collection

The mathematical models used for the CMS included the Hydrologic Evaluation of Landfill Performance (HELP) Model, Version 3.01 (Schroeder et al. 1994) and the Multimedia Exposure Assessment Model (MULTIMED) Version 2.00 (Salhorta et al. 1995). The models would have been applied to a conceptual vadose zone model of SWMU 48A to evaluate the potential for contaminants detected in the soil above the MSSLs to be transported to underlying groundwater, if any contaminants had been detected at levels above the MSSLs.

30.4.4.2 Sampling Data Collection

No data was collected during the CMS.

30.4.4.3 Data Gaps

The data collected during the previous investigations was sufficient to perform human health and ecological risk evaluations, and to evaluate the results of the vadose zone fate and transport modeling. Therefore, no data gaps existed.

30.4.4.4 Results and Conclusions

Results of the human health and ecological risk evaluations indicated that there was minimal risk to human health and the environment based on the maximum detected concentrations of COCs in the soil at SWMU 48A. In addition, results of the vadose zone fate and transport modeling showed, assuming sorption, dispersion, and biodegradation occurred, that the COCs would not reach groundwater above the maximum allowable concentrations for drinking water. The risk evaluations combined with the modeling were used to determine that the NFA alternative would be protective of human health and the environment at the lowest cost.

30.5 SITE CONCEPTUAL MODEL

30.5.1 Nature and Extent of Contamination

A total of six borings, three to a depth of 30 feet and three to a depth of 40 feet, were installed during the two phases of the RFIs to effectively delineate the extent of contamination at SWMU 48A. Chemical analyses detected elevated concentrations of metals and organic compounds, including TRPH, in samples collected during the Phase I and Phase II RFIs.

Groundwater at SWMU 48A was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

30.5.2 Environmental Fate

Because there were no chemicals detected in soil at levels above MSSLs in the area of SWMU 48A, the fate and transport of contaminants in the vadose zone was not modeled as part of the CMS.

30.6 SITE ASSESSMENTS

30.6.1 Summary

A CMS was conducted based on the results of the Phase I and II RFIs. The results of the CMS are discussed below.

30.6.2 Screening Assessments

30.6.2.1 Human Health

For the Tier 1 evaluation as part of the CMS, the maximum concentrations of COPCs detected during the Phase I and II RFIs were compared to the USEPA Region VI Residential MSSLs. The comparison is shown in Table 30-3 in Appendix B. None of the detected compounds (other than those that were considered laboratory contaminants) exceeded the MSSLs. Therefore, it was determined that there are no the COCs at SWMU 48A, and a Tier 2 evaluation was not required.

30.6.2.2 Ecological

The area of SWMU 48A has been covered with asphalt pavement and is being used as a parking lot. Based on this, SWMU 48A did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

30.6.3 Risk Assessments

30.6.3.1 Human Health

For the Tier 2 evaluation, site-specific target levels (SSTLs) would have been developed for any COCs using the Risk-Based Corrective Action (RBCA) Tool Kit for Chemical Releases (Groundwater Services, Inc. 1999), had any COPCs exceeded the corresponding MSSLs. However, none of the maximum detected concentrations for each of the contaminants found at SWMU 48A exceeded the corresponding MSSLs; as such, a Tier 2 evaluation was not warranted for this SWMU.

30.6.3.2 Ecological

Based on the conclusions of the ecological risk screening, SWMU 48A did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

30.6.4 Other Applicable Assessments

30.6.4.1 Surface Water

SWMU 48A contained no surface water.

30.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

30.6.4.3 Underground Storage Tanks (USTs)

The former UST at SWMU 48A was active from 1941 to 1985. Historically, the site was used as a gas station from 1941 to 1965. From 1965 to 1985 the tank was used to store waste products including: waste oils, spent solvents, paint thinners, and recovered fuels. These products were removed from the tank periodically. The quantities of each product stored in the tank during it use is unknown. The tank and its associated piping were removed in 1988. This former UST was addressed by the Phase I and II RFIs and the CMS performed for SWMU 48A.

30.6.4.4 Other

No other assessments have been conducted in the area of SWMU 48A.

30.7 NO FURTHER ACTION PROPOSAL

30.7.1 Rationale

Based on the conclusions reached in the Phase I RFI, the Phase II RFI and the CMS, NFA has been recommended for SWMU 48A.

30.7.2 Criterion

SWMU 48A is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

31.1 SUMMARY

SWMU 48B, Aboveground Overflow Capacity Tank, has been listed as an Appendix II site. A Phase I RFI of the Appendix II sites (LRL 1993) found elevated levels of organic compounds and metals in the area of SWMU 48B. The results of a limited risk assessment, performed as part of this investigation, indicated minimal or no risk to human health or the environment from SWMU 48B.

A Phase II RFI of the Appendix II sites (W-C 1997c) also found elevated levels of six organic compounds and five metals in the area of this SWMU. However, the report documenting this investigation noted that none of the concentrations of the chemicals detected at SWMU 48B pose an unacceptable human health risk. The Phase II RFI report recommended no further investigation at this site.

The conclusions reached in the Phase I and Phase II RFIs were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

31.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

31.2.1 Site Description

SWMU 48B, Aboveground Overflow Capacity Tank, was a 2,000-gallon aboveground storage tank (AST) located approximately 125 feet east of the intersection of Argentina Avenue and Torch Boulevard (Figure 31-1 in Appendix A). This SWMU and SWMU 48A were located adjacent to each other within a fenced area measuring approximately 20 feet by 40 feet in plan. Prior to its removal in 1992, the AST served as an overflow tank for the UST (SWMU 48A), which had been used to store waste products. The area currently is paved and used as a parking lot (W-C 1999).

31.2.2 Operational History

The former AST at SWMU 48B was active from 1941 to 1985. Historically, the site was used as a gas station from 1941 to 1965. From 1965 to 1985 the AST served as an overflow tank for the UST (SWMU 48A), which had been used to store waste products including: waste oils, spent solvents, paint thinners, and recovered fuels. These products were removed from the tanks periodically. The quantities of each product stored in the tanks during it use is unknown. The AST and its associated piping were removed in 1992.

31.3 LAND USE

31.3.1 Current

The area of SWMU 48B has been covered with asphalt pavement and is being used as a parking lot. The AST and its associated piping were removed in 1992.

31.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the AST and its associated piping were removed in 1992. Use classification will continue to remain industrial in nature.

31.4 INVESTIGATIVE ACTIVITIES

31.4.1 Summary

A Phase I RFI of the Appendix II sites (LRL 1993) found elevated levels of organic compounds and metals in the area of SWMU 48B. A Phase II RFI of the Appendix II sites (W-C 1997) also found elevated levels of found elevated levels of six organic compounds and five metals in the area of this SWMU.

31.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix II SWMUs – Phase I

31.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a limited risk assessment performed using the results of the investigation. The limited risk assessment indicated minimal or no risk to human health or the environment from SWMU 48B (LRL 1993).

31.4.2.2 Sampling Data Collection

A Phase I RFI was performed at SWMU 48B to determine whether a release of SWMU-related chemicals had occurred from the AST. Two borings were advanced to a depth of 30 feet below the surface to determine the vertical extent of any potential contamination. Target analytes for samples from the three borings included TCL VOCs, BTEX, cyanide, and TAL metals.

31.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

31.4.2.4 Results and Conclusions

Acetone, xylenes and methylene chloride were detected at low concentrations in one Phase I boring at the surface and at the 5-foot interval. Metals were detected above background levels (W-C 1997a) in surface and subsurface samples to a maximum depth of 20 feet in both borings. The results of this investigation are presented in Tables 31-1a, 31-1b, and 31-1c in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than

250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of a limited risk assessment, performed as part of this investigation, indicated minimal or no risk to human health or the environment from SWMU 48B.

31.4.3 Investigation #2: RFI, Appendix II SWMUs – Phase II

31.4.3.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to evaluate whether a release of SWMU-related chemicals had occurred as a result of spillage or leakage from the AST that could pose a significant risk to human health or the environment. In addition, the Phase II included a risk screening to verify whether the recommendation of NFA based on the Phase I RFI was appropriate for SWMU 48B, and to characterize the vertical extent of contamination in this area.

31.4.3.2 Sampling Data Collection

Two soil borings were drilled to a depth of approximately 40 feet in the area of the former AST (boring locations are shown in Figure 31-1 in Appendix A), and 18 soil samples were collected from these borings during the Phase II RFI. Two of the borings were drilled at each end of the presumed location of the former tank. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples were collected from the 0- to 0.5-foot depth interval in one boring and from the 0.5- to 2.5-foot depth interval in the other boring. Subsurface soil samples were also collected from each boring at the 3- to 5-foot, the 8- to 10-foot, the 13- to 15-foot, the 18- to 20-foot, the 23- to 25-foot, the 28- to 30-foot, the 33- to 35-foot, and the 38- to 40-foot depth intervals. Target analytes included VOCs, SVOCs, TAL metals, and TRPH.

31.4.3.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and to conduct a risk screening of this SWMU. There were no sampling issues associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SWMU 48B, and for completing the human health risk screening. Therefore, no data gaps existed.

31.4.3.4 Results and Conclusions

Six organic compounds and five metals were detected during the Phase II RFI. However, none of the concentrations of organics exceeded the associated RBCs , and none of the concentrations of metals exceeded the associated background levels (W-C 1997a) or the RBCs. Compounds detected were either detected at very low levels, or the concentrations decreased with depth. Based on the results of the Phase II RFI, the vertical extent of contamination has been adequately

assessed, and potential impacts to groundwater were considered low. The results of this investigation are presented in Table 31-2a in Appendix B.

Because there were no unacceptable health risks associated with SWMU 48B, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

31.5 SITE CONCEPTUAL MODEL

31.5.1 Nature and Extent of Contamination

A total of four borings, two to a depth of 30 feet and two to a depth of 40 feet, were installed during the two phases of the RFIs to effectively delineate the extent of contamination at SWMU 48B. Chemical analyses detected elevated concentrations of metals and organic compounds, including TRPH, in samples collected during the Phase I and Phase II RFIs.

Groundwater at SWMU 48B was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

31.5.2 Environmental Fate

Because there were no chemicals detected in soil at levels above the associated RBCs or background levels (W-C 1997a) in the area of SWMU 48B, the fate and transport of contaminants in the vadose zone was not modeled as part of the CMS.

31.6 SITE ASSESSMENTS

31.6.1 Summary

Limited risk assessments were conducted as part of the Phase I and II RFIs. The results of the limited risk assessments are discussed below.

31.6.2 Screening Assessments

31.6.2.1 Human Health

The results of a limited risk assessment, performed as part of the Phase I RFI, indicated minimal or no risk to human health from SWMU 48B. The results of the Phase II RFI at SWMU 48B showed no evidence that a significant chemical release, posing an unacceptable human health risk for any potential exposure pathway, had occurred at this SWMU. Risk comparisons from the Phase II RFI are presented in Table 31-2b in Appendix B.

31.6.2.2 Ecological

The area of SWMU 48B has been covered with asphalt pavement and is being used as a parking lot. Based on this, SWMU 48B did not contain any significant ecological component such that a formal ecological risk assessment was warranted. However, the results of a limited risk assessment, performed as part of Phase I RFI, indicated minimal or no risk to the environment from SWMU 48B.

31.6.3 Risk Assessments

31.6.3.1 Human Health

None of the maximum detected concentrations for each of the contaminants found at SWMU 48B exceeded the associated RBCs or the associated background levels (W-C 1997a); as such, a formal risk assessment was not warranted for this SWMU.

31.6.3.2 Ecological

Based on the conclusions of the ecological risk screening, SWMU 48B did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

31.6.4 Other Applicable Assessments

31.6.4.1 Surface Water

SWMU 48B contained no surface water.

31.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

31.6.4.3 Underground Storage Tanks (USTs)

The former UST at SWMU 48A was active from 1941 to 1985. Historically, the site was used as a gas station from 1941 to 1965. The AST at SWMU 48B served as an overflow tank for this UST. From 1965 to 1985, the UST was used to store waste products including: waste oils, spent solvents, paint thinners, and recovered fuels. These products were removed from the tank periodically. The quantities of each product stored in the tank during it use is unknown. The UST and its associated piping were removed in 1988. This former UST was addressed by the Phase I and II RFIs and the CMS performed for SWMU 48A, and is discussed in Section 30 of this document.

31.6.4.4 Other

No other assessments have been conducted in the area of SWMU 48B.

31.7 NO FURTHER ACTION PROPOSAL

31.7.1 Rationale

Based on the conclusions reached in the Phase I RFI, the Phase II RFI and the CMS, NFA has been recommended for SWMU 48B.

31.7.2 Criterion

SWMU 48B is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

32.1 SUMMARY

This SWMU never existed at Cannon AFB. The RFA (A.T. Kearney, Inc. 1987) description of this site was identical to the description given for SWMU 48A, an underground waste oil tank. This apparently was an accidental duplication. SWMU 49 was originally listed as an Appendix II site due to its misidentification as an Inactive POL Storage Tank.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

32.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

32.2.1 Site Description

Refer to summary in Section 32.1 above.

32.2.2 Operational History

Refer to summary in Section 32.1 above.

32.3 LAND USE

32.3.1 Current

Refer to summary in Section 32.1 above.

32.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 49 never existed. Use classification will continue to remain industrial in nature.

32.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 49 have been performed.

32.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 49 has never been the subject of a conceptual model.

32.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 49.

32.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 49.

32.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 49.

32.6.3 Other Applicable Assessments

32.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 49.

32.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 49 contained no means for groundwater discharges to occur.

32.6.3.3 Underground Storage Tanks (USTs)

No storage tanks, underground or aboveground, were ever located in the area of Cannon AFB misidentified as SWMU 49. This SWMU was originally listed as an Appendix II site due to its misidentification as an Inactive POL Storage Tank.

32.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 49.

32.7 NO FURTHER ACTION PROPOSAL

32.7.1 Rationale

Because SWMU 49 never existed, NFA is recommended for SWMU 49.

32.7.2 Criterion

SWMU 49 is proposed for NFA based on NMED NFA Criterion 1: This SWMU is a duplicate of SWMU 48A.

33.1 SUMMARY

This SWMU never existed at Cannon AFB. The RFA (A.T. Kearney, Inc. 1987) description of this site was identical to the description given for SWMU 48A, an underground waste oil tank. This apparently was an accidental duplication. SWMU 50 was originally listed as an Appendix II site due to its misidentification as an Inactive POL Storage Tank.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

33.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

33.2.1 Site Description

Refer to summary in Section 33.1 above.

33.2.2 Operational History

Refer to summary in Section 33.1 above.

33.3 LAND USE

33.3.1 Current

Refer to summary in Section 33.1 above.

33.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 50 never existed. Use classification will continue to remain industrial in nature.

33.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 50 have been performed.

33.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 50 has never been the subject of a conceptual model.

33.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 50.

33.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 50.

33.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 50.

33.6.3 Other Applicable Assessments

33.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 50.

33.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 50 contained no means for groundwater discharges to occur.

33.6.3.3 Underground Storage Tanks (USTs)

No storage tanks, underground or aboveground, were ever located in the area of Cannon AFB misidentified as SWMU 50. This SWMU was originally listed as an Appendix II site due to its misidentification as an Inactive POL Storage Tank.

33.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 50.

33.7 NO FURTHER ACTION PROPOSAL

33.7.1 Rationale

Because SWMU 50 never existed, NFA is recommended for SWMU 50.

33.7.2 Criterion

SWMU 50 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

34.1 SUMMARY

SWMU 55, Lead Acid Battery Accumulation Point, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) detected lead at concentrations of potential concern in the area of SWMU 55. Because there was no evidence of a significant release in the area of SWMU 55, the Phase I RFI recommended NFA at this SWMU.

A Phase II RFI (W-C 1997d) detected three metals and five organic compounds at concentrations of potential concern in the area of SWMU 55. Because there was no evidence of a significant release in the area of SWMU 55, the Phase II RFI recommended NFA at this SWMU.

The conclusions reached in the Phase I and Phase II RFIs were consistent in recommending NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

34.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

34.2.1 Site Description

SWMU 55, the Lead Acid Battery Accumulation Point, consisted of a square of asphalt pavement measuring approximately 8 feet by 8 feet. The SWMU was located approximately 100 feet north of the Vehicle Maintenance Shop, Building 379 (Figure 34-1 in Appendix A). The pavement was contiguous with an asphalt parking lot and sloped slightly toward the northwest. Used lead acid batteries were stored "wet" on pallets at the SWMU until enough had been accumulated to sell to a battery recycling company.

34.2.2 Operational History

The Lead Acid Battery Accumulation Point was active from approximately 1965 until sometime between the field investigation associated with the Phase I RFI (1993) and the field investigation associated with the Phase II RFI (1997).

34.3 LAND USE

34.3.1 Current

The Lead Acid Battery Accumulation Point at SWMU 55 is no longer used for battery storage.

34.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the Lead Acid Battery Accumulation Point is no longer used for battery storage. Use classification will continue to remain industrial in nature.

34.4 INVESTIGATIVE ACTIVITIES

34.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) detected lead at concentrations of potential concern in the area of SWMU 55. Because there was no evidence of a significant release in the area of SWMU 55, the Phase I RFI recommended NFA at this SWMU.

A Phase II RFI (W-C 1997c) detected three metals and five organic compounds at concentrations of potential concern in the area of SWMU 55. Because there was no evidence of a significant release in the area of SWMU 55, the Phase II RFI recommended NFA at this SWMU.

34.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

34.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a risk screening. The results of the risk screening are discussed below.

34.4.2.2 Sampling Data Collection

Three borings, drilled to maximum depths of 20 feet in the area of the asphalt pad, were sampled during the Phase I RFI (boring locations are shown in Figure 34-1 in Appendix A). Soil samples were collected from the 0.5- to 2-foot, 3- to 5-foot, 8- to 10-foot, 13- to 15-foot, and 18- to 20-foot depth intervals to characterize the distribution of potential contaminants. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included lead and pH. In total, 15 soil samples were sent for chemical analyses.

34.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk screening and to determine that a significant release had not occurred in the area of SWMU 55. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

34.4.2.4 Results and Conclusions

Lead was detected at concentrations exceeding the established background levels at SWMU 55 (W-C 1997a). However, the detected concentrations of lead did not exceed the corresponding RBCs or other risk screening criteria. The analytical results from this investigation are shown in Tables 34-1a and 34-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than

250 feet, and the soil sampling results demonstrated that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the risk screening found that no detected concentrations of any chemicals exceeded the corresponding RBCs or other risk screening criteria. Based on this, the Phase I RFI recommended NFA for SWMU 55.

34.4.3 Investigation #2: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase II

34.4.3.1 Non-Sampling Data Collection

The Phase II RFI included a risk screening. The results of the risk screening are discussed below.

34.4.3.2 Sampling Data Collection

Three borings drilled to depths of 20 feet in the area of the asphalt pad were sampled during the Phase II RFI (boring locations are shown in Figure 34-1 in Appendix A). Soil samples were collected from the 0- to 2-foot, 3- to 5-foot, 8- to 10-foot, 13- to 15-foot, and 18- to 20-foot depth intervals to characterize the distribution of potential contaminants. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, TAL metals, TRPH, and pH. In total, 15 soil samples were sent for chemical analyses.

34.4.3.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete and risk screening and to determine that a significant release had not occurred in the area of SWMU 55. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase II RFI. Therefore, no data gaps existed after the completion of the Phase II RFI.

34.4.3.4 Results and Conclusions

Three metals (aluminum, barium and zinc) were detected at concentrations slightly exceeding the established background levels for Cannon AFB (W-C 1997a). However, none of these metals exceeded the corresponding RBCs. Five organic compounds, all PAHs, were detected at concentrations exceeding the corresponding RBCs or other risk screening criteria. The analytical results from this investigation are presented in Table 34-2a in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrated that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of the risk screening found that the maximum detected concentrations of organics that exceeded the corresponding RBCs were all within the EPA target risk range of 1×10^{-6} to 1×10^{-4}. Based on this, the Phase II RFI recommended NFA for SWMU 55.

34.5 SITE CONCEPTUAL MODEL

34.5.1 Nature and Extent of Contamination

The Phase I RFI conducted at SWMU 55 included the drilling and sampling of three borings to a depth of 20 feet. Lead was detected at concentrations of potential concern. However, there was no evidence of a significant release in the area of SWMU 55, and the Phase I RFI recommended NFA at this SWMU.

The Phase II RFI conducted at SWMU 55 also included the drilling and sampling of three borings to a depth of 20 feet. Three metals and five organic compounds were detected at concentrations of potential concern in the area of SWMU 55. However, there was no evidence of a significant release in the area of SWMU 55, and the Phase II RFI recommended NFA at this SWMU.

Groundwater at SWMU 55 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrated that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

34.5.2 Environmental Fate

Contaminants encountered at the Lead Acid Battery Accumulation Point could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Based on the general subsurface characteristics at SWMU 55, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

34.6 SITE ASSESSMENTS

34.6.1 Summary

The Phase I and Phase II RFIs each included a risk screening for SWMU 55. Based on the results of the risk screening, no unacceptable human health risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 55.

34.6.2 Screening Assessments

34.6.2.1 Human Health

The Phase I RFI's risk screening consisted of a comparison of the maximum detected concentrations of lead to the established background level for lead at Cannon AFB (W-C 1997a). Because none of the detected concentrations of lead exceeded the established background level, a comparison to the highly conservative RBCs for residential soil was not warranted. No COPCs were detected at concentrations exceeding the corresponding RBCs during the Phase I RFI. Therefore, NFA was recommended for SWMU 55. The results of the risk screening are presented in Tables 34-2b and 34-2c in Appendix B.

No chemicals of potential concern were detected at concentrations exceeding the corresponding RBCs during the Phase II RFI. Therefore, NFA was recommended for SWMU 55.

34.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase I RFI or the Phase II RFI, but a human health risk screening was included in these investigations. In each investigation, the screening criteria were not exceeded by detected chemical concentrations attributable to SWMU contamination. The Region III RBCs, used as screening criteria, are highly conservative, and as such are protective of human health and the environment.

34.6.3 Risk Assessments

34.6.3.1 Human Health

Because the risk screening did not detect chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria, a full-scale human health risk assessment was not warranted for SWMU 55.

34.6.3.2 Ecological

The risk screening did not detect chemical concentrations attributable to SWMU contamination at concentrations exceeding the screening criteria. In addition, the Region III RBCs, used as screening criteria in the human health risk screening, are highly conservative, and as such are protective of human health and the environment. Therefore, an ecological risk assessment was not warranted for SWMU 55.

34.6.4 Other Applicable Assessments

34.6.4.1 Surface Water

SWMU 55 contained no surface water.

34.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

34.6.4.3 Underground Storage Tanks (USTs)

No USTs are associated with the Lead Acid Battery Accumulation Point.

34.6.4.4 Other

No other assessments have been conducted in the area of SWMU 55.

34.7 NO FURTHER ACTION PROPOSAL

34.7.1 Rationale

Based on the conclusions reached in the Phase I and Phase II RFIs, NFA has been recommended for SWMU 55.

34.7.2 Criterion

SWMU 55 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

35.1 SUMMARY

An RFA (A.T. Kearney 1987) mistakenly identified a 2,000-gallon recovered JP-4 UST as OWS No. 390. This led to the site being identified as SWMU 72. The UST, which is actually SWMU 71, was removed in April 1991 and replaced with a 2,000-gallon steel OWS enclosed in a concrete vault. This OWS is **not** SWMU 72.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

35.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

35.2.1 Site Description

Refer to summary in Section 35.1 above.

35.2.2 Operational History

Refer to summary in Section 35.1 above.

35.3 LAND USE

35.3.1 Current

Refer to summary in Section 35.1 above.

35.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 72 was a duplicate of SWMU 71, and the 2,000-gallon UST at SWMU 71 has been removed. Use classification will continue to remain industrial in nature.

35.4 INVESTIGATIVE ACTIVITIES

SWMU 72 is a duplicate of SWMU 71. However, immediately following the removal of the 2,000-gallon tank from SWMU 71, soil samples were collected from the excavation and analyzed for BTEX and TPH. These analytes were not detected.

35.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 72 has never been the subject of a conceptual model.

35.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 72.

35.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 72.

35.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 72.

35.6.3 Other Applicable Assessments

35.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 72.

35.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 72 contained no means for groundwater discharges to occur.

35.6.3.3 Underground Storage Tanks (USTs)

SWMU 72 was a duplicate of SWMU 71, and the 2,000-gallon UST at SWMU 71 has been removed.

35.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 72.

35.7 NO FURTHER ACTION PROPOSAL

35.7.1 Rationale

Because SWMU 72 never existed, NFA is recommended for SWMU 72.

35.7.2 Criterion

SWMU 72 is proposed for NFA based on NMED NFA Criterion 1: This SWMU is a duplicate of SWMU 71.

36.1 SUMMARY

SWMU 75, the Sanitary Sewage Lift Station Overflow Pit, served as an emergency overflow containment area for a lift station in the northwest area of the Base. The pit measured approximately 100 by 600 by 3 feet, or approximately 6,700 cubic yards. The pit was used once in February 1983 when 100,000 to 150,000 gallon of raw domestic sewage were bypassed to the pit when the lift pumps failed. The only hazardous wastes present in this overflow would have been from the domestic sewage. The lift pumps were repaired approximately one week later, and the sewage was cycled through the lift station. Since the original IRP investigation, this area has been rebuilt twice since to improve drainage around the old golf course and to create new water hazards for the new section of the golf course. Therefore, no remnants of this pit exist.

In October 1990, USEPA Region VI concluded that the Sanitary Sewage Lift Station Overflow Pit warranted NFA because the release at this site was an accidental spill and, therefore, did not qualify as an SWMU. Accidental spills are not included in the definition of an SWMU as defined in the following excerpt from the USEPA RFA Guidance: "The definition does not include accidental spills from production areas and units in which wastes have not been managed (e.g., product storage areas)."

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

36.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

36.2.1 Site Description

Refer to summary in Section 36.1 above.

36.2.2 Operational History

Refer to summary in Section 36.1 above.

36.3 LAND USE

36.3.1 Current

Refer to summary in Section 36.1 above.

36.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the Sanitary Sewage Lift Station Overflow Pit was mistakenly classified as a SWMU based on a single accidental spill in this area. Use classification will continue to remain industrial in nature.

36.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 75 have been performed.

36.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 75 has never been the subject of a conceptual model.

36.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 75.

36.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 75.

36.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 75.

36.6.3 Other Applicable Assessments

36.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 75.

36.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area mistakenly classified as SWMU 75 contained no means for groundwater discharges to occur.

36.6.3.3 Underground Storage Tanks (USTs)

There is no record of any storage tanks, either underground or aboveground, in the area misidentified as SWMU 75.

36.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 75.

36.7 NO FURTHER ACTION PROPOSAL

36.7.1 Rationale

Because the area referred to as SWMU 75 should never have been classified as a SWMU, and because USEPA Region VI concluded that the Sanitary Sewage Lift Station Overflow Pit did not qualify as a SWMU, NFA is recommended for SWMU 75.

36.7.2 Criterion

SWMU 75 is proposed for NFA based on NMED's NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or other constituents or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances.

37.1 SUMMARY

SWMU 76, the Sludge Weathering Pit, was located near Building 326, adjacent to the installation's northern boundary fence. The pit, last used in 1980, was used to weather sludge from leaded gasoline storage tanks in the 1960s and 1970s. The sludge was landfilled after it was judged to have been sufficiently weathered.

An RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended that NFA was required at SWMU 76.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria listed in the RFI Guidance, Volume I (USEPA 1989a), or if these levels were exceeded, by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 76.

The conclusions reached in the RI report and the BRA were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

37.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

37.2.1 Site Description

SWMU 76, the Sludge Weathering Pit, covered approximately 200 square feet (HARZA 1997). This relatively flat SWMU was located near Building 326 and adjacent to the northern boundary of Cannon AFB (Figure 37-1 in Appendix A). SWMU 76 was used throughout the 1960s and 1970s to weather sludge from leaded gasoline storage tanks. The sludge was landfilled after it was judged to have been sufficiently weathered.

37.2.2 Operational History

The Sludge Weathering Pit, last used in 1980, was used to weather sludge from leaded gasoline storage tanks during the 1960s and 1970s. According to a Phase I Records Search performed in 1983 (CH2M Hill 1983), a soil sample collected in 1981 to evaluate a past material disposal site was analyzed for total lead, oil and grease. The lead analysis was nondetect, and 0.012 mg/kg of oil and grease were detected. An RI of 18 IRP/SWMU sites investigated this site in 1991. The RI report included a BRA and recommended that NFA was required.

37.3 LAND USE

37.3.1 Current

The Sludge Weathering Pit, last used in 1980, was used to weather sludge from leaded gasoline storage tanks. Since 1980, SWMU 76 has been covered with fill material and closed.

37.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. However, SWMU 76 has been covered with fill material and has been inactive since 1980. Use classification will continue to remain industrial in nature.

37.4 INVESTIGATIVE ACTIVITIES

37.4.1 Summary

According to a Phase I Records Search (CH2M Hill 1983), a soil sample collected in 1981 to evaluate a past material disposal site was analyzed for total lead, oil and grease. The lead analysis was nondetect, and 0.012 mg/kg of oil and grease were detected. No additional information was reviewed regarding this sampling event.

SWMU 76 was the subject of a RI in 1991 (W-C 1992). A BRA, conducted using the results of the RI, was included in the RI report. Based on the results of the RI and the BRA, it was determined that the NFA alternative was most appropriate for SWMU 76.

37.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites

37.4.2.1 Non-Sampling Data Collection

In addition to the field investigation and data collection effort, the RI also included the performance of a BRA on the analytical data from SWMU 76. The BRA is addressed as Investigation #2 in Section 37.4.3 below.

37.4.2.2 Sampling Data Collection

Four soil borings were drilled and samples were collected for chemical and geotechnical analyses during the RI. Two surface samples were collected from three of the borings at depth intervals of 0 to 0.5 feet. Additionally, nine subsurface soil samples were collected from the four borings at depth intervals ranging from 4 to 31 feet. The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area of SWMU 76. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the Sludge Weathering Pit. The sampling locations are shown in Figure 37-1 in Appendix A.

All soil samples collected were analyzed for TCL VOCs and SVOCs, and for TAL metals and organic lead.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants were not being transported significantly in a vertical direction beneath the SWMU.

37.4.2.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

37.4.2.4 Results and Conclusions

The maximum concentrations of ethylbenzene and xylenes were detected in the same sample collected from a depth interval of 8 to 10 feet at estimated concentrations of 4,000 µg/kg and 7,900 µg/kg, respectively. Ethylbenzene and xylenes may have been present in a second sample collected from another boring drilled during the RI at the same depth and at similar concentrations. In addition, these compounds may have also been present in a third sample collected from a third boring at a depth interval of 4 to 6 feet at concentrations as high as 29,000 µg/kg. However, in both cases the presence of ethylbenzene and xylenes was potentially masked by the high detection limits necessitated by laboratory dilution of the samples due to the presence of non-target compounds. Lower levels of organics were also detected in the samples analyzed at intervals up to 18 feet in depth.

Mercury was the only metal detected at levels of potential concern. The maximum detected concentration of mercury was 0.85 mg/kg from a 25-foot depth interval. Organic lead was only detected at very low levels. However, inorganic lead was found at concentrations exceeding the background levels established for Cannon AFB (W-C 1997a), but these concentrations were well below regional background levels for lead. Both the maximum concentration of lead detected at SWMU 76 (12.6 mg/kg) and the background levels for lead were below the applicable USEPA Generic Soil Screening Level of 400 mg/kg. Tables 37-1a, and 37-1b in Appendix B present the analytical results for SWMU 76.

The analytical data from SWMU 76 suggest the possible presence of residual petroleum sludge from storage tank bottoms. Petroleum chemicals were also detected to depths of 18 feet in underlying native soils.

37.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites

37.4.3.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors and all appropriate exposure pathways was performed on the data collected during the RI.

37.4.3.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #1 in Section 37.4.2 above.

37.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

37.4.3.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 76. Potential receptors at this SWMU for human health risks included current and future maintenance workers at the SWMU. Potential construction workers and residents were eliminated as receptors because this SWMU is less than 0.5 acres in size (the minimum plot size judged to be reasonable for future construction) and covered with clean fill material and grass. In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 76, all exposure pathways were determined to be either incomplete, insignificant, or not applicable with the exception of the VOC inhalation pathway. Human receptors for this pathway were identified as adult, general-duty or ground maintenance workers. Potential exposures via this pathway were expected to be low because of the anticipated low ambient VOC concentrations and the short duration of relatively infrequent exposures (grass mowing for approximately 5 to 10 minutes once per month).

The COCs for SWMU 76 were identified as lead (despite being detected at concentrations below regional background levels), ethylbenzene, and xylenes. However, since a USEPA-verified toxicity value for lead had not been established, the quantitative evaluation of human health impacts at this site were limited to ethylbenzene and xylenes. None of these COCs are classified as carcinogenic chemicals. All hazard indices and hazard quotients for subchronic and chronic exposures to site COCs fell well below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk was expected.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, lead was the only COC discussed in the ecological risk assessment that was also detected at SWMU 76. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, none of the COC metals (including lead) were considered to pose a risk to small mammal populations. Tables 37-2a, 37-2b, and 37-2c in Appendix B present the selection of the COCs and the calculation of the risk characterizations for SWMU 76.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for this SWMU.

37.5 SITE CONCEPTUAL MODEL

37.5.1 Nature and Extent of Contamination

The analytical data from SWMU 76 suggested the possible presence of residual petroleum sludge from storage tank bottoms. The detection limits were elevated in two samples from the 4- to 6-foot depth interval because of dilution necessitated by the presence of nontarget compounds. Petroleum chemicals were also detected to depths of 18 feet in underlying native soils.

Ethylbenzene and xylenes were detected in a single boring at a depth interval of 8 to 10 feet at estimated concentrations of 4,000 µg/kg and 7,900 µg/kg, respectively. These compounds may have also been present in a second boring at the same depth, and also in a third boring at a depth of 4 to 6 feet, but their presence was potentially masked by the elevated detection limits discussed above.

Mercury, with a maximum detected concentration of 0.85 mg/kg at a 25-foot depth interval, was the only metal detected at levels of potential concern.

37.5.2 Environmental Fate

Based on site conditions at SWMU 76, all exposure pathways were determined to be either incomplete, insignificant, or not applicable, with the exception of the air pathway. Within the air pathway, the fate and transport of the metals detected in the soils of this area showed no evidence of health risks. Based on air quality modeling of soil gas releases, VOCs detected at SWMU 76 do not present a health risk. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

37.6 SITE ASSESSMENTS

37.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 76. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 76.

37.6.2 Screening Assessments

37.6.2.1 Human Health

The COPCs at SWMU 76, including ethylbenzene, xylenes, mercury, and lead, were initially screened by comparing detected concentration of these chemicals to RFI criteria. This screening process eliminated mercury; the remaining chemicals were considered COCs for this site.

Although the maximum concentration of lead detected at SWMU 76 (12.6 mg/kg) was below the applicable USEPA Generic Soil Screening Level of 400 mg/kg and regional background levels

for lead (W-C 1997a), lead was considered a COC because the maximum concentration detected exceeded the background levels established for Cannon AFB.

Ethylbenzene and xylenes were also considered COCs. All COCs were subjected to a quantitative characterization of risk.

37.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, lead was the only COC discussed in the ecological risk assessment that was also detected at SWMU 76. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, none of the COC metals (including lead) were considered to pose a risk to small mammal populations.

37.6.3 Risk Assessments

37.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included current and future maintenance workers at the SWMU. Based on site conditions at SWMU 76, all exposure pathways were determined to be either incomplete, insignificant, or not applicable, with the exception of the VOC inhalation pathway. Human receptors for this pathway were identified as adult, general-duty or ground maintenance workers. Potential exposures via this pathway were expected to be low because of the anticipated low ambient VOC concentrations and the short duration of relatively infrequent exposures.

The COCs for SWMU 76 were identified as lead, ethylbenzene, and xylenes. However, since a USEPA-verified toxicity value for lead had not been established, the quantitative evaluation of human health impacts at this site were limited to ethylbenzene and xylenes. None of these COCs are classified as carcinogenic chemicals. All hazard indices and hazard quotients for subchronic and chronic exposures to site COCs fell well below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk was expected.

37.6.3.2 Ecological

Based on the results of the BRA, NFA was recommended for SWMU 76. Therefore, a full-scale ecological risk assessment was not conducted for SWMU 76.

37.6.4 Other Applicable Assessments

37.6.4.1 Surface Water

SWMU 76 contained no surface water.

37.6.4.2 Groundwater

Groundwater at SWMU 76 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

37.6.4.3 Underground Storage Tanks (USTs)

There have never been any USTs located at SWMU 76.

37.6.4.4 Other

According to a Phase I Records Search (CH_2M Hill 1983), a soil sample collected in 1981 to evaluate a past material disposal site was analyzed for total lead, oil and grease. The lead analysis was nondetect, and 0.012 mg/kg of oil and grease were detected. No additional information was reviewed regarding this sampling event.

No other assessments have been conducted in the area of SWMU 76.

37.7 NO FURTHER ACTION PROPOSAL

37.7.1 Rationale

Based on the conclusions reached in the RI and the BRA, NFA has been recommended for SWMU 76.

37.7.2 Criterion

SWMU 76 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

38.1 SUMMARY

SWMU 77, Civil Engineering Container Storage Area (Facility No. 4038), has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) found elevated levels of one metal, five organic compounds, and TRPH in the area of SWMU 77. The Phase I RFI report recommended conducting a BRA at this site.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU. Based on this, the BRA recommended NFA for SWMU 77.

A Phase II RFI of the Appendix III sites (W-C 1997d) also found elevated levels of metals and organic compounds in the area of this SWMU. However, the report documenting this investigation noted that none of the concentrations of metals or organics exceeded the USEPA target risk range. The Phase II RFI report recommended no further investigation at this site.

The results of the human health and ecological risk evaluations conducted during the CMS (W-C 1999) at SWMU 77 indicated that there was minimal risk to human health and the environment. Based on the maximum concentrations of COCs detected, and the results of vadose zone fate and transport modeling at SWMU 77, NFA was recommended.

The conclusions reached in the BRA, the Phase II RFI, and the CMS are consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

38.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

38.2.1 Site Description

SWMU 77, Civil Engineering Container Storage Area (Facility No. 4038), is located east of Building 252 and south of the northern boundary fence of Cannon AFB (Figure 38-1 in Appendix A). The Container Storage Area consists of a concrete pad measuring approximately 150 feet by 250 feet, surrounded by an 8-foot-high fence with a locked gate. The fenced pad area is surrounded by gravel on the east and south sides. The site is relatively flat.

38.2.2 Operational History

The concrete pad at SWMU 77 is the remaining floor of the former Portair Airfield Hangar, which dates back to the 1930s. This facility served as passenger terminal for the former Portair Airfield until the building was removed by the U.S. Army in 1942. Based on historical photographs, the concrete pad was vacant until the 1970s, when it began to be used for storage. Approximately one hundred 55-gallon drums were stored at this SWMU at the time of the RFA Visual Site Inspection (A.T. Kearney 1987). A preliminary site inspection referenced in the RFA Visual Site Inspection report stated that the drums contained varying amounts of water, oil, solvents, and asphaltic material.

38.3 LAND USE

38.3.1 Current

The Civil Engineering Squadron continues to use the concrete pad as storage for supplies and used materials. The stored items included used transformers, streetlights, street signs, PVC piping, and heavy equipment parts.

38.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, it is possible that a change in the flying mission of Cannon AFB could result in the closure of SWMU 77. Use classification will continue to remain industrial in nature.

38.4 INVESTIGATIVE ACTIVITIES

38.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found elevated levels of one metal, five organic compounds, and TRPH in the area of SWMU 77. A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases were expected at this SWMU. A Phase II RFI of the Appendix III sites (W-C 1997d) also found elevated levels of metals and organic compounds in the area of this SWMU. The results of the human health and ecological risk evaluations conducted during the CMS (W-C 1999) at SWMU 77 indicated that there is no unacceptable risk to human health and the environment.

38.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

38.4.2.1 Non-Sampling Data Collection

The Phase I RFI was purely a field investigation and data collection effort. Therefore, non-sampling data was not collected during this investigation.

38.4.2.2 Sampling Data Collection

A Phase I RFI was performed at SWMU 77 to determine if a release of SWMU-related chemicals had occurred due to leakage of stored materials and equipment. A total of six borings were advanced to a depth of 20 feet below the surface to determine the vertical extent of potential contamination (boring locations are shown in Figure 38-1 in Appendix A). Two of the borings were drilled through the paved surface of the pad, and the other four were drilled just off the edges of the pad at visible drainage locations. Surficial samples were collected the 0.2- to 0.5-foot depth interval in areas of exposed soil to provide surface soil data for risk assessment purposes. Other near-surface samples were collected immediately beneath the concrete pad from

the 0.5- to 2-foot depth interval. Subsurface soil samples were collected from the 3- to 5-foot, 8- to 10-foot, 13- to 15-foot, and 18- to 20-foot depth intervals to characterize the vertical distribution of potential contaminants. No visual evidence of contamination was noted during the sampling process.

Target analytes for all borings included VOCs, SVOCs, metals, TRPH, PCBs, pesticides, and herbicides.

38.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

38.4.2.4 Results and Conclusions

One metal, five organic compounds, and TRPH were found at levels exceeding the corresponding RBCs or background levels (W-C 1997a). The highest concentrations of organics and metals were detected in surface and near-surface samples. The vertical extent of contamination was characterized by the soil borings. The analytical results from this investigation are shown in Tables 38-1a and 38-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 77.

38.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

38.4.3.1 Non-Sampling Data Collection

No additional non-sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed using the data collected during the Phase I RFI.

38.4.3.2 Sampling Data Collection

No sampling data was collected during the BRA.

38.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

38.4.3.4 Results and Conclusions

Potential receptors at SWMU 77 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to have been exposed to soil contaminants via ingestion, dermal contact, and inhalation pathways. The primary contributor to the risk was ingestion of PAHs in surface soils. The maximum potential human health risk at SWMU 77 was 6×10^{-7} for occupational workers. This level fell below the USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, indicating that no unacceptable risk was expected. A summary of human health risks at SWMU 77 is shown in Table 38-2 in Appendix B.

Analytical data for soils was collected during the Phase I RFI, and fate and transport modeling was conducted to evaluate air and groundwater pathways for contaminants detected at SWMU 77. Both pathways were considered insignificant.

Results of the ecological risk assessment show that no unacceptable ecological risks due to chemical releases were expected at SWMU 77.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended at this SWMU.

38.4.4 Investigation #3: RFI, Appendix III SWMUs – Phase II

38.4.4.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to further characterize the nature and extent of contamination in the area of SWMU 77. In addition, the Phase II RFI included a risk screening to verify whether the recommendation for NFA based on the BRA was appropriate for SWMU 77.

38.4.4.2 Sampling Data Collection

Five soil borings were drilled to 20-foot depth intervals in the area surrounding the Container Storage Area (boring locations are shown in Figure 38-1 in Appendix A), and 25 soil samples were collected from these borings during the Phase II RFI. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples were collected from each boring at the 0- to 2-foot depth interval. Subsurface soil samples were also collected from each boring at the 3- to 5-foot, the 8- to 10-foot, the 13- to 15-foot, and the 18- to 20-foot depth intervals. Target analytes included VOCs, SVOCs, TAL metals, TRPH, chlorinated herbicides, and pesticides/PCBs.

38.4.4.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and conduct a risk screening at this SWMU. There were no sampling issues

associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable, except for lead and selenium data, for determining the nature and extent of contamination in the area of SWMU 77, and for completing the human health risk screening.

38.4.4.4 Results and Conclusions

The Phase II RFI sampling results confirmed that contamination in the area of SWMU 77 was confined mainly to the top 5 feet of soil. Eight metals detected during the Phase II RFI exceeded the background levels (W-C 1997a), and six of these metals exceeded the levels detected during the Phase I RFI. Nine organic compounds also exceeded Phase I concentrations. Of the analytes that exceeded the Phase I concentrations, only one metal (manganese) and one organic compound (Arochlor-1260) exceeded residential RBCs. Based on the results of the Phase II RFI, the vertical extent of contamination appeared to be defined, and potential impacts to groundwater were considered low. The results of the risk screening are presented in Tables 38-3a and 38-3b in Appendix B.

Because there were no unacceptable health risks associated with SWMU 77, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

38.4.5 Investigation #4: Corrective Measures Study (CMS) at SWMU 77

38.4.5.1 Non-Sampling Data Collection

Mathematical models were applied to a conceptual vadose zone model of SWMU 77 to evaluate the potential for contaminants detected in the soil above the MSSLs to be transported to underlying groundwater. The mathematical models used included the HELP Model, Version 3.01 (Schroeder et al. 1994) and the MULTIMED Version 2.00 (Salhorta et al. 1995).

38.4.5.2 Sampling Data Collection

Nine soil borings were drilled at the Container Storage Area to 5-foot depth intervals as part of the CMS (boring locations are shown in Figure 38-2 in Appendix A). These borings were all located near three borings that had been drilled during the Phase II RFI to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples for all parameters except VOCs were collected from each boring at the 0- to 0.5-foot depth interval. Surface soil samples for VOC analysis were collected from each boring at 0.5-to 1.0-foot depth intervals. Subsurface soil samples were also collected from each boring from a 1-foot interval, generally between 2 and 5 feet in depth. Target analytes included VOCs, SVOCs, TRPH, TPH, and pesticides/PCBs.

38.4.5.3 Data Gaps

The data collected during the CMS field investigation, combined with the data collected during the previous investigations, was sufficient to perform human health and ecological risk

evaluations and to evaluate the results of the vadose zone fate and transport modeling. Therefore, no data gaps existed.

38.4.5.4 Results and Conclusions

Low concentrations of organic compounds were detected in several samples collected at SWMU 77 during the field investigation portion of the CMS. However, none of these compounds were detected at concentrations exceeding the residential RBCs. The results of this investigation are presented in Tables 38-4a, 38-4b, and 38-4c in Appendix B.

Results of the human health and ecological risk evaluations indicated that there was no unacceptable risk to human health and the environment based on the maximum detected concentrations of COCs in the soil at SWMU 77. In addition, results of the vadose zone fate and transport modeling showed, assuming sorption, dispersion and biodegradation occurred, that the COCs would not reach groundwater above the maximum allowable concentrations for drinking water. The risk evaluations, combined with the modeling, were used to determine that the NFA alternative would be protective of human health and the environment at the lowest cost.

38.5 SITE CONCEPTUAL MODEL

38.5.1 Nature and Extent of Contamination

Eleven borings to depths of 20 feet were installed during the two RFI phases, and nine hand auger borings were drilled during the field investigation portion of the CMS, to effectively delineate the extent of contamination at SWMU 77. Chemical analyses detected elevated concentrations of PAHs and TRPH in samples collected during the Phase I and Phase II RFIs. The highest concentrations of PAHs were detected in surface samples collected from borings drilled through the storage pad at this SWMU. The highest concentrations of other chemicals detected at SWMU 77 were also found in surface or near-surface soils.

Groundwater at SWMU 77 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

38.5.2 Environmental Fate

Because chemicals were detected in soil at levels above MSSLs at SWMU 77, the fate and transport of contaminants in the vadose zone was modeled as part of the CMS to evaluate the potential for contaminants in soil to be transported to underlying groundwater.

The mathematical models HELP and MULTIMED were applied to a conceptual vadose zone model of SWMU 77. The HELP model was used to estimate a net infiltration rate for input into MULTIMED. MULTIMED was then used to model contaminant migration through the vadose zone to the water table.

The modeling results, which assume that sorption, dispersion, and biodegradation would have occurred, predicted that the COCs would not reach groundwater above the allowable concentrations for drinking water. The model-predicted concentrations are shown in Table 38-4c in Appendix B.

38.6 SITE ASSESSMENTS

38.6.1 Summary

A BRA was conducted based on the results of the Phase I RFI for SWMU 77. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 77.

A CMS was then conducted based on the results of the Phase I and II RFIs and the field investigation portion of the CMS at SWMU 77. The results of the CMS are discussed below.

38.6.2 Screening Assessments

38.6.2.1 Human Health

For the Tier 1 evaluation as part of the CMS, the maximum concentrations of COPCs detected during the Phase I and II RFIs and the field investigation portion of the CMS were compared to the USEPA Region VI Residential MSSLs. The comparison is shown in Table 38-4b in Appendix B. Metals that exceeded background levels (W-C 1997a) and all detected organic compounds (except those dismissed as laboratory contaminants) were considered COPCs. TPH and TRPH were not considered to be COPCs because they are complex mixtures with varying constituents. Benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene all exceeded the Tier 1 values. Therefore, these three chemicals were considered the COCs at SWMU 77 and a Tier 2 evaluation was performed (see Section 38.6.3.1).

38.6.2.2 Ecological

SWMU 77 encompassed a fenced concrete pad. As the site contains no vegetation, the only permanent shelter for ecological resources is below the pad. Given the size of the pad (150 feet by 250 feet) and the consistent human activity associated with the site, the quantity and quality of biological resources was expected to be minimal. Based on this, SWMU 77 did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

38.6.3 Risk Assessments

38.6.3.1 Human Health

For the Tier 2 evaluation, SSTLs were developed for the COCs using the RBCA Tool Kit for Chemical Releases (Groundwater Services, Inc. 1999). These Tier 2 evaluations assumed a more realistic industrial exposure to the COCs. The SSTLs for each of the three COCs at SWMU 77,

along with the maximum detected concentrations of the COCs, are shown in Table 38-4c in Appendix B. The maximum detected concentrations of benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene did not exceed the corresponding SSTLs.

Results of the human health risk evaluation indicated that there was no unacceptable risk to human health based on the maximum detected concentrations of COCs in soil at SWMU 77. In addition, results of the vadose zone fate and transport modeling showed, assuming sorption, dispersion and biodegradation occurred, that the COCs would not reach groundwater above the allowable concentrations for drinking water. The risk evaluation, combined with the modeling, were used to determine that the NFA alternative would be protective of human health and the environment at the lowest cost.

38.6.3.2 Ecological

Based on the conclusions of the ecological risk screening, SWMU 77 did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

38.6.4 Other Applicable Assessments

38.6.4.1 Surface Water

SWMU 77 contained no surface water.

38.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

38.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at SWMU 77.

38.6.4.4 Other

No other assessments have been conducted in the area of SWMU 77.

38.7 NO FURTHER ACTION PROPOSAL

38.7.1 Rationale

Based on the conclusions reached in the BRA, the Phase II RFI, and the CMS, NFA has been recommended for SWMU 77.

38.7.2 Criterion

SWMU 77 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

39.1 SUMMARY

SWMU 78, Fire Department Training Area No. 1, is located in the northeast corner of the Base, south of the railroad tracks and northeast of Perimeter Road. The training area is an unlined surface approximately 100 feet in diameter. Between 1959 and 1968, the SWMU was used twice monthly when approximately 300 gallons of waste oils, solvents, and fuels were poured on the ground surface to create fires.

An RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended NFA at SWMU 78.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria and to proposed RCRA action levels, or by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 78.

The conclusions reached in the RI report, the BRA, and the Decision Document were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

39.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

39.2.1 Site Description

SWMU 78, Fire Department Training Area No. 1, covers approximately 0.2 acres in the northeast corner of the Base, south of the railroad tracks and northeast of Perimeter Road (Figure 39-1 in Appendix A). SWMU 78 was used twice monthly from 1959 to 1968, when approximately 300 gallons of waste oils, solvents, and fuels were poured on the ground surface to create fires.

39.2.2 Operational History

SWMU 78 was used from 1959 to 1968 as a fire fighting training area. According to a Phase I IRP Records Search (CH2M Hill 1983), the potential existence of hazardous contaminants at Fire Department Training Area No. 1 was evaluated by reviewing existing information, including installation records.

Two deep soil borings were drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation in 1984 and 1985 (Radian 1986). Soil samples from this investigation were analyzed for oil and grease, lead, and purgeable halocarbons and aromatics to determine if environmental contamination had resulted from fire training exercises in the area of SWMU 78.

Fire Department Training Area No. 1 was identified as a potential SWMU by a Preliminary Review/Visual Site Inspection RFA conducted for USEPA at Cannon AFB (A.T. Kearney 1987).

Surface and subsurface samples were collected and analyzed during the RI conducted for 18 IRP/SWMU sites at Cannon AFB in 1991 (W-C 1992). Surface and subsurface samples were collected for chemical and/or geotechnical analyses to evaluate the nature and extent of any potential contamination in this area.

39.3 LAND USE

39.3.1 Current

The area once occupied by SWMU 78 is now an open field covered with prairie grass. It is possible to discern the general area of this SWMU because of the earthen berm that still surrounds it, the abundance of aluminum slag visible on the ground surface, and the sparse vegetative cover in this area.

39.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. However, SWMU 78 has been inactive since 1968. Use classification will continue to remain industrial in nature.

39.4 INVESTIGATIVE ACTIVITIES

39.4.1 Summary

A Phase I IRP Records Search (CH2M Hill 1983) evaluated the potential existence of hazardous contaminants at Fire Department Training Area No. 1 by reviewing existing information, including installation records. Two deep soil borings were drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986). Based on the date of the Phase II investigation, the analyses performed (i.e., oil and grease and purgeable organics), and the lack of significant results from the Phase II, this investigation is not discussed in further detail below. A Preliminary Review/Visual Site Inspection RFA identified Fire Department Training Area No. 1 as a potential SWMU (A.T. Kearney 1987). Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992).

39.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites

39.4.2.1 Non-Sampling Data Collection

In addition to the field investigation and data collection effort, the RI also included the performance of a BRA on the analytical data from SWMU 78. The BRA is addressed as Investigation #2 in Section 39.4.3 below.

39.4.2.2 Sampling Data Collection

Two soil borings were drilled and samples were originally collected for chemical and geotechnical analyses during the RI (Figure 39-1 in Appendix A). Subsurface soil samples were collected from both borings at depth intervals ranging from 4 to 100 feet. The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area of SWMU 78. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the Fire Department Training Area No. 1.

Soil samples collected at depths of 4, 10, 20, 30, 40, 50, 60, 70, 75, and 100 feet were analyzed for TCL VOCs and SVOCs, TAL metals, PCBs, pesticides, and TPH. In addition, all samples collected from one boring, plus samples collected at depths of 80 and 90 feet in the same boring, were only analyzed for TOC. Samples were also collected at depths of 35 and 75 feet in one boring and samples were collected at depths of 14, 55, and 90 feet in the second boring for geotechnical gradation analysis.

One additional boring was drilled and sampled because the laboratory missed the holding times for the TCL VOCs and/or TPH. The samples, collected from this boring to depths of 100 feet, were analyzed for TCL VOCs and/or TPH, depending on which holding times had been missed for each boring.

Six surface samples were also collected from locations near each of the borings, from three additional locations within the SWMU boundary, and from one location outside the SWMU boundary, at depth intervals of 0 to 0.5 feet. Surface sample locations were selected based on the presence of sparse vegetation, noticeable debris, or visible staining.

Six additional surface samples were also collected because the laboratory missed the holding times for the TCL VOCs and/or TPH. These surface samples were analyzed for TCL VOCs and/or TPH, depending on which holding times had been missed for each sample.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

39.4.2.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

39.4.2.4 Results and Conclusions

With the exception of acetone, none of the TAL VOCs were detected in any of the samples collected during the RI. However, acetone is a common laboratory contaminant, and its detection was attributed to laboratory contamination.

With the exception of two phthalate compounds, none of the TAL SVOCs were detected in any of the samples collected during the RI. However, phthalates are common plasticizers, and the detection of these compounds was also attributed to laboratory contamination.

The pesticide 4,4-DDD was detected in surface samples at a maximum concentration of 2,000 µg/kg, and was detected in subsurface samples from one boring at a maximum depth of 12 feet. The pesticide 4,4-DDE was also detected in surface samples at a maximum concentration of 110 µg/kg. The detection of these pesticides was attributed to the possible presence of pesticides in the fuel mixtures used in past fire training exercises, or the possibility that pesticides were applied to the SWMU to ward off pests during training activities. The high soil/water partition coefficient for pesticides (USEPA 1979) indicates that these compounds have been retained on soil particles, thus retarding their migration to deeper soils.

TPH was detected in surface samples at a maximum concentration of 4,080 mg/kg, and was detected in one subsurface sample at a depth of 4 feet.

Lead and zinc were detected in surface samples at maximum concentrations of 529 mg/kg and 829 mg/kg, respectively. Lead was also detected in subsurface samples at a concentration of 25.0 mg/kg at a depth of 20 feet in one boring. These results correlate with the results of the Phase II investigation that detected lead at concentrations as high as 28 mg/kg at depths of 47.5 to 48.6 feet (Radian 1986). All other metals detected were found at concentrations comparable to regional background levels (W-C 1997a) and were attributed to natural soil conditions in this area. The results of this investigation are shown in Tables 39-1a, 39-1b, 39-1c, and 39-1d in Appendix B.

39.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites

39.4.3.1 Non-Sampling Data Collection

No additional non-sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the RI.

39.4.3.2 Sampling Data Collection

No sampling data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #1 in Section 39.4.2 above.

39.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

39.4.3.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 78. Potential receptors at this SWMU for human health risks included current and future maintenance workers at the SWMU. Potential construction workers and residents were eliminated as receptors because this SWMU is less than 0.5 acres in size (the minimum plot size judged to be reasonable for major excavation and future construction of residential homes). In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 78, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult, general-duty or ground maintenance workers.

The COCs identified for SWMU 78 included metals, VOCs, and pesticides. As shown in Table 39-2a in Appendix B, the average exposures and reasonable maximum exposures (RME) for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 78.

Corrective action levels are presented in Tables 39-2b and 39-2c in Appendix B. The total carcinogenic risk (i.e., the risk for all pathways combined) for average exposures and RME of workers at SWMU 78 were 1.7×10^{-11} and 8.9×10^{-10}, respectively. Both of these risks fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}) for carcinogenic effects at Superfund sites (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at SWMU 78.

The maximum concentration of lead detected at SWMU was 529 mg/kg in surficial soil. The surface soil lead 95 percent upper confidence limit for the SWMU 78 risk assessment area was calculated as 411 mg/kg, a number that fell below the USEPA interim guidance for residential soil lead cleanup levels (500 to 1,000 mg/kg). Therefore no unacceptable risk was expected due to the presence of lead at this SWMU.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, metals (including lead and zinc) were the only COCs discussed in the ecological risk assessment that were also detected at SWMU 78. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC metals (including lead and zinc) pose a risk to small mammalian populations.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for this SWMU.

39.5 SITE CONCEPTUAL MODEL

39.5.1 Nature and Extent of Contamination

Organic COPCs at this SWMU consist of the pesticides 4,4-DDD and 4,4-DDE, and TPH. Analytical data suggest that these COPCs are present in surficial soils throughout SWMU 78. It does not appear that soils below 4 to 6 feet in depth have been significantly impacted, although a concentration of 14 µg/kg was reported for 4,4-DDD at a depth of 10 to 12 feet in one boring. The high soil/water partition coefficient for pesticides indicates that these compounds will be retained on soil particles, thus retarding their migration into deeper soils. Lead and zinc are metals of potential concern in surficial soils throughout this SWMU. In addition, lead is also a potential concern at depths of 4 to 20 feet in the areas of two borings that were drilled at SWMU 78.

39.5.2 Environmental Fate

Based on site conditions at SWMU 78, applicable exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 78 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). The surface soil lead 95 percent upper confidence limit was calculated at a concentration that fell below the USEPA guidance for residential soil lead. The BRA indicated that no unacceptable risk was expected at SWMU 78.

Potential risks from the COCs lead and zinc in soil to biota were calculated, and it was determined that neither of these COC metals pose a risk to small mammalian populations. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur, and thus no risk of exposure via the groundwater pathway.

39.6 SITE ASSESSMENTS

39.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 78. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 78.

39.6.2 Screening Assessments

39.6.2.1 Human Health

The COPCs identified for SWMU 78 included metals, VOCs, and pesticides. These chemicals were initially screened by comparing their detected concentrations to RFI criteria and proposed RCRA action levels. The comparison identified lead, zinc, TPH, 4,4-DDD, and 4,4-DDE as COCs. All COCs were subjected to a quantitative characterization of risk.

39.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). Lead and zinc were the only COPCs detected at SWMU 78 that were addressed by the ecological risk assessment. Both lead and zinc were considered COCs based on a comparison to applicable screening criteria.

39.6.3 Risk Assessments

39.6.3.1 Human Health

Potential receptors for human health risks included current and future maintenance workers at the SWMU. Potential construction workers and residents were eliminated as receptors because this SWMU is less than 0.5 acres in size (the minimum plot size judged to be reasonable for major excavation and future construction of residential homes). In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 78, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult, general duty or ground maintenance workers.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 78 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 78.

39.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the maximum metal concentrations detected at all 18 SWMUs addressed by the RI, and based on the calculated toxicity values for incidental soil ingestion, none of the COC metals (including lead and zinc)

were considered to pose a significant risk to small mammalian populations. Based on the results of the BRA, NFA was recommended for SWMU 78.

39.6.4 Other Applicable Assessments

39.6.4.1 Surface Water

SWMU 78 contained no surface water.

39.6.4.2 Groundwater

Groundwater at SWMU 78 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

39.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at SWMU 78.

39.6.4.4 Other

A Phase I IRP Records Search (CH2M Hill 1983) evaluated the potential existence of hazardous contaminants at Fire Department Training Area No. 1 by reviewing existing information, including installation records.

Two deep soil borings were drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986).

A Preliminary Review/Visual Site Inspection RFA identified Fire Department Training Area No. 1 as a potential SWMU (A.T. Kearney 1987).

No other assessments have been conducted in the area of SWMU 78.

39.7 NO FURTHER ACTION PROPOSAL

39.7.1 Rationale

Based on the conclusions reached in the RI and the BRA, NFA has been recommended for SWMU 78.

39.7.2 Criterion

SWMU 78 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

40.1 SUMMARY

An RFA (A.T. Kearney 1987) describes SWMU 79, Underground Storage Tank, as a 2,000-gallon UST located at Fire Department Training Area No. 1 (SWMU No. 78). However, a thorough records search and several personnel interviews have failed to document the existence of this tank. This SWMU cannot be located or does not exist.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

40.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

40.2.1 Site Description

Refer to summary in Section 40.1 above.

40.2.2 Operational History

Refer to summary in Section 40.1 above.

40.3 LAND USE

40.3.1 Current

Refer to summary in Section 40.1 above.

40.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. Use classification will continue to remain industrial in nature.

40.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 79 have been performed.

40.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 79 has never been the subject of a conceptual model.

40.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 79.

40.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 79.

40.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 79.

40.6.3 Other Applicable Assessments

40.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 79.

40.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 79 contained no means for groundwater discharges to occur.

40.6.3.3 Underground Storage Tanks (USTs)

There is no record, other than the RFA, of any storage tanks, either underground or aboveground, in the area of SWMU 79.

40.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 79.

40.7 NO FURTHER ACTION PROPOSAL

40.7.1 Rationale

Because a thorough records search and several personnel interviews failed to document the existence of this tank, and because the site was eventually removed from the SWMU list when USEPA Region VI approved the Appendix II, Phase I RFI Work Plan in March 1992, NFA is recommended for SWMU 79.

40.7.2 Criterion

SWMU 79 is proposed for NFA based on NMED NFA Criterion 1: This SWMU cannot be located or does not exist.

41.1 SUMMARY

SWMU 81, Solvent Disposal Site, was first identified in the 1983 IRP Phase I Records Search (CH2M Hill 1983) as two empty drums labeled "trichloroethylene" lying on the ground. The drums had been positioned in such a way that they would have drained into a shallow pit. The site was located approximately 300 feet east of Fire Training Area No. 1 and approximately 100 feet south of the north installation fence. The site could not be located during the preparation of the RFA in 1987 (A.T. Kearney 1987) or during the site visit performed as part of the preparation of the Appendix I, Phase I RFI Work Plan (Lee Wan and Associates 1990).

Because SWMU 81 cannot be located or does not exist, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

41.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

41.2.1 Site Description

Refer to summary in Section 41.1 above.

41.2.2 Operational History

Refer to summary in Section 41.1 above.

41.3 LAND USE

41.3.1 Current

Refer to summary in Section 41.1 above.

41.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 81 could not be located during the preparation of RFA in 1987, or during the site visit performed as part of the preparation of the Appendix I, Phase I RFI Work Plan. Use classification will continue to remain industrial in nature.

41.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 81 have been performed.

41.5 SITE CONCEPTUAL MODEL

SWMU 81 has never been the subject of a conceptual model.

41.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 81.

41.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 81.

41.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 81.

41.6.3 Other Applicable Assessments

41.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 81.

41.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 81 contained no means for groundwater discharges to occur.

41.6.3.3 Underground Storage Tanks (USTs)

There is no record, other than the RFA, of any storage tanks, either underground or aboveground, associated with SWMU 81.

41.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 81.

41.7 NO FURTHER ACTION PROPOSAL

41.7.1 Rationale

Because SWMU 81 could not be located during the preparation of the RFA in 1987, or during the site visit performed as part of the preparation of the Appendix I, Phase I RFI Work Plan, NFA is recommended for SWMU 81.

41.7.2 Criterion

SWMU 81 is proposed for NFA based on NMED NFA Criterion 1: This SWMU cannot be located or does not exist.

42.1 SUMMARY

SWMU 82, Landfill No. 2, has been listed as an Appendix I site. An RFI of Landfill No. 2 (W-C 1993) found elevated levels of seven metals and 13 organic compounds, including one VOC and one PCB, in the area of SWMU 82. Based on the results of a BRA performed as part of this investigation, the recommendation of a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

42.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

42.2.1 Site Description

Landfill No. 2 (SWMU 82) is an inactive, unlined, cut-and-fill landfill occupying approximately 15 acres in the northeast corner of Cannon AFB (Figure 42-1 in Appendix A). This essentially flat SWMU slopes gently to the northwest. Based on a review of historical aerial photographs, Landfill No. 2 was found to consist of two distinct portions. The first (eastern) portion trended in a north-south direction, and the second (western) portion trended in an east-west direction (W-C 1993).

42.2.2 Operational History

Landfill No. 2 accepted wastes from 1946 to 1947 and from 1952 to 1959. The temporary period of inactivity occurred while Cannon AFB was on deactivated status. The landfill's operation apparently consisted of placing waste in trenches and burning it before burying it. The site reportedly received domestic solid wastes and shop wastes, which included waste oils and solvents, paint strippers and thinners, outdated paint, pesticide containers, and various empty cans and drums (Radian 1986).

During a 1985 IRP Phase II Investigation, Radian drilled and sampled five soil borings in the area of Landfill No. 2. The area of this SWMU was investigated due to its proximity to the Base boundary, due to its proximity to a Base drinking water well, and due to records of past hazardous waste disposal in this landfill.

42.3 LAND USE

42.3.1 Current

The site of Landfill No. 2 is currently a vacant, grass-covered field that is no longer in use. Grounds maintenance contractors mow the field approximately once per month for a few hours, six months of the year. In addition, electrical maintenance personnel travel a road located in the northwest corner of the western portion of the landfill to check nearby surface utilities. Base personnel travel through this area for approximately 5 to 10 minutes, twice a week, all year long.

42.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the area is currently vacant and is only occupied during maintenance activities. Use classification will continue to remain industrial in nature.

42.4 INVESTIGATIVE ACTIVITIES

42.4.1 Summary

The RFI of Landfill No. 2 (W-C 1993) found elevated levels of seven metals and 13 organic compounds, including one VOC and one PCB, in the area of SWMU 82. The BRA performed as part of this investigation indicated that this SWMU poses no unacceptable risk to human health.

42.4.2 Investigation #1: RCRA Facility Investigation Report for Landfill No. 2 (SWMU 82)

42.4.2.1 Non-Sampling Data Collection

The RFI included a BRA performed using the results of this investigation. The BRA assessment indicated that there is no unacceptable risk to human health from this SWMU (W-C 1993).

42.4.2.2 Sampling Data Collection

An RFI was performed at SWMU 82 to determine whether a release of landfill-related chemicals had occurred. An electromagnetic geophysical survey was completed using a Geonics EM-31. The results of both surveys were interpreted, and the anomalies encountered were determined to be indicative of the presence of landfill cells.

Based on these results, a subsurface soil investigation was designed. A trench approximately 28 feet long, 8 feet wide, and 7 feet deep was dug to investigate an area that appeared to be a landfill cell based on the results of the geophysical survey. After the landfill's cap was removed, landfilled materials were excavated and a field screening was performed using an organic vapor analyzer (OVA). No OVA readings above background levels (W-C 1997a) were detected, so the landfilled materials and the clay cap were replaced.

In addition, 27 borings were drilled and subsurface soil samples from 15 of the borings were collected and submitted for chemical analyses. The borings were advanced to depths ranging from 75.5 to 76 feet below the surface to determine the vertical extent of any potential contamination. Target analytes for the 120 samples collected from the 15 analytical borings included TCL VOCs and SVOCs, pesticides/PCBs, and TAL metals. In addition, samples were also analyzed for TPH and TOC.

Five surface samples were also collected from depths of 0 to 0.5 feet below ground surface and analyzed for TCL VOCs and SVOCs, pesticides/PCBs, and TAL metals. Geotechnical gradation analysis was also performed on 44 subsurface soil samples and one surface soil sample.

42.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the RFI QAPP. Therefore, no data gaps existed after the completion of the RFI.

42.4.2.4 Results and Conclusions

One VOC (toluene), two SVOCs (pyrene and pentachlorophenol), one herbicide (MCPP), one pesticide (4,4'-DDT), and one metal (barium) were detected at concentrations of potential concern during the RFI at Landfill No. 2. All other compounds detected were excluded from concern because they were detected below the associated background levels (W-C 1997a) in the case of metals, because they were considered to be a laboratory contaminant in the case of organic compounds, or because did not have risk screening criteria. Results of this investigation are presented in Table 42-1a and 42-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The landfill material encountered during the RFI included construction debris and domestic waste. No liquid wastes or soils saturated with liquid wastes were encountered during the field activities.

Based on the results of a BRA performed as part of this investigation, the RFI report recommended NFA for SWMU 82.

42.5 SITE CONCEPTUAL MODEL

42.5.1 Nature and Extent of Contamination

Fifteen analytical soil borings, to depths ranging from 75.5 to 76 feet, were installed during the RFI at Landfill No. 2 to effectively delineate the extent of contamination at SWMU 82. Chemical analyses detected elevated concentrations of metals and organic compounds in subsurface soil samples collected during the RFI.

Thirteen metals (aluminum, barium, cadmium, calcium, chromium, cobalt, copper, lead, magnesium, nickel, potassium, silver, and zinc) were detected in surface and/or subsurface samples at concentrations that exceeded the associated background levels (W-C 1997a). Generally, the concentrations of the detected metals decreased with depth. However, in instances when the concentrations of some metals increased (at approximately 14 to 34 feet), the trend appeared to coincide with the increased presence of caliche and calcium carbonate

cemented sands. The fact that the increased concentrations of metals were detected in borings drilled both within and outside of the landfill cells indicates that the metals were most likely naturally occurring.

Toluene was the only VOC detected in concentrations that exceeded the reporting limits. The highest concentration of toluene detected was 35 µg/kg at a depth of 34 feet.

Numerous SVOCs were detected during the RFI. Generally, the SVOCs were detected at depths ranging from 14 to 40 feet.

Two pesticides (4,4'-DDE and 4,4'-DDT) were detected in four surface samples. However, the concentrations detected were relatively low, and no pesticides were detected in the subsurface samples. Therefore, it appears that the presence of pesticides at SWMU 82 is most likely related to pesticide applications at the surface and not to landfill activities.

The PCB Aroclor 1254 was detected above the reporting limit (RL), at a concentration of 360 µg/kg, in one subsurface sample collected from a depth of 39 feet.

TPH were detected in one subsurface sample, at a concentration of 967.2 mg/kg, in one subsurface sample collected from a depth of 18 feet.

Groundwater at SWMU 82 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

42.5.2 Environmental Fate

Contaminants encountered at Landfill No. 2 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 82, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time. The potential for metals to precipitate in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the RFI.

Toluene is likely to be relatively too highly mobile in subsurface soil and is not likely to persist for long periods of time due to high vapor pressure, high volatilization potential, and a high biodegradation rate.

The SVOCs detected are likely to be relatively immobile due to low vapor pressures, low water solubilities, and tendencies to adsorb to clays. In addition, these compounds have moderate to low biodegradation rates.

The PCB compound detected in one subsurface sample and the two pesticides detected at the surface are likely to persist in the environment due to their extremely low vapor pressures, low water solubilities, and tendencies to readily adsorb to soil. These compounds also have low biodegradation rates.

42.6 SITE ASSESSMENTS

42.6.1 Summary

A BRA was conducted based on the results of the RFI. The results of the BRA are discussed below.

42.6.2 Screening Assessments

42.6.2.1 Human Health

A human health risk screening was performed for Landfill No. 2 to determine whether chemicals detected in soils at the site may pose an unacceptable risk to human health. Detected chemicals were evaluated based on detection frequency, comparison with background data, and availability of toxicity data. The results of this evaluation found elevated levels of seven metals and thirteen organic compounds, including one VOC and one PCB, in the area of SWMU 82. Many of the COCs were PAHs that were most likely derived from the practice of burning trash prior to landfilling it, or from decaying wood, rather than from the presence of hazardous materials in Landfill No. 2.

Maximum concentrations of the detected chemicals were compared to applicable RCRA Action Levels. RCRA Action Levels are highly conservative screening values used to assess whether a formal, site-specific risk assessment is warranted; therefore, the results overestimate the actual hazard/risk and the site. Based on the results of the screening, only one of the COCs, benzo(a)pyrene, slightly exceeded the corresponding RCRA Action Level for soil. However, based on this compound's small exceedance of the action level, the limited areal extent of its detection, and the low likelihood of chronic exposure, benzo(a)pyrene was not considered to be a significant concern at SWMU 82.

Based on the results of the human health risk screening, chemicals detected in soils at Landfill No. 2 do not pose an unacceptable risk to human health.

42.6.2.2 Ecological

The ecological screening assessment focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Small mammals, specifically ground-dwelling rodents, were chosen as the indicator species for SWMU 82.

Based on the potential for terrestrial organism exposure, only two of the compounds detected during the RFI were considered COCs. These two chemicals, pyrene and toluene, were the only

SWMU-related chemicals detected at the surface in concentrations of potential concern. The doses of pyrene and toluene that a ground-dwelling rodent would be exposed to by incidental soil ingestion is much lower than the corresponding chronic reference doses of these chemicals, indicating no risk to the indicator species. In addition, although PAHs (including pyrene) may bioaccumulate rapidly, they are also quickly metabolized and eliminated from an organism. Toluene biodegrades rapidly. Therefore, bioaccumulation of pyrene or toluene is not considered an important fate process that would put higher trophic predatory organisms at risk.

Based on the results of the ecological screening, chemicals detected in soils at Landfill No. 2 do not pose an unacceptable risk to the environment.

42.6.3 Risk Assessments

42.6.3.1 Human Health

A formal human health risk assessment was not warranted at SWMU 82.

42.6.3.2 Ecological

A formal ecological risk assessment was not warranted at SWMU 82.

42.6.4 Other Applicable Assessments

42.6.4.1 Surface Water

SWMU 82 contained no surface water.

42.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

42.6.4.3 Underground Storage Tanks (USTs)

There is no record of any storage tanks, either underground or aboveground, in the area of SWMU 82.

42.6.4.4 Other

No other assessments have been conducted in the area of SWMU 82.

42.7 NO FURTHER ACTION PROPOSAL

42.7.1 Rationale

Based on the conclusions reached in the RFI, NFA has been recommended for SWMU 82.

42.7.2 Criterion

SWMU 82 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

43.1 SUMMARY

SWMU 83, Sump, has been listed as an Appendix II site. A Phase I RFI of the Appendix II sites (LRL 1993) detected elevated levels of TRPH in the area of SWMU 83. The results of a limited risk assessment, performed as part of this investigation, indicated minimal or no risk to human health or the environment from SWMU 83.

A Phase II RFI of the Appendix II sites (W-C 1997c) also found elevated levels of 14 organic compounds, nine of which were PAHs, and one metal in the area of this SWMU. However, the report documenting this investigation noted that none of the concentrations of the chemicals detected at SWMU 83 posed an unacceptable human health risk. The Phase II RFI report recommended no further investigation at this site.

The conclusions reached in the Phase I and Phase II RFIs were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

43.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

43.2.1 Site Description

SWMU 83, Sump, was located approximately 90 feet northwest of Building 120 (Figure 43-1 in Appendix A). The depth to the former sump, which had been constructed in a 12- by 14-foot concrete pad, is unknown (W-C 1997c). A portion of the sump's former location has been paved. Historically, the sump received rainwater, wash water, and dilute waste oil runoff from flight line operations.

43.2.2 Operational History

The installation date and initial use date of SWMU 83 are unknown. The sump was removed in 1993. Historically, the sump received rainwater, wash water, and dilute waste oil runoff from flight line operations. A portion of the sump's former location is currently paved.

43.3 LAND USE

43.3.1 Current

The sump has been removed, and a portion of the sump's former location is currently paved.

43.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the sump was removed in 1993. Use classification will continue to remain industrial in nature.

43.4 INVESTIGATIVE ACTIVITIES

43.4.1 Summary

A Phase I RFI of the Appendix II sites (LRL 1993) found elevated levels of TRPH in the area of SWMU 83. A Phase II RFI of the Appendix II sites (W-C 1997c) also detected elevated levels of 14 organic compounds and one metal in the area of this SWMU.

43.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix II SWMUs – Phase I

43.4.2.1 Non-Sampling Data Collection

The Phase I RFI included a limited risk assessment performed using the results of this investigation. The limited risk assessment indicated minimal or no risk to human health or the environment from this SWMU (LRL 1993).

43.4.2.2 Sampling Data Collection

During the Phase I RFI, three soil borings were drilled and sampled to a depth of 10 feet at SWMU 83 to determine whether a release of SWMU-related chemicals had occurred from the sump (Figure 43-1 in Appendix A). Soil samples collected were analyzed for TCL VOCs, cyanide, TAL metals, and TRPH. TRPH was detected at the surface in all three borings, and at the 2.5-foot and 5-foot depth intervals in two of the three borings. A maximum concentration of 5,000 ppm was detected at a depth of 2.5 feet. Aluminum, iron, nickel, potassium, zinc, copper and manganese were all detected in low concentrations in surface and subsurface samples from each of the three soil borings.

43.4.2.3 Data Gaps

Sufficient data was collected during the Phase I RFI to complete a limited risk assessment for SWMU 83, and to reach the conclusion that this SWMU posed minimal or no risk to human health or the environment. Therefore, no data gaps existed after the completion of the Phase I RFI.

43.4.2.4 Results and Conclusions

TRPH was detected at elevated concentrations in samples collected from the surface and subsurface of all three Phase I borings drilled in the area of SWMU 83. Metals were detected at low concentrations in all three borings.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The results of a limited risk assessment, performed as part of this investigation, indicated minimal or no risk to human health or the environment from SWMU 83. The results of this investigation are presented in Tables 43-1a and 43-1b in Appendix B.

43.4.3 Investigation #2: RFI, Appendix II SWMUs – Phase II

43.4.3.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to evaluate whether a release of SWMU-related chemicals had occurred as a result of spillage or leakage from the sump that could pose a significant risk to human health or the environment. In addition, the Phase II RFI included a risk screening to verify whether the recommendation of NFA based on the Phase I RFI was appropriate for SWMU 83, and characterized the vertical extent of contamination in this area.

43.4.3.2 Sampling Data Collection

A Phase II RFI was performed at SWMU 83 to determine whether a release of SWMU-related chemicals had occurred from the sump. Two borings were advanced to depths of 25 feet below the surface and samples were collected and analyzed to determine the vertical extent of any potential contamination. Target analytes for samples from the three borings included VOCs, SVOCs, TAL metals, and TRPH.

43.4.3.3 Data Gaps

During the Phase II RFI, two borings were drilled instead of three, the number listed in the Final Work Plan Addendum (W-C 1994). The third boring could not be drilled due to the presence of overhead hazards. The data quality was deemed to be sufficient to meet the objectives of the Phase II RFI. Therefore, no data gaps existed after the completion of the Phase II RFI.

43.4.3.4 Results and Conclusions

Fourteen organic compounds were detected during the Phase II RFI. In addition, one metal, cadmium, was detected at a maximum concentration that exceeded the background level for soils (W-C 1997a) in the area of SWMU 83. However, the maximum concentration of only one compound, benzo(a)pyrene, slightly exceeded the associated RBC. Based on the results of the Phase II RFI at SWMU 83, the vertical extent of contamination has been adequately assessed and potential impacts to groundwater were considered low. The results of this investigation are presented in Tables 43-2a and 43-2b in Appendix B.

Because there were no unacceptable health risks associated with SWMU 83, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

43.5 SITE CONCEPTUAL MODEL

43.5.1 Nature and Extent of Contamination

Five borings, three to a depth of 10 feet and two to a depth of 25 feet, were installed during the two phases of the RFI to effectively delineate the extent of contamination at SWMU 83. Chemical analyses detected concentrations of metals and organic compounds, including TRPH, at concentrations of potential concern in samples collected during the Phase I and Phase II RFIs conducted at SWMU 83.

Groundwater at SWMU 83 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

43.5.2 Environmental Fate

Because there were no unacceptable health risks associated with SWMU 83, the fate and transport of contaminants in the vadose zone was not modeled as part of the Phase II RFI.

43.6 SITE ASSESSMENTS

43.6.1 Summary

A limited risk assessment and a risk screening were conducted as part of the Phase I and II RFIs, respectively. The results of the limited risk assessment and risk screening are discussed below.

43.6.2 Screening Assessments

43.6.2.1 Human Health

The results of a limited risk assessment, performed as part of the Phase I RFI, indicated minimal or no risk to human health from SWMU 83. The results of the Phase II RFI at SWMU 83 showed no evidence that a significant chemical release, posing an unacceptable human health risk for any potential exposure pathway, had occurred at this SWMU.

43.6.2.2 Ecological

The former sump located at SWMU 83 has been removed and the area has been partially paved. Based on this, SWMU 83 did not contain any significant ecological component such that a formal ecological risk assessment was warranted. However, the results of a limited risk assessment, performed as part of Phase I RFI, indicated minimal or no risk to the environment from SWMU 83.

43.6.3 Risk Assessments

43.6.3.1 Human Health

The results of a limited risk assessment, performed as part of the Phase I RFI, indicated minimal or no risk to human health from SWMU 83. The results of the Phase II RFI at SWMU 83 showed no evidence that a significant chemical release, posing an unacceptable human health risk for any potential exposure pathway, had occurred at this SWMU. As such, a formal risk assessment was not warranted for SWMU 83.

43.6.3.2 Ecological

Based on the conclusions of the ecological risk screening, SWMU 83 did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

43.6.4 Other Applicable Assessments

43.6.4.1 Surface Water

SWMU 83 contained no surface water.

43.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet, as such this SWMU contained no means for groundwater discharges to occur.

43.6.4.3 Underground Storage Tanks (USTs)

There is no record, other than the RFA, of any storage tanks, either underground or aboveground, associated with SWMU 83.

43.6.4.4 Other

No other assessments have been conducted in the area of SWMU 83.

43.7 NO FURTHER ACTION PROPOSAL

43.7.1 Rationale

Based on the conclusions reached in the Phase I and Phase II RFIs, NFA has been recommended for SWMU 83.

43.7.2 Criterion

SWMU 83 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the

available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

44.1 SUMMARY

SWMU 85, Stormwater Collection Point, has been listed as an Appendix I site. The IRP Phase II investigation (Radian 1986) of the Stormwater Collection Point investigated potential soil contamination in the area of SWMU 85. The IRP Phase II detected potentially significant concentrations of metals, including barium, chromium, lead, mercury, selenium, and zinc, in three near-surface soil samples collected from SWMU 85.

The Final IRP RI of the Stormwater Collection Point (Walk, Haydel 1990) included drilling and sampling of eight soil borings in the area of SWMU 85. Barium, mercury, and selenium were detected in several of the samples at slightly elevated concentrations exceeding the area background levels (W-C 1997a). However, these elevated concentrations were all within the ranges typical of soils. Therefore, the RI concluded that "no adverse impact to public health or the environment is expected from [SWMU 85] conditions and no further study or action is required," (Walk, Haydel 1990).

In addition, an RFI Field Sampling Plan (Lee Wan 1990), which agreed with the conclusions in the RI and did not propose any additional sampling, was accepted by USEPA.

Finally, these findings were summarized in the RFI Activities Phase II to Appendix I SWMUs Supplemental RFI Report (W-C 1995).

Based on the conclusions of the RI and the implicit acceptance of no further investigation at this SWMU by USEPA, the recommendation of a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

44.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

44.2.1 Site Description

The Stormwater Collection Point (SWMU 85) is a naturally occurring playa lake located in the southwestern portion of Cannon AFB (Figure 44-1 in Appendix A). Since the Base's activation in 1943, stormwater runoff from the flight line has collected in this nine-acre lake. Stormwater runoff flows toward the center of the site where it either evaporates or percolates into the soil. This SWMU is bound to the north by the intersection of the NE-SW and NW-SE Runways, to the east by NW-SE Runway, to the south by Perimeter Road followed by the Base boundary, and to the west by the NE-SW Runway (Walk, Haydel 1990).

44.2.2 Operational History

Stormwater runoff from the flight line has collected at the Stormwater Collection Point since Cannon AFB was activated in 1943.

44.3 LAND USE

44.3.1 Current

Stormwater runoff still collects in the area of SWMU 85, where it either evaporates or percolates into the soil.

44.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. Likewise, SWMU 85 will continue to receive stormwater runoff. Use classification will continue to remain industrial in nature.

44.4 INVESTIGATIVE ACTIVITIES

44.4.1 Summary

The IRP Phase II investigation of the Stormwater Collection Point investigated potential soil contamination in the area of SWMU 85. The IRP Phase II detected potentially significant concentrations of metals, including barium, chromium, lead, mercury, selenium, and zinc, in three near-surface soil samples collected from SWMU 85.

During the Final IRP RI of the Stormwater Collection Point, eight soil borings were drilled and sampled in the area of SWMU 85. Slightly elevated concentrations of barium, mercury, and selenium were detected in several of the samples. However, these elevated concentrations were all within the ranges typical of soils, so NFA was recommended for SWMU 85.

In addition, an RFI Field Sampling Plan that did not propose any additional sampling was accepted by USEPA.

Based on the conclusions of the RI and the USEPA's implicit acceptance of no further investigation, No Further Response Action Planned is warranted for SWMU 85, and this site should be removed from the Cannon AFB RCRA permit.

44.4.2 Investigation #1: Installation Restoration Program Phase II, the Stormwater Collection Point (SWMU 85)

44.4.2.1 Non-Sampling Data Collection

The IRP Phase II was purely a field investigation and data collection effort. Therefore, non-sampling data was not collected during this investigation.

44.4.2.2 Sampling Data Collection

The IRP Phase II was completed at SWMU 85 because the disposal of small amounts of hazardous materials was suspected and because the Storm Water Collection Point is located

within 800 feet of a drinking water well. As part of this investigation, three shallow borings were drilled and subsurface soil samples were collected from depth intervals of 3 to 4 feet for chemical analyses (Figure 44-1 in Appendix A). Each of the three subsurface samples was analyzed for total priority pollutant metals, oil and grease, and purgeable halocarbons and aromatics.

44.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the IRP Phase II. However, based on the findings of this investigation and the limited scope of the Phase II, further investigation was recommended for the Stormwater Collection Point.

44.4.2.4 Results and Conclusions

Various metals concentrations were detected in the three samples analyzed. The Phase II report noted that the concentration of heavy metals, especially lead, appeared to increase toward the center of the playa lake's basin. However, the report also noted that the environmental significance of this finding could not be fully evaluated using the limited data provided by the investigation.

An insignificant concentration of oil and grease was detected in just one of the three samples, and purgeable halocarbons and aromatics were not detected in any of the samples.

Groundwater was not investigated in this phase of the investigation because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU. The results are shown in Table 44-1 in Appendix B.

Based on the results of the Phase II, further investigation was recommended for SWMU 85.

44.4.3 Investigation #2: Final Installation Restoration Program Remedial Investigation, the Stormwater Collection Point (SWMU 85)

44.4.3.1 Non-Sampling Data Collection

A risk screening was completed by comparing the analytical results to the corresponding area background levels (W-C 1997a). The results of this risk screening are discussed below.

44.4.3.2 Sampling Data Collection

An IRP RI was completed at SWMU 85 to further determine whether the soils beneath SWMU 85 had been impacted by contaminants in stormwater runoff, and to delineate the extent of any potential contamination. Eight soil borings were drilled and analytical samples were collected from depths of 5 to 70 feet (Figure 44-2 in Appendix A). Near-surface and subsurface

samples were analyzed for VOCs, for base/neutral extractable compounds, and for total and EP toxicity metals.

44.4.3.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the Final IRP RI. Therefore, no data gaps existed after the completion of the Phase II RFI.

44.4.3.4 Results and Conclusions

No VOCs or base/neutral extractable compounds were detected above the reporting limits in any of the samples analyzed. Three metals, barium, mercury, and selenium, were detected at concentrations that slightly exceeded established background levels for the area (W-C 1997a). However, the concentrations reported were less than the background concentrations for metals typically found in soil. In addition, while the results of the Phase II reported a suspected trend of increasing metals concentrations towards the center of the site, the results of a more extensive RI did not substantiate this interpretation. Further, the EP toxicity test results indicated that the concentrations of metals detected would not be expected to leach out of site soils at significant concentrations, let alone at hazardous concentrations.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU. The results of this investigation are shown in Tables 44-2a, 44-2b, and 44-2c in Appendix B.

Based on the results of risk screening completed using the results of the RI, NFA was recommended for SWMU 85.

44.5 SITE CONCEPTUAL MODEL

44.5.1 Nature and Extent of Contamination

While the Phase II report noted that the potentially significant concentration of heavy metals, especially lead, appeared to increase toward the center of the playa lake's basin, the more extensive RI found this to be untrue. Instead, barium was only detected above the background level in samples collected at the 10- and 15-foot depth intervals from one of the eight soil borings drilled during the RI. This finding was not indicative of contaminant migration from the surface, it was most likely naturally occurring. Since mercury was only detected in intermittent intervals (at 2.5, 15, 25, and 30 feet, but not at 5, 7.5, 10, and 20 feet), its presence cannot be attributed to contaminant migration either and was most likely naturally occurring. In addition, while selenium was detected above background in samples from all but one boring, its distribution was also most likely a natural occurrence rather than a result of contaminant migration. Finally, no evidence of surface contamination was encountered since only selenium was detected in surface samples, and then at concentrations below the background level (W-C 1997a).

Therefore, SWMU 85 was not found to contain any significant concentrations of contaminants.

44.5.2 Environmental Fate

Based on the general subsurface characteristics at SWMU 85, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface; but they do persist for long periods of time.

44.6 SITE ASSESSMENTS

44.6.1 Summary

A risk screening was conducted based on the results of the IRP RI. The results of the risk screening are discussed below.

44.6.2 Screening Assessments

44.6.2.1 Human Health

A human health risk screening was completed for the Stormwater Collection Point to determine whether chemicals detected in soils at the site may pose an unacceptable risk to human health. However, the concentrations of barium, mercury, and selenium were more indicative of naturally occurring background concentrations than of SWMU-related contamination. In addition, the EP toxicity analyses demonstrate that none of the three metals will leach from the soils in hazardous concentrations. Because leaching is unlikely to occur to any degree of significance and because the depth to groundwater was greater than 250 feet at Cannon AFB, the potential impacts to groundwater beneath SWMU 85 were considered minimal.

Based on the fact that the detected concentrations of metals were more indicative of naturally occurring background concentrations (W-C 1997a) than of SWMU-related contamination, and the fact that the potential impacts to groundwater beneath SWMU 85 were considered minimal, the chemicals detected in soils at the Stormwater Collection Point do not pose an unacceptable human health risk.

44.6.2.2 Ecological

The ecological screening assessment focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). SWMU 85 contained three possible contaminants (barium, mercury, and selenium) above background levels (W-C 1997a). However, only mercury and selenium were detected in the first 5 feet of soil, the depth range most likely to be inhabited by indicator species. Mercury was only detected in a single sample, which was thus considered isolated and not indicative of site contamination, leaving selenium as the lone potential environmental stressor.

Selenium was detected in samples collected from the first 5 feet of soil at concentrations exceeding the area background level (W-C 1997a) in all but two boring locations (both located at

the center of the playa lake). Selenium was detected at concentrations considered toxic to wildlife (greater than 3 ppm). In addition to being toxic, selenium can also bioaccumulate in plants, birds, and mammals, thus potentially posing a problem of biomagnification up the food chain.

However, while the concentrations of selenium detected at SMWU 85 may adversely affect the environment, there is no evidence that its presence is attributable to site operations. Therefore, any environmental consequences would not be a result of site contamination.

Based on the results of the ecological screening, chemicals detected in soils at the Stormwater Collection Point do not pose an unacceptable ecological risk.

44.6.3 Risk Assessments

44.6.3.1 Human Health

Based on the results of the human health risk screening, a formal risk assessment was not warranted for the Stormwater Collection Point.

44.6.3.2 Ecological

A formal ecological risk assessment was not warranted SWMU 85.

44.6.4 Other Applicable Assessments

44.6.4.1 Surface Water

SWMU 85 receives an estimated 3.52×10^8 gallons of stormwater runoff each year. Thus surface water is present in the playa lake intermittently. However, surface water was not present at the time of either sampling event (although the near surface soil was saturated during the Phase II investigation), so no surface water samples could be collected and analyzed as part of either investigation.

44.6.4.2 Groundwater

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

44.6.4.3 Underground Storage Tanks (USTs)

There is no record of storage tanks, either underground or aboveground, in the area of SWMU 85.

44.6.4.4 Other

No other assessments have been conducted in the area of SWMU 85.

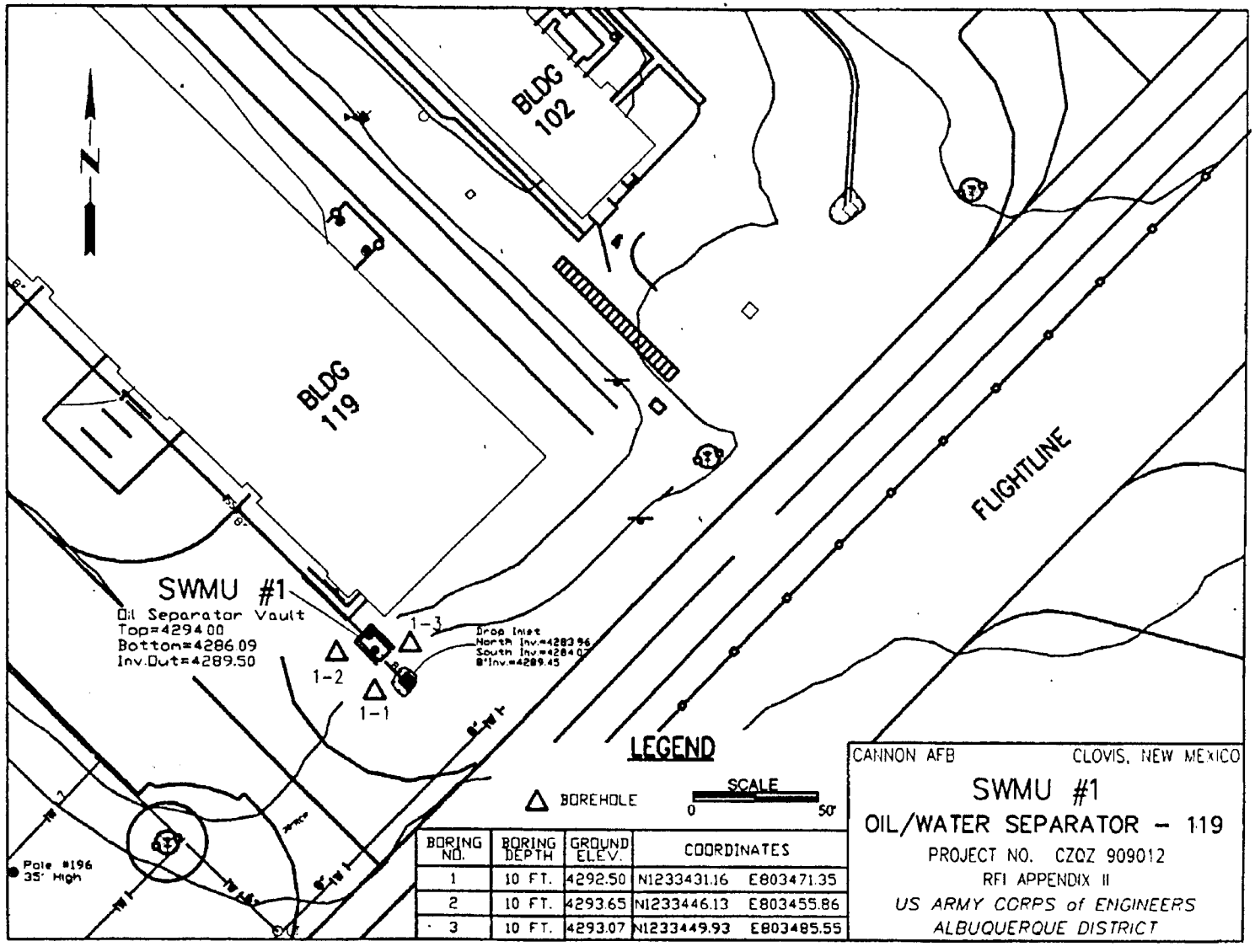
44.7 NO FURTHER ACTION PROPOSAL

44.7.1 Rationale

Based on the conclusions reached in the Final IRP RI, NFA has been recommended for SWMU 85.

44.7.2 Criterion

SWMU 85 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.



BORING NO.	BORING DEPTH	GROUND ELEV.	COORDINATES	
1	10 FT.	4292.50	N1233431.16	E803471.35
2	10 FT.	4293.65	N1233446.13	E803455.86
3	10 FT.	4293.07	N1233449.93	E803485.55

Figure 21-1
SWMU 1
Source: LRL Science, Inc., 1993

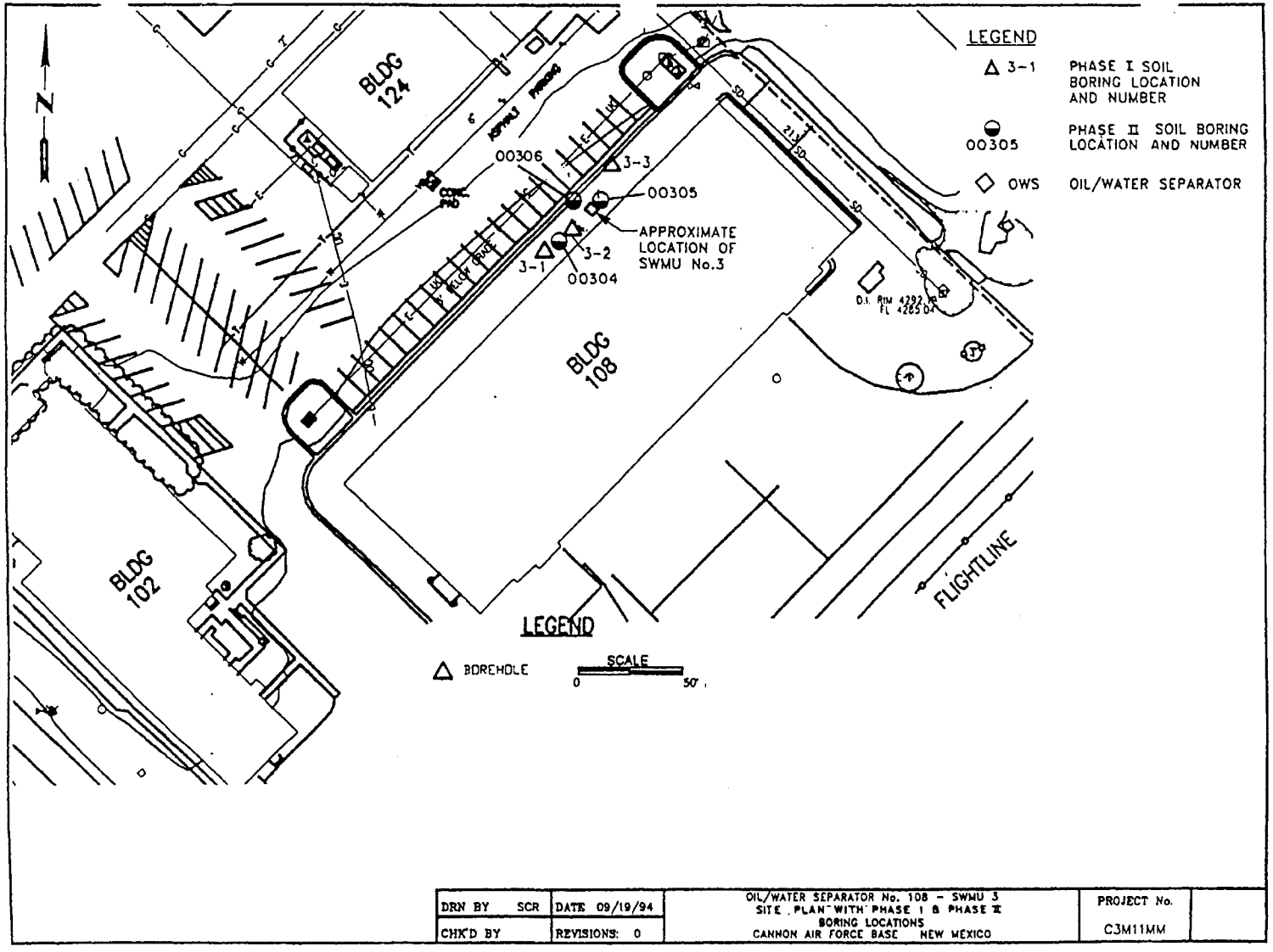


Figure 23-1
SWMU 3
Source: Woodward-Clyde, 1997

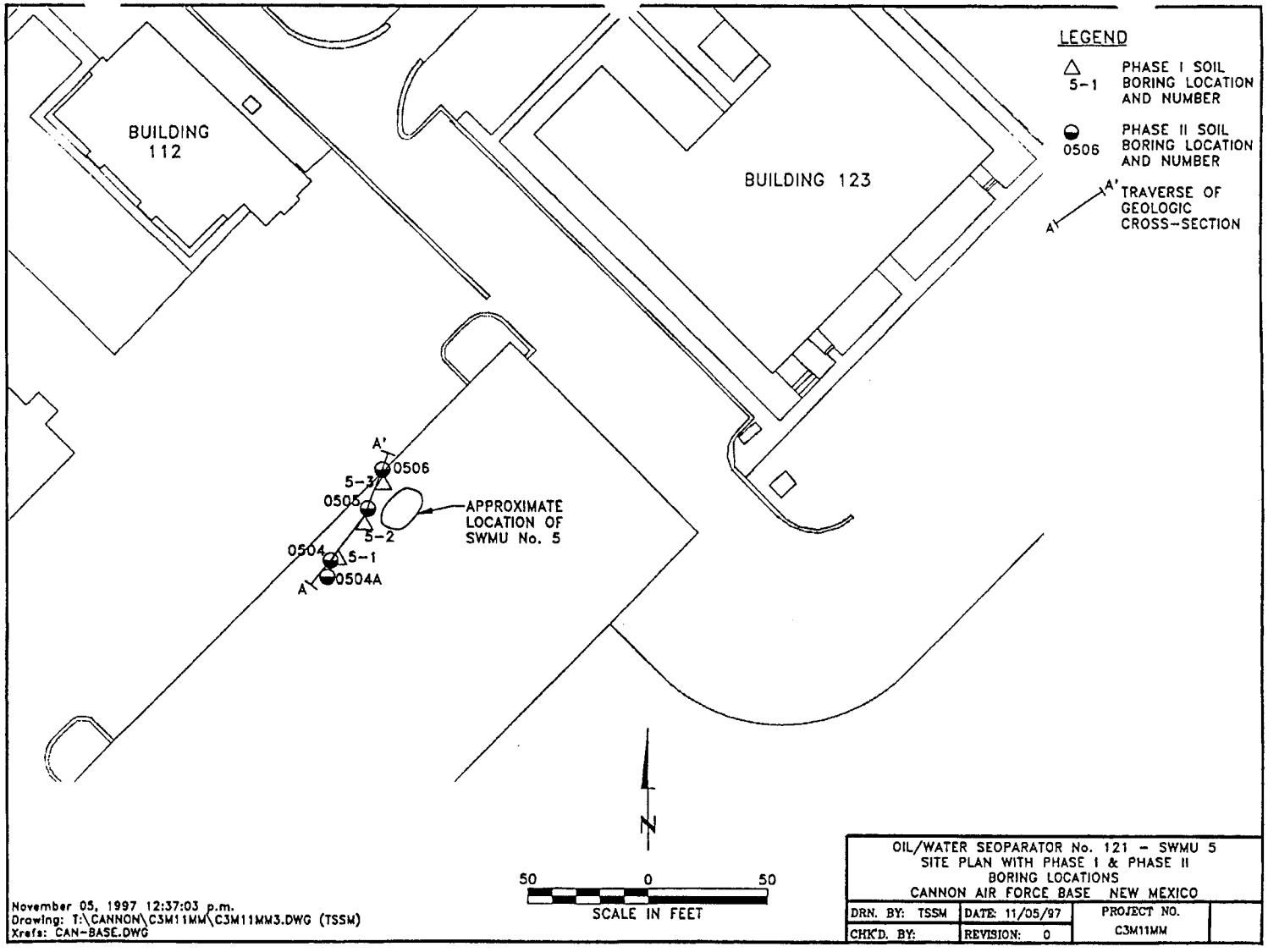


Figure 25-1
SWMU 5
Source: Woodward-Clyde, 1997

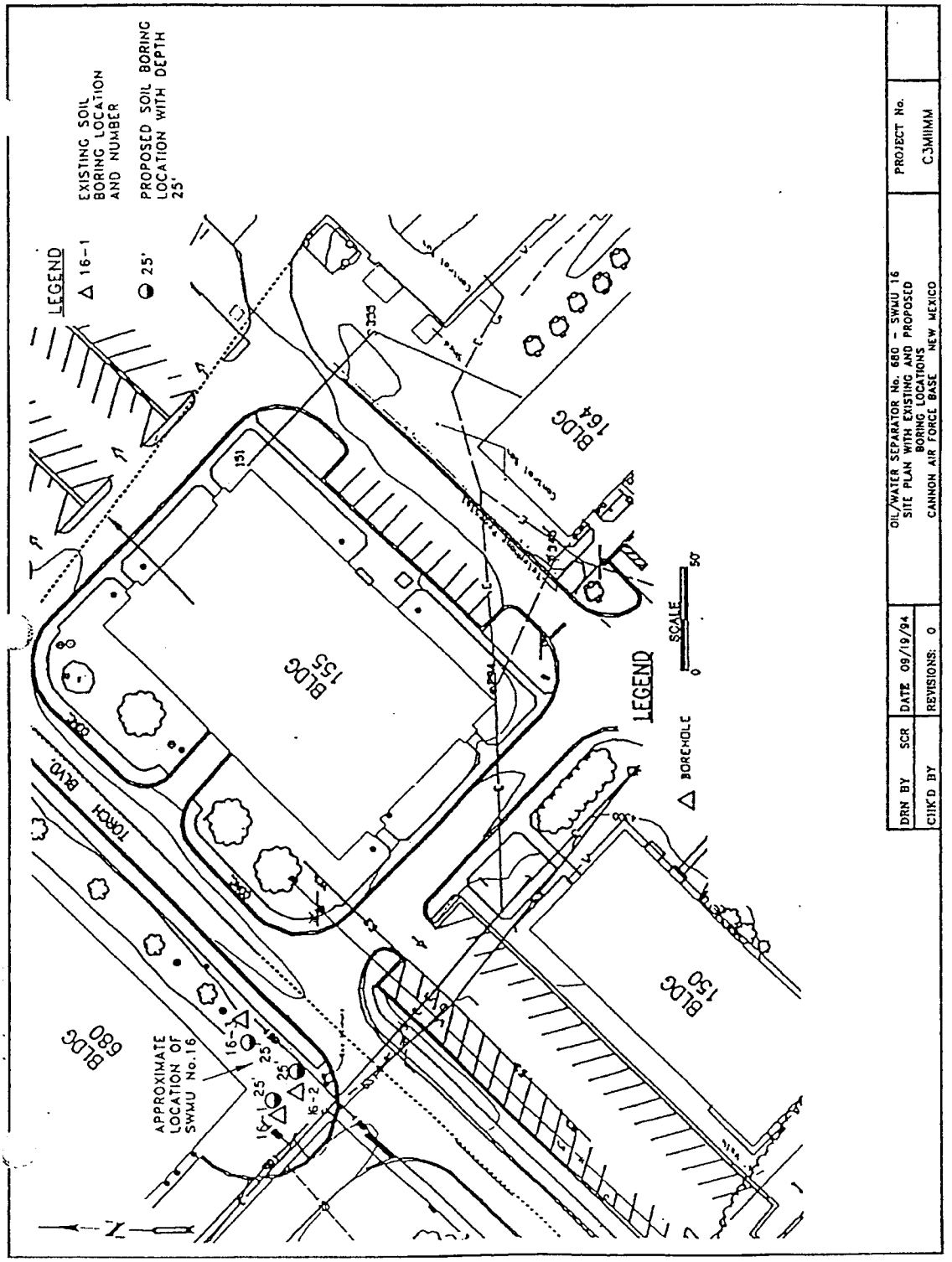


Figure 28-1

SWMU 16
Source: Woodward-Clyde, 1997

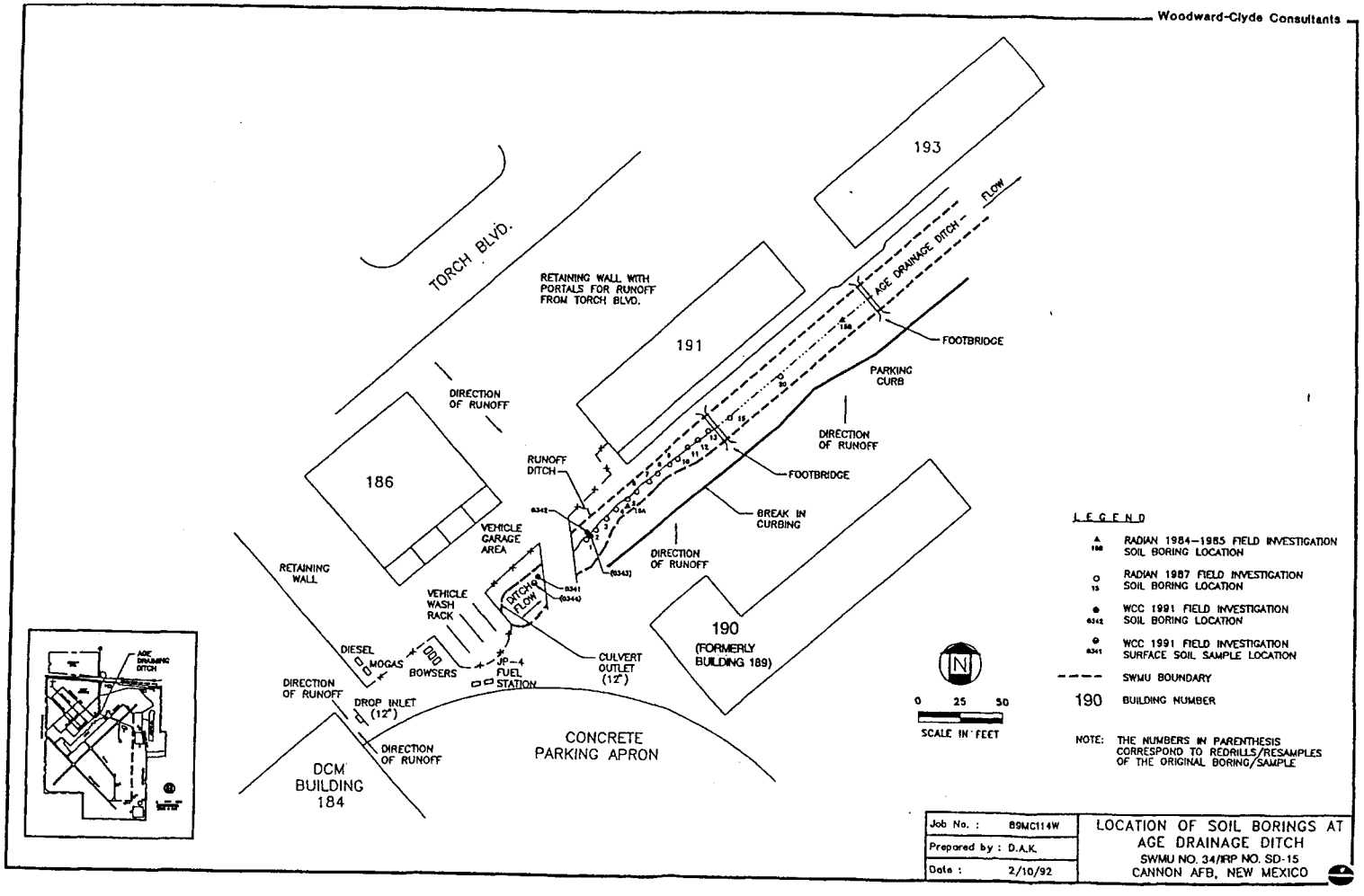


Figure 29-1
SWMU 34
Source: Woodward-Clyde, 1992

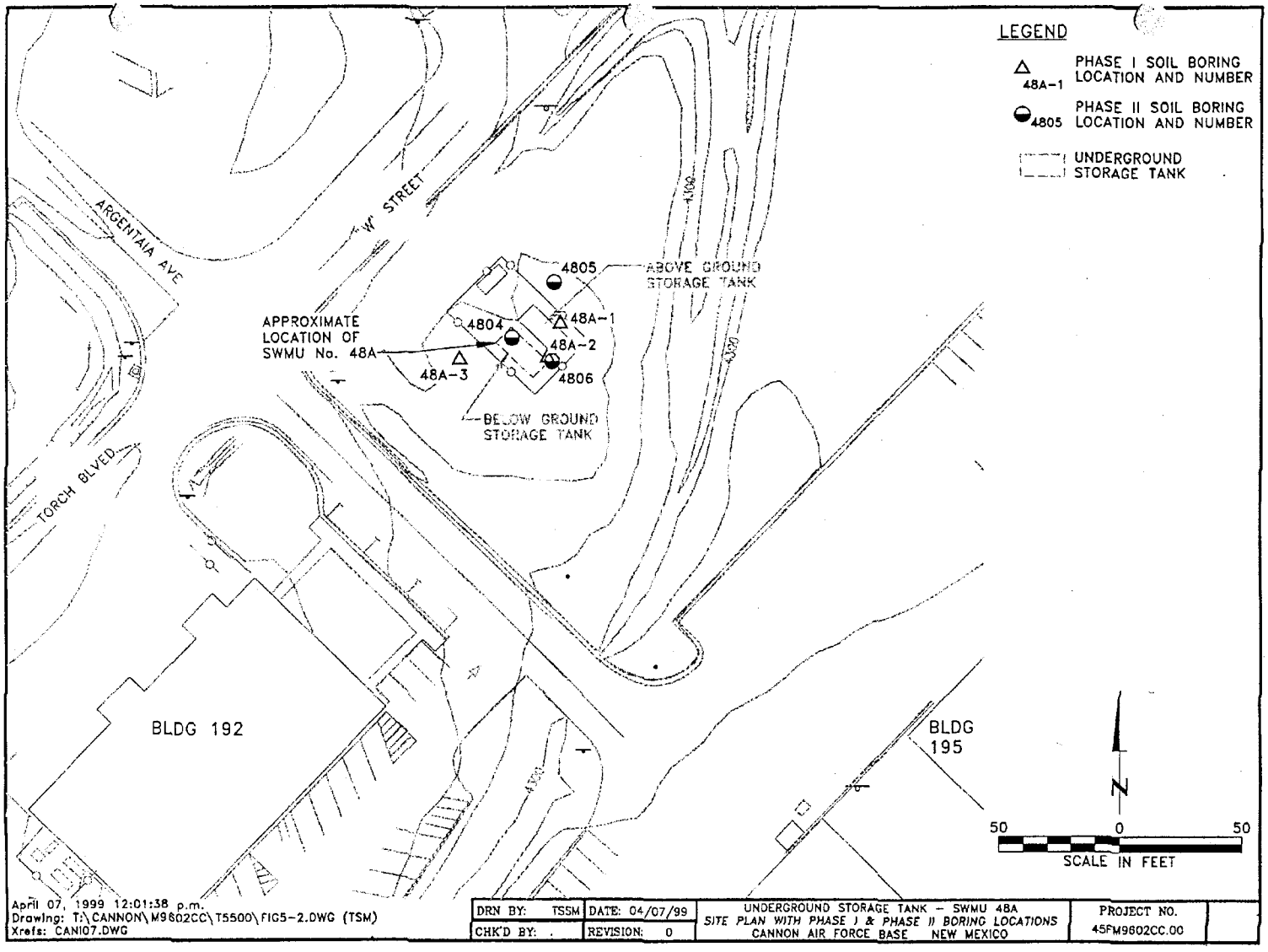


Figure 30-1
SWMU 48A
Source: URS Greiner Woodward Clyde, 2000

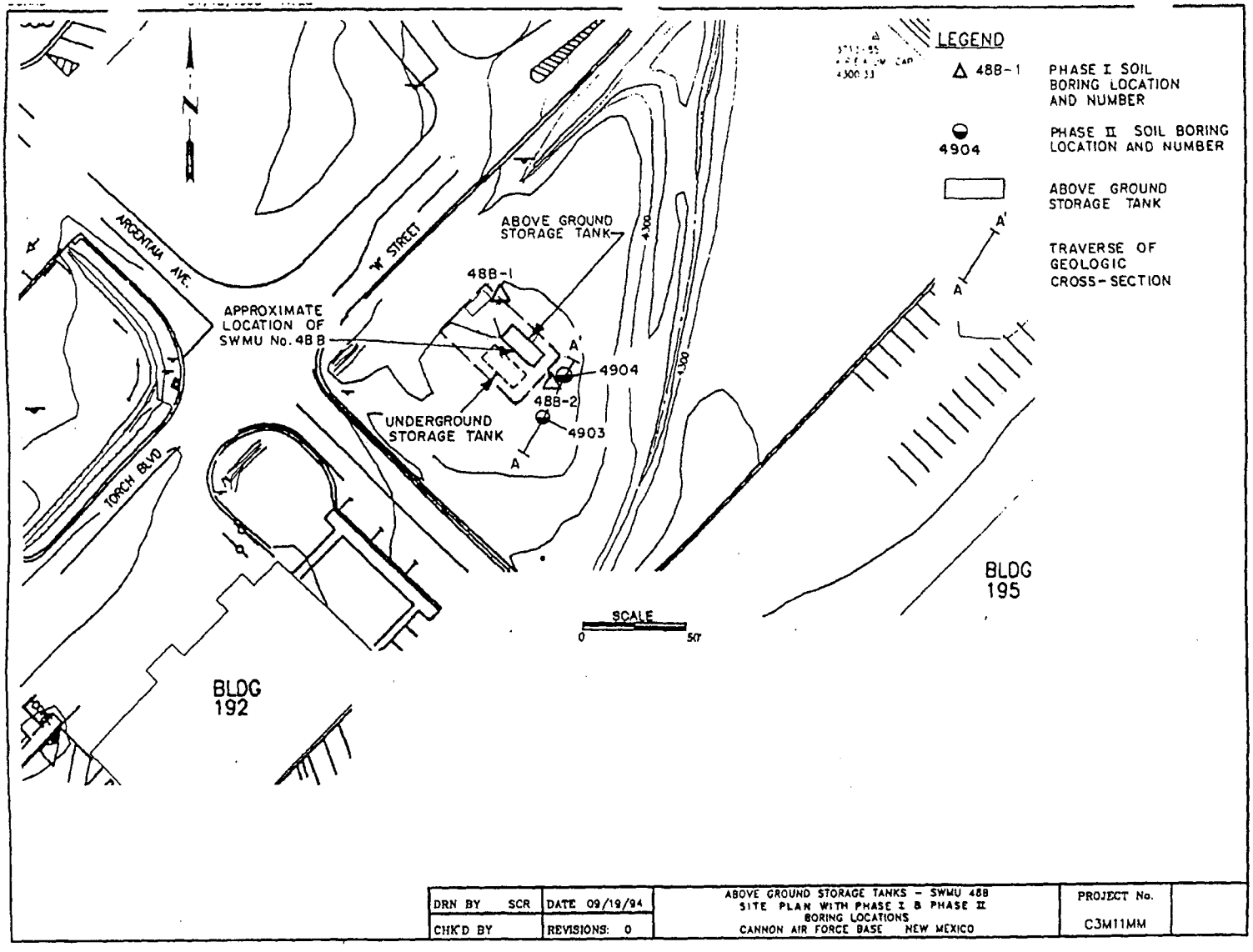


Figure 31-1
SWMU 48B
Source: Woodward-Clyde, 1997

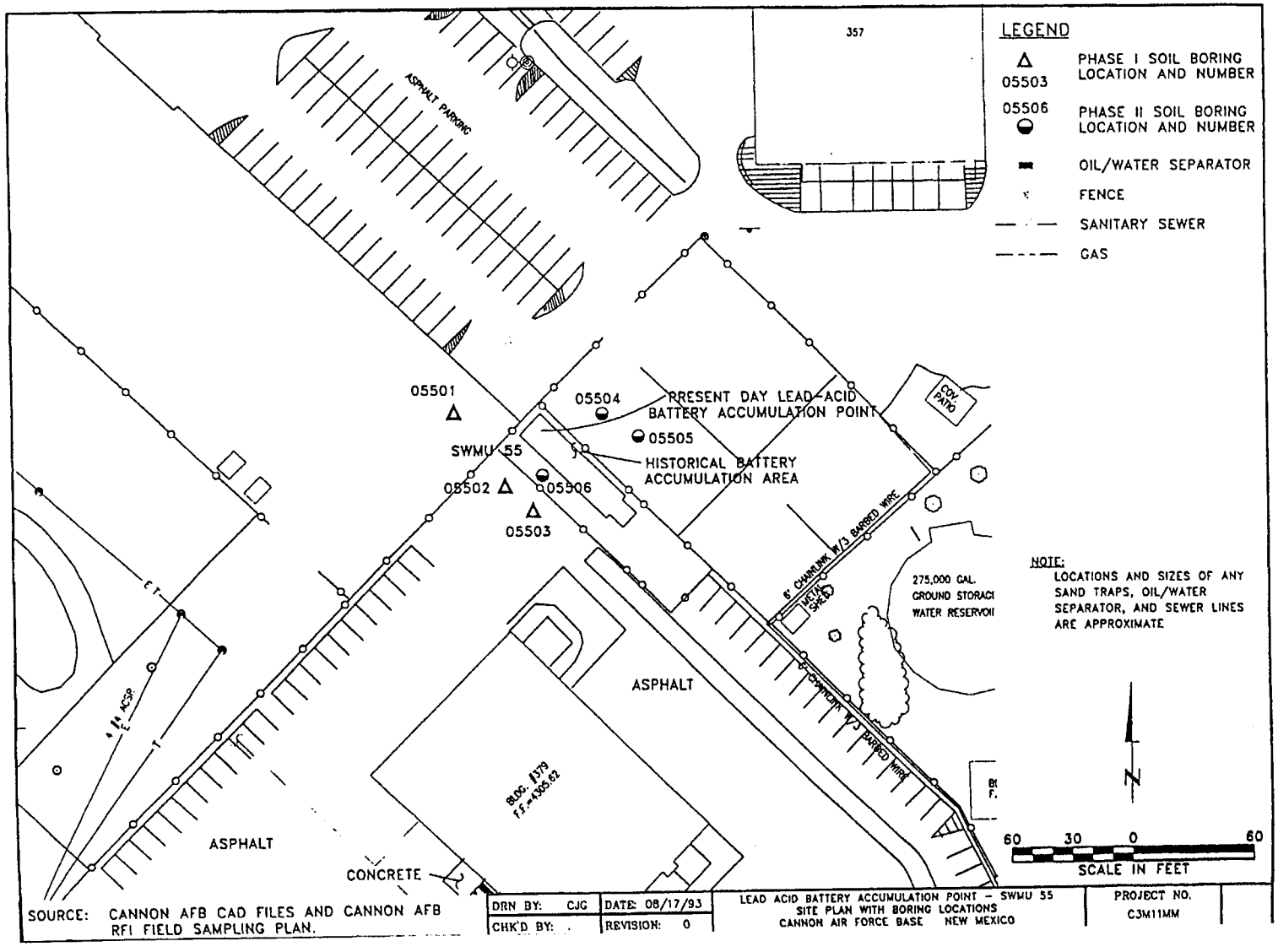


Figure 34-1
SWMU 55
Source: Woodward-Clyde, 1997

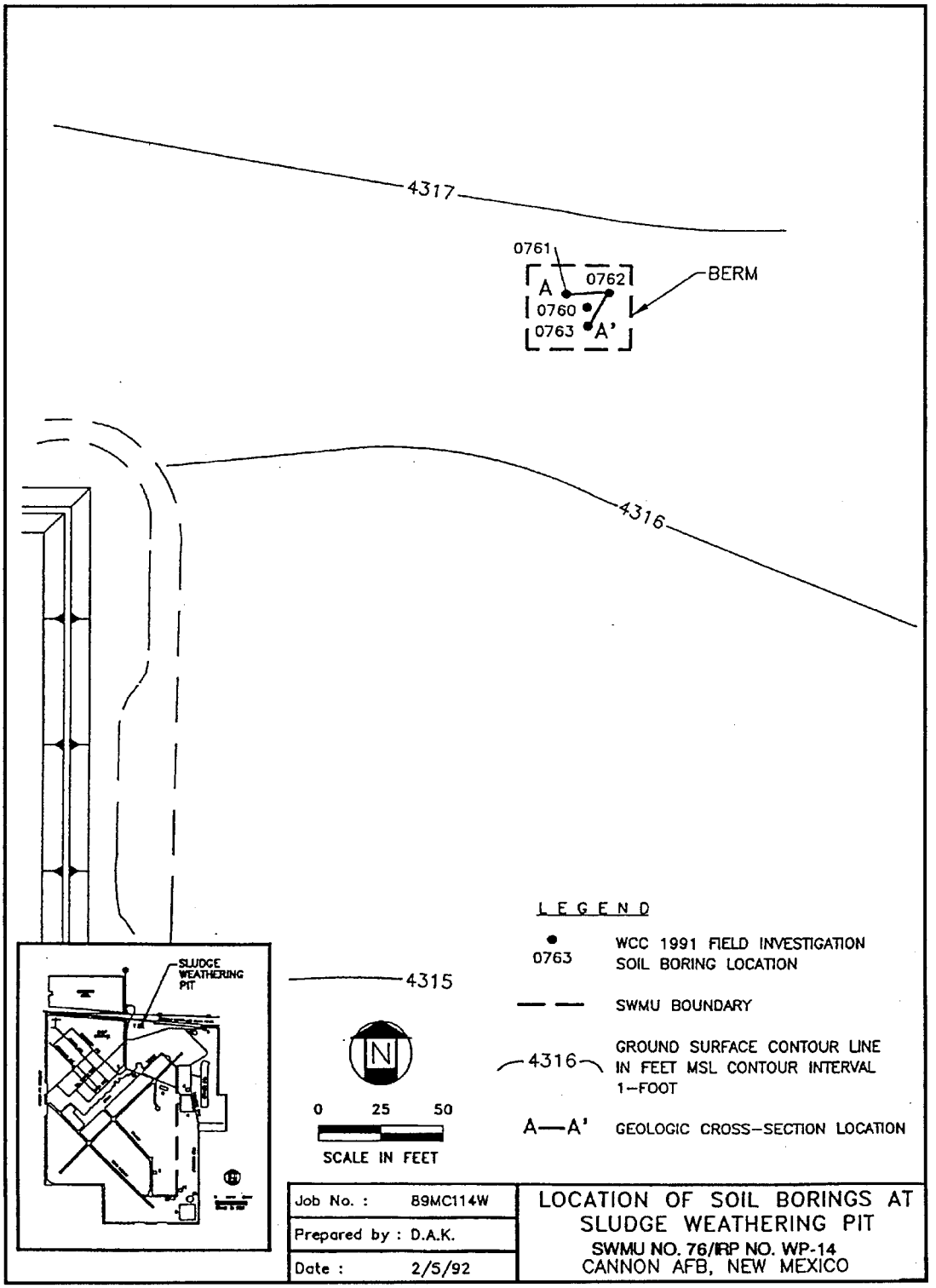


Figure 37-1

SWMU 76

Source: Woodward-Clyde, 1992

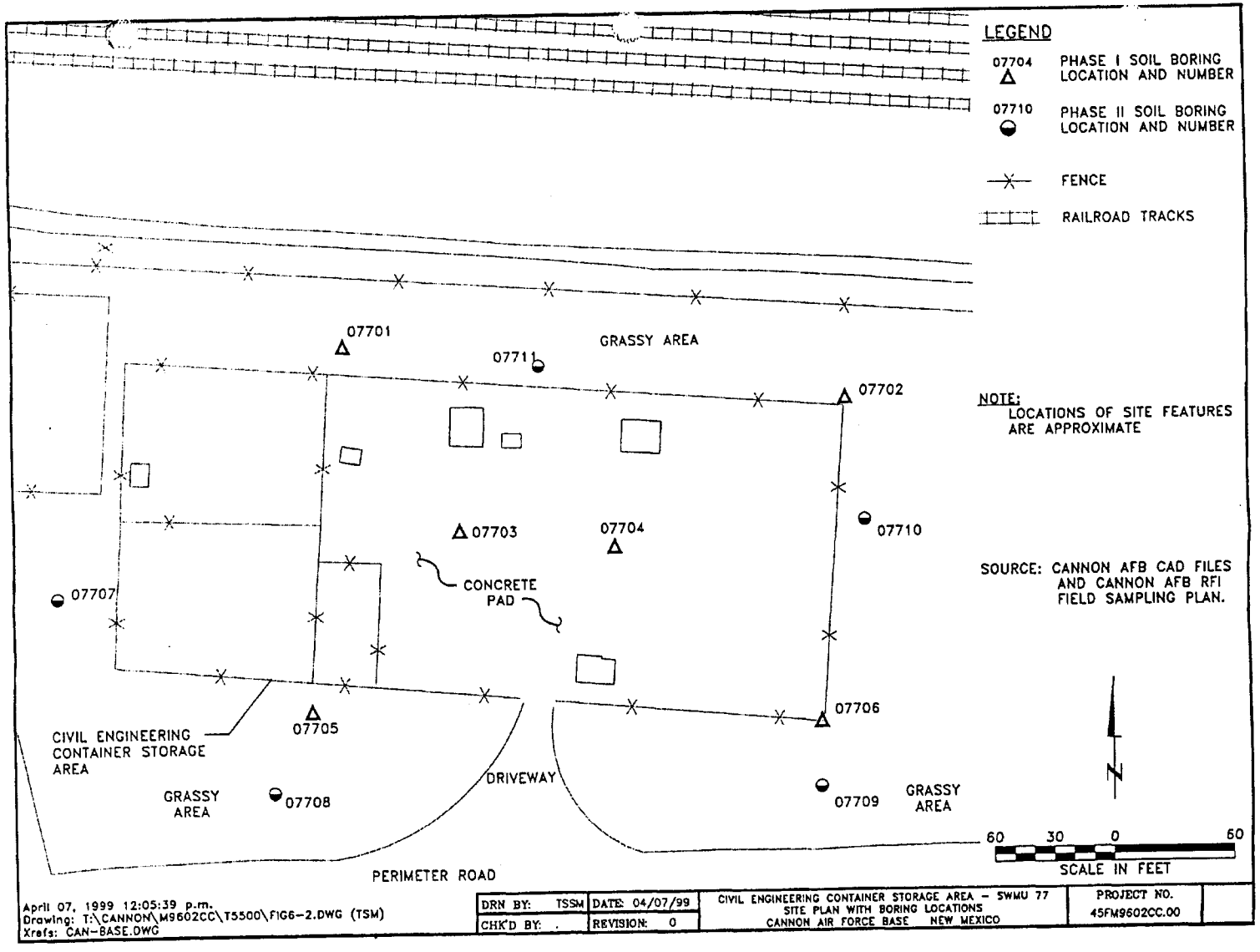


Figure 38-1
SWMU 77
Source: URS Greiner Woodward Clyde, 2000

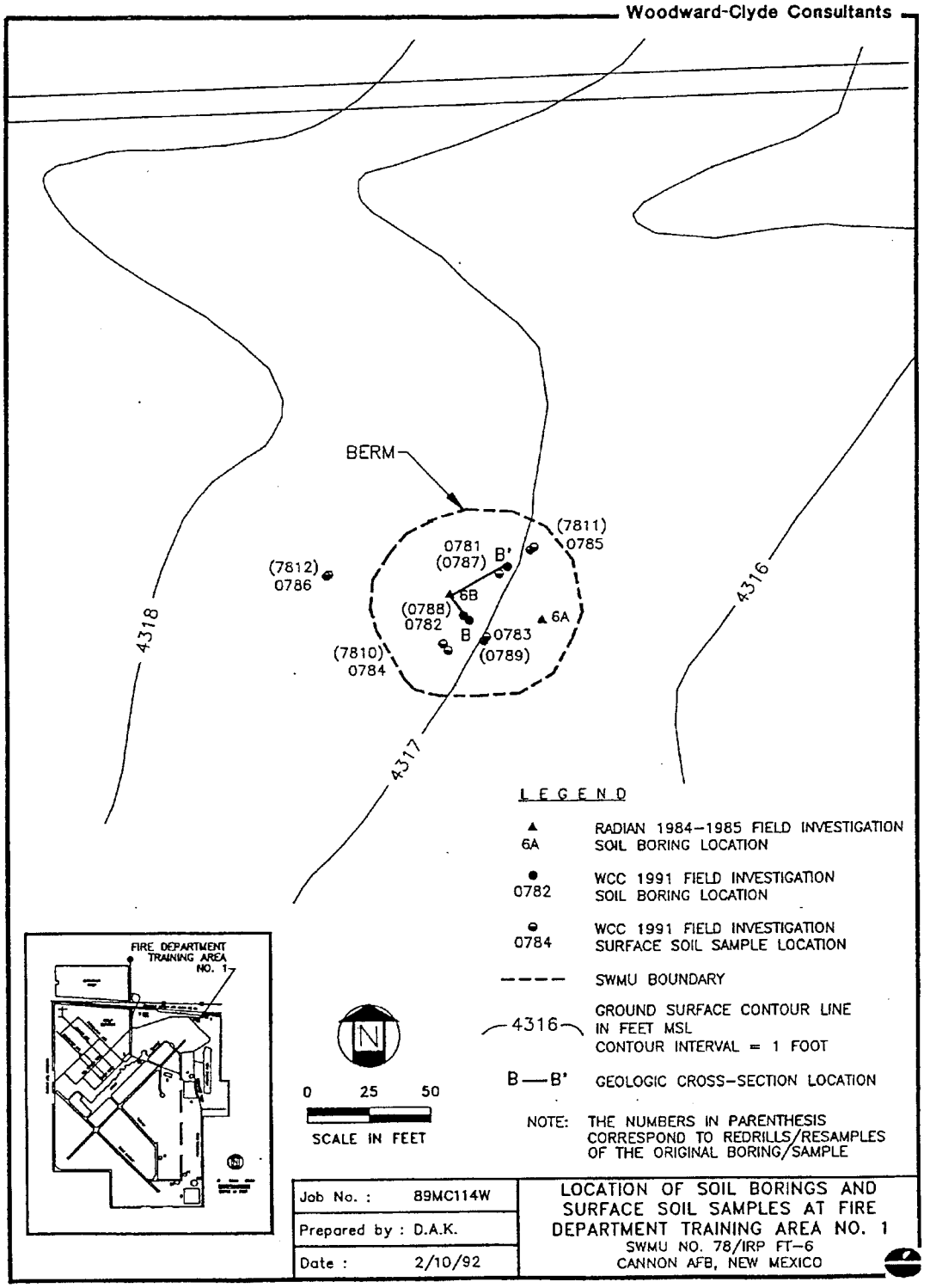


Figure 39-1

SWMU 78
Source: Woodward-Clyde, 1992

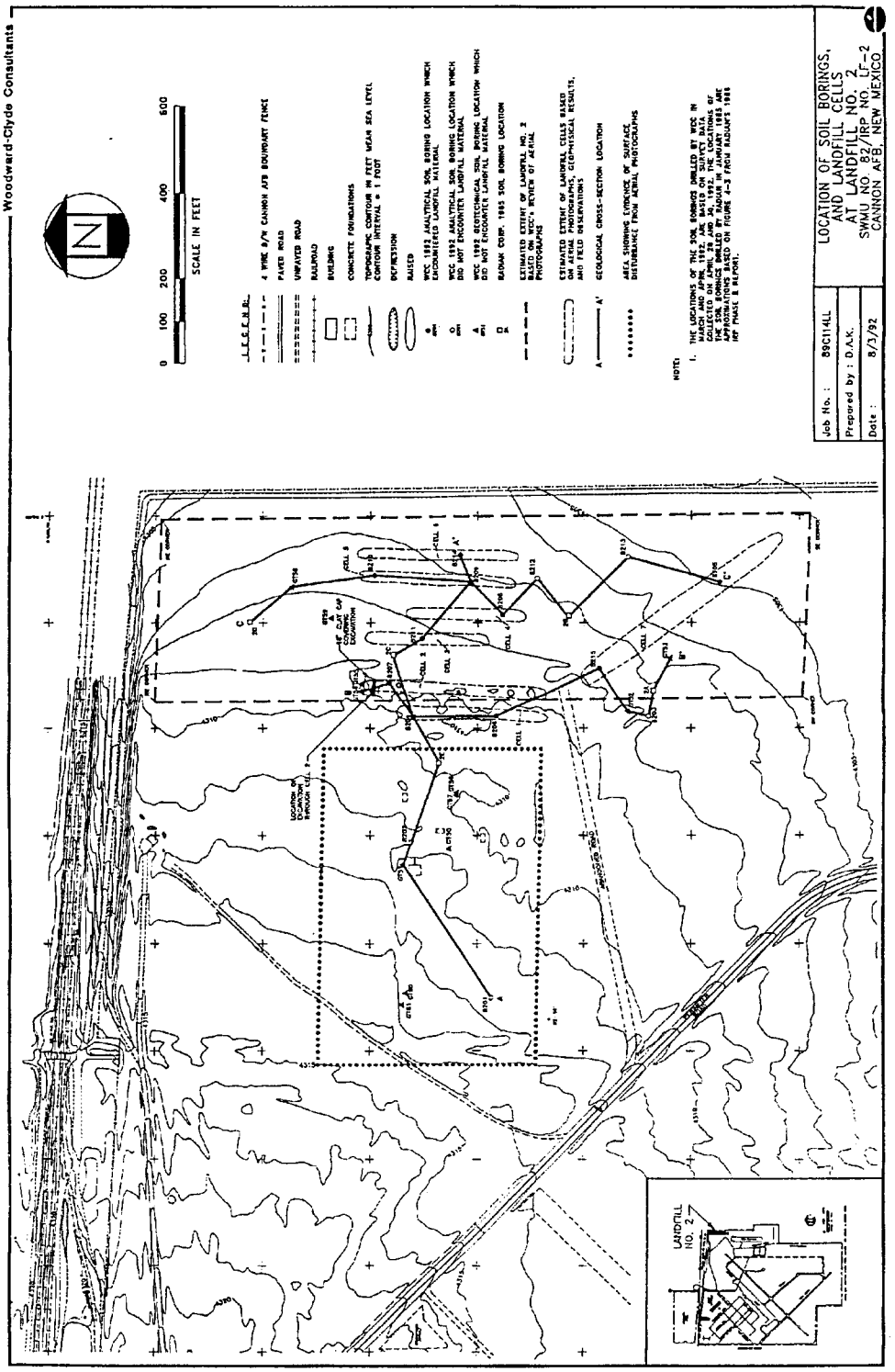


Figure 42-1

SWMU 82

Source: Woodward-Clyde, 1993

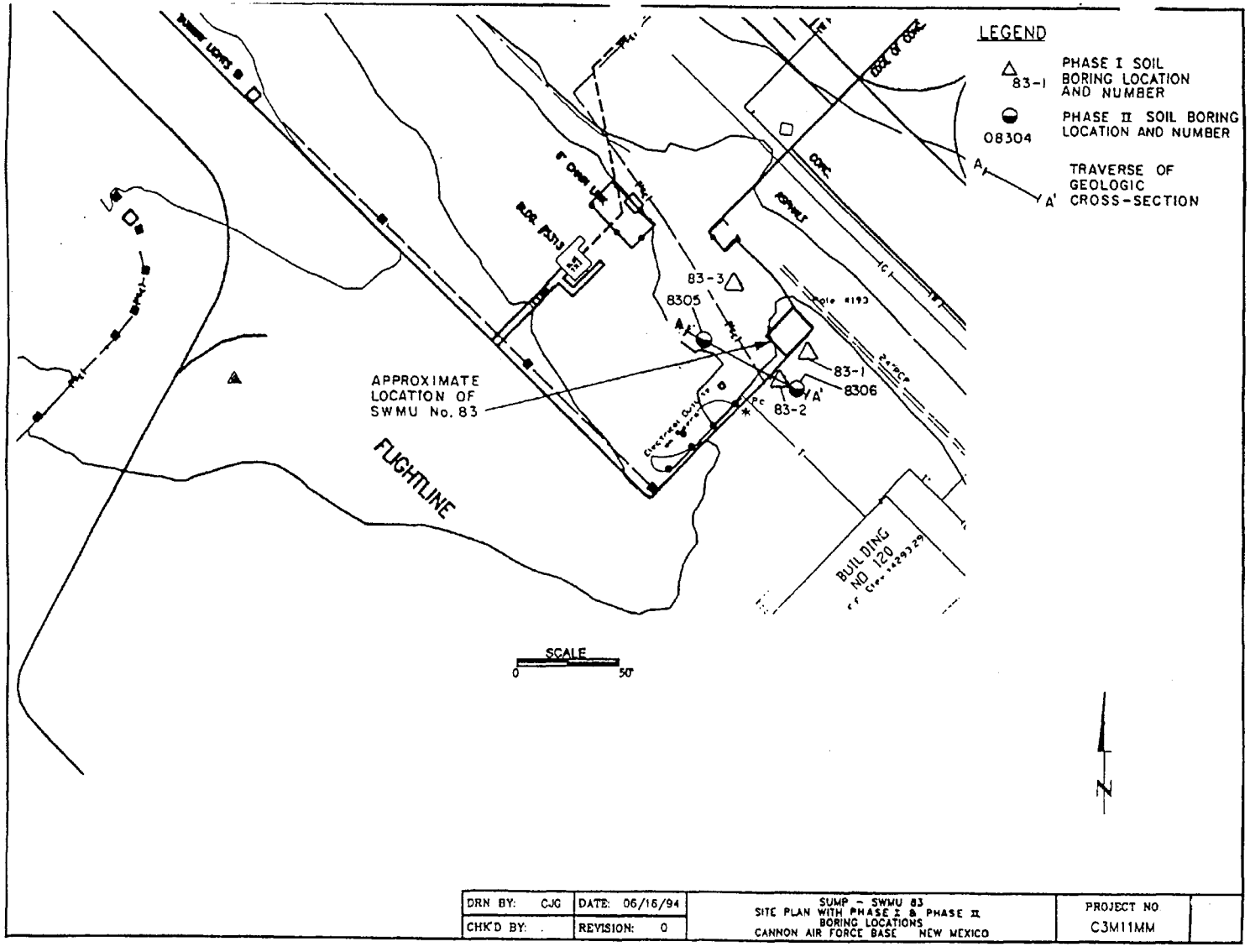
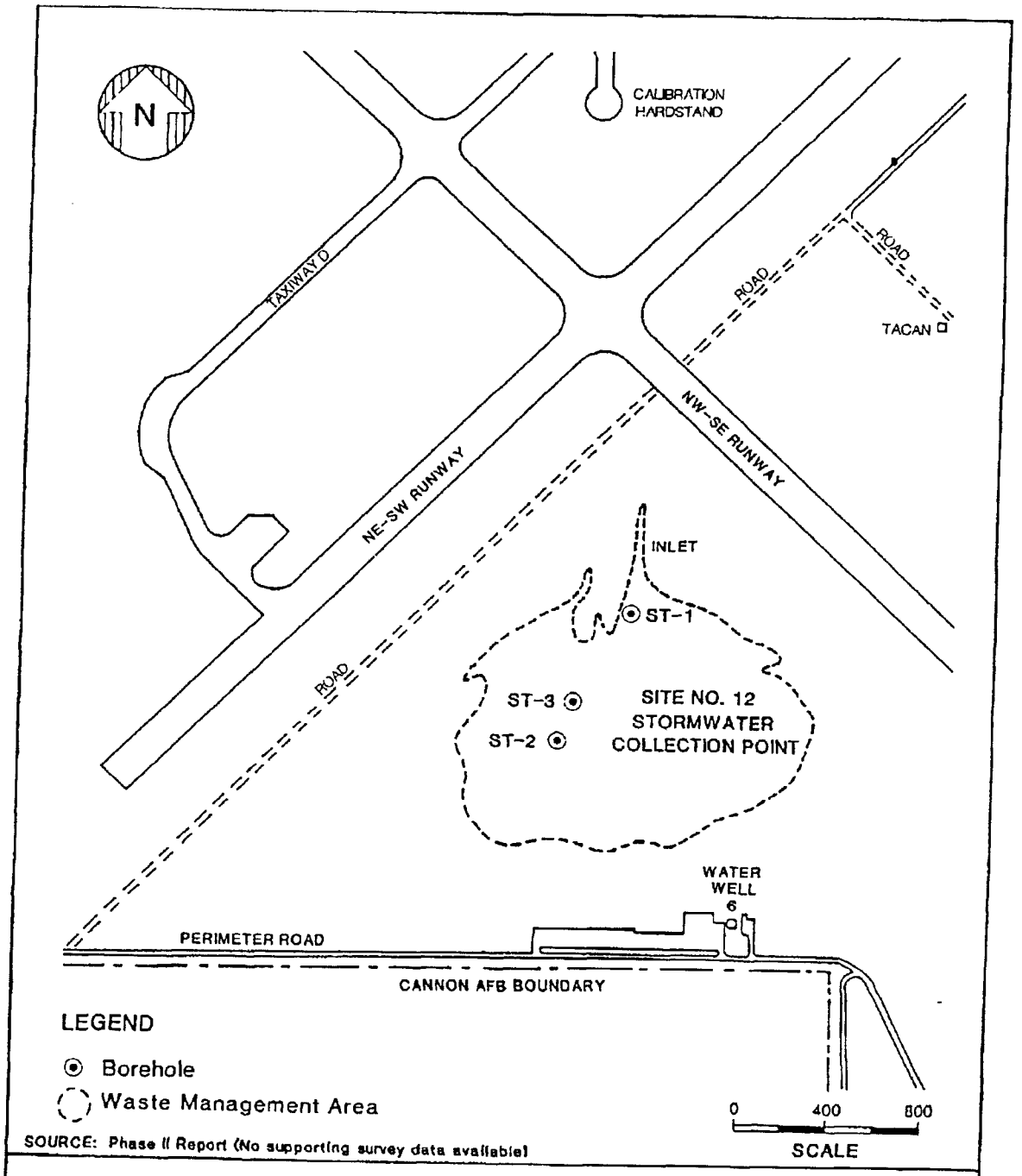


Figure 43-1
SWMU 83
Source: Woodward-Clyde, 1997

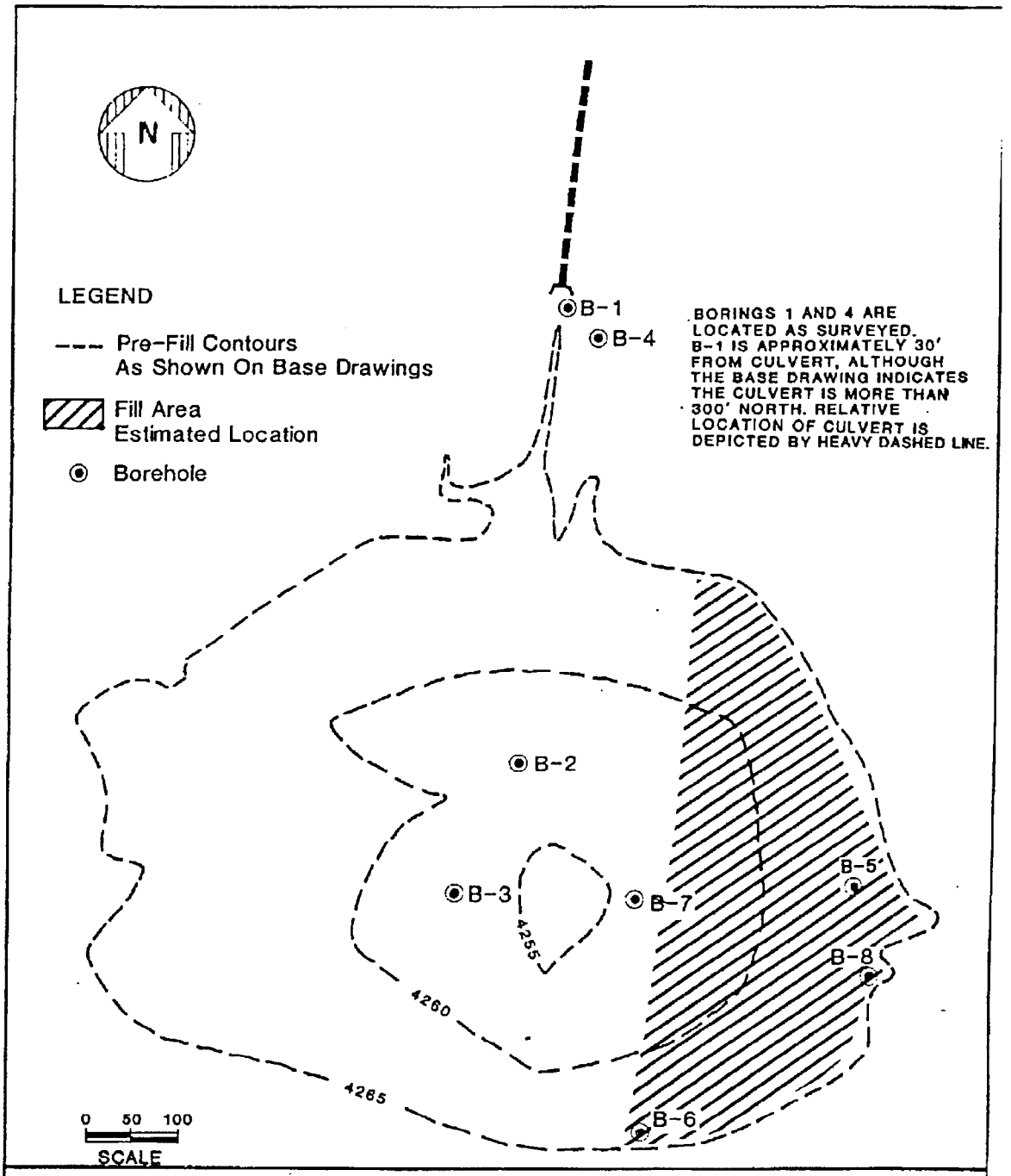


SITE 12: PHASE II SAMPLING LOCATIONS

Figure 44-1

SWMU 85

Source: Walk, Haydel & Associates, Inc., 1990



SITE 12: SOUTH STORMWATER COLLECTION POINT
RI SAMPLING LOCATIONS

Figure 44-2

SWMU 85

Source: Walk, Haydel & Associates, Inc., 1990

Table 21-1a
Concentration (µg/kg) of VOCs
SWMU 1

Borehole Number	Cannon Number	Depth (ft.)	Chemical	
			Toluene	Acetone
1	CAN001-1191-031A	Surface	9J	R
	CAN001-1191-032B	2.5	11U	11UJ
2	CAN001-1192-031A	Surface	36J	10UJ
	CAN001-1192-032B	2.5	11U	24J
3	CAN001-1193-031A	Surface	4J	R
	CAN001-1193-032B	2.5	11U	11UJ

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Science, Inc., 1993

Table 21-1b
Concentration (mg/kg) of Total Metals
SWMU 1

Borehole Number	Sample Number (CAN001-119)	Sample Depth (feet)	Chromium		Mercury		Nickel		Silver	
1	1-021A	0	13.6	J	0.01	UJ	8	J	5.8	J
	1-022B	2.5	4.8	J	0.11	UJ	4.8	J	*	R
	1-023C	5	8.6	J	0.11	UJ	6.3	J	*	R
	1-024D	10	7.2	J	0.01	UJ	5.2	J	*	R
2	2-021A	0	14.7	J	0.01	UJ	5.8	J	*	R
	2-022B	2.5	8.5	J	0.11	UJ	6.5	J	*	R
(QAD)	2-721B	2.5	8.8		**0.15**		6.7		0.41	U
(QCD)	2-821B	2.5	4.5	J	0.02	UJ	5.2	J	*	R
	2-023C	5	10.2	J	0.11	UJ	9.2	J	*	R
	2-024D	10	4.1	J	0.11	UJ	5.1	UJ	*	R
3	3-021A	0	34.6	U	0.1	UJ	8	J	*	R
	3-022B	2.5	7.5	J	0.11	UJ	7	J	*	R
	3-023C	5	9.3	J	0.02	UJ	9.6	J	*	R
	3-024D	10	4.4		0.11	J	5.5	UJ	0.85	U
Background (95% UCL) (1)			12.50		0.13		9.00		2.20	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Science, Inc., 1993

Table 21-2a
Summary of Soil Sample Results
SWMU 1

Table 4.1-1

SUMMARY OF SWMU 1 SOIL SAMPLE RESULTS										
No.	Depth (ft.)	Location	PID (units) ppm	4030 TPH ppm	4030 BTEX ppm	SWA846 8020A BTEX mg/Kg	SWA846 M8015 DRO mg/Kg	SWA846 8260 mg/Kg	SWA846 8270B SOX mg/Kg	Total Metals >bkgd* mg/Kg
1	5	OWS	0.02	<100	10	ND	ND	NT	NT	NT
2	11	OWS	ND	<20	<10	ND	ND	NT	NT	NT
3	4	OWS	ND	<20	<10	NT	NT	NT	NT	NT
4	11	OWS	ND	<20	<10	NT	NT	NT	NT	NT
5	11	OWS	ND	<20	<10	NT	NT	NT	NT	NT
6	11	OWS	ND	<20	<10	ND	NT	NT	NT	NT
7	11	OWS	NT	NT	NT	NT	ND	ND	ND	Ba

ND indicates non-detect
NT indicates not tested
* Upper threshold limit of background concentration, see Section 4.3, References, item #3.

Source: US Army Corps of Engineers, 1999

Table 21-2b
Maximum Soil Sample Concentrations Results
SWMU 1

SWMU 1 Maximum Soil Sample Concentrations						
Sample No.	Total Metals mg/Kg		TCLP Metals mg/L	Background Conc. Region V1/ Cannon AFB' mg/Kg		Region VI Residential RBSL mg/Kg
7	Arsenic	< 3.0	< 0.40	1.1-16.7	3.6	0. 32 C
	Barium	1390	1.2	430	805	5300.0 N
	Chromium	9.9	<0.02	38	13.3	31 C
	Nickel	9.1	NT	16	11.4	1500.0N
	Lead	7.6	< 0.05	10-18	7.1	400.0 N

N - noncarcinogenic
C - carcinogenic
NT - not tested

'CAFB Background Investigation, 1997

Source: US Army Corps of Engineers, 1999

Table 23-1a
Concentration (µg/kg) of VOCs
SWMU 3

Borehole Number	Cannon Number	Depth (ft.)	Chemical	
			Toluene	Acetone
1	CAN003-1081-031A	Surface	8J	11UJ
	CAN003-1081-032C	5.0	11U	11UJ
	CAN003-1081-831C	5.0		8J (QCD)
2	CAN003-1082-031A	Surface	11U	11UJ
	CAN003-1082-032C	5.0	11U	11UJ
3	CAN003-1083-031A	Surface	11UJ	11UJ
	CAN003-1083-032C	5.0	11U	11UJ

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QCD = duplicate analyzed at the same lab as normal sample.

Source: LRL Sciences, Inc., 1993

Table 23-1b
Concentration (mg/kg) of Total Metals
SWMU 3

Borehole Number	Sample Number (CAN003-108)	Sample Depth (feet)	Barium	Chromium	Mercury	Nickel	Silver
1	1-021A	0	614	17.8 J	0.01 U	8.1	1.6
	1-022B	2.5	70.4	10.7 J	0.02 U	7.3 J	0.85 U
	1-023C	5	63.6	6.2 J	0.02 U	7.5 J	0.93 U
(QAD)	1-721C	5	112	**10.2**	**0.15**	**10.3**	0.41 U
(QCD)	1-821C	5	80.9	8.5 J	0.02 U	8.3 J	0.93 U
	1-024D	10	54.3	4.8 J	0.1 U	4.8 J	0.92 U
2	2-021A	0	483	6.1 J	0.01 U	9.2 J	21.1 U
	2-022B	2.5	101	7.2 J	0.02 U	**9.6** J	0.93 U
	2-023C	5	91.8	6.5 J	0.01 U	6.9 J	0.89 U
	2-024D	10	**816**	3 J	0.01 U	4.4 J	0.88 U
3	3-021A	0	632	16.4 J	0.01 U	7.5	1
	3-022B	2.5	196	7.7 J	0.02 U	6.8	0.92 U
	3-023C	5	66.5	5.9 J	0.03 U	8.5	0.95 U
	3-024D	10	753	2.7 J	0.02 U	4.4	0.98
Background (95% UCL) (1)			642.00	12.50	0.13	9.00	2.20

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 23-2
Summary of Compounds Detected in Soil Samples
SWMU 3

LOCATOR	CAN003-0304-0000			CAN003-0304-0005			CAN003-0304-6005 [1]			CAN003-0304-0010			CAN003-0304-0015			CAN003-0304-0020		
LAB SAMPLE NUMBER	0397770006SA			0397770013SA			0397770017SA			0397770014SA			0397770015SA			0397770016SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	11	10		<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methylene chloride	<	5.2	U	3	5.7	J	3.9	5.7	J	2.9	5.7	J	3.4	5.5	J	4	5.7	J
Toluene	11	5.2		<	5.7	U	5	5.7	J	<	5.7	U	<	5.5	U	<	5.7	U
Semivolatile Organics (µg/kg)																		
Benzo(a)anthracene	130	350	J	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Benzo(a)pyrene	220	350	J	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Benzo(b)fluoranthene	140	350	J	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Benzo(g,h,i)perylene	39	350	J	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
bis(2-Ethylhexyl)phthalate	<	350	U	300	370	J	640	380		170	380	J	230	360	J	350	380	J
Chrysene	470	350		<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Di-n-octyl phthalate	<	350	U	<	370	U	890	380		<	380	U	<	360	U	<	380	U
Dibenz(a,h)anthracene	58	350	J	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Fluoranthene	49	350	J	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Phenanthrene	<	350	U	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Pyrene	<	350	U	<	370	U	<	380	U	<	380	U	<	360	U	<	380	U
Metals (mg/kg)																		
Aluminum	2380	21		10500	11.3		8700	11.4		5200	22.9		4670	54.9		6260	23	
Arsenic	4.6	0.52		2.1	0.57		2.3	0.57		1.6	0.57		1.5	0.55		1	0.57	
Barium	951	2.1	J	106	1.1		184	1.1		107	2.3		914	5.5		1510	2.3	
Beryllium	<	0.42	U	0.51	0.23		0.53	0.23		0.3	0.46	J	<	1.1	U	<	0.46	U
Calcium	132000	42		35000	22.6		38600	22.8		199000	45.8		301000	110		208000	45.9	
Chromium	3.2	2.1		9.1	1.1		8.9	1.1		3.5	2.3		<	5.5	U	3.7	2.3	
Cobalt	1.9	2.1	J	4.7	1.1		4.9	1.1		2.8	2.3		<	5.5	U	<	2.3	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] MS/MSD for the preceeding sample number.

Page 1 of 6

Source: Woodward-Clyde, 1997

Table 23-2
Summary of Compounds Detected in Soil Samples
SWMU 3

LOCATOR	CAN003-0304-0000			CAN003-0304-0005			CAN003-0304-6005 [1]			CAN003-0304-0010			CAN003-0304-0015			CAN003-0304-0020		
LAB SAMPLE NUMBER	0397770006SA			0397770013SA			0397770017SA			0397770014SA			0397770015SA			0397770016SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Copper	5.5	4.2	J	7.8	2.3		16.9	2.3		3.6	4.6	J	3.7	11	J	2	4.6	J
Iron	5460	21		9660	11.3		9240	11.4		3900	22.9		2810	54.9		3410	23	
Lead	4.1	0.52	J	8.8	0.57		9.9	1.1		3.4	1.1		1.8	0.55		4.7	0.57	
Magnesium	1540	42		2470	22.6		2330	22.8		4470	45.8		4900	110		11200	45.9	
Manganese	618	2.1	J	184	1.1		219	1.1		54.8	2.3		26.3	5.5		25.6	2.3	
Nickel	6.4	8.4	J	8.4	4.5		8.8	4.6		7.5	9.2	J	<	22	U	5.8	9.2	J
Potassium	372	1050	J	2060	566		1910	569		1020	1150	J	968	2750	J	893	1150	J
Vanadium	25.3	2.1		18.5	1.1		19.5	1.1		9.3	2.3		7.9	5.5		12	2.3	
Zinc	18.6	4.2		24.4	2.3		24.1	2.3		9.8	4.6		8.2	11	J	8	4.6	
TRPH (mg/kg)																		
Total Petroleum Hydrocarbons	1120	126	J	51.2	45.2		615	45.6		<	45.8	U	<	43.9	U	<	45.9	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] MS/MSD for the preceeding sample number.

Page 2 of 6

Source: Woodward-Clyde, 1997

Table 23-2
Summary of Compounds Detected in Soil Samples
SWMU 3

LOCATOR	CAN003-0305-0000			CAN003-0305-0005			CAN003-0305-0361[2]			CAN003-0305-0010			CAN003-0305-0015			CAN003-0305-0020		
LAB SAMPLE NUMBER	0397770007SA			0397770008SA			0397770009SA			0397770010SA			0397770011SA			0397770012SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	7.8	11	J	8.5	11	J	<	11	U	<	11	U	3.9	12	J
Methylene chloride	<	5.4	U	1.2	5.7	J	<	5.6	U	<	5.6	U	<	5.7	U	3.4	5.8	J
Toluene	<	5.4	U	<	5.7	U	<	5.6	U	3.2	5.6	J	<	5.7	U	<	5.8	U
Semivolatile Organics (µg/kg)																		
Benzo(a)anthracene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Benzo(a)pyrene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Benzo(b)fluoranthene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Benzo(g,h,i)perylene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
bis(2-Ethylhexyl)phthalate	<	300	U	<	370	U	<	510	U	<	370	U	<	380	J	300	390	J
Chrysene	44	360	J	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Di-n-octyl phthalate	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Dibenz(a,h)anthracene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Fluoranthene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Phenanthrene	<	360	U	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Pyrene	47	360	J	<	370	U	<	370	U	<	370	U	<	380	U	<	390	U
Metals (mg/kg)																		
Aluminum	2770	10.9		8670	22.7		6550	22.4		4690	11.2		8150	11.4		6560	58.3	
Arsenic	3.9	0.54		2.4	0.57		2	0.56		2.6	0.56		1.8	0.57		1.2	0.58	
Barium	682	1.1	J	147	2.3	J	303	2.2	J	162	1.1	J	702	1.1	J	398	5.8	
Beryllium	<	0.22	U	0.42	0.45	J	0.26	0.45	J	0.44	0.22		0.63	0.23		<	1.2	U
Calcium	89400	21.7		117000	45.4		149000	44.8		73500	22.4		113000	22.9		279000	117	
Chromium	4.3	1.1		5.9	2.3		5	2.2		5	1.1		5.8	1.1		<	5.8	U
Cobalt	2.2	1.1		3	2.3		3.4	2.2		3.4	1.1		3.2	1.1		<	5.8	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[2] Duplicate sample for the preceeding sample number.

Page 3 of 6

Source: Woodward-Clyde, 1997

Table 23-2
Summary of Compounds Detected in Soil Samples
SWMU 3

LOCATOR	CAN003-0305-0000			CAN003-0305-0005			CAN003-0305-0361[2]			CAN003-0305-0010			CAN003-0305-0015			CAN003-0305-0020		
LAB SAMPLE NUMBER	0397770007SA			0397770008SA			0397770009SA			0397770010SA			0397770011SA			0397770012SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Copper	4.6	2.2	J	5.8	4.5	J	4.5	4.5	J	5	2.2	J	3.7	2.3	J	5.5	11.7	J
Iron	4750	10.9		7460	22.7		6210	22.4		5950	11.2		5980	11.4		3690	58.3	
Lead	4.6	0.54	J	4.4	1.1	J	3.8	0.56	J	4.4	1.1	J	5	0.57	J	1.6	0.58	
Magnesium	1280	21.7		2810	45.4		3620	44.8		2620	22.4		4660	22.9	J	20600	117	
Manganese	389	1.1	J	94.5	2.3	J	95.6	2.2	J	110	1.1	J	80.3	1.1		30.7	5.8	
Nickel	3.4	4.3	J	7.4	9.1	J	5.4	9	J	7.4	4.5		6.2	4.6		<	23.3	U
Potassium	462	543	J	1580	1140		1400	1120		1220	559		2000	572		963	2920	J
Vanadium	18.4	1.1		16.8	2.3		18.5	2.2		21.5	1.1		14.4	1.1		15.2	5.8	
Zinc	13.6	2.2		17.6	4.5		14.6	4.5		13.6	2.2		15.2	2.3		<	11.7	U
TRPH (mg/kg)																		
Total Petroleum Hydrocarbons	191	43.5	J	<	45.4	U	<	44.8	U	<	44.7	U	<	45.7	U	<	46.7	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[2] Duplicate sample for the preceeding sample number.

Page 4 of 6

Source: Woodward-Clyde, 1997

Table 23-2
Summary of Compounds Detected in Soil Samples
SWMU 3

LOCATOR	CAN003-0306-0000			CAN003-0306-0005			CAN003-0306-0010			CAN003-0306-0015			CAN003-0306-0020		
LAB SAMPLE NUMBER	0397770001SA			0397770002SA			0397770003SA			0397770004SA			0397770005SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	9.8	11	J	7.6	11	J	2.5	11	J	<	11	U	6.5	12	J
Methylene chloride	1.8	5.4	J	2.5	5.7	J	2.3	5.6	J	1.9	5.5	J	<	6	U
Toluene	1.5	5.4	J	<	5.7	U	<	5.6	U	<	5.5	U	<	6	U
Semivolatile Organics (µg/kg)															
Benzo(a)anthracene	42	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Benzo(a)pyrene	100	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Benzo(b)fluoranthene	70	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Benzo(g,h,i)perylene	<	360	U	<	380	U	<	370	U	<	360	U	<	390	U
bis(2-Ethylhexyl)phthalate	<	540	U	<	380	U	<	370	U	<	360	U	<	530	U
Chrysene	130	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Di-n-octyl phthalate	540	360		<	380	U	<	370	U	<	360	U	<	390	U
Dibenz(a,h)anthracene	<	360	U	<	380	U	<	370	U	<	360	U	<	390	U
Fluoranthene	71	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Phenanthrene	52	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Pyrene	190	360	J	<	380	U	<	370	U	<	360	U	<	390	U
Metals (mg/kg)															
Aluminum	2640	21.7		7240	23		3800	22.3		4390	11		6960	23.9	
Arsenic	4.8	0.54		2.3	0.57		1.5	0.56		1.4	0.55		0.91	0.6	
Barium	1530	2.2	J	110	2.3	J	421	2.2	J	107	1.1	J	1090	2.4	J
Beryllium	<	0.43	U	0.46	0.46		<	0.45	U	0.36	0.22		<	0.48	U
Calcium	145000	43.3		156000	46		154000	44.6		56900	21.9		190000	47.8	
Chromium	4.6	2.2		5.3	2.3		1.6	2.2	J	4.1	1.1		4.5	2.4	
Cobalt	2.1	2.2	J	4.5	2.3		1.4	2.2	J	2.8	1.1		1.9	2.4	J

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.

Page 5 of 6

Source: Woodward-Clyde, 1997

Table 23-2
Summary of Compounds Detected in Soil Samples
SWMU 3

LOCATOR	CAN003-0306-0000			CAN003-0306-0005			CAN003-0306-0010			CAN003-0306-0015			CAN003-0306-0020		
LAB SAMPLE NUMBER	0397770001SA			0397770002SA			0397770003SA			0397770004SA			0397770005SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.															
Copper	6.3	4.3	J	6.8	4.6	J	2.5	4.5	J	2.8	2.2	J	3.5	4.8	J
Iron	5730	21.7		6830	23		3270	22.3		3870	11		3700	23.9	
Lead	5.4	0.54	J	6.9	2.9	J	2.6	1.1	J	3.8	0.55	J	2.2	0.6	J
Magnesium	1940	43.3		3200	46		2880	44.6		2310	21.9		22500	47.8	
Manganese	625	2.2	J	113	2.3	J	45.4	2.2	J	67.6	1.1	J	37.9	2.4	J
Nickel	4.9	8.7	J	8.3	9.2	J	<	8.9	U	3.7	4.4	J	6.6	9.6	J
Potassium	307	1080	J	1530	1150		893	1120	J	1250	548		1120	1190	J
Vanadium	23.2	2.2		17.2	2.3		9.5	2.2		12.1	1.1		16.9	2.4	
Zinc	15.6	4.3		17.2	4.6		7.8	4.5		10.1	2.2		9.3	4.8	
TRPH (mg/kg)															
Total Petroleum Hydrocarbons	771	43.3	J	<	46	U	<	44.6	U	<	43.8	U	<	47.8	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.

Page 6 of 6

Source: Woodward-Clyde, 1997

Table 25-1a
Concentration (µg/kg) of VOCs
SWMU 5

BOREHOLE NUMBER	CANNON NUMBER	DEPTH (ft.)	CHEMICAL
			ACETONE
1	CAN005-1211-031A	Surface	11UJ
	CAN005-1211-032D	10.0	12UJ
2	CAN005-1212-031A	Surface	11UJ
	CAN005-1212-032D	10.0	14J
3	CAN005-1213-031A	Surface	11UJ
	CAN005-1213-032D	10.0	11UJ
	CAN005-1213-831D	10.0	16J (QCD)

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QCD = duplicate analyzed at same lab as normal sample.

Source: LRL Sciences, Inc., 1993

Table 25-1b
Concentration (mg/kg) of Total Metals
SWMU 5

Borehole Number	Sample Number (CAN005-121)	Sample Depth (feet)	Barium	Mercury		Nickel	
1	1-021A	0	341	0.1	U	7.3	
	1-022B	2.5	68.5	0.1	U	**10.1**	
	1-023C	5	90.3	0.1	U	6.5	
	1-024D	10	37.9	0.1	U	7.6	
2	2-021A	0	357	0.1	U	6	UJ
	2-022B	2.5	60.9	0.1	U	**12.7**	
	2-023C	5	118	0.1	U	7.4	
	2-024D	10	344	0.1	U	**10.1**	
3	3-021A	0	337	0.1	U	6.6	
	3-022B	2.5	65.4	0.1	U	9.9	
	3-023C	5	73.1	0.1	U	7.7	
	3-024D	10	597	0.1	U	5.9	
(QAD)	3-721D	10	749	**0.2**		8.1	
(QCD)	3-821D	10	714	0.1	U	5.2	
Background (95% UCL) (1)			642.00	0.13		9.00	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 25-2a
Summary of Compounds Detected in Soil
SWMU 5

LOCATOR	CAN005-0504-0000			CAN005-0504-0005			CAN005-0504-0010			CAN005-0504-0015			CAN005-0504-6015[1]			CAN005-0504-0020		
LAB SAMPLE NUMBER	0397760006SA			0397760007SA			0397760008SA			0397760009SA			0397760011SA			0397760010SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	13	11		7.7	12	J	6.8	11	J	<	11	U	9.7	11	J	<	11	U
Methylene chloride	3.1	5.7	J	3.2	5.8	J	3.1	5.7	J	3.1	5.7	J	1.3	5.7	J	3.3	5.7	J
Toluene	1.2	5.7	J	3.2	5.8	J	<	5.7	U	2.6	5.7	J	<	5.7	U	<	5.7	U
Semivolatile Organics (ug/kg)																		
bis(2-Ethylhexyl)phthalate	<	370	U	<	380	U	<	380	U	<	370	U	<	370	U	<	380	U
Metals (mg/kg)																		
Aluminum	6310	11.3		14300	11.6		7810	11.4		5760	11.3		4350	11.3		7830	11.4	
Arsenic	2.2	0.57		2.7	0.58		2.2	0.57		2.1	0.57		2.3	0.57		1.4	0.57	
Barium	142	1.1		95.8	1.2		360	1.1		222	1.1		152	1.1		231	1.1	
Beryllium	0.41	0.23		0.62	0.23		0.57	0.23		0.45	0.23		0.37	0.23		0.33	0.23	
Calcium	66600	22.6		37700	23.2		94900	22.8		71100	22.6		69400	22.6		111000	22.8	
Chromium	6	1.1		11.4	1.2		5.7	1.1		4.8	1.1		6.3	1.1		5.4	1.1	
Cobalt	3.1	1.1		4.3	1.2		3.4	1.1		3.1	1.1		2.9	1.1		2.4	1.1	
Copper	6.2	2.3		8.4	2.3		5.4	2.3		4.2	2.3		4.4	2.3		2.6	2.3	
Iron	6880	11.3		11200	11.6		6410	11.4		5530	11.3		5400	11.3		5290	11.4	
Lead	11.7	5.7		8.9	0.58		8.3	5.7		8.9	2.8		9.8	1.1		3.4	0.57	
Magnesium	3280	22.6		2630	23.2		3110	22.8		3160	22.6		2850	22.6		6000	22.8	
Manganese	109	1.1	J	171	1.2	J	93.1	1.1	J	99.9	1.1	J	93.7	1.1	J	39.3	1.1	
Nickel	5.8	4.5		10.4	4.6		6.4	4.6		5.4	4.5		7.9	4.5		<	4.6	U
Potassium	1190	566		2420	580		1730	571		1560	565		1270	565		1670	569	
Thallium	<	0.57	UJ	<	0.58	UJ	<	1.1	U	<	0.57	UJ	<	0.57	UJ	<	1.1	UJ
Vanadium	17	1.1		21.2	1.2		17.4	1.1		11.9	1.1		13.9	1.1		14.5	1.1	
Zinc	15.9	2.3		26.6	2.3		16.2	2.3		13.7	2.3		12	2.3		12.3	2.3	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	185	45.3		87.7	46.4		131	45.7		170	45.2		197	45.2		209	45.5	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] MS/MSD for the preceeding sample number.

Page 1 of 3

Source: Woodward-Clyde, 1997

Table 25-2a
Summary of Compounds Detected in Soil
SWMU 5

LOCATOR	CAN005-0504-0028			CAN005-0504-0033			CAN005-0505-0005			CAN005-0505-0010			CAN005-0505-0562[1]			CAN005-0505-0015			CAN005-0505-0020		
LAB SAMPLE NUMBER	0453690010SA			0453690011SA			0397760013SA			0397760014SA			0397760017SA			0397760015SA			0397760016SA		
COLLECT DATE	10/24/95			10/24/95			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qua	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																					
Acetone	<	11	U	<	11	U	3.7	11	J	4.7	11	J	<	11	U	5.2	11	J	5.4	11	J
Methylene chloride	<	5.7	U	<	5.5	U	2.9	5.7	J	2.6	5.5	J	2.7	5.5	J	3	5.7	J	3.1	5.7	J
Toluene	<	5.7	U	<	5.5	U	<	5.7	U	2.5	5.5	J	<	5.5	U	<	5.7	U	<	5.7	U
Semivolatile Organics (ug/kg)																					
bis(2-Ethylhexyl)phthalate	400	380		<	360	U	<	390	U	<	360	U	<	370	U	<	370	U	<	380	U
Metals (mg/kg)																					
Aluminum	4130	22.8		4630	10.9		3960	22.6		8770	22.1		9980	22.2		10600	11.3		6400	22.8	
Arsenic	0.95	0.57		0.69	0.55		2.5	0.57		1.8	0.55		1.6	0.55		1.2	0.57		2	0.57	
Barium	84	2.3	J	25.5	1.1	J	129	2.3		451	2.2		694	2.2		156	1.1		468	2.3	
Beryllium	<	0.46	U	0.23	0.22		0.29	0.45	J	0.62	0.44		0.49	0.44		0.67	0.23		<	0.46	U
Calcium	139000	45.6		18600	21.9		133000	45.2		118000	44.2		155000	44.3		77100	22.6		191000	45.5	
Chromium	8.6	2.3		3.8	1.1		3.6	2.3		2.7	2.2		4.2	2.2		7.3	1.1		4	2.3	
Cobalt	1.8	2.3	J	1.4	1.1		2.8	2.3		2.6	2.2		2.1	2.2	J	3.5	1.1		1.5	2.3	J
Copper	1.5	4.6	J	1.3	2.2	J	5.5	4.5		3.5	4.4	J	3.8	4.4	J	4.6	2.3		3.4	4.6	J
Iron	2690	22.8		3860	10.9		4940	22.6		5240	22.1		5900	22.2		8000	11.3		4240	22.8	
Lead	1.6	0.57		2.2	0.55		4.3	0.57		5.3	0.55		6	0.55		6.1	1.1		2.3	0.57	
Magnesium	8890	45.6		3770	21.9		2290	45.2		3200	44.2		3770	44.3		4720	22.6		5810	45.5	
Manganese	24.2	2.3		29.3	1.1		57.4	2.3	J	98.8	2.2	J	98.9	2.2		110	1.1	J	32.8	2.3	J
Nickel	7.4	9.1	J	4.2	4.4	J	8.1	9	J	5.5	8.8	J	5	8.9	J	7.8	4.5		5.5	9.1	J
Potassium	708	1140	J	1170	546		992	1130	J	1590	1100		1670	1110		2570	565		1270	1140	
Thallium	10.2	2.3		10.3	1.1		<	1.1	U	<	2.2	U	<	5.5	UJ	<	1.1	UJ	<	1.1	UJ
Vanadium	7.2	4.6		6.8	2.2		13.5	2.3		9.5	2.2		12	2.2		20.1	1.1		9.9	2.3	
Zinc							11.3	4.5		15.3	4.4		16.3	4.4		20.6	2.3		10.7	4.6	
TRPH (mg/kg)																					
Total Recoverable Petroleum Hydrocarbons	<	45.6	U	<	43.7	U	<	45.2	U	<	44.2	U	<	44.3	U	<	45.2	U	<	45.5	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate sample for the preceeding sample number.

Page 2 of 3

Source: Woodward-Clyde, 1997

Table 25-2a
Summary of Compounds Detected in Soil
SWMU 5

LOCATOR	CAN005-0506-0000			CAN005-0506-0005			CAN005-0506-0010			CAN005-0506-0561[1]			CAN005-0506-0015			CAN005-0506-0020		
LAB SAMPLE NUMBER	0397740001SA			0397740002SA			0397740003SA			0397740006SA			0397740004SA			0397740005SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	<	11	U	<	11	U	<	10	U	<	11	U	<	11	U
Methylene chloride	1.8	5.6	UJ	2.7	5.6	UJ	1.8	5.7	UJ	<	5.1	U	1.7	5.7	J	<	5.6	U
Toluene	<	5.6	U	<	5.6	U	<	5.7	U	<	5.1	U	<	5.7	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
bis(2-Ethylhexyl)phthalate	<	370	U	<	370	U	<	380	U	<	340	U	<	370	U	<	370	U
Metals (mg/kg)																		
Aluminum	5920	22.6		7530	22.5		6230	11.4		9090	10.2		6960	22.7		9270	11.2	
Arsenic	2.6	0.56		2.5	0.56		2.2	0.57		2.2	0.51		1.9	0.57		0.96	0.56	
Barium	528	2.3		143	2.3		305	1.1		196	1		1170	2.3		123	1.1	
Beryllium	<	0.45	U	0.4	0.45	J	0.51	0.23		0.51	0.2		0.32	0.45	J	0.5	0.22	
Calcium	197000	45.2		135000	45		86400	22.8		79500	20.5		217000	45.4		55100	22.3	
Chromium	4	2.3		5.4	2.3		5.3	1.1		6.6	1		6.3	2.3		6.3	1.1	
Cobalt	1.7	2.3	J	3	2.3		3.4	1.1		3.2	1		2.9	2.3		2.7	1.1	
Copper	3.9	4.5	J	6.8	4.5		4.6	2.3		4.5	2		3.6	4.5	J	3.9	2.2	
Iron	3940	22.6		6880	22.5		5990	11.4		6990	10.2		4640	22.7		7140	11.2	
Lead	4.3	0.56		5.2	0.56		5.4	0.57	J	5.5	0.51	J	3.4	0.57	J	2.7	0.56	
Magnesium	5380	45.2	J	2770	45	J	3010	22.8	J	3200	20.5	J	4690	45.4		3860	22.3	J
Manganese	57.6	2.3		102	2.3		110	1.1		105	1		51.1	2.3		110	1.1	
Nickel	9.9	9		8.6	9	J	6.3	4.6		6.3	4.1		6.8	9.1	J	5.9	4.5	
Potassium	946	1130	J	1610	1130		1440	570		1740	512		1400	1140		2290	558	
Thallium	<	1.1	U	<	1.1	UJ	0.13	1.1	J	0.19	1	UJ	<	1.1	UJ	<	1.1	UJ
Vanadium	11.9	2.3		15.7	2.3		18.9	1.1		17.8	1		13.9	2.3		16.9	1.1	
Zinc	10.8	4.5		16.3	4.5		14.7	2.3		17.7	2		12.4	4.5		19.2	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	507	45.2	J	<	45	UJ	<	45.6	UJ	<	41	UJ	<	45.4	UJ	<	44.6	UJ

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate sample for the preceeding sample number.

Page 3 of 3

Source: Woodward-Clyde, 1997

Table 25-2b
Comparison of Maximum Detected Metal Concentrations in Soil to Residential RBCs
SWMU 5

Chemical	Maximum Detected Concentration (mg/kg)	Residential Soil Risk-Based Concentration(1) (mg/kg)	Exceeds RBC?
Acetone	0.013	7,800	NO
Methylene Chloride	0.0033	85	NO
Toluene	0.0032	16,000	NO
Bis(2-ethylhexyl) phthalate	0.400	46	NO
Manganese	277	390	NO
Nickel	10.4	1600	NO

(1) EPA Region III Risk-Based Concentrations for Residential Soil (EPA 1994).

Source: Woodward-Clyde, 1997

Table 28-1
Concentration (mg/kg) of Total Metals
SWMU 16

Borehole Number	Sample Number (CAN016-680)	Sample Depth (feet)	Lead		Mercury		Nickel
1	1-021A	0	20.5		0.03	U	8.1
	1-022B	2.5	10.1		0.03	U	6.9
	1-023C	5	9.2		0.02	U	9.3
	1-024D	10	4.3		0.01	U	7
2	2-021A	0	21.5		0.1	U	7
	2-022B	2.5	16.3		0.05	U	7.9
	2-023C	5	7		0.1	U	9.3
	2-024D	10	8		0.01	U	3.7
3	3-021A	0	41.3		0.02	U	6.2
	3-022B	2.5	14.9	J	0.02	U	6.7
(QAD)	3-721B	2.5	17.7		0.24		5.9
(QCD)	3-821B	2.5	13.7		0.02	U	5.5
	3-023C	5	8.3		0.1	U	9.6
	3-024D	10	12		0.01	U	6
Background (95% UCL) (1)			25.80		0.13		9.00

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Sciences, Inc., 1993

Table 29-1a
Petroleum Hydrocarbons and Total Lead Analytical Results
SWMU 34

Sample ID	Sample Interval (ft)	Analyses: Petroleum Hydrocarbons (mg/Kg)a		Analyses: Total Lead (mg/Kg)b	
1-1c	0-1	200	(5.0)	110	(.30)
1-2	1-2	ND	(5.0)	8.6	(.30)
2-1c	0-1	120	(5.0)	500	(.30)
2-2	1-2	ND	(4.0)	6.6	(.30)
2-2 (dup)	1-2	NA		6.8	(.30)
3-1c	0-1	540	(5.0)	120	(.30)
4-1	0-1	280	(5.0)	26	(.30)
5-1	0-.6	57	(5.0)	67	(.30)
5-2	.6-1.5	ND	(4.0)	5.6	(.30)
6-1	0-.75	15*	(5.0)	25	(.30)
6-2	.75-1.4	ND	(4.0)	8.2	(.30)
6-2 (dup)	.75-1.4	ND	(5.0)	8.4	(.30)
7-1	0-.6	ND	(5.0)	62	(.30)
8-1	0-.6	120	(5.0)	32	(.30)
9-1	0-.6	120	(5.0)	32	(.30)
9-2	.6-1.3	ND	(5.0)	7.6	(.30)
10-1	0-.9	910	(5.0)	62	(.30)
11-1c	0-.6	280	(5.0)	80	(.30)
12-1c	0-.6	320	(5.0)	90	(.30)
13-1	0-.6	150	(5.0)	35	(.30)
13-2	.6-2.0	ND	(5.0)	16	(.30)
15-1	0-1.0	120	(5.0)	55	(.30)
20-1	0-.75	75	(5.0)	45	(.30)
Background	0-.75	300/ND**	(5.0)	13.9	(.30)

a: Infrared Spectrophotometry, EPA Method 418.1
b: Flame Atomic Absorption Spectrophotometry, Method SW-846 3050
c: EP-Toxicity analyses run due to high total lead value detected. Results of EP-Toxicity analyses shown in Table 5-3.
ND: Not detected at specified detection limit
NA: Not Analyzed
( ): Detection limit
*: Value less than five times detection limit.
**: False positive value due to vaporization of acetone bottle resulting in contamination of background sample. See EPA 8240 results for acetone detection in trip blank and rinsate blank (Table 5-6). Rerun of background sample revealed <5 mg/Kg when analyzed.

Source: Radian Corp., 1987

Table 29-1b
EP-Toxicity Results and Regulatory Standards
SWMU 34

EPA Hazardous Waste Number	Metal	NIPDWS (mg/L)	Maximum Allowable Concentration (mg/L)	Maximum Reported Value, AGE Drainage Ditch (mg/L)
D004	Arsenic	0.05	5.0	0.004
D005	Barium	1.0	100.0	1.7
D006	Cadmium	0.01	1.0	0.04
D007	Chromium	0.05	5.0	0.1
D008	Lead	0.05	5.0	0.06
D009	Mercury	0.002	0.2	ND
D010	Selenium	0.01	1.0	ND
D011	Silver	0.05	5.0	ND

ND: Not Detected

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 1-1 3/12/87	1-2 3/12/87	2-1 3/12/87	2-2 3/12/87	2-2 (dup) 3/12/87	3-1 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)						
chloromethane	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
bromomethane	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
vinyl chloride	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
chloroethane	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
methylene chloride	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.1)
acetone	ND (8.7)	ND (8.6)	ND (8.6)	ND (8.6)	ND (8.6)	ND (8.4)
carbon disulfide	ND (2.0)	ND (2.0)	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)
trichlorofluoromethane	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
1,1-dichloroethene	ND (5.5)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.3)
1,1-dichloroethane	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.1)
trans-1,2-dichloroethene	ND (1.9)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)
chloroform	ND (1.9)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)
1,2-dichloroethane	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.1)
2-butanone	ND (29.0)	ND (29.0)	ND (29.0)	ND (29.0)	ND (29.0)	ND (28.0)
1,1,1-trichloroethane	ND (4.4)	ND (4.4)	ND (4.3)	ND (4.4)	ND (4.4)	ND (4.3)
carbon tetrachloride	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.2)	ND (3.1)
vinyl acetate	ND (8.0)	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.7)
bromodichloromethane	ND (2.6)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)
1,2-dichloropropane	ND (7.0)	ND (6.9)	ND (6.8)	ND (6.9)	ND (6.9)	ND (6.7)
cis-1,3-dichloropropene	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
trichloroethene	ND (2.2)	ND (2.2)	ND (2.2)	ND (2.2)	ND (2.2)	ND (2.1)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 1 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 1-1 3/12/87	1-2 3/12/87	2-1 3/12/87	2-2 3/12/87	2-2 (dup) 3/12/87	3-1 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)						
dibromochloromethane	ND (3.6)	ND (3.6)	ND (3.5)	ND (3.6)	ND (3.6)	ND (3.5)
1,1,2-trichloroethane	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
benzene	ND (5.1)	ND (5.1)	ND (5.0)	ND (5.1)	ND (5.1)	ND (4.9)
trans-1,3-dichloropropene	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
2-chloroethylvinyl ether	ND (5.8)	ND (5.8)	ND (5.7)	ND (5.8)	ND (5.8)	ND (5.6)
bromoform	ND (5.5)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.4)	ND (5.3)
2-hexanone	ND (42.0)	ND (41.0)	ND (41.0)	ND (41.0)	ND (41.0)	ND (40.0)
4-methyl-2-pentanone	ND (53.0)	ND (53.0)	ND (52.0)	ND (53.0)	ND (53.0)	ND (52.0)
tetrachloroethene	ND (4.8)	ND (4.7)	ND (4.7)	ND (4.7)	ND (4.7)	ND (4.6)
1,1,2,2-tetrachloroethane	ND (8.0)	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.7)
toluene	ND (7.0)	ND (6.9)	ND (6.8)	ND (6.9)	ND (6.9)	ND (6.7)
chlorobenzene	ND (7.0)	ND (6.9)	ND (6.8)	ND (6.9)	ND (6.9)	ND (6.7)
ethylbenzene	ND (8.4)	ND (8.3)	ND (8.2)	ND (8.3)	ND (8.3)	ND (8.1)
styrene	ND (3.5)	ND (3.5)	ND (3.4)	ND (3.5)	ND (3.5)	ND (3.4)
total xylenes	ND (5.3)	ND (5.3)	ND (5.2)	ND (5.3)	ND (5.3)	ND (5.2)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 2 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 4-1 3/12/87	5-1 3/12/87	5-2 3/12/87	6-1 3/12/87	6-2 3/12/87	6-2 (dup) 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)						
chloromethane	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
bromomethane	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
vinyl chloride	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
chloroethane	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
methylene chloride	ND (3.2)	ND (3.1)	ND (3.2)	ND (3.1)	2.8J (3.1)	110 (3.2)
acetone	ND (8.6)	ND (8.3)	ND (8.6)	ND (8.4)	ND (8.3)	13.0BL (8.6)
carbon disulfide	ND (2.0)	ND (1.9)	ND (2.0)	ND (1.9)	ND (1.9)	ND (2.0)
trichlorofluoromethane	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
1,1-dichloroethene	ND (5.4)	ND (5.2)	ND (5.4)	ND (5.3)	ND (5.2)	ND (5.4)
1,1-dichloroethane	ND (3.2)	ND (3.1)	ND (3.2)	ND (3.1)	ND (3.1)	ND (3.2)
trans-1,2-dichloroethene	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)
chloroform	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)
1,2-dichloroethane	ND (3.2)	ND (3.1)	ND (3.2)	ND (3.1)	ND (3.1)	ND (3.2)
2-butanone	ND (29.0)	ND (28.0)	ND (29.0)	ND (28.0)	ND (28.0)	ND (29.0)
1,1,1-trichloroethane	ND (4.4)	ND (4.2)	ND (4.4)	ND (4.3)	ND (4.2)	ND (4.4)
carbon tetrachloride	ND (3.2)	ND (3.1)	ND (3.2)	ND (3.1)	ND (3.1)	ND (3.2)
vinyl acetate	ND (7.9)	ND (7.7)	ND (7.9)	ND (7.7)	ND (7.6)	ND (7.9)
bromodichloromethane	ND (2.5)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.4)	ND (2.5)
1,2-dichloropropane	ND (6.9)	ND (6.7)	ND (6.9)	ND (6.7)	ND (6.6)	ND (6.9)
cis-1,3-dichloropropene	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
trichloroethene	ND (2.2)	ND (2.1)	ND (2.2)	ND (2.1)	ND (2.1)	ND (2.2)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 3 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 4-1 3/12/87	5-1 3/12/87	5-2 3/12/87	6-1 3/12/87	6-2 3/12/87	6-2 (dup) 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)						
dibromochloromethane	ND (3.6)	ND (3.4)	ND (3.6)	ND (3.5)	ND (3.4)	ND (3.6)
1,1,2-trichloroethane	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
benzene	ND (5.1)	ND (4.9)	ND (5.1)	ND (4.9)	ND (4.8)	ND (5.1)
trans-1,3-dichloropropene	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
2-chloroethylvinyl ether	ND (5.8)	ND (5.6)	ND (5.8)	ND (5.6)	ND (5.5)	ND (5.8)
bromoform	ND (5.4)	ND (5.2)	ND (5.4)	ND (5.3)	ND (5.2)	ND (5.4)
2-hexanone	ND (41.0)	ND (40.0)	ND (41.0)	ND (40.0)	ND (40.0)	ND (41.0)
4-methyl-2-pentanone	ND (53.0)	ND (51.0)	ND (53.0)	ND (52.0)	ND (51.0)	ND (53.0)
tetrachloroethene	ND (4.7)	ND (4.6)	ND (4.7)	ND (4.6)	ND (4.5)	ND (4.7)
1,1,2,2-tetrachloroethane	ND (7.9)	ND (7.7)	ND (7.9)	ND (7.7)	ND (7.6)	ND (7.9)
toluene	ND (6.9)	ND (6.7)	ND (6.9)	ND (6.7)	ND (6.6)	ND (6.9)
chlorobenzene	ND (6.9)	ND (6.7)	ND (6.9)	ND (6.7)	ND (6.6)	ND (6.9)
ethylbenzene	ND (8.3)	ND (8.0)	ND (8.3)	ND (8.1)	ND (7.9)	ND (8.3)
styrene	ND (3.5)	ND (3.3)	ND (3.5)	ND (3.4)	ND (3.3)	ND (3.5)
total xylenes	ND (5.3)	ND (5.1)	ND (5.3)	ND (5.2)	ND (5.1)	ND (5.3)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 4 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 7-1 3/12/87	8-1 3/12/87	9-1 3/12/87	9-1 (dup) 3/12/87	9-2 3/12/87	10-1 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)						
chloromethane	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
bromomethane	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
vinyl chloride	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
chloroethane	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
methylene chloride	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)
acetone	ND (8.3)	ND (8.3)	ND (8.3)	ND (8.3)	ND (8.3)	ND (8.3)
carbon disulfide	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)
trichlorofluoromethane	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
1,1-dichloroethene	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)
1,1-dichloroethane	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)
trans-1,2-dichloroethene	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)
chloroform	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)	ND (1.8)
1,2-dichloroethane	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)
2-butanone	ND (28.0)	ND (28.0)	ND (28.0)	ND (28.0)	ND (28.0)	ND (28.0)
1,1,1-trichloroethane	ND (4.2)	ND (4.2)	ND (4.2)	ND (4.2)	ND (4.2)	ND (4.2)
carbon tetrachloride	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)	ND (3.1)
vinyl acetate	ND (7.6)	ND (7.6)	ND (7.6)	ND (7.6)	ND (7.6)	ND (7.6)
bromodichloromethane	ND (2.4)	ND (2.4)	ND (2.4)	ND (2.4)	ND (2.4)	ND (2.4)
1,2-dichloropropane	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)
cis-1,3-dichloropropene	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
trichloroethene	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)	ND (2.1)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 5 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled: 7-1 3/12/87	8-1 3/12/87	9-1 3/12/87	9-1 (dup) 3/12/87	9-2 3/12/87	10-1 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)						
dibromochloromethane	ND (3.4)	ND (3.4)	ND (3.4)	ND (3.4)	ND (3.4)	ND (3.4)
1,1,2-trichloroethane	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
benzene	ND (4.8)	ND (4.8)	ND (4.8)	ND (4.8)	ND (4.8)	ND (4.8)
trans-1,3-dichloropropene	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
2-chloroethylvinyl ether	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)
bromoform	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)	ND (5.2)
2-hexanone	ND (40.0)	ND (40.0)	ND (40.0)	ND (40.0)	ND (40.0)	ND (40.0)
4-methyl-2-pentanone	ND (51.0)	ND (51.0)	ND (51.0)	ND (51.0)	ND (51.0)	ND (51.0)
tetrachloroethene	ND (4.5)	ND (4.5)	ND (4.5)	ND (4.5)	ND (4.5)	ND (4.5)
1,1,2,2-tetrachloroethane	ND (7.6)	ND (7.6)	ND (7.6)	ND (7.6)	ND (7.6)	ND (7.6)
toluene	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)
chlorobenzene	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)	ND (6.6)
ethylbenzene	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.9)	ND (7.9)
styrene	ND (3.3)	ND (3.3)	ND (3.3)	ND (3.3)	ND (3.3)	ND (3.3)
total xylenes	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 6 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 11-1 3/12/87	12-1 3/12/87	13-1 3/12/87	13-2 3/12/87	15-1 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)					
chloromethane	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
bromomethane	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
vinyl chloride	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
chloroethane	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
methylene chloride	3.8 (3.1)	ND (3.4)	ND (3.4)	5.7 (3.4)	20.6 (3.4)
acetone	ND (8.3)	ND (9.0)	ND (9.0)	ND (9.0)	ND (9.0)
carbon disulfide	ND (1.9)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
trichlorofluoromethane	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
1,1-dichloroethene	ND (5.2)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)
1,1-dichloroethane	ND (3.1)	ND (3.4)	ND (3.4)	ND (3.4)	ND (3.4)
trans-1,2-dichloroethene	ND (1.8)	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)
chloroform	ND (1.8)	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.9)
1,2-dichloroethane	ND (3.1)	ND (3.4)	ND (3.4)	ND (3.4)	ND (3.4)
2-butanone	ND (28.0)	ND (30.0)	ND (30.0)	ND (30.0)	ND (30.0)
1,1,1-trichloroethane	ND (4.2)	ND (4.6)	ND (4.6)	ND (4.6)	ND (4.6)
carbon tetrachloride	ND (3.1)	ND (3.4)	ND (3.4)	ND (3.4)	ND (3.4)
vinyl acetate	ND (7.6)	ND (8.3)	ND (8.3)	ND (8.3)	ND (8.3)
bromodichloromethane	ND (2.4)	ND (2.6)	ND (2.6)	ND (2.6)	ND (2.6)
1,2-dichloropropane	ND (6.6)	ND (7.2)	ND (7.2)	ND (7.2)	ND (7.2)
cis-1,3-dichloropropene	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
trichloroethene	ND (2.1)	ND (2.3)	ND (2.3)	ND (2.3)	ND (2.3)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 7 of 8

Source: Radian Corp., 1987

Table 29-1c
Purgeable Organic Analytical Results of Soil Samples
SWMU 34

Analytical Parameters	Sample ID / Date Sampled 11-1 3/12/87	12-1 3/12/87	13-1 3/12/87	13-2 3/12/87	15-1 3/12/87
EPA Method 8240 - Purgeable Organics (ug/Kg)					
dibromochloromethane	ND (3.4)	ND (3.7)	ND (3.7)	ND (3.7)	ND (3.7)
1,1,2-trichloroethane	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
benzene	ND (4.8)	ND (5.3)	ND (5.3)	ND (5.3)	ND (5.3)
trans-1,3-dichloropropene	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
2-chloroethylvinyl ether	ND (5.5)	ND (6.0)	ND (6.0)	ND (6.0)	ND (6.0)
bromoform	ND (5.2)	ND (5.6)	ND (5.6)	ND (5.6)	ND (5.6)
2-hexanone	ND (40.0)	ND (43.0)	ND (43.0)	ND (43.0)	ND (43.0)
4-methyl-2-pentanone	ND (51.0)	ND (55.0)	ND (55.0)	ND (55.0)	ND (55.0)
tetrachloroethene	ND (4.5)	ND (4.9)	ND (4.9)	ND (4.9)	ND (4.9)
1,1,2,2-tetrachloroethane	ND (7.6)	ND (8.3)	ND (8.3)	ND (8.3)	ND (8.3)
toluene	ND (6.6)	ND (7.2)	ND (7.2)	ND (7.2)	ND (7.2)
chlorobenzene	ND (6.6)	ND (7.2)	ND (7.2)	ND (7.2)	ND (7.2)
ethylbenzene	ND (7.9)	ND (8.6)	ND (8.6)	ND (8.6)	ND (8.6)
styrene	ND (3.3)	ND (3.6)	ND (3.6)	ND (3.6)	ND (3.6)
total xylenes	ND (5.1)	ND (5.5)	ND (5.5)	ND (5.5)	ND (5.5)

ND: Not detected at specified detection limit

( ): Detection limit

BL: Detected in Reagent Blank; Background subtraction not performed

J: Estimated value less than minimum detection limit

Page 8 of 8

Source: Radian Corp., 1987

Table 29-2a
PAH Concentrations in Soil Samples
SWMU 34

Compound	Boring 0341 Sample Depth (Ft-BGS)		Boring 0342 Sample Depth (Ft-BGS)		
	0-0.5	1-3	1.5-3	5-7	9-11
Phenanthrene	200J	370J	380U	370U	370U
Fluoroanthene	400J	840	380U	370U	370U
Pyrene	270J	600	380U	370U	370U
Anthracene	710U	100J	380U	370U	370U
Chrysene	200J	370J	380U	370U	370U
Benzo(a)anthracene	160J	340J	380U	370U	370U
Benzo(a)pyrene	200J	310J	380U	370U	370U
Benzo(b)fluoranthene	400J	520	380U	370U	370U
Benzo(k)fluoranthene	710U	200J	380U	370U	370U
Dibenzo(a,h)anthracene	710U	53J	380U	370U	370U
Benzo(g,h,i)perylene	300J	400U	380U	370U	370U
Indeno(1,2,3-cd)pyrene	240J	250J	380U	370U	370U

Ft-BGS = Feet below ground surface
J = Estimated value
U = Not detected
[1] All concentrations are in micrograms per kilogram (μg/kg).

Source: Woodward-Clyde, 1992

Table 29-2b
TPH Concentrations in Soil Samples
SWMU 34

Boring Number	Sample Depth (Ft-BGS)	TPH (mg/kg)
0341	0 - 0.5	1180
	1 - 3.0	397
0342	1.5 - 3	45.1 U
	5 - 7	44.6 U
	9 - 11	44.9 U

U = Not detected
Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram

Source: Woodward-Clyde, 1992

Table 29-2c
Metal Concentrations in Soil Samples
SWMU 34

	Boring 0341 Sample Depth (Ft-BGS)		Boring 0342 Sample Depth (Ft-BGS)		Background[2]
Element	0-0.5	1-3	1.5-3	5-7	($\bar{x}$ + 2σ)
Aluminum	4040	8230	12500	9170	2571-10447
Antimony	5UJ	5.5 UJ	5.2UJ	5.2UJ	4.88-5.4
Arsenic	1.6J	2.8 J	2J	2J	0.43-1.95
Barium	148J	161 J	94.8	163J	0-903
Beryllium	0.43U	0.48 U	0.55J	0.49J	0.32-0.68
Cadmium	1.3	0.96 U	0.9U	0.91U	0.81-1.01
Calcium	39200	49100	69700	122000	0-193062
Chromium	12.3	10.4	10.5	8.1	2.67-9.31
Cobalt	2.8J	2.8 J	4.2J	3.5J	1.38-4.06
Copper	15	20.7	14U	10.8U	0.00-15.44
Iron	4680J	6710 J	8920	6450	2239-8683
Lead	40.7	38.1	6.5	5.1	1.76-8.64
Magnesium	1530	2330	2810	3320	0-11903
Manganese	83.9	173 J	120	83.4J	10.88-167
Mercury	0.11U	0.12 U	0.11U	0.11U	-- - --
Nickel	7.5U	7.1 J	9.2	7.1J	3.57-8.49
Potassium	860J	1570	2140	1520	632-2613
Selenium	2.2J	- R	-R	-R	0.00-1.35
Silver	0.87U	0.96 U	0.9U	0.91U	0.86-0.94
Sodium	319J	316 U	298U	299U	154-540
Thallium	0.22UJ	0.24 UJ	0.23UJ	0.23UJ	0.20-0.24
Vanadium	11.8	16	18.1	19.1	9.26-26.74
Zinc	237J	60.3J	22	16.8J	4.58-21.82

UJ = Estimated as non-detect at instrument detection limit
J = Estimated value
U = Not detected
-R = Rejected
-- - -- = No range could be calculated
Ft-BGS = Feet below ground surface

1 All concentrations are in milligrams per kilogram (mg/kg).
2 Background range calculated from values in Table 2-7.

Source: Woodward-Clyde, 1992

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4804-0000			CAN048-4804-0005			CAN048-4804-0010			CAN048-4804-0015			CAN048-4804-0020			CAN048-4804-0025		
LAB SAMPLE NUMBER	0397740007SA			0397740008SA			0397740009SA			0397740010SA			0397740011SA			0397740012SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	3.4	11	J	<	11	U	3	12	J	<	11	U	<	11	U	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	12	U	<	11	U	<	11	U	<	11	U
Chlorobenzene	<	5.6	U	<	5.7	U	<	5.8	U	<	5.6	U	<	5.6	U	<	5.5	U
Ethylbenzene	<	5.6	U	<	5.7	U	<	5.8	U	<	5.6	U	<	5.6	U	<	5.5	U
Methylene chloride	<	5.6	U	<	5.7	U	<	5.8	U	<	5.6	U	<	5.6	U	<	5.5	U
Toluene	5.7	5.6		1.3	5.7	J	<	5.8	U	<	5.6	U	<	5.6	U	<	5.5	U
Xylenes (total)	<	5.6	U	<	5.7	U	<	5.8	U	<	5.6	U	<	5.6	U	<	5.5	U
Semivolatile Organics (µg/kg)																		
Acenaphthene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
bis(2-Ethylhexyl)phthalate	57	370	J	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
4-Chloroaniline	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Di-n-butyl phthalate	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Dibenzofuran	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
1,2-Dichlorobenzene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
1,3-Dichlorobenzene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
1,4-Dichlorobenzene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Fluoranthene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Fluorene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
2-Methylnaphthalene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Naphthalene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
N-Nitrosodiphenylamine	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Phenanthrene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U
Phenol	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	360	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for the preceeding sample number.

Page 1 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4804-0000			CAN048-4804-0005			CAN048-4804-0010			CAN048-4804-0015			CAN048-4804-0020			CAN048-4804-0025		
LAB SAMPLE NUMBER	0397740007SA			0397740008SA			0397740009SA			0397740010SA			0397740011SA			0397740012SA		
COLLECT DATE	12/11/94			12/11/94			12/11/94			12/11/94			12/11/94			12/11/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	12900	11.3		11900	11.3		8580	11.5		4400	55.6		8150	11.1		6370	22.1	
Antimony	5.5	6.8	J	<	6.8	UJ	<	6.9	U	<	33.3	UJ	<	6.7	UJ	<	13.2	UJ
Arsenic	3	0.56		2.6	0.57		2.9	0.58		2	0.56		1.2	0.56		1.8	0.55	
Barium	149	1.1		456	1.1		304	1.2		436	5.6		69.3	1.1		109	2.2	
Beryllium	0.53	0.23		0.5	0.23		0.46	0.23		<	1.1	U	0.26	0.22		<	0.44	U
Calcium	63800	22.5		102000	22.7		112000	23		250000	111		78900	22.3		173000	44.1	
Chromium	11.3	1.1		8.9	1.1		6.8	1.2		<	5.6	U	5.9	1.1		2.6	2.2	
Cobalt	4.1	1.1		3.5	1.1		3.3	1.2		<	5.6	U	1.6	1.1		1.2	2.2	J
Copper	7.3	2.3		7	2.3		5.9	2.3		<	11.1	U	1.8	2.2	J	1.9	4.4	J
Iron	9480	11.3		8550	11.3		6840	11.5		2410	55.6		4810	11.1		3680	22.1	
Lead	18.8	5.6	J	15.5	5.7	J	11.3	2.9	J	2.3	0.56	J	2.7	0.56	J	1.9	0.55	J
Magnesium	2830	22.5	J	3760	22.7	J	4160	23		13400	111		8310	22.3	J	10500	44.1	J
Manganese	133	1.1		168	1.1		118	1.2		21.4	5.6	J	40.5	1.1		34	2.2	
Nickel	8.2	4.5		7.8	4.5		8.3	4.6		9	22.2	J	5.7	4.5		4.2	8.8	J
Potassium	2140	563		1980	567		1540	576		448	2780	J	1400	556		1070	1100	J
Vanadium	18.6	1.1		18.3	1.1		17.2	1.2		17.7	5.6		18	1.1		15	2.2	
Zinc	29.2	2.3		28.2	2.3		18.2	2.3		6.1	11.1	J	10.3	2.2		7.5	4.4	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	185	45.1	J	1050	90.8	J	81	46.1	J	<	44.5	UJ	<	44.5	UJ	<	44.1	UJ

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. D = Sample was diluted for analysis.

U = Nondetected value. RL = Reporting Limit.

(1) Duplicate for the preceeding sample number.

Page 2 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4804-0030			CAN048-4804-0035			CAN048-4804-0040			CAN048-4805-0000			CAN048-4805-0005			CAN048-4805-0010			CAN048-4805-4861[1]		
LAB SAMPLE NUMBER	0397940007SA			0397940008SA			0397940009SA			0397940010SA			0397940011SA			0397940012SA			0398000001SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																					
Acetone	4.8	11	J	4.9	11	J	6.7	11	J	<	11	U	9.5	12	J	<	11	U	17	11	
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	12	U	<	11	U	<	11	U
Chlorobenzene	<	5.5	U	<	5.3	U	<	5.3	U	<	5.7	U	<	5.8	U	<	5.5	U	<	5.5	U
Ethylbenzene	<	5.5	U	<	5.3	U	<	5.3	U	<	5.7	U	<	5.8	U	<	5.5	U	<	5.5	U
Methylene chloride	<	5.5	U	<	5.3	U	<	5.3	U	<	5.7	U	<	5.8	U	<	5.5	U	5.6	5.5	
Toluene	<	5.5	U	<	5.3	U	<	5.3	U	<	5.7	U	<	5.8	U	<	5.5	U	<	5.5	U
Xylenes (total)	<	5.5	U	<	5.3	U	<	5.3	U	<	5.7	U	<	5.8	U	<	5.5	U	<	5.5	U
Semivolatile Organics (µg/kg)																					
Acenaphthene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
bis(2-Ethylhexyl)phthalate	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
4-Chloroaniline	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Di-n-butyl phthalate	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Dibenzofuran	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
1,2-Dichlorobenzene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
1,3-Dichlorobenzene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
1,4-Dichlorobenzene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Fluoranthene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Fluorene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
2-Methylnaphthalene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Naphthalene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
N-Nitrosodiphenylamine	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Phenanthrene	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U
Phenol	<	360	U	<	350	U	<	350	U	<	370	U	<	380	U	<	360	U	<	360	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate sample for the preceeding sample number.

Page 3 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4804-0030			CAN048-4804-0035			CAN048-4804-0040			CAN048-4805-0000			CAN048-4805-0005			CAN048-4805-0010			CAN048-4805-4861[1]		
LAB SAMPLE NUMBER	0397940007SA			0397940008SA			0397940009SA			0397940010SA			0397940011SA			0397940012SA			0398000001SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																					
Aluminum	4010	21.9		3210	10.7		3940	10.7		15300	11.3		6410	23.3		9080	10.9		4190	11	J
Antimony	<	13.1	UJ	<	6.4	UJ	<	6.4	UJ	<	6.8	UJ	<	14	UJ	<	6.6	UJ	<	6.6	UJ
Arsenic	1.6	0.55		0.85	0.53		0.67	0.53		2.5	0.57		2.1	0.58		2.1	0.55		2	0.55	
Barium	87.5	2.2		37.5	1.1		39.6	1.1		132	1.1		170	2.3		49.5	1.1		43.9	1.1	J
Beryllium	<	0.44	U	<	0.21	U	<	0.21	U	0.71	0.23	J	0.29	0.47	J	0.43	0.22	J	0.38	0.22	
Calcium	193000	43.8		67900	21.3		64000	21.3		21000	22.6		207000	46.6		49600	21.9		52600	22.1	J
Chromium	4.1	2.2		3	1.1		3.5	1.1		13.8	1.1		4.1	2.3		7.8	1.1		4.5	1.1	J
Cobalt	<	2.2	U	0.88	1.1	J	1.6	1.1		5.9	1.1		3	2.3		3.5	1.1		3.1	1.1	
Copper	2.2	4.4	J	1.8	2.1	J	2	2.1	J	10	2.3		3.2	4.7	J	5.4	2.2		4.5	2.2	
Iron	2830	21.9		3120	10.7		3800	10.7		13300	11.3		5230	23.3		8180	10.9		4480	11	J
Lead	1.4	0.55		1.8	0.53		1.7	1.1		11.8	1.1		3.7	0.58		5.9	0.55		5.2	1.1	J
Magnesium	7060	43.8		3260	21.3		5470	21.3		2840	22.6		2990	46.6		3410	21.9		2580	22.1	
Manganese	27.6	2.2		32.3	1.1		58.9	1.1		245	1.1		49.9	2.3		126	1.1		99.8	1.1	
Nickel	8.2	8.8	J	4.1	4.3	J	5	4.3		13.5	4.5		5.6	9.3	J	8.9	4.4		5.2	4.4	
Potassium	836	1100	J	725	533		838	533		2330	565		1040	1160	J	1810	547		1050	552	
Vanadium	9.5	2.2		7.4	1.1		11.6	1.1		22.2	1.1		13.9	2.3		23.4	1.1		20.7	1.1	J
Zinc	7	4.4		6.5	2.1		7.6	2.1		33.1	2.3		12.7	4.7		19.3	2.2		11.3	2.2	J
TRPH (mg/kg)																					
Total Recoverable Petroleum Hydrocarbons	<	43.8	U	<	42.7	U	<	42.6	U	61.6	45.2		<	46.6	U	<	43.8	U	<	44.2	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. D = Sample was diluted for analysis.

U = Nondetected value. RL = Reporting Limit.

[1] Duplicate sample for the preceeding sample number.

Page 4 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4805-0015			CAN048-4805-0020			CAN048-4805-0025			CAN048-4805-0030			CAN048-4805-0035			CAN048-4805-0040		
LAB SAMPLE NUMBER	0397940013SA			0397940001SA			0397940002SA			0397940003SA			0397940004SA			0397940005SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	5	11	J	<	11	U	8.9	11	J	4.8	11	J	<	11	U	3.8	11	J
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Chlorobenzene	<	5.6	U	<	5.7	U	<	5.4	U	<	5.4	U	<	5.3	U	<	5.4	U
Ethylbenzene	<	5.6	U	<	5.7	U	<	5.4	U	<	5.4	U	<	5.3	U	<	5.4	U
Methylene chloride	<	5.6	U	<	5.7	U	<	5.4	U	3.9	5.4	J	4.3	5.3	J	<	5.4	U
Toluene	<	5.6	U	<	5.7	U	<	5.4	U	<	5.4	U	<	5.3	U	<	5.4	U
Xylenes (total)	<	5.6	U	<	5.7	U	<	5.4	U	<	5.4	U	<	5.3	U	<	5.4	U
Semivolatile Organics (µg/kg)																		
Acenaphthene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
bis(2-Ethylhexyl)phthalate	<	370	U	<	370	U	120	360	J	<	360	U	<	350	U	<	350	U
4-Chloroaniline	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U
Di-n-butyl phthalate	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
Dibenzofuran	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
1,2-Dichlorobenzene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U
1,3-Dichlorobenzene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U
1,4-Dichlorobenzene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U
Fluoranthene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
Fluorene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
2-Methylnaphthalene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U
Naphthalene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U
N-Nitrosodiphenylamine	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
Phenanthrene	<	370	U	<	370	U	<	360	U	<	360	U	<	350	U	<	350	U
Phenol	<	370	U	<	370	U	<	360	U	<	360	U	<	350	UJ	<	350	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4805-0015			CAN048-4805-0020			CAN048-4805-0025			CAN048-4805-0030			CAN048-4805-0035			CAN048-4805-0040		
LAB SAMPLE NUMBER	0397940013SA			0397940001SA			0397940002SA			0397940003SA			0397940004SA			0397940005SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	8100	11.1		12100	11.4		7480	21.8		6460	10.8		3790	10.6		3120	10.7	
Antimony	<	6.7	UJ	<	6.8	UJ	<	13.1	UJ	<	6.5	UJ	<	6.4	UJ	<	6.4	UJ
Arsenic	1.7	0.56		1.7	1.1		0.79	0.54		0.65	0.54		0.58	0.53		0.64	0.54	
Barium	96.1	1.1		331	1.1		2390	2.2		40.1	1.1		35.3	1.1		41.7	1.1	
Beryllium	0.46	0.22	J	0.53	0.23	J	<	0.44	U	0.18	0.22	J	0.13	0.21	J	<	0.21	U
Calcium	37400	22.3		75100	22.7		128000	43.5		53900	21.6		41900	21.2		49200	21.5	
Chromium	7	1.1		9	1.1		4.6	2.2		5.6	1.1		2.8	1.1		3	1.1	
Cobalt	3	1.1		2.7	1.1		2.2	2.2		1.5	1.1		1.8	1.1		1.4	1.1	
Copper	5	2.2		4.1	2.3		14.5	4.4		1.8	2.2	J	1.6	2.1	J	2.4	2.1	
Iron	7620	11.1		8180	11.4		6130	21.8		4670	10.8		3630	10.6		3160	10.7	
Lead	6.5	1.1		5.8	0.57		2.5	0.54		1.9	0.54		2	0.53		2.1	0.54	
Magnesium	3340	22.3		7730	22.7		13700	43.5		5080	21.6		2820	21.2		3600	21.5	
Manganese	124	1.1		81.1	1.1		79.8	2.2		36.7	1.1		58.5	1.1		44.3	1.1	
Nickel	7.7	4.5		9.6	4.5		7.9	8.7	J	5.1	4.3		4.3	4.2		3.5	4.3	J
Potassium	1880	556		3110	568		1350	1090		1380	539		817	530		593	537	
Vanadium	17.9	1.1		21.2	1.1		15.3	2.2		11.3	1.1		8.2	1.1		8.6	1.1	
Zinc	18.3	2.2		19.5	2.3		21.1	4.4		9.2	2.2		7	2.1		7.2	2.1	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	<	44.5	U	<	45.4	U	<	43.5	U	<	43.1	U	<	42.4	U	<	42.9	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.

Page 6 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4806-0000			CAN048-4806-4862[1]			CAN048-4806-0005			CAN048-4806-0010			CAN048-4806-0010			CAN048-4806-0015		
LAB SAMPLE NUMBER	0398000002SA			0398000007SA			0398000003SA			0398000004RA			0398000004SA			0398000005RA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	<	11	U	29	11					<	5500	U			
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U				<	5500	U			
Chlorobenzene	<	5.3	U	<	5.6	U	3	5.6	J				<	2800	U			
Ethylbenzene	<	5.3	U	<	5.6	U	1.8	5.6	J				890	2800	J			
Methylene chloride	5.2	5.3	J	5.5	5.6	J	6.5	5.6					<	2800	U			
Toluene	1.3	5.3	J	<	5.6	U	2.3	5.6	J				<	2800	U			
Xylenes (total)	<	5.3	U	<	5.6	U	26	5.6					12000	2800				
Semivolatile Organics (µg/kg)																		
Acenaphthene	<	350	U	<	370	U	<	3700	U	<	1500	UJ	<	3600	UJ	<	750	UJ
bis(2-Ethylhexyl)phthalate	<	350	U	<	370	U	<	3700	U	9100	1500		<	7400	UJ	3300	750	
4-Chloroaniline	<	350	U	<	370	U	<	3700	U	<	1500	UJ	7900	3600	J	<	750	UJ
Di-n-butyl phthalate	<	350	U	<	370	U	<	3700	U	<	1500	UJ	410	3600	J	<	750	UJ
Dibenzofuran	<	350	U	<	370	U	<	3700	U	<	1500	UJ	<	3600	UJ	<	750	UJ
1,2-Dichlorobenzene	<	350	U	<	370	U	<	3700	U	7500	1500		4100	3600	J	1100	750	
1,3-Dichlorobenzene	<	350	U	<	370	U	<	3700	U	700	1500	J	450	3600	J	<	750	UJ
1,4-Dichlorobenzene	<	350	U	<	370	U	<	3700	U	1800	1500		950	3600	J	<	750	UJ
Fluoranthene	<	350	U	<	370	U	<	3700	U	1200	1500	J	700	3600	J	500	750	J
Fluorene	<	350	U	<	370	U	<	3700	U	190	1500	J	<	3600	UJ	110	750	J
2-Methylnaphthalene	<	350	U	<	370	U	<	3700	U	12000	1500		<	3600	UJ	5000	750	
Naphthalene	<	350	U	<	370	U	<	3700	U	5200	1500		2900	3600	J	2200	750	
N-Nitrosodiphenylamine	<	350	U	<	370	U	<	3700	U	<	1500	UJ	<	3600	UJ	400	750	J
Phenanthrene	<	350	U	<	370	U	<	3700	U	400	1500	J	<	3600	UJ	110	750	J
Phenol	<	350	U	<	370	U	<	3700	U	<	1500	UJ	<	3600	UJ	<	750	UJ

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value.
U = Nondetected value.
D = Sample was diluted for analysis.
RL = Reporting Limit.
[1] Duplicate sample for the preceeding sample number.

Page 7 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4806-0000			CAN048-4806-4862[1]			CAN048-4806-0005			CAN048-4806-0010			CAN048-4806-0010			CAN048-4806-0015		
LAB SAMPLE NUMBER	0398000002SA			0398000007SA			0398000003SA			0398000004RA			0398000004SA			0398000005RA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	5240	10.7	J	5640	11.1	J	9790	11.3	J				4050	55.1	J			
Antimony	<	6.4	UJ	<	6.7	UJ	<	6.8	UJ				<	33	U			
Arsenic	2.8	0.53		2.6	0.56		2.7	0.56					3.4	0.55				
Barium	242	1.1	J	169	1.1	J	206	1.1	J				1640	5.5	J			
Beryllium	0.37	0.21		0.41	0.22		0.44	0.23					<	1.1	U			
Calcium	54100	21.3	J	32000	22.3	J	47600	22.5	J				246000	110	J			
Chromium	5.2	1.1	J	6.2	1.1	J	8.2	1.1	J				<	5.5	UJ			
Cobalt	3	1.1		3.6	1.1		3.4	1.1					4.4	5.5	J			
Copper	6.5	2.1		7.1	2.2		6.9	2.3					<	11	U			
Iron	4900	10.7	J	5810	11.1	J	7930	11.3	J				2800	55.1	J			
Lead	11.2	1.1	J	16.1	1.1		25.7	2.8	J				8.9	1.1	J			
Magnesium	3100	21.3		2320	22.3		2140	22.5					7050	110				
Manganese	132	1.1		152	1.1		138	1.1					40.2	5.5				
Nickel	7	4.3		7.1	4.5		7.1	4.5					6	22	J			
Potassium	1150	533		1270	557		1830	563					926	2750	J			
Vanadium	13.4	1.1	J	14.7	1.1	J	15.9	1.1	J				12.3	5.5	J			
Zinc	17.5	2.1	J	17.7	2.2	J	23.1	2.3	J				9.4	11	J			
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	56.2	42.7		81.8	44.5		729	45					17300	1320				

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value.

U = Nondetected value.

D = Sample was diluted for analysis.

RL = Reporting Limit.

[1] Duplicate sample for the preceeding sample number.

Page 8 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4806-0015			CAN048-4806-0020			CAN048-4806-0025			CAN048-4806-0030			CAN048-4806-4863[1]		
LAB SAMPLE NUMBER	0398000005SA			0398000006SA			0398000008SA			0398000009SA			0398000012SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	5700	U	<	2900	U	410	110		13	12		<	11	U
2-Butanone (MEK)	<	5700	U	1200	2900	J	140	110		<	12	U	<	11	U
Chlorobenzene	<	2800	U	<	1400	U	<	56	U	<	5.8	U	<	5.3	U
Ethylbenzene	570	2800	J	420	1400	J	<	56	U	<	5.8	U	<	5.3	U
Methylene chloride	<	2800	U	<	1400	U	41	56	J	4.8	5.8	J	1.9	5.3	J
Toluene	<	2800	U	<	1400	U	<	56	U	<	5.8	U	<	5.3	U
Xylenes (total)	5500	2800		3300	1400		69	56		<	5.8	U	<	5.3	U
Semivolatile Organics (µg/kg)															
Acenaphthene	88	750	J	<	1900	U	<	370	U	<	380	U	<	350	U
bis(2-Ethylhexyl)phthalate	<	750	UJ	<	1900	U	<	370	U	<	380	U	<	350	U
4-Chloroaniline	<	750	R	<	1900	U	<	370	U	<	380	U	<	350	U
Di-n-butyl phthalate	<	750	R	<	1900	U	<	370	U	<	380	U	<	350	U
Dibenzofuran	220	750	J	<	1900	U	88	370	J	<	380	U	<	350	U
1,2-Dichlorobenzene	1100	750	J	220	1900	J	<	370	U	<	380	U	<	350	U
1,3-Dichlorobenzene	<	750	R	<	1900	U	<	370	U	<	380	U	<	350	U
1,4-Dichlorobenzene	<	750	R	<	1900	U	<	370	U	<	380	U	<	350	U
Fluoranthene	510	750	J	230	1900	J	150	370	J	<	380	U	<	350	U
Fluorene	130	750	J	<	1900	U	47	370	J	<	380	U	<	350	U
2-Methylnaphthalene	5700	750	J	3600	1900		2300	370		<	380	U	87	350	J
Naphthalene	2100	750	J	1200	1900	J	800	370		<	380	U	<	350	U
N-Nitrosodiphenylamine	<	750	R	<	1900	U	<	370	U	<	380	U	<	350	U
Phenanthrene	98	750	J	<	1900	U	41	370	J	<	380	U	<	350	U
Phenol	<	750		<	1900	U	38	370	J	<	380	U	<	350	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
D = Sample was diluted for analysis.
RL = Reporting Limit.
[1] Duplicate sample for the preceeding sample number.

Page 9 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4806-0015			CAN048-4806-0020			CAN048-4806-0025			CAN048-4806-0030			CAN048-4806-4863[1]		
LAB SAMPLE NUMBER	0398000005SA			0398000006SA			0398000008SA			0398000009SA			0398000012SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)															
Aluminum	3630	22.7	J	3860	22.9	J	4590	22.4	J	5850	11.5	J	2030	10.7	J
Antimony	<	13.6	UJ	14	13.7	J	<	13.4	UJ	<	6.9	UJ	<	6.4	UJ
Arsenic	1.7	0.57		1.4	0.57		1.6	0.56		0.82	0.58		0.94	2.1	J
Barium	402	2.3	J	205	2.3	J	518	2.2	J	244	1.2	J	63.6	1.1	J
Beryllium	<	0.45	U	<	0.46	U	0.23	0.45	J	0.2	0.23	J	0.12	0.21	J
Calcium	210000	45.3	J	170000	45.8	J	173000	44.7	J	33600	23.1	J	23000	21.4	J
Chromium	5.8	2.3	J	2.4	2.3	J	6.5	2.2	J	4	1.2	J	1.3	1.1	J
Cobalt	1.6	2.3	J	1.2	2.3	J	1.8	2.2	J	1.2	1.2		0.79	1.1	J
Copper	1.4	4.5	J	1.4	4.6	J	2.9	4.5	J	1.6	2.3	J	0.9	2.1	J
Iron	1980	22.7		2320	22.9	J	2890	22.4	J	4360	11.5	J	1560	10.7	J
Lead	1.8	0.57	J	1.9	0.57	J	2.1	0.56	J	2.1	0.58	J	2.1	0.53	J
Magnesium	16200	45.3		15500	45.8		17700	44.7		3330	23.1		2100	21.4	
Manganese	20.8	2.3		26.8	2.3		28.9	2.2		34.6	1.2		24.5	1.1	
Nickel	8.5	9.1	J	4.4	9.2	J	6.2	8.9	J	3.6	4.6	J	1.7	4.3	J
Potassium	478	1130	J	483	1140	J	735	1120	J	1310	577		613	534	
Vanadium	18.9	2.3	J	20	2.3	J	19.8	2.2	J	9.8	1.2	J	5.5	1.1	J
Zinc	6.1	4.5	J	5.5	4.6	J	7.1	4.5	J	9	2.3	J	3.7	2.1	J
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbons	3890	907		2080	137		1350	492		199	46.2		172	42.7	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
D = Sample was diluted for analysis.
RL = Reporting Limit.
[1] Duplicate sample for the preceeding sample number.

Source: URS Greiner Woodward Clyde, 2000

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4806-0035			CAN048-4806-0040		
LAB SAMPLE NUMBER	0398000010SA			0398000011SA		
COLLECT DATE	12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)						
Acetone	9.2	10	J	3.5	11	J
2-Butanone (MEK)	<	10	U	<	11	U
Chlorobenzene	<	5.2	U	<	5.3	U
Ethylbenzene	<	5.2	U	<	5.3	U
Methylene chloride	3.3	5.2	J	2.1	5.3	J
Toluene	<	5.2	U	<	5.3	U
Xylenes (total)	<	5.2	U	<	5.3	U
Semivolatile Organics (µg/kg)						
Acenaphthene	<	340	U	<	350	U
bis(2-Ethylhexyl)phthalate	<	340	U	<	350	U
4-Chloroaniline	<	340	U	<	350	U
Di-n-butyl phthalate	<	340	U	<	350	U
Dibenzofuran	<	340	U	<	350	U
1,2-Dichlorobenzene	<	340	U	<	350	U
1,3-Dichlorobenzene	<	340	U	<	350	U
1,4-Dichlorobenzene	<	340	U	<	350	U
Fluoranthene	<	340	U	<	350	U
Fluorene	<	340	U	<	350	U
2-Methylnaphthalene	<	340	U	<	350	U
Naphthalene	<	340	U	<	350	U
N-Nitrosodiphenylamine	<	340	U	<	350	U
Phenanthrene	<	340	U	<	350	U
Phenol	<	340	U	<	350	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. D = Sample was diluted for analysis.

U = Nondetected value. RL = Reporting Limit.

(1) Duplicate sample for the preceeding sample number.

Table 30-2
Summary of Compounds Detected in Phase II Soil Samples
SWMU 48A

LOCATOR	CAN048-4806-0035			CAN048-4806-0040		
LAB SAMPLE NUMBER	0398000010SA			0398000011SA		
COLLECT DATE	12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)						
Aluminum	2860	10.4	J	2970	10.5	J
Antimony	<	6.3	UJ	<	6.3	UJ
Arsenic	0.61	2.1	J	0.57	0.53	
Barium	24.3	1	J	23.1	1.1	J
Beryllium	<	0.21	U	<	0.21	U
Calcium	27700	20.9	J	33300	21.1	J
Chromium	2.5	1	J	2.3	1.1	J
Cobalt	0.82	1	J	0.86	1.1	J
Copper	1.3	2.1	J	0.94	2.1	J
Iron	2890	10.4	J	2810	10.5	J
Lead	1.6	0.52	J	1.5	0.53	J
Magnesium	1930	20.9		2640	21.1	
Manganese	32.1	1		29.9	1.1	
Nickel	1.9	4.2	J	2.2	4.2	J
Potassium	662	522		625	527	
Vanadium	6.8	1	J	7	1.1	J
Zinc	5.8	2.1	J	5.6	2.1	J
TRPH (mg/kg)						
Total Recoverable Petroleum Hydrocarbons	<	41.8	U	<	42.2	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. D = Sample was diluted for analysis.

U = Nondetected value. RL = Reporting Limit.

(1) Duplicate sample for the preceeding sample number.

Page 12 of 12

Source: URS Greiner Woodward Clyde, 2000

Table 30-3
Comparison of Maximum Soil Concentrations to MSSLs
SWMU 48A

Chemical	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?
VOLATILE ORGANICS				
2-Butanone	1.2		6900	NO
Acetone	0.41		1400	NO
Chlorobenzene	0.003		54	NO
Ethylbenzene	0.89		230	NO
Methylene Chloride	0.041		8.5	NO
Toluene	0.0057		520	NO
Xylenes	12		210	NO
SEMIVOLATILE ORGANICS				
1,2-Dichlorobenzene	7.5		370	NO
1,3-Dichlorobenzene	0.7		41	NO
1,4-Dichlorobenzene	1.8		3	NO
2-Methylnaphthalene*	12		55	NO
4-Chloroaniline	7.9		220	NO
Acenaphthene	0.088		2600	NO
Bis(2-ethylhexyl)phthalate	9.1		32	NO
Dibenzofuran	0.22		210	NO
Di-n-Butyl phthalate	0.41		5,500	NO
Fluoranthene	1.2		2,000	NO
Fluorene	0.19		1,800	NO
N-Nitrosodiphenylamine	0.4		91	NO
Naphthalene	5.2		55	NO
Phenanthrene*	0.4		55	NO
Phenol	0.038		33,000	NO
TRPH	17,300		NA	
METALS				
Aluminum	15,300		75,000	NO
Antimony	14		30	NO
Barium	2,390		5,200	NO
Chromium	13.8		30	NO
Copper	14.5		2,800	NO
Iron	13,300		22,000	NO
Lead	25.7		400	NO
Nickel	13.5		1,500	NO

(1) EPA Region Media-Specific Screening Levels for Residential Soil (EPA 1998)

* The MSSL for naphthalene was used as a surrogate for these PAHS. See text.

mg/kg = Milligrams per Kilogram

Source: URS Greiner Woodward Clyde, 2000

Table 31-1a
Concentration (µg/kg) of VOCs
SWMU 48B

Borehole Number	Cannon Number	Depth (ft.)	Chemical		
			Acetone	Xylene	Methylene Chloride
1	CAN48A-UST1-031A	Surface	11U	11U	11U
	CAN48A-UST1-032C	5.0	R	R	-R
2	CAN48A-UST2-031A	Surface	11U	11U	11U
	CAN48A-UST2-032C	5.0	12U	12U	20U
3	CAN48A-UST3-031A	Surface	11U	11U	14U
	CAN48A-UST3-032C	5.0	10U	11U	15U
1	CAN48B-UST1-031A	Surface	R	12U	12U
	CAN48B-UST1-032C	5.0	51U	12U	37
2	CAN48B-UST2-031A	Surface	110	75	150
	CAN48B-UST2-032C	5.0	33	12U	32
	CAN48B-UST2-831C		39 (QCD)		36 (QCD)

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected

U = not detected at CRQL
UJ = estimated as non-detect at CRQL
QCD = duplicate analyzed at the same laboratory as the normal sample.

Source: LRL Science, Inc., 1993

Table 31-1b
Concentration (µg/kg) of BTEX
SWMU 48B

Borehole Number	Cannon Number	Depth (ft.)	Chemical				
			Benzene	Ethyl Benzene	Toluene	Xylene	BTEX Total
1	CAN48A-UST1-011D	10.0	10U	20	10U	110	130
	CAN48A-UST1-012F	20.0	2U	2U	2U	2U	2U
	CAN48A-UST1-013G	30.0	2U	2U	2U	2U	2U
2	CAN48A-UST2-011D	10.0	1000U	4200	1200	32000	37400
	CAN48A-UST2-012F	20.0	10000U	16000	10000U	100000	116000
	CAN48A-UST2-013G	30.0	2U	2U	2U	2U	2U
3	CAN48A-UST3-011D	10.0	2U	2U	2U	2U	2U
	CAN48A-UST3-012F	20.0	2U	2U	2U	2U	2U
	CAN48A-UST3-013G	30.0	2U	2U	2U	2U	2U
1	CAN48B-UST1-011D	10.0	2U	2U	2U	2U	2U
	CAN48B-UST1-012F	20.0	2U	2U	2U	2U	2U
	CAN48B-UST1-013G	30.0	2U	2U	2U	2U	2U
2	CAN48B-UST2-011D	10.0	2U	2U	2U	2U	2U
	CAN48B-UST2-012F	20.0	2U	2U	2U	2U	2U
	CAN48B-UST2-013G	30.0	2U	2U	2U	2U	2U

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Science, Inc., 1993

Table 31-1c
Concentration (mg/kg) of Total TAL Metals
SWMU 48B

Boring Number	Sample Number (CAN48A-UST)	Sample Depth (feet)	Barium	Calcium	Magnesium	Nickel	Thalium	Vanadium
1	1-021A	0	729 J	224000	9100	9.2 J	0.33 R	10.4 J
	1-022C	5	155 J	156000	2410	7.5 J	0.34 R	10.7 J
(QAD)	1-721C	5	159	125000	3220	7.7	0.23 U	18.4
(QCD)	1-821C	5	57.2 J	5640	2920	12.9 J	0.34 R	20.1 J
	1-023D	10	194 J	40500	3020	8.6 J	0.31 R	28.9 J
	1-024F	20	34.9 J	35500	3520	7 J	0.32 R	14.7 J
	1-025G	30	125 J	64100	10400	6.4 J	0.32 R	14.7 J
2	2-021A	0	638 J	270000	10300	9.5 J	0.34 R	11.2 J
	2-022C	5	190 J	75700	3350	8.7 J	0.37 R	17.5 J
	2-023D	10	1760 J	211000	6520	5.6 J	0.35 R	13.2 J
	2-024F	20	363 J	148000	11400	4.6 J	0.33 R	18.1 J
	2-025G	30	365 J	88000	5830	5.6 J	0.33 R	11.6 J
3	3-021A	0	705 J	230000	11600	9.3 J	0.32 R	12 J
	3-022C	5	377 J	153000	4390	7.9 J	0.33 R	15.7 J
	3-023D	10	383 J	282000	4700	3.3 J	3.2 R	8 J
	3-024F	20	673 J	150000	13399	5.5 J	0.34 R	17.6 J
	3-025G	30	39.5 J	60800	3890	4 J	0.32 R	9.7 J
(CAN48B-UST)								
1	1-021A	0	492 J	20600 J	8660 J	8.2 J	5.4 UJ	10.2 J
	1-022C	5	1320 J	241000	3550 J	5.3 J	5.8 UJ	7.1 J
	1-023D	10	406 J	156000 J	3260 J	5.1 J	5.6 UJ	8.8 J
	1-024F	20	149 J	20400 J	16700 J	3.7 J	5.7 UJ	15.1 J
	1-025G	30	26.2 J	24400 J	3210 J	2.7 J	5.4 UJ	6.9 J
2	2-021A	0	445 J	22700 J	8250 J	7.1 J	5.3 UJ	12.5
	2-022C	5	236 J	163000 J	2510 J	6 J	5.7 UJ	8.6 J
(QAD)	2-721C	5	258	250000	3810	4.7	0.25 U	11.2
(QCD)	2-821C	5	153 J	276000 J	4110 J	4 J	6 UJ	7.5
	2-023D	10	461 J	255000 J	4080 J	3.3 J	5.6 UJ	6.5 J
	2-024F	20	126 J	142000 J	14900 J	4.6 J	5.6 J	13.1 J
	2-025G	30	15.7 J	4950 J	2400 J	4 J	5.3 UJ	7.6 J
Background (95% UCL) (1)			642.00	18640.00	11790.00	9.00	1.20	25.30

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

(1) Background data is described in Section 1.7.

Source: LRL Science, Inc., 1993

Table 31-2a
Summary of Compounds Detected in Soil Samples
SWMU 48B

LOCATOR	CAN049-4903-0000			CAN049-4903-0005			CAN049-4903-0010			CAN049-4903-4962[1]			CAN049-4903-0015			CAN049-4903-0020			CAN049-4903-0025		
LAB SAMPLE NUMBER	0398680001SA			0398680002SA			0398680003SA			0398680010SA			0398680004SA			0398680005SA			0398680006SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																					
Acetone	8	11	J	<	12	U	6.7	11	J	7.1	11	J	6.3	11	J	<	12	U	7	11	J
Carbon disulfide	<	5.5	U	<	5.8	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.8	U	<	5.7	U
Methylene chloride	3	5.5	J	3.3	5.8	J	2.8	5.6	J	3	5.6	J	2.8	5.5	J	3.3	5.8	J	3.2	5.7	J
Toluene	3	5.5	J	1.7	5.8	J	1.8	5.6	J	2.5	5.6	J	1.3	5.5	J	2.3	5.8	J	1.5	5.7	J
Semivolatile Organics (µg/kg)																					
bis(2-Ethylhexyl)phthalate	<	360	U	<	380	U	<	370	U	<	370	U	<	370	U	<	380	U	<	380	U
Fluoranthene	<	360	U	<	380	U	<	370	U	<	370	U	<	370	U	<	380	U	<	380	U
Metals (mg/kg)																					
Aluminum	16300	11		9850	23.2		6440	22.4		7430	22.2		3410	55.3		6840	23.1		10000	11.4	
Arsenic	3.9	0.55		2.4	0.58		1.3	0.56		1.6	0.56		0.69	0.55		0.89	0.58		1.3	0.57	
Barium	389	1.1	J	151	2.3	J	144	2.2	J	131	2.2	J	192	5.5	J	227	2.3	J	152	1.1	J
Beryllium	0.65	0.22		0.43	0.46	J	0.37	0.45	J	0.34	0.44	J	<	1.1	U	<	0.46	U	0.28	0.23	
Calcium	58500	22.1	J	158000	46.5	J	175000	44.9	J	156000	44.4	J	280000	111	J	184000	46.3	J	103000	22.8	J
Chromium	12.2	1.1		6.2	2.3		3.9	2.2		4	2.2		<	5.5	U	4.5	2.3		8.5	1.1	
Cobalt	4.3	1.1		3.2	2.3		2.3	2.2		2.7	2.2		1.4	5.5	J	<	2.3	U	1.8	1.1	
Copper	8.7	2.2		4.4	4.6	J	2.7	4.5	J	2.5	4.4	J	<	11.1	U	2.6	4.6	J	2.2	2.3	J
Iron	11500	11		7190	23.2		4980	22.4		5360	22.2		2140	55.3		3740	23.1		5340	11.4	
Lead	7.5	0.55		4.2	1.2		3.3	1.1		2.8	0.56		1.2	0.55		1.9	0.58		2.4	0.57	
Magnesium	4360	22.1	J	3720	46.5	J	3320	44.9	J	3230	44.4	J	6190	111	J	17000	46.3	J	14000	22.8	J
Manganese	184	1.1	J	82	2.3	J	54.9	2.2	J	57.6	2.2	J	19.8	5.5	J	28.9	2.3	J	31.1	1.1	J
Mercury	<	0.11	U	0.6	0.58		<	0.11	U	<	0.11	U	<	0.11	U	<	0.12	U	<	0.11	U
Nickel	10.2	4.4		7.6	9.3	J	8.3	9	J	7.7	8.9	J	4.8	22.1	J	7.9	9.3	J	5.7	4.6	
Potassium	2390	551		1570	1160		1420	1120		1630	1110		397	2770	J	1080	1160	J	1820	569	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Page 1 of 6

Source: Woodward-Clyde, 1997

Table 31-2a
Summary of Compounds Detected in Soil Samples
SWMU 48B

LOCATOR	CAN049-4903-0000			CAN049-4903-0005			CAN049-4903-0010			CAN049-4903-4962[1]			CAN049-4903-0015			CAN049-4903-0020			CAN049-4903-0025		
LAB SAMPLE NUMBER	0398680001SA			0398680002SA			0398680003SA			0398680010SA			0398680004SA			0398680005SA			0398680006SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																					
Sodium	<	551	U	<	1160	U	<	1120	U	<	1110	U	<	2770	U	<	1160	U	348	569	J
Thallium	<	1.1	UJ	<	1.2	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	2.3	UJ	<	2.3	UJ
Vanadium	23.8	1.1		18.8	2.3		13.7	2.2		13.8	2.2		7.9	5.5		19.6	2.3		16.9	1.1	
Zinc	28.6	2.2		18.1	4.6		13.7	4.5		14.2	4.4		6.9	11.1	J	9.5	4.6		10.4	2.3	
TRPH (mg/kg)																					
Total Recoverable Petroleum Hydrocarbons	<	44.1	U	<	46.5	U	<	44.9	U	<	44.4	U	<	44.3	U	<	46.3	U	<	45.5	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Page 2 of 6

Source: Woodward-Clyde, 1997

Table 31-2a
Summary of Compounds Detected in Soil Samples
SWMU 48B

LOCATOR	CAN049-4903-0030			CAN049-4903-0035			CAN049-4903-0040			CAN049-4904-0000			CAN049-4904-0005			CAN049-4904-4961[1]			CAN049-4904-0010		
LAB SAMPLE NUMBER	0398680007SA			0398680008SA			0398680009SA			0397900010SA			0397900011SA			0397900016SA			0397900012SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																					
Acetone	6.4	12	J	9.3	11	J	5.5	11	J	14	11		<	12	U	<	12	U	<	11	U
Carbon disulfide	<	5.9	U	1.2	5.5	J	<	5.4	U	<	5.5	U	<	6	U	<	5.9	U	<	5.6	U
Methylene chloride	3.2	5.9	J	3.1	5.5	J	3	5.4	J	4.7	5.5	UJ	<	6	U	1.7	5.9	UJ	1.6	5.6	J
Toluene	1.8	5.9	J	1.2	5.5	J	1.3	5.4	J	<	5.5	U	<	6	U	<	5.9	U	<	5.6	U
Semivolatile Organics (µg/kg)																					
bis(2-Ethylhexyl)phthalate	<	390	U	<	360	U	<	360	U	<	370	U	<	400	U	<	390	U	<	370	U
Fluoranthene	<	390	U	<	360	U	<	360	U	<	370	U	<	400	U	<	390	U	<	370	U
Metals (mg/kg)																					
Aluminum	10700	11.9		7660	10.9		4580	10.8		6540	50		2930	50		2840	59.4		4770	50	
Arsenic	1.1	0.59		1.1	0.55		0.56	0.54		2.2	5	J	1.6	0.5		1.5	1.2		2.7	0.5	
Barium	186	1.2	J	124	1.1	J	43.9	1.1	J	481	5		712	5		1060	5.9		2350	5	
Beryllium	0.28	0.24		0.23	0.22		0.14	0.22	J	<	1	U	<	1	U	<	1.2	U	<	1	U
Calcium	12800	23.7	J	59200	21.8	J	30700	21.5	J	196000	100		250000	100		335000	119		293000	100	
Chromium	6.8	1.2		5.6	1.1		3.6	1.1		3.5	5	J	<	5	U	<	5.9	U	<	5	U
Cobalt	1.8	1.2		1.1	1.1		1.7	1.1		4.7	5	J	<	5	U	<	5.9	U	2.2	5	J
Copper	4.5	2.4		2.4	2.2		1.8	2.2	J	6.2	10	J	<	10	U	3.9	11.9	J	2.1	10	J
Iron	6110	11.9		4720	10.9		3890	10.8		4680	50		2140	50		2390	59.4		3400	50	
Lead	3.2	0.59		2.4	0.55		1.7	0.54		3.1	1		1.5	0.5		1.9	0.59		1.9	0.5	
Magnesium	17100	23.7	J	7110	21.8	J	5030	21.5	J	8880	100		4120	100		4940	119		7960	100	
Manganese	38.7	1.2	J	42.3	1.1	J	34	1.1	J	82.9	5	J	21	5	J	21	5.9	J	33.8	5	J
Mercury	<	0.12	U	<	0.11	U	<	0.11	U	<	0.1	U	<	0.1	U	<	0.12	U	<	0.1	U
Nickel	5.7	4.7		4.8	4.4		4.3	4.3		14.5	20	J	<	20	U	<	23.7	U	<	20	U
Potassium	2100	594		1610	546		914	539		915	2500	J	504	2500	J	<	2970	U	690	2500	J

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. D = Sample was diluted for analysis.

U = Nondetected value. RL = Reporting Limit.

[1] Duplicate for preceeding sample number.

Page 3 of 6

Source: Woodward-Clyde, 1997

Table 31-2a
Summary of Compounds Detected in Soil Samples
SWMU 48B

LOCATOR	CAN049-4903-0030			CAN049-4903-0035			CAN049-4903-0040			CAN049-4904-0000			CAN049-4904-0005			CAN049-4904-4961[1]			CAN049-4904-0010		
LAB SAMPLE NUMBER	0398680007SA			0398680008SA			0398680009SA			0397900010SA			0397900011SA			0397900016SA			0397900012SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																					
Sodium	256	594	J	<	546	U	<	539	U	<	2500	U	<	2500	U	<	2970	U	<	2500	U
Thallium	<	1.2	UJ	<	1.1	UJ	<	1.1	UJ	<	2	U	<	1	U	<	1.2	U	0.28	2	J
Vanadium	19	1.2		10.9	1.1		11.3	1.1		14.6	5		8	5		9.3	5.9		15.9	5	
Zinc	12.5	2.4		9.9	2.2		7.3	2.2		13.2	10		6.9	10	J	5.7	11.9	J	7.5	10	J
TRPH (mg/kg)																					
Total Recoverable Petroleum Hydrocarbons	<	47.5	U	<	43.7	U	<	43.1	U	<	44.4	U	<	47.9	U	<	47.5	U	<	44.9	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Page 4 of 6

Source: Woodward-Clyde, 1997

Table 31-2a
Summary of Compounds Detected in Soil Samples
SWMU 48B

LOCATOR	CAN049-4904-0015			CAN049-4904-0020			CAN049-4904-0025			CAN049-4904-0030			CAN049-4904-0035			CAN049-4904-0040		
LAB SAMPLE NUMBER	0397900013SA			0397900014SA			0397900015SA			0397900017SA			0397900018SA			0398680011SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	13	11		9.2	11	J	5.9	11	J	<	11	U	6.5	11	J	9.1	11	J
Carbon disulfide	<	5.6	U	<	5.7	U	<	5.7	U	<	5.4	U	<	5.3	U	<	5.3	U
Methylene chloride	2	5.6	UJ	<	5.7	U	1.3	5.7	UJ	<	5.4	U	<	5.3	U	2.4	5.3	J
Toluene	<	5.6	U	<	5.7	U	<	5.7	U	<	5.4	U	<	5.3	U	1.5	5.3	J
Semivolatile Organics (µg/kg)																		
bis(2-Ethylhexyl)phthalate	780	370		42	380	J	89	380	J	<	360	U	<	350	U	<	350	U
Fluoranthene	210	370	J	<	380	U	<	380	U	<	360	U	<	350	U	<	350	U
Metals (mg/kg)																		
Aluminum	3480	50		3280	20		3340	20		3540	10.8		1960	10.5		4050	10.6	
Arsenic	1.6	0.5		1	0.5		1.2	0.5		0.99	0.54		0.56	0.53		0.57	0.53	
Barium	609	5		378	2		94.3	2		46	1.1		25.3	1.1		29.3	1.1	J
Beryllium	<	1	U	<	0.4	U	<	0.4	U	0.17	0.22	J	<	0.21	U	0.11	0.21	J
Calcium	214000	100		145000	40		127000	40		28000	21.5		32100	21		32900	21.3	J
Chromium	<	5	U	2	2		2.1	2		2.7	1.1		1.4	1.1		3.1	1.1	
Cobalt	1.9	5	J	1.1	2	J	<	2	U	1.1	1.1		1.2	1.1		1.5	1.1	
Copper	<	10	U	2.8	4	J	2.2	4	J	1.5	2.2	J	1.2	2.1	J	1.5	2.1	J
Iron	1970	50		2060	20		2300	20		3340	10.8		1790	10.5		3320	10.6	
Lead	1.2	0.5		1.5	0.5		1.8	0.5		2.5	0.54		1.6	0.53		1.5	0.53	
Magnesium	11500	100		13300	40		8620	40		4680	21.5		2010	21		4530	21.3	J
Manganese	19.6	5	J	19.9	2	J	22	2	J	26.8	1.1	J	33	1.1	J	37.4	1.1	J
Mercury	<	0.1	U	<	0.1	U	<	0.1	U	<	0.11	U	<	0.11	U	<	0.11	U
Nickel	<	20	U	<	8	U	3.5	8	J	3.5	4.3	J	1.9	4.2	J	3.5	4.3	J
Potassium	504	2500	J	336	1000	J	584	1000	J	910	538		563	526		824	532	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for preceeding sample number.

Page 5 of 6

Source: Woodward-Clyde, 1997

Table 31-2a
Summary of Compounds Detected in Soil Samples
SWMU 48B

LOCATOR	CAN049-4904-0015			CAN049-4904-0020			CAN049-4904-0025			CAN049-4904-0030			CAN049-4904-0035			CAN049-4904-0040		
LAB SAMPLE NUMBER	0397900013SA			0397900014SA			0397900015SA			0397900017SA			0397900018SA			0398680011SA		
COLLECT DATE	12/12/94			12/12/94			12/12/94			12/12/94			12/12/94			12/12/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Sodium	<	2500	U	<	1000	U	<	1000	U	<	538	U	<	526	U	<	532	U
Thallium	<	2	U	<	1	U	<	1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ
Vanadium	18.5	5		18	2		11.5	2		10.3	1.1		5.6	1.1		9.6	1.1	
Zinc	5.1	10	J	4.7	4		4.2	4		5.8	2.2		4.5	2.1		6.4	2.1	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	594	44.9		<	45.5	U	<	45.6	U	<	43	U	<	42.1	U	<	42.6	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for preceeding sample number.

Page 6 of 6

Source: Woodward-Clyde, 1997

Table 31-2b
Comparison of Maximum Soil Concentrations to RBCs for Residential Soil
SWMU 48B

Chemical	Maximum Detected Concentration (mg/kg)	Residential Soil Risk-Based Concentration(1) (mg/kg)	Exceeds RBC?
Acetone	0.014	7,800	NO
Carbon Disulfide	0.0012	7,800	NO
Methylene Chloride	0.0047	85	NO
Toluene	0.003	16,000	NO
Bis(2-ethylhexyl)phthalate	0.78	46	NO
Fluoranthene	0.21	3,100	NO
Barium	2,350	5,500	NO
Mercury	0.6	23	NO
Nickel	14.5	1,600	NO
Thallium	0.28	6.3	NO
Zinc	28.6	23,000	NO

(1) EPA Region III Risk-Based Concentrations for Residential Soil (EPA 1994).

Source: Woodward-Clyde, 1997

Table 34-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 55

LOCATOR	CAN055-0551-0000			CAN055-0551-0003			CAN055-0552-0000			CAN055-0552-0003			CAN055-0553-0000			CAN055-0553-0003		
LAB SAMPLE NUMBER	0312750001SA			0312750002SA			0313820009SA			0313820010SA			0313820004SA			0313820005SA		
COLLECT DATE	09/15/93			09/15/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Lead	6.1	0.56		4.5	2.8		6.3	0.57		3.3	1.2		8	1.1		3.9	0.58	
Water Quality (percent)																		
Water	10	0.1		11	0.1		12	0.1		14	0.1		11	0.1		14	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Source: Woodward-Clyde, 1994

Table 34-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 55

LOCATOR	CAN055-0551-0008			CAN055-0551-0013			CAN055-0551-0018			CAN055-0552-0008			CAN055-0552-0013			CAN055-0552-0018		
LAB SAMPLE NUMBER	0312750003SA			0312750004SA			0312750005SA			0313820011SA			0313820012SA			0313820013SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Lead	4.6	2.8		1.2	5.3	J	0.96	1.1	J	4.6	0.67		1	0.57		3.6	0.58	
Water Quality (percent)																		
Water	9.2	0.1		6.3	0.1		10	0.1		25	0.1		12	0.1		14	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 34-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 55

LOCATOR	CAN055-0553-0008			CAN055-0553-0013			CAN055-0553-0018		
LAB SAMPLE NUMBER	0313820006SA			0313820007SA			0313820008SA		
COLLECT DATE	09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)									
Lead	3.5	0.6		2.1	1.3		1.9	0.69	
Water Quality (percent)									
Water	16	0.1		26	0.1		28	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review. A complete summary of chemical results are presented in Appendix A.

J = Estimated value.

R = Rejected value. QUAL=Qualification

U = Nondetected value. RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 34-2a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 55

LOCATOR	CAN055-5504-0000			CAN055-5504-5561[1]			CAN055-5504-0005			CAN055-5504-0010			CAN055-5504-0015			CAN055-5504-0020		
LAB SAMPLE NUMBER	0398680012SA			0398680017SA			0398680013SA			0398680014SA			0398680015SA			0398680016SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	<	11	U	8.3	11	J	<	11	U	<	11	U	<	11	U
Methylene chloride	3	5.6	J	<	5.6	U	3	5.6	J	<	5.6	U	<	5.6	U	<	5.7	U
Toluene	7.4	5.6		3.1	5.6	J	1.8	5.6	J	<	5.6	U	<	5.6	U	<	5.7	U
Semivolatile Organics (µg/kg)																		
Anthracene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(a)anthracene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(a)pyrene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(b)fluoranthene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(g,h,i)perylene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(k)fluoranthene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
bis(2-Ethylhexyl)phthalate	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Carbazole	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Chrysene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Dibenz(a,h)anthracene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Diethyl phthalate	<	370	U	38	370	J	<	370	U	<	370	U	<	370	U	<	380	U
Fluoranthene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Phenanthrene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Pyrene	<	370	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Metals (mg/kg)																		
Aluminum	6100	56		6930	22.5		12300	11.1		9930	11.3		8780	11.1		13300	11.5	
Antimony	<	33.6	UJ	<	13.5	UJ	<	6.7	UJ	<	6.8	U	<	6.7	UJ	<	6.9	UJ
Arsenic	3.4	0.56		3.6	0.56		2.3	0.56		2.3	0.56		1.9	0.56		3.2	0.57	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value.
U = Nondetected value.
D = Sample was diluted for analysis.
RL = Reporting Limit.
[1] Duplicate for preceding sample number.

Page 1 of 6

Source: Woodward-Clyde, 1997

Table 34-2a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 55

LOCATOR	CAN055-5504-0000			CAN055-5504-5561[1]			CAN055-5504-0005			CAN055-5504-0010			CAN055-5504-0015			CAN055-5504-0020		
LAB SAMPLE NUMBER	0398680012SA			0398680017SA			0398680013SA			0398680014SA			0398680015SA			0398680016SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Barium	468	5.6	J	498	2.2	J	136	1.1	J	1120	1.1		115	1.1	J	90.7	1.1	J
Beryllium	<	1.1	U	0.26	0.45	J	0.54	0.22		0.44	0.23		0.42	0.22		0.76	0.23	
Cadmium	<	2.8	U	0.47	1.1	J	<	0.56	U	<	0.56	U	<	0.56	U	<	0.57	U
Calcium	230000	112	J	213000	44.9	J	41400	22.2	J	83000	22.5		60600	22.2	J	11000	22.9	J
Chromium	<	5.6	U	4.7	2.2		9.3	1.1		7.6	1.1		7	1.1		9.9	1.1	
Cobalt	4.4	5.6	J	2.3	2.2		3.6	1.1		3.3	1.1		2.4	1.1		3.4	1.1	
Copper	5	11.2	J	5.1	4.5		6.9	2.2		4.8	2.3		4.5	2.2		6.7	2.3	
Iron	4220	56		4860	22.5		9300	11.1		7120	11.3		6570	11.1		10500	11.5	
Lead	5.7	1.1		7.1	1.1		5.4	0.56		4.5	0.56		4.6	0.56		7.3	0.57	
Magnesium	5360	112	J	5100	44.9	J	2480	22.2	J	3750	22.5		3490	22.2	J	5460	22.9	J
Manganese	90.7	5.6	J	94	2.2	J	131	1.1	J	97.9	1.1		94.1	1.1	J	68.5	1.1	J
Nickel	7.9	22.4	J	9.4	9		9.1	4.4		7.5	4.5		5.9	4.4		8.2	4.6	
Potassium	788	2800	J	1150	1120		2110	556		1820	563		2190	556		3340	573	
Vanadium	13.2	5.6		15.2	2.2		16.8	1.1		17.8	1.1		14.8	1.1		24.9	1.1	
Zinc	11.2	11.2		12.7	4.5		22.1	2.2		17.8	2.3		15.8	2.2		27.3	2.3	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	1650	179		1640	180		50.1	44.5		<	45	U	<	44.5	U	<	45.9	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
[1] Duplicate for preceding sample number.
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 2 of 6

Source: Woodward-Clyde, 1997

Table 34-2a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 55

LOCATOR	CAN055-5505-0000			CAN055-5505-0005			CAN055-5505-0010			CAN055-5505-0015			CAN055-5505-0020			CAN055-5506-0000		
LAB SAMPLE NUMBER	0398700005SA			0398700007SA			0398700008SA			0398700012SA			0398700009SA			0398700002SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	13	11		12	12		<	11	U	<	12	U	18	11	J
Methylene chloride	<	5.6	U	<	5.7	U	2	5.8	J	<	5.6	U	2.7	5.9	J	4	5.4	J
Toluene	<	5.6	UJ	<	5.7	UJ	<	5.8	UJ	<	5.6	UJ	<	5.9	UJ	15	5.4	J
Semivolatile Organics (µg/kg)																		
Anthracene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	800	3600	J
Benzo(a)anthracene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	2700	3600	J
Benzo(a)pyrene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	4000	3600	
Benzo(b)fluoranthene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	3600	3600	
Benzo(g,h,i)perylene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	3000	3600	J
Benzo(k)fluoranthene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	3700	3600	
bis(2-Ethylhexyl)phthalate	860	3700	J	<	380	U	<	380	U	<	370	U	<	390	U	<	3600	U
Carbazole	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	<	3600	U
Chrysene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	3100	3600	J
Dibenz(a,h)anthracene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	1100	3600	J
Diethyl phthalate	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	<	3600	U
Fluoranthene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	5700	3600	
Indeno(1,2,3-cd)pyrene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	2600	3600	J
Phenanthrene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	3200	3600	J
Pyrene	<	3700	U	<	380	U	<	380	U	<	370	U	<	390	U	6200	3600	
Metals (mg/kg)																		
Aluminum	6020	11.2		6920	11.5		5950	23.1		2620	55.7		9790	11.8		3030	21.6	
Antimony	<	6.7	UJ	<	6.9	UJ	<	13.8	UJ	<	33.4	UJ	<	7.1	UJ	7.1	12.9	J
Arsenic	2.5	0.56		2.2	0.57		2.2	0.58		2.3	0.56		1.8	0.59		4.5	0.54	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for preceding sample number.

Page 3 of 6

Source: Woodward-Clyde, 1997

Table 34-2a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 55

LOCATOR	CAN055-5505-0000			CAN055-5505-0005			CAN055-5505-0010			CAN055-5505-0015			CAN055-5505-0020			CAN055-5506-0000		
LAB SAMPLE NUMBER	0398700005SA			0398700007SA			0398700008SA			0398700012SA			0398700009SA			0398700002SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Barium	153	1.1	J	184	1.1	J	156	2.3	J	867	5.6	J	398	1.2	J	723	2.2	J
Beryllium	0.41	0.22		0.45	0.23		0.47	0.46		<	1.1	U	0.48	0.24		0.29	0.43	J
Cadmium	<	0.56	U	<	0.57	U	<	1.2	U	<	2.8	U	<	0.59	U	<	1.1	U
Calcium	41700	22.3		78300	22.9		127000	46.1		275000	111		55200	23.6		150000	43.1	
Chromium	5.9	1.1		5.5	1.1		3.8	2.3		<	5.6	U	6.8	1.2		3.3	2.2	
Cobalt	3.2	1.1		3.6	1.1		3.3	2.3		<	5.6	U	1.6	1.2		3.3	2.2	
Copper	5.9	2.2		5.7	2.3		3.3	4.6	J	<	11.1	U	2.6	2.4		5.5	4.3	
Iron	6210	11.2		6010	11.5		4760	23.1		1580	55.7		5990	11.8		3960	21.6	
Lead	5.9	0.56		5.3	0.57		4.1	0.58		0.85	0.56		3	0.59		17.3	2.7	
Magnesium	1940	22.3		2250	22.9		4750	46.1		6920	111		11900	23.6		3260	43.1	
Manganese	153	1.1	J	112	1.1	J	55.2	2.3	J	22	5.6	J	34.5	1.2	J	336	2.2	J
Nickel	7.3	4.5		8.5	4.6		8.6	9.2	J	7.3	22.3	J	8.5	4.7		7.6	8.6	J
Potassium	1140	558		1250	573		1410	1150		336	2780	J	1640	591		481	1080	J
Vanadium	12.6	1.1		13.1	1.1		17.8	2.3		13	5.6		24	1.2		14.8	2.2	
Zinc	16.3	2.2		14.5	2.3		12.5	4.6		5	11.1	J	11.9	2.4		18.4	4.3	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	1540	178		<	45.8	U	<	46.1	U	<	44.6	U	<	47.3	U	11500	1730	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for preceding sample number.

Page 4 of 6

Source: Woodward-Clyde, 1997

Table 34-2a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 55

LOCATOR	CAN055-5506-5562[1]			CAN055-5506-0005			CAN055-5506-0010			CAN055-5506-0015			CAN055-5506-0020		
LAB SAMPLE NUMBER	0398700011SA			0398700004SA			0398700006SA			0398700010SA			0398700003SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	11	U	<	11	U	11	11		<	11	U	<	11	U
Methylene chloride	3.2	5.4	J	<	5.7	U	2	5.6	J	1.3	5.6	J	<	5.7	U
Toluene	28	5.4	J	<	5.7	UJ	<	5.6	UJ	<	5.6	UJ	<	5.7	UJ
Semivolatile Organics (µg/kg)															
Anthracene	780	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(a)anthracene	2600	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(a)pyrene	3800	3600		<	370	U	<	370	U	<	370	U	<	380	U
Benzo(b)fluoranthene	2700	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(g,h,i)perylene	2400	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(k)fluoranthene	3900	3600		<	370	U	<	370	U	<	370	U	<	380	U
bis(2-Ethylhexyl)phthalate	<	3600	U	<	370	U	<	370	U	<	370	U	<	380	U
Carbazole	400	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Chrysene	2900	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Dibenz(a,h)anthracene	<	3600	U	<	370	U	<	370	U	<	370	U	<	380	U
Diethyl phthalate	<	3600	U	<	370	U	<	370	U	<	370	U	<	380	U
Fluoranthene	4800	3600		<	370	U	<	370	U	<	370	U	<	380	U
Indeno(1,2,3-cd)pyrene	2400	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Phenanthrene	3200	3600	J	<	370	U	<	370	U	<	370	U	<	380	U
Pyrene	5600	3600		<	370	U	<	370	U	<	370	U	<	380	U
Metals (mg/kg)															
Aluminum	3250	21.7		6470	11.3		4530	11.2		5420	11.2		6650	22.8	
Antimony	<	13	UJ	<	6.8	UJ	2.9	6.7	J	<	6.7	UJ	<	13.7	UJ
Arsenic	5.4	0.54		2.3	0.57		2.2	1.1		1.5	0.56		1.9	0.57	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceding sample number.

Page 5 of 6

Source: Woodward-Clyde, 1997

Table 34-2a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 55

LOCATOR	CAN055-5506-5562[1]			CAN055-5506-0005			CAN055-5506-0010			CAN055-5506-0015			CAN055-5506-0020		
LAB SAMPLE NUMBER	0398700011SA			0398700004SA			0398700006SA			0398700010SA			0398700003SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Barium	851	2.2	J	148	1.1	J	254	1.1	J	97.7	1.1	J	111	2.3	J
Beryllium	0.28	0.43	J	0.44	0.23		0.31	0.22		0.42	0.22		0.55	0.46	
Cadmium	<	1.1	U	<	0.57	U	0.34	0.56	J	<	0.56	U	0.82	1.1	J
Calcium	172000	43.4		61800	22.7		96900	22.3		50400	22.4		137000	45.6	
Chromium	2.6	2.2		5.9	1.1		3.9	1.1		4.8	1.1		4.8	2.3	
Cobalt	3	2.2		4	1.1		2.9	1.1		2.6	1.1		1.7	2.3	J
Copper	6	4.3		7	2.3		2.9	2.2		3.3	2.2		3.7	4.6	J
Iron	4420	21.7		5970	11.3		4190	11.2		5060	11.2		4860	22.8	
Lead	18	2.7		6	0.57		4.1	0.56		4.5	0.56		4.2	0.57	
Magnesium	3840	43.4		1960	22.7		2930	22.3		3460	22.4		6380	45.6	
Manganese	258	2.2	J	122	1.1	J	69.7	1.1	J	51.7	1.1	J	40.9	2.3	J
Nickel	8.7	8.7		9.3	4.5		6	4.5		5.7	4.5		6.5	9.1	J
Potassium	482	1080	J	1310	567		1120	558		1550	561		1780	1140	
Vanadium	16.9	2.2		13.6	1.1		14.1	1.1		15	1.1		13.7	2.3	
Zinc	18.8	4.3		15.1	2.3		10.6	2.2		12.7	2.2		12.5	4.6	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbons	10700	911		<	45.3	U	<	44.7	U	<	44.9	U	<	45.6	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
A complete summary of chemical results are presented in Appendix A.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceding sample number.

Page 6 of 6

Source: Woodward-Clyde, 1997

Table 34-2b
Comparison of Maximum Soil Concentrations to RBCs for Residential Soil
SWMU 55

Chemical	Maximum Detected Concentration (mg/kg)	Residential Soil Risk-Based Concentration(1) (mg/kg)	Exceeds RBC?	Estimated Risk(3)	Risk Type	Industrial Soil Risk-based Concentration(2) (mg/kg)	Exceeds RBC?	Estimated Risk(3)
Acetone	0.018	7,800	NO					
Methylene Chloride	0.004	85	NO					
Toluene	0.015	16,000	NO					
Anthracene	0.8	23,000	NO					
Benzo(a)anthracene	2.7	0.88	YES	3 x 10-6	Carcinogenic	3.9	NO	
Benzo(a)pyrene	4	0.088	YES	5 x 10-5	Carcinogenic	0.39	YES	1 x 10-5
Benzo(b)fluoranthene	3.6	0.88	YES	4 x 10-6	Carcinogenic	3.9	NO	
Benzo(k)fluoranthene	3.7	8.80	NO					
Benzo(g,h,i)perylene	3	NA(a)	NA					
Bis(2-ethylhexyl)phthalate	0.86	46	NO					
Chrysene	3.1	88	NO					
Dibenzo(a,h)anthracene	1.1	0.088	YES	1 x 10-5	Carcinogenic	0.39	YES	3 x 10-6
Fluoranthene	5.7	3,100	NO					
Indeno(1,2,3-cd)pyrene	2.6	0.88	YES	3 x 10-6	Carcinogenic	3.9	NO	
Phenanthrene	3.2	NA(a)	NA					
Pyrene	6.2	2,300	NO					
TRPH	11,500	NA(a)	NA					
Antimony	7.1	31	NO					
Cadmium	0.82	39	NO					
Manganese	336	390	NO					

(1) EPA Region III Risk-Based Concentrations for residential soil (EPA 1994).
(2) EPA Region III Risk-Based Concentrations for industrial soil (EPA 1994).
(3) Estimated risk based on residential exposures to the maximum Phase II concentrations that exceeded previously evaluated Phase I levels.
Estimated risk = 1×10^{-6} * concentration/RBC.
(a) EPA has not established a toxicity factor for these chemicals, so RBCs could not be calculated.
NA = Not Applicable

Source: Woodward-Clyde, 1997

Table 34-2c
Potential Cumulative Risk
SWMU 55

Chemical[1]	Carcinogen?	Phase II Concentration (mg/kg)	Residential RBC (mg/kg)	Industrial RBC (mg/kg)	Risk Residential[2]	Hazard Residential[3]	Risk Industrial[2]	Hazard Industrial[3]
Acetone	No	0.018	7,800	100,000		0.000002		0.0000002
Methylene chloride	Yes	0.004	85	380	4.71E-11		1.05E-11	
Toluene	No	0.015	16,000	200,000		0.000001		0.00000008
Anthracene	No	0.8	23,000	310,000		0.00003		0.000003
Benzo(a)anthracene	Yes	2.7	0.88	3.9	3.07E-06		6.92E-07	
Benzo(a)pyrene	Yes	4	0.088	0.39	4.55E-05		1.03E-05	
Benzo(b)fluoranthene	Yes	3.6	0.88	3.9	4.09E-06		9.23E-07	
Benzo(k)fluoranthene	Yes	3.7	8.8	39	4.20E-07		9.49E-08	
Benzo(g,h,i)perylene		3	NA	NA				
Bis(2-ethylhexyl) phthalate	Yes	0.86	46	200	1.87E-08		4.30E-09	
Chrysene	No	3.1	88	390		0.04		0.008
Dibenzo(a,h)anthracene	Yes	1.1	0.088	0.39	1.25E-05		2.82E-06	
Fluoranthene	No	5.7	3,100	41,000		0.002		0.00014
Indeno(1,2,3-c,d)pyrene	Yes	2.6	0.88	3.9	2.95E-06		6.67E-07	
Phenanthrene	No	3.2	NA	NA				
Pyrene	No	6.2	2,300	31,000		0.003		0.0002
Antimony	No	7.1	31	410		0.2		0.02
Cadmium	No	0.82	39	510		0.02		0.002
Manganese	No	336	390	5,100		0.9		0.07
Totals					7E-05	1	2E-05	0.09
Phase I Risk[4]					NA	NA	NA	NA
Cumulative Risk[5]					NA	NA	NA	NA

[1] Chemicals with maximum Phase II concentration exceeding Phase I concentrations
[2] Risk = 1E-06 x concentration/RBC
[3] Hazard = concentration/RBC
[4] Not Applicable: Phase I risk assessment was not conducted.
[5] Not Applicable: Phase I risk assessment was not conducted.

Source: Woodward-Clyde, 1997

Table 37-1a
Ethyl Benzene and Xylenes Concentrations in Soil Samples
SWMU 76

Boring Number	Sample Depth (Ft-BGS)	Ethyl Benzene (µg/kg)	Xylenes (µg/kg)
0761	4 - 6	29,000 U	29,000 U
	10 - 12	11 U	11 U
	25 - 27	12 U	12 U
0762	0 - 0.5	3 J	11 U
	8 - 10	7,300 U	7,300 U
	14 - 16	12 U	12 U
	31 - 33	11 U	11 U
0763	0 - 0.5	11 U	11 U
	8 - 10	4,000 J	7,900 J
	18 - 20	11 U	11 U
	22 - 24	12 UJ	12 UJ

J = Estimated value
U = Not detected
UJ = Estimated as non-detect at the CRQL
Ft-BGS = Feet below ground surface

Source: Woodward-Clyde, 1992

Table 37-1b
Metal Concentrations(1) in Soil Samples
SWMU 76

Element	Boring 0761 Sample Depth (Ft-BGS)			Boring 0762 Sample Depth (Ft-BGS)				Boring 0763 Sample Depth (Ft-BGS)				Background[2]
	4	10	25	0	8	14	31	0	8	18	22	($\bar{x}$ + 2 σ)
Aluminum	8440J	6990J	6190J	8440	3820	5380J	5220J	9310	5770J	3530J	6140J	2571-10447
Antimony	5.4U	5.2U	5.4U	-R	5.3U	5.3U	4.9U	-R	5.5U	5.8U	5.2U	4.88-5.4
Arsenic	1.9U	1.2J	0.92J	1.8J	1.9J	1.1J	0.6J	1.8J	1.6J	0.63J	0.59J	0.43-1.95
Barium	151J	92.6	42.5J	82.6	374	77.5	61.2	86.6	680	1060	78.1	0-903
Beryllium	0.52J	0.51J	0.47U	0.82J	0.47U	0.46U	0.43U	0.72J	0.48U	0.5U	0.45U	0.32-0.68
Cadmium	0.94U	0.91U	0.94U	0.85J	0.93U	0.93U	0.86U	0.88U	0.96U	1U	0.91U	0.81-1.01
Calcium	164000	121000	113000	2600	210000	211000	38000	2850	219000J	160000	111000	0-193062
Chromium	7	6.1	5.5	9.4	3.8	4.5	6	10	4.6	3.6	6.2	2.67-9.31
Cobalt	3J	2.3J	2.1J	4.6J	2.5J	1.7J	1.5J	4.6J	3.5J	1.5J	1.9J	1.38-4.06
Copper	16.2	6.7	11.2	11	8.7	6.7	4.4U	13.7	5.1U	3.4U	3.5U	0.00-15.44
Iron	6140	5520	3770	8740	2990	3300	4150	9300	3830J	2150	3880	2239-8683
Lead	4.9	4.2	2.2	9.6	2.3	2.6	1.6	12.6	2.6	1.6	2.4	1.76-8.64
Lead, organic	1.2UJ	1.1UJ	1.1UJ	1.1UJ	1.2UJ	1.2UJ	1.1UJ	1.1UJ	1.2UJ	1.1UJ	1.2UJ	NA
Magnesium	2560	3540	11800	1570	3800	7880	9590	1660	5470	8940	8400	0-11903
Manganese	80.9	65.4	36.8	226	29.2	41.1	35.9	223	43.2	18	38.2	10.88-167
Mercury	0.13	0.11U	0.85	0.11U	0.12U	0.12U	0.11U	0.11U	0.12U	0.13U	0.11U	-- - --
Nickel	7.8J	6.2J	5.9J	8.4J	7J	5.4J	4.4J	8.4J	8.3J	5.6J	5.3J	3.57-8.49

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 37-1b
Metal Concentrations(1) in Soil Samples
SWMU 76

	Boring 0761 Sample Depth (Ft-BGS)			Boring 0762 Sample Depth (Ft-BGS)				Boring 0763 Sample Depth (Ft-BGS)				Background[2]
Element	4	10	25	0	8	14	31	0	8	18	22	($\bar{x}$ + 2 σ)
Potassium	1510J	1570J	1070J	1810	951J	1030J	1240	1830	1470	592J	1130J	632-2613
Selenium	0.23UJ	0.23UJ	0.24UJ	0.21U	0.23UJ	0.23UJ	0.21UJ	0.22U	2.4UJ	0.25UJ	2.3UJ	0.00-1.35
Silver	1J	0.91U	1.2J	0.85U	1.1J	0.93U	0.86U	0.88U	0.96U	1U	0.91U	0.86-0.94
Sodium	309U	299U	312J	280U	307U	307U	304J	289U	315U	330U	361J	154-540
Thallium	0.23UJ	0.23UJ	0.24UJ	0.21UJ	0.23UJ	0.23UJ	0.21UJ	0.22UJ	0.24UJ	0.25UJ	0.23UJ	0.20-0.24
Vanadium	16.3	14.4	11.2J	20	10	11.8	13.3	19.8	15.5	16.9	16.4	9.26-26.74
Zinc	15	12.6	7.7	22.2J	7.9	9.2	10.9	24.9	15	9.3	10.2	4.58-21.82

UJ = Estimated as non-detect at the instrument detection limit
J = Estimated value
U = Not detected
-R = Rejected
-- - -- = No range could be calculated
Ft-BGS = Feet below ground surface
NA = Not analyzed in background samples

[1] All concentrations are in milligrams per kilogram (mg/kg).
[2] Background range calculated from values ...

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 37-2a
Selection of COCs
SWMU 76

Medium	Soils
Chemicals Detected:	Aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), mercury (Hg), nickel (Ni), silver (Ag), vanadium (V), zinc (Zn), BEHP, Di-n-BP, toluene, 2-hexanone, acetone, ethylbenzene, total xylenes, methylene chloride
	*Cu, Fe, Mg
	**Ba, Be, Co, Mn, Hg, Ni, Ag, V, Zn, Al
Chemicals Discarded:	***As, Cr
	Lab contaminants: BEHP, Di-n-BP, 2-hexanone, acetone, methylene chloride
Chemicals of Concern:	Pb, ethylbenzene, xylene, toluene
Exceeded RFI Criteria:	None
Exposure Scenario:	Area < ½ acre; residential scenario not expected; (current and future) general duty work soil ingestion, dermal contact and inhalation of VOCs and particulates; industrial setting former weathering pit (sludge) already covered.

*Low toxicity chemicals
**At regional background concentrations
***At site background concentrations

Source: Woodward-Clyde, 1992

Table 37-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 76

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 37-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 76

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 37-2c
Proposed Corrective Action Levels and RFI Criteria for Carcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 76

	Chemical	EPA Weight of Evidence	Assumed Risk Level	Exposure Duration (years)	Oral Slope Factor (mg/k-d)-1	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	Benzene	A	1.0E-06	70	2.9E-02	24.14	24.14	5.0E-03*	5.0E-03*
	Bromoform	B2	1.0E-06	70	7.9E-03	88.61	88.61	1.0E-01*,(1)	1.0E-01*,(1)
	Chloroform	B2	1.0E-06	70	6.1E-03	114.75	114.75	1.0E-01*,(1)	1.0E-01*,(1)
	Chloromethane	C	1.0E-05	70	1.3E-02	538.46	538.46	2.69E-02	2.69E-02
	Dibromochloromethane	C	1.0E-05	70	8.4E-02	83.33	83.33	4.17E-03	4.17E-03
	Methylene Chloride	B2	1.0E-06	70	7.5E-03	93.33	93.33	4.67E-03	4.67E-03
	Tetrachloroethene	B2	1.0E-06	70	5.1E-02	13.73	13.73	5.0E-03*	5.0E-03*
	Trichloroethene	B2	1.0E-06	70	1.1E-02	63.64	63.64	5.0E-03*	5.0E-03*
	Vinyl Chloride	A	1.0E-06	70	1.9E+00	0.37	0.37	2.0E-03*	2.0E-03*
Semi-volatiles:	bis(2-Ethylhexyl)phthalate	B2	1.0E-06	70	1.4E-02	50.00	50.00	2.50E-03	2.50E-03
	Benzo(a)anthracene	B2	1.0E-06	70	8.4E-01	0.83	0.83	4.17E-05	4.17E-05
	Benzo(a)pyrene	B2	1.0E-06	70	5.8E+00	0.12	0.12	6.03E-06	6.03E-06
	Benzo(b)fluoranthene	B2	1.0E-06	70	8.1E-01	0.86	0.86	4.32E-05	4.32E-05
	Benzo(k)fluoranthene	B2	1.0E-06	70	3.8E-01	1.84	1.84	9.21E-05	9.21E-05
	Carbazole	B2	1.0E-06	70	2.0E-02	35.00	35.00	1.75E-03	1.75E-03
	Chloroform	B2	1.0E-06	70	6.1E-03	114.75	114.75	1.0E-01*,(1)	1.0E-01*,(1)
	Chrysene	B2	1.0E-06	70	3.0E-02	23.33	23.33	1.17E-03	1.17E-03
	Dibenzo(a,h)anthracene	B2	1.0E-06	70	6.4E+00	0.11	0.11	5.47E-06	5.47E-06
	Indeno(1,2,3-c,d)pyrene	B2	1.0E-06	70	1.4E+00	0.50	0.50	2.50E-05	2.50E-05
	Pentachlorophenol	B2	1.0E-06	70	1.2E-01	5.83	5.83	1.0E-03*	1.0E-03*
Pesticides:	4,4-DDD	B2	1.0E-06	70	2.4E-01	2.92	2.92	1.46E-04	1.46E-04
	4,4-DDE	B2	1.0E-06	70	3.4E-01	2.06	2.06	1.03E-04	1.03E-04
	4,4-DDT	B2	1.0E-06	70	3.4E-01	2.06	2.06	1.03E-04	1.03E-04
	alpha-Chlordane	B2	1.0E-06	70	1.3E+00	0.54	0.54	2.0E-03*	2.0E-03*
	gamma-Chlordane	B2	1.0E-06	70	1.3E+00	0.54	0.54	2.0E-03*	2.0E-03*
	Heptachlor epoxide	B2	1.0E-06	70	9.1E+00	0.08	0.08	2.0E-04*	2.0E-04*
Metals:	Arsenic	A	1.0E-06	70	1.8E+00	0.39	0.39	1.94E-05	1.94E-05
	Beryllium	B2	1.0E-06	70	4.3E+00	0.16	0.16	8.14E-06	8.14E-06

* = final MCL
(1) = MCL for total trihalomethanes
(2) = Effective July 30, 1992

Source: Woodward-Clyde, 1992

Table 38-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 77

LOCATOR	CAN077-0774-0000			CAN077-0774-0003			CAN077-0775-0000			CAN077-0775-0003			CAN077-0776-0000			CAN077-0776-0003		
LAB SAMPLE NUMBER	0313790001SA			0313790002SA			0311890006SA			0311890007SA			0311810001SA			0311810002SA		
COLLECT DATE	09/22/93			09/22/93			09/10/93			09/10/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Tetrachloroethene	<	5.9	U	<	5.8	U	<	5.2	U	1.3	5.4	J	<	5.4	U	<	5.6	U
Toluene	<	5.9	U	<	5.8	U	<	5.2	U	<	5.4	U	<	5.4	U	<	5.6	U
Xylenes (total)	<	5.9	U	<	5.8	U	<	5.2	U	<	5.4	U	<	5.4	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Anthracene	<	390	U	<	3800	U	<	340	U	150	360	J	57	360	J	<	370	U
Benzo(a)anthracene	<	390	U	<	3800	U	56	340	J	370	360		280	360	J	<	370	U
Benzo(a)pyrene	<	390	U	<	3800	U	54	340	J	350	360	J	200	360	J	<	370	U
Benzo(b)fluoranthene	<	390	U	<	3800	U	120	340	J	630	360		500	360		<	370	U
Benzo(g,h,i)perylene	<	390	U	<	3800	U	<	340	U	160	360	J	110	360	J	<	370	UJ
Butyl benzyl phthalate	<	390	U	<	3800	U	<	340	U	<	360	U	<	360	U	<	370	U
Carbazole	<	390	U	<	3800	U	<	340	U	43	360	J	41	360	J	<	370	UJ
Chrysene	<	390	U	<	3800	U	68	340	J	500	360		420	360	J	<	370	UJ
Di-n-octyl phthalate	<	390	U	<	3800	U	<	340	U	<	360	U	<	360	U	<	370	U
Dibenz(a,h)anthracene	<	390	U	<	3800	U	<	340	U	<	360	U	<	360	U	<	370	U
Fluoranthene	<	390	U	<	3800	U	140	340	J	1100	360		830	360		<	370	U
Indeno(1,2,3-cd)pyrene	<	390	U	<	3800	U	<	340	U	150	360	J	99	360	J	<	370	UJ
Pentachlorophenol	<	1900	U	<	18000	UJ	<	1700	U	<	1700	U	63	1700	J	<	1800	U
Phenanthrene	<	390	U	<	3800	U	94	340	J	800	360		400	360		<	370	U
Pyrene	<	390	U	<	3800	U	120	340	J	820	360		900	360		<	370	U
Pesticides/PCB's (ug/kg)																		
4,4'-DDE	<	3.9	U	<	3.8	U	2.3	3.4	J	<	3.6	U	3.8	7.1	J	<	3.7	U
4,4'-DDT	<	3.9	U	<	3.8	U	<	3.4	U	<	3.6	U	30	7.1		<	3.7	U
alpha-Chlordane	<	2	U	<	2	U	<	1.8	U	<	1.8	U	3.3	3.7	J	<	1.9	U
gamma-Chlordane	<	2	U	<	2	U	<	1.8	U	<	1.8	U	10	3.7		<	1.9	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 6

Source: Woodward-Clyde, 1994

Table 38-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 77

LOCATOR	CAN077-0771-0808			CAN077-0771-7783			CAN077-0772-8000			CAN077-0772-8083			CAN077-0773-8080			CAN077-0773-0803		
LAB SAMPLE NUMBER	0311810007SA			0311810009SA			0311890001SA			0311890002SA			0313790015SA			0313790016SA		
COLLECT DATE	09/11/93			09/11/93			09/11/93			09/11/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	7100	10.4		7050	22.9		4140	10.8		3240	23.4		7410	11.5		7460	11.2	J
Antimony	<	6.2	U	<	13.7	U	<	6.5	U	3.1	14	J	<	6.9	U	<	6.7	U
Arsenic	2.3	0.52		2.9	0.57		1.7	0.54		2.2	0.59		2.5	0.58		2.1	0.56	
Barium			R			R	135	1.1		130	2.3		79.3	1.2		60.2	1.1	J
Beryllium	0.47	0.21		0.48	0.46		0.25	0.22		<	0.47	U	0.58	0.23		0.54	0.22	J
Cadmium	<	0.52	U	<	1.1	U	<	0.54	U	3	1.2		<	0.58	U	<	0.56	J
Calcium	10900	20.8		115000	45.8		15000	21.7		175000	46.8		2080	23.1		17700	22.5	J
Chromium	8	1		4.1	2.3		6.9	1.1		<	2.3	U	9.5	1.2		7.6	1.1	J
Cobalt	3.3	1		3.5	2.3		2.2	1.1		1.7	2.3	J	4.4	1.2		4	1.1	J
Copper	9.7	2.1		4.2	4.6	J	11	2.2		3.1	4.7	J	8.2	2.3		7.2	2.2	J
Iron	8820	10.4		6900	22.9		6450	10.8		2990	23.4		9330	11.5		7780	11.2	J
Lead	19.6	2.6	J	5.5	0.57	J	27.8	2.7		3.5	0.59		7.5	0.58		7	0.56	
Magnesium	1380	20.8		2940	45.8		1170	21.7		2340	46.8		1360	23.1		1820	22.5	J
Manganese	187	1	J	116	2.3	J	196	1.1		40.2	2.3		244	1.2	J	167	1.1	J
Nickel	6.7	4.2		7.8	9.2	J	5.1	4.3		4.3	9.4	J	7.9	4.6		8.5	4.5	J
Potassium	1440	520		1330	1140		979	541		621	1170	J	1440	577		1500	562	
Silver	<	1	UJ	<	2.3	UJ	0.6	1.1	J	2	2.3	J	0.72	1.2	J	0.56	1.1	J
Vanadium	17.6	1		21.3	2.3		13.7	1.1		10.2	2.3		20.9	1.2		16.9	1.1	
Zinc	38.9	2.1		15	4.6		73.8	2.2		7.5	4.7		19.6	2.3		17.3	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	129	41.6		<	45.8	U	158	43.3		<	46.8	U	<	46.1	U	<	45	U
Water Quality (percent)																		
Water	3.8	0.1		13	0.1		7.7	0.1		15	0.1		13	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.

Page 2 of 6

Source: Woodward-Clyde, 1994

Table 38-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 77

LOCATOR	CAN77-4771-8000			CAN77-4771-7703			CAN77-4773-9000			CAN77-4773-9003			CAN77-4773-8000			CAN77-4773-8003		
LAB SAMPLE NUMBER	0311810007SA			0311810009SA			0311890001SA			0311890002SA			0313790015SA			0313790016SA		
COLLECT DATE	09/11/93			09/11/93			09/11/93			09/11/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual

R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 3 of 6

Source: Woodward-Clyde, 1994

Table 38-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 77

LOCATOR	CAN077-0774-0000			CAN077-0774-0003			CAN077-0775-0000			CAN077-0775-0003			CAN077-0776-0000			CAN077-0776-0003		
LAB SAMPLE NUMBER	0313790001SA			0313790002SA			0311890006SA			0311890007SA			0311810001SA			0311810002SA		
COLLECT DATE	09/22/93			09/22/93			09/10/93			09/10/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Tetrachloroethene	<	5.9	U	<	5.8	U	<	5.2	U	1.3	5.4	J	<	5.4	U	<	5.6	U
Toluene	<	5.9	U	<	5.8	U	<	5.2	U	<	5.4	U	<	5.4	U	<	5.6	U
Xylenes (total)	<	5.9	U	<	5.8	U	<	5.2	U	<	5.4	U	<	5.4	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Anthracene	<	390	U	<	3800	U	<	340	U	150	360	J	57	360	J	<	370	U
Benzo(a)anthracene	<	390	U	<	3800	U	56	340	J	370	360		280	360	J	<	370	U
Benzo(a)pyrene	<	390	U	<	3800	U	54	340	J	350	360	J	200	360	J	<	370	U
Benzo(b)fluoranthene	<	390	U	<	3800	U	120	340	J	630	360		500	360		<	370	U
Benzo(g,h,i)perylene	<	390	U	<	3800	U	<	340	U	160	360	J	110	360	J	<	370	UJ
Butyl benzyl phthalate	<	390	U	<	3800	U	<	340	U	<	360	U	<	360	U	<	370	U
Carbazole	<	390	U	<	3800	U	<	340	U	43	360	J	41	360	J	<	370	UJ
Chrysene	<	390	U	<	3800	U	68	340	J	500	360		420	360	J	<	370	UJ
Di-n-octyl phthalate	<	390	U	<	3800	U	<	340	U	<	360	U	<	360	U	<	370	U
Dibenz(a,h)anthracene	<	390	U	<	3800	U	<	340	U	<	360	U	<	360	U	<	370	U
Fluoranthene	<	390	U	<	3800	U	140	340	J	1100	360		830	360		<	370	U
Indeno(1,2,3-cd)pyrene	<	390	U	<	3800	U	<	340	U	150	360	J	99	360	J	<	370	UJ
Pentachlorophenol	<	1900	U	<	18000	UJ	<	1700	U	<	1700	U	63	1700	J	<	1800	U
Phenanthrene	<	390	U	<	3800	U	94	340	J	800	360		400	360		<	370	U
Pyrene	<	390	U	<	3800	U	120	340	J	820	360		900	360		<	370	U
Pesticides/PCB's (ug/kg)																		
4,4'-DDE	<	3.9	U	<	3.8	U	2.3	3.4	J	<	3.6	U	3.8	7.1	J	<	3.7	U
4,4'-DDT	<	3.9	U	<	3.8	U	<	3.4	U	<	3.6	U	30	7.1		<	3.7	U
alpha-Chlordane	<	2	U	<	2	U	<	1.8	U	<	1.8	U	3.3	3.7	J	<	1.9	U
gamma-Chlordane	<	2	U	<	2	U	<	1.8	U	<	1.8	U	10	3.7		<	1.9	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 4 of 6

Source: Woodward-Clyde, 1994

Table 38-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 77

LOCATOR	CAN077-8774-0000			CAN077-8774-0003			CAN077-8775-0000			CAN077-8775-0003			CAN077-8776-0000			CAN077-8776-0003		
LAB SAMPLE NUMBER	0313790001SA			0313790002SA			0311890006SA			0311890007SA			0311810001SA			0311810002SA		
COLLECT DATE	09/22/93			09/22/93			09/10/93			09/10/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Aluminum	9860	11.7		8330	11.6		2300	20.8		5890	10.8		5420	10.8		5670	11.2	
Antimony	<	7	U	<	6.9	U	<	12.5	U	<	6.5	U	<	6.5	U	5.9	6.7	J
Arsenic	2	0.59		1.5	0.58		2.5	0.52		2.1	0.54		2.3	0.54		1.8	0.56	
Barium	85.6	1.2		73.4	1.2		400	2.1		116	1.1	J			R			R
Beryllium	0.66	0.23		0.6	0.23		<	0.42	U	0.37	0.22		0.37	0.22		0.36	0.22	
Cadmium	<	0.59	U	<	0.58	U	2.4	1		0.62	0.54		<	0.54	U	<	0.56	U
Calcium	2090	23.4		1910	23.1		130000	41.7		48100	21.6	J	12300	21.6		81300	22.4	J
Chromium	10.4	1.2		9.3	1.2		2.1	2.1		6.6	1.1		8.6	1.1		4.6	1.1	
Cobalt	4.8	1.2		4.3	1.2		1.4	2.1	J	3.2	1.1		2.7	1.1		2.6	1.1	
Copper	8.4	2.3		8.2	2.3		4.4	4.2		6.8	2.2		7.3	2.2		4.1	2.2	
Iron	10800	11.7		9340	11.6		4430	20.8		6550	10.8		6490	10.8		5410	11.2	
Lead	8.1	0.59		8	0.58		9.1	1		9.3	1.1		41	2.7	J	5.9	0.56	J
Magnesium	1770	23.4		1670	23.1		1780	41.7		1570	21.6		1070	21.6		1850	22.4	
Manganese	252	1.2	J	228	1.2	J	410	2.1		206	1.1		182	1.1	J	74.9	1.1	J
Nickel	8.6	4.7		8.2	4.6		4	8.3	J	6.9	4.3		5.2	4.3		5.9	4.5	
Potassium	1770	586		1610	578		517	1040	J	1070	541		1010	539		1030	561	
Silver	0.8	1.2	J	0.78	1.2	J	1.6	2.1	J	0.69	1.1	J	<	1.1	UJ	<	1.1	UJ
Vanadium	22.5	1.2		17.9	1.2		11.1	2.1		18.8	1.1		14.4	1.1		12.6	1.1	
Zinc	22.9	2.3		23.6	2.3		17.3	4.2		19.2	2.2		6.2	2.2		11.9	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	46.9	U	10000	925		64	41.7		<	43.3	U	321	43.1		<	44.9	U
Water Quality (percent)																		
Water	15	0.1		14	0.1		4	0.1		7.5	0.1		7.2	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.

Page 5 of 6

Source: Woodward-Clyde, 1994

Table 38-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 77

LOCATOR	CAN077-0774-0000			CAN077-0774-0003			CAN077-0775-0000			CAN077-0775-0003			CAN077-0776-0000			CAN077-0776-0003		
LAB SAMPLE NUMBER	0313790001SA			0313790002SA			0311890006SA			0311890007SA			0311810001SA			0311810002SA		
COLLECT DATE	09/22/93			09/22/93			09/10/93			09/10/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual

R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 6 of 6

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0771-7708			CAN077-0771-7713			CAN077-0771-7718			CAN077-0772-0008			CAN077-0772-0613		
LAB SAMPLE NUMBER	0311810010SA			0311810011SA			0311810012SA			0311890003SA			0311890004SA		
COLLECT DATE	09/11/93			09/11/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)															
Toluene	<	5.8	U	2.6	5.5	J	<	5.6	U	<	5.5	U	<	5.8	U
Semivolatile Organics (ug/kg)															
Butyl benzyl phthalate	<	380	U	<	360	U	<	370	U	<	370	U	83	380	J
4-Nitrophenol	<	1800	U	<	1800	U	<	1800	U	<	1800	U	<	1800	U
Metals (mg/kg)															
Aluminum	3910	57.7		4910	21.9		4520	22.2		4740	11.1		5680	23	
Antimony	<	34.6	U	15.2	13.1		<	13.3	U	<	6.7	U	<	13.8	U
Arsenic	1.6	0.58		1.3	0.55		1.1	0.56		1.7	0.55		1.7	0.58	
Barium			R			R			R	503	1.1		372	2.3	
Beryllium	<	1.2	U	<	0.44	U	<	0.44	U	0.34	0.22		<	0.46	U
Cadmium	<	2.9	U	<	1.1	U	<	1.1	U	1.3	0.55		1.5	1.2	
Calcium	252000	115		154000	43.8		119000	44.4		98500	22.2		156000	46	
Chromium	<	5.8	U	<	2.2	U	1.3	2.2	J	3.1	1.1		<	2.3	U
Cobalt	<	5.8	U	1.7	2.2	J	2	2.2	J	1.7	1.1		2.4	2.3	
Copper	<	11.5	U	<	4.4	U	1.2	4.4	J	3	2.2		2.3	4.6	J
Iron	2980	57.7		3610	21.9		3460	22.2		3040	11.1		3990	23	
Lead	2.9	0.58	J	3.3	0.55	J	2.7	0.56	J	5.2	0.55		3.8	0.58	
Magnesium	5070	115		5530	43.8		5710	44.4		3410	22.2		6300	46	
Manganese	35.3	5.8	J	46.6	2.2	J	52.9	2.2	J	62.2	1.1		48.6	2.3	
Nickel	<	23.1	U	5.1	8.8	J	4.3	8.9	J	3.8	4.4	J	6.2	9.2	J
Potassium	703	2880	J	1050	1090	J	761	1110	J	959	555		1320	1150	
Silver	<	5.8	UJ	<	2.2	UJ	<	2.2	UJ	0.6	1.1	J	1.3	2.3	J
Sodium	<	2880	U	<	1090	U	<	1110	U	<	555	U	<	1150	U
Vanadium	11.6	5.8		11.6	2.2		12.6	2.2		8	1.1		15	2.3	
Zinc	6.8	11.5	J	8.3	4.4	J	7.5	4.4		8.6	2.2		7.4	4.6	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0771-7708			CAN077-0771-7713			CAN077-0771-7718			CAN077-0772-0008			CAN077-0772-0013		
LAB SAMPLE NUMBER	0311810010SA			0311810011SA			0311810012SA			0311890003SA			0311890004SA		
COLLECT DATE	09/11/93			09/11/93			09/11/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Water Quality (percent)															
Water	13	0.1		8.6	0.1		9.9	0.1		9.9	0.1		13	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0772-0018			CAN077-0773-0008			CAN077-0773-0015			CAN077-0773-0018			CAN077-0774-0008			CAN077-0774-0015		
LAB SAMPLE NUMBER	0311890005SA			0313790017SA			0313790018SA			03137900019SA			0313790003SA			0313790004SA		
COLLECT DATE	09/11/93			09/22/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.7	U	<	5.6	U	<	5.4	U	<	5.6	U	<	5.7	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate	<	380	U	<	370	U	<	360	U	<	370	U	<	370	U	<	370	U
4-Nitrophenol	58	1800	J	<	1800	U	<	1700	U	<	1800	U	<	1800	U	<	1800	U
Metals (mg/kg)																		
Aluminum	5540	22.8		3670	22.5		3010	10.8		5110	11.2		4030	22.7		5450	22.5	
Antimony	<	13.7	U	<	13.5	U	<	6.5	U	<	6.7	U	<	13.6	U	<	13.5	U
Arsenic	1.6	0.57		1.1	0.56		1	0.54		2.2	0.56		1.2	0.57		0.99	0.56	
Barium	341	2.3		190	2.3		38.9	1.1		106	1.1		597	2.3		454	2.3	
Beryllium	<	0.46	U	0.37	0.45	J	0.26	0.22		0.46	0.22		0.37	0.45	J	0.37	0.45	J
Cadmium	2.1	1.1		2.7	1.1		0.73	0.54		0.92	0.56		2.2	1.1		1.6	1.1	
Calcium	167000	45.6		183000	45.1		43700	21.6		66000	22.5		162000	45.4		158000	45.1	
Chromium	3.2	2.3		2.5	2.3		3.2	1.1		4	1.1		<	2.3	U	3.5	2.3	
Cobalt	1.8	2.3	J	2.1	2.3	J	2.1	1.1		3.1	1.1		2.2	2.3	J	2.7	2.3	
Copper	2.5	4.6	J	2.6	4.5	J	2.2	2.2		4.2	2.2		2.2	4.5	J	2.4	4.5	J
Iron	3660	22.8		2870	22.5		3190	10.8		4330	11.2		2970	22.7		4190	22.5	
Lead	3	0.57		3.4	5.6	J	3.7	2.7		5.6	0.56		3.2	5.7	J	3	0.56	
Magnesium	7820	45.6		4160	45.1		1920	21.6		4180	22.5		4170	45.4		5370	45.1	
Manganese	41.9	2.3		62.9	2.3	J	62.4	1.1	J	124	1.1	J	70.1	2.3	J	54.9	2.3	J
Nickel	4.2	9.1	J	4	9	J	3.9	4.3	J	5.6	4.5		4.7	9.1	J	6	9	J
Potassium	1160	1140		750	1130	J	944	541		1550	562		902	1130	J	1580	1130	
Silver	1.6	2.3	J	1.3	2.3	J	0.59	1.1	J	0.71	1.1	J	1.3	2.3	J	1.2	2.3	J
Sodium	<	1140	U	<	1130	U	171	541	J	336	562	J	<	1130	U	389	1130	J
Vanadium	17	2.3		10.6	2.3		10.2	1.1		18.4	1.1		10.9	2.3		13.1	2.3	
Zinc	5.9	4.6		8	4.5		8.2	2.2		12.4	2.2		8.8	4.5		10.6	4.5	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 3 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0772-0018			CAN077-0773-0008			CAN077-0773-0013			CAN077-0773-0018			CAN077-0774-0008			CAN077-0774-0013		
LAB SAMPLE NUMBER	0311890005SA			0313790017SA			0313790018SA			0313790019SA			0313790003SA			0313790004SA		
COLLECT DATE	09/11/93			09/22/93			09/22/93			09/22/93			09/22/93			09/22/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Water Quality (percent)																		
Water	12	0.1		11	0.1		7.6	0.1		11	0.1		12	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 4 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0774-0018			CAN077-0775-0008			CAN077-0775-0013			CAN077-0775-0018			CAN077-0776-0008			CAN077-0776-0013		
LAB SAMPLE NUMBER	0313790005SA			0311890009SA			0311890010SA			0311890011SA			0311810004SA			0311810005SA		
COLLECT DATE	09/22/93			09/10/93			09/10/93			09/10/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	<	5.6	U	<	5.4	U	<	5.6	U	<	5.5	U	<	5.7	U	<	5.7	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate	<	370	U	<	360	U	<	370	U	<	360	U	<	380	U	<	380	U
4-Nitrophenol	<	1800	U	<	1700	U	<	1800	U	<	1800	U	<	1800	U	<	1800	U
Metals (mg/kg)																		
Aluminum	5360	11.2		4940	10.8		4140	11.1		3110	11		7220	22.8		3080	56.9	
Antimony	<	6.7	U	<	6.5	U	<	6.7	U	<	6.6	U	<	13.7	U	<	34.1	U
Arsenic	1.3	0.56		2.1	0.54		1.6	0.56		1.3	0.55		1.7	0.57		1.1	0.57	
Barium	85.8	1.1		280	1.1		165	1.1		55.3	1.1				R			R
Beryllium	0.39	0.22		0.33	0.22		0.3	0.22		0.25	0.22		0.49	0.46		<	1.1	U
Cadmium	1.2	0.56		0.58	0.54		<	0.56	U	<	0.55	U	<	1.1	U	<	2.8	U
Calcium	105000	22.4		71700	21.7		42100	22.3		35300	22		102000	45.6		275000	114	
Chromium	3.8	1.1		6.1	1.1		3.4	1.1		3	1.1		4	2.3		<	5.7	U
Cobalt	2.4	1.1		2.5	1.1		2	1.1		1.9	1.1		2.1	2.3	J	<	5.7	U
Copper	2.6	2.2		6.4	2.2		7.9	2.2		2.8	2.2		4	4.6	J	<	11.4	U
Iron	3890	11.2		5170	10.8		4330	11.1		3610	11		5750	22.8		2040	56.9	
Lead	4.3	5.6	J	9.4	1.1		5.5	0.56		5.7	1.1		5.7	0.57	J	1.1	0.57	J
Magnesium	6270	22.4		1770	21.7		2090	22.3		1720	22		3320	45.6		5900	114	
Manganese	56.9	1.1	J	120	1.1		90.8	1.1		88.9	1.1		95	2.3	J	12.4	5.7	J
Nickel	5.5	4.5		5.6	4.3		5.2	4.5		3.6	4.4	J	5.7	9.1	J	<	22.8	U
Potassium	1460	561		883	542		892	557		790	551		1300	1140		383	2840	J
Silver	0.49	1.1	J	0.69	1.1	J	0.69	1.1	J	0.86	1.1	J	<	2.3	UJ	<	5.7	UJ
Sodium	349	561	J	<	542	U	<	557	U	<	551	U	<	1140	U	<	2840	U
Vanadium	16.2	1.1		14.9	1.1		17.1	1.1		10.6	1.1		13.7	2.3		10.2	5.7	
Zinc	10.4	2.2		16.2	2.2		10.5	2.2		8.4	2.2		14	4.6		<	11.4	U

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 5 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0774-0018			CAN077-0775-0008			CAN077-0775-0013			CAN077-0775-0018			CAN077-0776-0008			CAN077-0776-0013		
LAB SAMPLE NUMBER	0313790005SA			0311890009SA			0311890010SA			0311890011SA			0311810004SA			0311810005SA		
COLLECT DATE	09/22/93			09/10/93			09/10/93			09/10/93			09/11/93			09/11/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Water Quality (percent)																		
Water	11	0.1		7.7	0.1		10	0.1		9.2	0.1		12	0.1		12	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 6 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN077-0776-0012		
LAB SAMPLE NUMBER	0311810006SA		
COLLECT DATE	09/11/93		
	Result	RL	Qual
Volatile Organics (ug/kg)			
Toluene	<	5.7	U
Semivolatile Organics (ug/kg)			
Butyl benzyl phthalate	<	380	U
4-Nitrophenol	<	1800	U
Metals (mg/kg)			
Aluminum	6310	22.8	
Antimony	<	13.7	U
Arsenic	0.95	0.57	
Barium			R
Beryllium	0.23	0.46	J
Cadmium	<	1.1	U
Calcium	91100	45.7	
Chromium	3.5	2.3	
Cobalt	1.7	2.3	J
Copper	<	4.6	U
Iron	4380	22.8	
Lead	3.2	0.57	J
Magnesium	6100	45.7	
Manganese	43.4	2.3	J
Nickel	4.7	9.1	J
Potassium	1140	1140	
Silver	<	2.3	UJ
Sodium	<	1140	U
Vanadium	13.7	2.3	
Zinc	10	4.6	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 7 of 8

Source: Woodward-Clyde, 1994

Table 38-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 77

LOCATOR	CAN877-0776-0018		
LAB SAMPLE NUMBER	0311810006SA		
COLLECT DATE	09/11/93		
	Result	RL	Qual
Water Quality (percent)			
Water	12	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 8 of 8

Source: Woodward-Clyde, 1994

Table 38-2
Summary of Human Health Risks
SWMU 77

Receptor/Pathway	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic H.I.	Chronic H.I.	Cancer Risk	Subchronic H.I.	Chronic H.I.
Occupational Worker (Surface Soil)						
-- Dermal Contact	5×10^{-11}		4×10^{-6}	2×10^{-8}		5×10^{-4}
-- Ingestion	2×10^{-9}		6×10^{-6}	6×10^{-7}		2×10^{-3}
-- Inhalation of VOCs	0.00		9×10^{-8}	0.00		2×10^{-6}
-- Inhalation of Particulates	5×10^{-12}		0.00	3×10^{-10}		0.00
	2×10^{-9}		1×10^{-5}	6×10^{-7}		2×10^{-3}
Construction Worker (Total Soil)						
-- Dermal Contact	5×10^{-12}	1×10^{-6}		7×10^{-11}	2×10^{-5}	
-- Ingestion	6×10^{-10}	3×10^{-4}		6×10^{-9}	3×10^{-3}	
-- Inhalation of VOCs	0.00	3×10^{-8}		0.00	1×10^{-7}	
-- Inhalation of Particulates	2×10^{-13}	0.00		1×10^{-12}	0.00	
	7×10^{-10}	3×10^{-4}		6×10^{-9}	3×10^{-3}	
Future Resident						
-- Dermal Contact	1×10^{-11}	1×10^{-6}		2×10^{-9}	3×10^{-4}	
-- Ingestion	3×10^{-10}	7×10^{-7}		4×10^{-8}	1×10^{-4}	
-- Inhalation of VOCs	0.00	3×10^{-8}		0.00	5×10^{-7}	
-- Inhalation of Particulates	1×10^{-12}	0.00		2×10^{-11}	0.00	
	3×10^{-10}	2×10^{-6}		4×10^{-8}	4×10^{-2}	

Note: Apparent inconsistencies in summation of risks are due to rounding of risk values.

*No carcinogenic volatile organic compounds were detected in soil at SWMU 77.

Source: Woodward-Clyde, 1994

Table 38-3a
Comparison of Phase II Soil Concentrations to Phase I Concentrations and RBCs
SWMU 77

Chemical	Phase I Maximum Detected Concentration (mg/kg)	Phase II Maximum Detected Concentration (mg/kg)	Phase II Residential Soil Risk-Based Concentration(1) (mg/kg)	Exceeds RBC?	Phase II concentration greater than Phase I Concentration	Estimated Risk(3)	Risk Type	Phase II Industrial Soil Risk-based Concentration(2) (mg/kg)	Exceeds RBC?
Acetone	ND	0.021	7,800	NO	YES				
1,2-Dichloropropane	ND	0.002	9.4	NO	YES				
Methylene Chloride	ND	0.0036	85	NO	YES				
Tetrachloroethene	0.0013	ND	12	NO	NO				
Toluene	0.0075	0.0035	16,000	NO	NO				
Xylenes	0.0068	ND	160,000	NO	NO				
Anthracene	0.15	ND	23,000	NO	NO				
Aroclor-1260	ND	0.14	0.083	YES	YES	2 X 10-6	carcinogenic	0.37	NO
Benzo(a)anthracene	0.37	0.054	0.88	NO	NO				
Benzo(a)pyrene	0.35	0.056	0.088	NO	NO				
Benzo(b)fluoranthene	0.63	0.11	0.88	NO	NO				
Benzo(g,h,i)perylene	0.16	ND	NA(a)	NA	NO				
Bis(2-ethylhexyl) phthalate	ND	0.77	46	NO	YES				
Butyl Benzyl Phthalate	0.083	ND	16,000	NO	NO				
Carbazole	0.043	7.2	32	NO	YES				
Chlordane (total)	0.0178	ND	0.49	NO	NO				
Chrysene	0.5	0.076	88	NO	NO				
4,4'-DDE	0.0038	0.014	1.9	NO	YES				
4,4'-DDT	0.03	0.01	1.9	NO	NO				
Dibenzo(a,h)anthracene	0.073	ND	0.088	NO	NO				
Dibenzofuran	ND	1.2	310	NO	YES				
Di-n-Butyl phthalate	ND	0.91	7,800	NO	YES				
Di-n-octyl phthalate	0.16	ND	1,600	NO	NO				
Endrin Ketone	N/A	0.12	NA	NA	NA				
Fluoranthene	1.1	0.1	3,100	NO	NO				
Indeno(1,2,3-cd)pyrene	0.15	ND	0.88	NO	NO				
4-Nitrophenol	0.058	ND	NA(a)	NA	NO				
Pentachlorophenol	0.063	ND	5.3	NO	NO				
Phenanthrene	0.8	ND	NA(a)	NA	NO				

Page 1 of 2

Source: Woodward-Clyde, 1997

Table 38-3a
Comparison of Phase II Soil Concentrations to Phase I Concentrations and RBCs
SWMU 77

Chemical	Phase I Maximum Detected Concentration (mg/kg)	Phase II Maximum Detected Concentration (mg/kg)	Phase II Residential Soil Risk-Based Concentration(1) (mg/kg)	Exceeds RBC?	Phase II concentration greater than Phase I Concentration	Estimated Risk(3)	Risk Type	Phase II Industrial Soil Risk-based Concentration(2) (mg/kg)	Exceeds RBC?
Pyrene	0.9	0.1	2,300	NO	NO				
TRPH	10,000	1,320	NA(a)	NA	NO				
Antimony	5.9	ND	31	NO	NO				
Barium	503	2840	5,500	NO	YES				
Cadmium	3	0.57	39	NO	NO				
Chromium	8.6	25.4	390	NO	YES				
Cobalt	4.8	4.6	4700	NO	NO				
Copper	11	14.5	2900	NO	YES				
Lead	41	48.5	NA(a)	NA	YES				
Manganese	410	440	390	YES	YES	1.1	noncarcinogenic	5100	NO
Nickel	8.6	13.9	1600	NO	YES				
Silver	2	ND	390	NO	NO				
Thallium	NA	0.25	6.3	NO	NA				
Zinc	73.8	64.8	23000	NO	NO				

(1) EPA Region III Risk-Based Concentrations for residential soil (EPA 1994).
(2) EPA Region III Risk-Based Concentrations for industrial soil (EPA 1994).
(3) Estimated risk based on maximum Phase II concentrations that exceeded previously evaluated Phase I levels.
Estimated risk = 1×10^{-6} * concentrations/RBC for carcinogens; Estimated risk = concentration/RBC for noncarcinogens.
(a) EPA has not established a toxicity factor for these chemicals, so RBCs could not be calculated.
* No RBC has been calculated for lead. EPA recommends an interim residential soil lead concentration of 400 mg/kg (EPA 1994).
NA = Not Applicable
ND = Not Detected
N/A = Not Analyzed For

Page 2 of 2

Source: Woodward-Clyde, 1997

Table 38-3b
Potential Cumulative Risk
SWMU 77

Chemical[1]	Carcinogen?	Phase II Concentration (mg/kg)	Residential RBC (mg/kg)	Industrial RBC (mg/kg)	Risk Residential[2]	Hazard Residential[3]	Risk Industrial[2]	Hazard Industrial[3]
Acetone	No	0.021	7,800	100,000		0.000003		0.0000002
1,2-Dichloropropane	Yes	0.002	9.4	42	2.13E-10		4.76E-11	
Methylene chloride	Yes	0.0036	85	380	4.24E-11		9.47E-12	
Aroclor-1260	Yes	0.14	0.083	0.37	1.69E-06		3.78E-07	
Bis(2-ethylhexyl) phthalat	Yes	0.77	46	200	1.67E-08		3.85E-09	
Carbazole		7.2	NA	NA		NA		NA
4,4-DDE	Yes	0.014	1.9	8.4	7.37E-09		1.67E-09	
Dibenzofuran	No	1.2	310	4,100		0.004		0.0003
Di-n-butyl phthalate	No	0.91	7,800	100,000		0.0001		0.000009
Endrin ketone	No	0.12	23	310		0.01		0.0004
Barium	No	2,840	5,500	72,000		0.5		0.04
Chromium	No	25.4	390	5,100		0.07		0.005
Copper	No	2,900	2,900	38,000		1		0.08
Lead	No	48.5	400*	NA*		NA*		NA*
Manganese	No	440	390	5,100		1		0.09
Nickel	No	13.9	1,600	20,000		0.01		0.0007
Thallium	No	0.25	6.3	92		0.04		0.003
Totals					2E-06	3	4E-07	0.2
Phase I Risk[4]					NA	NA	6E-07	0.002
Cumulative Risk[5]					NA	NA	1E-06	0.2

[1] Chemicals with maximum Phase II concentration exceeding Phase I concentrations
[2] Risk = 1E-06 x concentration/RBC
[3] Hazard = concentration/RBC
[4] Highest calculated risk and hazard for all receptors evaluated in risk assessment (W-C 1994d)
[5] Sum of Phase I risk and incremental risk from Phase II concentrations (i.e., that exceeded Phase I levels)
* No RBC is available for lead; 400 is residential level generally acceptable based on EPA lead uptake model.

Source: Woodward-Clyde, 1997

Table 38-4a
Compounds Detected in CMS Surface Soils
SWMU 77

FIELD ID			C77-HA03-001			C77-HA04-001			C77-HA05-001			C77-HA06-001			C77-HA07-002			C77-HA09-002		
COLLECT DATE			12/03/98			12/05/98			12/05/98			12/05/98			12/06/98			12/06/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
Chloromethane	12	1/14	<	33	U	<	33	U	<	34	U	<	33	U	<	34	U	<	34	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Benzo(a)anthracene	35	2/14	<	37	U	<	37	U	<	38	U	<	37	U	9	37	J	35	38	J
Benzo(a)pyrene	39	2/14	<	37	U	<	37	U	<	38	U	<	37	U	9	37	J	39	38	
Benzo(b)fluoranthene	36	2/14	<	37	U	<	37	U	<	38	U	<	37	U	9	37	J	36	38	J
Benzo(g,h,i)perylene	13	1/14	<	37	U	<	37	U	<	38	U	<	37	U	<	37	U	13	38	J
Benzo(k)fluoranthene	32	2/14	<	37	U	<	37	U	<	38	U	<	37	U	10	37	J	32	38	J
bis(2-Ethylhexyl) Phthalate	1700	1/14	<	37	U	1700	37		<	38	U	<	37	U	<	37	U	<	38	U
Chrysene	39	2/14	<	37	U	<	37	U	<	38	U	<	37	U	11	37	J	39	38	
Di-N-Butyl Phthalate	20	1/14	<	37	U	20	37	J	<	38	U	<	37	U	<	37	U	<	38	U
Di-N-Octylphthalate	450	6/14	<	37	U	16	37	J	450	38		<	37	U	<	37	U	160	38	
Dibenz(a,h)anthracene	10	1/14	<	37	U	<	37	U	<	38	U	<	37	U	<	37	U	10	38	J
Fluoranthene	87	4/14	<	37	U	<	37	U	<	38	U	<	37	U	25	37	J	87	38	
Indeno(1,2,3-c,d)pyrene	25	1/14	<	37	U	<	37	U	<	38	U	<	37	U	<	37	U	25	38	J
Phenanthrene	35	2/14	<	37	U	<	37	U	<	38	U	<	37	U	11	37	J	35	38	J
Pyrene	72	2/14	<	37	U	<	37	U	<	38	U	<	37	U	19	37	J	72	38	
PESTICIDES/PCB (µg/kg)																				
DDE	2.7	1/8	<	3.7	U	2.7	3.7	J	<	3.8	U	<	3.7	U						
DDT	3.9	1/8	<	3.7	U	3.9	3.7		<	3.8	U	<	3.7	U						

µg/kg - microgram per kilogram
J - Estimated
U - Nondetect

Source: URS Greiner Woodward Clyde, 2000

Table 38-4b
Compounds Detected in CMS Subsurface Soils
SWMU 77

FIELD ID			C77-HA03-004			C77-HA04-004			C77-HA05-004			C77-HA06-004			C77-HA07-005			C77-HA09-005		
COLLECT DATE			12/03/98			12/05/98			12/05/98			12/05/98			12/06/98			12/06/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
Chloromethane	12	1/14	<	33	U	12	32		<	34	U	<	33	U	<	33	U	<	34	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Benzo(a)anthracene	35	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Benzo(a)pyrene	39	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Benzo(b)fluoranthene	36	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Benzo(g,h,i)perylene	13	1/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Benzo(k)fluoranthene	32	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
bis(2-Ethylhexyl) Phthalate	1700	1/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Chrysene	39	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Di-N-Butyl Phthalate	20	1/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Di-N-Octylphthalate	450	6/14	25	37	J	<	36	U	16	37	J	<	37	U	34	37	J	<	37	U
Dibenz(a,h)anthracene	10	1/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Fluoranthene	87	4/14	<	37	U	<	36	U	<	37	U	<	37	U	8	37	J	9	37	J
Indeno(1,2,3-c,d)pyrene	25	1/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Phenanthrene	35	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
Pyrene	72	2/14	<	37	U	<	36	U	<	37	U	<	37	U	<	37	U	<	37	U
PESTICIDES/PCB (µg/kg)																				
DDE	2.7	1/8	<	3.6	U	<	3.5	U	<	3.7	U	<	3.6	U						
DDT	3.9	1/8	<	3.6	U	<	3.5	U	<	3.7	U	<	3.6	U						
TPH (mg/kg)																				
TPH-GRO												11	5.5							

µg/kg - microgram per killogram
J - Estimated
U - Nondetect

Source: URS Greiner Woodward Clyde, 2000

Table 38-4c
Model-Predicted Concentrations
SWMU 77

Chemical	Source Conditions			Active Transport Processes			C_s (mg/kg)	C_w (mg/L)	Unsaturated Zone		Saturated Zone		Screening Levels	
	Steady-State	Pulse*	Decay**	Dispersion	Adsorption	Biodegradation			AF	$(C_w)_u$ (mg/L)	DAF	$(C_w)_s$ (mg/L)	Region VI Tap Water MSSL (mg/L)	MCL (mg/L)
Benzo(a)anthracene	✓			✓			0.35	0.0022	1.0	0.0022	6.0	0.00037	9.2E-05	-
	✓			✓		✓			-	0	-	0		
		✓		✓	✓				2,003	1.1E-06	14607.1	1.50E-07		
		✓		✓	✓	✓			-	0	-	0		
			✓	✓	✓				14,543	1.51E-07	-	-		
			✓	✓	✓	✓			-	0	-	0		
Benzo(a)pyrene	✓			✓			0.63	0.00154	1.0	0.0015	6.0	0.0003	9.2E-06	0.0002
	✓			✓		✓			-	0	-	0		
		✓		✓	✓				5,131	3.0E-07	37,439	4.1E-08		
		✓		✓	✓	✓			-	0	-	0		
			✓	✓	✓				37,258	4.1E-08	-	-		
			✓	✓	✓	✓			-	0	-	0		
Benzo(b)fluoranthene	✓			✓			0.073	0.000148	1.0	0.0001	6.0	0.0000	9.2E-05	-
	✓			✓		✓			-	0	-	0		
		✓		✓	✓				6,188	2.4E-08	45,147	3.3E-09		
		✓		✓	✓	✓			-	0	-	0		
			✓	✓	✓				44,944	3.3E-09	-	-		
			✓	✓	✓	✓			-	0	-	0		

* Pulse duration = 100 years.
** Decay half-life = 10 years for SVOCs.
C_s = maximum detected soil concentration
Cw = initial leachate concentration based on equilibrium partitioning
AF = attenuation factor for unsaturated zone calculated from MULTIMED results
$(C_w)_u$ = soil water concentration at bottom of unsaturated zone (= C_w / AF)
DAF = dilution-attenuation factor for initial groundwater mixing zone calculated from MULTIMED results
$(C_w)_s$ = groundwater concentration at water table after initial mixing (= C_w / DAF)
"-" indicates factor is not applicable or factor/concentration could not be calculated based on model results
indicates predicted concentration exceeds highlighted screening level

Source: URS Greiner Woodward Clyde, 2000

Table 39-1a
Pesticide Concentrations in Soil Samples
SWMU 78

Boring Number	Sample Depth (Ft-BGS)	4,4-DDD (μg/kg)	4,4-DDE (μg/kg)
0781	0-0.5	150	57J
	4-6	23	3.7U
	10-12	14	3.6U
	20-22	3.7U	3.7U
	All samples below 22 feet	Not detected above CRQL	Not detected above CRQL
0782	0-0.5	91	14U
	4-6	3.5UJ	3.5UJ
	10-12	3.7UJ	3.7UJ
	20-22	3.7UJ	3.7U
	All samples below 22 feet	Not detected above CRQL	Not detected above CRQL
0783	0-0.5	2,000	330U
0784	0-0.5	660	58J
0785	0-0.5	160	110
0786	0-0.5	4.3U	1.1J

J = Estimated value
U = Not detected at CRQL
UJ = Estimated as non-detect at the CRQL
Ft-BGS = Feet below ground surface
ug/kg = Micrograms per kilogram

Source: Woodward-Clyde, 1992

Table 39-1b
TPH Concentrations in Soil Samples
SWMU 78

Boring Number (Redrill Boring Number)	Sampling Depth (Ft-BGS)	TPH (mg/kg)
0781 (0787)	0-0.5	2,200
	4-6	95
	All samples deeper than 6 feet	ND
0782 (0788)	0-0.5	(1,970)
	4-6	42.2U
	All samples deeper than 6 feet	ND
0783 (0789)	0-0.5	(4,080)
0784 (7810)	0-0.5	(980)
0785 (7811)	0-0.5	(12,500J)
0786 (7812)	0-0.5	(45.5U)

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
ND = Not detected
J = Estimated value
U = Not detected
( ) = The values in parentheses are results from samples collected from the redrill borings due to laboratory missed holding times

Source: Woodward-Clyde, 1992

Table 39-1c
Metal Concentrations[1] in Surface Soil Samples
SWMU 78

Element	Boring Number						Background[2] ($\bar{x} + 2\sigma$)
	0781	0782	0783	0784	0785	0786	
Aluminum	26000J	10700J	10200J	9110J	14200J	13900J	2571-10447
Antimony	-R	-R	-R	-R	-R	6.1R	4.81-5.44
Arsenic	1.9J	2J	1.8J	1.6J	1.7J	2.5J	0.43-1.95
Barium	165J	142J	115J	132J	220J	83.5J	0-903
Beryllium	0.44U	0.49J	0.41U	0.53J	0.42U	0.53U	0.32-0.68
Cadmium	21.6	10.5	3.3	7.7	4.1	1.1U	0.81-1.01
Calcium	2540	1950	1450	1290	832J	12200	0-193062
Chromium	39.6	16.7	14.2	13.4	29.1	12.1	2.67-9.31
Cobalt	2J	4J	3.3J	2.5J	1.9J	4.5J	1.38-4.06
Copper	710	112	52	84.7	385	13U	0.00-15.44
Iron	7100	9230	8950	7500	6580	11400	2239-8683
Lead	336	292	194	271	529	25.6	1.76-8.64
Magnesium	1170	1410	1390	1290	968J	2020	0-11903
Manganese	225	171	99.5	74.6	51.1	198	10.89-167

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 39-1c
Metal Concentrations[1] in Surface Soil Samples
SWMU 78

Element	Boring Number						Background[2] ($\bar{x} + 2\sigma$)
	0781	0782	0783	0784	0785	0786	
Mercury	0.11U	0.11	0.12	0.1U	0.1U	0.13U	-- - --
Nickel	8.8J	7.8J	6.8J	5.6J	5.9J	8.8J	3.57-8.49
Potassium	1450	1900J	1880J	1710J	1110J	2570J	632-2613
Selenium	0.22UJ	0.22UJ	0.2UJ	0.2UJ	0.21UJ	0.27UJ	0.00-1.35
Silver	0.88U	0.87U	0.81U	0.81U	0.83U	1.1U	0.86-0.94
Sodium	289U	288U	268U	269U	275U	352U	154-540
Thallium	0.22UJ	0.22UJ	0.2UJ	0.2UJ	0.21UJ	0.27UJ	0.20-0.24
Vanadium	14.4	18.7	19.2	15.4	14.1	24.3	9.26-26.74
Zinc	829	214	126	154	614	33.3J	4.58-21.82

UJ = Estimated as non-detect at the instrument detection limit
J = Estimated value
U = Not detected
-R = Rejected
-- - -- = No range could be calculated

[1] All concentrations are in milligrams per kilogram (mg/kg)
[2] Background range calculated from values

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 39-1d
Metal Concentrations[1] in Soil Samples
SWMU 78

Element	Boring 0781 Depth (Ft-BGS)										Boring 0782 Depth (Ft-BGS)										Back-ground[3] ($\bar{x}$ + 2 σ)
	0	4	10	20	30	40	50	60	75	100	0	4	10	20	30	40	50	60	75	100	
Aluminum	26000J	13200J	10500J	6460J	6340J	4860J	4790J	1940J	1660J	1410J	10700J	6240J	6570J	7940J	9530J	3950J	4490J	2190J	1420J	1350J	2571-10447
Antimony	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	-R	4.88-5.44
Arsenic	1.9J	2.7	2.1J	2J	1J	0.76J	0.79J	0.77J	0.67J	-.69J	2J	1.8J	1.3J	1.9J	1.6J	0.83J	0.73J	0.89J	0.67J	0.85J	0.43-1.95
Barium	165J	111J	392J	60.3J	70J	52.5J	19.1J	6.7J	15.6J	27.5J	142J	158J	101J	498J	61.2J	13.4J	66.4J	12.4J	36.1J	13.3J	0-903
Beryllium	0.44U	0.59J	0.5J	0.44U	0.47U	0.42U	0.43U	0.41U	0.42U	0.41U	0.49J	0.42U	0.44U	0.45U	0.46U	0.42U	0.43U	0.43U	0.42U	0.41U	0.32-0.68
Cadmium	21.6	0.9U	0.9U	0.88U	0.94U	0.85U	0.85U	0.83U	0.84U	0.81U	10.5	0.84U	0.89U	0.9U	0.91U	0.85U	0.85U	0.85U	0.84U	0.83U	0.81-1.01
Calcium	2540	27400	73500	43800	132000	38900	29600	5920	8390	3350	1950	96400	151000	98100	109000	13700	36600	6950	49500	5780	0-193062
Chromium	39.6	11.3	8.1	5.3	9.9	3.7	4.2	1.9J	2.1	1.6J	16.7	5.8	5.6	10.4	8	3.3	4.6	2J	3.5	1.3J	2.67-9.31
Cobalt	2J	5.3J	3.6J	2J	1.6J	1.1J	1.4J	1U	1U	1U	4J	2.2J	2.2J	1.7J	1.7J	1.1J	1.1J	1.1U	1.1U	1U	1.38-4.06
Copper	710	12.6	7	4.3J	5.7J	3J	5.1J	3.1J	2.7J	2.3J	112	8.9	6	5.9	4.6J	2.7J	3.3J	3.7J	2.5J	3.2J	0.00-15.44
Iron	7100	11300	7880	4750	3340	3540	3650	1710	1900	2000	9230	5060	4660	5140	4820	3120	3320	1800	1470	2000	2239-8683
Lead	336	16.3	6.1	5	2.6	2.5	4.2	2	1.8	1.4	292	6.8	3.8	25	3.1	2.7	3.6	2.2	3	2.8	1.76-8.64
Magnesium	1170	2640	4370	4220	20700	5010	6430	1640	1100	827J	1410	2490	4290	4900	18800	3610	5180	2510	1200	823J	0-11903
Manganese	225	214	153	73.1	42	34.5	52.1	17.2	20.3	29.5	171	66	55.5	59.4	33.6	58.6	43	18.8	22.5	30.5	10.89-167
Mercury	0.11U	0.11U	0.11U	0.11U	0.12U	0.11U	0.11U	0.1U	0.1U	0.1U	0.11	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.1U	-- - --
Nickel	8.8J	11.6	8.8J	6.2J	6.1J	3.5J	4.4J	2.1J	2.2J	1.4U	7.8J	5.8J	7.4J	5.9J	6.1J	3.5J	4J	2.3J	1.5U	1.8J	3.57-8.49
Potassium	1450	2070J	1890	1650	1020J	1020J	996J	366J	313J	277J	1900J	1110	1420	1520	1600	841J	864J	369J	253J	261J	632-2613
Selenium	0.22UJ	0.23UJ	0.22UJ	0.22UJ	0.24UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.2UJ	0.22UJ	0.21UJ	0.22UJ	0.23UJ	0.23UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.00-1.35
Silver	0.88U	0.9U	0.9U	0.88U	0.94U	0.85U	0.85U	0.83U	0.84U	0.81U	0.87U	0.84U	0.89U	0.9U	0.91U	0.85U	0.85U	0.85U	0.84U	0.83U	0.86-0.94
Sodium	289U	299U	296U	292U	312U	280U	282U	274U	276U	269U	288U	278U	294U	298U	301U	280U	282U	281U	278U	274U	154-540

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 39-1d
Metal Concentrations[1] in Soil Samples
SWMU 78

Element	Boring 0781 Depth (Ft-BGS)										Boring 0782 Depth (Ft-BGS)										Back-ground[2] ($\bar{x}$ + 2 σ)
	0	4	10	20	30	40	50	60	75	100	0	4	10	20	30	40	50	60	75	100	
Thallium	0.22UJ	0.23UJ	0.22UJ	0.22UJ	0.24UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.22UJ	0.21UJ	0.22UJ	0.23UJ	0.23UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.21UJ	0.20-0.24
Vanadium	14.4	23.4	25	18.1	19.7	10.1J	15.8	7.5J	5.1J	5.2J	18.7	16.4	15.2	19.7	27.1	9.4J	12.8	9.2J	4.7J	4.9J	9.26-26.74
Zinc	829	33.7	21.4	12.4	9.2	9.7	9.9	4.8	4.7	5	214	18	13.7	13.7	11.3	7.9	9.7	5.8	4.2	5	4.58-21.82

UJ = Estimated as non-detect at the instrument detection limit
J = Estimated value
U = Not detected
-R = Rejected
-- - -- = No range could be calculated
Ft-BGS = Feet below ground surface

[1] All concentrations are in milligrams per kilogram (mg/kg)
[2] Background range calculated from values

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 39-2a
Selection of COCs
SWMU 78

Medium	Soils (SWMU 81 - VOC analytes only)
Chemicals Detected:	Aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), mercury (Hg), nickel (Ni), vanadium (V), zinc (Zn), BEHP, di-n-butylphthalate (Di-n-BP), DDD, DDE, DDT, Chlordane, Methoxychlor†, trichloroethane (TCA), MEK, Acetone, Vinyl Chloride††, ethylbenzene, methylene chloride, PCE, toluene, trichloroethylene (TCE), xylene
Chemicals Discarded:	**As, Cr
	*Cu, Fe, Mg
	***Ba, Be, Co, Mn, Hg, Ni, V, Al
	Lab contaminants - BEHP, Di-n-BP, MEK, and methylene chloride
Chemicals of Concern:	Cd, Pb, Zn, DDD, DDE, DDT, TCA, ethylbenzene, PCE, toluene, TCE, xylene, acetone
Exceed RFI Criteria:	None
Exposure Scenario:	Area < ½ acre- future residential scenario unlikely current and future worker; No groundwater data available.

Legend:
†Methoxychlor was detected at the extremely low value of 0.009 (estimated below DL.) at 100 ft.
††Vinyl Chloride (1/49) with concentration of 0.11 mg/kg is considered an outlier.
*Lower than site background but > regional background.
**Lower than regional and/or comparable to site background.
***Lower than site regional background.
+Low toxicity chemicals.

Source: Woodward-Clyde, 1992

Table 39-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 78

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 39-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 78

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 39-2c
Proposed Corrective Action Levels and RFI Criteria for Carcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 78

	Chemical	EPA Weight of Evidence	Assumed Risk Level	Exposure Duration (years)	Oral Slope Factor (mg/k-d)-1	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	Benzene	A	1.0E-06	70	2.9E-02	24.14	24.14	5.0E-03*	5.0E-03*
	Bromoform	B2	1.0E-06	70	7.9E-03	88.61	88.61	1.0E-01*,(1)	1.0E-01*,(1)
	Chloroform	B2	1.0E-06	70	6.1E-03	114.75	114.75	1.0E-01*,(1)	1.0E-01*,(1)
	Chloromethane	C	1.0E-05	70	1.3E-02	538.46	538.46	2.69E-02	2.69E-02
	Dibromochloromethane	C	1.0E-05	70	8.4E-02	83.33	83.33	4.17E-03	4.17E-03
	Methylene Chloride	B2	1.0E-06	70	7.5E-03	93.33	93.33	4.67E-03	4.67E-03
	Tetrachloroethene	B2	1.0E-06	70	5.1E-02	13.73	13.73	5.0E-03*	5.0E-03*
	Trichloroethene	B2	1.0E-06	70	1.1E-02	63.64	63.64	5.0E-03*	5.0E-03*
	Vinyl Chloride	A	1.0E-06	70	1.9E+00	0.37	0.37	2.0E-03*	2.0E-03*
Semi-volatiles:	bis(2-Ethylhexyl)phthalate	B2	1.0E-06	70	1.4E-02	50.00	50.00	2.50E-03	2.50E-03
	Benzo(a)anthracene	B2	1.0E-06	70	8.4E-01	0.83	0.83	4.17E-05	4.17E-05
	Benzo(a)pyrene	B2	1.0E-06	70	5.8E+00	0.12	0.12	6.03E-06	6.03E-06
	Benzo(b)fluoranthene	B2	1.0E-06	70	8.1E-01	0.86	0.86	4.32E-05	4.32E-05
	Benzo(k)fluoranthene	B2	1.0E-06	70	3.8E-01	1.84	1.84	9.21E-05	9.21E-05
	Carbazole	B2	1.0E-06	70	2.0E-02	35.00	35.00	1.75E-03	1.75E-03
	Chloroform	B2	1.0E-06	70	6.1E-03	114.75	114.75	1.0E-01*,(1)	1.0E-01*,(1)
	Chrysene	B2	1.0E-06	70	3.0E-02	23.33	23.33	1.17E-03	1.17E-03
	Dibenzo(a,h)anthracene	B2	1.0E-06	70	6.4E+00	0.11	0.11	5.47E-06	5.47E-06
	Indeno(1,2,3-c,d)pyrene	B2	1.0E-06	70	1.4E+00	0.50	0.50	2.50E-05	2.50E-05
	Pentachlorophenol	B2	1.0E-06	70	1.2E-01	5.83	5.83	1.0E-03*	1.0E-03*
Pesticides:	4,4-DDD	B2	1.0E-06	70	2.4E-01	2.92	2.92	1.46E-04	1.46E-04
	4,4-DDE	B2	1.0E-06	70	3.4E-01	2.06	2.06	1.03E-04	1.03E-04
	4,4-DDT	B2	1.0E-06	70	3.4E-01	2.06	2.06	1.03E-04	1.03E-04
	alpha-Chlordane	B2	1.0E-06	70	1.3E+00	0.54	0.54	2.0E-03*	2.0E-03*
	gamma-Chlordane	B2	1.0E-06	70	1.3E+00	0.54	0.54	2.0E-03*	2.0E-03*
	Heptachlor epoxide	B2	1.0E-06	70	9.1E+00	0.08	0.08	2.0E-04*	2.0E-04*
Metals:	Arsenic	A	1.0E-06	70	1.8E+00	0.39	0.39	1.94E-05	1.94E-05
	Beryllium	B2	1.0E-06	70	4.3E+00	0.16	0.16	8.14E-06	8.14E-06

* = final MCL
(1) = MCL for total trihalomethanes
(2) = Effective July 30, 1992

Source: Woodward-Clyde, 1992

Table 42-1a
Elemental Concentrations (mg/kg) that Exceeded the Estimated Background Range in Surface and Subsurface Soil Samples
SWMU 82

BORING NO	8201	8202		8203					8204			8205						8206				ESTIMATED RANGE (1)	BACKGROUND LEVELS IN CLOVIS, NM REGION (2)
SAMPLE DEPTH IN Ft-BGS	0	24	28	14	18	24	28	52	0	21	27	14	18	24	28	52	74	0	18	22	34		
ELEMENT																							
ALUMINUM	11000						10500															0 to 10049	5000
ANTIMONY																						2 to 14.48	< 1
ARSENIC	6																					0 to 4.5	6.5
BARIUM		186	206	518	259	224	328			864 J		244		221	220	387	759		1800	814		0 to 183	500
BERYLLIUM	0.7								0.82											0.66 J		0 to 0.83	1 - 2
CADMIUM																		1.4				0.2 to 1.23	—
CALCIUM							358000 J				185000 J								237000 J	258000 J		0 to 183118	790 - 1800
CHROMIUM			15.4				117	14.5			13.4 J	13.8									13.1	1 to 12.75	30
COBALT	5.3						10.2		4.7													0 to 4.6	3 - 7
COPPER	13.1								9.5			61.7						18.6 J				0 to 7.34	20
IRON	11000						9040											11400				13 to 6242	100-15000
LEAD	16.1 J								13			20.2 J						72.6				0 to 10.3	15
MAGNESIUM		11800J				18900	19000				18000									14800		0 to 11588	200-500
MANGANESE	216								153									174				0 to 148	500
MERCURY																						0.1 to 0.12	0.32
NICKEL	9.8						330		9.7		8.6 J	9.2										0 to 8.48	15
POTASSIUM									2460													0 to 2287	1600
SELENIUM																						0.2 to 2	0.15 - 0.30
SILVER												2.8										0.25 to 2.32	—
SODIUM																						120 to 1227	700
THALLIUM																						0 to 1.42	—
VANADIUM	21.5						27.5						20.2									3.9 to 20.1	30 - 70
ZINC	27.5								32.6			53.1						87.3 J				0 to 20.8	45

1 - The estimated background range was calculated as (+) or (-) two standard deviations from the mean (but not less than zero)

2 - Concentrations are provided from USGS 1979 data for this region

Ft-BGS - Feet below ground surface

mg/kg - Milligrams per kilogram

— - No concentration value given

11000 - Concentrations which exceeded both the estimated background range at the site and background levels in the Clovis, New Mexico region reported by USGS (1979)

J - Estimated concentration below the reporting limit

Page 1 of 3

Source: Woodward-Clyde, 1993

Table 42-1a

Elemental Concentrations (mg/kg) that Exceeded the Estimated Background Range in Surface and Subsurface Soil Samples

SWMU 82

BORING NO.	8207				8208		8209						8210					8211			ESTIMATED RANGE (1)	BACKGROUND LEVELS IN CLOVIS, NM REGION (2)
SAMPLE DEPTH IN Ft-BGS	13	17	23	27	19	29	0	14	18	24	34	44	15	21	25	34	44	18	28			
ELEMENT																						
ALUMINUM																					0 to 10049	5000
ANTIMONY														16.1 J							2 to 14.48	< 1
ARSENIC																					0 to 4.5	6.5
BARIUM	457	338	237		230	213	248							758	509	5600	465	287	568		0 to 183	500
BERYLLIUM													0.68								0 to 0.63	1 - 2
CADMIUM																					0.2 to 1.23	—
CALCIUM	245000 J													248000 J					186000 J		0 to 183118	790 - 1800
CHROMIUM						19.7															1 to 12.75	30
COBALT													4.8								0 to 4.6	3 - 7
COPPER																					0 to 7.34	20
IRON																					13 to 8242	100-15000
LEAD							12.9														0 to 10.3	15
MAGNESIUM				15900		14200					16600				23200						0 to 11588	200-500
MANGANESE																					0 to 148	500
MERCURY																					0.1 to 0.12	0.32
NICKEL								8.8					9.6								0 to 6.48	15
POTASSIUM																					0 to 2267	1600
SELENIUM																					0.2 to 2	0.15 - 0.30
SILVER																					0.25 to 2.32	—
SODIUM																					120 to 1227	700
THALLIUM																					0 to 1.42	—
VANADIUM							20.2		20.6	22.8	21.3	20.6	21.6								3.9 to 20.1	30 - 70
ZINC							30.6 J														0 to 20.8	45

1 - The estimated background range was calculated as (+) or (-) two standard deviations from the mean (but not less than zero).
2 - Concentrations are provided from USGS 1979 data for this region.
Ft-BGS - Feet below ground surface
mg/kg - Milligrams per kilogram
— - No concentration value given
245000 J - Concentrations which exceeded both the estimated background range at the site and background levels in the Clovis, New Mexico region reported by USGS (1979)
J - Estimated concentration below the reporting limit

Page 2 of 3

Source: Woodward-Clyde, 1993

Table 42-1a

Elemental Concentrations (mg/kg) that Exceeded the Estimated Background Range in Surface and Subsurface Soil Samples

SWMU 82

BORING NO.	8212						8213						8214			8215		ESTIMATED RANGE (1)	BACKGROUND LEVELS IN CLOVIS, NM REGION (2)
SAMPLE DEPTH IN Ft-BGS	14	18	24	28	40	52	0	14	18	24	28	40	13	23	27	25			
ELEMENT																			
ALUMINUM																		0 to 10049	5000
ANTIMONY																		2 to 14.48	< 1
ARSENIC																		0 to 4.5	8.5
BARIUM	467		226			498	248		316					261	689			0 to 183	500
BERYLLIUM																		0 to 0.63	1 - 2
CADMIUM													190000 J					0.2 to 1.23	—
CALCIUM																		0 to 183116	790 - 1800
CHROMIUM												18.1				18.8 J		1 to 12.75	30
COBALT																		0 to 4.6	3 - 7
COPPER																		0 to 7.34	20
IRON							8900											13 to 8242	100-15000
LEAD																		0 to 10.3	15
MAGNESIUM		14900	19800	14200														0 to 11588	200-500
MANGANESE																		0 to 148	500
MERCURY																		0.1 to 0.12	0.32
NICKEL																		0 to 8.48	15
POTASSIUM								2430										0 to 2287	1600
SELENIUM																		0.2 to 2	0.15 - 0.30
SILVER																		0.25 to 2.32	—
SODIUM																		120 to 1227	700
THALLIUM																		0 to 1.42	—
VANADIUM									20.4							22.4		3.9 to 20.1	30 - 70
ZINC																		0 to 20.8	45

1 - The estimated background range was calculated as (+) or (-) two standard deviations from the mean (but not less than zero)
2 - Concentrations are provided from USGS 1979 data for this region.
Ft-BGS - Feet below ground surface
mg/kg - Milligrams per kilogram
— - No concentration value given
2250 - Concentrations which exceeded both the estimated background range at the site and background levels in the Clovis, New Mexico region reported by USGS (1979).
J - Estimated concentration below the reporting limit

Page 3 of 3

Source: Woodward-Clyde, 1993

Table 42-1b
Summary of Volatile, Semivolatile, Pesticide/PCB, and Other Analytes Detected* in Surface and Subsurface Soil Samples
SWMU 82

BORING NO.	8201			8202	8203		8204		8205		8206								
SAMPLE DEPTH IN Ft-BGS	0	18	24	24	18	28	0	15	39	74	0	18	22	30	34	39	49	59	74
ANALYTYE																			
BENZENE				1.2 J															
ETHYL BENZENE																			
TOLUENE		4.7 J	5.5				1.9 J	2.5 J	1.3 J	4.1 J	14					3.5 J			
VINYL ACETATE																			
XYLENES	1.7 J																		
2-METHYLNAPTHALENE												160 J	230 J						
4-NITROPHENOL																			
ACENAPHTHENE												490	710						
ANTHRACENE												850	1300		51 J		42 J		
BENZO(a)ANTHRACENE												880	2100	41 J	72 J	37 J	57 J		
BENZO(a)PYRENE												610	1600		51 J		48 J		
BENZO(b)FLUORANTHENE												820	2200	45 J	92 J	37 J	72 J		
BENZO(g,h,i)PERYLENE												190 J	460						
BENZO(k)FLUORANTHENE												380	930						
BENZOIC ACID																			
CHRYSENE												740	1900	37 J	80 J		62 J		
DIBENZO(a,h)ANTHRACENE												91 J	54 J						
DIBENZOFURAN												370	620						
FLUORANTHENE												2700	5100	61 J	190 J	88 J	170 J		
FLUORENE												630	890						
INDENO(1,2,3-c,d)PYRENE												300 J	850						
NAPHTHALENE												470	530						
PENTACHLOROPHENOL																			
PHENANTHRENE												3000	4700	44 J	180 J	95 J	170 J		
PYRENE							56 J					1900	4100	50 J	130 J	62 J	110 J		
4,4-DDE	3.9						11				29								
4,4-DDT							1.1 J				17								
AROCLOR 1254																360		18 J	22 J
TPH (mg/kg)					97.2														

* Contaminants suspected to be contributed by the sampling procedure or the laboratory have been excluded. Units are ug/kg unless otherwise noted

Ft-BGS = Feet Below Ground Surface ug/kg = Micrograms per kilogram mg/kg = Milligrams per kilogram TPH = Total Petroleum Hydrocarbons

J = Estimated Concentration

Page 1 of 3

Source: Woodward-Clyde, 1993

Table 42-1b
Summary of Volatile, Semivolatile, Pesticide/PCB, and Other Analytes Detected* in Surface and Subsurface Soil Samples
SWMU 82

BORING NO.	8207				8208		8209						8210				8211		
SAMPLE DEPTH IN Ft-BGS	13	23	27	39	29	55	0	18	28	34	58	74	15	21	34	44	14	18	40
ANALYTE																			
BENZENE																			
ETHYL BENZENE	3.8 J																		
TOLUENE		2.1 J	2.1 J	1.4 J	1.2 J	1.9 J	13 J	2.3 J	16	35	1.3 J	1.4 J	1.8 J	3.2 J	6.5	2.8 J	2.5 J	1.7 J	1.7 J
VINYL ACETATE																			
XYLENES																			
2-METHYLNAPTHALENE																			
4-NITROPHENOL														75 J					
ACENAPHTHENE																			
ANTHRACENE																			
BENZO(a)ANTHRACENE																			
BENZO(a)PYRENE																			
BENZO(b)FLUORANTHENE																			
BENZO(g,h,i)PERYLENE																			
BENZO(k)FLUORANTHENE																			
BENZOIC ACID																			
CHRYSENE																			
DIBENZO(a,h)ANTHRACENE																			
DIBENZOFURAN																			
FLUORANTHENE																			
FLUORENE																			
INDENO(1,2,3-c,d)PYRENE																			
NAPHTHALENE																			
PENTACHLOROPHENOL																			
PHENANTHRENE																			
PYRENE																			
4,4-DDE																			
4,4-DDT							4.6												
AROCLOR 1254																			
TPH (mg/kg)																			

* Contaminants suspected to be contributed by the sampling procedure or the laboratory have been excluded. Units are ug/kg unless otherwise noted

Ft-BGS = Feet Below Ground Surface ug/kg = Micrograms per kilogram mg/kg = Milligrams per kilogram TPH = Total Petroleum Hydrocarbons

J = Estimated Concentration

Page 2 of 3

Source: Woodward-Clyde, 1993

Table 42-1b
Summary of Volatile, Semivolatile, Pesticide/PCB, and Other Analytes Detected* in Surface and Subsurface Soil Samples
SWMU 82

BORING NO.	8212	8213							8214	8215
SAMPLE DEPTH IN Ft-BGS		0	14	24	28	40	52	74	17	15
ANALYTE										
BENZENE										
ETHYL BENZENE										
TOLUENE		6.4		1.4 J	1.6 J	1.5 J	2.3 J	2.9 J	1.2 J	1.2 J
VINYL ACETATE							1.5 J			
XYLENES		1.1 J								
2-METHYLNAPTHALENE										
4-NITROPHENOL			59 J			160 J				16.1
ACENAPHTHENE										
ANTHRACENE										
BENZO(a)ANTHRACENE		55 J	43 J							
BENZO(a)PYRENE										
BENZO(b)FLUORANTHENE										
BENZO(g,h,i)PERYLENE										
BENZO(k)FLUORANTHENE										
BENZOIC ACID			39 J							
CHRYSENE		49 J	38 J							
DIBENZO(a,h)ANTHRACENE										
DIBENZOFURAN										
FLUORANTHENE										
FLUORENE										
INDENO(1,2,3-c,d)PYRENE									20.4	
NAPHTHALENE										
PENTACHLOROPHENOL						88 J				
PHENANTHRENE										
PYRENE						81 J				
4,4-DDE										
4,4-DDT										
AROCLOR 1254										
TPH (mg/kg)										

* Contaminants suspected to be contributed by the sampling procedure or the laboratory have been excluded. Units are ug/kg unless otherwise noted.

Ft-BGS = Feet Below Ground Surface ug/kg = Micrograms per kilogram mg/kg = Milligrams per kilogram TPH = Total Petroleum Hydrocarbons

J = Estimated Concentration

Page 3 of 3

Source: Woodward-Clyde, 1993

Table 43-1a
Concentration (mg/kg) of TRPH
SWMU 83

BOREHOLE NUMBER	CANNON NUMBER	DEPTH (ft.)	CHEMICAL TRPH
1	CAN083-SUM1-041A	0	3400
	CAN083-SUM1-042B	2.5	3800
	CAN083-SUM1-043C	5	47
	CAN083-SUM1-044D	10	<10
2	CAN083-SUM2-041A	0	1600
	CAN083-SUM2-042B	2.5	5000
	CAN083-SUM2-043C	5	40
	CAN083-SUM2-044D	10	<10
3	CAN083-SUM3-041A	0	1200
	CAN083-SUM3-042B	2.5	<10
	CAN083-SUM3-043C	5	<10
	CAN083-SUM3-044D	10	<10

Duplicate samples or laboratory repeat samples are presented only if they are different from the original sample and not rejected.

J = estimate
R = rejected
U = not detected at CRQL
UJ = estimated as non-detect at CRQL

Source: LRL Sciences, Inc., 1993

Table 43-1b
Concentration (mg/kg) of TAL Metals
SWMU 83

Borehole Number	Sample Number (CAN083-SUM)	Sample Depth (feet)	Aluminum	Barium	Beryllium	Cobalt	Chromium	Copper	Iron	Lead
1	1-051A	0	6250	514	0.27	1.6	6 J	10.2 J	4280	5 J
	1-052B	2.5	7210	227	0.4	2.3	6.1 J	8.2 J	5900	10.2 J
	1-053C	5	13600	74	0.7	3.9	9.9	10.5 J	10400	7.4 J
	1-054D	10	7760	2170	0.47	1.3 U	3.3 J	6.9 J	4180	7.1 J
2	2-051A	0	5780	260	0.21	1.5	3.4 J	13.7 J	3690	9.6 J
	2-052B	2.5	15800	95.4	0.81	4.5	12	12.7	11700	10.4 J
	2-053C	5	15100	68.2	0.69	3.5	10.6	10.4 J	10700	7.6 J
(QAD)	2-751C	5	16400	129	0.77	5	13.2	6.2	11900	6.7
(QCD)	2-851C	5	12300	84.6	0.63	3.1	8.9	11 J	9560	7.6 J
	2-054D	10	8470	1140	0.58	1.6	3 J	7.4 J	4540	7.2 J
3	3-051A	0	8180	233	0.46	3.3	11.8	18 J	8550	36.8 J
	3-052B	2.5	7720	133	0.28	1.9	4.9 J	8.3 J	4890	5.6 J
	3-053C	5	15700 U	68.4	0.72	4	11.3	11.5 J	11700	7.3 J
	3-054D	10	11000	45.8	0.51	2.6	8.6 J	8.4 J	7660	5.2 J
Background (95% UCL) (1)			10540.00	642.00	0.73	4.5	12.50	13.00	1970.00	25.80

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

Page 1 of 2

Source: LRL Sciences, Inc., 1993

Table 43-1b
Concentration (mg/kg) of TAL Metals
SWMU 83

Borehole Number	Sample Number (CAN083-SUM)	Sample Depth (feet)	Manganese		Mercury		Nickel	Potassium		Silver		Zinc	
1	1-051A	0	105	J	0.01	J	8.6	1050		1.1	UJ	*	R
	1-052B	2.5	239	U	0.01	U	8.9	1210	J	3.4	J	*	R
	1-053C	5	111	J	0.01	U	10.3	2370	J	0.86	UJ	*	R
	1-054D	10	56.2	J	0.02	U	6	1210	J	0.95	UJ	22.5	J
2	2-051A	0	93.6	J	0.01	U	6.6	1030		0.84	UJ	13.9	J
	2-052B	2.5	175	J	0.02	U	11.1	2370		0.86	UJ	*	R
	2-053C	5	111	J	0.02	U	9.5	2810		0.85	UJ	82.1	J
(QAD)	2-751C	5	131	J	0.15		11.4	2860		0.41	U	31.6	
(QCD)	2-851C	5	106	J	0.01	U	10.4	2190		0.92	UJ	30.1	J
	2-054D	10	63.2	J	0.02	U	5.6	1320		0.93	UJ	*	R
3	3-051A	0	271	J	0.02	U	7.6	1500		0.92	UJ	231	J
	3-052B	2.5	50	J	0.02	U	6.1	1320		0.91	UJ	*	R
	3-053C	5	149	J	0.02	U	10.4	2320		0.87	UJ	36.5	J
	3-054D	10	99.9		0.1	U	6.9	1850		0.91	UJ	22.8	
Background (95% UCL) (1)			164		0.13		9.00	2572.00		2.20		21.90	

NOTES:

Duplicate samples (QAD) or (QCD) samples are presented only if they are different from the original sample and not rejected.

U indicates that the compound was analyzed for, but not detected at or above the standard limit.
J indicates and estimated value.
UJ indicates the compound was analyzed for but not detected. The sample quantification limit or reported detection limit is an estimated quantity.
*R indicates that the data was rejected because of quality control measures.

Boldface indicates a detection above the 95% UCL background level.

Only data for metals detected above background is presented.

Page 2 of 2

Source: LRL Sciences, Inc., 1993

Table 43-2a
Summary of Compounds Detected in Soil Samples
SWMU 83

LOCATOR	CAN083-8305-0000			CAN083-8305-0005			CAN083-8305-0010			CAN083-8305-8362[1]			CAN083-8305-0015			CAN083-8305-0020		
LAB SAMPLE NUMBER	0398670001SA			0398670002SA			0398670003SA			0398670008SA			0398670004SA			0398670005SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	<	11	U	3.4	11	J	<	11	U	3.1	11	J	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methylene chloride	2.1	5.4	J	1.9	5.5	J	4.2	5.6	J	<	5.6	U	3.6	5.6	J	4.5	5.7	J
Toluene	<	5.4	U	<	5.5	U	<	5.6	U	<	5.6	U	1.4	5.6	J	<	5.7	U
Semivolatile Organics (µg/kg)																		
Benzo(a)anthracene	64	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(a)pyrene	78	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(b)fluoranthene	120	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Benzo(g,h,i)perylene	58	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Chrysene	84	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Fluoranthene	160	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Indeno(1,2,3-cd)pyrene	58	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Phenanthrene	73	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Phenol	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Pyrene	130	360	J	<	370	U	<	370	U	<	370	U	<	370	U	<	380	U
Metals (mg/kg)																		
Aluminum	10800	10.8		8450	11.1		7980	22.6		7210	22.6		7570	11.3		5530	57.3	
Arsenic	3.2	0.54		2.4	0.55		2.6	0.56		2.7	0.56		2	1.1		1	0.57	
Barium	92.6	1.1	J	83.8	1.1	J	633	2.3	J	454	2.3	J	90.8	1.1		234	5.7	J
Beryllium	0.44	0.22		0.41	0.22		0.54	0.45		0.37	0.45	J	0.45	0.23		<	1.1	U
Cadmium	<	0.54	U	<	0.55	U	<	1.1	U	<	1.1	U	<	0.56	U	<	2.9	U
Calcium	8660	21.5		95400	22.2		135000	45.2		132000	45.2		80900	22.6		233000	115	
Chromium	11	1.1		7.3	1.1		5.3	2.3		3.7	2.3		6.4	1.1		<	5.7	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Page 1 of 6

Source: Woodward-Clyde, 1997

Table 43-2a
Summary of Compounds Detected in Soil Samples
SWMU 83

LOCATOR	CAN083-8305-0000			CAN083-8305-0005			CAN083-8305-0010			CAN083-8305-8362[1]			CAN083-8305-0015			CAN083-8305-0020		
LAB SAMPLE NUMBER	0398670001SA			0398670002SA			0398670003SA			0398670008SA			0398670004SA			0398670005SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Cobalt	3.8	1.1		3.1	1.1		2.8	2.3		2.8	2.3		3.4	1.1		3.4	5.7	J
Copper	8.1	2.2		5.2	2.2		4.6	4.5		4.1	4.5	J	4.4	2.3		<	11.5	U
Iron	10200	10.8		7200	11.1		6470	22.6		6000	22.6		6990	11.3		4040	57.3	
Lead	12.9	2.7		4.7	0.55		4.9	0.56		5.5	0.56		5.1	0.56		2.2	0.57	
Magnesium	1790	21.5		2430	22.2		4120	45.2		3860	45.2		4000	22.6		5830	115	
Manganese	157	1.1		85.6	1.1		106	2.3		95.1	2.3		116	1.1		40.3	5.7	
Nickel	9	4.3		8.7	4.4		5.9	9	J	5.5	9	J	7.3	4.5		<	22.9	U
Potassium	1800	539		1430	554		1400	1130		1210	1130		1840	565		852	2860	J
Vanadium	19.8	1.1		15.9	1.1		17.1	2.3		16.4	2.3		19.5	1.1		14.4	5.7	
Zinc	23.3	2.2		17.3	2.2		16	4.5		14.6	4.5		17	2.3		8.9	11.5	J
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	325	43.1		<	44.3	U	<	45.2	U	<	45.2	U	<	45.2	U	<	45.8	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Source: Woodward-Clyde, 1997

Table 43-2a
Summary of Compounds Detected in Soil Samples
SWMU 83

LOCATOR	CAN083-8305-0025			CAN083-8306-0000			CAN083-8306-0005			CAN083-8306-0010			CAN083-8306-8361[1]		
LAB SAMPLE NUMBER	0398670006SA			0398670010SA			0398710016SA			0398710015SA			0398670009SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	12	U	<	11	U	<	11	U	<	11	U	<	11	U
2-Butanone (MEK)	<	12	U	<	11	U	<	11	U	1.5	11	J	<	11	U
Methylene chloride	<	5.8	U	<	5.7	U	<	5.7	U	<	5.7	U	<	5.7	U
Toluene	<	5.8	U	<	5.7	U	<	5.7	U	<	5.7	U	<	5.7	U
Semivolatile Organics (µg/kg)															
Benzo(a)anthracene	<	380	U	85	380	J	<	370	U	<	370	U	<	380	U
Benzo(a)pyrene	<	380	U	120	380	J	<	370	U	<	370	U	<	380	U
Benzo(b)fluoranthene	<	380	U	160	380	J	<	370	U	<	370	U	<	380	U
Benzo(g,h,i)perylene	<	380	U	75	380	J	<	370	U	<	370	U	<	380	U
Chrysene	<	380	U	99	380	J	<	370	U	<	370	U	<	380	U
Fluoranthene	<	380	U	120	380	J	<	370	U	<	370	U	<	380	U
Indeno(1,2,3-cd)pyrene	<	380	U	68	380	J	<	370	U	<	370	U	<	380	U
Phenanthrene	<	380	U	48	380	J	<	370	U	<	370	U	<	380	U
Phenol	<	380	U	<	380	U	1700	370		59	370	J	<	380	U
Pyrene	<	380	U	110	380	J	<	370	U	<	370	U	<	380	U
Metals (mg/kg)															
Aluminum	5290	23.1		8240	11.4		6810	11.4		8790	22.7		7230	22.8	
Arsenic	1.1	0.58		2.6	1.1		2.4	1.1		1.5	0.57		2.2	0.57	
Barium	133	2.3	J	207	1.1	J	102	1.1		538	2.3	J	1360	2.3	J
Beryllium	<	0.46	U	0.45	0.23		0.49	0.23		0.62	0.45		0.57	0.46	
Cadmium	<	1.2	U	<	0.57	U	<	0.57	U	<	1.1	U	<	1.1	U
Calcium	180000	46.2		72000	22.9		75400	22.7		161000	45.4		173000	45.7	
Chromium	5.2	2.3		7.4	1.1		6.2	1.1		3.9	2.3		4.1	2.3	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Page 3 of 6

Source: Woodward-Clyde, 1997

Table 43-2a
Summary of Compounds Detected in Soil Samples
SWMU 83

LOCATOR	CAN083-8305-0025			CAN083-8306-0000			CAN083-8306-0005			CAN083-8306-0010			CAN083-8306-8361[1]		
LAB SAMPLE NUMBER	0398670006SA			0398670010SA			0398710016SA			0398710015SA			0398670009SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.															
Cobalt	1.2	2.3	J	3.2	1.1		4	1.1		2.7	2.3		2	2.3	J
Copper	3.5	4.6	J	6.6	2.3		5.7	2.3		3.8	4.5	J	4	4.6	J
Iron	3130	23.1		7530	11.4		6640	11.4		5280	22.7		4660	22.8	
Lead	1.5	0.58		7.5	0.57		6	0.57	J	4.9	0.57	J	5.4	0.57	
Magnesium	16400	46.2		2660	22.9		2360	22.7		4970	45.4		4860	45.7	
Manganese	27.2	2.3		123	1.1		86.1	1.1		71.8	2.3		68.1	2.3	
Nickel	7.2	9.2	J	8.1	4.6		8.9	4.5		8.3	9.1	J	5.8	9.1	J
Potassium	883	1160	J	1330	571		1370	568		1440	1140		1240	1140	
Vanadium	17.1	2.3		15.9	1.1		14.7	1.1		12.1	2.3		11.5	2.3	
Zinc	7.4	4.6		18.2	2.3		15.1	2.3		14.3	4.5		11.6	4.6	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbons	<	46.2	U	127	45.7		<	45.4	U	<	45.4	U	<	45.7	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceeding sample number.

Page 4 of 6

Source: Woodward-Clyde, 1997

Table 43-2a
Summary of Compounds Detected in Soil Samples
SWMU 83

LOCATOR	CAN083-8306-0015			CAN083-8306-0020			CAN083-8306-0025		
LAB SAMPLE NUMBER	0398710014SA			0398710013SA			0398710012SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)									
Acetone	<	11	U	<	11	U	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U
Methylene chloride	<	5.6	U	4.5	5.5	J	<	5.6	U
Toluene	<	5.6	U	<	5.5	U	<	5.6	U
Semivolatile Organics (µg/kg)									
Benzo(a)anthracene	<	370	U	<	370	U	<	370	U
Benzo(a)pyrene	<	370	U	<	370	U	<	370	U
Benzo(b)fluoranthene	<	370	U	<	370	U	<	370	U
Benzo(g,h,i)perylene	<	370	U	<	370	U	<	370	U
Chrysene	<	370	U	<	370	U	<	370	U
Fluoranthene	<	370	U	<	370	U	<	370	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	370	U	<	370	U
Phenanthrene	<	370	U	<	370	U	<	370	U
Phenol	<	370	U	<	370	U	<	370	U
Pyrene	<	370	U	<	370	U	<	370	U
Metals (mg/kg)									
Aluminum	6480	11.2		4750	11.1		7440	11.1	
Arsenic	0.96	2.2	J	0.67	2.2	J	0.56	2.2	J
Barium	620	1.1	J	75.1	1.1	J	377	1.1	J
Beryllium	0.42	0.22		0.31	0.22		0.4	0.22	
Cadmium	<	0.56	U	<	0.55	U	0.46	0.56	J
Calcium	86400	22.4		85700	22.2		62300	22.3	
Chromium	4.7	1.1		4	1.1		5.3	1.1	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for preceeding sample number.

Page 5 of 6
Source: Woodward-Clyde, 1997

Table 43-2a
Summary of Compounds Detected in Soil Samples
SWMU 83

LOCATOR	CAN083-8306-0015			CAN083-8306-0020			CAN083-8306-0025		
LAB SAMPLE NUMBER	0398710014SA			0398710013SA			0398710012SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.									
Cobalt	2.6	1.1		1.8	1.1		2	1.1	
Copper	2.9	2.2		2.1	2.2	J	2.7	2.2	
Iron	5030	11.2		3830	11.1		5540	11.1	
Lead	3.8	1.1		2.8	1.1	J	2.8	1.1	J
Magnesium	2940	22.4		3080	22.2		4520	22.3	
Manganese	67.9	1.1		41.3	1.1		50.9	1.1	
Nickel	6.5	4.5		5	4.4		6	4.5	
Potassium	1670	560		1280	555		1780	556	
Vanadium	11.1	1.1		10	1.1		12.9	1.1	
Zinc	12.6	2.2		8.8	2.2		13.3	2.2	
TRPH (mg/kg)									
Total Recoverable Petroleum Hydrocarbons	<	44.8	U	<	44.4	U	<	44.5	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.

R = Rejected value. D = Sample was diluted for analysis.

U = Nondetected value. RL = Reporting Limit.

(1) Duplicate for preceeding sample number.

Page 6 of 6

Source: Woodward-Clyde, 1997

Table 43-2b
Comparison of Maximum Concentrations to RBCs for Residential Soil
SWMU 83

Chemical	Maximum Detected Concentration (mg/kg)	Residential Soil Risk-Based Concentration(1) (mg/kg)	Exceeds RBC?	Estimated Risk	Risk Type	Industrial Soil Risk-based Concentration(2) (mg/kg)	Exceeds RBC?
Acetone	0.0034	7,800	NO				
2-Butanone (MEK)	0.0015	47,000	NO				
Methylene Chloride	0.0045	85	NO				
Toluene	0.0014	16,000	NO				
Benzo(a)anthracene	0.085	0.88	NO				
Benzo(a)pyrene	0.12	0.088	YES	1.36×10^{-6}	Carcinogenic	0.39	NO
Benzo(b)fluoranthene	0.16	0.88	NO				
Benzo(g,h,i)perene	0.075	0.88	NO				
Chrysene	0.099	88	NO				
Fluoranthene	0.16	3,100	NO				
Indeno(1,2,3-cd)pyrelene	0.068	NA(a)					
Phenanthrene	0.073	NA(a)					
Phenol	1.7	47,000	NO				
Pyrene	0.13	2,300	NO				
Cadmium	0.46	39	NO				

(1) EPA Region III Risk-Based Concentrations for Residential Soil (EPA 1994).

(2) EPA Region III Risk-Based Concentrations for Industrial Soil (EPA 1994).

(a) Not Applicable: EPA has not established a toxicity factor for these chemicals, so RBCs could not be calculated.

Source: Woodward-Clyde, 1997

Table 44-1
Phase II Analytical Results (µg/kg)
SWMU 85

Depth	Compound	ST-1	ST-2	St-3
3.0-4.0'	Silver	0.40 (LT 0.2)	LT 0.2	LT 0.19
	Arsenic	1.6 (3.1)	1.8	1.5
	Barium	48 (48)	70	110
	Cadmium	0.28 (0.2)	1.2	2.3
	Chromium	5.5 (3.4)	18.0	28.0
	Copper	3.5 (4.2)	7.7	12.0
	Iron	5500 (3900)	6900	7700
	Mercury	0.17 (0.17)	0.20	0.21
	Nickel	3.3 (3.2)	4.4	6.1
	Lead	5.3 (5.3)	33.0	74.0
	Selenium	LT 0.18 (1.3)	LT 0.18	LT 0.18
	Zinc	9.9 (9.0)	46.0	57.0
	O & G	LT 10 (10)	LT 10	40

LT = Less Than

Source: Walk, Haydel & Associates, Inc., 1990

Table 44-2a
Remedial Investigation Analytical Results - Barium (µg/kg)
SWMU 85

DEPTH	B1	B2	B3	B4	B5*	B6*	B7	B8*
0-1'		--	--	--	--	--	--	--
0-1.5'	--							
2-3'		--	--	--	--	--	--	--
2.5-4'	--							
4-5'		--	--	--	--	--	--	--
5-6.5'	--							
7.5-9'	--							
10-11.5'	--				2,503			
15-16.5'	--				1,318			
20-21.5	--						--	--
25-26.5'	--					**	--	--
30-31.5'	--							
45-46.5'	--	--	--	--	--	--		
60-61.5'	--	--	--	--	--	---		

-- No sample collected in accordance with Scope of Services/Sampling Plan

* Depth corresponds to surface of naturally occuring soils. Top of fill is approximately 10 feet above 0-1.5' sample.

** Insufficient sample recovered for analysis.

Source: Walk, Haydel & Associates, Inc., 1990

Table 44-2b
Remedial Investigation Analytical Results - Mercury (µg/kg)
SWMU 85

DEPTH	B1	B2	B3	B4	B5*	B6*	B7	B8*
0-1'		--	--	--	--	--	--	--
0-1.5'	--							
2-3'		--	--	--	--	--	--	--
2.5-4'	--	0.13						
4-5'		--	--	--	--	--	--	--
5-6.5'	--							
7.5-9'	--							
10-11.5'	--							
15-16.5'	--	0.13						
20-21.5	--						--	--
25-26.5'	--	0.12				**	--	--
30-31.5'	--	0.11						
45-46.5'	--	--	--	--	--	--		
60-61.5'	--	--	--	--	--	--		

-- No sample collected in accordance with Scope of Services/Sampling Plan

* Depth corresponds to surface of naturally occuring soils. Top of fill is approximately 10 feet above 0-1.5' sample.

** Insufficient sample recovered for analysis.

Source: Walk, Haydel & Associates, Inc., 1990

Table 44-2c
Remedial Investigation Analytical Results - Selenium (µg/kg)
SWMU 85

DEPTH	B1	B2	B3	B4	B5*	B6*	B7	B8*
0-1'	145.6	--	--	--	--	--	--	--
0-1.5'	--			101.7	101.6	110	54.7	
2-3'	179.5	--	--	--	--	--	--	--
2.5-4'	--			84.4	182.9	53.7		
4-5'	190.8	--	--	--	--	--	--	--
5-6.5'	--			115.8	--	15.5		71.2
7.5-9'	--			139.3	84.7	58.8		99
10-11.5'	--			169.6	103.8	60.9		123.3
15-16.5'	--	49.6		121.3	87.3	78.2		49.2
20-21.5'	--			136	56.6	65.8	--	--
25-26.5'	--			105.7	87	**	--	--
30-31.5'	--			95.9	70.4		54.3	85.5
45-46.5'	--	--	--	--	--	--		
60-61.5'	--	--	--	--	--	--		

-- No sample collected in accordance with Scope of Services/Sampling Plan

* Depth corresponds to surface of naturally occuring soils. Top of fill is approximately 10 feet above 0-1.5' sample.

** Insufficient sample recovered for analysis.

Source: Walk, Haydel & Associates, Inc., 1990

A.T. Kearney, Inc. 1987. Preliminary Review/VSI Report RCRA Facility Assessment. Cannon Air Force Base; Clovis, New Mexico. July.

CH2M Hill. 1983. Installation Restoration Program Records Search for Cannon Air Force Base, New Mexico. August.

Department of the Air Force. 1994. Letter from Brigadier General William M. Guth, Commander to William K. Honker, USEPA Region VI, regarding AOC36. June 29.

Foothill Engineering Consultants, Inc. 1999. Annual Summary Report Assessment Monitoring, Long-Term Monitoring Landfill No. 3 (SWMU 105) and Landfill No. 4 (SWMU 104). Draft. Cannon Air Force Base; Clovis, New Mexico. May.

Geoscience Consultants, Ltd. 1985. Cannon AFB, New Mexico, Landfill Core Drilling Project.

Groundwater Services, Inc. 1999. RBCA Tool Kit for Chemical Releases.

Gutentag, Edwin D., et al. 1984. Geohydrology of the High Plains Aquifer in Parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. USGS Professional Paper 1400-B.

IMS, P.C. 1997. Site Inspection Report, Area of Concern – D. Final. Cannon Air Force Base, New Mexico. June.

IT Corporation. 1995. Final Project Report, Rapid Response Corrective Action, DP-33 Drum Removal. January.

Lee Wan and Associates, Inc. 1990. RCRA Facility Investigation Work Plan, Volumes I & II – Cannon AFB, New Mexico. June.

Lee Wan & Associates, Inc. 1990. RCRA Facility Investigation Field Sampling Plan. Cannon Air Force Base, New Mexico. June.

LRL Sciences, Inc. 1993. Appendix II RCRA Facility Investigation. RFI Report, Volume 1 and Risk Assessment, Volume 2.

Radian Corporation. 1986. Installation Restoration Program Phase II – Confirmation/Quantification Stage I, Cannon Air Force Base, New Mexico. September.

Radian Corporation. 1987. Soil Removal Investigation Report, AGE Drainage Ditch – Site 15, Cannon Air Force Base, NM 88103. June.

Radian Corp. 1994. RCRA Facility Investigation. Final Report, SWMU No. 105, Landfill No. 4, IRP Site LF-3. Cannon AFB, N.M. Vol. I. February.

Remediation Services, Incorporated. 1994. Closure Report: DACA 45-94-B-0100. September.

Salhotra, A.M., P. Mineart, s. Sharp-Hansen, t. Allison, R. Johns, and W. B. Mills. 1995. Multimedia Exposure Assessment Model (MULTIMED 2.0) for Evaluating the land disposal of Wastes – Model Theory. U.S. Environmental Protection Agency. Athens, GA. April.

Schroeder, P.R., T.S. Dozier, P.A. Zappi, B.M. McEnroe, J.W. Sjostrom, and R.L. Peyton. 1994. The Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering Documentation for Version 3. EPA/600/R-94/168b. U.S. Environmental Protection Agency, Risk Reduction Engineering Laboratory, Cincinnati, OH. September.

State of New Mexico Environment Department, Ground Water Protection and Remediation Bureau. 1996. Letter from Julie A. Jacobs to Col. W.P. Ard, Commander 27th Support Group, regarding closure of DP-33 Drum Removal. December 12.

State of New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. 1997. Letter from Robert S. Dinwiddie, Ph.D. to Col. David E. Clary, Commander, regarding Site Inspection Report for AOC-D. November 6.

State of New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. 1998. Letter from Robert S. Dinwiddie, Ph.D. to Col. David E. Clary, Commander, regarding Phase I RCRA Facility Investigation Report for Landfill No. 5. February 17.

United States Air Force (USAF). 1990. Final Environmental Impact Statement, Realignment of Cannon AFB, Curry County, New Mexico. May.

United States Army Corps of Engineers, Albuquerque District. 1999. Corrective Measure Completion Report, Appendices II and III Solid Waste Management Units. Cannon Air Force Base, Clovis, New Mexico. Volume 1. July.

United States Army Corps of Engineers, Tulsa District. 1988. Cannon Air Force Base Oil/Water Separators Sampling and Analytical Report.

United States Department of Agriculture (USDA) Soil Conservation Service. 1958. Soil Survey of Curry County, New Mexico, Soil Survey Series 1953, No. 4. United States Government Printing Office.

United States Environmental Protection Agency. 1979. Water-Related Environmental Fate of 129 Priority Pollutants. EPA-440/4-79-029a.

United States Environmental Protection Agency. 1987. Resource Conservation and Recovery Act Facility Assessment Guidance.

United States Environmental Protection Agency. 1989a. RCRA Facility Assessment Guidance, Volume I. May.

United States Environmental Protection Agency. 1989b. Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual.

United States Environmental Protection Agency. 1991a. Update on OSWER Soil Lead Cleanup Guidance. Memorandum by Don R. Clay, Assistant Administrator. USEPA Office of Solid Waste and Emergency Response. Washington D.C. August 29.

United States Environmental Protection Agency. 1991b. Guidance Manual for Site-Specific Use of USEPA Land Model. USEPA Office of Emergency and Remedial Response. December.

United States Environmental Protection Agency. 1994a. Region III. Risk-Based Concentration Table, Fourth Quarter 1994.

United States Environmental Protection Agency. 1994b. Revised Interim Soil Lead Evidence for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response. July.

United States Environmental Protection Agency. 1996. Region VI. Human Health Media-Specific Screening Levels. October.

United States Geological Survey Water Resources Division. 1993. Geology and Analytical Results for Soils at the Open Burn/Open Detonation Thermal Treatment Facility. Melrose Air Force Range, New Mexico. August.

United States Geological Survey Water Resources Division. 1997. Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326. Cannon Air Force Base, New Mexico. December.

United States Geological Survey Water Resources Division. 1999. Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326. Analytical Results for Samples Collected August 10-11, 1998. Cannon Air Force Base, New Mexico. May.

URS Greiner Woodward Clyde. 1999a. CERCLA Site Inspections at AOCs E, F. G, and H. Cannon AFB, New Mexico. March.

URS Greiner Woodward Clyde. 1999b. Corrective Measures Study, Site SD-11 (SWMUs 86-90). Cannon AFB, New Mexico. July.

URS Greiner Woodward Clyde. 2000. Corrective Measures Study at SWMUs 31, 48A, 77, and 127. Draft. Cannon AFB, New Mexico. January.

Walk, Haydel & Associates, Inc. 1990. Remedial Investigation Report. Final Volume I. Cannon Air Force Base, New Mexico. January.

Woodward-Clyde. 1991. Field Sampling Plan. Remedial Investigation. Phase I (18 SWMUs). Cannon Air Force Base, New Mexico.

Woodward-Clyde. 1992. Remedial Investigation Report for 18 Solid Waste Management Units. Final Volumes Ia and Ib. Cannon Air Force Base; Clovis, New Mexico. October.

Woodward-Clyde. 1993. RCRA Facility Investigation Report for Landfill No. 1 (SWMU No. 74/IRP No. LF-1) and Landfill No. 2 (SWMU 82/IRP No. LF-2). Final Volume I. Cannon Air Force Base; Clovis, New Mexico. January.

Woodward-Clyde. 1994a. RCRA Facility Investigation Report for Appendix III SWMUs – Phase I, Cannon Air Force Base, New Mexico. February.

Woodward-Clyde. 1994b. Baseline Risk Assessment for Appendix III SWMUs – Phase I, Cannon Air Force Base, New Mexico. February.

Woodward-Clyde. 1994c. RCRA Facility Investigation Activities Phase II to Appendix I (Old Entomology Rinse Area Boring). Supplemental RFI Report (19 SWMU Boundary Survey). Final. Cannon Air Force Base, New Mexico. September.

Woodward Clyde. 1995a. Phase II RCRA Facility Investigation Landfills 3 and 4 SWMUs 105 and 104, Cannon Air Force Base, New Mexico. March.

Woodward-Clyde. 1995b. RCRA Facility Investigation Activities Phase II to Appendix I Solid Waste Management Units Supplemental RFI Report. Final (Revised). Cannon Air Force Base, New Mexico. January.

Woodward-Clyde. 1995c. Management Action Plan, Cannon Air Force Base, Clovis, New Mexico. August.

Woodward-Clyde. 1996. Site Inspection Geophysical Survey Report Area of Concern – D, Cannon Air Force Base, Clovis, New Mexico. May.

Woodward-Clyde. 1997a. Naturally Occurring Concentrations of Inorganics and Background Concentrations of Pesticides at Cannon Air Force Base, New Mexico. Final Report. September.

Woodward-Clyde. 1997b. Phase I RCRA Facility Investigation Report for Landfill No. 1. Final Volume I. Cannon Air Force Base; Clovis, New Mexico. September.

Woodward-Clyde. 1997c. RCRA Facility Investigation, Appendix II SWMUs – Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1997d. RCRA Facility Investigation, Appendix III SWMUs – Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1997e. RCRA Facility Investigation, Appendix I SWMUs 86-90 (IRP Site SD-11), Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1998. Final Phase I RCRA Facility Investigation for Landfill No. 5 (SWMU No. 113/ IRP No. LF-5), Cannon Air Force Base, Clovis, New Mexico. Volume I. May.

LIBRARY COPY

VOLUME III OF III

HAZARDOUS AND SOLID WASTE AMENDMENTS / CORRECTIVE ACTION-RELATED PERMIT MODIFICATION REQUEST

NO FURTHER ACTION PROPOSALS

CANNON AFB, NEW MEXICO PERMIT NO. NM7572124454

Prepared for
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau

July 2000

TABLE OF CONTENTS

Volume Breakdown

Volume I of III

Executive Summary ES-1
Section 1 Introduction 1-1
Section 2 SWMU 74, Landfill No. 1 2-1
Section 3 AOC D, Asbestos Burial Pit 3-1
Section 4 SWMU 113, Landfill No. 5 4-1
Section 5 DP-33, Drum Disposal Pit 5-1
Section 6 SWMU 7, Oil/Water Separator No. 129 6-1
Section 7 SWMU 9, Aircraft Washrack Drain System 7-1
Section 8 SWMU 32A, Oil/Water Separator No. 186 (#1 - East) 8-1
Section 9 SWMU 33B, Oil/Water Separator No. 186 (#2 - West) 9-1
Section 10 SWMU 11, Oil/Water Separator No. 170 10-1
Section 11 SWMU 38, Oil/Water Separator No. 194 11-1
Section 12 SWMU 39, Oil/Water Separator No. 195 12-1
Section 13 SWMU 46, Oil/Water Separator No. 196 13-1
Section 14 SWMU 47, Oil/Water Separator No. 494 14-1
Section 15 SWMU 51, Oil/Water Separator No. 375 15-1
Section 16 SWMU 57, Oil/Water Separator No. 379 16-1
Section 17 SWMUs 61,62 and 63, Sand Traps 5077A and 5077B and Oil/Water Separator 5077C 17-1
Section 18 SWMU 92, Oil/Water Separator No. 5120 18-1
Section 19 SWMU 94, Oil/Water Separator No. 5144 19-1
Section 20 SWMU 8, Oil/Water Separator No. 165 20-1

Volume II of III

Section 21 SWMU 1, Oil/Water Separator No. 119 21-1
Section 22 SWMU 2, Recovered Diesel Tank No. 108 22-1
Section 23 SWMU 3, Oil/Water Separator No. 108 23-1
Section 24 SWMU 4, Recovered Oil Tank No. 121 24-1
Section 25 SWMU 5, Oil/Water Separator No. 121 25-1
Section 26 SWMU 6, POL Tank No. 129 26-1
Section 27 SWMU 10, POL Tank No. 170 27-1
Section 28 SWMU 16, Oil/Water Separator No. 680 28-1
Section 29 SWMU 34, AGE Drainage Ditch 29-1
Section 32 SWMU 49, Inactive POL Storage Tank No. 4028a 32-1
Section 33 SWMU 50, Inactive POL Storage Tank No. 4028b 33-1

Volume II of III, cont.

Section 34	SWMU 55, Lead Acid Battery Accumulation Point	34-1
Section 35	SWMU 72, Oil/Water Separator No. 390	35-1
Section 36	SWMU 75, Sanitary Sewage Lift Station Overflow Pit	36-1
Section 37	SWMU 76, Sludge Weathering Pit (WP-14)	37-1
Section 38	SWMU 77, Civil Engineering Container Storage Area	38-1
Section 39	SWMU 78, Fire Department Training Area No. 1	39-1
Section 40	SWMU 79, Underground Storage Tank	40-1
Section 41	SWMU 81, Solvent Disposal Site	41-1
Section 42	SWMU 82, Landfill No. 2	42-1
Section 43	SWMU 83, Sump	43-1
Section 44	SWMU 85, Stormwater Collection Point	44-1

Volume III of III

Section 45	SD-11, Engine Test Cell Area (SWMUs 86, 87, 88, 89, and 90)	45-1
Section 46	SWMU 91, Recovered Fuel Tank No. 5114	46-1
Section 47	SWMU 93, Oil/Water Separator No. 5121	47-1
Section 49	SWMU 96, Old Entomology Rinse Area	49-1
Section 50	SWMU 98, Sanitary Sewer Line	50-1
Section 51	SWMU 104, Landfill No. 4	51-1
Section 52	SWMU 105, Landfill No. 3	52-1
Section 53	SWMU 106, Fire Department Training Area No. 2	53-1
Section 54	SWMU 107, Fire Department Training Area No. 3	54-1
Section 55	SWMU 124, Inactive Underground Storage Tank No. 1	55-1
Section 56	SWMU 125, Inactive Underground Storage Tank No. 2	56-1
Section 57	SWMU 126, Inactive Underground Storage Tank No. 3	57-1
Section 58	SWMU 127, Sand Trap and Leach Field for Facility 4095 (#1)	58-1
Section 59	SWMU 128, Oil/Water Separator Near Tank 4095 (#2) and Leach Field	59-1
Section 62	AOC C, Blown Capacitor Site	62-1
Section 64	AOC F, Calibration Target Berm	64-1
Section 65	AOC G, Disturbed Area - North Housing Site	65-1
Section 66	AOC H, Disturbed Area - South Housing Site	66-1
Section 67	AOC 36, Building #214 Parking Lot	67-1

Vol. 3 - TABLE OF CONTENTS

Section 45 SD-11, Engine Test Cell Area (SWMUs 86, 87, 88, 89, and 90) 45-1

45.1 Summary 45-1
45.2 Site Description and Operational History 45-2
45.2.1 Site Description 45-2
45.2.2 Operational History 45-2
45.3 Land Use 45-2
45.3.1 Current 45-2
45.3.2 Future/Proposed 45-2
45.4 Investigative Activities 45-3
45.4.1 Summary 45-3
45.4.2 Investigation #1: Remedial Investigation (RI) for 18 IRP/SWMUs 45-3
45.4.2.1 Non-Sampling Data Collection 45-3
45.4.2.2 Sampling Data Collection 45-3
45.4.2.3 Data Gaps 45-4
45.4.2.4 Results and Conclusions 45-4
45.4.3 Investigation #2: Baseline Risk Assessment (BRA) for 18 IRP/SWMUs 45-4
45.4.3.1 Non-Sampling Data Collection 45-4
45.4.3.2 Sampling Data Collection 45-4
45.4.3.3 Data Gaps 45-5
45.4.3.4 Results and Conclusions 45-5
45.4.4 Investigation #3: RCRA Facility Investigation (RFI), Appendix I SWMUs 86-90 (IRP Site SD-11) – Phase III 45-6
45.4.4.1 Non-Sampling Data Collection 45-6
45.4.4.2 Sampling Data Collection 45-6
45.4.4.3 Data Gaps 45-6
45.4.4.4 Results and Conclusions 45-6
45.4.5 Investigation #4: Corrective Measures Study (CMS) at SD-11 45-7
45.4.5.1 Non-Sampling Data Collection 45-7
45.4.5.2 Sampling Data Collection 45-7
45.4.5.3 Data Gaps 45-7
45.4.5.4 Results and Conclusions 45-8
45.5 Site Conceptual Model 45-8
45.5.1 Nature and Extent of Contamination 45-8
45.5.2 Environmental Fate 45-8
45.6 Site Assessments 45-9
45.6.1 Summary 45-9
45.6.2 Screening Assessments 45-9

45.6.2.1 Human Health 45-9
45.6.2.2 Ecological 45-9
45.6.3 Risk Assessments 45-9
45.6.3.1 Human Health 45-9
45.6.3.2 Ecological 45-10
45.6.4 Other Applicable Assessments 45-10
45.6.4.1 Surface Water 45-10
45.6.4.2 Groundwater 45-10
45.6.4.3 Underground Storage Tanks (USTs) 45-10
45.6.4.4 Other 45-11
45.7 No Further Action Proposal 45-11
45.7.1 Rationale 45-11
45.7.2 Criterion 45-11

Section 46 SWMU 91, Recovered Fuel Tank No. 5114 46-1

46.1 Summary 46-1
46.2 Site Description and Operational History 46-1
46.2.1 Site Description 46-1
46.2.2 Operational History 46-1
46.3 Land Use 46-1
46.3.1 Current 46-1
46.3.2 Future/Proposed 46-1
46.4 Investigative Activities 46-1
46.5 Site Conceptual Model 46-1
46.6 Site Assessments 46-2
46.6.1 Screening Assessments 46-2
46.6.2 Risk Assessments 46-2
46.6.3 Other Applicable Assessments 46-2
46.6.3.1 Surface Water 46-2
46.6.3.2 Groundwater 46-2
46.6.3.3 Underground Storage Tanks (USTs) 46-2
46.6.3.4 Other 46-2
46.7 No Further Action Proposal 46-2
46.7.1 Rationale 46-2
46.7.2 Criterion 46-2

Section 47 SWMU 93, Oil/Water Separator No. 5121 47-1

47.1 Summary 47-1
47.2 Site Description and Operational History 47-1
47.2.1 Site Description 47-1

47.2.2 Operational History 47-1
47.3 Land Use 47-1
47.3.1 Current 47-1
47.3.2 Future/Proposed 47-2
47.4 Investigative Activities 47-2
47.4.1 Summary 47-2
47.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 47-2
47.4.2.1 Non-Sampling Data Collection 47-2
47.4.2.2 Sampling Data Collection 47-2
47.4.2.3 Data Gaps 47-2
47.4.2.4 Results and Conclusions 47-3
47.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 47-3
47.4.3.1 Non-Sampling Data Collection 47-3
47.4.3.2 Sampling Data Collection 47-3
47.4.3.3 Data Gaps 47-3
47.4.3.4 Results and Conclusions 47-3
47.4.4 Investigation #3: RFI, Appendix III SWMUs – Phase II 47-4
47.4.4.1 Non-Sampling Data Collection 47-4
47.4.4.2 Sampling Data Collection 47-4
47.4.4.3 Data Gaps 47-4
47.4.4.4 Results and Conclusions 47-4
47.5 Site Conceptual Model 47-5
47.5.1 Nature and Extent of Contamination 47-5
47.5.2 Environmental Fate 47-5
47.6 Site Assessments 47-6
47.6.1 Summary 47-6
47.6.2 Screening Assessments 47-6
47.6.2.1 Human Health 47-6
47.6.2.2 Ecological 47-6
47.6.3 Risk Assessments 47-7
47.6.3.1 Human Health 47-7
47.6.3.2 Ecological 47-7
47.6.4 Other Applicable Assessments 47-7
47.6.4.1 Surface Water 47-7
47.6.4.2 Groundwater 47-7
47.6.4.3 Underground Storage Tanks (USTs) 47-7
47.6.4.4 Other 47-7
47.7 No Further Action Proposal 47-8
47.7.1 Rationale 47-8

47.7.2 Criterion 47-8

Section 49 SWMU 96, Old Entomology Rinse Area 49-1

49.1 Summary 49-1
49.2 Site Description and Operational History 49-1
49.2.1 Site Description 49-1
49.2.2 Operational History 49-2
49.3 Land Use 49-2
49.3.1 Current 49-2
49.3.2 Future/Proposed 49-2
49.4 Investigative Activities 49-2
49.4.1 Summary 49-2
49.4.2 Investigation #1: Installation Restoration Program Phase II – Confirmation/Quantification, Stage 1 for the Old Entomology Rinse Area (SWMU 96) 49-3
49.4.2.1 Non-Sampling Data Collection 49-3
49.4.2.2 Sampling Data Collection 49-3
49.4.2.3 Data Gaps 49-3
49.4.2.4 Results and Conclusions 49-3
49.4.3 Investigation #2: Installation Restoration Program Phase IV-A, Site 17, Environmental Assessment for the Old Entomology Rinse Area (SWMU 96) 49-4
49.4.3.1 Non-Sampling Data Collection 49-4
49.4.3.2 Sampling Data Collection 49-4
49.4.3.3 Data Gaps 49-4
49.4.3.4 Results and Conclusions 49-4
49.4.4 Investigation #3: Remedial Investigation Report for the 18 IRP/SWMUs, the Old Entomology Rinse Area (SWMU 96) 49-5
49.4.4.1 Non-Sampling Data Collection 49-5
49.4.4.2 Sampling Data Collection 49-5
49.4.4.3 Data Gaps 49-5
49.4.4.4 Results and Conclusions 49-5
49.4.5 Investigation #4: Baseline Risk Assessment for the Old Entomology Rinse Area (SWMU 96) 49-6
49.4.5.1 Non-Sampling Data Collection 49-6
49.4.5.2 Sampling Data Collection 49-6
49.4.5.3 Data Gaps 49-6
49.4.5.4 Results and Conclusions 49-6
49.4.6 Investigation #5: RCRA Facility Investigation Activities Phase II to Appendix I Solid Waste Management Units

Supplemental RFI Report, the Old Entomology Rinse Area (SWMU 96) 49-7
49.4.6.1 Non-Sampling Data Collection 49-7
49.4.6.2 Sampling Data Collection 49-7
49.4.6.3 Data Gaps 49-7
49.4.6.4 Results and Conclusions 49-7
49.5 Site Conceptual Model 49-8
49.5.1 Nature and Extent of Contamination 49-8
49.5.2 Environmental Fate 49-8
49.6 Site Assessments 49-9
49.6.1 Summary 49-9
49.6.2 Screening Assessments 49-9
49.6.2.1 Human Health 49-9
49.6.2.2 Ecological 49-9
49.6.3 Risk Assessments 49-10
49.6.3.1 Human Health 49-10
49.6.3.2 Ecological 49-10
49.6.4 Other Applicable Assessments 49-10
49.6.4.1 Surface Water 49-10
49.6.4.2 Groundwater 49-10
49.6.4.3 Underground Storage Tanks (USTs) 49-10
49.6.4.4 Other 49-11
49.7 No Further Action Proposal 49-11
49.7.1 Rationale 49-11
49.7.2 Criterion 49-11

Section 50 SWMU 98, Sanitary Sewer Line 50-1

50.1 Summary 50-1
50.2 Site Description and Operational History 50-1
50.2.1 Site Description 50-1
50.2.2 Operational History 50-1
50.3 Land Use 50-2
50.3.1 Current 50-2
50.3.2 Future/Proposed 50-2
50.4 Investigative Activities 50-2
50.4.1 Summary 50-2
50.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU sites 50-2
50.4.2.1 Non-Sampling Data Collection 50-2
50.4.2.2 Sampling Data Collection 50-2
50.4.2.3 Data Gaps 50-3

50.4.2.4 Results and Conclusions 50-3
50.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU sites 50-3
50.4.3.1 Non-Sampling Data Collection 50-3
50.4.3.2 Sampling Data Collection 50-3
50.4.3.3 Data Gaps 50-3
50.4.3.4 Results and Conclusions 50-3
50.5 Site Conceptual Model 50-4
50.5.1 Nature and Extent of Contamination 50-4
50.5.2 Environmental Fate 50-4
50.6 Site Assessments 50-5
50.6.1 Summary 50-5
50.6.2 Screening Assessments 50-5
50.6.2.1 Human Health 50-5
50.6.2.2 Ecological 50-5
50.6.3 Risk Assessments 50-5
50.6.3.1 Human Health 50-5
50.6.3.2 Ecological 50-6
50.6.4 Other Applicable Assessments 50-6
50.6.4.1 Surface Water 50-6
50.6.4.2 Groundwater 50-6
50.6.4.3 Underground Storage Tanks (USTs) 50-6
50.6.4.4 Other 50-6
50.7 No Further Action Proposal 50-6
50.7.1 Rationale 50-6
50.7.2 Criterion 50-6

Section 51 SWMU 104, Landfill No. 4 51-1

51.1 Summary 51-1
51.2 Site Description and Operational History 51-1
51.2.1 Site Description 51-1
51.2.2 Operational History 51-1
51.3 Land Use 51-2
51.3.1 Current 51-2
51.3.2 Future/Proposed 51-2
51.4 Investigative Activities 51-2
51.4.1 Summary 51-2
51.4.2 Investigation #1: RCRA Facility Investigation Report for Landfill No. 4 (SWMU 104) 51-2
51.4.2.1 Non-Sampling Data Collection 51-2
51.4.2.2 Sampling Data Collection 51-3

51.4.2.3 Data Gaps 51-3
51.4.2.4 Results and Conclusions 51-3
51.4.3 Investigation #2: Phase II RCRA Facility Investigation Report for Landfill No. 4 (SWMU 104) 51-4
51.4.3.1 Non-Sampling Data Collection 51-4
51.4.3.2 Sampling Data Collection 51-4
51.4.3.3 Data Gaps 51-4
51.4.3.4 Results and Conclusions 51-4
51.5 Site Conceptual Model 51-5
51.5.1 Nature and Extent of Contamination 51-5
51.5.2 Environmental Fate 51-5
51.6 Site Assessments 51-6
51.6.1 Summary 51-6
51.6.2 Screening Assessments 51-6
51.6.2.1 Human Health 51-6
51.6.2.2 Ecological 51-7
51.6.3 Risk Assessments 51-7
51.6.3.1 Human Health 51-7
51.6.3.2 Ecological 51-8
51.6.4 Other Applicable Assessments 51-8
51.6.4.1 Surface Water 51-8
51.6.4.2 Groundwater 51-8
51.6.4.3 Underground Storage Tanks (USTs) 51-9
51.6.4.4 Other 51-9
51.7 No Further Action Proposal 51-9
51.7.1 Rationale 51-9
51.7.2 Criterion 51-9

Section 52 SWMU 105, Landfill No. 3 52-1

52.1 Summary 52-1
52.2 Site Description and Operational History 52-1
52.2.1 Site Description 52-1
52.2.2 Operational History 52-1
52.3 Land Use 52-2
52.3.1 Current 52-2
52.3.2 Future/Proposed 52-2
52.4 Investigative Activities 52-2
52.4.1 Summary 52-2
52.4.2 Investigation #1: RCRA Facility Investigation Report for Landfill No. 3 (SWMU 105) 52-2
52.4.2.1 Non-Sampling Data Collection 52-2

52.4.2.2 Sampling Data Collection 52-3
52.4.2.3 Data Gaps 52-3
52.4.2.4 Results and Conclusions 52-3
52.4.3 Investigation #2: Phase II RCRA Facility Investigation Report for Landfill No. 3 (SWMU 105) 52-4
52.4.3.1 Non-Sampling Data Collection 52-4
52.4.3.2 Sampling Data Collection 52-4
52.4.3.3 Data Gaps 52-4
52.4.3.4 Results and Conclusions 52-4
52.5 Site Conceptual Model 52-5
52.5.1 Nature and Extent of Contamination 52-5
52.5.2 Environmental Fate 52-5
52.6 Site Assessments 52-6
52.6.1 Summary 52-6
52.6.2 Screening Assessments 52-6
52.6.2.1 Human Health 52-6
52.6.2.2 Ecological 52-6
52.6.3 Risk Assessments 52-7
52.6.3.1 Human Health 52-7
52.6.3.2 Ecological 52-7
52.6.4 Other Applicable Assessments 52-8
52.6.4.1 Surface Water 52-8
52.6.4.2 Groundwater 52-8
52.6.4.3 Underground Storage Tanks (USTs) 52-8
52.6.4.4 Other 52-8
52.7 No Further Action Proposal 52-8
52.7.1 Rationale 52-8
52.7.2 Criterion 52-8

Section 53 SWMU 106, Fire Department Training Area No. 2 53-1

53.1 Summary 53-1
53.2 Site Description and Operational History 53-1
53.2.1 Site Description 53-1
53.2.2 Operational History 53-1
53.3 Land Use 53-2
53.3.1 Current 53-2
53.3.2 Future/Proposed 53-2
53.4 Investigative Activities 53-2
53.4.1 Summary 53-2
53.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites 53-3

53.4.2.1 Non-Sampling Data Collection 53-3
53.4.2.2 Sampling Data Collection 53-3
53.4.2.3 Data Gaps 53-3
53.4.2.4 Results and Conclusions 53-3
53.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites 53-4
53.4.3.1 Non-Sampling Data Collection 53-4
53.4.3.2 Sampling Data Collection 53-4
53.4.3.3 Data Gaps 53-4
53.4.3.4 Results and Conclusions 53-4
53.5 Site Conceptual Model 53-5
53.5.1 Nature and Extent of Contamination 53-5
53.5.2 Environmental Fate 53-6
53.6 Site Assessments 53-6
53.6.1 Summary 53-6
53.6.2 Screening Assessments 53-6
53.6.2.1 Human Health 53-6
53.6.2.2 Ecological 53-6
53.6.3 Risk Assessments 53-7
53.6.3.1 Human Health 53-7
53.6.3.2 Ecological 53-7
53.6.4 Other Applicable Assessments 53-7
53.6.4.1 Surface Water 53-7
53.6.4.2 Groundwater 53-7
53.6.4.3 Underground Storage Tanks (USTs) 53-7
53.6.4.4 Other 53-8
53.7 No Further Action Proposal 53-8
53.7.1 Rationale 53-8
53.7.2 Criterion 53-8

Section 54 SWMU 107, Fire Department Training Area No. 3 54-1

54.1 Summary 54-1
54.2 Site Description and Operational History 54-1
54.2.1 Site Description 54-1
54.2.2 Operational History 54-2
54.3 Land Use 54-2
54.3.1 Current 54-2
54.3.2 Future/Proposed 54-2
54.4 Investigative Activities 54-2
54.4.1 Summary 54-2

54.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites 54-3
54.4.2.1 Non-Sampling Data Collection 54-3
54.4.2.2 Sampling Data Collection 54-3
54.4.2.3 Data Gaps 54-4
54.4.2.4 Results and Conclusions 54-4
54.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites 54-4
54.4.3.1 Non-Sampling Data Collection 54-4
54.4.3.2 Sampling Data Collection 54-4
54.4.3.3 Data Gaps 54-4
54.4.3.4 Results and Conclusions 54-5
54.5 Site Conceptual Model 54-6
54.5.1 Nature and Extent of Contamination 54-6
54.5.2 Environmental Fate 54-6
54.6 Site Assessments 54-6
54.6.1 Summary 54-6
54.6.2 Screening Assessments 54-7
54.6.2.1 Human Health 54-7
54.6.2.2 Ecological 54-7
54.6.3 Risk Assessments 54-7
54.6.3.1 Human Health 54-7
54.6.3.2 Ecological 54-7
54.6.4 Other Applicable Assessments 54-8
54.6.4.1 Surface Water 54-8
54.6.4.2 Groundwater 54-8
54.6.4.3 Underground Storage Tanks (USTs) 54-8
54.6.4.4 Other 54-8
54.7 No Further Action Proposal 54-8
54.7.1 Rationale 54-8
54.7.2 Criterion 54-8

Section 55 SWMU 124, Inactive Underground Storage Tank No. 1 55-1

55.1 Summary 55-1
55.2 Site Description and Operational History 55-1
55.2.1 Site Description 55-1
55.2.2 Operational History 55-1
55.3 Land Use 55-1
55.3.1 Current 55-1
55.3.2 Future/Proposed 55-1
55.4 Investigative Activities 55-1

55.5 Site Conceptual Model 55-1
55.6 Site Assessments 55-2
55.6.1 Screening Assessments 55-2
55.6.2 Risk Assessments 55-2
55.6.3 Other Applicable Assessments 55-2
55.6.3.1 Surface Water 55-2
55.6.3.2 Groundwater 55-2
55.6.3.3 Underground Storage Tanks (USTs) 55-2
55.6.3.4 Other 55-2
55.7 No Further Action Proposal 55-2
55.7.1 Rationale 55-2
55.7.2 Criterion 55-2

Section 56 SWMU 125, Inactive Underground Storage Tank No. 2 56-1

56.1 Summary 56-1
56.2 Site Description and Operational History 56-1
56.2.1 Site Description 56-1
56.2.2 Operational History 56-1
56.3 Land Use 56-1
56.3.1 Current 56-1
56.3.2 Future/Proposed 56-1
56.4 Investigative Activities 56-1
56.5 Site Conceptual Model 56-1
56.6 Site Assessments 56-2
56.6.1 Screening Assessments 56-2
56.6.2 Risk Assessments 56-2
56.6.3 Other Applicable Assessments 56-2
56.6.3.1 Surface Water 56-2
56.6.3.2 Groundwater 56-2
56.6.3.3 Underground Storage Tanks (USTs) 56-2
56.6.3.4 Other 56-2
56.7 No Further Action Proposal 56-2
56.7.1 Rationale 56-2
56.7.2 Criterion 56-2

Section 57 SWMU 126, Inactive Underground Storage Tank No. 3 57-1

57.1 Summary 57-1
57.2 Site Description and Operational History 57-1
57.2.1 Site Description 57-1
57.2.2 Operational History 57-1

57.3 Land Use 57-1
57.3.1 Current 57-1
57.3.2 Future/Proposed 57-1
57.4 Investigative Activities 57-1
57.5 Site Conceptual Model 57-2
57.6 Site Assessments 57-2
57.6.1 Screening Assessments 57-2
57.6.2 Risk Assessments 57-2
57.6.3 Other Applicable Assessments 57-2
57.6.3.1 Surface Water 57-2
57.6.3.2 Groundwater 57-2
57.6.3.3 Underground Storage Tanks (USTs) 57-2
57.6.3.4 Other 57-2
57.7 No Further Action Proposal 57-2
57.7.1 Rationale 57-2
57.7.2 Criterion 57-3

Section 58 SWMU 127, Sand Trap and Leach Field for Facility 4095 (#1) 58-1

58.1 Summary 58-1
58.2 Site Description and Operational History 58-1
58.2.1 Site Description 58-1
58.2.2 Operational History 58-1
58.3 Land Use 58-2
58.3.1 Current 58-2
58.3.2 Future/Proposed 58-2
58.4 Investigative Activities 58-2
58.4.1 Summary 58-2
58.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I 58-2
58.4.2.1 Non-Sampling Data Collection 58-2
58.4.2.2 Sampling Data Collection 58-2
58.4.2.3 Data Gaps 58-3
58.4.2.4 Results and Conclusions 58-3
58.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I 58-3
58.4.3.1 Non-Sampling Data Collection 58-3
58.4.3.2 Sampling Data Collection 58-4
58.4.3.3 Data Gaps 58-4
58.4.3.4 Results and Conclusions 58-4
58.4.4 Investigation #3: RFI, Appendix III SWMUs – Phase II 58-4
58.4.4.1 Non-Sampling Data Collection 58-4

58.4.4.2 Sampling Data Collection 58-4
58.4.4.3 Data Gaps 58-5
58.4.4.4 Results and Conclusions 58-5
58.4.5 Investigation #4: Corrective Measures Study (CMS) at SWMU 127 58-5
58.4.5.1 Non-Sampling Data Collection 58-5
58.4.5.2 Sampling Data Collection 58-6
58.4.5.3 Data Gaps 58-6
58.4.5.4 Results and Conclusions 58-6
58.5 Site Conceptual Model 58-6
58.5.1 Nature and Extent of Contamination 58-6
58.5.2 Environmental Fate 58-6
58.6 Site Assessments 58-7
58.6.1 Summary 58-7
58.6.2 Screening Assessments 58-7
58.6.2.1 Human Health 58-7
58.6.2.2 Ecological 58-7
58.6.3 Risk Assessments 58-7
58.6.3.1 Human Health 58-7
58.6.3.2 Ecological 58-8
58.6.4 Other Applicable Assessments 58-8
58.6.4.1 Surface Water 58-8
58.6.4.2 Groundwater 58-8
58.6.4.3 Underground Storage Tanks (USTs) 58-8
58.6.4.4 Other 58-8
58.7 No Further Action Proposal 58-8
58.7.1 Rationale 58-8
58.7.2 Criterion 58-9

Section 59 SWMU 128, Oil/Water Separator Near Tank 4095 (#2) and Leach Field 59-1

59.1 Summary 59-1
59.2 Site Description and Operational History 59-1
59.2.1 Site Description 59-1
59.2.2 Operational History 59-1
59.3 Land Use 59-1
59.3.1 Current 59-1
59.3.2 Future/Proposed 59-1
59.4 Investigative Activities 59-1
59.5 Site Conceptual Model 59-1
59.6 Site Assessments 59-1
59.6.1 Screening Assessments 59-2

59.6.2 Risk Assessments 59-2
59.6.3 Other Applicable Assessments 59-2
59.6.3.1 Surface Water 59-2
59.6.3.2 Groundwater 59-2
59.6.3.3 Underground Storage Tanks (USTs) 59-2
59.6.3.4 Other 59-2
59.7 No Further Action Proposal 59-2
59.7.1 Rationale 59-2
59.7.2 Criterion 59-2

Section 62 AOC C, Blown Capacitor Site 62-1

62.1 Summary 62-1
62.2 Site Description and Operational History 62-1
62.2.1 Site Description 62-1
62.2.2 Operational History 62-1
62.3 Land Use 62-1
62.3.1 Current 62-1
62.3.2 Future/Proposed 62-1
62.4 Investigative Activities 62-2
62.5 Site Conceptual Model 62-2
62.6 Site Assessments 62-2
62.6.1 Screening Assessments 62-2
62.6.2 Risk Assessments 62-2
62.6.3 Other Applicable Assessments 62-2
62.6.3.1 Surface Water 62-2
62.6.3.2 Groundwater 62-2
62.6.3.3 Underground Storage Tanks (USTs) 62-2
62.6.3.4 Other 62-2
62.7 No Further Action Proposal 62-3
62.7.1 Rationale 62-3
62.7.2 Criterion 62-3

Section 64 AOC F, Calibration Target Berm 64-1

64.1 Summary 64-1
64.2 Site Description and Operational History 64-1
64.2.1 Site Description 64-1
64.2.2 Operational History 64-1
64.3 Land Use 64-1
64.3.1 Current 64-1
64.3.2 Future/Proposed 64-1

64.4 Investigative Activities 64-2
64.4.1 Summary 64-2
64.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H 64-2
64.4.2.1 Non-Sampling Data Collection 64-2
64.4.2.2 Sampling Data Collection 64-2
64.4.2.3 Data Gaps 64-2
64.4.2.4 Results and Conclusions 64-2
64.5 Site Conceptual Model 64-3
64.5.1 Nature and Extent of Contamination 64-3
64.5.2 Environmental Fate 64-3
64.6 Site Assessments 64-3
64.6.1 Summary 64-3
64.6.2 Screening Assessments 64-4
64.6.2.1 Human Health 64-4
64.6.2.2 Ecological 64-4
64.6.3 Risk Assessments 64-4
64.6.3.1 Human Health 64-4
64.6.3.2 Ecological 64-4
64.6.4 Other Applicable Assessments 64-4
64.6.4.1 Surface Water 64-4
64.6.4.2 Groundwater 64-5
64.6.4.3 Underground Storage Tanks (USTs) 64-5
64.6.4.4 Other 64-5
64.7 No Further Action Proposal 64-5
64.7.1 Rationale 64-5
64.7.2 Criterion 64-5

Section 65 AOC G, Disturbed Area - North Housing Site 65-1

65.1 Summary 65-1
65.2 Site Description and Operational History 65-1
65.2.1 Site Description 65-1
65.2.2 Operational History 65-1
65.3 Land Use 65-1
65.3.1 Current 65-1
65.3.2 Future/Proposed 65-1
65.4 Investigative Activities 65-2
65.4.1 Summary 65-2
65.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H 65-2
65.4.2.1 Non-Sampling Data Collection 65-2

65.4.2.2 Sampling Data Collection 65-2
65.4.2.3 Data Gaps 65-2
65.4.2.4 Results and Conclusions 65-2
65.5 Site Conceptual Model 65-3
65.5.1 Nature and Extent of Contamination 65-3
65.5.2 Environmental Fate 65-3
65.6 Site Assessments 65-4
65.6.1 Summary 65-4
65.6.2 Screening Assessments 65-4
65.6.2.1 Human Health 65-4
65.6.2.2 Ecological 65-4
65.6.3 Risk Assessments 65-5
65.6.3.1 Human Health 65-5
65.6.3.2 Ecological 65-5
65.6.4 Other Applicable Assessments 65-5
65.6.4.1 Surface Water 65-5
65.6.4.2 Groundwater 65-5
65.6.4.3 Underground Storage Tanks (USTs) 65-5
65.6.4.4 Other 65-5
65.7 No Further Action Proposal 65-5
65.7.1 Rationale 65-5
65.7.2 Criterion 65-5

Section 66 AOC H, Disturbed Area - South Housing Site 66-1

66.1 Summary 66-1
66.2 Site Description and Operational History 66-1
66.2.1 Site Description 66-1
66.2.2 Operational History 66-1
66.3 Land Use 66-1
66.3.1 Current 66-1
66.3.2 Future/Proposed 66-2
66.4 Investigative Activities 66-2
66.4.1 Summary 66-2
66.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H 66-2
66.4.2.1 Non-Sampling Data Collection 66-2
66.4.2.2 Sampling Data Collection 66-2
66.4.2.3 Data Gaps 66-2
66.4.2.4 Results and Conclusions 66-2
66.5 Site Conceptual Model 66-3
66.5.1 Nature and Extent of Contamination 66-3

66.5.2 Environmental Fate 66-3
66.6 Site Assessments 66-4
66.6.1 Summary 66-4
66.6.2 Screening Assessments 66-4
66.6.2.1 Human Health 66-4
66.6.2.2 Ecological 66-4
66.6.3 Risk Assessments 66-5
66.6.3.1 Human Health 66-5
66.6.3.2 Ecological 66-5
66.6.4 Other Applicable Assessments 66-5
66.6.4.1 Surface Water 66-5
66.6.4.2 Groundwater 66-5
66.6.4.3 Underground Storage Tanks (USTs) 66-5
66.6.4.4 Other 66-5
66.7 NFA Proposal 66-5
66.7.1 Rationale 66-5
66.7.2 Criterion 66-6

Section 67 AOC 36, Building #214 Parking Lot 67-1

67.1 Summary 67-1
67.2 Site Description and Operational History 67-1
67.2.1 Site Description 67-1
67.2.2 Operational History 67-1
67.3 Land Use 67-1
67.3.1 Current 67-1
67.3.2 Future/Proposed 67-1
67.4 Investigative Activities 67-1
67.5 Site Conceptual Model 67-2
67.6 Site Assessments 67-2
67.6.1 Screening Assessments 67-2
67.6.2 Risk Assessments 67-2
67.6.3 Other Applicable Assessments 67-2
67.6.3.1 Surface Water 67-2
67.6.3.2 Groundwater 67-2
67.6.3.3 Underground Storage Tanks (USTs) 67-2
67.6.3.4 Other 67-2
67.7 No Further Action Proposal 67-3
67.7.1 Rationale 67-3
67.7.2 Criterion 67-3

List of Figures

Figure 45-1	SWMUs 86-90 (SD-11)
Figure 45-3	SWMUs 86-90 (SD-11)
Figure 45-4	SWMUs 86-90 (SD-11)
Figure 47-1	SWMU 93
Figure 48-1	SWMU 95
Figure 49-1	SWMU 96
Figure 50-1a	SWMU 98
Figure 50-1b	SWMU 98
Figure 50-1c	SWMU 98
Figure 50-1d	SWMU 98
Figure 51-1	SWMU 104
Figure 52-1	SWMU 105
Figure 53-1	SWMU 106
Figure 54-1	SWMU 107
Figure 58-1	SWMU 127
Figure 63-1	AOC E
Figure 64-1	AOC F
Figure 65-1	AOC G
Figure 66-1	AOC H

Vol. 3 - TABLE OF CONTENTS

List of Tables

Table 45-1a	Acetone and Toluene Concentrations in Soil Samples, SD-11 (SWMUs 86-90)
Table 45-1b	Heavy Metal Concentrations in Soil Samples, SD-11 (SWMUs 86-90)
Table 45-2a	Selection of COCs, SD-11 (SWMUs 86-90)
Table 45-2b	Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB - Soil and Groundwater, SD-11 (SWMUs 86-90)
Table 45-3a	Summary of Chemicals Detected in the Soil Samples, SD-11 (SWMUs 86-90)
Table 45-3b	Comparison of Maximum Soil Concentrations to RBCs for Residential Soil, SD-11 (SWMUs 86-90)
Table 45-4a	Summary of Chemicals Detected in Surface Soils, SD-11 (SWMUs 86-90)
Table 45-4b	Summary of Chemicals Detected in Subsurface Soils, SD-11 (SWMUs 86-90)
Table 45-4c	Comparison of Maximum Soil Concentrations to MSSLs, SD-11 (SWMUs 86-90)
Table 47-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 93
Table 47-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 93
Table 47-2a	Comparison of Detected Concentrations with RBCs, SWMU 93
Table 47-2b	Summary of Human Health Risks, SWMU 93
Table 47-3a	Summary of Compounds Detected in Phase II Soil Samples, SWMU 93
Table 47-3b	Comparison of Phase II Soil Concentrations to Phase I Concentrations and RBCs, SWMU 93
Table 48-1a	Organic Compound Concentrations[1] in Soil Samples Collected by Walk, Haydel, SWMU 95
Table 48-1b	Selenium and Barium Concentrations[1] in Soil Samples Collected by Walk, Haydel, SWMU 95
Table 48-2a	TPH, VOC and SVOC Concentrations in Soil Samples Collected by Woodward-Clyde, SWMU 95
Table 48-2b	Metal Concentrations[1] in Soil Samples Collected by Woodward-Clyde, SWMU 95
Table 48-3a	Selection of COCs, SWMU 95
Table 48-3b	Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens, SWMU 95
Table 48-3b	Proposed Corrective Action Levels and RFI Criteria for Carcinogens, SWMU 95

List of Tables, cont.

Table 49-1	Pesticide Concentrations in Soil Samples Collected by Radian in 1985 and by Walk, Haydel & Associates in 1986, SWMU 96
Table 49-3a	Pesticide/PCB Concentrations in Surface Soil Sample, SWMU 96
Table 49-3b	Metal Concentrations in the Groundwater Sample, SWMU 96
Table 49-4a	Concentrations of Organics Detected in Soil Samples Collected from Boring 0962, SWMU 96
Table 49-4b	Concentrations of Metals Detected in Soil Samples Collected from Boring 0962, SWMU 96
Table 50-1	Metal Concentrations in Soil Samples, SWMU 98
Table 50-2a	Selection of COCs, SWMU 98
Table 50-2b	Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB - Soil and Groundwater, SWMU 98
Table 51-1a	Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples, SWMU 104
Table 51-1b	Samples Reanalyzed for Antimony and Thallium, SWMU 104
Table 51-1c	Organochlorine Pesticides and PCBs Found in Soil Samples, SWMU 104
Table 51-1d	VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples, SWMU 104
Table 51-2a	Summary of Compounds Detected in Groundwater Samples, SWMU 104
Table 51-2b	Comparison of Compounds Detected in Groundwater Samples to MCLs, SWMU 104
Table 52-1a	Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples, SWMU 105
Table 52-1b	Organochlorine Pesticides and PCBs Found in Soil Samples, SWMU 105
Table 52-1c	TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples, SWMU 105
Table 52-2a	Summary of Compounds Detected in Groundwater Sample, SWMU 105
Table 52-2b	Comparison of Compounds Detected in Groundwater Samples to MCLs, SWMU 105
Table 53-1a	Analytical Results of Soil Samples Collected by Radian, SWMU 106
Table 53-1b	Chromium and Lead Concentrations in Soil Samples, SWMU 106
Table 53-1c	TPH Concentrations in Soil Samples, SWMU 106
Table 53-2a	Selection of COCs, SWMU 106
Table 53-2b	Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater,

List of Tables, cont.

Table 53-2b	Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater, SWMU 106
Table 54-1a	Analytical Results of Soil Samples Collected by Radian, SWMU 107
Table 54-1b	TPH and BTEX Concentrations in Soil Samples, SWMU 107
Table 54-1c	Chromium and Lead Concentrations in Soil Samples, SWMU 107
Table 54-2a	Selection of COCs, SWMU 107
Table 54-2b	Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater, SWMU 107
Table 58-1a	Summary of Chemicals Reported for Near-Surface Soil Samples, SWMU 127
Table 58-1b	Summary of Chemicals Reported for Subsurface Soil Samples, SWMU 127
Table 58-2a	Comparison of Maximum Detected Concentration with RBCs, SWMU 127
Table 58-2b	Risk Characterization Summary, SWMU 127
Table 58-3a	Summary of Compounds Detected in Phase II Soil Samples, SWMU 127
Table 58-3b	Summary of Compounds Detected in Phase II Soil Samples, SWMU 127
Table 58-3c	Summary of Compounds Detected in Phase II Soil Samples, SWMU 127
Table 58-3d	Summary of Compounds Detected in Phase II Soil Samples, SWMU 127
Table 58-4a	Comparison of Maximum Soil Concentrations to MSSLs, SWMU 127
Table 58-4b	Model-Predicted Concentrations, SWMU 127
Table 63-1a	Detected Compounds in Surface Soils, AOC E
Table 63-1b	Detected Compounds in Subsurface Soils, AOC E
Table 63-1c	Comparison of Maximum Surface Soil Concentrations to MSSLs, AOC E
Table 63-1d	Comparison of Maximum Subsurface Soil Concentrations to MSSLs, AOC E
Table 64-1a	Detected Compounds in Surface Soils, AOC F
Table 64-1b	Detected Compounds in Subsurface Soils, AOC F
Table 64-1c	Comparison of Maximum Surface Soil Concentrations to MSSLs, AOC F
Table 64-1d	Comparison of Maximum Subsurface Soil Concentrations to MSSLs, AOC F

List of Tables, cont.

Table 65-1a	Detected Compounds in Surface Soils, AOC G
Table 65-1b	Detected Compounds in Subsurface Soils, AOC G
Table 65-1c	Comparison of Maximum Surface Soil Concentrations to MSSLs, AOC G
Table 65-1d	Comparison of Maximum Subsurface Soil Concentrations to MSSLs, AOC G
Table 66-1a	Detected Compounds in Surface Soils, AOC H
Table 66-1b	Detected Compounds in Subsurface Soils, AOC H
Table 66-1c	Comparison of Maximum Surface Soil Concentrations to MSSLs, AOC H
Table 66-1d	Comparison of Maximum Subsurface Soil Concentrations to MSSLs, AOC H

Vol. 3 - TABLE OF CONTENTS

List of Appendixes

Appendix A	Figures
Appendix B	Tables
Appendix C	References

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
ACM	Asbestos-containing material
AFB	Air Force Base
AOC	Area of Concern
AST	Aboveground Storage Tank
BRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CRQL	Contract Required Quantitation Limit
DPDO	Defense Property Disposal Office
DRO	Diesel-Range Organics
EP	Extraction Procedure
GC	Gas Chromatograph
GIS	Geographical Information System
GRO	Gasoline-Range Organics
HELP	Hydrologic Evaluation of Landfill Performance (Model)
HI	Hazard Index
IRP	Installation Restoration Program
JP-4	Jet Propellant
MCL	Maximum Contaminant Level
MCPP	2-(2-methyl-4-chlorophenoxy) propionic acid
mgd	million gallons per day
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MOGAS	Motor Gasoline
MSSL	Media-Specific Screening Level

MULTIMED	Multimedia Exposure Assessment Model
NFA	No Further Action
NMED	New Mexico Environment Department
OVA	Organic Vapor Analyzer
OWS	Oil/Water Separator
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PLM	Polarized light microscopy
POL	Petroleum, Oil, and Lubricants
ppb	parts per billion
ppm	parts per million
ppm/v	parts per million on a volume to volume basis
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
RBC	Risk-Based Concentration
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RL	Reporting Limit
RME	Reasonable Maximum Exposure
SI	Site Inspection
SSTL	Site-Specific Target Level
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCO	Total Chromatographable Organics
TIC	Tentatively Identified Compound

TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
VOC	Volatile Organic Compound
W-C	Woodward-Clyde
WWTP	Wastewater Treatment Plant

45.1 SUMMARY

IRP Site SD-11 consists of five related SWMUs. These five SWMUs are SWMU 86 - Engine Test Cell, SWMU 87 - Former Overflow Pit, SWMU 88 - Former Leaching Pond, SWMU 89 - Evaporation Pond, and SWMU 90 - OWS No. 5114. SWMUs 86-90 have been listed as Appendix I sites.

A Phase I IRP Records Search(CH2M Hill 1983) evaluated the existence of and potential for contamination in the area of SD-11, and recommended sampling potable Production Well No. 9.

A Phase II IRP investigation (Radian 1986) included the installation and sampling of two borings, one in the leach field and the other near the overflow pit. Although the analytical results detected no contaminants in either boring, an additional investigation was recommended based on the limited scope of the Phase II.

A Preliminary Review/Visual Site Inspection RFA (A.T. Kearney 1987) identified SD-11 as a potential SWMU and indicated a high potential for contaminant releases. Based on this, further action (including soil sampling) was recommended to determine if any releases had occurred in this area.

An RI (Walk, Haydel 1990) included the installation and sampling of five borings in the area of SD-11. The analytical results detected low levels of two organic compounds and one metal (which was subsequently dismissed as naturally occurring) in the soil samples.

A subsequent RI for 18 IRP/SWMUs at Cannon AFB (W-C 1992) included the drilling and sampling of six original borings in the area of SD-11. However, because of missed holding times, several of the borings had to be redrilled and resampled. Slightly elevated concentrations of several organic compounds and metals were detected during this investigation. This RI also included a BRA that concluded additional action was necessary at SD-11.

The OWS system and the petroleum-contaminated soil surrounding this system were removed in 1994 (RSI 1994). Based on sampling information, approximately 186 tons of excavated soil were transported off site for disposal. In addition, based on concerns about residual contamination in the remaining excavated soil, clean off-site soil was mixed in prior to backfilling the excavation.

A Phase III RFI (W-C 1997e) included drilling and sampling nine borings in the area of SD-11, and sampling groundwater from one Base production well. Low levels of organic compounds and metals were detected in the soil/backfill samples, and low levels of one organic and metals were detected in the groundwater sample.

Three additional soil borings were drilled and sampled during the CMS at SD-11 (W-C 1999). The analytical results detected low levels of organic compounds in the soil samples from SD-11. In addition, the CMS included a risk assessment and fate and transport modeling based on the field investigation results of the CMS and Phase III RFI. The CMS recommended the NFA alternative based on the results of the field investigations, the human health and ecological risk evaluations, and the fate and transport modeling.

Based on the conclusions reached in the CMS, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

45.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

45.2.1 Site Description

Site SD-11 (SWMUs 86-90) is located in the southeast portion of Cannon AFB, approximately 5,000 feet east and 2,000 feet south of the intersection of the two main runways (Figure 45-1 in Appendix A). The site consists of a former engine test cell (SWMU 86), a former overflow pit (SWMU 87), a former leach field (SWMU 88), which was later converted into an evaporation pond (SWMU 89), and an OWS with an associated 100-gallon collection tank (SWMU 90). The former test cell was enclosed by a 50-foot by 10-foot building. The building and an associated pump house have been removed, leaving a concrete slab. The OWS system has also been removed. Mainly asphalt, gravel, and weeds cover the area surrounding SD-11. At the time of the field investigation portion of the CMS, outdoor engine tests were still being conducted on the slab using portable equipment.

45.2.2 Operational History

The SWMUs that compose site SD-11 were active from approximately 1965 to 1988. The separate areas of the site all received potential contaminants from a single operation, the steam cleaning and testing of jet aircraft engines. The jet engines reportedly had water injected into the exhaust during testing to muffle the engine's noise. Initially, effluent produced at the site was discharged directly into an overflow pit (SWMU 87). Then, the OWS system (SWMU 90) and leach field (SWMU 88) were installed. Finally, the effluent from the OWS was routed to an evaporation pond (SWMU 89) that had been constructed in the area of the former leach field.

45.3 LAND USE

45.3.1 Current

The engine test cell building and an associated pump house have been removed, leaving a concrete slab. The OWS system has also been removed. At the time of the field investigation portion of the CMS, outdoor engine tests were still being conducted on the slab using portable equipment.

45.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the engine test cell building, an associated pump house, and the OWS system no longer exist. Use classification will continue to remain industrial in nature.

45.4 INVESTIGATIVE ACTIVITIES

45.4.1 Summary

A Phase I IRP Records Search evaluated the existence of and potential for contamination in the area of SD-11, and recommended sampling potable Production Well No. 9. A Phase II IRP investigation detected no contaminants in either boring, but an additional investigation was recommended based on the limited scope. A Preliminary Review/Visual Site Inspection RFA recommended further action, including soil sampling, to determine if any releases had occurred in this area. An RI detected low levels of two organic compounds and one metal (which was subsequently dismissed as naturally occurring) in the soil samples. A subsequent RI for 18 IRP/SWMUs detected slightly elevated concentrations of several organic compounds and metals and included a BRA. Based on the use of outdated analytical methods and a lack of significant findings, the Phase I IRP Records Search, the Phase II IRP investigation, the RFA, and the initial RI are not discussed in further detail below. However, the subsequent RI for 18 IRP/SWMUs is discussed as Investigation #1 in Section 45.4.2 and the BRA portion of this investigation is discussed as Investigation #2 in Section 45.4.3 below.

The OWS system and the petroleum-contaminated soil surrounding this system were removed in 1994. However, clean soil was mixed with excavated soil prior to backfilling the excavation due to concerns about residual contamination in the excavated soil that had not been sent for off-site disposal. Because the excavation activities were stopped before the extent of contamination was defined during the removal activities, this removal is not discussed in further detail below.

A Phase III RFI detected low levels of organic compounds in the soil/backfill samples, and low levels of metals in the groundwater sample. Three additional soil borings were drilled and sampled during the CMS, and low levels of organic compounds were detected. The Phase III RFI is discussed as Investigation #3 below. The CMS recommended the NFA alternative based on the results of the field investigations, the human health and ecological risk evaluations, and the fate and transport modeling. The CMS is discussed as Investigation #3 in Section 45.4.4 below.

45.4.2 Investigation #1: Remedial Investigation (RI) for 18 IRP/SWMUs

45.4.2.1 Non-Sampling Data Collection

The RI for 18 IRP/SWMUs included a BRA, performed using the results of the field investigation portion of the RI.

45.4.2.2 Sampling Data Collection

Five 10-foot borings were installed (boring locations are shown in Figure 45-1 in Appendix A) at locations near the engine test pad and the OWS during the RI for 18 IRP/SWMUs. Soil samples were collected from the 2-foot, 4-foot, and 8-foot depth intervals. A sixth boring was drilled near the location of the first boring, and samples were collected at 10, 13, 18, and 23 feet to characterize the vertical distribution of potential contaminants. Surface soil samples were also collected from the 0- to 0.5-foot depth interval of the first five borings.

Target analytes for all samples included TCL VOCs and TAL metals. Twenty-four soil samples were originally sent for chemical analyses.

Due to laboratory-missed holding times, four borings had to be redrilled to depths of 6 or 10 feet, depending on which holding times were missed. The redrilled borings were located 1 to 3 feet from the original locations. The eight additional subsurface samples were analyzed for TCL VOCs. Four additional surface soil samples were also collected and analyzed for TCL VOCs.

45.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI for 18 IRP/SWMUs. However, the RI concluded that the lateral extent of the contamination identified during this investigation had not been determined and required further action.

45.4.2.4 Results and Conclusions

Only two VOCs, acetone and toluene, were detected in the soil samples analyzed. However, other VOCs may have been present but were possibly masked by the elevated reporting limits associated with sample dilutions. The dilutions were necessitated by the presence of high concentrations of target analytes, particularly acetone. Elevated concentrations of ten metals (antimony, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, and zinc) were also detected in the samples analyzed. The analytical results from this investigation are shown in Tables 45-1a and 45-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The RI concluded that the lateral extent of the contamination identified during this investigation had not been determined, and SD-11 required further action.

45.4.3 Investigation #2: Baseline Risk Assessment (BRA) for 18 IRP/SWMUs

45.4.3.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors and all appropriate exposure pathways was performed on the data collected during the RI.

45.4.3.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #1 in Section 45.4.2 above.

45.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. However, the RI concluded that the lateral extent of the contamination identified during this investigation had not been determined, and SD-11 required further action.

45.4.3.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at the SD-11 SWMUs. Potential receptors at SD-11 for human health risks included workers on site for 1 to 2 hours per week and workers at buildings north of SD-11 for a maximum of 40 hours per week. Future workers performing intrusive actions and hypothetical future residents dwelling on the area of this SWMU were considered unlikely receptors because SD-11 is less than 0.5 acres in size (the minimum plot size judged to be reasonable for major excavation and future construction of residential homes). The major and complete exposure pathways for these workers included inhalation of volatiles and fugitive particulates, incidental soil ingestion, and absorption from dermal contact. For the purposes of the BRA, hazards and risks were combined across exposure pathways.

As shown in Table 45-2a in Appendix B, the COCs identified for SD-11 included VOCs and metals. As shown in Table 45-2b in Appendix B, the average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SD-11.

The total carcinogenic risk (i.e., the risk for all pathways combined) for average and RME exposures at SD-11 fell below the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} (EPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at SD-11.

The maximum concentration of lead detected within the SD-11 risk assessment area fell below the applicable USEPA interim guidance for soil lead cleanup levels at Superfund sites (USEPA 1991a). In addition, the estimated ambient air concentrations of lead at SD-11 fell below the USEPA background concentration of 0.200 $\mu g/mg^3$ (USEPA 1991b). Therefore, no unacceptable risk was expected due to the presence of lead at SD-11.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMUs covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, cadmium, chromium, cobalt, copper, lead, and zinc were the only COCs discussed in the ecological risk assessment that were also detected at SD-11. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC metals pose a risk to small mammalian populations.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from the SD-11 SWMUs. However, the RI concluded that the lateral extent of the contamination at SD-11 had not been determined and required further action.

45.4.4 Investigation #3: RCRA Facility Investigation (RFI), Appendix I SWMUs 86-90 (IRP Site SD-11) – Phase III

45.4.4.1 Non-Sampling Data Collection

The purpose of the Phase III RFI (W-C 1997e) was to further characterize the nature and extent of contamination in the area of SD-11. In addition, the Phase III RFI included a risk evaluation to further evaluate whether a significant release had occurred at any of the SD-11 SWMUs.

45.4.4.2 Sampling Data Collection

Nine soil borings were installed during the Phase III RFI (boring locations are shown in Figure 45-3 in Appendix A). Surface soil samples were collected from all borings, generally at the 0- to 2-foot depth interval. The borings were drilled and sampled to maximum depths ranging from 35 to 71 feet. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Based on the results of field screening immunoassays, soil samples were selected and analyzed for the following target analytes: VOCs, SVOCs, TAL metals, and TPH.

A groundwater sample was also collected from Production Well No. 9, located approximately 300 feet northwest of the former OWS, and analyzed for VOCs, SVOCs, herbicides, pesticides/PCBs, Appendix IX metals, and TPH.

45.4.4.3 Data Gaps

Sufficient data was collected during the Phase III RFI to further characterize the nature and extent of contamination and conduct a risk screening at these SWMUs. Other than chromium data from a single boring that was rejected, there were no sampling issues associated with the Phase III RFI that adversely affected data usability. (The chromium data was judged not to have impacted the project decisions because the levels of chromium detected in the other borings during this investigation were below the established background levels for Cannon AFB [W-C 1997a].) In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SD-11 and for completing the risk evaluation. Therefore, no data gaps existed.

45.4.4.4 Results and Conclusions

Low levels of several organic compounds were detected during the Phase III RFI, including toluene, xylenes, PAHs, and TPH. However, during the risk evaluation, only benzo(a)pyrene was detected at a concentration (0.27 mg/kg) that exceeded the corresponding USEPA Region III RBC for residential soil.

Although seven metals (aluminum, barium, chromium, cobalt, manganese, nickel, and zinc) were detected at potentially significant concentrations during the Phase III RFI, a comparison during the risk evaluation found that all concentrations were within established background levels (W-C 1997a).

An insignificant concentration of bromoform, at a level below the RBC, was the only organic compound detected in the groundwater sample. Four metals (arsenic, barium, copper, and vanadium) were also detected in the groundwater sample at insignificant concentrations, below the corresponding background levels (W-C 1997a) and/or RBCs. The analytical results from this investigation are shown in Tables 45-3a and 45-3b in Appendix B.

The Phase III RFI sampling results confirmed that contamination at SD-11 was mainly confined to surface and near-surface soils. In addition, the vertical distribution of site contaminants appears to be well defined, and potential impacts to site groundwater are considered low.

There were no unacceptable health risks associated with SD-11, and the Phase III RFI recommended that no further investigation was necessary for this SWMU.

45.4.5 Investigation #4: Corrective Measures Study (CMS) at SD-11

45.4.5.1 Non-Sampling Data Collection

Mathematical models were applied to a conceptual vadose zone model of SD-11 to evaluate the potential for contaminants detected in the soil above the USEPA Region VI MSSLs to be transported to underlying groundwater. The mathematical models used for the CMS included the HELP Model, Version 3.01 (Schroeder et al. 1994) and the MULTIMED Version 2.00 (Salhorta et al. 1995).

The CMS also included a human health and ecological risk assessment based on the results of the Phase III RFI and CMS field investigations.

45.4.5.2 Sampling Data Collection

Three soil borings were drilled and sampled to maximum depths of 40 feet in the area of SWMU 89, the evaporation pond, during the CMS (Figure 45-4 in Appendix A). Five soil samples, collected from the 0- to 1-foot, the 8- to 10-foot, the 18- to 20-foot, the 28- to 30-foot, and the 38- to 40-foot intervals from each boring, were analyzed for VOCs, SVOCs, TPH – DRO, and TRPH.

45.4.5.3 Data Gaps

The data collected during this investigation, in conjunction with data collected previously, was sufficient to perform human health and ecological risk evaluations and to evaluate the results of the vadose zone fate and transport modeling. Therefore, no data gaps existed.

45.4.5.4 Results and Conclusions

No VOCs and only two low-level concentrations of SVOCs were detected in the samples analyzed as part of the CMS. The analytical results from this investigation are shown in Tables 45-4a and 45-4b in Appendix B. As shown in Table 45-4c in Appendix B, these results were compared to the corresponding MSSLs.

Results of the human health and ecological risk evaluations indicated that there was minimal risk to human health and the environment based on the maximum detected concentrations of COCs in the soil at SD-11. In addition, results of the vadose zone fate and transport modeling showed, assuming sorption, dispersion and biodegradation occurred, that the COCs would not reach groundwater above the maximum allowable concentrations for drinking water. The risk evaluations, combined with the modeling, were used to determine that the NFA alternative would be protective of human health and the environment at the lowest cost.

45.5 SITE CONCEPTUAL MODEL

45.5.1 Nature and Extent of Contamination

The Phase III RFI sampling results confirmed that contamination at SD-11 was mainly confined to surface and near surface soils. In addition, the vertical distribution of site contaminants appears to be well defined and potential impacts to site groundwater are considered low.

45.5.2 Environmental Fate

Contaminants encountered at SD-11 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Organic compounds are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

Benzo(a)pyrene was used as the indicator chemical during the vadose zone contaminant fate and transport modeling at SD-11, since this was the only compound detected above the MSSLs (at a maximum concentration of 0.270 mg/kg). Based on the modeling results, the initial leachate concentration for benzo(a)pyrene was calculated to be 0.00066 mg/L. Multiplying this concentration by an attenuation factor of 3,700 yielded a predicted concentration at the bottom of the vadose zone of 1.8×10^{-7}. Even without accounting for the initial groundwater mixing, which would lower the results by an order of magnitude, the model-predicted value falls below the USEPA Region VI tap water MSSL of 9.2×10^{-6} and the MCL of 0.0002 mg/L for benzo(a)pyrene. Biodegradation would be expected to further reduce the concentration at the bottom of the vadose zone to 0.0.

45.6 SITE ASSESSMENTS

45.6.1 Summary

Neither the BRA nor the CMS found any reason to expect elevated levels of risk at SD-11.

45.6.2 Screening Assessments

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at the SD-11 SWMUs. The Phase III RFI included a risk evaluation to further evaluate whether a significant release had occurred at any of the SD-11 SWMUs.

45.6.2.1 Human Health

All validated VOCs that were detected and not dismissed as laboratory contaminants, and all validated metals detected in concentrations that exceeded the background levels (W-C 1997a), were considered COCs for the BRA.

COPCs, all detected organics that were not considered laboratory contaminants, and all detected metals that exceeded background levels (W-C 1997a) were compared to USEPA Region VI Residential MSSLs during the risk screening portion of the CMS. Based on the comparisons only one compound, benzo(a)pyrene, was considered a COC.

45.6.2.2 Ecological

Metals that exceeded the background levels (W-C 1997a), including cadmium, chromium, cobalt, lead, and zinc, were considered the only ecological COCs for the BRA.

Based on exceedance of background levels (W-C 1997a) and potential for biomagnification, aluminum, chromium, and vanadium were considered the only ecological COCs for the CMS.

45.6.3 Risk Assessments

The BRA portion of the RI included a human health and ecological risk assessment using the COCs for SD-11. The CMS also included a human health and ecological risk assessment based on the results of the Phase III RFI and CMS field investigations.

45.6.3.1 Human Health

The BRA portion of the RI found that the average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SD-11 based on the results of the BRA.

The BRA portion of the RI also found that the total carcinogenic risk (i.e., the risk for all pathways combined) for average and RME exposures at SD-11 fell below the USEPA's target

risk range of 1 x 10^{-4} to 1 x 10^{-6} for Superfund sites (USEPA 1989). This indicated that no unacceptable risk of carcinogenic effects was expected at SD-11 based on the results of the BRA.

The maximum concentration of lead detected within the SD-11 risk assessment area fell below the applicable USEPA interim guidance for soil lead cleanup levels at Superfund sites. In addition, the estimated ambient air concentrations of lead at SD-11 fell below the USEPA background concentration of 0.200 $\mu g/mg^3$. Therefore, no unacceptable risk was expected due to the presence of lead at SD-11 based on the results of the BRA.

After the COPCs had been compared to the corresponding MSSLs, an SSTL was calculated for the lone COC, benzo(a)pyrene, using the RBCA Tool Kit for Chemical Releases developed by Groundwater Services, Inc. (GSI 1999).

45.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the maximum metal concentrations detected at SD-11 during the RI, and based on the calculated toxicity values for incidental soil ingestion, none of the COC metals posed a significant risk to small mammalian populations or other biota.

Based on the conservative estimation of exposures and effects to biota, there appears to be only one issue regarding ecological risk within SD-11: direct soil ingestion of aluminum to omnivorous birds. However, the soil ingestion rates were intentionally overestimated and aversion to aluminum-tainted soil is probable, so the suggested risks are most likely insignificant.

45.6.4 Other Applicable Assessments

45.6.4.1 Surface Water

SD-11 contained no surface water.

45.6.4.2 Groundwater

The groundwater sample collected from Production Well No. 9 was found to contain an insignificant concentration of one VOC at a level below the RBC, and insignificant concentrations of four metals below the corresponding background levels (W-C 1997a) and/or RBCs.

45.6.4.3 Underground Storage Tanks (USTs)

OWS No. 5114 included a detached 100-gallon oil UST. This tank was removed along with the unit and associated leach field in 1994.

45.6.4.4 Other

No other assessments have been conducted in the area of SD-11.

45.7 NO FURTHER ACTION PROPOSAL

45.7.1 Rationale

Based on the conclusions reached in the Phase III RFI and the CMS, NFA has been recommended for SD-11.

45.7.2 Criterion

SD-11 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

46.1 SUMMARY

An RFA (A.T. Kearney 1987) misidentified the suspected SWMU 91 location as having an aboveground storage tank for fuel recovered from OWS No. 5114 (SWMU 86). The tank was actually a 5,000-gallon aboveground JP-4 bulk storage tank for Test Stand No. 5114. The tank was removed in 1988 when the test stand was demolished. Because the bulk storage tank was never used for the management of wastes, it was not a SWMU. Storage tanks are not included in the definition of a SWMU as defined in the following excerpt from the RFA Guidance: "The definition does not include . . . units in which wastes have not been managed (e.g., product storage areas)."

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

46.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

46.2.1 Site Description

Refer to summary in Section 46.1 above.

46.2.2 Operational History

Refer to summary in Section 46.1 above.

46.3 LAND USE

46.3.1 Current

Refer to summary in Section 46.1 above.

46.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the area misidentified as SWMU 91 was never used for the management of wastes. Use classification will continue to remain industrial in nature.

46.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 91 have been performed.

46.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 91 has never been the subject of a conceptual model.

46.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 91.

46.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 91.

46.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 91.

46.6.3 Other Applicable Assessments

46.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 91.

46.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 91 contained no means for groundwater discharges to occur.

46.6.3.3 Underground Storage Tanks (USTs)

The bulk, aboveground storage tank misidentified as SWMU 91 was removed in 1988 when the associated test stand was demolished.

46.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 91.

46.7 NO FURTHER ACTION PROPOSAL

46.7.1 Rationale

Because SWMU 91 was never used for the management of waste, NFA is recommended for SWMU 91.

46.7.2 Criterion

SWMU 91 is proposed for NFA based on NMED NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other CERCLA hazardous substances.

46.1 SUMMARY

An RFA (A.T. Kearney 1987) misidentified the suspected SWMU 91 location as having an aboveground storage tank for fuel recovered from OWS No. 5114 (SWMU 86). The tank was actually a 5,000-gallon aboveground JP-4 bulk storage tank for Test Stand No. 5114. The tank was removed in 1988 when the test stand was demolished. Because the bulk storage tank was never used for the management of wastes, it was not a SWMU. Storage tanks are not included in the definition of a SWMU as defined in the following excerpt from the RFA Guidance: "The definition does not include . . . units in which wastes have not been managed (e.g., product storage areas)."

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

46.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

46.2.1 Site Description

Refer to summary in Section 46.1 above.

46.2.2 Operational History

Refer to summary in Section 46.1 above.

46.3 LAND USE

46.3.1 Current

Refer to summary in Section 46.1 above.

46.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the area misidentified as SWMU 91 was never used for the management of wastes. Use classification will continue to remain industrial in nature.

46.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as SWMU 91 have been performed.

46.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 91 has never been the subject of a conceptual model.

46.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 91.

46.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 91.

46.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 91.

46.6.3 Other Applicable Assessments

46.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 91.

46.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 91 contained no means for groundwater discharges to occur.

46.6.3.3 Underground Storage Tanks (USTs)

The bulk, aboveground storage tank misidentified as SWMU 91 was removed in 1988 when the associated test stand was demolished.

46.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 91.

46.7 NO FURTHER ACTION PROPOSAL

46.7.1 Rationale

Because SWMU 91 was never used for the management of waste, NFA is recommended for SWMU 91.

46.7.2 Criterion

SWMU 91 is proposed for NFA based on NMED NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other CERCLA hazardous substances.

47.1 SUMMARY

SWMU 93, OWS No. 5121, has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) found elevated levels of four organic compounds and one metal in the area of SWMU 93. The Phase I RFI report recommended conducting a BRA at this site using available data.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases were expected at this SWMU. Based on this, the BRA recommended NFA for SWMU 93.

A Phase II RFI of the Appendix III sites (W-C 1997d) also found elevated levels of organic compounds and metals in the area of this SWMU. However, the report documenting this investigation noted that none of the concentrations of metals or organics exceeded the USEPA Region III RBCs for residential soil (USEPA 1994). The Phase II RFI report recommended no further investigation at this site.

The conclusions reached in the BRA and the Phase II RFI are consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

47.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

47.2.1 Site Description

This SWMU was formerly located beneath the hush house portion of Building 5123, a jet engine test facility. The OWS, which consisted of a two-compartment underground unit with a detached 100-gallon oil storage tank, had been located on the east side of former Power Check Pad No. 5121 (Figure 47-1 in Appendix A). The unit received waste wash water from aircraft engine testing and maintenance operations. Recovered oils were stored in the 100-gallon tank and the wastewaters were discharged to a leach field located approximately 40 feet to the east of the OWS.

47.2.2 Operational History

OWS No. 5121 was active from approximately 1957 to 1988. In 1988, the unit and the associated leach field were removed during the demolition of Building 5121. This building was then replaced with Building 5123, which was constructed atop the former location of OWS No. 5121.

47.3 LAND USE

47.3.1 Current

The OWS and the associated leach field no longer exist. Building 5123, which sits atop the former location of SWMU 93, is currently used for the testing of jet engines from fighter aircraft.

47.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, OWS No. 5121 and the associated leach field no longer exist. Use classification will continue to remain industrial in nature.

47.4 INVESTIGATIVE ACTIVITIES

47.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found elevated levels of four organic compounds and one metal in the area of SWMU 93. A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU. A Phase II RFI of the Appendix III sites (W-C 1997d) also found elevated levels of organic compounds and metals in the area of this SWMU, but none of the detected concentrations exceeded the corresponding RBCs.

47.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

47.4.2.1 Non-Sampling Data Collection

The Phase I RFI was purely a field investigation and data collection effort. However, a BRA, performed using the results of the Phase I RFI, is discussed as Investigation #2 in Section 47.4.3 below.

47.4.2.2 Sampling Data Collection

Three 60-foot borings were installed at locations as close as possible to the OWS and the leach field during the Phase I RFI (boring locations are shown in Figure 47-1 in Appendix A). Soil samples were collected from the 1.5- to 3.5-foot, 4- to 6-foot, 8- to 10-foot, 18- to 20-foot, 28- to 30-foot, 38- to 40-foot, 48- to 50-foot, and 58- to 60-foot depth intervals to characterize the vertical distribution of potential contaminants.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Surficial samples were collected from the 0.2- to 0.5-foot depth interval to provide surface soil data for risk assessment purposes. Twenty-seven soil samples were sent for chemical analyses.

47.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

47.4.2.4 Results and Conclusions

Four organic compounds (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) and one metal (barium) were found at levels exceeding the corresponding RBCs. The highest concentrations of organics were detected in near-surface samples. The highest concentration of barium was detected at 28 feet. The vertical extent of contamination was characterized by the soil borings. The analytical results from this investigation are shown in Tables 47-1a and 47-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 93.

47.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

47.4.3.1 Non-Sampling Data Collection

No additional data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the Phase I RFI.

47.4.3.2 Sampling Data Collection

No data was collected during the BRA.

47.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

47.4.3.4 Results and Conclusions

Potential receptors at SWMU 93 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to be exposed to soil via ingestion, dermal contact, and inhalation pathways. The maximum potential excess human risk at SWMU 93 was 2×10^{-7} for occupational workers. The primary contributor to the risk was ingestion of PAHs in surface soils. This level fell below the USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, thus indicating that no unacceptable risk was expected. The concentrations of COCs identified during the BRA are shown in Table 47-2a and 47-2b in Appendix B. A summary of human health risks at SWMU 93 are shown in Table 47-2c in Appendix B.

Results of the ecological risk assessment showed that there is a low potential for risk to predatory birds (i.e., the Northern Harrier) from SWMU-related chemicals. However, this risk is most likely insignificant because the SWMU 93 area represents only a very small percentage of the birds' hunting range.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended at this SWMU.

47.4.4 Investigation #3: RFI, Appendix III SWMUs – Phase II

47.4.4.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to further characterize the nature and extent of contamination in the area of SWMU 93. In addition, the Phase II included a risk screening to verify whether the recommendation for NFA based on the BRA was appropriate for SWMU 93.

47.4.4.2 Sampling Data Collection

Three soil borings were installed during the Phase II RFI (boring locations are shown in Figure 47-1 in Appendix A). One boring was drilled near the northwest corner of Building 5123, the second boring was drilled near the southeast corner of Building 5123, and the third boring was drilled immediately south of Building 5123. Each boring was drilled and sampled to a maximum depth of 10 feet. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples from all borings were collected from 0 to 2 feet. All three borings were also sampled at intervals of 3 to 5 and 8 to 10 feet. Nine soil samples were analyzed for the following target analytes: VOCs, SVOCs, total TAL metals, and TRPH.

47.4.4.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and conduct a risk screening at this SWMU. There were no sampling issues associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SWMU 93, and for completing the human health risk screening. Therefore, no data gaps existed.

47.4.4.4 Results and Conclusions

Three organic compounds and two metals detected during the Phase II RFI exceeded the levels detected during the Phase I RFI. However, none of the organics or metals exceeded the corresponding RBCs. The analytical results from this investigation are shown in Tables 47-3a and 47-3b in Appendix B.

The Phase II sampling results confirmed that contamination at SWMU 93 was mainly confined to surface and near surface soils. In addition, the vertical distribution of site contaminants appears to be well defined, and potential impacts to site groundwater are considered low.

Because there were no unacceptable health risks associated with SWMU 93, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

47.5 SITE CONCEPTUAL MODEL

47.5.1 Nature and Extent of Contamination

The Phase I and Phase II RFIs conducted at SWMU 93 found organic compounds and metals at levels of potential concern. Six borings (three to a depth of 10 feet and three to a depth of 60 feet) were installed during the two phases of investigation to effectively delineate and characterize the horizontal vertical extents of contamination. The highest concentrations of organics were detected in near-surface samples. The highest concentration of barium was detected at the 28-foot depth interval.

Groundwater at SWMU 93 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

47.5.2 Environmental Fate

Contaminants encountered at OWS No. 5121 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 93, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time. The potential for metals to precipitate in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the IRP Phase II, the RFI, and the Phase II RFI.

VOCs are likely to be relatively to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

47.6 SITE ASSESSMENTS

47.6.1 Summary

A BRA was conducted based on the results of the Phase I RFI for SWMU 93. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 93.

The Phase II RFI also included a risk screening that was completed to verify that the analytical results of this investigation corresponded to the results of the Phase I RFI, and to verify that the NFA recommendation is appropriate for SWMU 93.

47.6.2 Screening Assessments

47.6.2.1 Human Health

The first step in the risk screening was to compare the maximum detected Phase II concentrations to the maximum detected Phase I concentrations. The comparison evaluated whether the extent of contamination and potential risk had been adequately defined by the Phase I RFI, and assessed whether the NFA recommendation was appropriate.

The maximum detected Phase II concentrations that exceeded the maximum detected Phase I concentrations were compared to highly conservative USEPA Region III RBCs for residential soil (USEPA 1994). The purpose of this comparison was to evaluate whether the concentrations detected during the Phase II posed a significant human health risk (i.e., whether the potential risk at SWMU 93 is higher than predicted by the Phase I BRA). Region III RBCs were selected for the comparison because they were comprehensive, current, and derived using accepted risk assessment methodologies.

None of the maximum detected Phase II concentrations found to exceed the maximum detected Phase I concentrations also exceeded the corresponding RBCs. Therefore no unacceptable human health risks are expected from SWMU 93.

47.6.2.2 Ecological

An ecological risk screening was not included as part of the Phase II RFI. However, the analytical results and the human health risk screening results from the Phase II generally corresponded to the analytical results of the Phase I and the human health risk assessment results of the BRA, respectively. Based on this, results of an ecological risk screening using the results of the Phase II investigation, had such a screening been conducted, were expected to correspond to the ecological risk assessment results of the BRA.

47.6.3 Risk Assessments

47.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included occupational workers, hypothetical workers performing intrusive actions, and hypothetical trespassers. Based on site conditions at SWMU 93, the most significant exposure pathways included inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for exposures at SWMU 93 fell below the USEPA's target risk range (1.0×10^{-4} to 1.0×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 93.

47.6.3.2 Ecological

The ecological risk assessment portion of the BRA focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Potential risk from contaminants in soil to biota was considered greatest through indirect exposure of predatory birds (i.e., the robin) to SWMU-related chemicals bioaccumulated in the birds' prey (earthworms, etc.) that inhabits SWMU 93.

The ecological risk assessment found a low potential for risk to predatory birds from SWMU-related chemicals (i.e., selenium). However, this risk is most likely insignificant because the SWMU 93 area represents only a very small percentage of the predatory birds' hunting range.

47.6.4 Other Applicable Assessments

47.6.4.1 Surface Water

SWMU 93 contained no surface water.

47.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

47.6.4.3 Underground Storage Tanks (USTs)

OWS No. 5121 included a detached 100-gallon oil UST. This tank was removed along with the unit and associated leach field in 1988 during the demolition of Building 5121.

47.6.4.4 Other

No other assessments have been conducted in the area of SWMU 93.

47.7 NO FURTHER ACTION PROPOSAL

47.7.1 Rationale

Based on the conclusions reached in the BRA and the Phase II RFI, NFA has been recommended for SWMU 93.

47.7.2 Criterion

SWMU 93 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

48.1 SUMMARY

SWMU 95, the Northeast Stormwater Drainage Area, has been listed as an Appendix I SWMU. This SWMU is an open drain, approximately 40 feet wide, that receives water from several OWS units and stormwater runoff from runways in the east-central portion of Cannon AFB.

The Final IRP RI of the Northeast Stormwater Drainage Area (Walk, Haydel 1990) included drilling and sampling of 11 soil borings in the area of SWMU 95. Barium and selenium were detected in several of the samples at slightly elevated concentrations exceeding the area background levels. However, these elevated concentrations were all within the ranges typical of area soils. Therefore, the RI concluded that "no adverse impact to public health or the environment is expected from (SWMU 95) conditions," (Walk, Haydel 1990).

In addition, a RFI Field Sampling Plan (Lee Wan 1990), which agreed with the conclusions in the RI and did not propose any additional sampling, was accepted by USEPA.

An RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended NFA under RCRA for SWMU 95.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria and to proposed RCRA action levels, or by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 95.

The conclusions reached in the RI report and the BRA were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

48.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

48.2.1 Site Description

The Northeast Stormwater Drainage Area at Cannon AFB is a shallow, open ditch that begins near the end of the northeastern runway, Runway 4/22, and extends to the southeast under an access road before emptying into to an open field. The northwest end of the ditch is marked by a concrete culvert and is surrounded by heavy vegetation. The drainage ditch is approximately 40 feet wide and runs for approximately 550 feet until it reaches the field (Figures 48-1).

48.2.2 Operational History

SWMU 95 began receiving stormwater runoff from the runways in approximately 1953. The OWS units were installed in 1969 (USAF 1990).

48.3 LAND USE

48.3.1 Current

SWMU 95, the Northeast Stormwater Drainage Area, is currently operational and continues to transport stormwater. Land use in the area is classified as airfield/industrial.

48.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. In addition, land use in the area of SWMU 95 will continue to remain airfield/industrial in nature.

48.4 INVESTIGATIVE ACTIVITIES

48.4.1 Summary

The Final IRP RI of the Northeast Stormwater Drainage Area (Walk, Haydel 1990) included drilling and sampling of 11 soil borings in the area of SWMU 95. The RI concluded that "no adverse impact to public health or the environment is expected from (SWMU 95) conditions," (Walk, Haydel 1990).

A RFI Field Sampling Plan (Lee Wan 1990) agreed with the conclusions in the RI and did not propose any additional sampling.

Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992).

48.4.2 Investigation #1: Installation Restoration Program (IRP) Phase II

48.4.2.1 Non-Sampling Data Collection

The IRP Phase II was purely a field investigation and data collection effort. Therefore, non-sampling data was not collected during this investigation.

48.4.2.2 Sampling Data Collection

The IRP Phase II was completed at SWMU 95 because small amounts of oils, greases and alkaline-based cleaning compounds may have been contained in the water received at the Northeast Stormwater Drainage Area. As part of this investigation, 11 borings were drilled and soil samples were collected to maximum depths ranging from 5 to 61.5 feet. Boring locations are illustrated in Figure 48-1 in Appendix A. Soil samples from each boring were analyzed for total metals, EP toxicity characteristics, volatile organics, and base/neutral organics.

48.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the IRP Phase II. Based on the findings of this investigation, the report concluded that no further investigation was warranted for the Northeast Stormwater Drainage Area.

48.4.2.4 Results and Conclusions

Long chain organics (heptanes to heptadecanes) were detected at depths ranging from 0 to 3 feet in a boring located at the northwest end of SWMU 95, near the concrete culvert. However, the concentrations of these compounds diminished with depth and were not found to have migrated with the flow of the drainage area. Analytical results are presented in Table 48-1a in Appendix B.

Selenium and barium were detected above background concentrations, but the concentrations were all within ranges typical of area soils. In addition, the distribution of these metals did not reflect trends typically associated with contamination. Analytical results are presented in Table 48-1b in Appendix B.

Groundwater was not investigated in this phase of the investigation because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

Based on the results of the Phase II, the report concluded that no further investigation was warranted for SWMU 95.

48.4.3 Investigation #2: Remedial Investigation (RI) of 18 IRP/SWMU Sites

48.4.3.1 Non-Sampling Data Collection

In addition to the field investigation and data collection effort, the RI also included the performance of a BRA on the analytical data from SWMU 95. The BRA is addressed as Investigation #3 in Section 48.4.4 below.

48.4.3.2 Sampling Data Collection

Two soil borings were drilled and samples were collected for chemical and geotechnical analyses during the RI (Figure 48-1). Subsurface soil samples were collected from the borings to maximum depth intervals of 10 feet. The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area upstream of SWMU 95, based on the results of the IRP Phase II. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the Northeast Stormwater Drainage Area.

Soil samples were collected at depth intervals of 0 to 0.5, 2 to 4, 4 to 6, 6 to 8, and 8 to 10 feet in each boring. The samples were analyzed for one or more of the following: TCL VOCs, SVOCs, TAL metals, and TPH. In addition, samples were also collected from 0 to 2 feet in each location for geotechnical gradation analysis.

Two additional borings were drilled and sampled at locations near the two previous borings (Figure 48-1) after the laboratory missed the holding times for several of the original samples. Samples were collected at depth intervals of 0 to 0.5, 2 to 4, 4 to 6, and 8 to 10 feet from one boring, and at depth intervals of 0 to 0.5, 4 to 6, and 8 to 10 feet from the other boring. The samples were analyzed for one or more of the following: TCL VOCs, SVOCs, and TPH.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

48.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

48.4.3.4 Results and Conclusions

No VOCs or SVOCs were detected above the corresponding CRQLs in any of the samples analyzed, except for acetone. However, acetone is a common laboratory contaminant, and at least the highest detection was most likely due to laboratory contamination. TPH was detected in near-surface samples at a maximum concentration of 1,060 mg/kg, and was not detected in subsurface samples below a maximum depth of 2 feet.

Elevated concentrations of 10 metals (barium, cadmium, chromium, cobalt, copper, iron, lead, mercury, nickel, and zinc) were also detected in the samples analyzed. However, only concentrations of two metals (lead and zinc) collected from one near-surface sampling location exceeded established background levels (W-C 1997a). The analytical results from this investigation are presented in Tables 48-2a and 48-2b.

The conclusions reached in the RI of 18 IRP/SWMU sites were based on the results of the BRA, and are discussed below.

48.4.4 Investigation #3: Baseline Risk Assessment (BRA) of 18 IRP/SWMU sites

48.4.4.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors and all appropriate exposure pathways was performed on the data collected during the RI.

48.4.4.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #2 in Section 48.4.3 above.

48.4.4.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

48.4.4.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 95. The major and complete exposure pathways included incidental soil ingestion, dermal contact, and inhalation of fugitive VOCs and particulates. Future potential construction workers performing intrusive actions and hypothetical future residents dwelling on the area of this SWMU were considered potential receptors for these exposure pathways. For the purposes of the BRA, hazards and risks were combined across exposure pathways.

The COCs identified for SWMU 95 were lead and zinc (Table 48-3a). As shown in Table 48-3b, the average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 95.

Carcinogenic risks are also presented in Table 48-3c. The total carcinogenic risk (i.e., the risk for all pathways combined) for average exposures and RME at SWMU 95 fell below the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} (EPA 1989).

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMUs addressed by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, neither lead nor zinc, the COCs discussed in the ecological risk assessment that were also detected at SWMU 95, are thought to bioaccumulate through the food chain to concentrations that would pose a risk to raptors, one potential ecological receptor. In addition, the toxicity values for incidental soil ingestion of lead and/or zinc by a mouse (the other potential ecological receptor for SWMU 95) did not pose a risk to populations of small mammals.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for this SWMU.

48.5 SITE CONCEPTUAL MODEL

48.5.1 Nature and Extent of Contamination

Lead and zinc were considered the COCs in the subsurface soils at this SWMU.

48.5.2 Environmental Fate

Based on site conditions at SWMU 95, applicable exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers and future residents at SWMU 95 fell below the target risk range. The BRA indicated that no unacceptable risk was expected at SWMU 95.

Potential risks from the COCs in soil to biota were determined to be absent (zero), and it was determined that the site does not pose a risk to small mammalian populations. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur, and thus no risk of exposure via the groundwater pathway.

48.6 SITE ASSESSMENTS

48.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 95. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 95, with respect to RCRA. However, under the National Pollutant Discharge Elimination System effluent sampling may be required at SWMU 95 in the future.

48.6.2 Screening Assessments

48.6.2.1 Human Health

The COPCs identified for SWMU 95 included metals and organics. These chemicals were initially screened by comparing their detected concentrations to RFI criteria and proposed RCRA action levels. The comparison identified lead and zinc as COCs. All COCs were subjected to a quantitative characterization of risk.

48.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels.

The comparison identified lead and zinc as COCs. All COCs were subjected to a quantitative characterization of risk.

48.6.3 Risk Assessments

48.6.3.1 Human Health

The potential receptors for human health risks included future construction workers and future potential residents at the SWMU. Potential residents were included as receptors despite the fact that the area of SWMU 95 is a natural drainage channel, and as such is unlikely to become the location of a residential area. Trespassers and off-site residents/workers were eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 95, the most significant exposure pathways included inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult, general-duty or ground maintenance and intrusive construction workers, and as adult and child future residents.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 95 was below the target risk range. This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 95.

48.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Neither of the two COCs identified at SWMU 95 and addressed by the RI posed a significant risk to raptors or to small mammalian populations. Based on the results of the BRA, NFA was recommended for SWMU 95.

48.6.4 Other Applicable Assessments

48.6.4.1 Surface Water

SWMU 95 is a shallow, open ditch, and as such surface water accumulates intermittently due to stormwater runoff.

48.6.4.2 Groundwater

Groundwater at SWMU 95 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

48.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at SWMU 95.

48.6.4.4 Other

No other assessments have been conducted in the area of SWMU 95.

48.7 NO FURTHER ACTION PROPOSAL

48.7.1 Rationale

Based on the conclusions reached in the RI and the BRA, NFA has been recommended for SWMU 95.

48.7.2 Criterion

SWMU 95 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

49.1 SUMMARY

SWMU 96, the Old Entomology Rinse Area, has been listed as an Appendix I site. The IRP Phase II investigation (Radian 1986) for the Old Entomology Rinse Area investigated potential soil contamination in the area of SWMU 96. The IRP Phase II detected potentially significant concentrations of pesticides and herbicides in samples collected from two soil borings.

An IRP Phase IV-A investigation of the Old Entomology Rinse Area (Walk Haydel 1988) was completed to confirm and delineate the potential contamination detected in the area of SWMU 96 during the Phase II investigation. The Phase IV-A investigation, which was more extensive than the prior investigation, did not detect any herbicides and only detected pesticides at concentrations of potential concern in samples collected near the surface at SWMU 96.

An RI included the collection and analysis of one surface soil sample and one groundwater sample (W-C 1992). The results of the chemical analyses detected pesticides in the surface soil sample at far lower concentrations than were detected during the IRP Phase IV-A investigation. In addition, the results of the analyses performed on the groundwater sample indicated that groundwater in the area of SWMU 96 had not been impacted by metals, pesticides, or PCBs.

A BRA, completed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria and to proposed RCRA action levels, or by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 96.

A Supplemental RFI was also completed at SWMU 96 (W-C 1994c). This investigation included drilling and sampling one additional boring in the area of SWMU 96. Insignificant concentrations of VOCs, pesticides, and metals were detected in the samples collected from this boring.

Based on the conclusions reached in the RI in conjunction with the conclusions reached in the Supplemental RFI, the recommendation of a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

49.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

49.2.1 Site Description

The Old Entomology Rinse Area (SWMU 96) was located behind pesticide storage Building 2160, which was abandoned in October 1983 and demolished in September 1984 (Figure 49-1 in Appendix A). The former location of SWMU 96 was in the east-central portion of Cannon AFB, north of the wastewater lagoons and west of Perimeter Road. During the site's use, pesticide and herbicide application equipment were cleaned in a sink located inside Building 2160. The sink drained into a 3-foot-square and 2-foot-deep pit at the rear of the building. The bottom of the pit was reportedly unlined and open to the soil (W-C 1992).

49.2.2 Operational History

It is suspected that pesticide and herbicide application equipment were cleaned in a sink located inside Building 2160 which drained into a pit at the rear of the building. This operation is believed to have started in 1968, but may have begun earlier. This operation ceased at some point prior to Building 2160's abandonment in October 1983. Building 2160 was later demolished in September 1984.

49.3 LAND USE

49.3.1 Current

The area surrounding SWMU 96 currently receives minimal usage. The closest facilities to this unit are the wastewater lagoons located approximately 150 feet to the south and the wastewater treatment plant located approximately 150 feet to the west.

49.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the area is currently vacant and unoccupied. Use classification will continue to remain industrial in nature.

49.4 INVESTIGATIVE ACTIVITIES

49.4.1 Summary

The IRP Phase II investigation (Radian 1986) for the Old Entomology Rinse Area detected potentially significant concentrations of pesticides and herbicides in samples collected from two soil borings.

The IRP Phase IV-A investigation, a more extensive investigation than the prior IRP Phase II, did not detect herbicides and only detected pesticides at concentrations of potential concern in samples collected near the surface at SWMU 96.

The RI detected pesticides in a surface soil sample at lower concentrations than had been previously detected, and found that groundwater in the area of SWMU 96 had not been impacted by metals, pesticides, or PCBs. The BRA, completed using the results of the RI, concluded that potential impacts to human health and the environment were insignificant at SWMU 96.

A Supplemental RFI detected insignificant concentrations of VOCs, pesticides, and metals in the samples collected during this sampling event.

Based on the conclusions reached in the RI in conjunction with the conclusions reached in the Supplemental RFI, NFA is warranted for SWMU 96, and this site should be removed from the Cannon AFB RCRA permit.

49.4.2 Investigation #1: Installation Restoration Program Phase II – Confirmation/Quantification, Stage 1 for the Old Entomology Rinse Area (SWMU 96)

49.4.2.1 Non-Sampling Data Collection

The IRP Phase II was purely a field investigation and data collection effort. Therefore, no sampling data was collected during this investigation.

49.4.2.2 Sampling Data Collection

The IRP Phase II of the Old Entomology Rinse Area was completed to investigate the potential percolation of pesticide waste into the site soils, given the proximity of a potable water well within 1,200 feet of SWMU 96. Three borings were drilled, and subsurface soil samples were collected from depth intervals ranging from 2 to 63 feet and submitted for chemical analyses (Figure 49-1 in Appendix A). Target analytes for the nine subsurface samples included purgeable halocarbons and aromatics, organophosphate and organochlorine pesticides, herbicides, arsenic, and mercury.

49.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the IRP Phase II investigation. However, as discussed below, potentially significant concentrations of herbicides and pesticides were detected in a sample collected from the deepest interval (61.5 to 62 feet) in one of the borings. This finding warranted additional investigation.

49.4.2.4 Results and Conclusions

None of the samples contained detectable concentrations of purgeable halocarbons or aromatics.

None of the samples contained detectable concentrations of organophosphate pesticides. Detected organochlorine pesticides included 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, and toxaphene. Two of the three samples found to contain pesticides were collected from depths of 2 to 4 feet. However, the third sample was collected from a depth of 61.5 to 62 feet, an interval "in an unconsolidated, permeable sand unit below the caliche profile" (Radian 1986).

The herbicide 2,4-D was detected in several samples. The highest concentration of 2,4-D was also detected in the same sample collected from a depth of 61.5 to 62 feet, an interval "in an unconsolidated, permeable sand unit below the caliche profile" (Radian 1986).

Arsenic and mercury were each detected in several samples, but all detected concentrations corresponded to area background levels (W-C 1997a). The analytical results for this investigation are presented in Table 49-1 in Appendix B.

Groundwater was not investigated in this phase of the investigation because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth

to groundwater was greater than 250 feet at Cannon AFB, and the source of any contaminants present in the area of SWMU 96 was believed to be the disposal pit described above.

The IRP Phase II Report postulated the wastewater treatment lagoons were a potential source of the deeper zone of herbicide and pesticide contamination. Despite that fact that the sample of concern was collected from a boring located upgradient from the lagoons, "there exists a nearly constant standing body of water, which could drive wastewater downward through the unsaturated sands and caliche downgradient from the (Old) Entomology Rinse Area" (Radian 1986).

49.4.3 Investigation #2: Installation Restoration Program Phase IV-A, Site 17, Environmental Assessment for the Old Entomology Rinse Area (SWMU 96)

49.4.3.1 Non-Sampling Data Collection

The IRP Phase IV-A was purely a field investigation and data collection effort. Therefore, no sampling data was collected during this investigation.

49.4.3.2 Sampling Data Collection

The IRP Phase IV-A was completed at SWMU 96 to confirm the results of the Phase II investigation and to further delineate the extent of any potential contamination. During the Phase IV-A, eight borings were drilled and sampled, four to depths of 50 feet and the other four to depths of 100 feet. Each boring was sampled from 0 to 10 feet at designated intervals, and at 10-foot intervals thereafter. The soil samples were analyzed for herbicides and organochlorine pesticides.

In addition, one groundwater monitoring well was installed and developed downgradient from the Old Entomology Rinse Area. The well was installed to a depth of 356 feet, an adequate depth to sample the groundwater in the area of SWMU 96. However, due a lack of water production by the well, the well had to be developed using water under pressure, and a qualitative falling head test had to be performed to confirm that the well screen was not plugged. Based on the well's limited production, a groundwater sample was not collected for chemical analysis.

49.4.3.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the IRP Phase IV-A investigation. Therefore, no data gaps existed after the completion of the Phase IV-A investigation.

49.4.3.4 Results and Conclusions

The Phase IV-A investigation detected no herbicides in any of the samples analyzed. In addition, the four pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and chlordane) detected during this investigation were found in samples collected from shallow depths. The concentrations of

pesticides diminished with depth; 2.6 ppm was the highest concentration detected, and 6 feet was the deepest depth where pesticides were detected.

The Phase IV-A report noted that no herbicides were detected during this investigation, even though the investigation was more extensive than the previous investigations. In addition, the herbicide 2,4-D has a half-life of just 21 days in the aerated zone, so it could have degraded during the interval between investigations. Finally, despite the detection of 2,4-D in deep samples collected during the Phase II investigation, the geologic and climatic conditions in conjunction with results of the shallower samples from the Phase II indicate that herbicides did not exist at depths deeper than 10 feet (Walk, Haydel 1986).

49.4.4 Investigation #3: Remedial Investigation Report for the 18 IRP/SWMUs, the Old Entomology Rinse Area (SWMU 96)

49.4.4.1 Non-Sampling Data Collection

A human health and ecological BRA that considered both present and future potential receptors, and all appropriate exposure pathways, was completed using the data collected during the RI.

49.4.4.2 Sampling Data Collection

The RI was completed to provide additional information regarding the nature and extent of potential hazardous contaminants in the surface soil near the former site of Building 2160 and in the groundwater downgradient from SWMU 96 for risk assessment purposes.

One surface sample was collected from the approximate former location of the open pit, near Building 2160, and analyzed for pesticides and PCBs. One groundwater sample was also collected from the monitoring well installed during the Phase IV-A investigation. The groundwater sample was analyzed for pesticides, PCBs, and total metals.

49.4.4.3 Data Gaps

The data collected was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

49.4.4.4 Results and Conclusions

Low concentrations of pesticides, ranging from 16 to 110 parts per billion (ppb), were detected in the surface soil sample. The detected pesticides included 4,4-DDE, 4,4-DDT, alpha- and gamma-chlordane, and heptachlor epoxide. No PCBs were detected in the surface soil sample at levels exceeding the CRQLs.

Six metals (barium, chromium, copper, lead, vanadium, and zinc) were detected in the groundwater sample at low concentrations. As part of the risk screening process, discussed below, the detected metals concentrations were compared to the corresponding USEPA MCLs. None of the detected metals exceeded the corresponding MCLs. In addition, no pesticides or

PCBs were detected above the CRQLs. The analytical results of this investigation are presented in Tables 49-3a and 49-3b in Appendix B.

49.4.5 Investigation #4: Baseline Risk Assessment for the Old Entomology Rinse Area (SWMU 96)

49.4.5.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the RI.

49.4.5.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included as part of the RI report. The RI was addressed as Investigation #3 in Section 49.4.4 above.

49.4.5.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

49.4.5.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 96. Potential receptors at this SWMU for human health risks included workers at the nearby wastewater lagoons. The major and complete exposure pathways for these workers included incidental soil ingestion, dermal contact, and inhalation of fugitive particulates. Future workers performing intrusive actions and hypothetical future residents dwelling on the area of this SWMU were also considered potential receptors with the same exposure pathways listed above. For the purposes of the BRA, hazards and risks were combined across exposure pathways.

The COCs identified for SWMU 96 were the pesticides 4,4-DDE, 4,4-DDT, alpha- and gamma-chlordane, and heptachlor epoxide. As shown in Table 49-4a in Appendix B, the average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 96.

Carcinogenic risks are also presented in Table 49-4b in Appendix B. The total carcinogenic risk (i.e., the risk for all pathways combined) for average and RME exposures at SWMU 96 fell below the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} (EPA 1989).

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMUs addressed by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C

1997a). However, none of the COCs discussed in the ecological risk assessment were detected at SWMU 96.

All chemicals detected in the groundwater sample occurred at concentrations below the USEPA drinking water MCLs. Based on the results of this risk screening, as discussed below, no potential groundwater COCs were selected for SWMU 96.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for this SWMU.

49.4.6 Investigation #5: RCRA Facility Investigation Activities Phase II to Appendix I Solid Waste Management Units Supplemental RFI Report, the Old Entomology Rinse Area (SWMU 96)

49.4.6.1 Non-Sampling Data Collection

The Supplemental RFI was purely a field investigation and data collection effort. Therefore, non-sampling data was not collected during this investigation.

49.4.6.2 Sampling Data Collection

The Supplemental RFI was completed to sample the deeper soil beneath the suspected rinse sink pit location that had not yet been sampled, and to provide more current information on site conditions of the SWMU.

One boring was drilled to a total depth of 102 feet. Analytical samples were collected from the boring at 10-foot intervals (10 feet, 20 feet, etc.) for a total of ten subsurface soil samples. Each sample was analyzed for the following parameters: TCL VOCs, SVOCs, TAL metals, pesticides, PCBs, chlorinated herbicides, TRPH, gasoline-range organics (GRO), and total chromatographable organics (TCO).

49.4.6.3 Data Gaps

The data collected was sufficient to meet the sampling and data quality objectives of this investigation. Therefore, no data gaps existed.

49.4.6.4 Results and Conclusions

The VOCs detected in the analyzed samples (acetone, methylene chloride, and toluene) were all attributed to laboratory contamination. No other VOCs were detected.

No SVOCs, pesticides, PCBs, or herbicides were detected at concentrations above the corresponding RLs in any of the analyzed samples. However, two pesticides, 4,4-DDE and 4,4-DDT, were detected in a sample collected at the 10-foot depth interval at estimated concentrations below the RLs. This detection may be attributed to general pesticide application at the Base (W-C 1995).

Seventeen metals (aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, silver, sodium, and vanadium) were detected in the ten subsurface samples, but all detected concentrations fell within the range of area background levels (W-C 1997a).

Insignificant concentrations of petroleum hydrocarbons were detected in several samples by each of the three analytical methods, TRPH, GRO, and TCO. Based on this, NFA was recommended for SWMU 96.

49.5 SITE CONCEPTUAL MODEL

49.5.1 Nature and Extent of Contamination

Potentially significant concentrations of pesticides and herbicides were detected in samples collected both near the surface and at a depth of 61.5 to 62 feet during the IRP Phase II investigation. However, based on the results of later, more extensive investigations, it appears that the detection of pesticides and herbicides in the deeper sample was most likely the result of cross contamination from a shallower interval.

No herbicides were detected during the IRP Phase IV-A investigation. Pesticides were only detected at insignificant concentrations in samples collected near the surface, and the concentrations detected diminished with depth.

Insignificant concentrations of pesticides were again detected in the surface soil sample collected during the RI. Metals were detected in the groundwater sample collected and analyzed as part of this investigation. However, none of the detected metals exceeded the corresponding MCLs. In addition, no pesticides or PCBs were detected in the groundwater sample above the CRQLs.

A BRA was completed using the results of the RI. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU.

Insignificant concentrations of pesticides were detected in near surface samples during the Supplemental RFI. In addition, the concentrations of metals detected corresponded to area background concentrations, and the concentrations of petroleum hydrocarbons detected were also insignificant.

49.5.2 Environmental Fate

Based on site conditions at SWMU 96, applicable exposure pathways include incidental soil ingestion, dermal contact, and inhalation of fugitive particulates. All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risks at SWMU 96 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). The BRA indicated that no unacceptable risk was expected at SWMU 96.

Because none of the chemicals detected in the groundwater near SWMU 96 exceeded the corresponding MCLs, no unacceptable risk via the groundwater exposure route was anticipated.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMUs addressed by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, none of the COCs discussed in the ecological risk assessment were detected at SWMU 96.

49.6 SITE ASSESSMENTS

49.6.1 Summary

Investigations performed at SWMU 96 included IRP Phase II and IV-A investigations, an RI, and a Supplemental RFI.

A BRA was conducted based on the results of the RI for SWMU 96. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. In addition, the Supplemental RFI did not detect any potentially significant concentrations of SWMU-related chemicals. Therefore, NFA was recommended for SWMU 96.

49.6.2 Screening Assessments

49.6.2.1 Human Health

The COPCs identified for SWMU 96 included herbicides, pesticides, and metals. These chemicals were initially screened by comparing their detected concentrations in soil to area background levels (W-C 1997a), to RFI criteria, and to proposed RCRA action levels. Their detected concentrations in groundwater were screened by comparison to area background levels and to USEPA MCLs.

The comparison identified several pesticides as COCs. All COCs were subjected to a quantitative characterization of risk.

49.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites addressed by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, none of the COCs discussed in the ecological risk assessment were detected at SWMU 96.

49.6.3 Risk Assessments

49.6.3.1 Human Health

At the time of the BRA's completion potential receptors at this SWMU for human health risks included workers at the nearby wastewater treatment plant, future workers performing intrusive actions, and hypothetical future residents dwelling on the area of this SWMU.

Based on site conditions at SWMU 96, the most significant exposure pathways include inhalation of fugitive dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 96 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 96.

49.6.3.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites addressed by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, none of the COCs discussed in the ecological risk assessment were detected at SWMU 96.

49.6.4 Other Applicable Assessments

49.6.4.1 Surface Water

SWMU 96 contained no surface water.

49.6.4.2 Groundwater

During the IRP Phase IV-A investigation, a monitoring well was installed downgradient from SWMU 96. A groundwater sample was subsequently collected and analyzed during the RI. Analytical results from the sample detected metals concentrations that corresponded to area background levels (W-C 1997a), but no other concentrations of potential groundwater contaminants in the area of the Old Entomology Rinse Area.

49.6.4.3 Underground Storage Tanks (USTs)

There is no record of storage tanks, either underground or aboveground, in the area of SWMU 96.

49.6.4.4 Other

No other assessments have been conducted in the area of SWMU 96.

49.7 NO FURTHER ACTION PROPOSAL

49.7.1 Rationale

Based on the conclusions reached in the BRA and the Phase II RFI, NFA has been recommended for SWMU 96.

49.7.2 Criterion

SWMU 96 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

50.1 SUMMARY

SWMU 98, the Sanitary Sewer Line, located underground throughout Cannon AFB, transports sanitary wastewater to the wastewater treatment plant. The sewer lines are constructed of polyvinyl chloride (PVC) in the housing area and of clay tile in the main base area. Pipe diameters range from 8 inches for PVC to 15 inches for clay tile.

The sanitary sewer system's main trunk line flows northeast along Torch Boulevard in the aircraft maintenance area. A smaller branch flows south along Torch Boulevard near the main entrance to the Base. A secondary line flows southeast and enters the main trunk at Argentina Avenue, then a transmission line flows east across the runways to the wastewater lagoon. Only the main trunk, the south flowing branch, and the east flowing transmission line potentially received hazardous wastes. All other lines, including the secondary branch lines, receive only domestic sewage.

An RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended that NFA was required at SWMU 98.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria and to proposed RCRA action levels, or by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 98.

The conclusions reached in the RI report and the BRA were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

50.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

50.2.1 Site Description

The sanitary sewer lines at cannon AFB are located underground and are used to transport sanitary wastewater to the wastewater treatment plant. The sewer lines are constructed of PVC in the housing area and of clay tile in the main Base area. The pipe diameters range from 8 inches for PVC to 15 inches for clay tile (Figures 50-1a, 50-1b, 50-1c, and 50-1d in Appendix A).

50.2.2 Operational History

SWMU 98 has been in operation since approximately 1943. The average daily flow through the sanitary sewer line is 0.4 million gallons per day (mgd). No indication of significant line losses have been observed.

No previous investigations have been conducted at SWMU 98. SWMU 98, the Sanitary Sewer Line, is currently operational and is used to transport sanitary wastewater to the wastewater treatment lagoons.

50.3 LAND USE

50.3.1 Current

The current land use of SWMU location is industrial.

50.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. In addition, it is anticipated that SWMU 98 will continue to transport sanitary wastewater to the wastewater treatment plant. Use classification will continue to remain industrial in nature.

50.4 INVESTIGATIVE ACTIVITIES

50.4.1 Summary

Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992).

50.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU sites

50.4.2.1 Non-Sampling Data Collection

The activities conducted during this field effort included a video camera survey of over 8,900 feet of sanitary sewer line. In addition to the field investigation and data collection effort, the RI also included a BRA that used the analytical data collected from SWMU 98. The BRA is addressed as Investigation #3 in Section 50.4.3 below.

50.4.2.2 Sampling Data Collection

Forty-two soil borings were drilled and samples were collected for chemical and geotechnical analyses during the RI. Subsurface soil samples were collected from borings to maximum depth intervals ranging from 8 to 29 feet, determined by terminating each boring approximately 5 feet below the estimated depth to the sewer line at each location. The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area of SWMU 98. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the Sanitary Sewer Line.

Forty-four subsurface soil samples were analyzed for TCL VOCs, TAL metals, and TPH. Samples were also collected for geotechnical gradation analysis.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

50.4.2.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

50.4.2.4 Results and Conclusions

Acetone was the only TAL VOC detected at concentratrions exceeding the CRQL in samples collected during the RI. In all borings except one, the presence of acetone was dismissed as laboratory contamination. The exception may indicate past leakage from the sewer near this point.

TPH was detected in one boring at a concentration above 100 mg/kg.

Lead and cadmium were detected above background levels in two samples. However, they are not metals of concern in this area. The analytical results of this investigation are presented in Table 50-1 in Appendix B.

50.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU sites

50.4.3.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways was performed on the data collected during the RI.

50.4.3.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #1 in Section 50.4.2 above.

50.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

50.4.3.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 98. Potential receptors at this SWMU for human

health risks are future workers performing construction or other intrusive actions at the SWMU. Potential residents were eliminated as receptors despite the fact that this SWMU is greater than 0.5-acres in size because the site would be unlikely to become a residential area due to its long, narrow shape. In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 98, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult construction workers.

As shown in Table 50-2a in Appendix B, the COCs identified for SWMU 98 included barium, acetone, and toluene. Acetone does not have an inhalation toxicity value, so it was not evaluated for noncarcinogenic effects from inhalation exposure. As shown in Table 50-2b in Appendix B, the average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 98.

Carcinogenic risks were absent (or zero) due to the absence of carcinogenic chemicals identified as COCs at SWMU 98.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels. However, none of the COCs discussed in the ecological risk assessment were detected at SWMU 98. Based on this, it was determined that none of the COCs detected at SWMU 98 pose a risk to small mammalian populations.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, no further response action was recommended for this SWMU.

50.5 SITE CONCEPTUAL MODEL

50.5.1 Nature and Extent of Contamination

Barium, acetone, and toluene are of potential concern in subsurface soils at this SWMU.

50.5.2 Environmental Fate

Based on site conditions at SWMU 98, applicable exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 98 was absent. The BRA indicated that no unacceptable risk was expected at SWMU 98.

Potential risks from the COCs in soil to biota were determined to be absent (zero), and it was determined that the site does not pose a risk to small mammalian populations. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur, and thus no risk of exposure via the groundwater pathway.

50.6 SITE ASSESSMENTS

50.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 98. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 98.

50.6.2 Screening Assessments

50.6.2.1 Human Health

The COPCs identified for SWMU 98 included metals and VOCs. These chemicals were initially screened by comparing their detected concentrations to RFI criteria and proposed RCRA action levels. The comparison identified barium, acetone, and toluene as COCs. All COCs were subjected to a quantitative characterization of risk.

50.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels. None of the COPCs detected at SWMU 98 were addressed by the ecological risk assessment.

50.6.3 Risk Assessments

50.6.3.1 Human Health

Potential receptors for human health risks included future construction workers at the SWMU. Potential residents were eliminated as receptors because this SWMU is long and narrow, and as such is unlikely to become the location of a residential area. In addition, trespassers and off-site residents/workers were also eliminated because of the low frequency and duration of exposure associated with these potential receptors.

Based on site conditions at SWMU 98, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for this pathway were identified as adult, general-duty or ground maintenance and construction workers.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 98 was absent. This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 98.

50.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. None of the COCs identified at the 18 IRP/SWMU sites addressed by the RI were detected at SWMU 98; therefore, there is no risk to small mammalian populations. Based on the results of the BRA, NFA was recommended for SWMU 98.

50.6.4 Other Applicable Assessments

50.6.4.1 Surface Water

SWMU 98 is a subterranean sanitary sewer system, and as such contains no surface water.

50.6.4.2 Groundwater

Groundwater at SWMU 98 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

50.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at SWMU 98.

50.6.4.4 Other

No other assessments, aside from the video survey, have been conducted in the area of SWMU 98.

50.7 NO FURTHER ACTION PROPOSAL

50.7.1 Rationale

Based on the conclusions reached in the RI and the BRA, NFA has been recommended for SWMU 98.

50.7.2 Criterion

SWMU 98 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

51.1 SUMMARY

SWMU 104, Landfill No. 4, has been listed as an Appendix I site. The RFI report (Radian 1994) for Landfill No. 4 investigated potential soil contamination in the area of SWMU 104. Based on the results of a BRA, completed using the results of the RFI, NFA was recommended for SWMU 104.

The Phase II RFI of Landfill No. 4 (W-C 1995) included the installation and sampling of a monitoring well downgradient from the landfill to investigate groundwater in the area of SWMU 104. Quarterly monitoring of this well was conducted for two sampling events in 1996, then annual monitoring was conducted in 1997, 1998, and 1999. Comparisons of the results of these sampling events to the corresponding USEPA MCLs indicated that NFA is required at SWMU 104.

Based on the conclusions of the RFI and the Phase II RFI, the recommendation of a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

51.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

51.2.1 Site Description

Landfill No. 4 (SWMU 104) is an inactive, unlined, cut-and-fill landfill occupying approximately 6.3 acres along the eastern boundary of Cannon AFB (Figure 51-1 in Appendix A). This SWMU is bound to the north by an unused portion of Perimeter Road, to the east by a vacant field, to the south by the playa lake, and to the west by barbed wire fence. The ground surface is sloped slightly to the south and the playa lake, and the site is covered with native prairie grasses. Remnant depressions observed at the surface of this SWMU are most likely the locations of former disposal trenches where settling has occurred (W-C 1995).

51.2.2 Operational History

Landfill No. 4 accepted wastes during 1967 and 1968. The landfill's operation apparently consisted of placing waste in trenches and burning it before burying it. The landfill reportedly received domestic solid wastes and shop wastes, which included waste oils and solvents, paint strippers and thinners, outdated paint, pesticide containers, and various empty cans and drums (Radian 1986).

During a 1985 IRP Phase II Investigation, Radian drilled and sampled seven soil borings in the area of Landfill No. 4. The area of this SWMU was investigated due to its proximity to the Base boundary, to a disposal lake, and to a Base drinking water well, and due to records of past hazardous waste disposal in this landfill. Twenty-seven soil samples collected at depths ranging from 1 to 63 feet were analyzed for metals, oils and greases, and purgeable and aromatic hydrocarbons. Based on the insignificant concentrations of these chemicals detected in the samples, the report recommended NFA for SWMU 104.

51.3 LAND USE

51.3.1 Current

The site of Landfill No. 4 is currently a vacant, grass-covered field that is no longer in use. Waste has not been accepted at Landfill No. 4 since 1968.

51.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the area is currently vacant and unoccupied. Use classification will continue to remain industrial in nature.

51.4 INVESTIGATIVE ACTIVITIES

51.4.1 Summary

The IRP Phase II Investigation included drilling and sampling nine soil borings in the area of Landfill No. 4. Soil samples collected at depths ranging from 1 to 63 feet were analyzed for metals, oils and greases, and halogenated and aromatic organics. Insignificant concentrations of these chemicals were detected in the samples, and the report recommended NFA for SWMU 104. Based on the date of the IRP Phase II Investigation, the analyses completed (i.e., oil and grease and halogenated and aromatic organics), and the lack of significant results from the IRP Phase II, this investigation is not discussed in further detail below.

The RFI, conducted by Radian in 1992, investigated potential soil contamination in the area of SWMU 104. The BRA, completed using the results of the RFI, recommended NFA for SWMU 104.

During the Phase II RFI, a monitoring well was installed downgradient from SWMU 104, and groundwater samples were subsequently collected five times between 1995 and 1998. Analytical results from these samples detected insignificant concentrations of groundwater contaminants in the area of Landfill No. 4.

Based on the conclusions reached in the IRP Phase II, the RFI, and the Phase II RFI, the recommendation of No Further Response Action Planned is warranted for SWMU 104.

51.4.2 Investigation #1: RCRA Facility Investigation Report for Landfill No. 4 (SWMU 104)

51.4.2.1 Non-Sampling Data Collection

The RFI included a BRA completed using the results of this investigation. The BRA, discussed below, indicated that there is no unacceptable risk to human health or the environment from this SWMU (Radian 1994).

51.4.2.2 Sampling Data Collection

An RFI was completed at SWMU 104 to determine whether a release of landfill-related chemicals had occurred. As part of this investigation, an exploration trench was dug to locate the bottom of the landfill. In addition, ten borings were drilled and subsurface soil samples were collected from depth intervals ranging from 15 to 62 feet and submitted for chemical analyses (Figure 51-1 in Appendix A). These intervals were chosen because they had not been sampled during the IRP Phase II Investigation and because the vertical extent of any potential contamination had not been determined. Target analytes for the 124 subsurface and six surface samples included VOCs, SVOCs, organochlorine pesticides, PCBs, TRPH, and TAL metals. A portion of the samples were also analyzed for total extractable hydrocarbons (diesel, jet fuel, kerosene), total purgeable hydrocarbons (gasoline and its components), and chlorinated herbicides.

51.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the RFI QAPP, and to complete the BRA. Therefore, no data gaps existed after the completion of the RFI.

51.4.2.4 Results and Conclusions

Methylene chloride, toluene, and xylenes were detected at concentrations of potential concern during the RFI at Landfill No. 4. All other VOCs and SVOCs detected were excluded from concern because they were considered to be laboratory contaminants.

Detected herbicides, pesticides, and PCBs included 2,4,5-TP, dichloroprop, MCPP, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, endosulfan II, endrin, heptachlor epoxide, beta-BHC, delta-BHC, gamma-BHC, and Aroclor 1260.

Thirteen metals (aluminum, barium, beryllium, cadmium, chromium, cobalt, copper, iron, mercury, potassium, selenium, vanadium, and zinc) were detected in concentrations exceeding the Upper Tolerance Limits (UTLs) calculated from background concentrations for the area around SWMU 104. The analytical results at this investigation are presented in Tables 51-1a, 51-1b, 51-1c, and 51-1d in Appendix B.

Groundwater was not investigated in this phase of the investigation because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The landfill material encountered during the RFI included construction debris and domestic waste. No liquid wastes or soils saturated with liquid wastes were encountered during the field activities.

Based on the results of a BRA completed as part of this investigation, the RFI report recommended NFA for SWMU 104.

51.4.3 Investigation #2: Phase II RCRA Facility Investigation Report for Landfill No. 4 (SWMU 104)

51.4.3.1 Non-Sampling Data Collection

A formal risk assessment was not completed using the groundwater monitoring results from Landfill No. 4. However, a risk screening was completed by comparing the analytical results from the groundwater samples to the corresponding USEPA MCLs. The results of this risk screening are discussed below.

51.4.3.2 Sampling Data Collection

A Phase II RFI was completed at SWMU 104 to determine whether a release of landfill-related chemicals to groundwater in the area of SWMU 104 had occurred. One groundwater monitoring well was installed and developed downgradient from Landfill No. 4. The total depth of the boring was 299 feet. The screened interval was located from a depth of 268 to a depth of 297.5 feet below ground surface.

Geotechnical samples were collected and analyzed from within the screened interval at depths of 270, 280 and 290 feet, but no samples were collected for chemical analyses. Although no samples were collected for chemical analyses, soils encountered in the boring were field screened for headspace information. The highest headspace readings observed were 1.7 ppm. However, these readings most likely resulted from soil moisture, not the presence of organic contaminants in the soil.

After the well had been developed, a groundwater sample was collected and analyzed for VOCs, SVOCs, pesticides/PCBs, herbicides, metals, TPH, and TRPH. Additional samples were collected from the well in March 1996, June 1996, December 1997, December 1998, and December 1999. In addition to being analyzed for the same parameters as the initial sample, the four other samples were also analyzed for several additional parameters, including general chemistry parameters, dioxins, and cyanide, all of which yielded insignificant results.

51.4.3.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the Phase II RFI QAPP. Therefore, no data gaps existed after the completion of the Phase II RFI.

51.4.3.4 Results and Conclusions

Three VOCs (acetone, methylene chloride, and toluene) and two SVOCs (acetophenone and bis(2-ethylhexyl) phthalate) were detected in at least one groundwater sample collected during the five sampling events. Fourteen metals (arsenic, barium, calcium, cobalt, copper, lead, magnesium, potassium, selenium, silver, sodium, tin, vanadium, and zinc) were also detected. In addition, TPH was detected in the initial groundwater sample. None of the pesticides/PCBs,

herbicides, dioxins, etc., were detected in any of the samples, and none of the general chemistry results were above corresponding USEPA MCL or secondary MCL. The analytical results of this investigation are presented in Tables 51-2a and 51-2b in Appendix B.

Based on the results of risk screening completed on the results of these sampling events, NFA is recommended for SWMU 104.

51.5 SITE CONCEPTUAL MODEL

51.5.1 Nature and Extent of Contamination

Ten analytical soil borings, to depths ranging from 15 to 62 feet, were installed and sampled during the RFI at Landfill No. 4 to identify any potential contamination in the subsurface interval not investigated during the IRP Phase II. Together with the results of the IRP Phase II, the analytical results of this investigation effectively delineated the extent of contamination in the area of SWMU 104. Chemical analyses detected elevated concentrations of metals and organic compounds in subsurface soil samples collected during the Phase II RFI at SWMU 104.

Three VOCs were detected at concentrations of potential concern during the RFI at Landfill No. 4. Three herbicides, ten pesticides, and one PCB compound were also detected. In addition, thirteen metals were detected at concentrations exceeding the UTLs calculated from background concentrations for the area around SWMU 104.

During the Phase II RFI, a monitoring well was installed downgradient from SWMU 104, and groundwater samples were subsequently collected five times between 1995 and 1998.

Three VOCs and two SVOCs were detected in at least one groundwater sample collected during the five groundwater sampling events. Fourteen metals were also detected. In addition, TPH was detected in the initial groundwater sample.

51.5.2 Environmental Fate

Contaminants encountered at Landfill No. 4 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 104, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time. The potential for metals to precipitate in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the IRP Phase II, the RFI, and the Phase II RFI.

VOCs are likely to be relatively to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

The SVOCs detected are likely to be relatively immobile due to low vapor pressures, low water solubilities, and tendencies to adsorb to clays. In addition, these compounds have moderate to low biodegradation rates.

The herbicides, pesticides, and PCB compounds detected are likely to persist in the environment due to their extremely low vapor pressures, low water solubilities, and tendencies to readily adsorb to soil. These compounds also have low biodegradation rates.

51.6 SITE ASSESSMENTS

51.6.1 Summary

A BRA was conducted based on the results of the RFI. The results of the BRA are discussed below.

51.6.2 Screening Assessments

51.6.2.1 Human Health

A human health risk screening was completed for Landfill No. 4 to determine whether chemicals detected in soils at the site may pose an unacceptable risk to human health. Chemicals detected during the RFI were evaluated based on detection frequency, comparison with background data, and availability of toxicity data. The results of this evaluation found elevated levels of two VOCs, two SVOCs, eight pesticides, TPH, and TRPH in the area of SWMU 104. These chemicals were considered the COCs for Landfill No. 4. In addition, two compounds, 2-hexanone and 4-methyl-2-pentanone, were not listed as detected compounds in the discussion of the analytical results included in the RFI report. However, these two compounds were listed as COCs. 4-Methyl-2-pentanone was found to contribute less than one percent of the noncarcinogenic risks, and 2-hexanone was not mentioned in the BRA sections of the report. Based on the ambiguity of these two compounds' detection at Landfill No. 4, and on the apparently insignificant contribution to the overall risk associated with SWMU 104, 2-hexanone and 4-methyl-2-pentanone are not included in the discussion of the BRA.

The maximum concentrations of chemicals detected in the five groundwater samples were compared to the applicable USEPA MCLs. None of the compounds with established MCLs exceeded the corresponding MCL. Based on the results of the human health risk screening, chemicals detected in groundwater in the area of Landfill No. 4 do not pose an unacceptable risk to human health.

51.6.2.2 Ecological

The ecological screening assessment focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Waterfowl, specifically dabbler ducks, were chosen as the indicator species for SWMU 104 (Radian 1994). Potential exposure of these ducks to contaminants originating in Landfill No. 4 would be via surface water runoff downgradient to the playa lake located approximately one-quarter mile to the south of this SWMU. Based on low annual precipitation (15 inches with low monthly averages of 0.4 inches during the winter) and the relatively low concentrations of COCs detected in the area of SWMU 104, few chemicals would likely be transported from the landfill to the playa lake. In addition, the ducks migrate through Clovis beginning in late October and potentially remain as late as mid-March during mild winters. The average amount of time ducks spend in the area is 1.5 to 3 months. Considering the low precipitation levels, the relatively low concentrations of contaminants, and the limited amount of time ducks spend in the area, the ducks' level of exposure to SWMU chemicals is likely to be very low.

The MCLs to which the maximum concentrations of chemicals detected in the five groundwater samples were compared are also protective of the environment. Because none of the compounds detected exceeded the corresponding MCLs, the chemicals detected in groundwater in the area of Landfill No. 4 do not pose an unacceptable risk to the environment.

Based on the results of the ecological screening, chemicals detected in soils at Landfill No. 4 do not pose an unacceptable ecological risk.

51.6.3 Risk Assessments

51.6.3.1 Human Health

The BRA included three viable exposure pathways for off-site residents: ingestion of fruits and vegetables, ingestion of meats and dairy products, and inhalation of volatiles and particulates in the ambient air. Exposure concentrations were based on modeled on-site contaminant concentrations in surface water for purposes of predicting uptake and accumulation in food products, and predicted contaminant concentrations in ambient air based on soil sample analytical results.

The carcinogenic risk to off-site residents was calculated for adults only. The total hazard indices for average exposures and RME were 1×10^{-9} and 1×10^{-8}, respectively, for present residents, and 3×10^{-12} and 1×10^{-11}, respectively, for future residents. These hazard indices are below the Superfund site remediation risk range goal of 1×10^{-4} to 1×10^{-6}, indicating that contaminants migrating off site are not likely to cause adverse carcinogenic health risks in residential adults under current exposure conditions.

The noncarcinogenic risk to off-site residents was calculated for both adults and children. The total hazard indices for average exposures and RME were 2×10^{-3} and 2×10^{-5}, respectively, for present adult residents, and 1×10^{-2} and 2×10^{-2}, respectively, for future adult residents. The total hazard indices for average and reasonable maximum child exposures were 7×10^{-3} and

1×10^{-2}, respectively, for present child residents, and 3×10^{-2} and 6×10^{-2}, respectively, for future child residents. These hazard indices are below the USEPA target of 1.0, indicating that contaminants migrating off site are not likely to cause adverse noncarcinogenic health risks in residential adults or children under current exposure conditions.

The carcinogenic risk to on-site workers was also calculated. The total HIs for average exposure and RME were 2×10^{-14} and 7×10^{-14}, respectively, for present workers, and 1×10^{-5} and 2×10^{-5}, respectively, for future workers. These hazard indices are within the Superfund site remediation risk range goal of 1×10^{-4} to 1×10^{-6}, indicating that SWMU contaminants are not likely to cause adverse carcinogenic health risks in on-site workers under current exposure conditions.

In addition, the noncarcinogenic risk to onsite workers was calculated. The total HIs for average chronic and subchronic exposures were 5×10^{-5} and 1×10^{-3}, respectively, for present workers, and 1×10^{-1} and 5×10^{-3}, respectively, for future workers. The total HIs for reasonable maximum chronic and subchronic exposures were 2×10^{-4} and 4×10^{-3}, respectively, for present workers, and 1×10^{-1} and 1×10^{-2}, respectively, for future workers. These HIs are below the USEPA target of 1.0, indicating that SWMU contaminants are not likely to cause adverse noncarcinogenic health risks in on-site workers under current exposure conditions.

Because inhalation reference concentrations are not available for contaminants predicted to enter the atmosphere through volatilization (2,4,5-TP and xylenes) or wind entrainment (dichloroprop, MCPP, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, endrin, heptachlor epoxide, beta-BHC, delta-BHC, gamma-BHC, and zinc), the evaluation of noncarcinogenic risks associated with the inhalation pathway was precluded.

Based on the results of the human health risk screening, a risk assessment was not warranted for the chemicals detected in the groundwater in the area of Landfill No. 4.

51.6.3.2 Ecological

A formal ecological risk assessment was not warranted SWMU 104.

51.6.4 Other Applicable Assessments

51.6.4.1 Surface Water

SWMU 104 contained no surface water.

51.6.4.2 Groundwater

During the Phase II RFI, a monitoring well was installed downgradient from SWMU 104, and groundwater samples were subsequently collected and analyzed five times between 1995 and 1998. Analytical results from these samples detected insignificant concentrations of groundwater contaminants in the area of Landfill No. 4.

51.6.4.3 Underground Storage Tanks (USTs)

There is no record of storage tanks, either underground or aboveground, in the area of SWMU 104.

51.6.4.4 Other

No other assessments have been conducted in the area of SWMU 104.

51.7 NO FURTHER ACTION PROPOSAL

51.7.1 Rationale

Based on the conclusions reached in the Phase II RFI, NFA has been recommended for SWMU 104.

51.7.2 Criterion

SWMU 104 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

52.1 SUMMARY

SWMU 105, Landfill No. 3, has been listed as an Appendix I site. The RFI report (Radian 1994) for Landfill No. 3 investigated potential soil contamination in the area of SWMU 105. Based on the results of a BRA, completed using the results of the RFI, NFA was recommended for SWMU 105.

The Phase II RFI of Landfill No. 3 (W-C 1995) included the installation and sampling of a monitoring well downgradient from the landfill to investigate groundwater in the area of SWMU 105. Quarterly monitoring of this well was conducted for two sampling events in 1996, then annual monitoring was conducted in 1997 and 1998. Comparisons of the results of these sampling events to the corresponding USEPA MCLs indicated that NFA is required at SWMU 105.

Based on the conclusions of the RFI and the Phase II RFI, the recommendation of a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

52.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

52.2.1 Site Description

Landfill No. 3 (SWMU 105) is an inactive, unlined, cut-and-fill landfill occupying approximately 13.5 acres along the eastern boundary of Cannon AFB (Figure 52-1 in Appendix A). This SWMU is bound to the north by a road leading to the Base's transmitter tower, to the east and south by barbed wire fences installed along the Base's boundary, and to the west by Perimeter Road. The ground surface is slightly hummocky and is covered with native prairie grasses. The remnant depressions observed at the surface of this SWMU are most likely the locations of former disposal trenches where settling has occurred (W-C 1995).

52.2.2 Operational History

Landfill No. 3 accepted wastes between 1959 and 1967. The landfill's operation apparently consisted of placing waste in trenches and burning it before burying it. The landfill reportedly received domestic solid wastes and shop wastes, which included waste oils and solvents, paint strippers and thinners, outdated paint, pesticide containers, and various empty cans and drums (Radian 1986).

During a 1985 IRP Phase II Investigation, Radian drilled and sampled nine soil borings in the area of Landfill No. 3. The area of this SWMU was investigated due to its proximity to the Base boundary, to a disposal lake, and to a Base drinking water well, and due to records of past hazardous waste disposal in this landfill. Twenty-seven soil samples collected at depths ranging from 0 to 59.5 feet were analyzed for metals, oils and greases, and purgeable and aromatic hydrocarbons. Based on the insignificant concentrations of these chemicals detected in the samples, the report recommended NFA for SWMU 105.

52.3 LAND USE

52.3.1 Current

The site of Landfill No. 3 is currently a vacant, grass-covered field that is no longer in use. Waste has not been accepted at Landfill No. 3 since 1967.

52.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the area is currently vacant and unoccupied. Use classification will continue to remain industrial in nature.

52.4 INVESTIGATIVE ACTIVITIES

52.4.1 Summary

The IRP Phase II Investigation included drilling and sampling nine soil borings in the area of Landfill No. 3. Soil samples collected at depths ranging from 0 to 59.5 feet were analyzed for metals, oils and greases, and halogenated and aromatic organics. Insignificant concentrations of these chemicals were detected in the samples, and the report recommended NFA for SWMU 105. Based on the date of the IRP Phase II Investigation, the analyses completed (i.e., oil and grease, and halogenated and aromatic organics), and the lack of significant results from the IRP Phase II, this investigation is not discussed in further detail below.

The RFI, conducted by Radian in 1992, investigated potential soil contamination in the area of SWMU 105. The BRA, completed using the results of the RFI, recommended NFA for SWMU 105.

During the Phase II RFI, a monitoring well was installed downgradient from SWMU 105, and groundwater samples were subsequently collected five times between 1995 and 1998. Analytical results from these samples detected insignificant concentrations of groundwater contaminants in the area of Landfill No. 3.

Based on the conclusions reached in the IRP Phase II, the RFI, and the Phase II RFI, the recommendation of No Further Response Action Planned is warranted for SWMU 105.

52.4.2 Investigation #1: RCRA Facility Investigation Report for Landfill No. 3 (SWMU 105)

52.4.2.1 Non-Sampling Data Collection

The RFI included a BRA completed using the results of this investigation. The BRA, discussed below, indicated that there is no unacceptable risk to human health or the environment from this SWMU (Radian 1994).

52.4.2.2 Sampling Data Collection

An RFI was completed at SWMU 105 to determine whether a release of landfill-related chemicals had occurred. As part of this investigation, an exploration trench was dug to locate the bottom of the landfill. In addition, 12 borings were drilled and subsurface soil samples were collected from depth intervals ranging from 20 to 61 feet and submitted for chemical analyses (Figure 52-1 in Appendix A). These intervals were chosen because they had not been sampled during the IRP Phase II Investigation and because the vertical extent of any potential contamination had not been determined. Target analytes for the 141 subsurface and three surface samples included VOCs, SVOCs, organochlorine pesticides, PCBs, TRPH, and TAL metals.

52.4.2.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the RFI QAPP, and to complete the BRA. Therefore, no data gaps existed after the completion of the RFI.

52.4.2.4 Results and Conclusions

Toluene, methylene chloride, xylenes, and bis(2-ethylhexyl) phthalate were detected at concentrations of potential concern during the RFI at Landfill No. 3. All other VOCs and SVOCs detected were excluded from concern because they were considered to be laboratory contaminants.

Detected pesticides and PCBs included 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, dieldrin, endrin, endrin aldehyde, heptachlor epoxide, methoxychlor, beta-BHC, delta-BHC, gamma-BHC, Aroclor 1254, and Aroclor 1260.

Fourteen metals (aluminum, barium, beryllium, calcium, chromium, cobalt, copper, iron, magnesium, nickel, potassium, selenium, vanadium, and zinc) were detected in concentrations exceeding the UTLs calculated from background concentrations for the area around SWMU 105. The analytical results of this investigation are presented in Tables 52-1a, 52-1b, and 52-1c in Appendix B.

Groundwater was not investigated in this phase of the investigation because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater was greater than 250 feet at Cannon AFB, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The landfill material encountered during the RFI included construction debris and domestic waste. No liquid wastes or soils saturated with liquid wastes were encountered during the field activities.

Based on the results of a BRA completed as part of this investigation, the RFI report recommended NFA for SWMU 105.

52.4.3 Investigation #2: Phase II RCRA Facility Investigation Report for Landfill No. 3 (SWMU 105)

52.4.3.1 Non-Sampling Data Collection

A formal risk assessment was not completed using the groundwater monitoring results from Landfill No. 3. However, a risk screening was completed by comparing the analytical results from the groundwater samples to the corresponding USEPA MCLs. The results of this risk screening are discussed below.

52.4.3.2 Sampling Data Collection

A Phase II RFI was completed at SWMU 105 to determine whether a release of landfill-related chemicals to groundwater in the area of SWMU 105 had occurred. One groundwater monitoring well was installed and developed downgradient from Landfill No. 3. The total depth of the boring was 304.3 feet. The screened interval was located from a depth of 273.9 to a depth of 303.9 feet below ground surface.

Geotechnical samples were collected and analyzed from within the screened interval at depths of 280, 290, and 300 feet, but no samples were collected for chemical analyses. Although no samples were collected for chemical analyses, soils encountered in the boring were field screened for headspace information. The highest headspace readings observed were 0.3 ppm. However, these readings most likely resulted from soil moisture, not the presence of organic contaminants in the soil.

After the well had been developed, a groundwater sample was collected and analyzed for VOCs, SVOCs, pesticides/PCBs, herbicides, metals, TPH, and TRPH. Additional samples were collected from the well in March 1996, June 1996, December 1997, and December 1998. In addition to being analyzed for the same parameters as the initial sample, the four other samples were also analyzed for several additional parameters, including general chemistry parameters, dioxins, and cyanide, all of which yielded insignificant results.

52.4.3.3 Data Gaps

The data quality was deemed to be sufficient to meet the quality assurance objectives of the Phase II RFI QAPP. Therefore, no data gaps existed after the completion of the Phase II RFI.

52.4.3.4 Results and Conclusions

Four VOCs (carbon tetrachloride, chloroform, methylene chloride, and trichloroethene) and two SVOCs (bis(2-ethylhexyl) phthalate and di-n-butyl phthalate) were detected in at least one groundwater sample collected during the five sampling events. Ten metals (arsenic, barium, copper, magnesium, potassium, selenium, silver, sodium, vanadium, and zinc) were also detected. In addition, TPH was detected in the initial groundwater sample. No pesticides/PCBs, herbicides, dioxins, etc., were detected in any of the samples, and none of the general chemistry

results were above corresponding USEPA MCL or secondary MCL. The analytical results of this investigation are presented in tables 52-1a and 52-1b.

Based on the results of risk screening completed on the results of these sampling events, NFA is recommended for SWMU 105.

52.5 SITE CONCEPTUAL MODEL

52.5.1 Nature and Extent of Contamination

Twelve analytical soil borings, to depths ranging from 20 to 61 feet, were installed and sampled during the RFI at Landfill No. 3 to identify any potential contamination in the subsurface interval not investigated during the IRP Phase II. Together with the results of the IRP Phase II, the analytical results of this investigation effectively delineated the extent of contamination in the area of SWMU 105. Chemical analyses detected elevated concentrations of metals and organic compounds in subsurface soil samples collected during the Phase II RFI at SWMU 105.

Three VOCs and one SVOC were detected at concentrations of potential concern during the RFI at Landfill No. 3. Twelve pesticides and two PCB compounds were also detected. In addition, fourteen metals were detected in concentrations exceeding the UTLs calculated from background concentrations for the area around SWMU 105.

During the Phase II RFI, a monitoring well was installed downgradient from SWMU 105, and groundwater samples were subsequently collected five times between 1995 and 1998.

Four VOCs and two SVOCs were detected in at least one groundwater sample collected during the five groundwater sampling events. Ten metals were also detected. In addition, TPH was detected in the initial groundwater sample.

52.5.2 Environmental Fate

Contaminants encountered at Landfill No. 3 could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – volatilization of organics and movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at SWMU 105, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time. The potential for metals to precipitate in the subsurface, thus limiting downward migration in the vadose zone, is evidenced by the caliche layers encountered in the borings drilled during the IRP Phase II, the RFI, and the Phase II RFI.

VOCs are likely to be relatively to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

The SVOCs detected are likely to be relatively immobile due to low vapor pressures, low water solubilities, and tendencies to adsorb to clays. In addition, these compounds have moderate to low biodegradation rates.

The pesticides and PCB compounds detected are likely to persist in the environment due to their extremely low vapor pressures, low water solubilities, and tendencies to readily adsorb to soil. These compounds also have low biodegradation rates.

52.6 SITE ASSESSMENTS

52.6.1 Summary

A BRA was conducted based on the results of the RFI. The results of the BRA are discussed below.

52.6.2 Screening Assessments

52.6.2.1 Human Health

A human health risk screening was completed for Landfill No. 3 to determine whether chemicals detected in soils at the site may pose an unacceptable risk to human health. Detected chemicals were evaluated based on detection frequency, comparison with background data, and availability of toxicity data. The results of this evaluation found elevated levels of two VOCs, two SVOCs, eight pesticides, TPH, and TRPH in the area of SWMU 105. These chemicals were considered the COCs for Landfill No. 3.

The maximum concentrations of chemicals detected in the five groundwater samples were compared to the applicable USEPA MCLs. None of the compounds with established MCLs exceeded the corresponding MCL. Based on the results of the human health risk screening, chemicals detected in groundwater in the area of Landfill No. 3 do not pose an unacceptable risk to human health.

52.6.2.2 Ecological

The ecological screening assessment focused on the potential for adverse effects to occur to selected indicator species (chemical receptors) from environmental stressors (COCs). Waterfowl, specifically dabbler ducks, were chosen as the indicator species for SWMU 105 (Radian 1994). Potential exposure of these ducks to contaminants originating in Landfill No. 3 would be via surface water runoff downgradient to the playa lake located approximately one-quarter mile to the north of this SWMU. Based on low annual precipitation (15 inches with low monthly averages of 0.4 inches during the winter) and the relatively low concentrations of COCs detected in the area of SWMU 105, few chemicals would likely be transported from the landfill to the playa lake. In addition, the ducks migrate through Clovis beginning in late October and potentially remain as late as mid-March during mild winters. The average amount of time ducks spend in the area is 1.5 to 3 months. Considering the low precipitation levels, the relatively low

concentrations of contaminants, and the limited amount of time duck spend in the area, the duck's level of exposure to SWMU chemicals is likely to be very low.

The MCLs to which the maximum concentrations of chemicals detected in the five groundwater samples were compared are also protective of the environment. Because none of the compounds detected exceeded the corresponding MCLs, the chemicals detected in groundwater in the area of Landfill No. 3 do not pose an unacceptable risk to the environment.

Based on the results of the ecological screening, chemicals detected in soils at Landfill No. 3 do not pose an unacceptable ecological risk.

52.6.3 Risk Assessments

52.6.3.1 Human Health

The BRA included three viable exposure pathways for off-site residents: ingestion of fruits and vegetables, ingestion of meats and dairy products, and inhalation of volatiles and particulates in the ambient air. Exposure concentrations were based on modeled on-site contaminant concentrations in surface water for purposes of predicting uptake and accumulation in food products, and predicted contaminant concentrations in ambient air based on soil sample analytical results.

Toluene was the only COC detected in surface soil samples, and was therefore considered the only contaminant that would be found at significant concentrations in the playa lake due to runoff from Landfill No. 3. However, toluene has not been classified by the USEPA as to its carcinogenicity, so no oral slope factor was available to evaluate carcinogenic risks. Therefore, carcinogenic effects were not assessed for ingestion pathways. In addition, the lack of slope factors for contaminants predicted to enter the atmosphere through volatilization (TPH, TRPH, tetrahydrofuran, trichloropropene) or wind entrainment (bis[2-ethylhexyl] phthalate) also precluded the evaluation of carcinogenic risks associated with the inhalation pathway.

The total hazard index for both adults and children, for both average exposure and RME, was calculated as 6×10^{-5}. This number fell below the USPEPA target of 1.0, indicating that contaminants that migrate off site are not likely to cause adverse noncarcinogenic health effects in adults or children under current exposure conditions. Because inhalation reference concentrations are not available for contaminants predicted to enter the atmosphere through volatilization (TPH, TRPH, tetrahydrofuran, trichloropropene) or wind entrainment (bis[2-ethylhexyl] phthalate), the evaluation of noncarcinogenic risks associated with the inhalation pathway was precluded.

Based on the results of the human health risk screening, a risk assessment was not warranted for the chemicals detected in the groundwater in the area of Landfill No. 3.

52.6.3.2 Ecological

A formal ecological risk assessment was not warranted SWMU 105.

52.6.4 Other Applicable Assessments

52.6.4.1 Surface Water

SWMU 105 contained no surface water.

52.6.4.2 Groundwater

During the Phase II RFI, a monitoring well was installed downgradient from SWMU 105, and groundwater samples were subsequently collected and analyzed five times between 1995 and 1998. Analytical results from these samples detected insignificant concentrations of groundwater contaminants in the area of Landfill No. 3.

52.6.4.3 Underground Storage Tanks (USTs)

There is no record of storage tanks, either underground or aboveground, in the area of SWMU 105.

52.6.4.4 Other

No other assessments have been conducted in the area of SWMU 105.

52.7 NO FURTHER ACTION PROPOSAL

52.7.1 Rationale

Based on the conclusions reached in the Phase II RFI, NFA has been recommended for SWMU 105.

52.7.2 Criterion

SWMU 105 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

53.1 SUMMARY

SWMU 106, Fire Department Training Area No. 2, is located in the southeast corner of the Base, near abandoned north-south taxiway T-5 and bound to the north by an east-west paved road. The training area consists of two small round depressions in the land surface, characterized by sparse vegetation and measuring approximately 250 feet across. From 1968 to 1974, the SWMU was used concurrently with SWMU 107, Fire Department Training Area No. 3. During training exercises, the ground was saturated with water, then unused jet fuel (JP-4) was introduced and ignited for training purposes. Approximately 300 gallons of fuel was burned during each training exercise. The exercises occurred about eight times per year (W-C 1992).

An RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended that NFA or investigation was required at SWMU 106.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria and to RCRA action levels, or by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 106.

A RFI conducted at SWMU 106 in 1995 (W-C 1995) did not include any further sampling activities at Fire Department Training Area No. 2, instead the RFI (W-C 1995) reiterated the results of the RI.

The conclusions reached in the RI report, the BRA, and the RFI were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

53.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

53.2.1 Site Description

SWMU 106, Fire Department Training Area No. 2 is located in the southeast corner of the Base, near abandoned north-south taxiway T-5 and bound to the north by an east-west paved road (Figure 53-1 in Appendix A). The training area consists of two small round depressions in the land surface, characterized by sparse vegetation and measuring approximately 250 feet across. About eight times per year, approximately 300 gallons of jet fuel was burned during training exercises at the site (W-C 1992).

53.2.2 Operational History

From 1968 to 1974, SWMU 106 was used concurrently with SWMU 107 as a fire fighting training area. According to a Phase I IRP Records Search (CH2M Hill 1983), the potential existence of hazardous contaminants at Fire Department Training Area No. 2 was evaluated by reviewing existing information, including installation records.

One deep soil boring was drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986) conducted in 1984 and 1985. Soil samples from this investigation were analyzed for oil and grease, lead, and purgeable organic compounds to determine if environmental contamination had resulted from fire training exercises in the area of SWMU 106. The investigation concluded that this site did not pose a threat to surface water or groundwater in its vicinity.

Surface and subsurface samples were collected and analyzed during the RI conducted for 18 IRP/SWMU sites (W-C 1992) at Cannon AFB in 1991. Surface and subsurface samples were collected for chemical and/or geotechnical analyses to evaluate the nature and extent of any potential contamination in this area.

Later, an RFI (W-C 1995) reiterated the results of the RI.

53.3 LAND USE

53.3.1 Current

The area once occupied by SWMU 106 is now an open field covered with prairie grass. It is possible to discern the general area of this SWMU because of the two slight depressions in the ground surface and the sparse vegetative cover.

53.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. However, SWMU 106 has been inactive since 1974. Use classification will continue to remain industrial in nature.

53.4 INVESTIGATIVE ACTIVITIES

53.4.1 Summary

A Phase I IRP Records Search (CH2M Hill 1983) evaluated the potential existence of hazardous contaminants at Fire Department Training Area No. 2 by reviewing existing information, including installation records. One deep soil boring was drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986). Based on the date of the Phase II investigation, the analyses performed (i.e., oil and grease and purgeable organics), and the lack of significant results from the Phase II, this investigation is not discussed in further detail below. Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992). The RFI conducted at SWMU 106 (W-C 1995) did not include any further sampling activities at Fire Department Training Area No. 2, so this investigation is not discussed in further detail below.

53.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites

53.4.2.1 Non-Sampling Data Collection

In addition to the field investigation and data collection effort, the RI also included the performance of a BRA on the analytical data from SWMU 106. The BRA is addressed as Investigation #2 in Section 53.4.3 below.

53.4.2.2 Sampling Data Collection

Four soil borings were drilled and samples were collected for chemical and geotechnical analyses during the RI. Subsurface soil samples were collected from the borings to maximum depth intervals of 32 feet in three of the borings and of 31 feet in the fourth boring (Figure 53-1 in Appendix A). The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area of SWMU 106. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the Fire Department Training Area No. 2.

Soil samples collected at depths of 4, 10, 20, and 30 feet in the three borings drilled to 32 feet, and at depths of 6, 10, 20, and 30 feet in the boring drilled to 31 feet were analyzed for TCL VOCs, TPH, and lead/chromium. In addition, seven other subsurface samples were collected for geotechnical gradation analysis.

Four surface samples were also collected from the borings at depth intervals of 0 to 0.5 feet. Surface samples were analyzed for BTEX, TPH, and lead/chromium.

Two additional borings were drilled and sampled at locations near two of the previous borings after the laboratory missed the TCL VOCs holding times for several of the original samples. The samples, collected from one boring to a maximum depth of 6 feet and the other boring to a maximum depth of 32 feet, depending on which samples had missed holding times, were analyzed for TCL VOCs.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

53.4.2.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

53.4.2.4 Results and Conclusions

No TAL VOCs were detected in any of the subsurface samples collected during the RI, with the exception of acetone. However, acetone is a common laboratory contaminant, and its detection was attributed to laboratory contamination. Toluene was detected in one surface sample and

benzene was detected in a second, but the concentrations of these compounds were below the quantitation limits.

TPH was detected in surface samples at a maximum concentration of 232 mg/kg, but was not detected in any subsurface samples.

Lead and chromium were detected at concentrations exceeding the site background levels (W-C 1997a) in surface samples at maximum concentrations of 41.0 mg/kg and 19.2 mg/kg, respectively. Lead and chromium were not detected above the background levels in any of the subsurface samples. The analytical results for this investigation are presented in Tables 53-1a, 53-1b, and 53-1c in Appendix B.

The conclusions reached in the RI of 18 IRP/SWMU sites was based on the results of the BRA, and are discussed below.

53.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites

53.4.3.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the RI.

53.4.3.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #1 in Section 53.4.2 above.

53.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

53.4.3.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 106. Potential receptors at this SWMU for human health risks included workers at nearby Landfill No. 5. The major and complete exposure pathways for these workers included incidental soil ingestion, dermal contact, and inhalation of volatiles and fugitive particulates. Future workers performing intrusive actions and hypothetical future residents dwelling on the area of this SWMU were also considered potential receptors with the same exposure pathways listed above. For the purposes of the BRA, hazards and risks were combined across exposure pathways.

As shown in table 53-2a, the COCs identified for SWMU 106 were VOCs. The average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects (Table 53-2b in

Appendix B). This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 106.

Carcinogenic risks are also presented in Table 53-3 in Appendix B. The total carcinogenic risk (i.e., the risk for all pathways combined) for average and RME exposures at SWMU 106 fell below the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} (EPA 1989), with the exception of total RME cancer risk for the future hypothetical child resident (1.1×10^{-4}). The exposure pathway and chemical(s) contributing the majority of the cancer risk was the inhalation of VOCs. In this case, benzene contributed at least 80 percent of this risk, regardless of exposure scenario (i.e., average or RME). However, the chemicals contributing to the estimated risks were detected at extremely low frequencies. The highest values used in the calculation of risks were based on nondetect concentrations of these chemicals. The detection limits used ranged from approximately 30 to 60 mg/kg. Thus, the corresponding risk estimates are most likely based on matrix effects associated with the soils analyses. In addition, the fugitive VOC model that was used to estimate the airborne VOC concentrations did not take into account the biodegradation of benzene, which would tend to decrease fugitive VOC concentrations over time. Thus, the estimated VOC concentrations would probably not be sustained over the entire duration of exposure.

The maximum concentration of lead detected within SWMU 106's risk assessment area fell below the applicable USEPA residential soil guidance lead cleanup levels. Therefore, no unacceptable risk was expected due to the presence of lead at this SWMU.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, lead and chromium were the only COCs discussed in the ecological risk assessment that were also detected at SWMU 106. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC metals (including lead and chromium) pose a risk to small mammalian populations.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for this SWMU.

53.5 SITE CONCEPTUAL MODEL

53.5.1 Nature and Extent of Contamination

Toluene was detected in one surface sample and benzene was detetced in a second, but the concentrations of these compounds were below the quantitation limits. No VOCs, aside from acetone, a common laboratory contaminant, were detected in any of subsurface soil samples.

TPH was detected in surface samples at a maximum concentration of 232 mg/kg, but was not detected in any subsurface samples.

Lead and chromium were detected at concentrations exceeding the site background levels (W-C 1997a) in surface samples at maximum concentrations of 41.0 mg/kg and 19.2 mg/kg, respectively. Lead and chromium were not detected above the background levels in any of the subsurface samples.

53.5.2 Environmental Fate

Based on site conditions at SWMU 106, applicable exposure pathways include incidental soil ingestion, dermal contact, and inhalation of volatiles and fugitive particulates. All HIs for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risks at SWMU 106 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). The maximum concentration of lead detected in soil fell below the applicable USEPA guidance for residential soil lead. The BRA indicated that no unacceptable risk was expected at SWMU 106.

Potential risks from the COCs lead and chromium in soil to biota were calculated, and it was determined that neither of these COC metals pose a risk to small mammalian populations or other biota. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur, and thus no risk of exposure via the groundwater pathway.

53.6 SITE ASSESSMENTS

53.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 106. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 106.

53.6.2 Screening Assessments

53.6.2.1 Human Health

The COPCs identified for SWMU 106 included metals and VOCs. These chemicals were initially screened by comparing their detected concentrations to RFI criteria and proposed RCRA action levels.

The comparison identified lead, chromium, benzene, and toluene as COCs. All COCs were subjected to a quantitative characterization of risk.

53.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was

detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). Lead and chromium were the only COPCs detected at SWMU 106 that were addressed by the ecological risk assessment. Both lead and chromium were considered COCs based on a comparison to applicable screening criteria.

53.6.3 Risk Assessments

53.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included workers at nearby Landfill No. 5, future workers performing intrusive actions, and hypothetical future residents dwelling on the area of this SWMU.

Based on site conditions at SWMU 106, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 106 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 106.

53.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the maximum metal concentrations detected at all 18 IRP/SWMUs addressed by the RI, and based on the calculated toxicity values for incidental soil ingestion, none of the COC metals (including lead and chromium) posed a significant risk to small mammalian populations or other biota. Based on the results of the BRA, NFA was recommended for SWMU 106.

53.6.4 Other Applicable Assessments

53.6.4.1 Surface Water

SWMU 106 contained no surface water.

53.6.4.2 Groundwater

Groundwater at SWMU 106 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

53.6.4.3 Underground Storage Tanks (USTs)

Based on a review of available information, there have never been USTs located at SWMU 106.

53.6.4.4 Other

A Phase I IRP Records Search (CH2M Hill 1983) evaluated the potential existence of hazardous contaminants at Fire Department Training Area No. 2 by reviewing existing information, including installation records.

One deep soil boring was drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986).

Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992).

The RFI conducted at SWMU 106 (W-C 1995) did not include any further sampling activities at Fire Department Training Area No. 2, instead the RFI for SWMU 106 reiterated the results of the RI.

No other assessments have been conducted in the area of SWMU 106.

53.7 NO FURTHER ACTION PROPOSAL

53.7.1 Rationale

Based on the conclusions reached in the RI, the BRA, and the RFI, NFA has been recommended for SWMU 106.

53.7.2 Criterion

SWMU 106 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

54.1 SUMMARY

SWMU 107, Fire Department Training Area No. 3, is located in the southeast corner of the Base, adjacent to and east of abandoned north-south taxiway T-5. The training area consists of an unlined surface area in a half-moon shape, measuring approximately 100 feet in length. The site has little vegetation, but was littered with numerous empty storage containers of various sizes at the time of the RI sampling event (W-C 1992). From 1968 to 1974, the SWMU was used concurrently with SWMU 106, Fire Department Training Area No. 2. During training exercises, the ground was first saturated with water, then unused jet fuel (JP-4) was introduced and ignited for training purposes. Approximately 300 gallons of fuel was burned during each training exercise. The exercises occurred about eight times per year (W-C 1992). More recently, according to the 1995 RFI (W-C 1995), the area of SWMU 107 has been used for activities associated with the adjacent ordnance training site.

An RI of 18 IRP/SWMU sites was completed in 1991 (W-C 1992). Based on the analytical results from this investigation, the RI report recommended that NFA or investigation was required at SWMU 107.

A BRA, performed using the results of the RI, was included in the RI report. The BRA assessed potential adverse human health and ecological effects by comparing soil data to risk-based RFI criteria and to RCRA action levels, or by calculating site-specific health risks. The BRA concluded that potential impacts to human health and the environment were insignificant at SWMU 107.

An RFI conducted at SWMU 107 in 1995 (W-C 1995) did not include any further sampling activities at Fire Department Training Area No. 3, instead the RFI reiterated the results of the RI.

The conclusions reached in the RI report, the BRA, and the RFI were consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

54.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

54.2.1 Site Description

SWMU 107, Fire Department Training Area No. 3, is located in the southeast corner of the Base, adjacent to and east of abandoned north-south taxiway T-5 (Figure 54-1 in Appendix A). The training area consists of an unlined surface area in a half-moon shape, measuring approximately 100 feet in length. The site has little vegetation, but was littered with numerous empty storage containers of various sizes at the time of the RI sampling event (W-C 1992). During training exercises, the ground was saturated with water, then approximately 300 gallons of jet fuel was ignited for training purposes. More recently, according to the 1995 RFI, the area of SWMU 107 has been used for activities associated with the adjacent ordnance training site.

54.2.2 Operational History

From 1968 to 1974, SWMU 107 was used concurrently with SWMU 106 as a fire fighting training area. According to a Phase I IRP Records Search (CH2M Hill 1983), the potential existence of hazardous contaminants at Fire Department Training Area No. 3 was evaluated by reviewing existing information, including installation records.

One deep soil boring was drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986) conducted in 1984 and 1985. Soil samples from this investigation were analyzed for oil and grease, lead, and purgeable organic compounds to determine if environmental contamination had resulted from fire training exercises in the area of SWMU 107. The investigation concluded that this site did not pose a threat to surface water or groundwater in its vicinity.

Surface and subsurface samples were collected and analyzed during the RI conducted for 18 IRP/SWMU sites (W-C 1992) at Cannon AFB in 1991. Surface and subsurface samples were collected for chemical and/or geotechnical analyses to evaluate the nature and extent of any potential contamination in this area.

Later, an RFI (W-C 1995) reiterated the results of the RI, and added that the site had been used more recently for activities associated with the adjacent ordnance training site.

54.3 LAND USE

54.3.1 Current

The area once occupied by SWMU 107 is now an open field covered with prairie grass. It is possible to discern the general area of this SWMU because of sparse vegetative cover in this area.

54.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the facility will remain active for the foreseeable future. However, SWMU 107 has been inactive since 1974. Use classification will continue to remain industrial in nature.

54.4 INVESTIGATIVE ACTIVITIES

54.4.1 Summary

A Phase I IRP Records Search (CH2M Hill 1983), evaluated the potential existence of hazardous contaminants at Fire Department Training Area No. 3 by reviewing existing information, including installation records. One deep soil boring was drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986). Based on the date of the Phase II investigation, the analyses performed (i.e., oil and grease and purgeable organics), and the lack of significant results from the Phase II, this investigation is not discussed in further

detail below. Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992). The RFI conducted at SWMU 107 (W-C 1995) did not include any further sampling activities at Fire Department Training Area No. 3, so this investigation is not discussed in further detail below.

54.4.2 Investigation #1: Remedial Investigation (RI) of 18 IRP/SWMU Sites

54.4.2.1 Non-Sampling Data Collection

In addition to the field investigation and data collection effort, the RI also included the performance of a BRA on the analytical data from SWMU 107. The BRA is addressed as Investigation #2 in Section 54.4.3 below.

54.4.2.2 Sampling Data Collection

Four soil borings were drilled and samples were collected for chemical and geotechnical analyses during the RI (Figure 54-1 in Appendix A). Subsurface soil samples were collected from the borings to maximum depth intervals of 31 feet in three of the borings and of 67 feet in the fourth boring. The boring locations and total depths were chosen to evaluate the nature and extent of potential hazardous contaminants in the area of SWMU 107. Samples were selected for analyses from varying depth intervals to provide a cross-section profile of the Fire Department Training Area No. 3.

Soil samples were collected at depths of 5, 10, 20, and 29.5 feet in one boring, 4, 10, 20, and 30 feet in the second and third borings, and at depths of 4, 10, 20, 30, 45, 50, and 60 feet in the fourth boring drilled to 67 feet. The samples were analyzed for TCL VOCs, TPH, and lead/chromium. In addition, seven other subsurface samples were collected for geotechnical gradation analysis.

Four surface samples were also collected from the borings at depth intervals of 0 to 0.5 feet. Surface samples were analyzed for BTEX, TPH, and lead/chromium.

Two additional borings were drilled and sampled at locations near two of the previous borings after the laboratory missed the TCL VOCs holding times for several of the original samples. The samples, collected from one boring to a maximum depth of 31 feet and the other boring to a maximum depth of 52 feet, depending on which samples had missed holding times, were analyzed for TCL VOCs.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater at Cannon AFB is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

54.4.2.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

54.4.2.4 Results and Conclusions

No TAL VOCs were detected in any of the subsurface samples collected during the RI, with the exception of acetone and BTEX compounds. However, acetone is a common laboratory contaminant, and its detection was attributed to laboratory contamination. Xylenes were detected in one boring at a maximum concentration of 94 mg/kg. Ethylbenzene was also detected in the same boring at a maximum concentration of 15 mg/kg. Benzene and toluene were not detected in any of the samples above the quantitation limits.

TPH was detected in the four surface samples at a maximum concentration of 6,080 mg/kg, and was detected in subsurface samples at potentially significant concentrations to a maximum depth of 32 feet.

Lead was detected at concentrations exceeding the site background levels (W-C 1997a) in two surface samples at a maximum concentration 322 mg/kg. Lead was not detected above the background levels in any of the subsurface samples. Chromium was detected infrequently and in concentrations comparable to site background levels. The analytical results from this investigation are presented in Tables 54-1a, 54-1b, and 54-1c in Appendix B.

The conclusions reached in the RI of 18 IRP/SWMU sites was based on the results of the BRA, and are discussed below.

54.4.3 Investigation #2: Baseline Risk Assessment (BRA) of 18 IRP/SWMU Sites

54.4.3.1 Non-Sampling Data Collection

No additional sampling data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the RI.

54.4.3.2 Sampling Data Collection

No data was collected during the BRA. However, the BRA was included in the RI report. The RI was addressed as Investigation #1 in Section 54.4.2 above.

54.4.3.3 Data Gaps

It was concluded that the data collected during the RI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the RI and the BRA. Therefore, no data gaps existed.

54.4.3.4 Results and Conclusions

The BRA used validated soil data collected as part of the RI to identify and select COCs for the quantitative characterization of risk at SWMU 107. Potential receptors at this SWMU for human health risks included workers at nearby Landfill No. 5. The major and complete exposure pathways for these workers included incidental soil ingestion, dermal contact, and inhalation of volatiles and fugitive particulates. Future workers performing intrusive actions and hypothetical future residents dwelling on the area of this SWMU were also considered potential receptors with the same exposure pathways listed above. For the purposes of the BRA, hazards and risks were combined across exposure pathways.

The COCs identified for SWMU 107 were VOCs. As shown in Table 54-2a in Appendix B, the average exposures and RME for all hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. This indicated that no unacceptable risk of noncarcinogenic effects was expected at SWMU 107.

Carcinogenic risks are also presented in Table 54-2b in Appendix B. The total carcinogenic risk (i.e., the risk for all pathways combined) for average and RME exposures at SWMU 107 fell below the USEPA's target risk range of 1×10^{-4} to 1×10^{-6} (EPA 1989), with the exception of total RME cancer risk for the future hypothetical child resident (1.1×10^{-4}). The exposure pathway and chemical(s) contributing the majority of the cancer risk was the inhalation of VOCs. In this case, benzene contributed at least 80 percent of this risk, regardless of exposure scenario (i.e., average or RME). However, the chemicals contributing to the estimated risks were detected at extremely low frequencies. The highest values use in the calculation of risks were based on nondetect concentrations of these chemicals. The detection limits used ranged from approximately 30 to 60 mg/kg. Thus, the corresponding risk estimates are most likely based on matrix effects associated with the soils analyses. In addition, the fugitive VOC model that was used to estimate the airborne VOC concentrations did not take into account the biodegradation of benzene, which would tend to decrease fugitive VOC concentrations over time. Thus, the estimated VOC concentrations would probably not be sustained over the entire duration of exposure.

The maximum concentration of lead detected within the SWMU 107 risk assessment area fell below the applicable USEPA guidance for residential soil lead cleanup levels. Therefore, no unacceptable risk was expected due to the presence of lead at this SWMU.

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). However, lead and chromium were the only COCs discussed in the ecological risk assessment that were also detected at SWMU 107. Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the calculated toxicity values for incidental soil ingestion, it was determined that none of the COC metals (including lead and chromium) pose a risk to small mammalian populations.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, no further response action was recommended for this SWMU.

54.5 SITE CONCEPTUAL MODEL

54.5.1 Nature and Extent of Contamination

Xylenes were detected in one boring at a maximum concentration of 94 mg/kg. Ethylbenzene was also detected in the same boring at a maximum estimated concentration of 15 mg/kg. Benzene and toluene were not detected in any of the samples above the quantitation limits.

TPH was detected in the four surface samples at a maximum concentration of 6,080 mg/kg, and was detected in subsurface samples at potentially significant concentrations to a maximum depth of 32 feet.

Lead was detected at concentrations exceeding the site background levels (W-C 1997a) in two surface samples at a maximum concentration 322 mg/kg. Lead was not detected above the background levels in any of the subsurface samples. Chromium was detected infrequently and in concentrations comparable to site background levels.

54.5.2 Environmental Fate

Based on site conditions at SWMU 107, applicable exposure pathways include incidental soil ingestion, dermal contact, and inhalation of volatiles and fugitive particulates. All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risks at SWMU 107 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). The maximum concentration of lead detected in soil fell below the applicable USEPA guidance for residential soil lead cleanup levels. The BRA indicated that no unacceptable risk was expected at SWMU 107.

Potential risks from the COCs lead and chromium in soil to biota were calculated, and it was determined that neither of these COC metals pose a risk to small mammalian populations or other biota. Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur, and thus no risk of exposure via the groundwater pathway.

54.6 SITE ASSESSMENTS

54.6.1 Summary

A BRA was conducted based on the results of the RI for SWMU 107. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 107.

54.6.2 Screening Assessments

54.6.2.1 Human Health

The COPCs identified for SWMU 107 included metals and VOCs. These chemicals were initially screened by comparing their detected concentrations to RFI criteria and proposed RCRA action levels.

The comparison identified lead, chromium, benzene, and toluene as COCs. However, only lead was detected at potentially significant concentrations at SWMU 107. All COCs were subjected to a quantitative characterization of risk.

54.6.2.2 Ecological

A single ecological risk assessment was included in the BRA for all 18 IRP/SWMU sites covered by the RI report. The ecological risk assessment addressed each chemical that was detected in the soils at Cannon AFB at concentrations determined to exceed background levels (W-C 1997a). Lead and chromium were the only COPCs detected at SWMU 107 that were addressed by the ecological risk assessment. However, only lead was considered a COC based on a comparison to applicable screening criteria.

54.6.3 Risk Assessments

54.6.3.1 Human Health

Potential receptors at this SWMU for human health risks included workers at nearby Landfill No. 5, future workers performing intrusive actions, and hypothetical future residents dwelling on the area of this SWMU.

Based on site conditions at SWMU 107, the most significant exposure pathways include inhalation of fugitive VOCs or dust, and direct contact with soil resulting in incidental ingestion or dermal absorption of chemicals from soil.

All hazard indices for subchronic and chronic exposures to site COCs fell below the USEPA's level of concern (1.0) for noncarcinogenic effects. In addition, the total carcinogenic risk for workers at SWMU 107 fell below the USEPA's target risk range (1×10^{-4} to 1×10^{-6}). This indicated that no unacceptable risk of noncarcinogenic or carcinogenic effects was expected at SWMU 107.

54.6.3.2 Ecological

Potential risk from metals in soil to biota was considered greatest through direct exposure of small mammals and other ground-dwelling organisms. Based on the maximum metal concentrations detected at all 18 IRP/SWMU sites addressed by the RI, and based on the calculated toxicity values for incidental soil ingestion, none of the COC metals (including lead) posed a significant risk to small mammalian populations or other biota. Based on the results of the BRA, NFA was recommended for SWMU 107.

54.6.4 Other Applicable Assessments

54.6.4.1 Surface Water

SWMU 107 contained no surface water.

54.6.4.2 Groundwater

Groundwater at SWMU 107 has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

54.6.4.3 Underground Storage Tanks (USTs)

Based on a review of available information, there have never been USTs located at SWMU 107.

54.6.4.4 Other

A Phase I IRP Records Search (CH2M Hill 1983), evaluated the potential existence of hazardous contaminants at Fire Department Training Area No. 3 by reviewing existing information, including installation records.

One deep soil boring was drilled and samples were collected for chemical analyses during a Phase II (Stage 1) investigation (Radian 1986).

Soil borings were drilled and surface samples were collected during the RI conducted at 18 IRP/SWMU sites in 1991 (W-C 1992).

The RFI conducted at SWMU 107 (W-C 1995) did not include any further sampling activities at Fire Department Training Area No. 3, instead the RFI for SWMU 107 reiterated the results of the RI.

No other assessments have been conducted in the area of SWMU 107.

54.7 NO FURTHER ACTION PROPOSAL

54.7.1 Rationale

Based on the conclusions reached in the RI, the BRA, and the RFI, no further response action has been recommended for SWMU 107.

54.7.2 Criterion

SWMU 107 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

55.1 SUMMARY

An RFA (A.T. Kearney 1987) described the suspected SWMU 124 location as being an inactive UST in the area of Facility 4028. However, site inspections, record searches, and interviews with facility personnel failed to reveal the existence of a UST, other than a UST associated with SWMU 48A, in this area. It was determined that SWMU 124 must have been a duplication of SWMU 48A.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

55.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

55.2.1 Site Description

Refer to summary in Section 55.1 above.

55.2.2 Operational History

Refer to summary in Section 55.1 above.

55.3 LAND USE

55.3.1 Current

Refer to summary in Section 55.1 above.

55.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 124 was determined a duplicate of SWMU 48A and; as such, never existed. Use classification will continue to remain industrial in nature.

55.4 INVESTIGATIVE ACTIVITIES

SWMU 124 is a duplicate of SWMU 48A. Therefore, the area misidentified as SWMU 124 was never investigated.

55.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 124 has never been the subject of a conceptual model.

55.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 124.

55.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 124.

55.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 124.

55.6.3 Other Applicable Assessments

55.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 124.

55.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 124 contained no means for groundwater discharges to occur.

55.6.3.3 Underground Storage Tanks (USTs)

SWMU 124 was determined to be a duplicate of SWMU 48A, and as such, never existed.

55.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 124.

55.7 NO FURTHER ACTION PROPOSAL

55.7.1 Rationale

Because SWMU 124 never existed, NFA is recommended for SWMU 124.

55.7.2 Criterion

SWMU 124 is proposed for NFA based on NMED NFA Criterion 1: This SWMU is a duplicate of SWMU 48A.

56.1 SUMMARY

An RFA (A.T. Kearney 1987) described the suspected SWMU 124 location as a UST of unknown dimensions, capacity, and construction adjacent to Building 357. However, site inspection and record searches failed to reveal the existence of this unit. Interviews with paint shop personnel indicated that a UST had been removed prior to the effective date of the NMED UST regulations. However, real property records indicate that the tank had been abandoned in place. In either case, there was no evidence indicating that this UST had been used for waste storage. Therefore, it is likely that this tank, which had been removed or abandoned in place, was mistakenly identified as a SWMU.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

56.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

56.2.1 Site Description

Refer to summary in Section 56.1 above.

56.2.2 Operational History

Refer to summary in Section 56.1 above.

56.3 LAND USE

56.3.1 Current

Refer to summary in Section 56.1 above.

56.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, it was determined that SWMU 125 does not exist. Use classification will continue to remain industrial in nature.

56.4 INVESTIGATIVE ACTIVITIES

SWMU 125 does not exist. Therefore, the area misidentified as SWMU 125 was never investigated.

56.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 125 has never been the subject of a conceptual model.

56.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 125.

56.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 125.

56.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 125.

56.6.3 Other Applicable Assessments

56.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 125.

56.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 125 contained no means for groundwater discharges to occur.

56.6.3.3 Underground Storage Tanks (USTs)

SWMU 125 does not exist. However, the UST formerly located in the area misidentified as SWMU 125 was either removed or abandoned in place prior to the effective date of the NMED UST regulations.

56.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 125.

56.7 NO FURTHER ACTION PROPOSAL

56.7.1 Rationale

Because SWMU 125 does not exist, NFA is recommended for SWMU 125.

56.7.2 Criterion

SWMU 125 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

57.1 SUMMARY

The area misidentified as SWMU 126 was actually a heating oil tank associated with Building 163. This building was demolished in 1985, and Building 164 was subsequently constructed in its place. The tank was located in front of Hangar 162 (A.T. Kearney 1987). Hangar 162 was demolished and the tank was removed following NMED UST regulations. No contamination was encountered during the removal activities. Because the heating oil tank was never used for the management of wastes, it was not a SWMU. Storage tanks are not included in the definition of a SWMU as defined in the following excerpt from the RFA Guidance (USEPA 1987): "The definition does not include...units in which wastes have not been managed (e.g., product storage areas)."

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

57.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

57.2.1 Site Description

Refer to summary in Section 57.1 above.

57.2.2 Operational History

Refer to summary in Section 57.1 above.

57.3 LAND USE

57.3.1 Current

Refer to summary in Section 57.1 above.

57.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the area misidentified as SWMU 126 was never used for the management of wastes. Use classification will continue to remain industrial in nature.

57.4 INVESTIGATIVE ACTIVITIES

Samples were collected from the area misidentified as SWMU 126 in accordance with NMED UST regulations during the tank removal activities.

57.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 126 has never been the subject of a conceptual model.

57.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 126.

57.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 126.

57.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 126.

57.6.3 Other Applicable Assessments

57.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 126.

57.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 126 contained no means for groundwater discharges to occur.

57.6.3.3 Underground Storage Tanks (USTs)

The heating oil tank located in the area misidentified as SWMU 126 was removed in accordance with NMED UST regulations.

57.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 126.

57.7 NO FURTHER ACTION PROPOSAL

57.7.1 Rationale

Because SWMU 126 was never used for the management of wastes, NFA is recommended for SWMU 126.

57.7.2 Criterion

SWMU 126 is proposed for NFA based on NMED NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents, or other CERCLA hazardous substances.

58.1 SUMMARY

SWMU 127 consisted of the Sand Trap and Leach Field Associated with Facility 4095 (#1), and has been listed as an Appendix III site. A Phase I RFI of the Appendix III sites (W-C 1994a) found elevated levels of metals and organic compounds in the area of SWMU 127. The Phase I RFI report recommended conducting a BRA at this site.

A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU. Based on this the BRA recommended NFA for SWMU 127.

A Phase II RFI of the Appendix III sites (W-C 1997d) also found elevated levels of metals and organic compounds in the area of this SWMU. However, the report documenting this investigation noted that none of the concentrations of metals or organics exceeded the USEPA target risk range. The Phase II RFI report recommended no further investigation at this site.

The results of the human health and ecological risk evaluations conducted during the CMS (URSGWC 2000) at SWMU 127 indicate there is no unacceptable risk to human health and the environment. Based on the maximum concentrations of COCs detected, and the results of vadose zone fate and transport modeling at SWMU 127, an NFA alternative was recommended.

The conclusions reached in the BRA, the Phase II RFI, and the CMS are consistent in recommending no further work at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

58.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

58.2.1 Site Description

This SWMU consisted of a 135-gallon concrete sand trap and leach field that received wash water from the POL refueling truck wash rack at Facility 4095 (Figure 58-1 in Appendix A). The sand trap measured 2.5 feet by 4.5 feet in plan and extended approximately 3.5 feet below the pavement. The sand trap discharged to a rectangular leach field approximately 300 square feet in size, located approximately 60 feet east of the wash rack. There are no aboveground or underground tanks located at Facility 4095.

58.2.2 Operational History

The sand trap became active in 1977. However, the leach field ceased to function in the late 1980s. The old leach field was bypassed and an OWS enclosed in a concrete vault was subsequently installed in line with the wash rack's drainpipe and downstream from the sand trap in 1991. The original leach field remains in place, but is no longer used. Wastewater now drains to a new leach field approximately 40 feet southeast of the wash rack. Potential contaminants include JP-4 fuel and oil and grease.

The OWS vault was inspected as part of the Phase I RFI. The unit consists of a three-compartment steel tank with clean-out access for each compartment. No evidence of any leakage or spillage was found, and the OWS should not be considered part of SWMU 127.

The wash rack sand trap continues to receive heavy usage. The wastewater from the OWS discharges to a new leach field located northeast of the former leach field, and recovered petroleum products are temporarily stored in the OWS for future recycling.

58.3 LAND USE

58.3.1 Current

The current land use of the SWMU location is industrial.

58.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, it is possible that a change in the flying mission of Cannon AFB could result in the closure of SWMU 127. Use classification will continue to remain industrial in nature.

58.4 INVESTIGATIVE ACTIVITIES

58.4.1 Summary

A Phase I RFI of the Appendix III sites (W-C 1994a) found elevated levels of metals and organic compounds in the area of SWMU 127. A BRA of the Appendix III SWMUs (W-C 1994b) found that no unacceptable human health or ecological risks due to chemical releases are expected at this SWMU. A Phase II RFI of the Appendix III sites (W-C 1997d) also found elevated levels of metals and organic compounds in the area of this SWMU. The results of the human health and ecological risk evaluations conducted during the CMS (URSGWC 2000) at SWMU 127 indicate there is no unacceptable risk to human health and the environment.

58.4.2 Investigation #1: RCRA Facility Investigation (RFI), Appendix III SWMUs – Phase I

58.4.2.1 Non-Sampling Data Collection

The Phase I RFI was purely a field investigation and data collection effort. Therefore, non-sampling data was not collected during this investigation.

58.4.2.2 Sampling Data Collection

Eight borings were installed during the Phase I RFI (boring locations are shown in Figure 58-1 in Appendix A). Two 10-foot borings were drilled through holes cut in the concrete wash rack to

sample the soil beneath the pad. Soil samples were collected from the 0.5- to 2-foot, 2- to 4-foot, 4- to 6-foot, and 8- to 10-foot depth intervals to characterize the vertical distribution of potential contaminants. Minor visual and olfactory indications of contamination, probably attributable to spillage of JP-4 jet fuel on the wash rack, were found in the soils directly beneath the concrete pad.

One 60-foot boring was drilled adjacent to the OWS and five 60-foot borings were drilled within the new and abandoned leach fields. Soil samples were collected from the surface and from the 1.5- to 3.5-foot, 4- to 6-foot, 8- to 10-foot, 18- to 20-foot, 28- to 30-foot, 38- to 40-foot, 48- to 50-foot, and 58- to 60-foot depth intervals to characterize the vertical distribution of potential leachate contaminants percolating into the soil. Odors indicating subsurface contamination beyond the wash rack were encountered during the drilling of boring 12708, located in the new leach field.

Target analytes for all borings included VOCs, SVOCs, metals, and TRPH. Surficial samples were collected from directly beneath the concrete wash rack and from the 0.2- to 0.5-foot depth interval in areas with plant cover to provide surface soil data for risk assessment purposes.

58.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI. Therefore, no data gaps existed after the completion of the Phase I RFI.

58.4.2.4 Results and Conclusions

Six organic compounds and three metals were found at levels exceeding the corresponding RBCs. The highest concentrations of organics and metals were detected in near-surface samples. The vertical extent of contamination was characterized by the soil borings. The analytical results from this investigation are shown in Tables 58-1a and 58-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

The Phase I RFI recommended completing a BRA for SWMU 127.

58.4.3 Investigation #2: Baseline Risk Assessment (BRA) for Appendix III SWMUs – Phase I

58.4.3.1 Non-Sampling Data Collection

No additional data was collected as part of the BRA. However, a human health and ecological risk assessment that considered both present and future potential receptors, and all appropriate exposure pathways, was performed on the data collected during the Phase I RFI.

58.4.3.2 Sampling Data Collection

No data was collected during the BRA.

58.4.3.3 Data Gaps

It was concluded that the data collected during the Phase I RFI was sufficient to complete a BRA. In addition, the data quality was deemed to be sufficient to meet the objectives of the Phase I RFI and the BRA. Therefore, no data gaps existed.

58.4.3.4 Results and Conclusions

Potential receptors at SWMU 127 for human health risks included occupational workers, hypothetical future construction workers, and hypothetical future trespassers. The receptors were assumed to be exposed to soil via ingestion, dermal contact, and inhalation pathways. The primary contributor to the risk was ingestion of PAHs in surface soils. The maximum potential excess human risk at SWMU 127 was 2×10^{-5} for occupational workers. This level fell within the USEPA's target risk range of 1×10^{-6} to 1×10^{-4} for risk from releases at hazardous waste sites, and indicated that no unacceptable risk was expected. The concentrations of COCs identified during the BRA are shown in Tables 58-2a and 58-2b in Appendix B. A summary of human health risks at SWMU 127 are shown in Table 58-2c in Appendix B.

Analytical data for soils was collected during the Phase I RFI, and fate and transport modeling was conducted to evaluate air and groundwater pathways for contaminants detected at SWMU 127. Both pathways were considered insignificant.

Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended at this SWMU.

58.4.4 Investigation #3: RFI, Appendix III SWMUs – Phase II

58.4.4.1 Non-Sampling Data Collection

The purpose of the Phase II RFI was to further characterize the nature and extent of contamination in the area of SWMU 127. In addition, the Phase II included a risk screening to verify whether the recommendation for NFA based on the BRA was appropriate for SWMU 127.

58.4.4.2 Sampling Data Collection

Eight borings were installed during the Phase II RFI (boring locations are shown in Figure 58-1 in Appendix A). Two borings to depths of 10 feet were drilled at the location of the POL wash rack. Three borings to depths of 60 feet were drilled in the area of the historic leach field and three borings to 60 feet were drilled in the area of the new leach field. The boring locations were chosen to further assess the lateral presence and extent of site-related soil contaminants.

Surface soil samples from all borings were collected from 0 to 0.5 feet. All eight borings were also sampled at intervals of 3 to 5 feet and 8 to 10 feet. Other samples collected from the 60-foot borings included depths of 13 to 15 feet, 18 to 20 feet, 23 to 25 feet, 28 to 30 feet, 33 to 35 feet, 38 to 40 feet, 48 to 50 feet, and 58 to 60 feet. Target analytes included VOCs, SVOCs, metals, and TRPH.

58.4.4.3 Data Gaps

Sufficient data was collected during the Phase II RFI to further characterize the nature and extent of contamination and conduct a risk screening at this SWMU. There were no sampling issues associated with the Phase II RFI that adversely affected data usability. In addition, the analytical data was judged acceptable for determining the nature and extent of contamination in the area of SWMU 127, and for completing the human health risk screening. Therefore, no data gaps existed.

58.4.4.4 Results and Conclusions

The Phase II RFI sampling results confirmed that contamination in the area of SWMU 127 is confined mainly to shallow soils. The NMED action levels for BTEX and benzene were not exceeded, but the maximum concentration of TRPH (11,600 mg/kg) did exceed the corresponding NMED action level of 1,000 mg/kg. However, TRPH was not detected in the 58- to 60-foot interval in any of the borings. Based on the fact that the depth to groundwater at Cannon AFB is greater than 250 feet, it is not likely that the TRPH would impact the site groundwater.

Eight metals detected during the Phase II RFI exceeded the background levels (W-C 1997a), and six of these metals exceeded the levels detected during the Phase I RFI.

Seventeen organic compounds were also detected at levels exceeding the concentrations detected during the Phase I. However, only one compound, dibenzo(a,h)anthracene, exceeded the residential soil RBCs. The risk posed by the maximum detected concentration of this compound was estimated at 3×10^{-6}, a level within the acceptable USEPA target risk range of 1×10^{-6} to 1×10^{-4} for exposure to chemicals released from hazardous waste sites. The analytical results from this investigation are shown in Tables 58-3a, 58-3b, 58-3c, and 58-3d in Appendix B.

Because there were no unacceptable health risks associated with SWMU 127, the Phase II RFI recommended that no further investigation was necessary for this SWMU.

58.4.5 Investigation #4: Corrective Measures Study (CMS) at SWMU 127

58.4.5.1 Non-Sampling Data Collection

Mathematical models were applied to a conceptual vadose zone model of SWMU 127 to evaluate the potential for contaminants detected in the soil above the MSSLs to be transported to underlying groundwater. The mathematical models used included the HELP Model, Version 3.01 (Schroeder et al. 1994) and the MULTIMED Version 2.00 (Salhorta et al. 1995).

58.4.5.2 Sampling Data Collection

No data was collected during the CMS.

58.4.5.3 Data Gaps

The data collected during the previous investigations was sufficient to perform human health and ecological risk evaluations, and to evaluate the results of the vadose zone fate and transport modeling. Therefore, no data gaps existed.

58.4.5.4 Results and Conclusions

As shown in Tables 58-4a and 58-4b in Appendix B results of the human health and ecological risk evaluations indicated that there was no unacceptable risk to human health and the environment based on the maximum detected concentrations of COCs in the soil at SWMU 127. In addition, results of the vadose zone fate and transport modeling showed, assuming sorption, dispersion, and biodegradation occurred, that the COCs would not reach groundwater above the maximum allowable concentrations for drinking water. The risk evaluations combined with the modeling were used to determine that the NFA alternative would be protective of human health and the environment at the lowest cost.

58.5 SITE CONCEPTUAL MODEL

58.5.1 Nature and Extent of Contamination

The Phase I and Phase II RFIs conducted at SWMU 127 found organic compounds and metals at levels of potential concern. Sixteen borings (4 to depths of 10 feet and 12 to depths of 60 feet) were installed during the two phases of the RFIs to effectively delineate the horizontal extent of contamination. The highest concentrations of organics and metals were detected in near-surface samples. The vertical extent of contamination was characterized by the soil borings.

Groundwater at SWMU 127 was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the SWMU.

58.5.2 Environmental Fate

Because chemicals were detected in soil at levels above MSSLs at SWMU 127, the fate and transport of contaminants in the vadose zone was modeled as part of the CMS to evaluate the potential for contaminants in soil to be transported to underlying groundwater.

The mathematical models HELP and MULTIMED were applied to a conceptual vadose zone model of SWMU 127. The HELP model was used to estimate a net infiltration rate for input into MULTIMED. MULTIMED was then used to model contaminant migration through the vadose zone to the water table.

The modeling results, which assume that sorption, dispersion, and biodegradation would have occurred, predicted that the COCs would not reach groundwater above the allowable concentrations for drinking water. The calculation and the model-predicted concentrations are shown in Tables 58-4a and 58-4b in Appendix B, respectively.

58.6 SITE ASSESSMENTS

58.6.1 Summary

A BRA was conducted based on the results of the Phase I RFI for SWMU 127. Based on the results of the BRA, no unacceptable human health or ecological risks due to chemical releases were expected from this SWMU. Therefore, NFA was recommended for SWMU 127.

A CMS was then conducted based on the results of the Phase I and II RFIs for SWMU 127. The results of the CMS are discussed below.

58.6.2 Screening Assessments

58.6.2.1 Human Health

For the Tier 1 evaluation, the maximum concentrations of COPCs detected during the Phase I and II RFIs were compared to the USEPA Region VI Residential MSSLs as part of the CMS. The comparison is shown in Table 58-4b in Appendix B. Benzene, xylenes, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene all exceeded the Tier 1 values. Therefore, these six chemicals were considered the COCs at SWMU 127 and a Tier 2 evaluation was performed (see Section 58.6.3.1).

58.6.2.2 Ecological

SWMU 127 encompassed a fenced area of mowed grass. It has been maintained as a near monoculture of grass and there was limited forage and biomass production. Therefore, it was not expected to be ecologically significant – nor would any such forage be considered attractive to native (relevant) New Mexico species. Based on this, SWMU 127 did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

58.6.3 Risk Assessments

58.6.3.1 Human Health

For the Tier 2 evaluation, SSTLs were developed for the COCs using the RBCA Tool Kit for Chemical Releases (Groundwater Services, Inc. 1999). These Tier 2 evaluations assumed a more realistic industrial exposure to the COCs. The SSTLs for each of the six COCs at SWMU 127, along with the maximum detected concentrations of the COCs, are shown in Table 58-4c in Appendix B. The maximum detected concentrations of benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene exceeded the corresponding SSTLs; the other COCs were below the

corresponding SSTLs. The maximum concentrations of each of the three chemicals that exceeded the SSTLs were detected during the Phase I RFI. Therefore, each of these detections were addressed by the BRA. The BRA included both human health and ecological risk evaluations and concluded that the risk was within USEPA acceptable levels.

Results of the human health risk evaluation indicated that there was no unacceptable risk to human health based on the maximum detected concentrations of COCs in soil at SWMU 127. In addition, results of the vadose zone fate and transport modeling showed, assuming sorption, dispersion, and biodegradation occurred, that the COCs would not reach groundwater above the allowable concentrations for drinking water. The risk evaluation combined with the modeling were used to determine that the NFA alternative would be protective of human health and the environment at the lowest cost.

58.6.3.2 Ecological

Based on the conclusions of the ecological risk screening, SWMU 127 did not contain any significant ecological component such that a formal ecological risk assessment was warranted.

58.6.4 Other Applicable Assessments

58.6.4.1 Surface Water

SWMU 127 contained no surface water.

58.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this SWMU contained no means for groundwater discharges to occur.

58.6.4.3 Underground Storage Tanks (USTs)

There have never been USTs located at SWMU 127.

58.6.4.4 Other

No other assessments have been conducted in the area of SWMU 127.

58.7 NO FURTHER ACTION PROPOSAL

58.7.1 Rationale

Based on the conclusions reached in the BRA, the Phase II RFI, and the CMS, NFA has been recommended for SWMU 127.

58.7.2 Criterion

SWMU 127 is proposed for NFA based on NMED NFA Criterion 5: The SWMU has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

59.1 SUMMARY

Only one separator device (SWMU 127, Sand Trap and Leach Field for Facility 4095 [#1]) is associated with Facility 4095. Therefore, the area misidentified as SWMU 128, Oil/Water Separator Near Tank 4095 (#2) and Leach Field, does not exist at Cannon AFB.

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this SWMU.

59.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

59.2.1 Site Description

Refer to summary in Section 59.1 above.

59.2.2 Operational History

Refer to summary in Section 59.1 above.

59.3 LAND USE

59.3.1 Current

Refer to summary in Section 59.1 above.

59.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, SWMU 128 does not exist. Use classification will continue to remain industrial in nature.

59.4 INVESTIGATIVE ACTIVITIES

SWMU 128 does not exist. Therefore, the area misidentified as SWMU 128 was never investigated.

59.5 SITE CONCEPTUAL MODEL

The area misidentified as SWMU 128 has never been the subject of a conceptual model.

59.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as SWMU 128.

59.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as SWMU 128.

59.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as SWMU 128.

59.6.3 Other Applicable Assessments

59.6.3.1 Surface Water

There is no surface water in the area misidentified as SWMU 128.

59.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as SWMU 128 contained no means for groundwater discharges to occur.

59.6.3.3 Underground Storage Tanks (USTs)

SWMU 128 does not exist. Therefore, there are no USTs associated with the area misidentified as SWMU 128.

59.6.3.4 Other

No other assessments have been conducted in the area misidentified as SWMU 128.

59.7 NO FURTHER ACTION PROPOSAL

59.7.1 Rationale

Because SWMU 128 does not exist, NFA is recommended for SWMU 128.

59.7.2 Criterion

SWMU 128 is proposed for NFA based on NMED NFA Criterion 1: This SWMU does not exist.

60.1 SUMMARY

AOC A, Motor Gasoline (MOGAS) Spill Site, is the name assigned to an area along Argentina Avenue, across from the refueling area of Facility No. 379. On two occasions in the early 1960s, fuel trucks overturned into a ditch located in this area and spilled unknown quantities of MOGAS (estimated at 2,000 to 3,000 gallons each) (Radian 1986).

The MOGAS Spill Site warrants NFA because the release at this site was an accidental spill and, therefore, did not qualify as an AOC or a SWMU. Accidental spills are not included in the definition of a SWMU as defined in the following excerpt from the USEPA RFA Guidance: "The definition does not include accidental spills from production areas and units in which wastes have not been managed (e.g., product storage areas)."

Solid waste was not discovered at AOC A; in addition this site was never a SWMU or an AOC. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

60.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

60.2.1 Site Description

Refer to summary in Section 60.1 above.

60.2.2 Operational History

Refer to summary in Section 60.1 above.

60.3 LAND USE

60.3.1 Current

Refer to summary in Section 60.1 above.

60.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the area misidentified as AOC A was never used for the management of wastes.

60.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as AOC A have been performed. However, after the soil that appeared to be visually impacted was discovered and segregated, samples were collected from this soil and analyzed for VOCs, BTEX, TPH, and a full TCLP suite. Barium was the only chemical detected in the analyses above the laboratory detection limits, and the

level detected (1.7 mg/L) was well below the regulatory level as defined by the RCRA TCLP (100 mg/L). Therefore, no significant contamination was discovered in the area misidentified as AOC A. These results were provided to USEPA Region VI as an attachment to a letter from Gen. Guth, Commander Cannon AFB, dated June 29, 1994.

60.5 SITE CONCEPTUAL MODEL

The area misidentified as AOC A has never been the subject of a conceptual model.

60.6 SITE ASSESSMENTS

No formal site assessments were performed for the area misidentified as AOC A. However, samples of the suspect soil were collected and analyzed for VOCs, BTEX, TPH, and a full TCLP suite. Barium, the only chemical detected above the laboratory detection limits (at a concentration 1.7 mg/L), was compared to the corresponding regulatory level (100 mg/L), and found to be well below this level.

60.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as AOC A.

60.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as AOC A.

60.6.3 Other Applicable Assessments

60.6.3.1 Surface Water

There is no surface water in the area misidentified as AOC A.

60.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as AOC A contained no means for groundwater discharges to occur.

60.6.3.3 Underground Storage Tanks (USTs)

There have never been storage tanks, either aboveground or underground, located in the area misidentified as AOC A.

60.6.3.4 Other

No other assessments have been conducted in the area misidentified as AOC A.

60.7 NO FURTHER ACTION PROPOSAL

60.7.1 Rationale

Because AOC A was a spill site and was never used for the management of waste, NFA is recommended for AOC A.

60.7.2 Criterion

AOC A is proposed for NFA based on NMED NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other CERCLA hazardous substances.

61.1 SUMMARY

AOC B, Jet Propellent 4 (JP-4) Fuel Spill Site, is the name assigned to an area located in the west-central portion of Cannon AFB that was the site of an accidental fuel spill in 1980. An estimated 400 gallons of JP-4 spilled from an aircraft fuel tank onto a concrete parking apron during the incident, as a result of a broken fuel line coupling (CH2M Hill 1983).

The JP-4 Fuel Spill Site warrants NFA because the release at this site was an accidental spill and, therefore, did not qualify as an AOC or a SWMU. Accidental spills are not included in the definition of a SWMU as defined in the following excerpt from the USEPA RFA Guidance: "The definition does not include accidental spills from production areas and units in which wastes have not been managed (e.g., product storage areas)."

The release at this site was an accidental spill and, therefore, did not qualify as a SWMU or an AOC. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

61.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

61.2.1 Site Description

Refer to summary in Section 61.1 above.

61.2.2 Operational History

Refer to summary in Section 61.1 above.

61.3 LAND USE

61.3.1 Current

Refer to summary in Section 61.1 above.

61.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the area misidentified as AOC B was never used for the management of wastes.

61.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as AOC B have been performed.

61.5 SITE CONCEPTUAL MODEL

The area misidentified as AOC B has never been the subject of a conceptual model.

61.6 SITE ASSESSMENTS

No formal site assessments were performed for the area misidentified as AOC B.

61.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as AOC B.

61.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as AOC B.

61.6.3 Other Applicable Assessments

61.6.3.1 Surface Water

There is no surface water in the area misidentified as AOC B.

61.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as AOC B contained no means for groundwater discharges to occur.

61.6.3.3 Underground Storage Tanks (USTs)

There have never been storage tanks, either aboveground or underground, located in the area misidentified as AOC B.

61.6.3.4 Other

No other assessments have been conducted in the area misidentified as AOC B.

61.7 NO FURTHER ACTION PROPOSAL

61.7.1 Rationale

Because AOC B was a spill site and was never used for the management of waste, NFA is recommended for AOC B.

61.7.2 Criterion

AOC B is proposed for NFA based on NMED NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other CERCLA hazardous substances.

62.1 SUMMARY

AOC C, the Blown Capacitor Site, is the location of a power pole that houses six capacitors. Lightning struck the pole in 1978 and ruptured three of the capacitors. Approximately 6 gallons of oil, believed to contain PCBs, were released and spilled onto the ground. The contaminated soil was excavated, placed in 55-gallon drums, and sent for off-site disposal by the Defense Property Disposal Office (DPDO).

The IRP Records Search (CH2M Hill 1983) determined that the removal activities completed in the area of AOC C were adequate and would have eliminated any potential contamination. The site did not present significant concern for adverse effects to human health or to the environment. Based on this, IRP Phase II studies, including sampling and analytical testing, were not warranted for AOC C.

The Blown Capacitor Site warranted NFA because the release at this site was an accidental spill and, therefore, did not qualify as an AOC. Accidental spills are not included in the definition of an AOC as defined in the following excerpt from the USEPA RFA Guidance: "The definition does not include accidental spills from production areas and units in which wastes have not been managed (e.g., product storage areas)."

Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

62.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

62.2.1 Site Description

Refer to summary in Section 62.1 above.

62.2.2 Operational History

Refer to summary in Section 62.1 above.

62.3 LAND USE

62.3.1 Current

Refer to summary in Section 62.1 above.

62.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the Blown Capacitor Site was mistakenly classified as an AOC based on a single accidental spill in this area. Use classification will continue to remain industrial in nature.

62.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as AOC C have been performed. However, after the spill occurred, the contaminated soil was excavated, placed in 55-gallon drums, and sent for off-site disposal. In addition, the IRP Records Search determined that the removal activities completed in the area of AOC C were adequate and would have eliminated any potential contamination.

62.5 SITE CONCEPTUAL MODEL

The area misidentified as AOC C has never been the subject of a conceptual model.

62.6 SITE ASSESSMENTS

No site assessments were performed for the area misidentified as AOC C.

62.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as AOC C.

62.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as AOC C.

62.6.3 Other Applicable Assessments

62.6.3.1 Surface Water

There is no surface water in the area misidentified as AOC C.

62.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as AOC C contained no means for groundwater discharges to occur.

62.6.3.3 Underground Storage Tanks (USTs)

There is no record of storage tanks, either underground or aboveground, in the area of AOC C.

62.6.3.4 Other

No other assessments have been conducted in the area misidentified as AOC C.

62.7 NO FURTHER ACTION PROPOSAL

62.7.1 Rationale

Because the area referred to as AOC C should never have been classified as a AOC, NFA is recommended for AOC C.

62.7.2 Criterion

AOC C is proposed for NFA based on NMED NFA Criterion 2: This AOC has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or other constituents, or other CERCLA hazardous substances.

63.1 SUMMARY

AOC E, Runway Rubble Pile, consists of a mound of asphalt and concrete debris stripped from a former runway and piled on the ground surface sometime between 1959 and 1966. A CERCLA SI of AOC E (W-C 1999) detected one VOC, one SVOC, two pesticides, and eleven metals at concentrations of potential concern in the surface soil. In addition, the SI also detected four VOCs, three SVOCs, two pesticides, and three metals at concentrations of potential concern in the subsurface soil. However, a risk evaluation determined that no evidence of a significant release in the area of AOC E existed, and the SI report recommended NFA at this AOC.

The conclusions reached in the SI report recommended NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

63.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

63.2.1 Site Description

AOC E, the Runway Rubble Pile, measures approximately 1,000 feet long by 200 feet wide and has an average height of approximately 2 to 3 feet. The AOC is located approximately 120 feet east of a former runway that, in turn, is located east of the current runway (Figure 63-1 in Appendix A). The rubble pile trends north-south, parallel to the former runway.

63.2.2 Operational History

The Runway Rubble Pile was discovered in 1995 after a brush fire exposed the debris pile. A historical documents review (CH2M Hill 1983) indicated that the debris had been piled at the site sometime between 1959 and 1966. The debris is believed to have been stripped from a runway constructed during World War II during its demolition. No records were found that indicated any other past use of the site.

63.3 LAND USE

63.3.1 Current

The Runway Rubble Pile at AOC E was observed during the SI field activities to consist primarily of asphalt rubble with some concrete debris and gravel. The site is currently unused.

63.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the Runway Rubble Pile is still present at the Base and no plans exist to remove it. Use classification will continue to remain industrial in nature.

63.4 INVESTIGATIVE ACTIVITIES

63.4.1 Summary

A CERCLA SI (W-C 1999) detected VOCs, SVOCs, pesticides, and metals at concentrations of potential concern in the area of AOC E. However, a risk evaluation determined that no evidence of a significant release in the area of AOC E existed, and the SI report recommended NFA at this AOC.

63.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H

63.4.2.1 Non-Sampling Data Collection

The SI included a risk evaluation, the results of which are discussed below. An EM-61 electromagnetic geophysical survey and trenching activities were also conducted in the area of AOC E during the SI field effort. These investigations found no significant metal (i.e., drums) or other debris buried at the site.

63.4.2.2 Sampling Data Collection

Eight borings drilled to maximum depths of 40 feet using a drill rig were sampled during the SI. Soil samples were collected from the 0- to 2-foot, 3- to 5-foot, 8- to 10-foot, 18- to 20-foot, 28- to 30-foot, and 38- to 40-foot depth intervals in these borings. Four other borings drilled to maximum depths of 10 feet using a hand auger were also sampled. Soil samples were collected from the 0- to 2-foot, 3- to 5-foot, and 8- to 10-foot depth intervals in these borings. Borings were located near anomalies identified by the geophysical survey (boring locations are shown in Figure 63-1 in Appendix A). No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, TAL metals, and pesticides/PCBs. In total, 60 soil samples collected from the 12 borings were sent for chemical analyses.

63.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk evaluation and to determine that a significant release had not occurred in the area of AOC E. In addition, the data quality was deemed to be sufficient to meet the objectives of the CERCLA SI. Therefore, no data gaps existed after the completion of the SI.

63.4.2.4 Results and Conclusions

Low concentrations of one VOC, toluene, one SVOC, phenol, and two pesticides, DDT and DDE, were detected in at least one surface soil sample at AOC E. In addition, eleven metals (aluminum, antimony, beryllium, cadmium, chromium, iron, magnesium, nickel, potassium, vanadium, and zinc) were also detected above established background levels in at least one

surface soil sample at AOC E. Low concentrations of four VOCs (carbon disulfide, methyl ethyl ketone, methyl isobutyl ketone, and toluene), three SVOCs (di-n-butyl phthalate, di-n-octyl phthalate and n-nitrosodiphenylamine), and two pesticides (DDT and DDE) were detected in at least one subsurface soil sample at AOC E. In addition, ten metals (aluminum, arsenic, barium, beryllium, calcium, chromium, copper, lead, mercury, and potassium) were detected above background levels (W-C 1997a) in at least one subsurface soil sample at AOC E. The analytical results from this investigation are shown in Tables 63-1a and 63-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

The maximum detected concentrations of all organic compounds and of all metals that exceeded background levels in surface and subsurface soil samples were compared to USEPA Region VI Residential MSSLs (Tables 63-1c and 63-1d in Appendix B). The results of the risk evaluation found that the cumulative excess cancer risk for AOC E was 1×10^{-5} and the cumulative HI for noncarcinogenic health effects was estimated at 0.85 for surface soils and at 0.01 for subsurface soils. These levels all meet USEPA acceptable levels. Based on this, the SI report recommended NFA for AOC E.

63.5 SITE CONCEPTUAL MODEL

63.5.1 Nature and Extent of Contamination

The SI conducted at AOC E included the drilling and sampling of twelve borings to depths of 10 or 40 feet. VOCs, SVOCs, pesticides, and metals were detected at concentrations of potential concern. However, there was no evidence of a significant release in the area of AOC E, and the SI report recommended NFA at this AOC.

Groundwater at AOC E was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

63.5.2 Environmental Fate

Contaminants encountered at the Runway Rubble Pile could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

VOCs are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

SVOCs are likely to be relatively immobile due to low vapor pressure, low water solubility, and a tendency to adsorb to clays. In addition, these three compounds have moderate to low biodegradation rates.

Pesticides are likely to persist in the environment due to their extremely low vapor pressure, low water solubility, and tendency to readily adsorb to soil. These compounds also have low biodegradation rates.

Based on the general subsurface characteristics at AOC E, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but these compounds do persist for long periods of time.

63.6 SITE ASSESSMENTS

63.6.1 Summary

The SI report included a risk evaluation of AOC E. Based on the results of the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this AOC. Therefore, NFA was recommended for AOC E.

63.6.2 Screening Assessments

63.6.2.1 Human Health

The SI's risk screening consisted of comparing the maximum detected concentrations of all organic compounds and all metals that exceeded background levels, in surface and subsurface soil samples, to USEPA Region VI Residential MSSLs. Based on maximum detected concentrations, generic high-end exposure assumptions, and using the MSSLs as a baseline of 1×10^{-6} for carcinogenic risks and 1.0 for noncarcinogenic risks, the lifetime excess cancer risks and the cumulative adverse health effects were estimated for soils at AOC E. The results of the risk evaluation found that the cumulative excess cancer risk for AOC E was 1×10^{-5} and the cumulative HI for noncarcinogenic health effects was estimated at 0.85 for surface soils and at 0.01 for subsurface soils.

These levels all meet USEPA acceptable levels. Based on this, the SI recommended NFA for AOC E.

63.6.2.2 Ecological

An ecological risk screening was not included as part of the SI, but a human health risk screening was conducted. Both the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC E. The Region VI MSSLs, used as screening criteria, are highly conservative and, as such, are protective of ecological and human health.

63.6.3 Risk Assessments

63.6.3.1 Human Health

Because the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC E, a full-scale human health risk assessment was not warranted for AOC E.

63.6.3.2 Ecological

Both the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC E. In addition, the Region VI MSSLs, used as screening criteria in the human health risk evaluation, are highly conservative and, as such, are protective of ecological and human health. Therefore, an ecological risk assessment was not warranted for AOC E.

63.6.4 Other Applicable Assessments

63.6.4.1 Surface Water

AOC E contained no surface water.

63.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this AOC contained no means for groundwater discharges to occur.

63.6.4.3 Underground Storage Tanks (USTs)

No USTs are associated with the Runway Rubble Pile.

63.6.4.4 Other

No other assessments have been conducted in the area of AOC E.

63.7 NO FURTHER ACTION PROPOSAL

63.7.1 Rationale

Based on the conclusions reached in SI, NFA has been recommended for AOC E.

63.7.2 Criterion

AOC E is proposed for NFA based on NMED NFA Criterion 5: The AOC has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

64.1 SUMMARY

AOC F, Calibration Target Berm, consists of an earthen structure that was used as a backstop for bore sighting aircraft weaponry. A CERCLA SI of AOC F (W-C 1999) detected arsenic and lead at concentrations of potential concern. However, a risk evaluation determined that no evidence of a significant release in the area of AOC F existed, and the SI report recommended NFA at this AOC.

The conclusions reached in the SI report recommended NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

64.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

64.2.1 Site Description

AOC F, the Calibration Target Berm, is irregularly shaped, approximately 15 feet high, and comprised mainly of sand soil with numerous rock fragments, sparse vegetation, and some debris. A former target support, constructed of telephone poles, iron bars, and concrete, is located approximately 150 feet north of the berm. The AOC is located to the southwest of the current small arms firing range (Figure 64-1 in Appendix A).

64.2.2 Operational History

The Calibration Target Berm was used as a backstop when bore sighting aircraft weaponry in the 1950s and 1960s.

64.3 LAND USE

64.3.1 Current

The irregularly shaped Calibration Target Berm at AOC F was observed during the SI field activities to be comprised mainly of sand soil with numerous rock fragments, sparse vegetation, and some debris. The site is currently unused.

64.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. However, the Calibration Target Berm is still present at the Base and no plans exist to remove it. Use classification will continue to remain industrial in nature.

64.4 INVESTIGATIVE ACTIVITIES

64.4.1 Summary

A CERCLA SI (W-C 1999) detected arsenic and lead at concentrations of potential concern in the area of AOC F. However, a risk evaluation determined that no evidence of a significant release in the area of AOC F existed, and the SI report recommended NFA at this AOC.

64.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H

64.4.2.1 Non-Sampling Data Collection

The SI included a risk evaluation, the results of the risk evaluation are discussed below.

64.4.2.2 Sampling Data Collection

Nine borings drilled to maximum depths of 4 feet from the top surface of the berm using a hand auger were sampled during the SI. The hand auger borings were completed in an approximate grid atop the berm. Soil samples were collected from the berm's surface and from the 1.5- to 2-foot and the 3.5- to 4-foot depth intervals in these borings. Nine other surface samples were collected from locations near the former target stand, between the stand and the berm, and around the berm at depths of 0- to 2-feet using a hand auger (boring locations are shown in Figure 64-1 in Appendix A). All samples were sieved using a 0.25-inch mesh screen to remove debris.

Target analytes for all borings included total antimony, arsenic, and lead. Thirty-six soil samples were sent for chemical analyses.

64.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk evaluation and to determine that a significant release had not occurred in the area of AOC F. In addition, the data quality was deemed to be sufficient to meet the objectives of the CERCLA SI. Therefore, no data gaps existed after the completion of the SI.

64.4.2.4 Results and Conclusions

Concentrations of arsenic and lead were detected above established background levels (W-C 1997a) in soil samples collected at AOC F. The analytical results from this investigation are shown in Tables 64-1a and 64-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

Concentrations of arsenic detected in surface soil exceeded both residential and industrial USEPA Region VI MSSLs (Tables 64-1c and 64-1d in Appendix B). The results of the risk evaluation found that the excess cancer risk from arsenic at AOC F was 2×10^{-6}, which fell within the USEPA target range of 1×10^{-4} to 1×10^{-6}. This indicated that no unacceptable adverse health effects were anticipated due to arsenic concentrations at AOC F.

Although concentrations of arsenic exceeded the corresponding MSSLs, all concentrations fell within the established USEPA Region VI background range for arsenic in soil (USEPA 1998). Arsenic often occurs naturally along with lead and has been used historically as a rodenticide. Therefore, the concentrations of arsenic detected may not be site-related. The concentrations of lead detected in soil at AOC F did not exceed the residential or the industrial MSSLs.

Therefore, the SI report recommended NFA for AOC F.

64.5 SITE CONCEPTUAL MODEL

64.5.1 Nature and Extent of Contamination

The SI conducted at AOC F included the drilling and sampling of nine shallow borings and the collection of nine surface samples. Arsenic and lead were detected at concentrations of potential concern. However, there was no evidence of a significant release in the area of AOC F, and the SI report recommended NFA at this AOC.

Groundwater at AOC F was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

64.5.2 Environmental Fate

Contaminants encountered at the Calibration Target Berm could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

Based on the general subsurface characteristics at AOC 3, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but these compounds do persist for long periods of time.

64.6 SITE ASSESSMENTS

64.6.1 Summary

The SI report included a risk evaluation of AOC F. Based on the results of the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this AOC. Therefore, NFA was recommended for AOC F.

64.6.2 Screening Assessments

64.6.2.1 Human Health

The SI's risk screening consisted of comparing the maximum detected concentrations of all metals that exceeded background levels (W-C 1997a), in surface and subsurface soil samples, to USEPA Region VI MSSLs. The results of the risk screening found that the excess cancer risk from arsenic at AOC F was 2×10^{-6}, which fell within the USEPA target range of 1×10^{-4} to 1×10^{-6}. This indicated that no unacceptable adverse health effects were anticipated due to arsenic concentrations at AOC F. The concentrations of lead detected in soil at AOC F did not exceed the residential or the industrial MSSLs.

Therefore, the SI report recommended NFA for AOC F.

64.6.2.2 Ecological

An ecological risk screening was not included as part of the SI, but a human health risk screening was conducted. The risk evaluation found that no unacceptable adverse health effects were anticipated due to arsenic or lead concentrations in soil at AOC F. The Region VI MSSLs, used as screening criteria, are highly conservative and, as such, are protective of ecological and human health.

64.6.3 Risk Assessments

64.6.3.1 Human Health

Because the risk evaluation found that no unacceptable adverse health effects were anticipated due to arsenic or lead concentrations in soil at AOC F, a full-scale human health risk assessment was not warranted for AOC F.

64.6.3.2 Ecological

The risk evaluation found that no unacceptable adverse health effects were anticipated due to arsenic or lead concentrations in soil at AOC F. In addition, the Region VI MSSLs, used as screening criteria in the human health risk evaluation, are highly conservative and, as such, are protective of ecological and human health. Therefore, an ecological risk assessment was not warranted for AOC F.

64.6.4 Other Applicable Assessments

64.6.4.1 Surface Water

AOC F contained no surface water.

64.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this AOC contained no means for groundwater discharges to occur.

64.6.4.3 Underground Storage Tanks (USTs)

No USTs are associated with the Calibration Target Berm.

64.6.4.4 Other

No other assessments have been conducted in the area of AOC F.

64.7 NO FURTHER ACTION PROPOSAL

64.7.1 Rationale

Based on the conclusions reached in SI, NFA has been recommended for AOC F.

64.7.2 Criterion

AOC F is proposed for NFA based on NMED NFA Criterion 5: The AOC has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

65.1 SUMMARY

AOC G, Disturbed Area - North Housing Site, consists of an area identified in historical aerial photographs from 1959 as the site of an unknown disturbance. A CERCLA SI of AOC G (W-C 1999) detected three VOCs and thirteen metals at concentrations of potential concern in the surface soil. In addition, the SI also detected five VOCs, nine SVOCs, and ten metals at concentrations of potential concern in the subsurface soil. However, a risk evaluation determined that no evidence of a significant release in the area of AOC G existed, and the SI report recommended NFA at this AOC.

The conclusions reached in the SI report recommended NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

65.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

65.2.1 Site Description

AOC G, the Disturbed Area - North Housing Site, measured approximately 735 feet long by 320 feet wide and was located in the northwest corner of the Base housing area, in the northwest corner of the Base (Figure 65-1 in Appendix A). At least five housing units are located within the area of the disturbance. Although the disturbance was observed in 1959 historical aerial photographs, the site appeared inactive in 1966 historical aerial photographs. The reason for the disturbance is unknown.

65.2.2 Operational History

The Disturbed Area - North Housing Site was identified in 1959 historical aerial photographs, and the site appeared inactive in 1966 historical aerial photographs. The reason for the disturbance is unknown.

65.3 LAND USE

65.3.1 Current

The Disturbed Area - North Housing Site at AOC G currently contains at least five housing units. The portions of the Disturbed Area - North Housing Site that are not covered by the housing units are presently paved as streets and driveways, or landscaped.

65.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. The Disturbed Area - North Housing Site currently contains at least five housing units and no plans exist to remove the units or their occupants. Use classification will continue to remain residential in nature.

65.4 INVESTIGATIVE ACTIVITIES

65.4.1 Summary

A CERCLA SI (W-C 1999) detected VOCs, SVOCs, and metals at concentrations of potential concern in the area of AOC G. However, a risk evaluation determined that no evidence of a significant release in the area of AOC G existed, and the SI report recommended NFA at this AOC.

65.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H

65.4.2.1 Non-Sampling Data Collection

The SI included a risk evaluation, the results of which are discussed below. An EM-61 electromagnetic geophysical survey was also conducted across the northern half of AOC G during the SI field effort, but no data was downloaded or recorded. No anomalies were detected using the EM-61.

65.4.2.2 Sampling Data Collection

Eight borings drilled to maximum depths of 40 feet using a drill rig were sampled during the SI. Soil samples were collected from the 0- to 2-foot, 3- to 5-foot, 8- to 10-foot, 18- to 20-foot, 28- to 30-foot, and 38- to 40-foot depth intervals in these borings. Boring locations were distributed to cover as much of the Disturbed Area - North Housing Site as possible (boring locations are shown in Figure 65-1 in Appendix A). A uniform grid pattern was not possible due to the presence of buildings and utilities at the site, and neither the historical aerial photographs nor the EM-61 data suggested the need for specific boring placements. No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, TPH (DRO and GRO), TAL metals, herbicides, and pesticides/PCBs. Forty-eight soil samples collected from the eight borings were sent for chemical analyses.

65.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk evaluation and to determine that a significant release had not occurred in the area of AOC G. In addition, the data quality was deemed to be sufficient to meet the objectives of the CERCLA SI. Therefore, no data gaps existed after the completion of the SI.

65.4.2.4 Results and Conclusions

Low concentrations of three VOCs (methyl ethyl ketone, methyl isobutyl ketone, and toluene) were detected in at least one surface soil sample at AOC G. In addition, thirteen metals (aluminum, beryllium, calcium, chromium, iron, lead, magnesium, mercury, nickel, potassium,

sodium, vanadium, and zinc) were also detected above established background levels in at least one surface soil sample at AOC G. Low concentrations of five VOCs (carbon disulfide, chloromethane, methyl ethyl ketone, methyl isobutyl ketone, and toluene) and nine SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, di-n-butyl phthalate, di-n-octyl phthalate, fluoranthene, and pyrene) were detected in at least one subsurface soil sample at AOC G. In addition, ten metals (aluminum, barium, calcium, chromium, copper, lead, magnesium, mercury, potassium, and sodium) were detected above background levels in at least one subsurface soil sample at AOC G. The analytical results from this investigation are shown in Tables 65-1a and 65-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

The maximum detected concentrations of all organic compounds and of all metals that exceeded background levels (W-C 1997a) in surface and subsurface soil samples were compared to USEPA Region VI Residential MSSLs (Tables 65-1c and 65-1d in Appendix B). The results of the risk evaluation found that the cumulative excess cancer risk for AOC G was 1×10^{-7} for surface soils and 1×10^{-6} for subsurface soils, and the cumulative HI for noncarcinogenic health effects was estimated at 1.0 for surface soils and at 0.01 for subsurface soils. These levels all meet USEPA acceptable levels. Based on this, the SI report recommended NFA for AOC G.

65.5 SITE CONCEPTUAL MODEL

65.5.1 Nature and Extent of Contamination

The SI conducted at AOC G included the drilling and sampling of eight borings to a depth of 40 feet. VOCs, SVOCs, and metals were detected at concentrations of potential concern. However, there was no evidence of a significant release in the area of AOC G, and the SI report recommended NFA at this AOC.

Groundwater at AOC G was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

65.5.2 Environmental Fate

Contaminants encountered at the Disturbed Area - North Housing Site could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

VOCs are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

SVOCs are likely to be relatively immobile due to low vapor pressure, low water solubility, and a tendency to adsorb to clays. In addition, these compounds have moderate to low biodegradation rates.

Based on the general subsurface characteristics at AOC G, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

65.6 SITE ASSESSMENTS

65.6.1 Summary

The SI report included a risk evaluation of AOC G. Based on the results of the risk evaluation, no unacceptable human health risks due to chemical releases were expected from this AOC. Therefore, NFA was recommended for AOC G.

65.6.2 Screening Assessments

65.6.2.1 Human Health

The SI's risk screening consisted of comparing the maximum detected concentrations of all organic compounds and all metals that exceeded background levels (W-C 1997a), in surface and subsurface soil samples, to USEPA Region VI Residential MSSLs. Based on maximum detected concentrations, generic high-end exposure assumptions, and using the MSSLs as a baseline of 1×10^{-6} for carcinogenic risks and 1.0 for noncarcinogenic risks, the lifetime excess cancer risks and the cumulative adverse health effects were estimated for soils at AOC G. The results of the risk evaluation found that the cumulative excess cancer risk for AOC G was 1×10^{-7} for surface soils and 1×10^{-6} for subsurface soils, and the cumulative HI for noncarcinogenic health effects was estimated at 1.0 for surface soils and at 0.01 for subsurface soils.

These levels all meet USEPA acceptable levels. Based on this, the SI recommended NFA for AOC G.

65.6.2.2 Ecological

An ecological risk screening was not included as part of the SI, but a human health risk screening was conducted. Both the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC G. The Region VI MSSLs, used as screening criteria, are highly conservative and, as such, are protective of ecological and human health.

65.6.3 Risk Assessments

65.6.3.1 Human Health

Because the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC G, a full scale human health risk assessment was not warranted for AOC G.

65.6.3.2 Ecological

Both the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC G. In addition, the Region VI MSSLs, used as screening criteria in the human health risk evaluation, are highly conservative and, as such, are protective of ecological and human health. Therefore, an ecological risk assessment was not warranted for AOC G.

65.6.4 Other Applicable Assessments

65.6.4.1 Surface Water

AOC G contained no surface water.

65.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this AOC contained no means for groundwater discharges to occur.

65.6.4.3 Underground Storage Tanks (USTs)

No USTs are suspected to be associated with the Disturbed Area - North Housing Site.

65.6.4.4 Other

No other assessments have been conducted in the area of AOC G.

65.7 NO FURTHER ACTION PROPOSAL

65.7.1 Rationale

Based on the conclusions reached in SI, NFA has been recommended for AOC G.

65.7.2 Criterion

AOC G is proposed for NFA based on NMED NFA Criterion 5: The AOC has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

66.1 SUMMARY

AOC H, Disturbed Area - South Housing Site, consists of an area identified, in historical aerial photographs from 1951 as the site of a "blowout," which is a naturally occurring, low-lying feature common to this region. This feature appears as an unknown disturbance in 1954 historical aerial photographs.

A CERCLA SI of AOC H (W-C 1999) detected two VOCs, one SVOC, two pesticides, and eleven metals at concentrations of potential concern in the surface soil. In addition, the SI also detected five VOCs, two SVOCs, one pesticide, and eleven metals at concentrations of potential concern in the subsurface soil. However, a risk evaluation determined that no evidence of a significant release in the area of AOC H existed, and the SI report recommended NFA at this AOC.

The conclusions reached in the SI report recommended NFA at this site. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

66.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

66.2.1 Site Description

AOC G, the Disturbed Area - South Housing Site, was an irregularly shaped area that measured several hundred feet long by approximately 350 feet across. It was located in the northwest corner of the Base housing area, in the northwest corner of the Base, south of AOC G (Figure 66-1 in Appendix A). At least five housing units are located within the area of the disturbance. The disturbance appeared to be a blow out in 1951 historical aerial photographs, and the site appeared as an unknown disturbance in 1954 historical aerial photographs.

66.2.2 Operational History

The Disturbed Area - South Housing Site was identified as a blowout in 1951 historical aerial photographs, and the site appeared to contain a disturbance in 1954 historical aerial photographs. The reason for the disturbance is unknown.

66.3 LAND USE

66.3.1 Current

The Disturbed Area - South Housing Site at AOC G currently contains at least five housing units. The portions of the Disturbed Area - South Housing Site that are not covered by the housing units are presently paved as streets and driveways, or landscaped.

66.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. The Disturbed Area - South Housing Site currently contains at least five housing units and no plans exist to remove the units or their occupants. Use classification will continue to remain residential in nature.

66.4 INVESTIGATIVE ACTIVITIES

66.4.1 Summary

A CERCLA SI (W-C 1999) detected VOCs, SVOCs, pesticides, and metals at concentrations of potential concern in the area of AOC H. However, a risk evaluation determined that no evidence of a significant release in the area of AOC H existed, and the SI report recommended NFA at this AOC.

66.4.2 Investigation #1: CERCLA Site Inspections at Areas of Concern (AOCs) E, F, G, and H

66.4.2.1 Non-Sampling Data Collection

The SI included a risk evaluation, the results of which are discussed below.

66.4.2.2 Sampling Data Collection

Six borings drilled to a maximum depth of 40 feet using a drill rig were sampled during the SI. Soil samples were collected from the 0- to 2-foot, 3- to 5-foot, 8- to 10-foot, 18- to 20-foot, 28- to 30-foot, and 38- to 40-foot depth intervals in these borings (boring locations are shown in Figure 66-1 in Appendix A). No visual evidence of contamination was observed during this investigation.

Target analytes for all borings included VOCs, SVOCs, TPH (DRO and GRO), TAL metals, herbicides, and pesticides/PCBs. Thirty-six soil samples were sent for chemical analyses.

66.4.2.3 Data Gaps

It was concluded that the data available from this investigation was sufficient to complete a risk evaluation and to determine that a significant release had not occurred in the area of AOC H. In addition, the data quality was deemed to be sufficient to meet the objectives of the CERCLA SI. Therefore, no data gaps existed after the completion of the SI.

66.4.2.4 Results and Conclusions

Low concentrations of two VOCs (methyl isobutyl ketone and toluene) one SVOC (di-n-octyl phthalate), and two pesticides (DDT and DDE) were detected in at least one surface soil sample at AOC H. In addition, eleven metals (aluminum, antimony, arsenic, chromium, iron, lead,

magnesium, mercury, potassium, sodium, and vanadium) were detected above established background levels (W-C 1997a) in at least one surface soil sample at AOC H. Low concentrations of five VOCs (2-hexanone, benzene, methyl ethyl ketone, methyl isobutyl ketone, and toluene), two SVOCs (benzyl butyl phthalate and di-n-butyl phthalate), and one pesticide (DDE) were detected in at least one subsurface soil sample at AOC H. In addition, eleven metals (aluminum, barium, beryllium, calcium, chromium, cobalt, copper, lead, mercury, potassium, and zinc) were detected above background levels in at least one subsurface soil sample at AOC H. The analytical results from this investigation are shown in Tables 66-1a and 66-1b in Appendix B.

Groundwater was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

The maximum detected concentrations of all organic compounds and of all metals that exceeded background levels (W-C 1997a) in surface and subsurface soil samples were compared to USEPA Region VI Residential MSSLs (Tables 66-1c and 66-1d in Appendix B). The results of the risk evaluation found that the cumulative excess cancer risk for AOC H was 1×10^{-5} for surface soils and 1×10^{-7} for subsurface soils, and the cumulative HI for noncarcinogenic health effects was estimated at 1.0 for surface soils and at 0.03 for subsurface soils. These levels all meet USEPA acceptable levels. Based on this, the SI report recommended NFA for AOC H.

66.5 SITE CONCEPTUAL MODEL

66.5.1 Nature and Extent of Contamination

The SI conducted at AOC H included the drilling and sampling of a total of six borings to a depth of 40 feet. VOCs, SVOCs, pesticides, and metals were detected at concentrations of potential concern. However, there was no evidence of a significant release in the area of AOC H, and the SI report recommended NFA at this AOC.

Groundwater at AOC H was not investigated because the potential impacts to groundwater were considered minimal. The potential was considered minimal since the depth to groundwater is greater than 250 feet, and the soil sampling results demonstrate that contaminants are not being transported significantly in a vertical direction beneath the AOC.

66.5.2 Environmental Fate

Contaminants encountered at the Disturbed Area - South Housing Site could potentially migrate into other environmental media through any of several transport mechanisms. The mechanisms include: air – movement within soil gas or the atmosphere, and wind transport of contaminants off site; leaching – through the vadose zone; and groundwater – movement via groundwater flow.

VOCs are likely to be moderately to highly mobile in subsurface soil and are not likely to persist for long periods of time due to high vapor pressures, high volatilization potentials, and high biodegradation rates.

SVOCs are likely to be relatively immobile due to low vapor pressure, low water solubility, and a tendency to adsorb to clays. In addition, these compounds have moderate to low biodegradation rates.

Pesticides are likely to persist in the environment due to their extremely low vapor pressure, low water solubility, and tendency to readily adsorb to soil. These compounds also have low biodegradation rates.

Based on the general subsurface characteristics at AOC H, including moderate to high clay content and an alkaline soil pH, metals are not likely to be very mobile in the subsurface, but they do persist for long periods of time.

66.6 SITE ASSESSMENTS

66.6.1 Summary

The SI report included a risk evaluation of AOC H. Based on the results of the risk evaluation no unacceptable human health risks due to chemical releases were expected from this AOC. Therefore, NFA was recommended for AOC H.

66.6.2 Screening Assessments

66.6.2.1 Human Health

The SI's risk screening consisted of comparing the maximum detected concentrations of all organic compounds and all metals that exceeded background levels (W-C 1997a), in surface and subsurface soil samples, to USEPA Region VI Residential MSSLs. Based on maximum detected concentrations, generic high-end exposure assumptions, and using the MSSLs as a baseline of 1×10^{-6} for carcinogenic risks and 1.0 for noncarcinogenic risks, the lifetime excess cancer risks and the cumulative adverse health effects were estimated for soils at AOC H. The results of the risk evaluation found that the cumulative excess cancer risk for AOC H was 1×10^{-5} for surface soils and 1×10^{-7} for subsurface soils, and the cumulative HI for noncarcinogenic health effects was estimated at 1.0 for surface soils and at 0.03 for subsurface soils.

These levels all meet USEPA acceptable levels. Based on this, the SI recommended NFA for AOC H.

66.6.2.2 Ecological

An ecological risk screening was not included as part of the SI, but a human health risk screening was conducted. Both the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC H. The Region VI MSSLs,

used as screening criteria, are highly conservative and, as such, are protective of ecological and human health.

66.6.3 Risk Assessments

66.6.3.1 Human Health

Because the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC H, a full-scale human health risk assessment was not warranted for this AOC.

66.6.3.2 Ecological

Both the estimated lifetime excess cancer risks and the estimated cumulative adverse health effects met acceptable USEPA levels for soils at AOC H. In addition, the Region VI MSSLs, used as screening criteria in the human health risk evaluation, are highly conservative and, as such, are protective of ecological and human health. Therefore, an ecological risk assessment was not warranted for AOC H.

66.6.4 Other Applicable Assessments

66.6.4.1 Surface Water

AOC H contained no surface water.

66.6.4.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, this AOC contained no means for groundwater discharges to occur.

66.6.4.3 Underground Storage Tanks (USTs)

No USTs are associated with the Disturbed Area - South Housing Site.

66.6.4.4 Other

No other assessments have been conducted in the area of AOC H.

66.7 NFA PROPOSAL

66.7.1 Rationale

Based on the conclusions reached in SI, NFA has been recommended for AOC H.

66.7.2 Criterion

AOC H is proposed for NFA based on NMED NFA Criterion 5: The AOC has been characterized in accordance with the current applicable state and federal regulations, and the available data has indicated that the contaminants present pose an acceptable level of risk under current and projected future land use.

67.1 SUMMARY

AOC 36, Building #214 Parking Lot, is the name assigned to an area of potential soil contamination while analytical results were pending. During excavation activities to prepare the site for a parking lot, a contractor reported discovering an area of potentially contaminated soil. Soil that visually appeared to be impacted was segregated, and samples of this soil were collected. However, laboratory analysis of these samples did not indicate the presence of any significant contamination in the soil.

Solid waste was not discovered at AOC 36, and there is no reason, other than the excavator's report, to suspect that this site was ever a SWMU or an AOC. AOC 36 should never have been entered into the IRP. Therefore, a Class 3 modification to the Cannon AFB RCRA Part B Permit pursuant to 40 CFR 270.42(c) is warranted for closure of this AOC.

67.2 SITE DESCRIPTION AND OPERATIONAL HISTORY

67.2.1 Site Description

Refer to summary in Section 67.1 above.

67.2.2 Operational History

Refer to summary in Section 67.1 above.

67.3 LAND USE

67.3.1 Current

Refer to summary in Section 67.1 above.

67.3.2 Future/Proposed

Cannon AFB is an integral part of the defense system of the United States; therefore, the Base will remain active for the foreseeable future. In addition, the area misidentified as AOC 36 was never used for the management of wastes.

67.4 INVESTIGATIVE ACTIVITIES

No formal investigations of the area misidentified as AOC 36 have been performed. However, after the soil that visually appeared to be impacted was discovered and segregated, samples were collected from this soil and analyzed for VOCs, BTEX, TPH, and a full TCLP suite. Barium was the only chemical detected in the analyses above the laboratory detection limits, and the level detected (1.7 mg/L) was well below the RCRA regulatory level as defined by the Toxicity Characteristic Leaching Procedure (100 mg/L). Therefore, no significant contamination was

discovered in the area misidentified as AOC 36. These results were provided to USEPA Region VI as an attachment to a letter from Gen. Guth, Commander Cannon AFB, dated June 29, 1994.

67.5 SITE CONCEPTUAL MODEL

The area misidentified as AOC 36 has never been the subject of a conceptual model.

67.6 SITE ASSESSMENTS

No formal site assessments were performed for the area misidentified as AOC 36. However, samples of the suspect soil were collected and analyzed for VOCs, BTEX, TPH, and a full TCLP suite. Barium, the only chemical detected above the laboratory detection limits, was compared to the corresponding regulatory level (100 mg/L) and found to be well below this level.

67.6.1 Screening Assessments

No screening assessments were performed for the area misidentified as AOC 36.

67.6.2 Risk Assessments

No risk assessments were performed for the area misidentified as AOC 36.

67.6.3 Other Applicable Assessments

67.6.3.1 Surface Water

There is no surface water in the area misidentified as AOC 36.

67.6.3.2 Groundwater

Groundwater at Cannon AFB has been located at a depth greater than 250 feet; as such, the area misidentified as AOC 36 contained no means for groundwater discharges to occur.

67.6.3.3 Underground Storage Tanks (USTs)

There have never been storage tanks, either aboveground or underground, located in the area misidentified as AOC 36.

67.6.3.4 Other

No other assessments have been conducted in the area misidentified as AOC 36.

67.7 NO FURTHER ACTION PROPOSAL

67.7.1 Rationale

Because AOC 36 was never used for the management of waste, NFA is recommended for AOC 36.

67.7.2 Criterion

AOC 36 is proposed for NFA based on NMED NFA Criterion 2: This SWMU has never been used for the management (i.e., generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous wastes and/or constituents or other CERCLA hazardous substances.

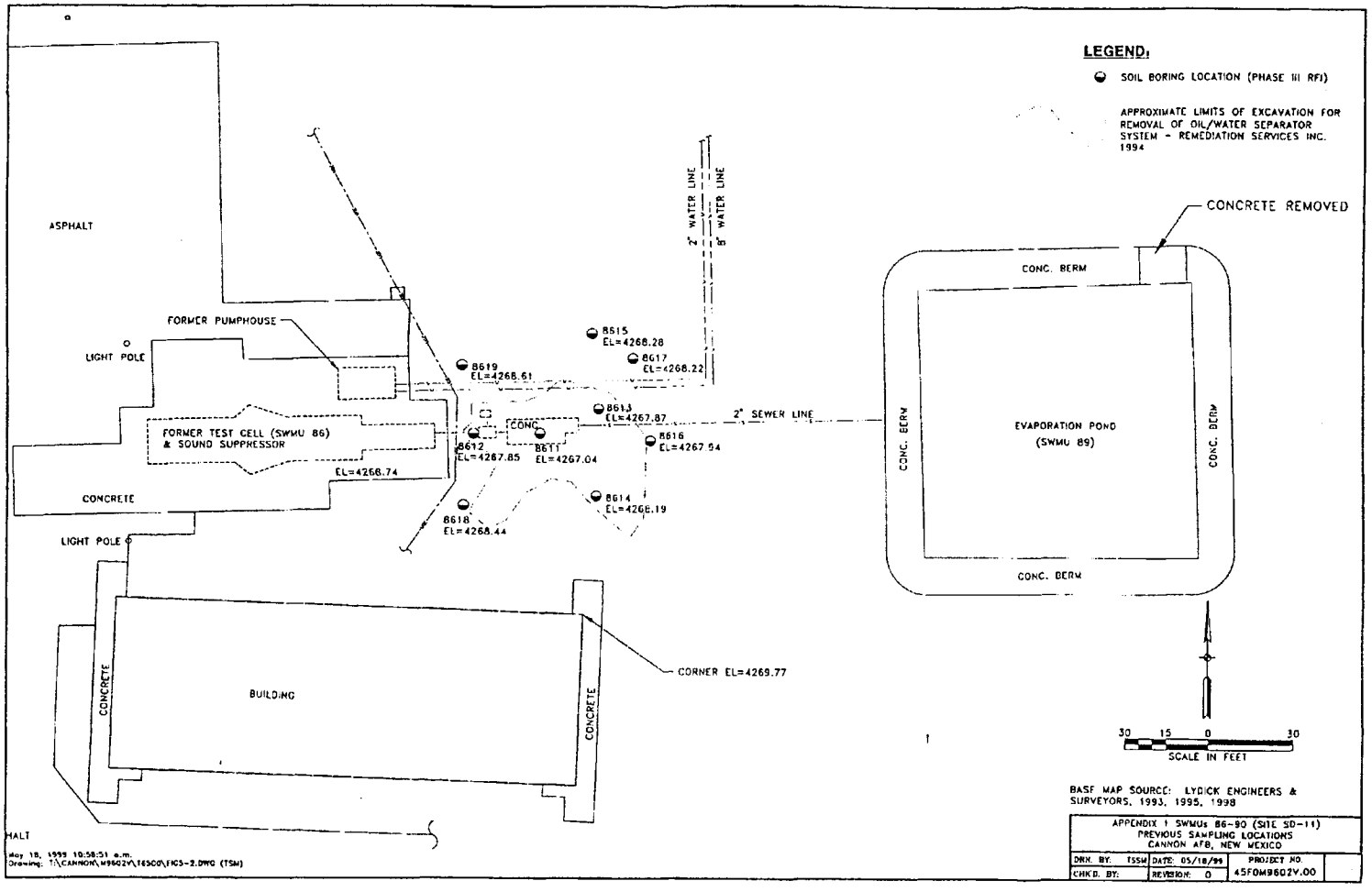


Figure 45-1

SWMUs 86-90 (SD-11)

Source: URS Greiner Woodward Clyde, 1999

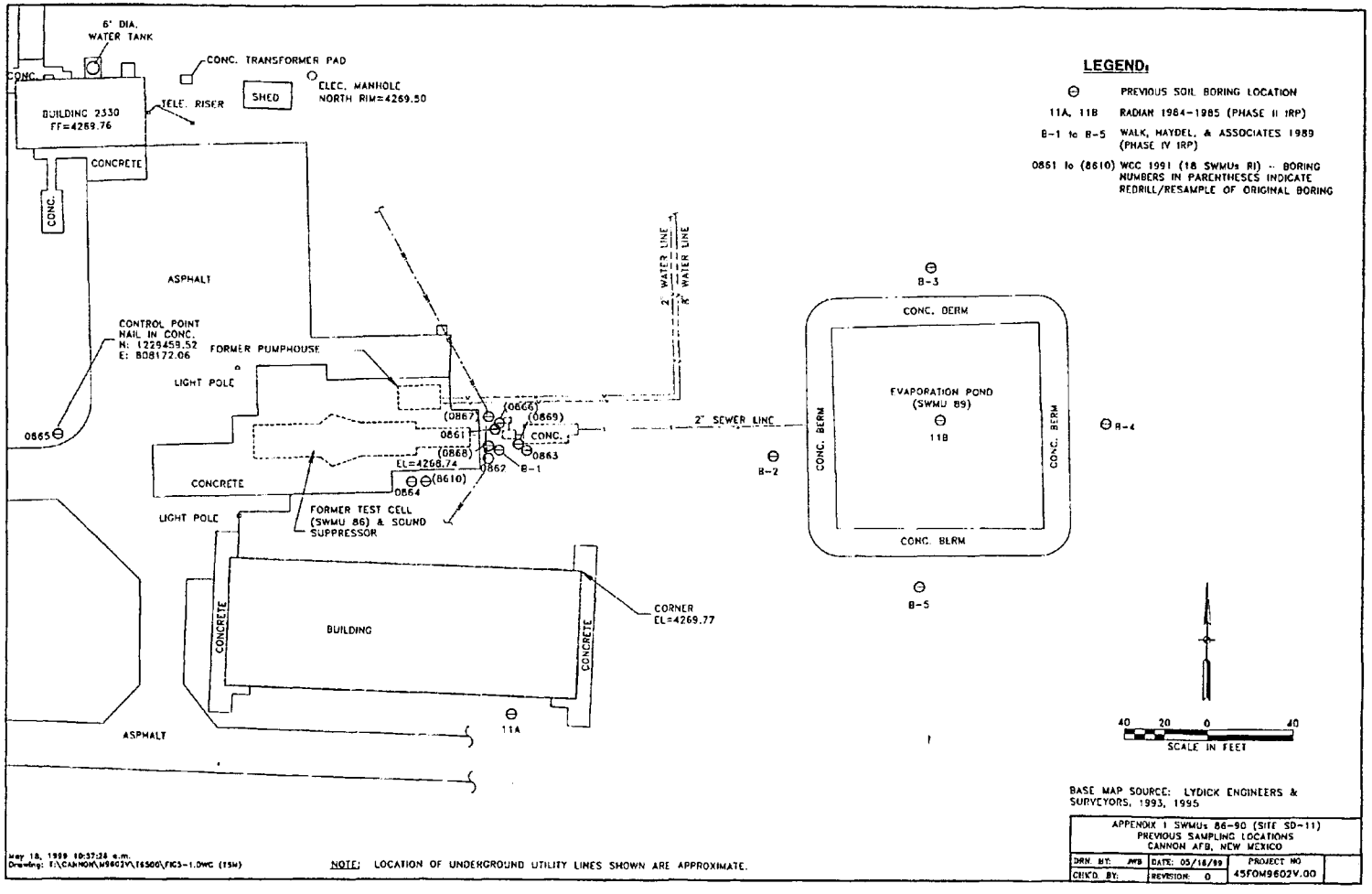


Figure 45-3

SWMUs 86-90 (SD-11)

Source: URS Greiner Woodward Clyde, 1999

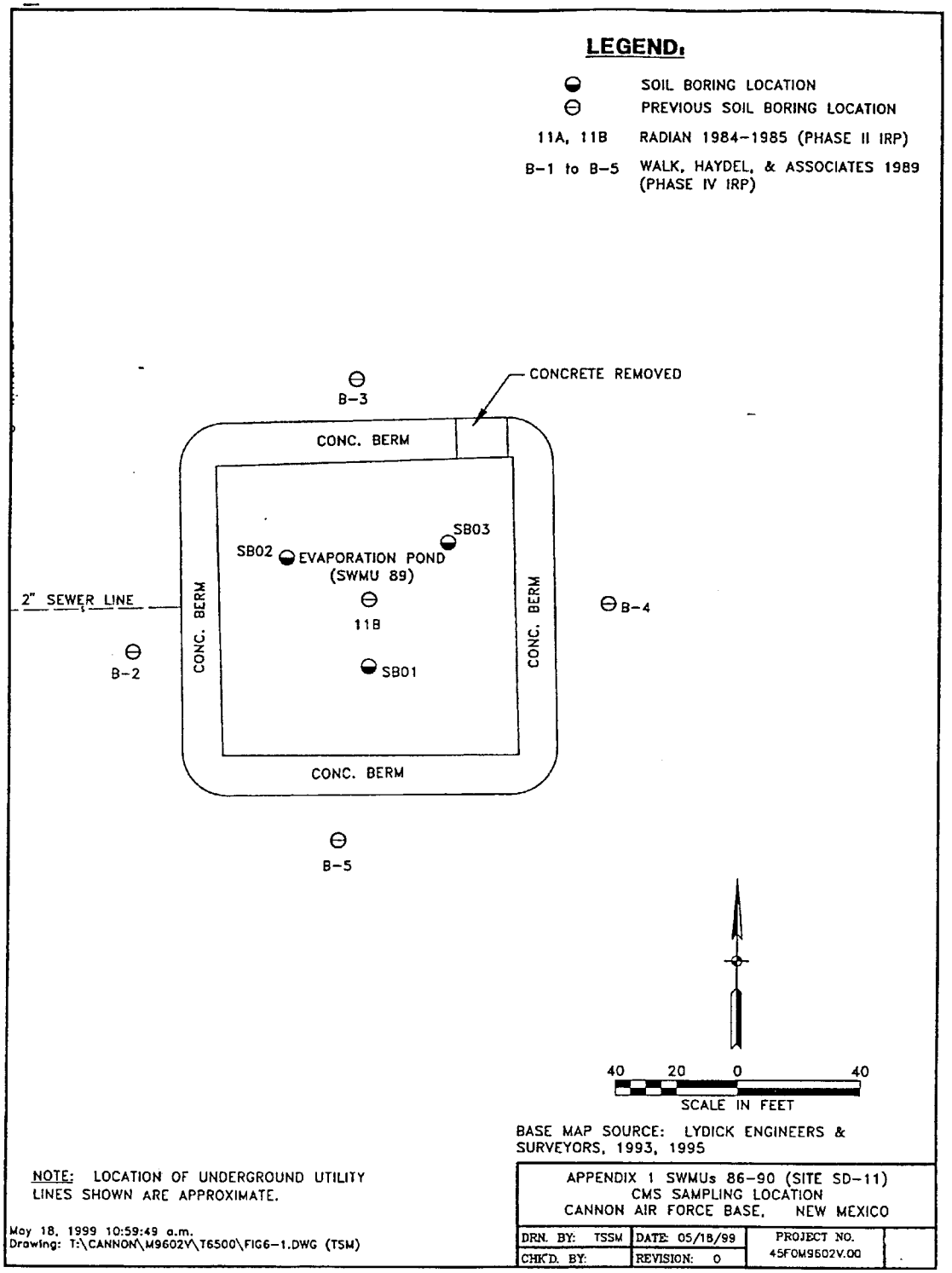


Figure 45-4

SWMUs 86-90 (SD-11)

Source: URS Greiner Woodward Clyde, 1999

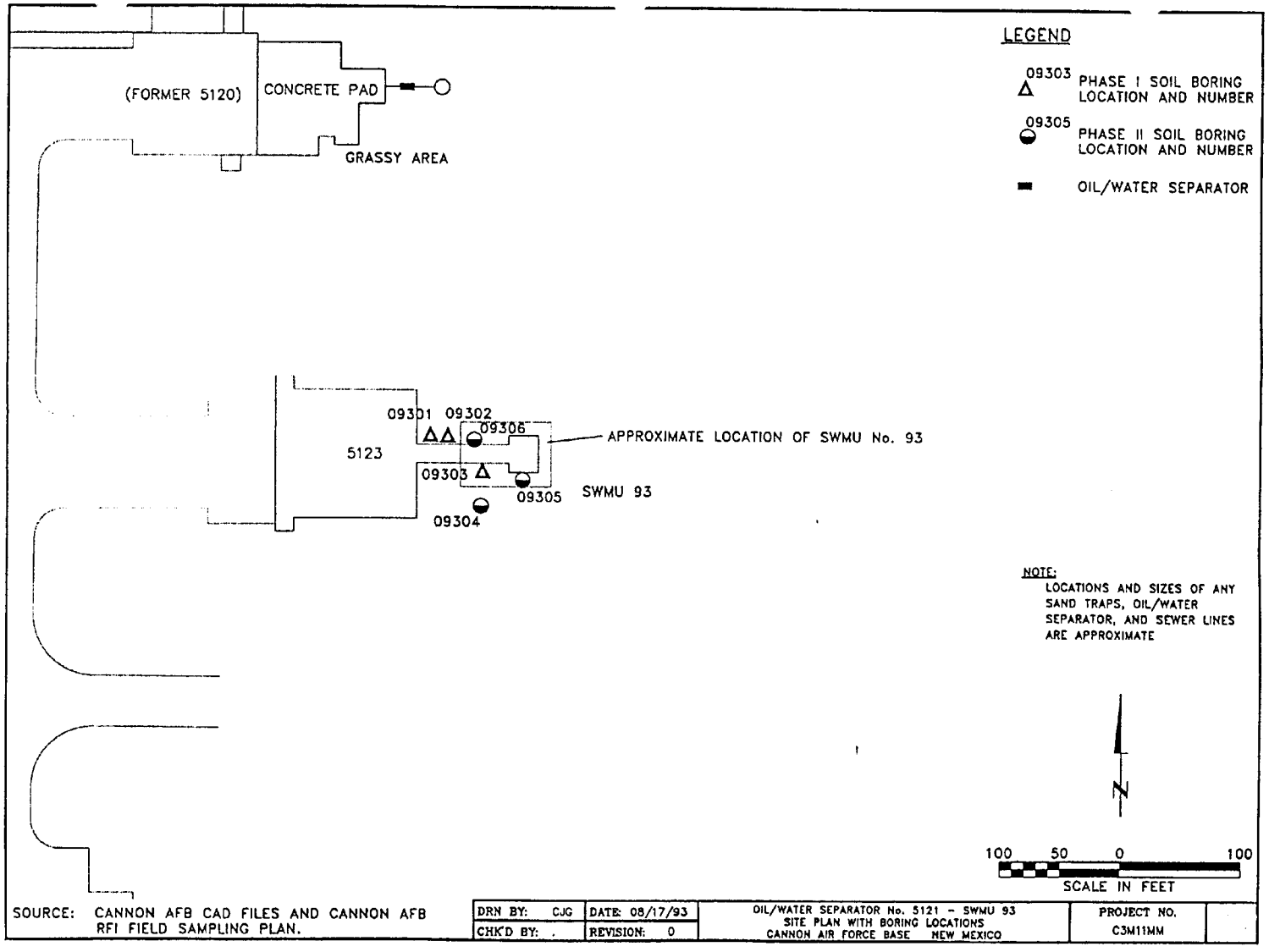


Figure 47-1
SWMU 93
Source: Woodward-Clyde, 1997

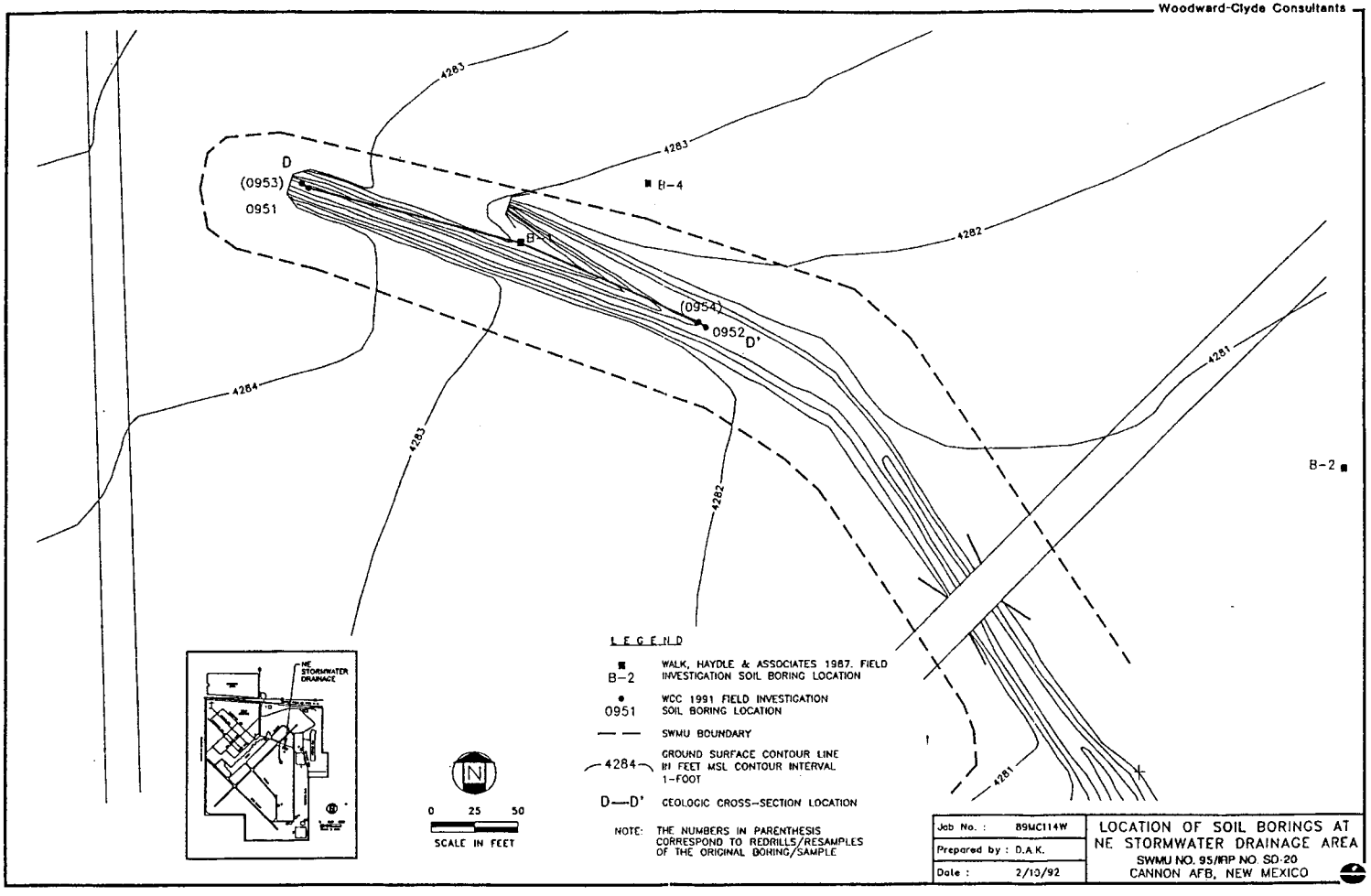


Figure 48-1
SWMU 95
Source: Woodward-Clyde, 1992

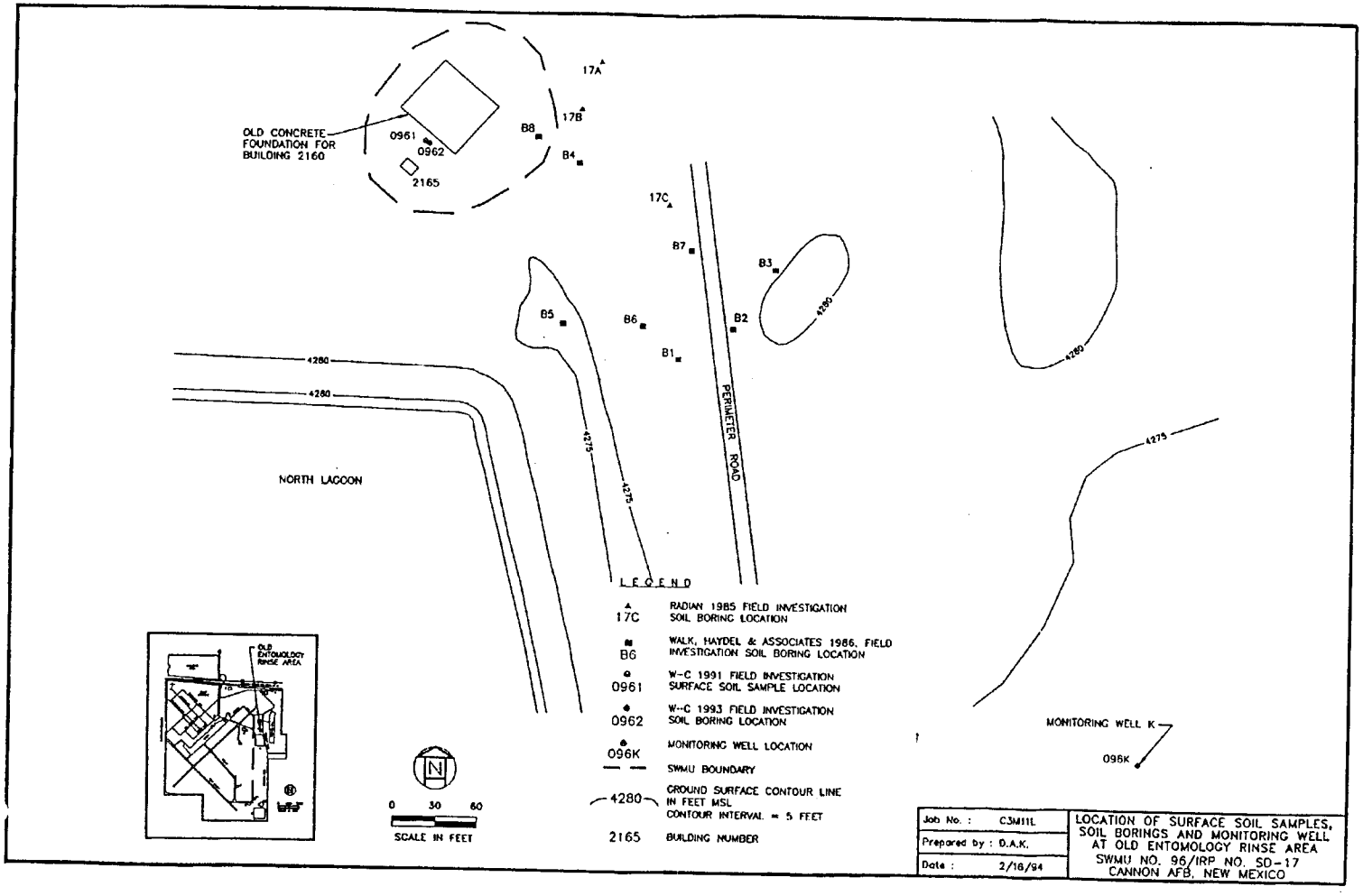


Figure 49-1
SWMU 96
Source: Woodward-Clyde, 1994

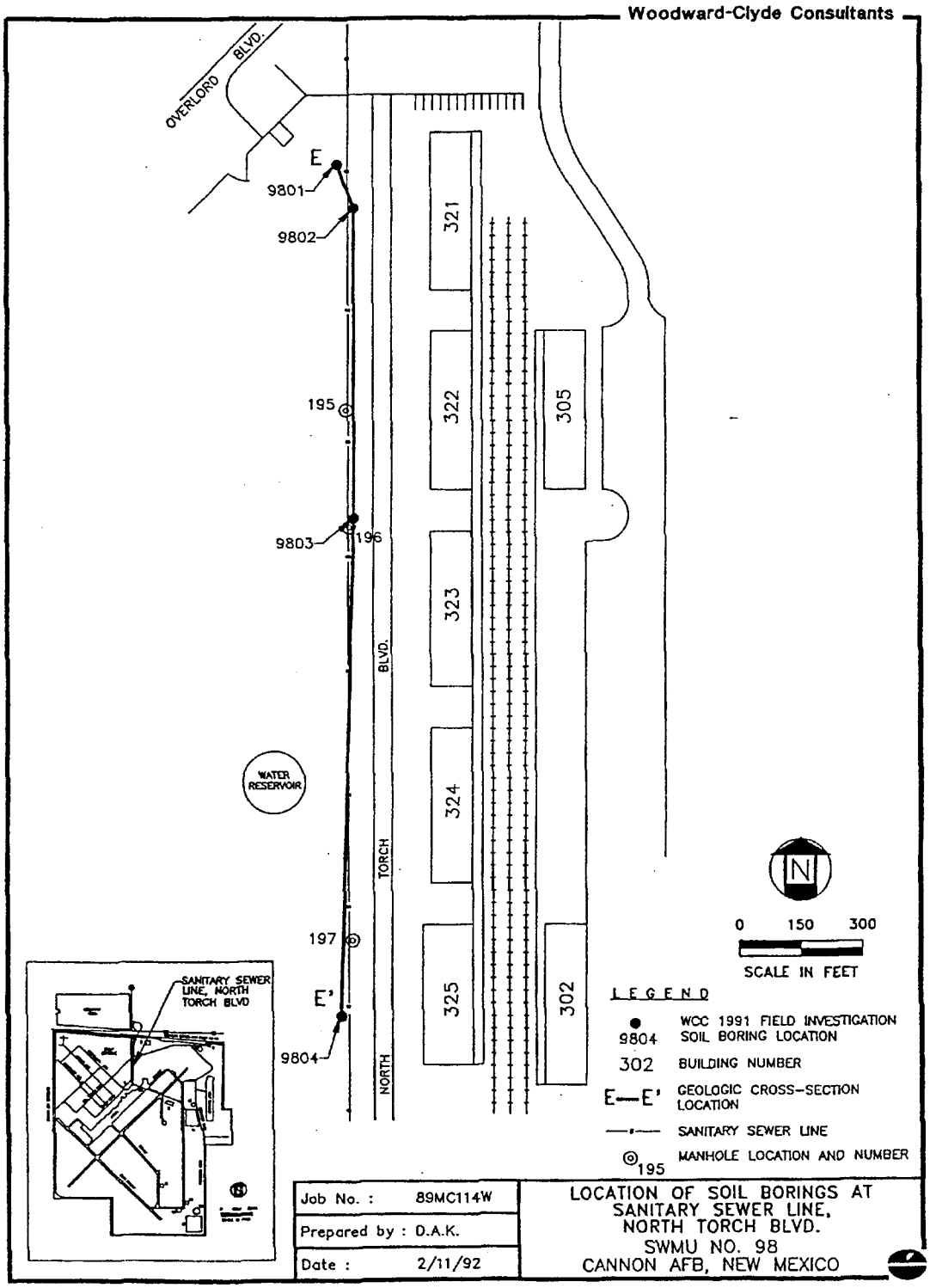


Figure 50-1a

SWMU 98

Source: Woodward-Clyde, 1992

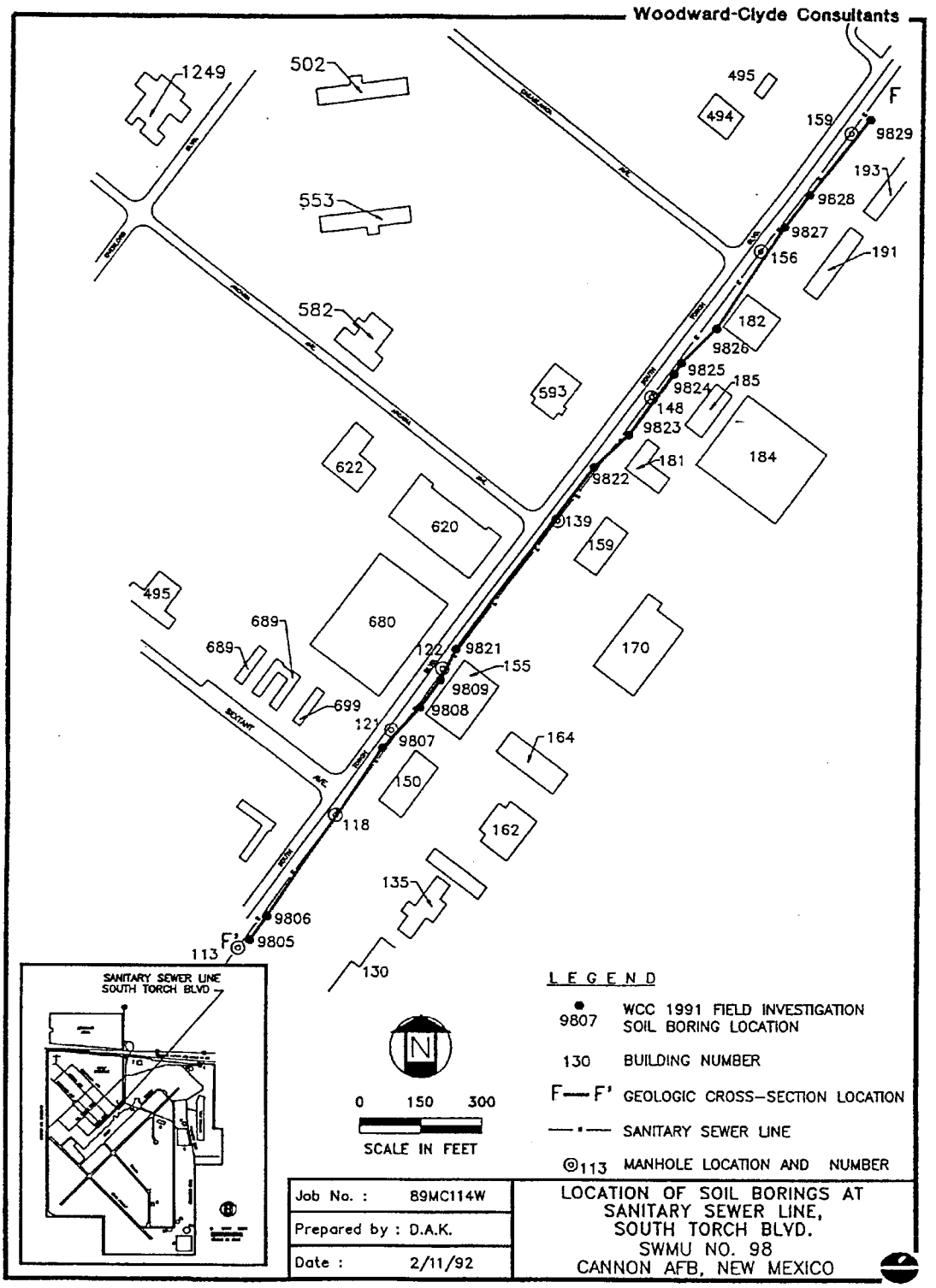


Figure 50-1b

SWMU 98

Source: Woodward-Clyde, 1992

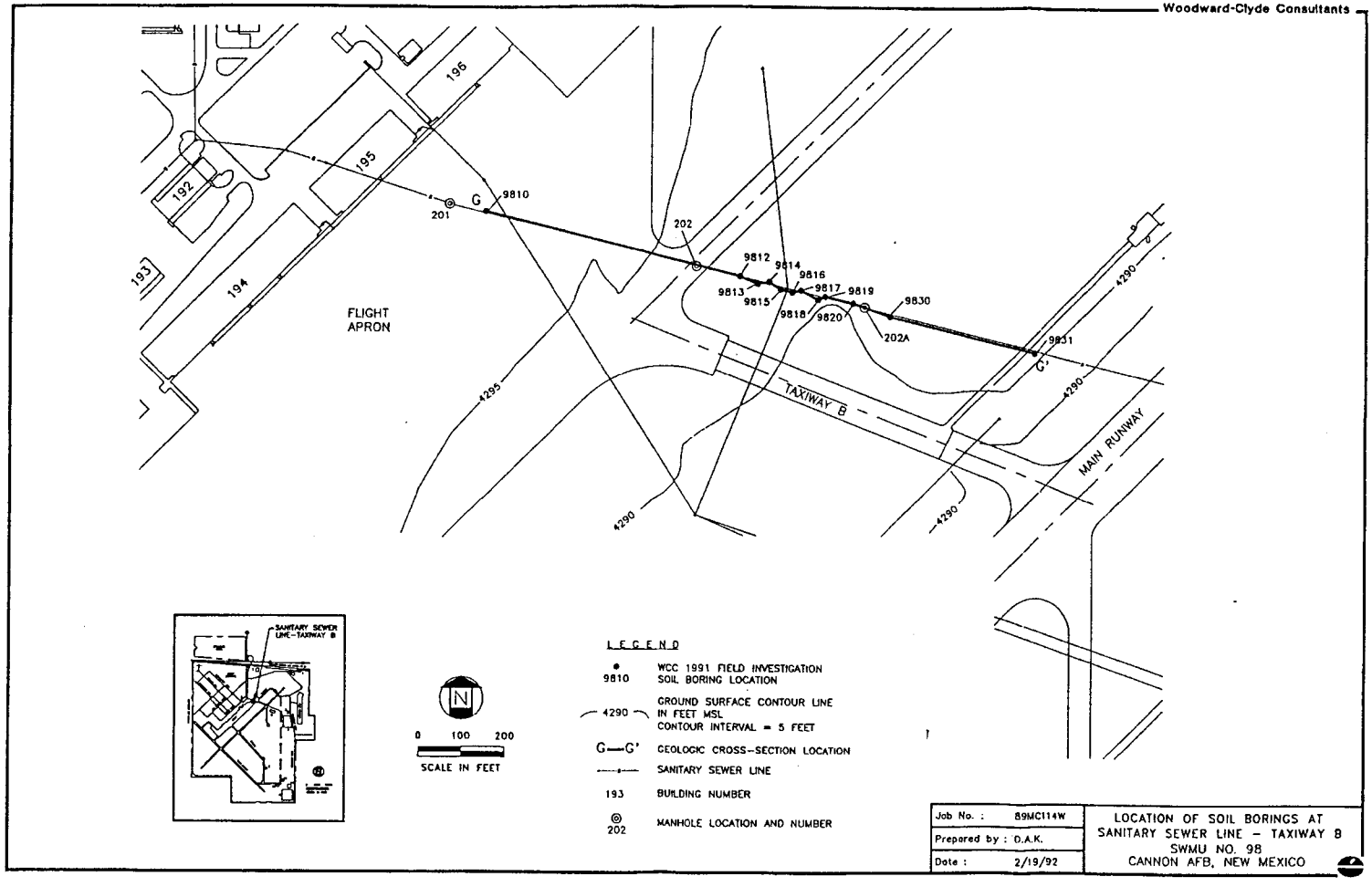


Figure 50-1c
SWMU 98
Source: Woodward-Clyde, 1992

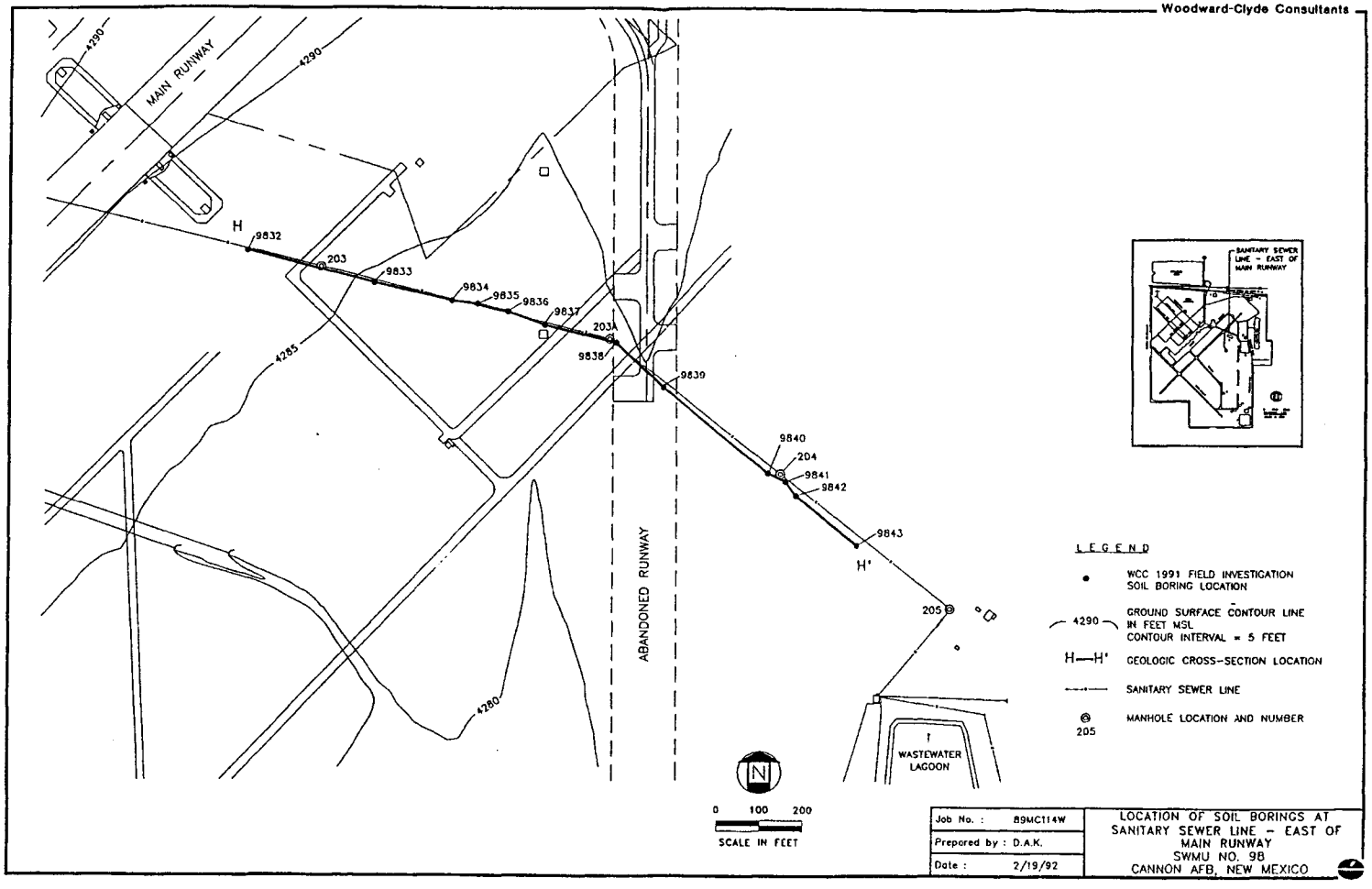


Figure 50-1d
SWMU 98
Source: Woodward-Clyde, 1992

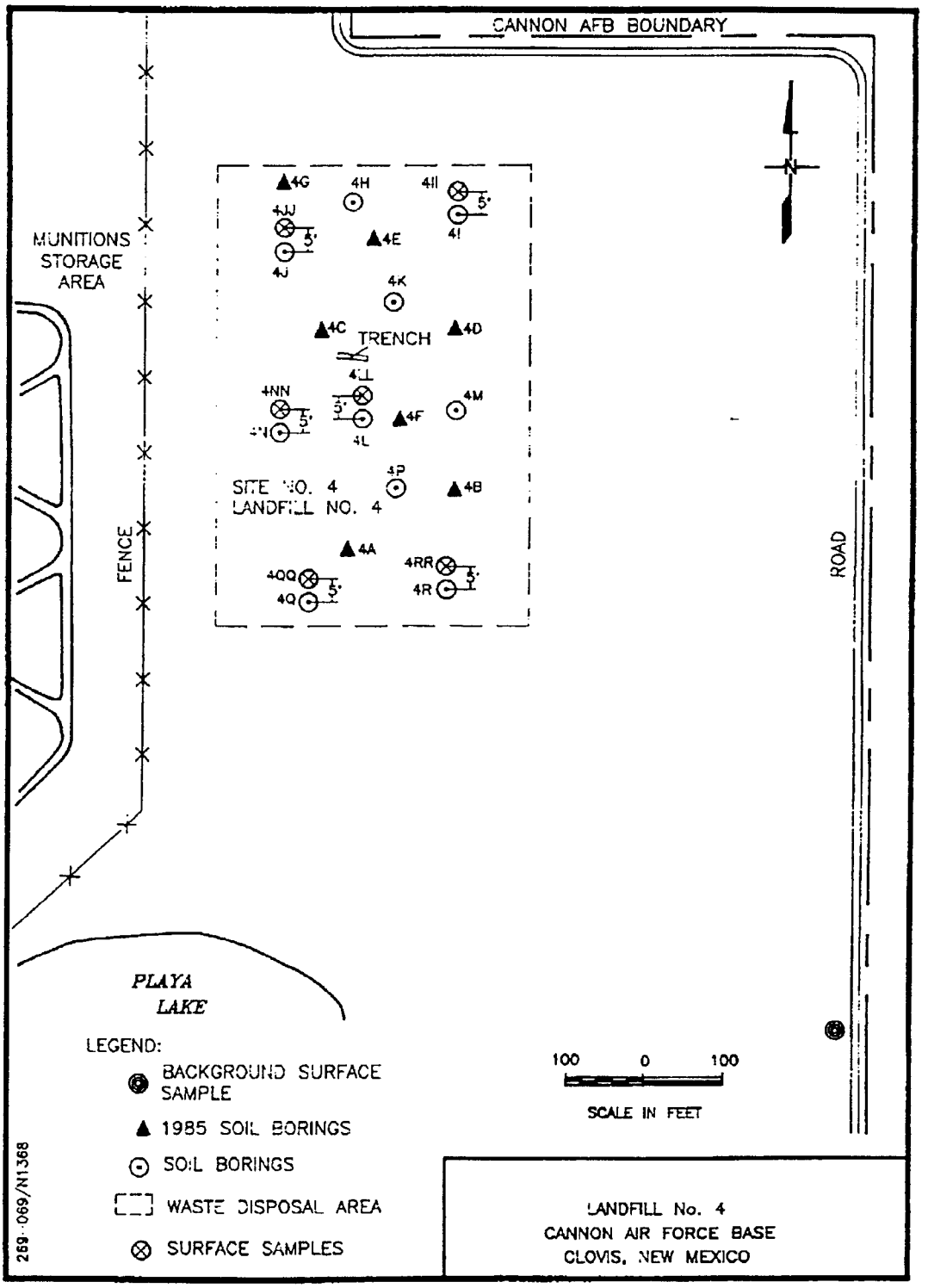


Figure 51-1

SWMU 104

Source: Radian Corp., 1994

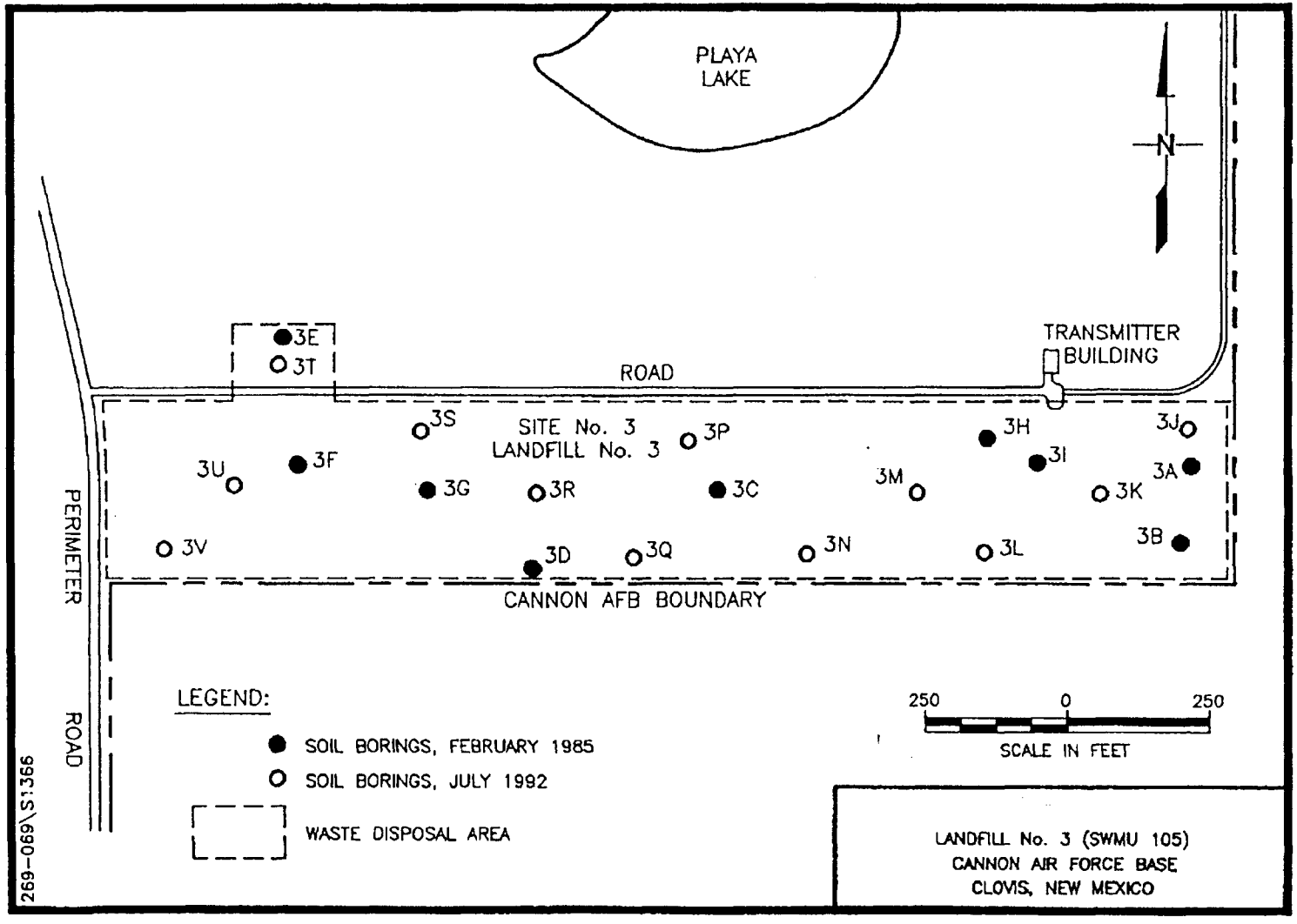


Figure 52-1
SWMU 105
Source: Radian Corp., 1994

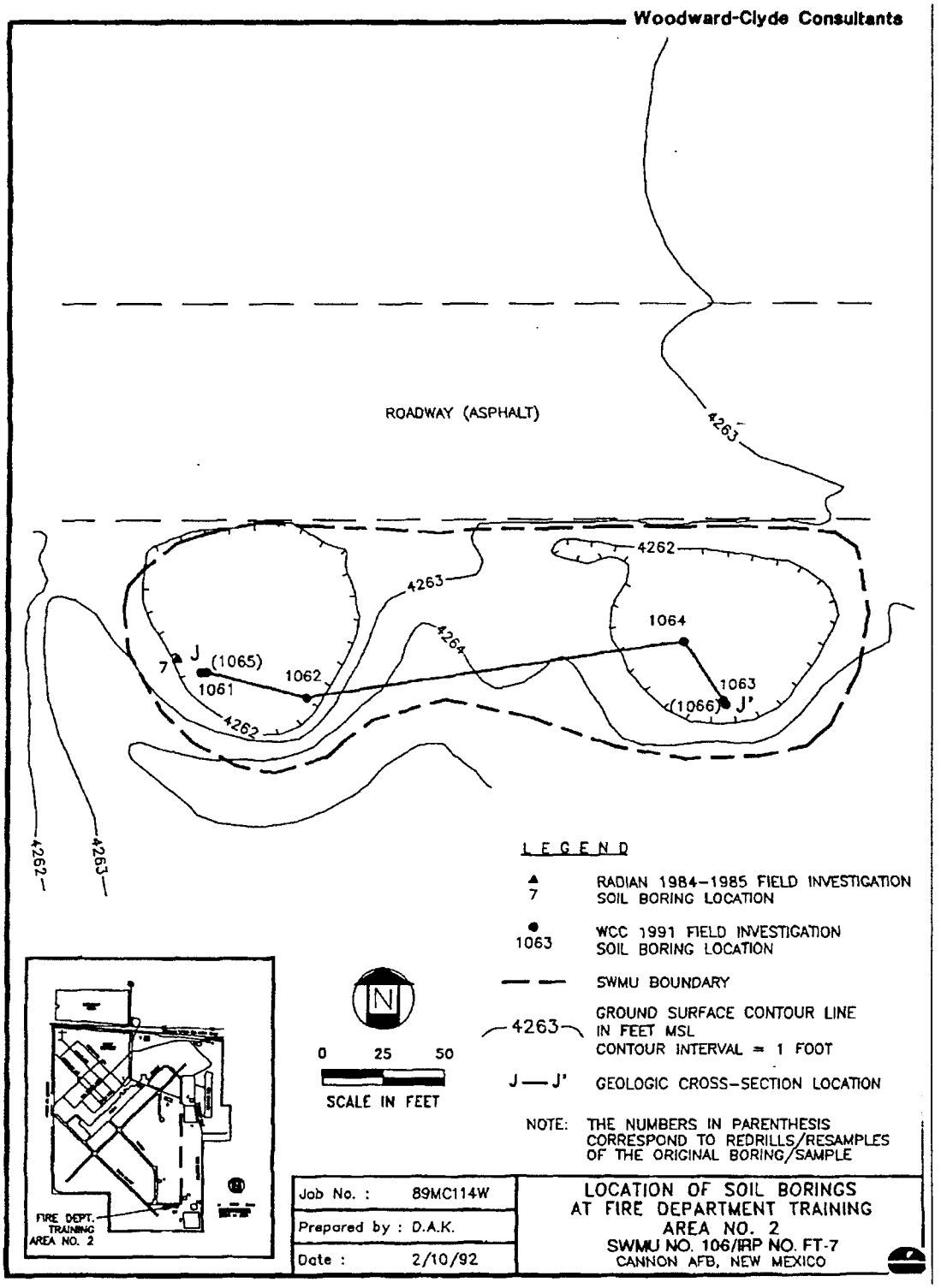


Figure 53-1

SWMU 106

Source: Woodward-Clyde, 1992

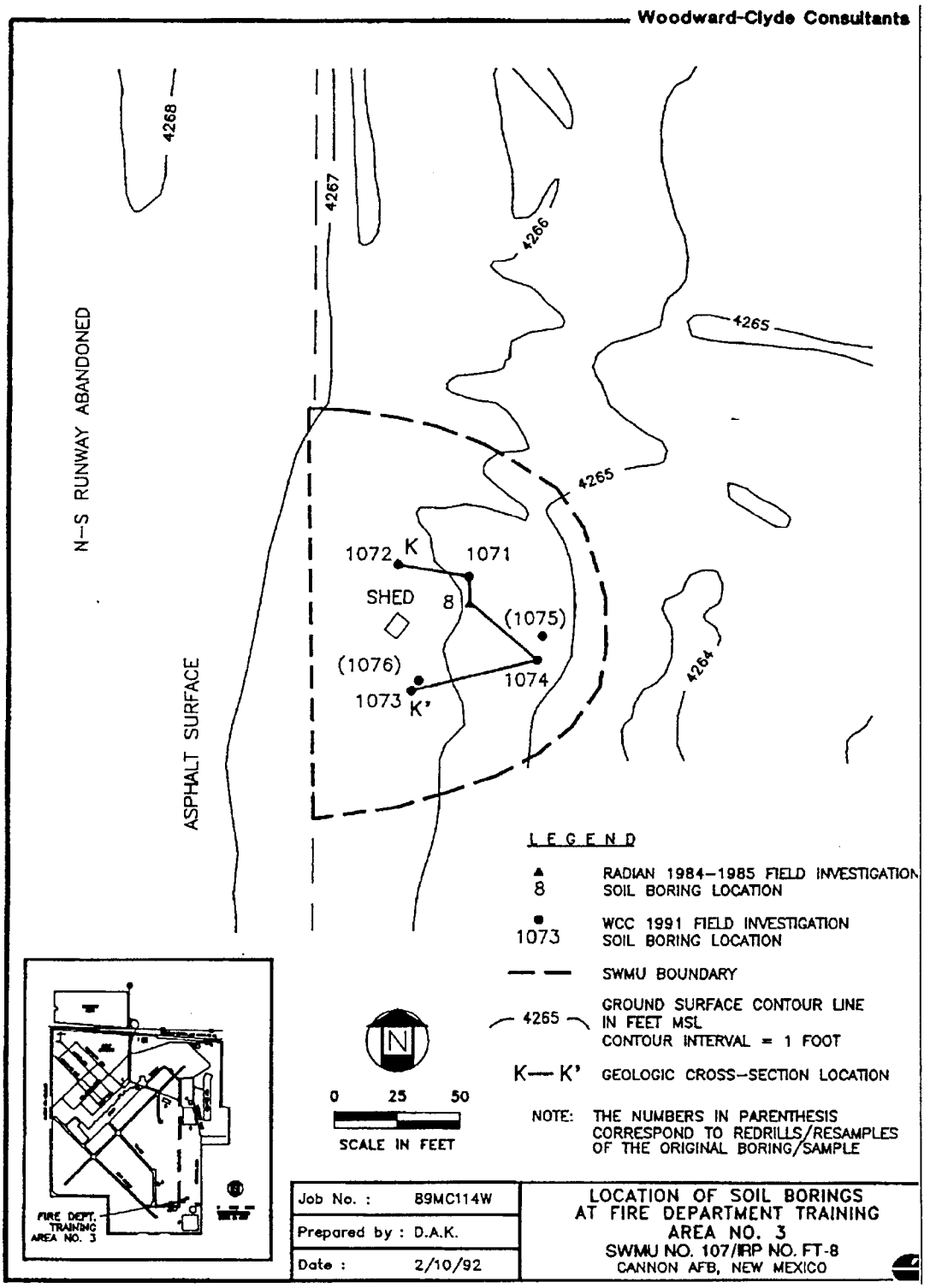


Figure 54-1

SWMU 107

Source: Woodward-Clyde, 1992

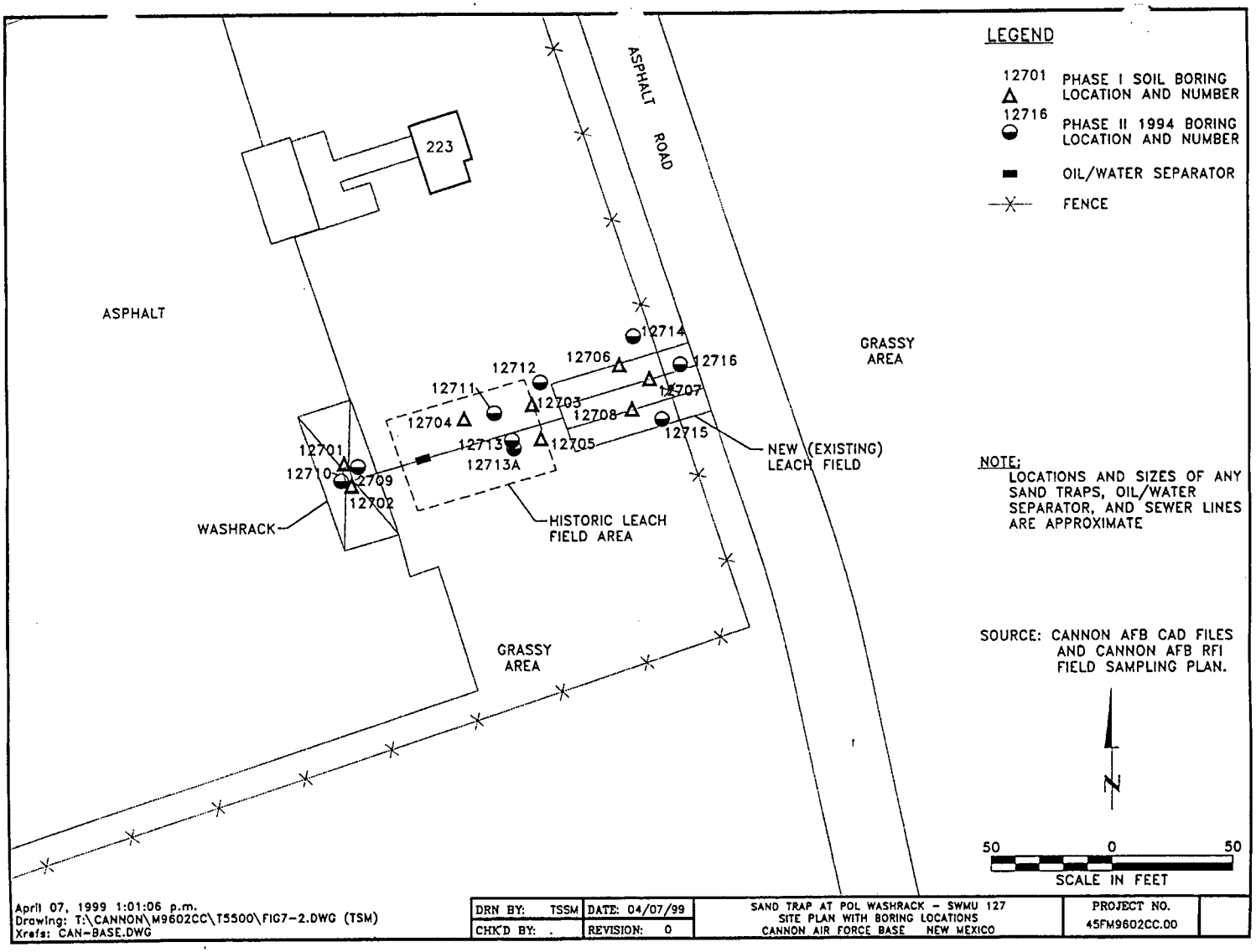


Figure 58-1
SWMU 127
Source: URS Greiner Woodward Clyde, 2000

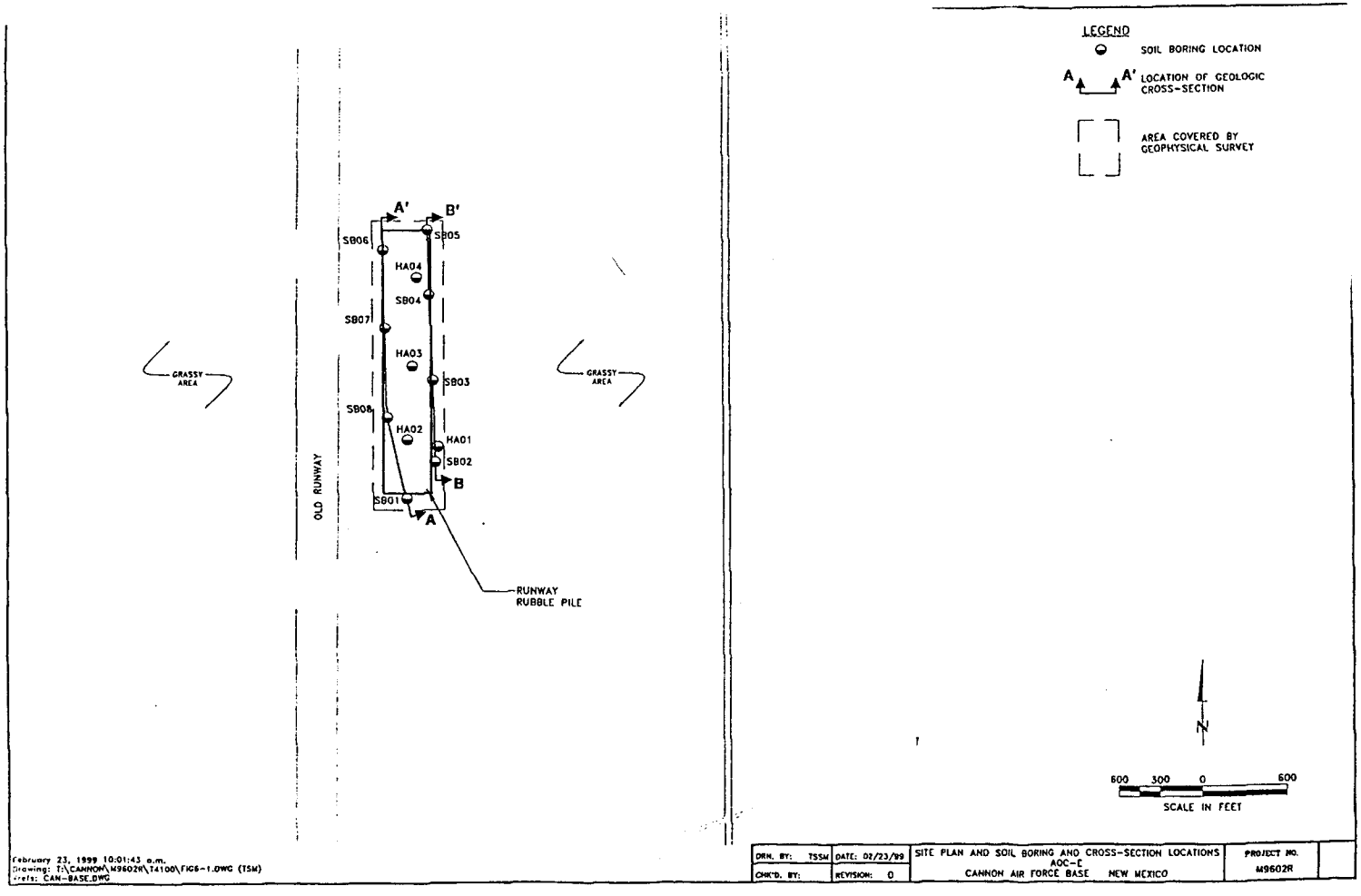


Figure 63-1
AOC E
Source: URS Greiner Woodward Clyde, 1999

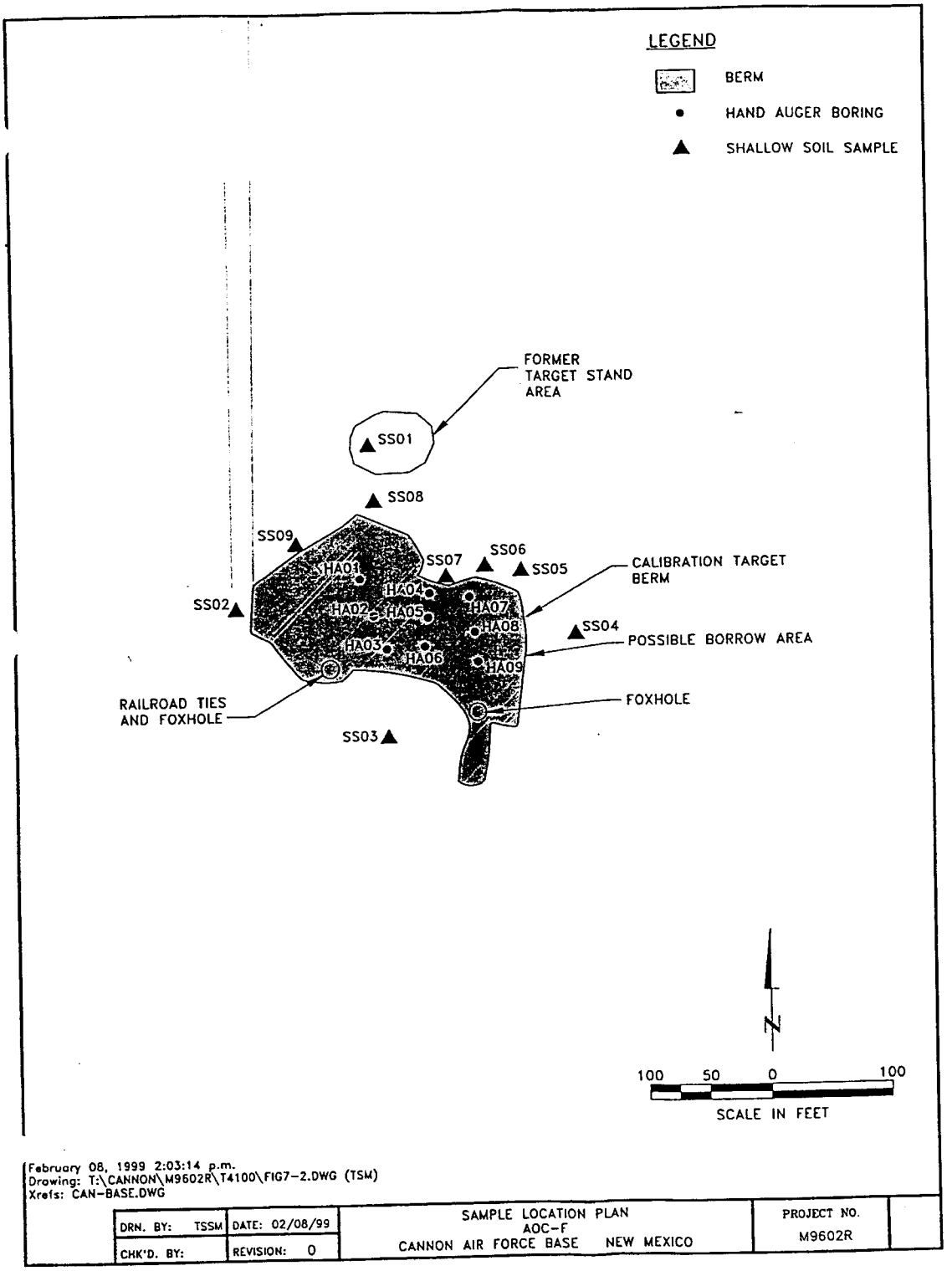


Figure 64-1

AOC F

Source: URS Greiner Woodward Clyde, 1999

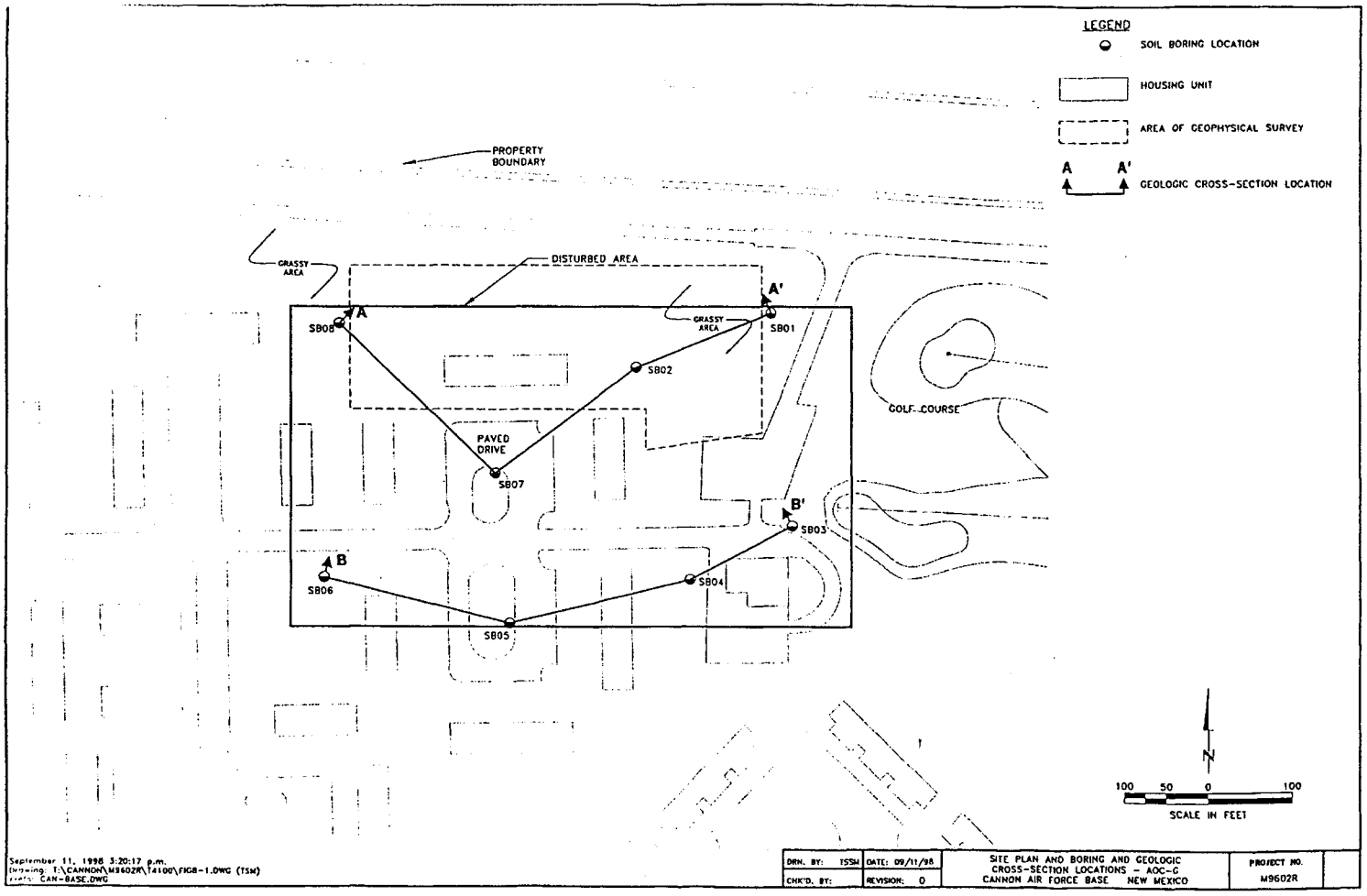


Figure 65-1
AOC G
Source: URS Greiner Woodward Clyde, 1999

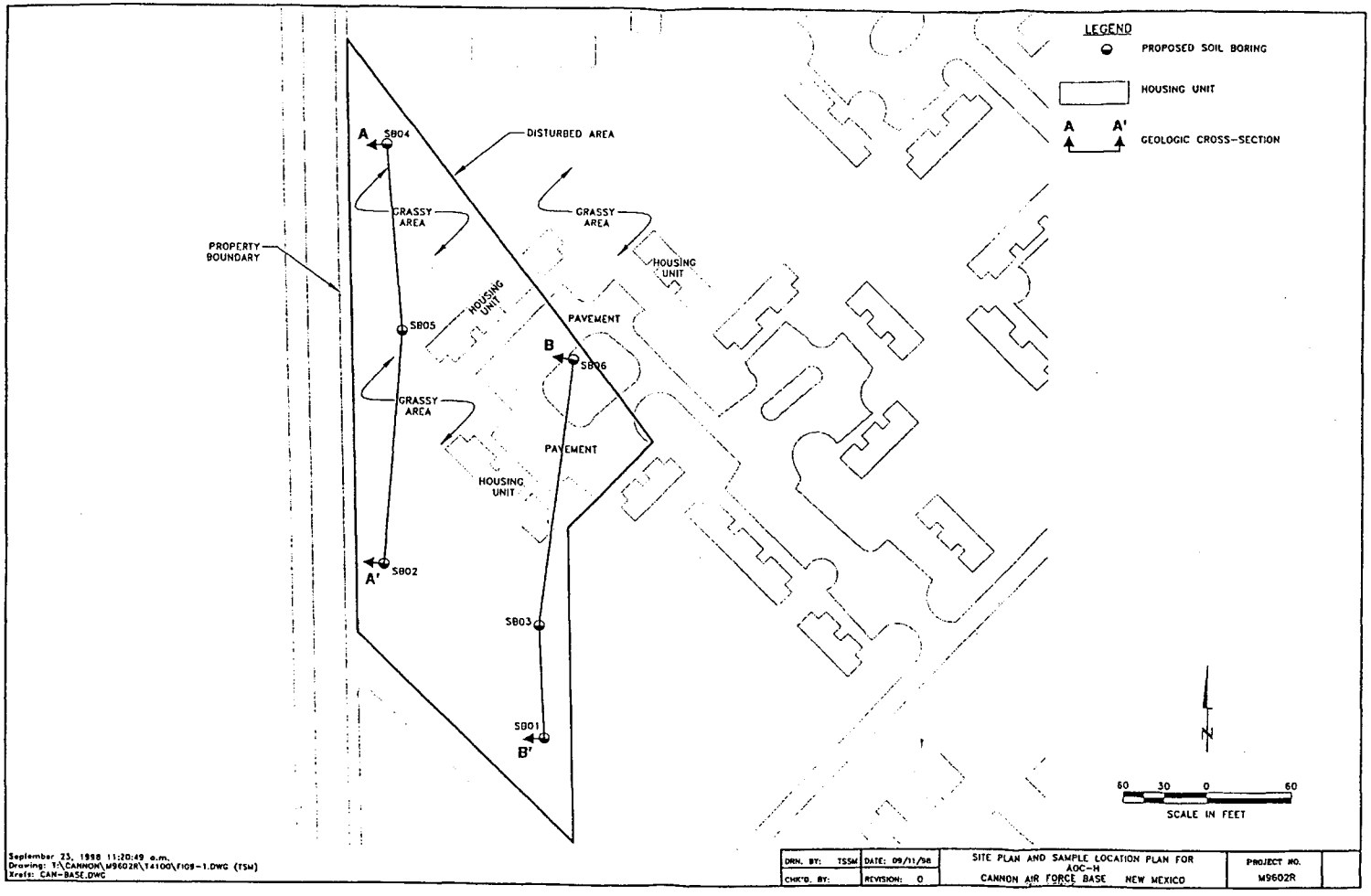


Figure 66-1
AOC H
Source: URS Greiner Woodward Clyde, 1999

Table 45-1a
Acetone and Toluene Concentrations in Soil Samples
SD-11 (SWMUs 86-90)

Boring Number (Redrill Boring Number)	Sample Depth (Ft-BGS)	Acetone (ug/kg)	Toluene (ug/kg)
0861	0-0.5	(11U)	(2J)
[0866]	2-4	10J	12U
(0867)	4-6	21J	11U
	8-10	(270U)	(6J)
	13-15	[13U]	[11U]
	18-20	[5700]	[2800U]
	23-25	[13J]	[2J]
0862	0-0.5	(35U)	(4J)
(0868)	2-4	(660)	(33J)
	4-6	(220)	(11U)
	8-10	1300	1100U
0863	0-0.5	(3J)	(2J)
(8669)	2-4	(1100J)	(55U)
	4-6	(2100J)	(1400U)
	8-10	(390UJ)	(8J)
0864	0-0.5	(17J)	(2J)
(8610)	2-4	(68)	(1J)
	4-6	(290)	(3J)
	8-10	98	26U
0865	0-0.5	8J	100
	2-4	7700U	1400U
	4-6	330J	12U
	8-10	91	11U

Ft-BGS = Feet below ground surface
ug/kg = Micrograms per kilogram
U = Not detected
J = Estimated value
UJ = Estimated as non-detect at the CRQL

[ ] = The values in brackets are results from samples collected from the deeper redrill borings.
( ) = The values in parentheses are results from samples collected form the redrill borings due to laboratory missed holding times.

Source: Woodward-Clyde, 1992

Table 45-1b
Heavy Metal Concentrations[1] in Soil Samples
SD-11 (SWMUs 86-90)

Boring Number	Sample Depth (Ft-BGS)	Antimony	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Zinc
0861	0-0.5	5.4UJ	1,950	2.3	11.1	4.1J	9.8	48.1J	752	7.7J	1,320
	2-4	5.1UJ	147	1.9J	9.8	3.9J	46.8	32.7	152	7.8J	41.1
	4-6	5.4UJ	154	0.94UJ	11.7	5.0J	10.4	12.9	132	11.4	25.6
	8-10	5.2UJ	298	0.9UJ	5.3	2.4J	3U	5.1	64.5	6.5J	11.1U
0862	0-0.5	2.3J	390	4.9	67.8	18.7	56.4	236J	383	103	3,000
	2-4	5.2UJ	128	0.9U	10	5.1J	10	8.5	293	9.5	51.9
	4-6	5UJ	78.1	0.88UJ	9.7	4.1J	7.5	5.3	86.3	9	19U
0863	0-0.5	4.7UJ	207	1.6	14.6	4.4J	14.5	13.5J	187	10.5	249J
	2-4	5.7UJ	80.6	0.99U	11.4	5.1J	8.5	7.9	219	9.7J	26.2
	4-6	5.1UJ	49.9	0.88U	8.9	3.9J	7	6.3	131	8.2J	17.6U
	8-10	5.2UJ	96.1	0.9U	6.9	3.3J	6.9	4.2	97.5	5.4J	14.7
0864	0-0.5	87.4J	503	8.8	113	15.2J	470J	224	229	54.4J	2,900J
	2-4	5.3UJ	82.8	0.92U	12	5.6J	8.7	9.8	219	10.1	37.8
	4-6	5.2UJ	88	0.91U	10.1	3.8J	7.9	4.3	110	8.8J	19.9U
	8-10	5.4UJ	65.4	0.94UJ	8.3	3.5J	7.4	6.5	123	8.8J	18.6

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 45-1b
Heavy Metal Concentrations[1] in Soil Samples
SD-11 (SWMUs 86-90)

Boring Number	Sample Depth (Ft-BGS)	Antimony	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Zinc
0865	0-0.5	4.9UJ	126	0.85U	12	2.8J	8.9J	13.2J	210	6.9J	49.4J
	2-4	5.3UJ	214	0.93UJ	8.8	3.8J	7.4U	7.3	148	8.5J	20.9
	4-6	5.4UJ	71.7	0.93UJ	11.5	3.5J	8.2U	7.1	111	11.2	23.7
	8-10	5.4UJ	87	0.95UJ	7.7	3.4J	6.5U	6	86.7	7.7J	16.5
	Background[2] $\bar{x} + 2\sigma$	4.88-5.44	0-903	0.81-1.01	2.67-9.31	1.38-4.06	0.00-15.44	1.76-8.64	10.89-167	3.57-8.49	4.58-21.82

Ft-BGS = Feet below ground surface
UJ = Estimated as non-detect at the instrument detection limit
J = Estimated value
U = Not detected

1 All concentrations are in milligrams per kilogram (mg/kg)
2 Background range calculated from values

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 45-2a
Selection of COCs
SD-11 (SWMUs 86-90)

Media	Soils
Chemicals Detected:	Aluminum (Al), silver (Ag), arsenic (As), barium (Ba), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), antimony (Sb), manganese (Mn), mercury (Hg), nickel (Ni), vanadium (V), zinc (Zn), 1,1,1-trichloroethane (TCA), 2-butanone, acetone, ethylbenzene, methylene chloride, perchloroethylene (PCE), toluene, trichloroethylene (TCE), total xylenes
Chemicals Discarded:	*Al
	**As, Mn, Hg, Ag, V
	***Be
	+Fe, Mg, Cu
	Lab contaminants - MEK (2-butanone), methylene chloride
Chemicals of Concern:	Sb, Ba, Cd, Cr, Co, Pb, Ni, Zn, TCA, ethylbenzene, PCE, toluene, TCE, xylene, acetone
Exceeded RFI Criteria:	Sb
Exposure Scenario:	Worker - dermal contact, inhalation of VOCs/dust, ingestion of soil

*Lower than site background but > regional background.
**Lower than regional and/or comparable to site background.
***Lower than site regional background.
+Low toxicity chemicals.

Source: Woodward-Clyde, 1992

Table 45-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB - Soil and Groundwater
SD-11 (SWMUs 86-90)

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 45-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB - Soil and Groundwater
SD-11 (SWMUs 86-90)

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8611-0000			CAN086-8611-0004			CAN086-8611-0009			CAN086-8611-0014			CAN086-8611-0039			CAN086-8611-0049			CAN086-8611-0059			CAN086-8611-0069		
LAB SAMPLE NUMBER	0452880010SA			0452880011SA			0452880012SA			0452880013SA			0452880014SA			0452880015SA			0452880016SA			0452880017SA		
COLLECT DATE	10/18/95			10/18/95			10/18/95			10/18/95			10/19/95			10/19/95			10/19/95			10/19/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																								
Acetone	<	11	U	<	90	U	<	240	U	<	1100	U	<	1100	U	<	12	U	<	11	U	<	10	U
2-Butanone (MEK)	<	11	U	12	11		33	28		<	1100	U	<	1100	U	<	12	U	<	11	U	<	10	U
Ethylbenzene	<	5.6	U	1.4	5.5	U	<	14	U	18000	570		7200	540		1.5	5.8	U	<	5.5	U	<	5.2	U
Methylene chloride	<	5.6	U	<	5.5	U	<	14	U	<	570	U	<	540	U	<	5.8	U	<	5.5	U	<	5.2	U
Toluene	<	5.6	U	<	5.5	U	<	14	U	<	570	U	300	540	J	<	5.8	U	<	5.5	U	<	5.2	U
Xylenes (total)	<	5.6	U	1.2	5.5	J	3	14	J	33000	570		22000	540		6.3	5.8		<	5.5	U	<	5.2	U
Semivolatile Organics (µg/kg)																								
Benzo(a)anthracene	41	370	J	44	360	J	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Benzo(a)pyrene	40	370	J	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Benzo(b)fluoranthene	64	370	J	75	360	J	50	370	J	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Benzo(g,h,i)perylene	<	370	U	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
bis(2-Ethylhexyl)phthal	<	370	U	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Chrysene	44	370	J	40	360	J	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Di-n-octyl phthalate	<	370	U	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Dibenzofuran	<	370	U	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Fluoranthene	70	370	J	90	360	J	56	370	J	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Isophorone	<	370	U	<	360	U	<	370	U	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
2-Methylnaphthalene	<	370	U	190	360	J	110	370	J	18000	3800		3900	350		120	380	J	140	360	J	<	340	U
Naphthalene	<	370	U	79	360	J	<	370	U	11000	3800		2200	350		85	380	J	83	360	J	<	340	U
Phenanthrene	<	370	U	55	360	J	38	370	J	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U
Pyrene	61	370	J	69	360	J	48	370	J	<	3800	U	<	350	U	<	380	U	<	360	U	<	340	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 1 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8611-0000			CAN086-8611-0004			CAN086-8611-0009			CAN086-8611-0014			CAN086-8611-0039			CAN086-8611-0049			CAN086-8611-0059			CAN086-8611-0069		
LAB SAMPLE NUMBER	0452880010SA			0452880011SA			0452880012SA			0452880013SA			0452880014SA			0452880015SA			0452880016SA			0452880017SA		
COLLECT DATE	10/18/95			10/18/95			10/18/95			10/18/95			10/19/95			10/19/95			10/19/95			10/19/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																								
Aluminum	12500	11.2		11600	11		10600	11.1		6640	57		4500	10.7		3450	11.5		3880	10.9		1770	10.4	
Arsenic	2.2	1.1		2.3	1.1		2.8	0.56		1.4	1.1		0.9	0.54		0.54	0.58	J	0.78	0.55		0.56	0.52	
Barium	213	1.1	J	230	1.1	J	273	1.1	J	326	5.7	J	83	1.1	J	26.5	1.2	J	43.4	1.1	J	20.4	1	J
Beryllium	0.62	0.22		0.67	0.22		0.63	0.22		0.71	1.1	J	0.26	0.21		0.22	0.23	J	0.27	0.22		0.14	0.21	J
Calcium	49900	22.5		74200	22.1		64900	22.2		246000	114		82600	21.5		22400	23		73900	21.8		899	20.9	
Chromium	13.6	1.1		13.4	1.1		11.1	1.1		4.7	5.7	J	5.4	1.1		4	1.2		10.5	1.1		2.9	1	
Cobalt	4.1	1.1		4.3	1.1		3.8	1.1		<	5.7	U	1.6	1.1		1.4	1.2		2.1	1.1		<	1	U
Copper	7.5	2.2		7.7	2.2		6.4	2.2		2.3	11.4	J	2.6	2.1		1.5	2.3	J	9.5	2.2		1.3	2.1	J
Iron	10600	11.2		10100	11		9420	11.1		4660	57		3850	10.7		3740	11.5		3980	10.9		2370	10.4	
Lead	7.6	0.56		7.5	0.55		9	1.1		2.6	0.57		2	0.54		2	0.58		5.5	0.55		1.3	0.52	
Magnesium	2880	22.5		2820	22.1		2770	22.2		6050	114		4110	21.5		3730	23		5680	21.8		1430	20.9	
Manganese	173	1.1		204	1.1		143	1.1		105	5.7		37.1	1.1		42.9	1.2		48.7	1.1		18	1	
Mercury	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.12	U	<	0.11	U	<	0.1	U
Nickel	10.5	4.5		10.3	4.4		8.3	4.4		6.2	22.8	J	3.9	4.3	J	3.1	4.6	J	5.3	4.4		2.6	4.2	J
Potassium	2020	562		1900	552		1800	556		1970	2850	J	919	536		669	575		668	545		421	521	J
Sodium	<	562	U	204	552	J	<	556	U	<	2850	U	149	536	J	<	575	U	<	545	U	172	521	J
Thallium	<	0.56	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	0.58	UJ	<	1.1	UJ	<	0.52	UJ
Vanadium	24.2	1.1		22.9	1.1		22.2	1.1		12.4	5.7		9.6	1.1		10.8	1.2		13.9	1.1		6.5	1	
Zinc	33.6	2.2		29.5	2.2		27.6	2.2		12.1	11.4		7.7	2.1		7.1	2.3		14.4	2.2		4.2	2.1	
TPH (mg/kg)																								
Total Petroleum Hydroc	523	44.9	J	551	44.2	J	866	44.5	J	5010	456	J	626	42.9	J	166	46	J	533	43.6	J	<	41.7	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 2 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8612-0000			CAN086-8612-0009			CAN086-8612-0014			CAN086-8612-0019			CAN086-8612-0029			CAN086-8612-0034			CAN086-8613-0000			CAN086-8613-0014		
LAB SAMPLE NUMBER	0452600005SA			0452880002SA			0452880003SA			0452880004SA			0452880008SA			0452880009SA			0452880007SA			0453180002SA		
COLLECT DATE	10/18/95			10/18/95			10/18/95			10/18/95			10/18/95			10/18/95			10/18/95			10/19/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																								
Acetone	<	11	U	<	55	U	<	110	U	<	63	U	<	11	U	<	11	U	<	11	U	590	57	J
2-Butanone (MEK)	<	11	U	<	55	U	<	110	U	<	56	U	<	11	U	<	11	U	<	11	U	36	57	J
Ethylbenzene	<	5.7	U	<	28	U	<	56	U	<	28	U	<	5.6	U	<	5.5	U	<	5.5	U	480	29	J
Methylene chloride	<	5.7	U	<	28	U	<	56	U	<	28	U	<	5.6	U	<	5.5	U	<	5.5	U	<	29	U
Toluene	<	5.7	U	<	28	U	<	56	U	<	28	U	<	5.6	U	<	5.5	U	3	5.5	J	<	29	U
Xylenes (total)	<	5.7	U	<	28	U	<	56	U	<	28	U	<	5.6	U	<	5.5	U	<	5.5	U	540	29	J
Semivolatile Organics (µg/																								
Benzo(a)anthracene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	94	360	J	<	3800	U
Benzo(a)pyrene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	98	360	J	<	3800	U
Benzo(b)fluoranthene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	160	360	J	<	3800	U
Benzo(g,h,i)perylene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	49	360	J	<	3800	U
bis(2-Ethylhexyl)phthal	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	3800	U
Chrysene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	110	360	J	<	3800	U
Di-n-octyl phthalate	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	3800	U
Dibenzofuran	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	3800	U
Fluoranthene	38	380	J	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	150	360	J	<	3800	U
Indeno(1,2,3-cd)pyrene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	40	360	J	<	3800	U
Isophorone	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	930	3800	J
2-Methylnaphthalene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	940	3800	J
Naphthalene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	760	3800	J
Phenanthrene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	57	360	J	<	3800	U
Pyrene	<	380	U	<	1500	U	<	370	U	<	370	U	<	370	U	<	360	U	110	360	J	<	3800	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 3 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8612-0000			CAN086-8612-0009			CAN086-8612-0014			CAN086-8612-0019			CAN086-8612-0029			CAN086-8612-0034			CAN086-8613-0000			CAN086-8613-0014		
LAB SAMPLE NUMBER	0452600005SA			0452880002SA			0452880003SA			0452880004SA			0452880008SA			0452880009SA			0452880007SA			0453180002SA		
COLLECT DATE	10/18/95			10/18/95			10/18/95			10/18/95			10/18/95			10/18/95			10/18/95			10/19/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																								
Aluminum	11300	11.5		7080	22.1		6060	22.5		6540	22.3		5240	22.4		8020	11		10100	10.9		8080	22.8	
Arsenic	3	0.57		1.7	0.55		1.6	0.56		0.89	0.56		0.95	0.56		0.71	0.55		2	0.55		1.5	0.57	
Barium	215	1.1	J	327	2.2	J	189	2.3	J	129	2.2	J	685	2.2	J	40.9	1.1	J	410	1.1	J	297	2.3	J
Beryllium	0.47	0.23		0.59	0.44		0.49	0.45		0.39	0.45	J	0.24	0.45	J	0.31	0.22		0.58	0.22		0.45	0.46	J
Calcium	75100	22.9		126000	44.2		218000	45.1		159000	44.6		147000	44.7		65300	22.1		71400	21.8		199000	45.6	
Chromium	9.5	1.1		5.3	2.2		4.3	2.3		6	2.2		4.9	2.2		6.5	1.1		13.3	1.1		8.1	2.3	
Cobalt	3.6	1.1		2.7	2.2		<	2.3	U	<	2.2	U	<	2.2	U	1.3	1.1		3.7	1.1		2.4	2.3	
Copper	6.6	2.3		2.5	4.4	J	1.6	4.5	J	1.2	4.5	J	1.9	4.5	J	1.7	2.2	J	7.5	2.2		4.3	4.6	J
Iron	9250	11.5		4940	22.1		4330	22.5		4430	22.3		3470	22.4		5260	11		9520	10.9		5800	22.8	
Lead	8.5	2.9		5.1	0.55		3.5	0.56		2.8	0.56		1.9	0.56		2.9	0.55		8	1.1	J	3.7	0.57	
Magnesium	2770	22.9		3580	44.2		4000	45.1		5230	44.6		13200	44.7		8250	22.1		2590	21.8	J	4900	45.6	
Manganese	205	1.1		60.7	2.2		39.2	2.3		32.8	2.2		27.7	2.2		35.6	1.1		175	1.1		160	2.3	
Mercury	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U
Nickel	9	4.6		5.3	8.8	J	3.8	9	J	3.6	8.9	J	6.1	8.9	J	5.1	4.4		9.8	4.4		8.4	9.1	J
Potassium	1950	573		1450	1100		1400	1130		1390	1120		1000	1120	J	1320	552		1740	545		1810	1140	
Sodium	<	573	U	<	1100	U	<	1130	U	<	1120	U	<	1120	U	<	552	U	<	545	U	<	1140	U
Thallium	0.13	0.57	J	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ
Vanadium	19.6	1.1		12.2	2.2		12.3	2.3		12.8	2.2		15.9	2.2		15.5	1.1		21.8	1.1		19.1	2.3	
Zinc	26.1	2.3		13.7	4.4		11.8	4.5		10.9	4.5		7.4	4.5		10.7	2.2		38.3	2.2		16.2	4.6	
TPH (mg/kg)																								
Total Petroleum Hydroc	280	45.9		5390	442	J	3230	225	J	889	44.6	J	<	44.7	U	<	44.2	U	553	43.6	J	5270	456	

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 4 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8613-0024			CAN086-8613-0034			CAN086-8613-0049			CAN086-8613-0064			CAN086-8614-0000			CAN086-8614-0009			CAN086-8614-0029			CAN086-8614-0034		
LAB SAMPLE NUMBER	0453180003SA			0453180004SA			0453180005SA			0453180006SA			0452600001SA			0452600002SA			0452600003SA			0452600004SA		
COLLECT DATE	10/19/95			10/19/95			10/20/95			10/20/95			10/17/95			10/17/95			10/17/95			10/17/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																								
Acetone	130	27		240	58		<	11	U	<	11	U	<	14	U	<	14	U	<	17	U	<	11	U
2-Butanone (MEK)	20	27	J	51	58	J	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Ethylbenzene	150	14		180	29		<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Methylene chloride	3.2	14	J	<	29	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Toluene	<	14	U	<	29	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Xylenes (total)	200	14		400	29		<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Semivolatile Organics (µg/																								
Benzo(a)anthracene	<	720	U	<	760	U	<	360	U	<	360	U	200	360	J	<	360	U	<	360	U	<	360	U
Benzo(a)pyrene	<	720	U	<	760	U	<	360	U	<	360	U	270	360	J	<	360	U	<	360	U	<	360	U
Benzo(b)fluoranthene	<	720	U	<	760	U	<	360	U	<	360	U	440	360		<	360	U	<	360	U	<	360	U
Benzo(g,h,i)perylene	<	720	U	<	760	U	<	360	U	<	360	U	110	360	J	<	360	U	<	360	U	<	360	U
bis(2-Ethylhexyl)phthal	<	720	U	<	760	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Chrysene	<	720	U	<	760	U	<	360	U	<	360	U	260	360	J	<	360	U	<	360	U	<	360	U
Di-n-octyl phthalate	<	720	U	<	760	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Dibenzofuran	<	720	U	150	760	J	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Fluoranthene	<	720	U	<	760	U	<	360	U	<	360	U	210	360	J	<	360	U	<	360	U	<	360	U
Indeno(1,2,3-cd)pyrene	<	720	U	<	760	U	<	360	U	<	360	U	89	360	J	<	360	U	<	360	U	<	360	U
Isophorone	<	720	U	<	760	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
2-Methylnaphthalene	2600	720		4800	760		<	360	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Naphthalene	970	720		1500	760		<	360	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Phenanthrene	<	720	U	<	760	U	<	360	U	<	360	U	56	360	J	<	360	U	<	360	U	<	360	U
Pyrene	<	720	U	<	760	U	<	360	U	<	360	U	260	360	J	<	360	U	<	360	U	<	360	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for
RL = Reporting Limit.

D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 5 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8613-0024			CAN086-8613-0034			CAN086-8613-0049			CAN086-8613-0064			CAN086-8614-0000			CAN086-8614-0009			CAN086-8614-0029			CAN086-8614-0034		
LAB SAMPLE NUMBER	0453180003SA			0453180004SA			0453180005SA			0453180006SA			0452600001SA			0452600002SA			0452600003SA			0452600004SA		
COLLECT DATE	10/19/95			10/19/95			10/20/95			10/20/95			10/17/95			10/17/95			10/17/95			10/17/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																								
Aluminum	6830	11		6880	11.5		3690	10.9		3440	10.9		11700	11		8840	11		3760	22.1		6150	11	
Arsenic	1	0.55		1	0.58		<	3.3	U	<	3.3	U	2.8	0.55	J	2	0.55	J	1.2	0.55	J	1.1	0.55	J
Barium	176	1.1	J	193	1.2	J	58.7	1.1	J	24.5	1.1	J	253	1.1	J	463	1.1	J	67.4	2.2	J	1260	1.1	J
Beryllium	0.26	0.22		0.19	0.23	J	0.14	0.22	J	0.14	0.22	J	0.53	0.22		0.5	0.22		0.22	0.44	J	0.2	0.22	J
Calcium	34400	21.9		115000	23		55600	21.7		7600	21.8		56400	22		1E+05	22.1		168000	44.2		39100	22	
Chromium	4.9	1.1		6	1.2		3.5	1.1		3.6	1.1				R			R			R			R
Cobalt	1.4	1.1		1.5	1.2		<	1.1	U	1.2	1.1		4.1	1.1		2.6	1.1		<	2.2	U	<	1.1	U
Copper	1.9	2.2	J	2.4	2.3		1.1	2.2	J	1.5	2.2	J	7.3	2.2		4.2	2.2		<	4.4	U	1.9	2.2	J
Iron	5240	11		4020	11.5		3510	10.9		4280	10.9		10200	11		5980	11		2690	22.1		5030	11	
Lead	3.1	0.55		2.5	0.58		2	0.54		2	0.55		4.6	1.1		3.3	0.55		1.4	0.55		2.3	1.1	
Magnesium	3120	21.9		12700	23		5540	21.7		2970	21.8		2680	22		3120	22.1		5930	44.2		3650	22	
Manganese	34.2	1.1		30.5	1.2		44.6	1.1		57.8	1.1		191	1.1	J	95.3	1.1	J	23.8	2.2	J	48	1.1	J
Mercury	<	0.11	U	<	0.12	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U
Nickel	4.2	4.4	J	4.3	4.6	J	2.6	4.3	J	2.4	4.4	J	9.3	4.4		6	4.4		2.8	8.8	J	4.5	4.4	
Potassium	1490	548		1390	576		715	543		675	545		2030	550		1600	552		672	1110	J	1550	550	
Sodium	<	548	U	<	576	U	<	543	U	<	545	U	<	550	U	<	552	U	<	1110	U	<	550	U
Thallium	<	0.55	UJ	<	1.2	UJ	<	0.54	UJ	<	0.55	UJ	0.18	1.1	J	0.17	1.1	J	0.12	1.1	J	0.11	1.1	J
Vanadium	12.6	1.1		15	1.2		11	1.1		12.7	1.1		21.1	1.1		14.4	1.1		14.7	2.2		13.1	1.1	
Zinc	10.9	2.2		7	2.3		6.3	2.2		6.7	2.2		29.3	2.2		15.2	2.2		7.7	4.4		10.9	2.2	
TPH (mg/kg)																								
Total Petroleum Hydroc	497	43.8		786	46.1		<	43.4	U	<	43.6	U	363	44		<	44.2	U	<	44.2	U	<	44	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for
RL = Reporting Limit.

D = Sample was diluted for analysis.
RL = Reporting Limit.

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8615-0001			CAN086-8615-0029			CAN086-8615-0034			CAN086-8616-0000			CAN086-8616-0029			CAN086-8616-0034			CAN086-8617-0000			CAN086-8617-0029		
LAB SAMPLE NUMBER	0453180007SA			0453180008SA			0453180009SA			0453390001SA			0453390002SA			0453390003SA			0453390004SA			0453390005SA		
COLLECT DATE	10/20/95			10/20/95			10/20/95			10/21/95			10/21/95			10/21/95			10/21/95			10/21/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																								
Acetone	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Ethylbenzene	<	5.7	U	<	5.5	U	<	5.4	U	<	5.7	U	<	5.6	U	<	5.7	[illegible]	<	5.6	U	<	5.5	U
Methylene chloride	<	5.7	U	<	5.5	U	<	5.4	U	<	5.7	U	<	5.6	U	<	[illegible]	U	<	5.6	U	<	5.5	U
Toluene	<	5.7	U	4.6	5.5	J	<	5.4	U	<	5.7	U	1.6	5.6	J	<	5.7	U	<	5.6	U	<	5.5	U
Xylenes (total)	<	5.7	U	<	5.5	U	<	5.4	U	<	5.7	U	<	5.6	U	<	5.7	U	<	5.6	U	<	5.5	U
Semivolatile Organics (µg/																								
Benzo(a)anthracene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Benzo(a)pyrene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Benzo(b)fluoranthene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	[illegible]	<	370	U	<	370	U	<	360	U
Benzo(g,h,i)perylene	<	380	U	<	360	U	<	360	U	<	370	U	<	[illegible]	U	<	370	U	<	370	U	<	360	U
bis(2-Ethylhexyl)phthal	<	380	U	<	360	U	<	360	U	<	370	U		370	U	<	370	U	<	370	U	<	360	U
Chrysene	<	380	U	<	360	U	<	360	U	<	[illegible]	[illegible]	<	370	U	<	370	U	<	370	U	<	360	U
Di-n-octyl phthalate	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Dibenzofuran	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Fluoranthene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Indeno(1,2,3-cd)pyrene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Isophorone	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
2-Methylnaphthalene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Naphthalene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Phenanthrene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U
Pyrene	<	380	U	<	360	U	<	360	U	<	370	U	<	370	U	<	370	U	<	370	U	<	360	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 7 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8615-0001			CAN086-8615-0029			CAN086-8615-0034			CAN086-8616-0000			CAN086-8616-0029			CAN086-8616-0034			CAN086-8617-0000			CAN086-8617-0029		
LAB SAMPLE NUMBER	0453180007SA			0453180008SA			0453180009SA			0453390001SA			0453390002SA			0453390003SA			0453390004SA			0453390005SA		
COLLECT DATE	10/20/95			10/20/95			10/20/95			10/21/95			10/21/95			10/21/95			10/21/95			10/21/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																								
Aluminum	12000	11.5		6280	11		5990	10.9		8770	11.3		4430	22.5		5420	11.3		10700	11.1		3730	22	
Arsenic	2.5	0.57		1.4	0.55		1	0.54		2.4	0.57		0.78	0.56		0.69	0.57		2.6	1.1		0.89	0.55	
Barium	78.6	1.1	J	260	1.1	J	110	1.1	J	86.1	1.1	J	931	2.2	J	63.6	1.1	J	145	1.1	J	90.9	2.2	J
Beryllium	0.58	0.23		0.23	0.22		0.19	0.22	J	0.53	0.23		<	0.45	U	0.19	0.23	J	0.55	0.22		<	0.44	U
Calcium	1940	23		80300	22.1		83000	21.7		6370	22.6	J	153000	45	J	108000	22.7	J	20900	22.3		167000	44	
Chromium	11.2	1.1		4.8	1.1		4.3	1.1		8.8	1.1		3.6	2.2		5.7	1.1		9.7	1.1		7.1	2.2	
Cobalt	4.4	1.1		2.4	1.1		<	1.1	U	4.5	1.1		<	2.2	U	1.7	1.1		4.9	1.1		1.8	2.2	J
Copper	8.2	2.3		2	2.2	J	1.4	2.2	J	6.9	2.3		1.6	4.5	J	1.6	2.3	J	9.2	2.2		9.6	4.4	
Iron	11800	11.5		4670	11		4120	10.9		9400	11.3		2800	22.5		3260	11.3		10400	11.1		2620	22	
Lead	8.3	0.57		3	0.55		2.4	0.54		5.7	0.57		1.7	0.56		2	0.57		8.7	0.56		1.8	0.55	
Magnesium	1780	23		5070	22.1		6480	21.7		1650	22.6		9970	45		9670	22.7		2100	22.3		8610	44	
Manganese	183	1.1		47.7	1.1		27.3	1.1		199	1.1		25	2.2		30.3	1.1		214	1.1		37.9	2.2	
Mercury	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U
Nickel	9.2	4.6		4.7	4.4		3.8	4.3	J	9.5	4.5		4.5	9	J	5.2	4.5		9.4	4.5		6.1	8.8	J
Potassium	1950	575		1520	551		1190	543		1630	566		667	1120	J	959	567		1820	557		629	1100	J
Sodium	<	575	U	<	551	U	<	543	U	<	566	U	<	1120	U	<	567	U	<	557	U	<	1100	U
Thallium	0.18	0.57	J	<	1.1	UJ	<	0.54	UJ	<	0.57	UJ	<	2.2	UJ	<	1.1	UJ	0.14	0.56	J	<	2.2	UJ
Vanadium	24.1	1.1		11.8	1.1		10.1	1.1		21.1	1.1		14.8	2.2		13.5	1.1		21.6	1.1		10.2	2.2	
Zinc	24.8	2.3		10.5	2.2		8	2.2		20.6	2.3		8.3	4.5		6.5	2.3		22.1	2.2		6.3	4.4	
TPH (mg/kg)																								
Total Petroleum Hydroc	<	46	U	<	44.1	U	<	43.4	U	<	45.3	U	<	45	U	<	45.3	U	<	44.6	U	<	44	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 8 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8617-0034			CAN086-8618-0000			CAN086-8618-0029			CAN086-8618-0034			CAN086-8619-0000			CAN086-8619-0029			CAN086-8619-0034		
LAB SAMPLE NUMBER	0453390006SA			0453690004SA			0453690005SA			0453690006SA			0453690007SA			0453690008SA			0453690009SA		
COLLECT DATE	10/21/95			10/23/95			10/23/95			10/23/95			10/24/95			10/24/95			10/24/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																					
Acetone	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	12	U	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	12	U	<	11	U
Ethylbenzene	<	5.6	U	<	5.7	U	<	5.6	U	<	5.6	U	<	5.3	U	<	5.8	U	<	5.5	U
Methylene chloride	<	5.6	U	<	5.7	U	<	5.6	U	<	5.6	U	<	5.3	U	<	5.8	U	<	5.5	U
Toluene	<	5.6	U	<	5.7	U	<	5.6	U	<	5.6	U	<	5.3	U	<	5.8	U	<	5.5	U
Xylenes (total)	<	5.6	U	<	5.7	U	<	5.6	U	<	5.6	U	1.1	5.3	J	<	5.8	U	<	5.5	U
Semivolatile Organics (µg/																					
Benzo(a)anthracene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Benzo(a)pyrene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Benzo(b)fluoranthene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Benzo(g,h,i)perylene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
bis(2-Ethylhexyl)phthal	<	370	U	<	370	UJ	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Chrysene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Di-n-octyl phthalate	<	370	U	<	370	UJ	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Dibenzofuran	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Fluoranthene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Isophorone	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
2-Methylnaphthalene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Naphthalene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Phenanthrene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U
Pyrene	<	370	U	<	370	U	<	370	U	<	370	U	<	350	U	<	380	U	<	360	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 9 of 10

Source: Woodward-Clyde, 1997

Table 45-3a
Summary of Chemicals Detected in the Soil Samples
SD-11 (SWMUs 86-90)

LOCATOR	CAN086-8617-0034			CAN086-8618-0000			CAN086-8618-0029			CAN086-8618-0034			CAN086-8619-0000			CAN086-8619-0029			CAN086-8619-0034		
LAB SAMPLE NUMBER	0453390006SA			0453690004SA			0453690005SA			0453690006SA			0453690007SA			0453690008SA			0453690009SA		
COLLECT DATE	10/21/95			10/23/95			10/23/95			10/23/95			10/24/95			10/24/95			10/24/95		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																					
Aluminum	5090	11.2		10200	11.3		4100	22.6		5820	11.1		7790	10.6		4090	23.1		5500	22	
Arsenic	0.78	1.1	J	2.5	0.57		0.78	0.56		0.77	0.56		2.2	0.53		0.69	0.58		0.84	1.1	J
Barium	53.7	1.1	J	177	1.1	J	129	2.3	J	131	1.1	J	129	1.1	J	289	2.3	J	124	2.2	J
Beryllium	<	0.22	U	0.56	0.23		<	0.45	U	0.26	0.22		0.42	0.21		<	0.46	U	<	0.44	U
Calcium	103000	22.4		64100	22.6		206000	45.2		68900	22.2		32700	21.3		205000	46.3		140000	44.1	
Chromium	3.7	1.1		8.8	1.1		9.7	2.3		4.1	1.1		8	1.1		3.4	2.3		3.5	2.2	
Cobalt	1.4	1.1		3.6	1.1		<	2.3	U	1.4	1.1		2.9	1.1		1.7	2.3	J	2	2.2	J
Copper	<	2.2	U	6.6	2.3		2.4	4.5	J	1.6	2.2	J	5.4	2.1		2	4.6	J	1.4	4.4	J
Iron	3330	11.2		8960	11.3		3010	22.6		4160	11.1		7500	10.6		2420	23.1		3370	22	
Lead	2.2	0.56		5.5	1.1		1.5	0.56		2.6	0.56		10.1	1.1		1.4	0.58		1.8	0.55	
Magnesium	8140	22.4		2900	22.6		6240	45.2		5040	22.2		1760	21.3		13400	46.3		9000	44.1	
Manganese	30.1	1.1		109	1.1		28.1	2.3		34.2	1.1		130	1.1		22.6	2.3		41.6	2.2	
Mercury	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.11	U	<	0.12	U	<	0.11	U
Nickel	4.5	4.5		9.9	4.5		4.9	9	J	4.7	4.4		7.3	4.3		4.8	9.3	J	4.6	8.8	J
Potassium	879	559		1700	565		690	1130	J	1290	555		1430	532		634	1160	J	962	1100	J
Sodium	<	559	U	<	565	U	<	1130	U	<	555	U	<	532	U	<	1160	U	<	1100	U
Thallium	<	2.2	UJ	<	1.1	UJ	<	2.3	UJ	<	1.1	UJ	<	0.53	UJ	<	2.3	UJ	<	2.2	UJ
Vanadium	13.7	1.1		19.4	1.1		13.7	2.3		10.4	1.1		16.2	1.1		14.5	2.3		11.7	2.2	
Zinc	6.6	2.2		19.1	2.3		10	4.5		8.1	2.2		23.9	2.1		9.8	4.6		7.5	4.4	
TPH (mg/kg)																					
Total Petroleum Hydroc	<	44.7	U	81.2	45.2		<	45.2	U	<	44.4	U	83.9	42.6		<	46.3	U	<	44.1	U

Results presented here are only those chemicals which were detected at least once at this site and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL = Qualification
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 10 of 10

Source: Woodward-Clyde, 1997

Table 45-3b
Comparison of Maximum Soil Concentrations to RBCs for Residential Soil
SD-11 (SWMUs 86-90)

Chemicals	Carcinogen?	Maximum Concentration (mg/kg)	Residential RBC (mg/kg)	Exceeds RBC?	Industrial RBC (mg/kg)	Risk Residential (2)	Hazard Residential (3)	Risk Industrial (2)	Hazard Industrial (3)
VOCs									
Acetone	N	0.59	7800	NO	100000		0.00008		0.0000059
2-Butanone(MEK)	N	0.051	47000	NO	1.00E+06		0.00000		0.0000001
Ethylbenzene	N	18	7800	NO	200000		0.00231		0.00009
Methylene chloride	Y	0.0032	85	NO	380	3.76E-11		8.42E-12	
Toluene	N	0.0046	16000	NO	200000		0.0000003		0.000000023
Xylenes (total)	N	33	160000	NO	1.00E+06		0.00021		0.000033
SVOCs									
Benzo(a)anthracene	Y	0.2	0.88	NO	3.9	2.27E-07		5.13E-08	
Benzo(a)pyrene	Y	0.27	0.088	YES	0.39	3.07E-06		6.92E-07	
Benzo(b)fluoranthene	Y	0.44	0.88	NO	3.9	5.00E-07		1.13E-07	
Benzo(g,h,i)perylene		0.11	NA(a)	---					
Chrysene	N	0.26	88	NO	390		0.0030		0.00067
Dibenzofuran	N	0.15	310	NO	8200		0.00048		0.00002
Fluoranthene	N	0.21	3100	NO	41000		0.00007		0.0000051
Indeno(1,2,3-cd)pyrene	Y	0.089	0.88	NO	7.8	1.01E-07		1.14E-08	
Isophorone	Y	0.93	670	NO	6000	1.39E-09		1.55E-10	
2-Methylnaphthalene		18	NA(a)	---					
Naphthalene	N	11	3100	NO	82000		0.00355		0.0001341
Phenanthrene		0.057	NA(a)	---					
Pyrene	N	0.26	2300	NO	31000		0.00011		0.000008
TPH		5390	NA(a)	---					
Cumulative Risk(3)						4E-06	0.01	9E-07	0.001

(1) Risk = 1 E-06 X concentration/RBC
(2) Hazard = concentration/RBC
(3) Estimated total risk associated with chemicals detected at SD-11 based on RBCs.
(a) Not Applicable: EPA has not established a toxicity foacator for these chemicals, so RBCs could not be calculated.

Source: Woodward-Clyde, 1997

Table 45-4a
Summary of Chemicals Detected in Surface Soils
SD-11 (SWMUs 86-90)

FIELD ID			C11-SB01-002			C11-SB02-002			C11-SB03-002		
COLLECT DATE			12/2/98			12/2/98			12/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
TOTAL PETROLEUM HYDROCARBONS (mg/kg)											
TRPH by Method 418.1	130	3/3	41	20		43	20		130	20	
Diesel Range Organics (DRO)	68	1/3	<	28	U	<	28	U	68	28	

TRPH - Total Recoverable Petroleum Hydrocarbons
DRO - Diesel Range Organics
mg/kg - milligram per kilogram
µg/kg - microgram per kilogram
J - Estimated
U - Nondetect

Source: URS Greiner Woodward Clyde, 1999

Table 45-4b
Summary of Chemicals Detected in Subsurface Soils
SD-11 (SWMUs 86-90)

FIELD ID			C11-SB01-010			C11-SB01-020			C11-SB01-030			C11-SB01-040			C11-SB02-010			C11-SB02-020		
COLLECT DATE			12/2/98			12/2/98			12/2/98			12/2/98			12/2/98			12/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Di-N-Butyl Phthalate	150J	1/12	<	380	UJ	<	360	UJ	<	360	UJ	<	360	UJ	150	380	J	<	380	UJ
Phenol	55	1/12	<	380	UJ	<	360	UJ	<	360	UJ	<	360	UJ	<	380	UJ	<	380	UJ
TOTAL PETROLEUM HYDROCARBONS (mg/kg)																				
TRPH by Method 418.1	62	12/12	26	20		28	20		34	20		39	20		24	20		62	20	

TRPH - Total Recoverable Petroleum Hydrocarbons
mg/kg - milligram per killogram
µg/kg - microgram per killogram
J - Estimated
U - Nondetect

Page 1 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 45-4b
Summary of Chemicals Detected in Subsurface Soils
SD-11 (SWMUs 86-90)

FIELD ID			C11-SB02-030			C11-SB02-040			C11-SB03-010			C11-SB03-020			C11-SB03-030			C11-SB03-040		
COLLECT DATE			12/2/98			12/2/98			12/2/98			12/2/98			12/2/98			12/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Di-N-Butyl Phthalate	150J	1/12	<	400	UJ	<	360	UJ	<	360	UJ	<	370	UJ	<	380	UJ	<	380	UJ
Phenol	55	1/12	<	400	UJ	<	360	UJ	55	360	J	<	370	UJ	<	380	UJ	<	380	UJ
TOTAL PETROLEUM HYDROCARBONS (mg/kg)																				
TRPH by Method 418.1	62	12/12	32	20		25	20		30	20		34	20		36	20		39	20	

TRPH - Total Recoverable Petroleum Hydrocarbons
mg/kg - milligram per kilogram
µg/kg - microgram per kilogram
J - Estimated
U - Nondetect

Page 2 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 45-4c
Comparison of Maximum Soil Concentrations to MSSLs
SD-11 (SWMUs 86-90)

Chemical	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?
VOLATILE ORGANICS					
Acetone	CAN086-8613-0014	0.59	J	1400	NO
2-Butanone	CAN086-8613-0034	0.051	J	6900	NO
Ethylbenzene**	CAN086-8611-0014	18		230	NO
Methylene Chloride	CAN086-8613-0024	0.0032	J	8.5	NO
Toluene**	CAN086-8611-0039	0.3		520	NO
Xylenes**	CAN086-8611-0014	33		210	NO
SEMIVOLATILE ORGANICS					
Benzo(a)anthracene	CAN086-8611-0004	0.2	J	0.56	NO
Benzo(a)pyrene	CAN086-8614-0000	0.27		0.056	YES
Benzo(b)fluoranthene	CAN086-8614-0000	0.44	J	0.56	NO
Benzo(g,h,i)perylene*	CAN086-8614-0000	0.11	J	55	NO
Chrysene	CAN086-8611-0004	0.26	J	56	NO
Di-n-Butyl Phthalate	C11-SB02-010	0.15	J	5500	NO
Dibenzofuran	CAN086-8613-0003	0.15	J	210	NO
Fluoranthene	CAN086-8614-0000	0.21	J	2000	NO
Indeno(1,2,3-cd)pyrene	CAN086-8614-0000	0.089	J	0.56	NO
Isophorone	CAN086-8613-0014	0.93	J	4700	NO
2-Methylnaphthalene*	CAN086-8611-0014	18		55	NO
Naphthalene	CAN086-8611-0014	11		55	NO
Phenanthrene*	CAN086-8613-0000	0.057	J	55	NO
Phenol	C11-SB03-010	0.055	J	33000	NO
Pyrene	CAN086-8614-0000	0.26	J	1500	NO
TRPH (418.1)	CAN086-8612-0004	5390	J	NA	NA
TPH-DRO (8015)	C11-SB03-002	68		NA	NA
METALS					
Aluminum	CAN086-8611-0000	12,500		75000	NO
Barium	CAN086-8614-0034	1260		5200	NO
Chromium	CAN086-8611-0000	13.6		30	NO
Copper	CAN086-8617-0029	9.6		2800	NO
Lead	CAN086-8619-0000	10.1		400	NO
Vanadium	CAN086-8611-0000	24.2		520	NO
Zinc	CAN086-8613-0000	38.3		22000	NO

(1) EPA Region Media-Specific Screening Levels for Residential Soil (EPA 1998)

* The MSSL for naphthalene was used as a surrogate for these PAHs.

** The MSSL for ethylbenzene, toluene and xylenes is based on a soil saturation concentration and is not based on risk.

mg/kg = Milligrams per Kilogram

Source: URS Greiner Woodward Clyde, 1999

Table 47-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 93

LOCATOR	CAN093-0931-0000			CAN093-0931-0002			CAN093-0932-0000			CAN093-0932-0002			CAN093-0933-0000			CAN093-0933-0002		
LAB SAMPLE NUMBER	0312740001SA			0312740003SA			0312730001SA			0312730002SA			0312730010SA			0312730011SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Toluene	2.6	6.4	J	<	5.4	U	<	5.4	U	8	5.6		4.9	5.3	J	<	5.7	U
Xylenes (total)	1.8	6.4	J	<	5.4	U	<	5.4	U	<	5.6	U	1.8	5.3	J	<	5.7	U
Semivolatile Organics (ug/kg)																		
Benzo(a)anthracene	<	420	U				74	360	J	<	370	U	77	350	J			
Benzo(a)pyrene	<	420	U				62	360	J	<	370	U	84	350	J			
Benzo(b)fluoranthene	<	420	U				73	360	J	<	370	U	140	350	J			
Benzo(g,h,i)perylene	<	420	U				73	360	J	<	370	U	56	350	J			
Chrysene	<	420	U				95	360	J	<	370	U	120	350	J			
Fluoranthene	<	420	U				150	360	J	<	370	U	100	350	J			
Indeno(1,2,3-cd)pyrene	<	420	U				55	360	J	<	370	U	38	350	J			
Pentachlorophenol	45	2000	J				<	1700	U	<	1800	U	<	1700	U			
Phenanthrene	<	420	U				130	360	J	<	370	U	100	350	J			
Pyrene	<	420	U				190	360	J	<	370	U	120	350	J			
Metals (mg/kg)																		
Aluminum	5930	12.8		3950	10.8		7130	10.8		8660	11.1		9380	10.6		10500	11.4	
Arsenic	2.3	0.64		1.6	0.54		2.5	0.54		2	0.56		2.3	0.53		2.5	0.57	
Barium	99.9	1.3	J	51.9	1.1	J	114	1.1	J	126	1.1	J	140	1.1	J	108	1.1	J
Beryllium	0.48	0.26		0.3	0.22		0.44	0.22		0.5	0.22		0.49	0.21		0.54	0.23	
Cadmium	<	0.64	U	<	0.54	U	1.9	0.54		1.2	0.56		1	0.53		1	0.57	
Calcium	14700	25.5		3710	21.6		26600	21.5		54300	22.3		37400	21.1		33400	22.8	
Chromium	9.5	1.3	J	5.3	1.1		7.7	1.1		8.1	1.1		12.9	1.1		11.8	1.1	
Cobalt	3.9	1.3		2.4	1.1		3.6	1.1		3.1	1.1		3.4	1.1		3.9	1.1	
Copper	8.6	2.6		4.5	2.2		158	2.2		7.4	2.2		8.4	2.1		8.5	2.3	
Iron	6980	12.8		4560	10.8		7920	10.8		8220	11.1		8360	10.6		9110	11.4	
Lead	7.3	0.64		5.2	0.54		32.4	2.7		5.8	2.8		10	1.1		11.8	1.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 47-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 93

LOCATOR	CAN093-0931-0000			CAN093-0931-0002			CAN093-0932-0000			CAN093-0932-0002			CAN093-0933-0000			CAN093-0933-0002		
LAB SAMPLE NUMBER	0312740001SA			0312740003SA			0312730001SA			0312730002SA			0312730010SA			0312730011SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Magnesium	1440	25.5		830	21.6		1740	21.5		2560	22.3		2220	21.1		2310	22.8	
Manganese	155	1.3	J	102	1.1	J	183	1.1		161	1.1		146	1.1		162	1.1	
Nickel	7.2	5.1		4.7	4.3		8.2	4.3		7.5	4.5		7.8	4.2		8.4	4.6	
Potassium	1150	638		760	539		1340	539		1420	557		1630	528		1780	569	
Selenium	<	0.64	U	<	0.54	U	0.25	1.1	J	<	1.1	U	<	0.53	U	<	1.1	UJ
Silver	0.69	1.3	J	0.57	1.1	J	0.72	1.1	J	0.62	1.1	J	1	1.1	J	1.2	1.1	
Sodium	<	638	U	170	539	J	<	539	U	<	557	U	424	528	J	<	569	U
Vanadium	17	1.3		11.9	1.1		16.3	1.1		17.9	1.1		18	1.1		18.9	1.1	
Zinc	25.4	2.6		13.1	2.2		77.2	2.2		18.1	2.2		53.3	2.1		38	2.3	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	77.4	51		<	43.1	U	255	43.1		311	44.6		325	42.2		294	45.6	
Water Quality (percent)																		
Water	22	0.1		7.2	0.1		7.2	0.1		10	0.1		5.3	0.1		12	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0931-0004			CAN093-0931-0008			CAN093-0931-0018			CAN093-0931-0028			CAN093-0931-0038			CAN093-0931-0048		
LAB SAMPLE NUMBER	0312740004SA			0312740005SA			0312740006SA			0312740007SA			0312740008SA			0312740009SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Bromodichloromethane				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Carbon disulfide				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Chlorobenzene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Chloroform				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
1,1-Dichloroethane				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
1,1-Dichloroethene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
1,2-Dichloroethene (total)				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
1,2-Dichloropropane				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Ethylbenzene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
4-Methyl-2-pentanone (MIBK)				<	12	U	<	11	U	<	12	U	<	11	U	<	11	U
Styrene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Tetrachloroethene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Toluene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
1,1,1-Trichloroethane				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
1,1,2-Trichloroethane				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Trichloroethene				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Xylenes (total)				<	6.2	U	<	5.6	U	<	6.1	U	<	5.4	U	<	5.5	U
Metals (mg/kg)																		
Aluminum	3740	11.5		4300	12.3		4240	11.3		4550	24.5		2250	10.8		2040	11	
Antimony	<	6.9	U	<	7.4	U	2.3	6.8	J	<	14.7	U	<	6.5	U	<	6.6	U
Arsenic	2.4	0.58		2.1	0.62		1	0.56		1.5	0.61		0.77	0.54		0.44	1.1	JJ
Barium	115	1.2	J	243	1.2	J	76.9	1.1	J	1110	2.5	J	66.3	1.1	J	29.2	1.1	J
Beryllium	0.31	0.23		0.35	0.25		0.45	0.23		<	0.49	U	0.19	0.22	J	0.14	0.22	J
Cadmium	1.9	0.58		1.7	0.62		0.98	0.56		2.8	1.2		0.85	0.54		1.1	0.55	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0931-0004			CAN093-0931-0008			CAN093-0931-0018			CAN093-0931-0028			CAN093-0931-0038			CAN093-0931-0048		
LAB SAMPLE NUMBER	0312740004SA			0312740005SA			0312740006SA			0312740007SA			0312740008SA			0312740009SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Calcium	107,000	23.1		94000	24.6		76800	22.6		188000	49.1		69700	21.7		90000	22	
Chromium	4.1	1.2		3.8	1.2		3.3	1.1		5.2	2.5		1.8	1.1		2.1	1.1	
Cobalt	2.3	1.2		3.2	1.2		2.6	1.1		2.5	2.5		1.2	1.1		0.58	1.1	J
Copper	4.3	2.3		3.5	2.5		3.3	2.3		6.9	4.9		1.6	2.2	J	1.3	2.2	J
Iron	3,690	11.5		3850	12.3		3390	11.3		2200	24.5		1600	10.8		1230	11	
Lead	3.5	0.58		3.8	0.62		5.1	0.56		0.92	0.61		1.3	0.54		1.1	0.55	
Magnesium	1750	23.1		2650	24.6		3160	22.6		33700	49.1		4520	21.7		4970	22	
Manganese	59.8	1.2	J	78.1	1.2	J	95.2	1.1	J	26.7	2.5	J	29.1	1.1	J	20.4	1.1	J
Nickel	5.3	4.6		6.2	4.9		4.9	4.5		<	9.8	U	3.1	4.3	J	2	4.4	J
Potassium	823	577		1030	616		1340	565		<	1230	U	653	542		384	549	J
Selenium	<	1.2	UJ	<	0.62	U	<	0.56	U	<	1.2	UJ	<	0.54	U	<	1.1	UJ
Silver	0.52	1.2		0.51	1.2	J	0.67	1.1	J	0.75	2.5	J	<	1.1	U	<	1.1	U
Sodium	<	577	U	259	616	J	229	565	J	472	1230	J	286	542	J	219	549	J
Vanadium	12.2	1.2		16.4	1.2		13.8	1.1		21.9	2.5		6.7	1.1		7	1.1	
Zinc	10	2.3		9.7	2.5		10	2.3		7.5	4.9		5.1	2.2		3.8	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	ND	46.1	U	<	49.3	U	<	45.2	U	<	49.1	U	<	43.4	U	<	43.9	U
Water Quality (percent)																		
Water				19	0.1		12	0.1		18	0.1		7.8	0.1		8.9	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 2 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0931-0058			CAN093-0932-0004			CAN093-0932-0008			CAN093-0931-0018			CAN093-0932-0028		
LAB SAMPLE NUMBER	0312740010SA			0312730003SA			0312730004SA			0312730005SA			0312730006SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)															
Benzene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Bromodichloromethane	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Carbon disulfide	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Chlorobenzene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Chloroform	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
1,1-Dichloroethane	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
1,1-Dichloroethene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
1,2-Dichloroethene (total)	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
1,2-Dichloropropane	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Ethylbenzene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
4-Methyl-2-pentanone (MIBK)	<	11	U	<	11	U	<	12	U	<	12	U	<	12	U
Styrene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Tetrachloroethene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Toluene	<	5.4	U	1.4	5.6	J	<	6.2	U	<	5.8	U	<	6.1	U
1,1,1-Trichloroethane	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
1,1,2-Trichloroethane	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Trichloroethene	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Xylenes (total)	<	5.4	U	<	5.6	U	<	6.2	U	<	5.8	U	<	6.1	U
Metals (mg/kg)															
Aluminum	2220	10.8		6410	11.2		5190	12.4		3710	57.6		5350	24.5	
Antimony	<	6.5	U	<	6.7	U	<	7.4	U	<	34.6	U	<	14.7	U
Arsenic	0.37	0.54	JJ	2	0.56		2	0.62		0.78	0.58		0.93	0.61	
Barium	33.6	1.1	J	66.5	1.1	J	200	1.2	J	320	5.8	J	438	2.5	J
Beryllium	0.11	0.22	J	0.44	0.22		0.48	0.25		<	1.2	U	<	0.49	U
Cadmium	0.79	0.54		<	0.56	U	1.1	0.62		3	2.9		1.2	1.2	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 3 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0931-0058			CAN093-0932-0004			CAN093-0932-0008			CAN093-0932-0018			CAN093-0932-0028		
LAB SAMPLE NUMBER	0312740010SA			0312730003SA			0312730004SA			0312730005SA			0312730006SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Calcium	55400	21.7		19300	22.4		107000	24.8		241000	115		137000	49.1	
Chromium	2.4	1.1		7	1.1		5	1.2		<	5.8	U	4.8	2.5	
Cobalt	0.85	1.1	J	2.8	1.1		2.9	1.2		<	5.8	U	1.4	2.5	J
Copper	0.97	2.2	J	5.9	2.2		5.8	2.5		1.7	11.5	J	8.2	4.9	
Iron	2070	10.8		6830	11.2		4640	12.4		2050	57.6		5300	24.5	
Lead	1.2	0.54		5.5	0.56		2.9	1.2		1.4	2.9	J	1.5	0.61	
Magnesium	2990	21.7		1530	22.4		2890	24.8		7460	115		24800	49.1	
Manganese	27.4	1.1	J	91	1.1		77.1	1.2		21.1	5.8		51.4	2.5	
Nickel	2	4.3	J	7.2	4.5		6.2	5		<	23	U	7.3	9.8	J
Potassium	429	542	J	1240	561		1150	620		426	2880	J	748	1230	J
Selenium	0.31	0.54	J	<	0.56	UJ	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ
Silver	0.73	1.1	J	0.77	1.1	J	0.71	1.2	J	4.8	5.8	J	1.3	2.5	J
Sodium	270	542	J	<	561	U	<	620	J	<	2880	U	379	1230	J
Vanadium	8.9	1.1		14.8	1.1		17.3	1.2		10.8	5.8		17.7	2.5	
Zinc	4.7	2.2		13.7	2.2		13.6	2.5		5.2	11.5	J	14.7	4.9	
TPH (mg/kg)															
Total Petroleum Hydrocarbons	<	43.3	U	<	44.8	U	<	49.6	U	<	46.1	U	<	49.1	U
Water Quality (percent)															
Water	7.7	0.1		11	0.1		19	0.1		13	0.1		18	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 4 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0932-0038			CAN093-0932-0048			CAN093-0932-0058			CAN093-0933-0004			CAN093-0933-0008			CAN093-0933-0018		
LAB SAMPLE NUMBER	0312730007SA			0312730008SA			0312730009SA			0312730012SA			0312730013SA			0312730014SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Bromodichloromethane	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Carbon disulfide	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Chlorobenzene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Chloroform	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
1,1-Dichloroethane	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
1,1-Dichloroethene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
1,2-Dichloroethene (total)	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
1,2-Dichloropropane	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Ethylbenzene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
4-Methyl-2-pentanone (MIBK)	<	11	U	<	12	U	<	11	U	<	12	U	<	12	U	<	12	U
Styrene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Tetrachloroethene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Toluene	16	5.5		8	5.8		1.6	5.5	J	<	5.8	U	<	5.9	U	<	5.9	U
1,1,1-Trichloroethane	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
1,1,2-Trichloroethane	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Trichloroethene	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Xylenes (total)	<	5.5	U	<	5.8	U	<	5.5	U	<	5.8	U	<	5.9	U	<	5.9	U
Metals (mg/kg)																		
Aluminum	7820	11.1		3380	11.5		3040	11		7490	11.7		3910	58.6		3660	23.4	
Antimony	<	6.6	U	<	6.9	U	<	6.6	U	<	7	U	<	35.2	U	<	14.1	U
Arsenic	0.85	0.55		0.55	1.2	J	0.63	0.55		2.6	0.58		1.3	0.59		1.4	0.59	
Barium	35.9	1.1	J	40.5	1.2	J	17.2	1.1	J	172	1.2	J	697	5.9	J	221	2.3	J
Beryllium	0.32	0.22		0.12	0.23	J	<	0.22	U	0.43	0.23		<	1.2	U	<	0.47	U
Cadmium	<	0.55	U	<	0.58	U	<	0.55	U	1.2	0.58		3	2.9		1.6	1.2	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 5 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0932-0038			CAN093-0932-0048			CAN093-0932-0058			CAN093-0933-0004			CAN093-0933-0008			CAN093-0933-0018		
LAB SAMPLE NUMBER	0312730007SA			0312730008SA			0312730009SA			0312730012SA			0312730013SA			0312730014SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Calcium	37200	22.1		48100	23.1		13700	22		80300	23.4		221000	117		142000	46.9	
Chromium	4.9	1.1		2.9	1.2		3.6	1.1		5.8	1.2		<	5.9	U	<	2.3	U
Cobalt	1.5	1.1		0.94	1.2	J	1.2	1.1		2.8	1.2		5	5.9	J	2.4	2.3	
Copper	2.5	2.2		2.4	2.3		1.9	2.2	J	5.1	2.3		3.2	11.7	J	2.3	4.7	J
Iron	5050	11.1		2460	11.5		2490	11		6020	11.7		2800	58.6		2850	23.4	
Lead	4.6	0.55		1.8	1.2		1.9	0.55		4.7	2.9		1.9	2.9	J	3	2.9	
Magnesium	8180	22.1		12500	23.1		7340	22		2060	23.4		3930	117		3150	46.9	
Manganese	38.8	1.1		23.7	1.2		31.7	1.1		75.6	1.2		45.2	5.9	J	31.3	2.3	
Nickel	5.4	4.4		2.6	4.6	J	3	4.4	J	7.1	4.7		<	23.4	U	3.9	9.4	J
Potassium	1750	553		563	577	J	442	551	J	1370	585		723	2930	J	1010	1170	J
Selenium	<	1.1	UJ	<	1.2	UJ	<	0.55	U	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ
Silver	0.76	1.1	J	0.65	1.2	J	0.65	1.1	J	0.95	1.2	J	4.3	5.9	J	1.9	2.3	J
Sodium	304	553	J	210	577	J	<	551	U	<	585	U	<	2930	U	<	1170	U
Vanadium	11.8	1.1		13.6	1.2		12.3	1.1		14.1	1.2		10.5	5.9		11.9	2.3	
Zinc	9.4	2.2		4.9	2.3		4.6	2.2		13.6	2.3		9.9	11.7	J	7.4	4.7	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	44.2	U	<	46.1	U	<	44	U	<	46.8	U	<	46.9	U	<	46.9	U
Water Quality (percent)																		
Water	9.6	0.1		13	0.1		9.2	0.1		14	0.1		15	0.1		15	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 6 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0933-0028			CAN093-0933-0038			CAN093-0933-0048			CAN093-0933-0058		
LAB SAMPLE NUMBER	0312730015SA			0312730016SA			0312730017SA			0312730018SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)												
Benzene	<	5.8	U	<	5.4	U	<	5.5	U	<	5.4	U
Bromodichloromethane	1.3	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
Carbon disulfide	1.3	5.8	J	<	5.4	U	1.6	5.5	J	<	5.4	U
Chlorobenzene	<	5.8	U	<	5.4	U	<	5.5	U	<	5.4	U
Chloroform	1.8	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
1,1-Dichloroethane	1.6	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
1,1-Dichloroethene	1.4	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
1,2-Dichloroethene (total)	3.1	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
1,2-Dichloropropane	1.6	5.8	J	<	5.4	U	1.5	5.5	J	2.8	5.4	J
Ethylbenzene	1.5	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
4-Methyl-2-pentanone (MIBK)	2.1	12	J	<	11	U	<	11	U	<	11	U
Styrene	1.5	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
Tetrachloroethene	1.3	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
Toluene	<	5.8	U	<	5.4	U	<	5.5	U	1.4	5.4	J
1,1,1-Trichloroethane	1.5	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
1,1,2-Trichloroethane	1.7	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
Trichloroethene	<	5.8	U	<	5.4	U	<	5.5	U	<	5.4	U
Xylenes (total)	3.5	5.8	J	<	5.4	U	<	5.5	U	<	5.4	U
Metals (mg/kg)												
Aluminum	4070	23.4		3440	21.8		3760	11		3730	10.8	
Antimony	<	14	U	<	13.1	U	<	6.6	U	<	6.5	U
Arsenic	1.1	0.58		0.88	0.54		0.54	1.1	J	0.57	0.54	
Barium	113	2.3	J	76.7	2.2	J	27.6	1.1	J	43.1	1.1	J
Beryllium	<	0.47	U	<	0.44	U	0.14	0.22	J	0.15	0.22	J
Cadmium	2.8	1.2		2.2	1.1		<	0.55	U	0.61	0.54	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 7 of 8

Source: Woodward-Clyde, 1994

Table 47-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 93

LOCATOR	CAN093-0933-0028			CAN093-0933-0038			CAN093-0933-0048			CAN093-0933-0058		
LAB SAMPLE NUMBER	0312730015SA			0312730016SA			0312730017SA			0312730018SA		
COLLECT DATE	09/15/93			09/15/93			09/15/93			09/15/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Calcium	153000	46.7		130000	43.6		24500	22.1		41600	21.6	
Chromium	2.8	2.3		2	2.2	J	3.9	1.1		3.2	1.1	
Cobalt	2	2.3	J	1.8	2.2	J	1.2	1.1		1.3	1.1	
Copper	2.5	4.7	J	5.5	4.4		2	2.2	J	2	2.2	J
Iron	2380	23.4		2350	21.8		2890	11		3110	10.8	
Lead	1.1	1.2	J	1.2	1.1		1.3	0.55		1.4	0.54	
Magnesium	12600	46.7		4910	43.6		6800	22.1		5240	21.6	
Manganese	28.8	2.3		32.4	2.2		30.7	1.1		38.1	1.1	
Nickel	4.8	9.3	J	2.6	8.7	J	3.3	4.4	J	3.2	4.3	J
Potassium	590	1170	J	725	1090	J	736	552		670	539	
Selenium	<	1.2	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ
Silver	2	2.3	J	1.1	2.2	J	0.58	1.1	J	0.5	1.1	J
Sodium	390	1170	J	<	1090	U	299	552	J	219	539	J
Vanadium	15.7	2.3		6.4	2.2		10.4	1.1		11.1	1.1	
Zinc	5.3	4.7		5.9	4.4		6	2.2		6.4	2.2	
TPH (mg/kg)												
Total Petroleum Hydrocarbons	<	46.7	U	<	43.6	U	<	44.2	U	<	43.1	U
Water Quality (percent)												
Water	14	0.1		8.2	0.1		9.5	0.1		7.2	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.
J = Estimated value.
R = Rejected value. QUAL=Qualification
U = Nondetected value. RL = Reporting Limit.

Page 8 of 8

Source: Woodward-Clyde, 1994

Table 47-2a
Comparison of Detected Concentrations with RBCs
SWMU 93

Sample ID	Analyte	Maximum Detected	RBC (2)	Maximum Detected Exceed RBC
CAN093-0933-0058	1,2-Dichloropropane	0.0028	30	N
CAN093-0933-0028	4-Methyl-2-pentanone (MIBK)	0.0021	400	N
CAN093-0931-0018	Antimony	2.3	3	N
CAN093-0931-0028	**Barium**	**1110**	**600**	**Y**
CAN093-0933-0028	Benzene	0.0017	2	N
CAN093-0933-0000	**Benzo(a)anthracene**	**0.077**	**0.07**	**Y**
CAN093-0933-0000	**Benzo(a)pyrene**	**0.084**	**0.01**	**Y**
CAN093-0933-0000	**Benzo(b)fluoranthene**	**0.14**	**0.07**	**Y**
CAN093-0932-0000	Benzo(g,h,i)perylene	0.073	NTF	N
CAN093-0933-0028	Bromodichloromethane	0.0013	0.5	N
CAN093-0933-0008	Cadmium	3	8	N
CAN093-0933-0048	Carbon disulfide	0.0016	800	N
CAN093-0933-0028	Chlorobenzene	0.0017	200	N
CAN093-0933-0028	Chloroform	0.0018	10	N
CAN093-0933-0000	Chromium	12.9	40	N
CAN093-0933-0000	Chrysene	0.12	2	N
CAN093-0933-0008	Cobalt	5	NTF	N
CAN093-0932-0000	Copper	158	300	N
CAN093-0932-0000	**Indeno(1,2,3-cd)pyrene**	**0.055**	**0.04**	**Y**
CAN093-0932-0000	Lead (3)	32.4	500	N
CAN093-0931-0000	Pentachlorophenol	0.045	0.6	N
CAN093-0932-0000	Phenanthrene	0.13	NTF	N
CAN093-0932-0000	Pyrene	0.19	200	N
CAN093-0931-0058	Selenium	0.31	40	N
CAN093-0932-0058	Silver	0.65	20	N
CAN093-0933-0028	Styrene	0.0015	2000	N
CAN093-0933-0028	Tetrachloroethene	0.0013	1	N
CAN093-0932-0038	Toluene	0.016	2000	N
CAN093-0933-0000	Total Petroleum Hydrocarbons (4)	325	1000	N
CAN093-0933-0028	Trichloroethene	0.0024	6	N
CAN093-0933-0028	Xylenes (total)	0.0035	20000	N
CAN093-0932-0000	Zinc	77.2	2000	N

NTF = No EPA Established Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) EPA suggests 500-1,000 mg/kg as allowable concentration for residential soils based on EPA's IUBK Lead Model (EPA 1990)

(4) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metals that exceeded background appear in this table.

Source: Woodward-Clyde, 1994

Table 47-2b
Summary of Human Health Risks
SWMU 93

Receptor/Pathway	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic H.I.	Chronic H.I.	Cancer Risk	Subchronic H.I.	Chronic H.I.
Occupational Worker (Surface Soil)						
-- Dermal Contact	3×10^{-11}		7×10^{-8}	5×10^{-9}		4×10^{-6}
-- Ingestion	5×10^{-10}		2×10^{-5}	1×10^{-7}		3×10^{-3}
-- Inhalation of VOCs*	0.00		8×10^{-8}	0.00		1×10^{-6}
-- Inhalation of Particulates	4×10^{-12}		0.00	2×10^{-10}		0.00
	6×10^{-10}		2×10^{-5}	2×10^{-7}		3×10^{-3}
Construction Worker (Total Soil)						
-- Dermal Contact	2×10^{-12}	5×10^{-8}		4×10^{-11}	7×10^{-7}	
-- Ingestion	2×10^{-10}	8×10^{-5}		2×10^{-9}	1×10^{-3}	
-- Inhalation of VOCs*	0.00	4×10^{-8}		0.00	2×10^{-7}	
-- Inhalation of Particulates	3×10^{-13}	3×10^{-7}		1×10^{-12}	1×10^{-6}	
	2×10^{-10}	8×10^{-5}		2×10^{-9}	1×10^{-3}	
Future Trespasser						
-- Dermal Contact	6×10^{-12}	2×10^{-8}		7×10^{-10}	2×10^{-6}	
-- Ingestion	1×10^{-10}	3×10^{-6}		1×10^{-8}	7×10^{-4}	
-- Inhalation of VOCs*	0.00	2×10^{-8}		0.00	4×10^{-7}	
-- Inhalation of Particulates	7×10^{-13}	0.00		1×10^{-11}	0.00	
	1×10^{-10}	3×10^{-6}		1×10^{-8}	7×10^{-4}	

Note: Apparent inconsistencies in summation of risks are due to rounding of risk values.

* No carcinogenic volatile organic compounds were detected at SWMU 93.

Source: Woodward-Clyde, 1994

Table 47-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 93

LOCATOR	CAN093-9304-0000			CAN093-9304-0005			CAN093-9304-9361[1]			CAN093-9304-0010			CAN093-9305-0000			CAN093-9305-0005		
LAB SAMPLE NUMBER	0397140002SA			0397140003SA			0397140001SA			0397140004SA			0397140005SA			0397140006SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg//kg)																		
Toluene	<	5.5	U	<	5.7	U	<	5.7	U	4.9	5.8	J	<	5.5	U	<	5.5	U
Semivolatile Organics (µg//kg)																		
Benzo(a)anthracene	45	360	J	<	380	U	<	380	U	<	380	U	49	360	J	<	360	U
Benzo(a)pyrene	52	360	J	<	380	U	<	380	U	<	380	U	69	360	J	<	360	U
Benzo(b)fluoranthene	50	360	J	<	380	U	<	380	U	<	380	U	<	360	U	<	360	U
Benzo(k)fluoranthene	71	360	J	<	380	U	<	380	U	<	380	U	160	360	J	<	360	U
bis(2-Ethylhexyl)phthalate	<	360	U	<	380	U	<	380	U	<	380	U	<	360	U	120	360	J
Chrysene	70	360	J	<	380	U	<	380	U	<	380	U	78	360	J	<	360	U
Fluoranthene	110	360	J	<	380	U	<	380	U	<	380	U	130	360	J	<	360	U
Phenanthrene	<	360	U	<	380	U	<	380	U	<	380	U	38	360	J	<	360	U
Pyrene	73	360	J	<	380	U	<	380	U	<	380	U	90	360	J	<	360	U
Metals (mg/kg)																		
Aluminum	14800	10.9		13300	11.4		10700	11.4		8620	23		12400	11.1		13300	11.1	
Arsenic	2.8	0.55		2.6	0.57		2.9	0.57		2.3	0.58		2.5	1.1		2	0.55	
Barium	153	1.1		94.1	1.1		80.8	1.1		647	2.3		326	1.1		126	1.1	
Beryllium	0.61	0.22		0.55	0.23		0.58	0.23		0.41	0.46	J	0.51	0.22		0.52	0.22	
Cadmium	0.68	0.55		<	0.57	U	<	0.57	U	<	1.2	U	<	0.55	U	<	0.55	U
Calcium	48600	21.9		20800	22.7		15400	22.8		158000	46.1		65300	22.1		15300	22.1	
Chromium	12.1	1.1		11.8	1.1		9.3	1.1		5.4	2.3		11	1.1		11.9	1.1	
Cobalt	3.4	1.1		4.5	1.1		3.9	1.1		1.8	2.3	J	3.2	1.1		4	1.1	
Copper	13.6	2.2		8.1	2.3		7.2	2.3		3.8	4.6	J	7.9	2.2		7.9	2.2	
Iron	11200	10.9		11200	11.4		9560	11.4		5890	23		10100	11.1		10700	11.1	
Lead	11.9	2.7	J	8.6	0.57	J	8.3	0.57	J	5.1	0.58	J	11.7	1.1	J	7.5	0.55	J

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceding sample number.
[2] MS/MSD for preceding sample number.

Page 1 of 4

Source: Woodward-Clyde, 1997

Table 47-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 93

LOCATOR	CAN093-9304-0000			CAN093-9304-0005			CAN093-9304-9361[1]			CAN093-9304-0010			CAN093-9305-0000			CAN093-9305-0005		
LAB SAMPLE NUMBER	0397140002SA			0397140003SA			0397140001SA			0397140004SA			0397140005SA			0397140006SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Magnesium	2790	21.9		2570	22.7		2190	22.8		3610	46.1		2590	22.1		2340	22.1	
Manganese	168	1.1	J	206	1.1	J	205	1.1	J	73	2.3	J	193	1.1	J	181	1.1	J
Nickel	10.3	4.4		10.1	4.5		10.2	4.6		9.1	9.2	J	9.6	4.4		10.6	4.4	
Potassium	2370	547		2270	568		1830	571		1330	1150		2050	553		2350	553	
Thallium	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	1.2	UJ	<	1.1	U	0.14	0.55	J
Vanadium	22.1	1.1		19.3	1.1		12.8	1.1		17.9	2.3		21	1.1		18.7	1.1	
Zinc	46.7	2.2		28.4	2.3		24.6	2.3		15.2	4.6		45.8	2.2		28.4	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	213	43.8		<	45.5	U	51.2	45.6		<	46.1	U	547	44.2		<	44.2	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceding sample number.
[2] MS/MSD for preceding sample number.

Page 2 of 4

Source: Woodward-Clyde, 1997

Table 47-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 93

LOCATOR	CAN093-9305-0010			CAN093-9306-0000			CAN093-9306-0005			CAN093-9306-6005[2]			CAN093-9306-0010		
LAB SAMPLE NUMBER	0397140007SA			0397140008SA			0397140009SA			0397140010SA			0397140011SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg//kg)															
Toluene	<	5.5	U	3.1	5.4	J	<	5.6	U	<	5.6	U	<	5.7	U
Semivolatile Organics (µg//kg)															
Benzo(a)anthracene	<	360	U	<	360	U	<	370	U	<	370	U	<	380	U
Benzo(a)pyrene	<	360	U	<	360	UJ	<	370	U	<	370	U	<	380	U
Benzo(b)fluoranthene	<	360	U	<	360	UJ	<	370	U	<	370	U	<	380	U
Benzo(k)fluoranthene	<	360	U	<	360	UJ	<	370	U	<	370	U	<	380	U
bis(2-Ethylhexyl)phthalate	<	360	U	<	360	U	<	370	U	<	370	U	<	380	U
Chrysene	<	360	U	<	360	U	<	370	U	<	370	U	<	380	U
Fluoranthene	<	360	U	<	360	U	<	370	U	<	370	U	<	380	U
Phenanthrene	<	360	U	<	360	U	<	370	U	<	370	U	<	380	U
Pyrene	<	360	U	<	360	U	<	370	U	<	370	U	<	380	U
Metals (mg/kg)															
Aluminum	8540	11		15400	10.8		14700	11.1		12500	11.2		11500	11.4	
Arsenic	1.9	0.55		2.7	1.1		2.6	0.56		2.9	0.56		2.7	0.57	
Barium	90.8	1.1		122	1.1		97.5	1.1		109	1.1		1890	1.1	
Beryllium	0.42	0.22		0.62	0.22		0.59	0.22		0.52	0.22		0.73	0.23	
Cadmium	<	0.55	U	0.48	0.54	J	<	0.56	U	<	0.56	U	<	0.57	U
Calcium	28700	22		21300	21.5		51300	22.3		80500	22.4		101000	22.9	
Chromium	8	1.1		12.5	1.1		10.6	1.1		9	1.1		7.2	1.1	
Cobalt	3.3	1.1		4	1.1		2.4	1.1		2.5	1.1		1.7	1.1	
Copper	6.5	2.2		17.8	2.2		6.6	2.2		6.1	2.2		4.6	2.3	
Iron	8170	11		12000	10.8		10100	11.1		8570	11.2		7370	11.4	
Lead	7.4	0.55	J	10.2	1.1	J	6.1	0.56	J	6.5	0.56	J	7.4	0.57	J

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
(1) Duplicate for preceding sample number.
(2) MS/MSD for preceding sample number.

Page 3 of 4

Source: Woodward-Clyde, 1997

Table 47-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 93

LOCATOR	CAN093-9305-0010			CAN093-9306-0000			CAN093-9306-0005			CAN093-9306-6005[2]			CAN093-9306-0010		
LAB SAMPLE NUMBER	0397140007SA			0397140008SA			0397140009SA			0397140010SA			0397140011SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Magnesium	2050	22		2490	21.5		2540	22.3		2600	22.4		4070	22.9	
Manganese	209	1.1		168	1.1		112	1.1	J	98.2	1.1		86.6	1.1	J
Nickel	8.3	4.4		11.5	4.3		10.2	4.5		9.3	4.5		8.2	4.6	
Potassium	1730	550		2460	538		2190	557		1910	559		1970	572	
Thallium	0.15	1.1	J	0.12	1.1	J	<	1.1	UJ	0.13	0.56	J	<	1.1	UJ
Vanadium	14.4	1.1	J	22.3	1.1		19.7	1.1		16.5	1.1		18.5	1.1	
Zinc	21.5	2.2		38.4	2.2		23.7	2.2		21.2	2.2		19.5	2.3	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbons	<	44	U	1760	215		<	44.6	U	<	44.7	U	<	45.8	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.
[1] Duplicate for preceding sample number.
[2] MS/MSD for preceding sample number.

Page 4 of 4

Source: Woodward-Clyde, 1997

Table 47-3b
Comparison of Phase II Soil Concentrations to Phase I Concentrations and RBCs
SWMU 93

Chemical	Phase I Maximum Detected Concentration (mg/kg)	Phase II Maximum Detected Concentration (mg/kg)	Phase II Concentration Treater than Phase I Concentration	Residential Soil Risk-Based Concentration[1] (mg/kg)	Phase II Concentration Exceeds RBC?
Toluene	0.016	0.0049	NO	16,000	NA
Xylenes	0.0035	ND	NO	160,000	NA
Benzo(a)anthracene	0.077	0.049	NO	0.88	NA
Benzo(a)pyrene	0.084	0.069	NO	0.088	NA
Benzo(b)fluoranthene	0.14	0.05	NO	0.88	NA
Benzo(k)fluoranthene	ND	0.16	YES	8.80	NO
Benzo(g,h,i)perylene	0.073	ND	NA	NA(a)	NA
Bis(2-ethylhexyl)phthalate	ND	0.12	YES	46	NO
Chrysene	0.12	0.078	NO	88	NA
Fluoranthene	0.15	0.13	NO	3,100	NA
Indeno(1,2,3-cd)pyrelene	0.055	ND	NO	0.88	NA
Pentachlorophenol	0.045	ND	NO	5	NA
Phenanthrene	0.13	0.038	NO	NA(a)	NA
Pyrene	0.19	0.073	NO	2,300	NA
TPH	325	1760	YES	NA(a)	NA
Antimony	2.3	ND	NO	31	NA
Barium	1110	1890	YES	5,500	NO
Cadmium	3	0.68	NO	39	NA
Copper	158	17.8	NO	2900	NA
Lead*	32.4	11.9	NO	400	NO
Nickel	8.2	11.5	YES	1600	NO
Silver	4.8	ND	NO	390	NA
Zinc	77.2	46.7	NO	23000	NA

[1] EPA Region III Risk-Based Concentrations for residential soil (EPA 1994).

(a) EPA has not established a toxicity factor for these chemicals, so RBCs could not be calculated.

*No RBC has been calculated for lead; however, EPA recommends an interim residential soil lead concentration of 400 mg/kg (EPA 1994)

ND = Not Detected

NA = Not Applicable

Source: Woodward-Clyde, 1997

Table 48-1a
Organic Compound Concentrations[1] in Soil Samples Collected by Walk, Haydel
SWMU 95

Sample Depth (Ft-BGS)	Compound	Boring Number	
		B1	B8
0-1	2,5,9-Trimethyl-decane	73,000	340
	7-Methyl-tridecane	56,000	
	2,7,10-Trimethyl-dodecane	60,000	
	2,6-Dimethyl-heptadecane	49,000	
	2,6,7-Trimethyl-decane	73,000	
	Ethylbenzene		37
	Total Xylene		70
2-3	4-Propyl-heptane	52,000	
	2,5,9-Trimethyl-decane	70,000	
	7-methyl-tridecane	74,000	
	2,7,10-Trimethyl-dodecane	37,000	
	2,6-Dimethyl-heptadecane	70,000	

Ft-BGS = Feet below ground surface
[1] All concentrations are in micrograms per kilogram (μg/kg)

Source: Final Report, IRP Phase IV (Walk, Haydel and Associates Inc. 1990)

Source: Woodward-Clyde, 1992

Table 48-1b
Selenium and Barium Concentrations[1] in Soil Samples Collected by Walk, Haydel
SWMU 95

Sample Depth (Ft-BGS)	Boring Number										
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
0-1			149.1	61.8		NS	NS	NS	NS	NS	NS
0-1.5	NS	NS	NS	NS	NS	80.2		54.2	105	153.9	68.2
2-3	174.1	150.6	131.3 (1,499)			NS	NS	NS	NS	NS	NS
2.5-4	NS	NS	NS	NS	NS	162.3		94.9 (4,294.6)	175.2	149.4	94.6
4-5	185.9	149.7	273	71.4	68.9	NS	NS	NS	NS	NS	NS
5-6.5	NS	NS	NS	NS	NS	120.6	53.3		75.3	174.4	76.6
7.5-9	NS	NS	NS	NS	NS		81.2	78.6	129.5	140.8	57.1
10-11.5	NS	NS	NS	NS	NS	124.7			132.4		
15-16.5	NS	NS	NS	NS	NS	142.1		75.8		74.1	
20-21.5	NS	NS	NS	NS	NS	138.6			130.5	106.8	NS
25-26.5	NS	NS	NS	NS	NS	100.6	111.2		106.2	83.3	NS
30-31.5	NS	NS	NS	NS	NS		101.2		106.3		
45-46.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
60-61.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	

Ft-BGS = Feet Below ground surface
NS = Sample not collected in accordance with Scope of Services/Sampling Plan
( ) = The values in parentheses are for barium, all other values are for selenium

[1] All concentrations are in milligrams per kilogram (mg/kg)

Source: Final Report, IRP Phase IV (Walk, Haydel and Associates, Inc. 1990)

Source: Woodward-Clyde, 1992

Table 48-2a
TPH, VOC and SVOC Concentrations in Soil Samples Collected by Woodward-Clyde
SWMU 95

Boring Number (Redrill Boring Number)	Sample Depth (Ft-BGS)	TPH (mg/kg)	Volatile Organics[1]				Semi-Volatile Organics[1]		
			Acetone (ug/kg)	2-Butanone (ug/kg)	Methylene Chloride (ug/kg)	Toluene (ug/kg)	2-Methyl naphthalene (ug/kg)	bis(2-Ethylhexyl) phthalate (ug/kg)	Butyl benzyl phthalate (ug/kg)
0951 (0953)	0 to 0.5	1260	(140J)	(23J)	(57UJ)	(57U)	1300J	1700J	7500U
	2 - 4	(48.5U)	(22)	(12U)	(2J)	(12U)	390U	350J	390U
	4 - 6	(46.4U)	11J	11U	11U	11U	380U	380U	380U
	8 - 10	(46.5U)	17	11U	11U	11U	(380U)	(45J)	(240J)
0952 (0954)	0 - 0.5	285	12U	12UJ	12U	3J	8200U	8200U	8200U
	2 - 4	(49U)	(21)	(12J)	(3J)	(12U)	(400U)	(400U)	(120J)
	4 - 6	(49.9U)	37U	12U	12U	12U	410U	410U	410U
	8 - 10	48.5U	(12UJ)	(12UJ)	(2UJ)	(12UJ)	400U	190J	400U

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram
U = Not detected
J = Estimated value
UJ = Estimated as non-detect at the CRQL
( ) = The values in parentheses are results from samples collected from the redrill borings due to laboratory missed holding times.
Only the volatile and semi-volatile organic compounds listed were detected (or estimated) in soil samples. All values are in ug/kg (micrograms per kilogram). All other volatile and semi-volatile organic compounds were not detected.

Source: Woodward-Clyde, 1992

Table 48-2b
Metal Concentrations[1] in Soil Samples Collected by Woodward-Clyde
SWMU 95

Element	Boring 0951 Sample Depth (Ft-BGS)				Boring 0952 Sample Depth (Ft-BGS)				Background[2] $\bar{x} + 2\sigma$
	0-0.5	2-4	4-6	8-10	0-0.5	2-4	4-6	8-10	
Aluminum	2180	4560	9840	7840	6320	4160	4760	5240	2571-10447
Antimony	5.1UJ	5.4UJ	5.2UJ	5.2UJ	5.8UJ	5.6UJ	5.6UJ	5.5UJ	4.81-5.44
Arsenic	3.9	1.5J	2.3	1.3J	2.2J	1.9J	1.8J	1.9J	0.43-1.95
Barium	3820	255	188	50.9	184	74.3	82.7	239	0-903
Beryllium	0.44U	0.47U	0.54J	0.54J	0.51U	0.48U	0.49U	0.48U	0.32-0.68
Cadmium	1.8	0.94U	0.91U	0.9U	1U	0.97U	0.97U	0.97U	0.81-1.01
Calcium	144000	223000	88900	109000	137000	146000	127000	160000	0-193062
Chromium	115J	4.2	7.6	6.6	26.8J	4.4J	4.3J	4.4J	2.67-9.31
Cobalt	12.6	2.7J	4.3J	3J	3.5J	1.5J	2.4J	3.1J	1.38-4.06
Copper	59	4.3U	6.1U	4.5U	14U	4.7U	4U	4.3U	0.00-15.44
Iron	41200	2660	6530	4730	6310	3810	3880	3800	2239-8683
Lead	147	1.6	4.8	3.1	31.6	3.6	3.3	2.9	1.76-8.64
Magnesium	2740	3910	4500	4340	2610	2360	2290	3450	0-11903
Manganese	443	115	103	57.2	165	106	99.9	113	10.89-167

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 48-2b
Metal Concentrations[1] in Soil Samples Collected by Woodward-Clyde
SWMU 95

Element	Boring 0951 Sample Depth (Ft-BGS)				Boring 0952 Sample Depth (Ft-BGS)				Background[2] $\bar{x} + 2\sigma$
	0-0.5	2-4	4-6	8-10	0-0.5	2-4	4-6	8-10	
Mercury	0.38	0.12U	0.11U	0.11U	0.13U	0.12U	0.12U	0.12U	-- - --
Nickel	49.1	5.6J	9.6	6.8J	8.1J	4.7J	4.6J	4.9J	3.57-8.49
Potassium	448J	814J	2030	1680	1130J	982J	1110J	1110J	632-2613
Selenium	0.22UJ	2.3UJ	2.3UJ	2.2UJ	2.5UJ	2.4UJ	2.4UJ	2.4UJ	0.00-1.35
Silver	0.88U	1J	0.91U	0.9U	1U	0.97U	0.97U	0.97U	0.86-0.94
Sodium	6410	5570	3140	1170	1850	1410	1800	1420	154-540
Thallium	0.22UJ	2.3UJ	2.3UJ	0.22UJ	0.25UJ	0.24U	0.24U	0.24UJ	0.20-0.24
Vanadium	15.5	9.4J	20.7	14.3	13.8	12.5	11.5J	11.6J	9.26-26.74
Zinc	467J	7.6	17.4	11.3	62.6J	9	8.8	9.3J	4.58-21.82

Ft-BGS = Feet below ground surface
UJ = Estimated as non detect at the instrument detection limit
J = Estimated value
U = Not detected
-- - -- = No range could be calculated

[1] All concentrations are in milligrams per kilogram (mg/kg)
[2] Background range calculated from values

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 48-3a
Selection of COCs
SWMU 95

Media	Soils/Sediment
Chemicals Detected:	Aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), mercury (Hg†), nickel (Ni), silver (Ag), vanadium (V), zinc (Zn), selenium (Se†), MEK, acetone*, methylene chloride, toluene, carbon disulfide (CS_2), chloromethane, chloride, DDT, DDE, chlordane, heptachlor epoxide, 2 methylnaphthalene, BEHP†, PCBs†
	Chloromethane - below reporting limits of nondetects.
Chemicals Discarded:	Cd - comparable to background
	+Al, Cu, Fe, Mg, Chloride
	**As, Be, Mn, 2-Methylnaphthalene
	Lab contaminants - MEK, Acetone, Methylene chloride, CS_2, BEHP, Butylbenzyl Phthalate (2 hits at 2, 8 ft; not surficial soil)
Chemicals of Concern:	
SWMU Nos. 95, 96 only:	DDE, DDT, chlordane, heptachlor epoxide, toluene
	Cd, Co, Hg, Ba, Cr, Pb, Ni, Zn
SWMU Nos. 101, 102 only*:	Cd, Cr, Pb, Hg, Ni, Se, Ag, Zn, BEHP, DDD, DDE, chlordane, PCBs
Exceeded RFI Criteria (Soil):	None
Exposure Scenario:	SWMU Nos. 95 & 96, < ½ acre, therefore no intrusive construction and future residential scenario is unlikely; complete exposure paths include maintenance worker soil ingestion, dermal contact and inhalation of VOCs/particulates.

†High in sludge only
*Chemicals detected in sediment
**Lower than site background and/or comparable to
+Low toxicity chemicals
BEHP - bis(2-ethylhexyl)phthalate

Source: Woodward-Clyde, 1992

Table 48-3b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens
SWMU 95

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 48-3b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens
SWMU 95

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 48-3b
Proposed Corrective Action Levels and RFI Criteria for Carcinogens
SWMU 95

	Chemical	EPA Weight of Evidence	Assumed Risk Level	Exposure Duration (years)	Oral Slope Factor (mg/k-d)-1	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	Benzene	A	1.0E-06	70	2.9E-02	24.14	24.14	5.0E-03*	5.0E-03*
	Bromoform	B2	1.0E-06	70	7.9E-03	88.61	88.61	1.0E-01*,(1)	1.0E-01*,(1)
	Chloroform	B2	1.0E-06	70	6.1E-03	114.75	114.75	1.0E-01*,(1)	1.0E-01*,(1)
	Chloromethane	C	1.0E-05	70	1.3E-02	538.46	538.46	2.69E-02	2.69E-02
	Dibromochloromethane	C	1.0E-05	70	8.4E-02	83.33	83.33	4.17E-03	4.17E-03
	Methylene Chloride	B2	1.0E-06	70	7.5E-03	93.33	93.33	4.67E-03	4.67E-03
	Tetrachloroethene	B2	1.0E-06	70	5.1E-02	13.73	13.73	5.0E-03*	5.0E-03*
	Trichloroethene	B2	1.0E-06	70	1.1E-02	63.64	63.64	5.0E-03*	5.0E-03*
	Vinyl Chloride	A	1.0E-06	70	1.9E+00	0.37	0.37	2.0E-03*	2.0E-03*
Semi-volatiles:	bis(2-Ethylhexyl)phthalate	B2	1.0E-06	70	1.4E-02	50.00	50.00	2.50E-03	2.50E-03
	Benzo(a)anthracene	B2	1.0E-06	70	8.4E-01	0.83	0.83	4.17E-05	4.17E-05
	Benzo(a)pyrene	B2	1.0E-06	70	5.8E+00	0.12	0.12	6.03E-06	6.03E-06
	Benzo(b)fluoranthene	B2	1.0E-06	70	8.1E-01	0.86	0.86	4.32E-05	4.32E-05
	Benzo(k)fluoranthene	B2	1.0E-06	70	3.8E-01	1.84	1.84	9.21E-05	9.21E-05
	Carbazole	B2	1.0E-06	70	2.0E-02	35.00	35.00	1.75E-03	1.75E-03
	Chloroform	B2	1.0E-06	70	6.1E-03	114.75	114.75	1.0E-01*,(1)	1.0E-01*,(1)
	Chrysene	B2	1.0E-06	70	3.0E-02	23.33	23.33	1.17E-03	1.17E-03
	Dibenzo(a,h)anthracene	B2	1.0E-06	70	6.4E+00	0.11	0.11	5.47E-06	5.47E-06
	Indeno(1,2,3-c,d)pyrene	B2	1.0E-06	70	1.4E+00	0.50	0.50	2.50E-05	2.50E-05
	Pentachlorophenol	B2	1.0E-06	70	1.2E-01	5.83	5.83	1.0E-03*	1.0E-03*
Pesticides:	4,4-DDD	B2	1.0E-06	70	2.4E-01	2.92	2.92	1.46E-04	1.46E-04
	4,4-DDE	B2	1.0E-06	70	3.4E-01	2.06	2.06	1.03E-04	1.03E-04
	4,4-DDT	B2	1.0E-06	70	3.4E-01	2.06	2.06	1.03E-04	1.03E-04
	alpha-Chlordane	B2	1.0E-06	70	1.3E+00	0.54	0.54	2.0E-03*	2.0E-03*
	gamma-Chlordane	B2	1.0E-06	70	1.3E+00	0.54	0.54	2.0E-03*	2.0E-03*
	Heptachlor epoxide	B2	1.0E-06	70	9.1E+00	0.08	0.08	2.0E-04*	2.0E-04*
Metals:	Arsenic	A	1.0E-06	70	1.8E+00	0.39	0.39	1.94E-05	1.94E-05
	Beryllium	B2	1.0E-06	70	4.3E+00	0.16	0.16	8.14E-06	8.14E-06

* = final MCL
(1) = MCL for total trihalomethanes
(2) = Effective July 30, 1992

Source: Woodward-Clyde, 1992

Table 49-1
Pesticide Concentrations[1] in Soil Samples Collected by Radian in 1985 and by Walk, Haydel & Associates in 1986
SWMU 96

Sample Depth (Ft-BGS)	Compound	Boring Number								
		17A	17C	B1	B3	B4	B5	B6	B7	B8
0.5	4,4 - DDD			300		500		200		400
	4,4 - DDE			2600	500	1500	100	1300	500	200
	4,4 - DDT			900	200	2000	100	800	700	600
	Chlordane			700	100	500	300	1000	500	300
1.0	4,4 - DDE			100					300	
	4,4 - DDT					100			200	
	Chlordane						200		200	
2.0 - 4.0	4,4 - DDD		7[2]							
	4,4 - DDE		25[2]							
	4,4 - DDT		29[2]							
	Dieldrin	.002								
	Toxaphene	.221								
5.0 - 6.0	2,4 - D	283								
	4,4 - DDD									300
	4,4 - DDE									900
	4,4 - DDT									1300
	Chlordane									200
7.5 - 9.5	2,4 - D	59								
61.5 - 62.0	2,4 - D		406							
	4,4 - DDT		8[2]							
62.5 - 63.0	2,4 - D	3410								

Source: Woodward-Clyde, 1994

Ft-BGS = Feet below ground surface

[1] All concentrations are in milligrams per kilogram (mg/kg)
[2] Below detection limit

Source: Final Report, IRP Phase IV-A (Walk, Haydel & Associates Inc. 1990)

Table 49-3a
Pesticide/PCB Concentrations in Surface Soil Sample
SWMU 96

Boring Number	Sample Depth (Ft-BGS)	Compound	Concentration (µg/kg)
0961	0 - 0.5	4,4-DDD	14 UJ
		4,4-DDE	66 J
		4,4-DDT	110 J
		Aldrin	7.4 UJ
		Dieldrin	14 UJ
		Endosulfan I	7.4 UJ
		Endosulfan II	14 UJ
		Endosulfan Sulfate	14 UJ
		Endrin	14 UJ
		Endrin Aldehyde	14 UJ
		Endrin Ketone	14 UJ
		Heptachlor	7.4 UJ
		Heptachlor Epoxide	19 J
		Methoxychlor	74 UJ
		PCB 1016	140 UJ
		PCB 1221	290 UJ
		PCB 1232	140 UJ
		PCB 1242	140 UJ
		PCB 1248	140 UJ
		PCB 1254	140 UJ
		PCB 1260	140 UJ
		Toxaphene	740 UJ
		alpha-BHC	7.4 UJ
		alpha-Chlordane	16 J
		beta-BHC	7.4 UJ
		delta-BHC	7.4 UJ
		gamma-BHC	7.4 UJ
		gamma-Chlordane	47 J

Ft-BGS = Feet below ground surface
J = Estimated value
UJ = Estimated as non-detect at the CRQL

Source: Woodward-Clyde, 1994

Table 49-3b
Metal Concentrations[1] in the Groundwater Sample
SWMU 96

Element	Well 96K	MCL[2]
Antimony	0.06 U	0.01/0.005
Arsenic	0.0047 J	0.05
Barium	0.66	1.0
Beryllium	0.002 U	0.01[3]
Cadmium	0.005 U	0.005[3]
Chromium	0.034 U	0.1
Cobalt	0.01 U	*
Copper	0.15	1.0[4]
Lead	0.034 J	0.05[5]
Mercury	0.0002 U	0.002
Nickel	0.029 J	1.0[3]
Selenium	0.02 U	0.05[5]
Silver	0.003 U	1.0[4]
Thallium	0.01 U	0.022/0.001[3]
Tin	0.1 U	*
Vanadium	0.035	*
Zinc	0.049	5.0[4]

MCL = Maximum contaminant level
J = Estimated value
U = Not detected

1 All concentrations are in milligrams per liter (mg/L)
2 Primary MCL in effect as of November 13, 1991 (i.e., date monitoring well was sampled).
3 Proposed primary MCL
4 Secondary MCL in effect as of November 13, 1991 (i.e., date monitoring well was sampled).
5 Effective until 12/7/92, at which time action level of 0.015 mg/L became effective.
* No primary or secondary MCL or proposed MCL as of March 1992

Source: Woodward-Clyde, 1994

Table 49-4a
Concentrations (1) of Organics Detected in Soil Samples Collected from Boring 0962
SWMU 96

Boring No.	0962																			
Sample Depth in FT-BGS	10		20		30		40		50		60		70		80		90		100	
Analyte	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Acetone	150	J	240	J	28	J	39	J	26	J	120	J	15	J	10	UJ	10	UJ	11	UJ
Methylene chloride	4.5	J	3.1	J	5.4	U	5.2	U	5.3	U	5.2	U	5.2	U	5.2	U	5.2	U	5.3	U
Toluene	13	U	9.4	J	5.1	J	2.5	J	5.3	U	10		5.2	J	4.2	J	1.9	J	3.4	J
4,4-DDE	3.5*	U	3.6	U	3.5	U	3.5	U	3.5	U	3.4	U	3.5	U	3.4	U	3.4	U	3.5	U
4,4-DDT	3.5**	UJ	3.6	UJ	3.5	UJ	3.5	UJ	3.5	UJ	3.4	UJ	3.5	UJ	3.4	UJ	3.4	UJ	3.5	UJ
TRPH	42.9	U	43.9	U	43	U	64.9		42.5	U	41.5	U	41.8	U	41.8	U	41.2	U	42.1	U
GRO	0.54	J	0.55	U	0.54	U	0.52	U	0.53	U	0.52	U	0.52	U	0.52	U	0.52		0.53	
TCO	4***	UJ	4	J	4	UJ	4	UJ	4	UJ	4	UJ	4	J	4	UJ	4	UJ	4	J

U = Not detected
J = Estimated value
UJ = Estimated as a non-detect at the Contract Required Quantitation Limit
TRPH = Total recoverable petroleum hydrocarbons
GRO = Gasoline range organics
TCO = Total chromatographable organics

(1) Concentrations for acetone, methylene chloride, toluene, 4,4-DDE, and 4,4-DDT are in micrograms per kilogram (ug/kg), while concentrations for TRPH, GRO, and TCO are in milligrams per kilogram (mg/kg).

* 4,4-DDE was reported at 2.6 ug/kg in the field duplicate sample (CAN096-0962-0661) collected at this interval.
** 4,4-DDT was reported at 17 ug/kg in the field duplicate sample (CAN096-0962-0661) collected at this interval.
*** Total chromatographable organics were reported PRESENT in the field duplicate sample (CAN096-0962-0661) collected at this interval.

Source: Woodward-Clyde, 1994

Table 49-4b
Concentrations (1) of Metals Detected in Soil Samples Collected from Boring 0962
SWMU 96

Boring No.		0962																			
Sample Depth in FT-BGS	Background Range	10		20		30		40		50		60		70		80		90		100	
Analyte		Result	Qual	Result	u	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	0-10,800	7090		6460		4430		2470		2600		1320		1570		1460		1210		1510	
Antimony	0-30	6.4	U	6.6	U	6.5	U	6.3	U	6.4	U	6.2	U	6.3	U	6.3	U	6.2	U	6.3	U
Arsenic	0-10	2.1		2.3		1.1		0.71		0.54		0.4		0.49		0.67		0.86		0.85	
Barium	0-550	68	J	89.1	J	15	J	29	J	45.8	J	11.2	J	61.8	J	17.8	J	18.5	J	32.6	J
Beryllium	0-0.6	0.59		0.76		0.29		0.21	U	0.24		0.21	U	0.21	U	0.21	U	0.21	U	0.21	U
Cadmium	0-2.1	0.54	U	0.55	U	0.54	U	0.52	U	0.53	U	0.52	U	0.52	U	0.52	U	0.52	U	0.53	U
Calcium	0-167,000	5400	J	70000	J	19900	J	62700	J	52700	J	15600	J	28300	J	12600	J	12100	J	17400	J
Chromium	0.8-12	8.5		10.2		4.5		2.5		7.1		2.3		4.4		2.6		2.4		5.8	
Cobalt	0-4	3.3		2.8		1.6		0.94		1.3		0.78		1.1		1.4		1.1		1.4	
Copper	0-10	7.2		4.5		3		1.3		2		1.3		1.4		1.9		1.8		1.8	
Iron	0-8600	8530		5270		3880		2010		2300		1990		2290		2730		2440		2930	
Lead	0-18	6.3		3.6		2.8		1		1.1		0.79		0.9		1.7		1.9		1.7	
Magnesium	0-9900	1370		5030		5490		4550		4580		1140		1500		1200		1000		1180	
Manganese	0-152	59.9	J	194	J	45.9	J	27.1	J	39	J	24	J	30.2	J	43	J	39	J	57.3	J
Mercury	0-0.2	0.11	U	0.11	U	0.11	U	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U
Nickel	0-9.7	6.1		8.2		3.4		2		2.6		1.2		1.6		1.7		1.7		2.3	
Potassium	0-2500	1310		2150		1860		617		577		288		351		365		333		413	
Selenium	0-37	0.54	UJ	1.1	U	1.1	UJ	1	UJ	1.1	UJ	1	UJ	0.52	UJ	0.52	UJ	0.52	UJ	0.53	UJ
Silver	0-1.8	1.1	U	0.37		1.1	U	1	U	1.1	U	1	U	0.31		1	U	1	U	0.38	
Sodium	0-830	205		292		219		90.2		135		68.4		140		136		135		148	
Thallium	0-6	0.54	UJ	1.1	U	0.54	UJ	1	UJ	1.1	UJ	1	UJ	1	UJ	0.52	UJ	0.52	UJ	0.53	UJ
Vanadium	2-25	16.8		20.4		13.1		7		9.6		6		6.6		7.8		7.1		8.2	
Zinc	0-21	16.5	U	11.7	U	8.1	U	4.4	U	4.6	U	3.5	U	4.2	U	5.3	U	6.4	U	0.54	U

U = Not detected

J = Estimated value

UJ = Estimated as a non-detect at the Contract Required Quantitation Limit

(1) All concentrations are in milligrams per kilogram (mg/kg).

(2) Background range from Concentrations of Selected Naturally Occurring Constituents in Soil and Groundwater at Cannon AFB W-C 1994.

Source: Woodward-Clyde, 1994

Table 50-1
Metal Concentrations (1) in Soil Samples
SWMU 98

Boring Number	Sample Depth (Ft-BGS)	Element															
		Aluminum		Antimony		Arsenic		Barium		Beryllium		Cadmium		Calcium		Chromium	
9801	20	7090	J	5.3	UJ	1.4	J	561	J	0.72	J	0.91	U	36300	J	7	
9802	17	5800	J	5.2	UJ	1.1	J	485	J	0.49	J	0.91	U	36000	J	5.9	
9803	12	9630		5.3	UJ	2.4	J	173	J	0.46	U	1.3		118000		6.3	
9804	14	7080		5.4	UJ	1.5	J	109	J	0.47	U	0.94	U	156000		5.5	
9806	17	6220		4.9	UJ	1.5	J	57.3		0.47	J	0.85	U	52200	J	5	
9808	8	5990		5.2	UJ	2	J	1060		0.45	U	0.9	U	159000	J	5	
9810	15	11100		5.3	UJ	1.6	J	49.9	J	0.46	U	0.92	U	66700		8.4	
9812	13	4670		5.5	UJ	1.3	J	1310	J	0.48	U	0.96	U	212000		3.8	
9813	13	5460		5.3	UJ	1.5	J	861	J	0.47	U	0.93	U	195000		4.3	
9814	13	7620		5.2	UJ	1.9	J	148	J	0.45	U	0.9	U	109000		5.3	
9815	5	7870		5.3	UJ	2.2	J	1560	J	0.46	U	0.92	U	86000		6	
9816	5	6280		5	UJ	1.6	J	386	J	0.44	U	0.88	U	57300		5.5	
9817	9	11500		5.2	UJ	1.7	J	159		0.45	U	0.9	U	135000		7.3	
9818	11	4720		5.3	UJ	1.1	J	3480		0.46	U	0.92	U	216000		3.1	
9820	6	6150		5	U	1.3	J	151		0.44	U	0.87	U	90000		4.9	
9821	9	4800		5.2	UJ	1.1	J	158	J	0.45	U	0.91	U	116000	J	4.5	
9821	17	4770		5.3	UJ	0.58	J	70.7		0.46	U	0.92	U	197000	J	4.8	
9821	23	7060		5.5	UJ	0.71	J	120		0.48	U	0.95	U	87800	J	4.5	
9822	14	6400		5.5	UJ	0.76	J	123	J	0.48	U	0.95	U	198000		4.7	
9824	14	8130		5.2	UJ	1.5	J	338	J	0.46	U	0.91	U	102000		6.4	
9830	6	5400		5.3	UJ	1.3	J	570	J	0.46	U	1.3		178000		4.1	
9831	7	6750		5.3	UJ	1.5	J	525	J	0.46	U	0.92	U	177000		4.6	
9832	12	4450		5.4	UJ	1.6	J	406	J	0.49	J	0.93	U	195000	J	3.6	
9833	10	5500		5.6	UJ	1.4	J	398	J	0.5	J	0.97	U	114000	J	5.4	
9835	10	5330		5.2	J	1.1	J	151	J	0.45	U	0.9	U	114000		5.3	
9837	11	5460		5.3	J	1.1	J	1040	J	0.46	U	0.92	U	72400		6.1	
9838	9	6200		10.3	UJ	1.9	J	1830	J	0.9	U	1.8	U	246000		2.6	J
9839	9	8820		5.1	UJ	1.7	J	325	J	0.44	U	0.89	U	102000		6.7	
9840	9	4030		5.3	J	1.4	J	121	J	0.46	U	0.92	U	148000		3.9	

Page 1 of 3

Source: Woodward-Clyde, 1992

Table 50-1
Metal Concentrations (1) in Soil Samples
SWMU 98

Boring Number	Sample Depth (Ft-BGS)	Element															
		Cobalt		Copper		Iron		Lead		Manganese		Magnesium		Mercury		Nickel	
9801	20	3.2	J	8.5	U	7030	J	6.4		133		3610		0.11	U	7.2	J
9802	17	3.1	J	7.5	U	6580	J	5.5		110		3340		0.11	U	6.2	J
9803	12	3	J	4.1	J	6330		8.9		82		5320		0.12	U	6.5	J
9804	14	3	J	6.7		3670		2.7		29.5		7890		0.12	U	6.5	J
9806	17	3.1	J	4.9	J	4880		5	J	110		2980		0.11	U	5.5	J
9808	8	2.7	J	5.9	U	4220		3	J	51.6		2990		0.11	U	5.2	J
9810	15	3.2	J	9.8	U	7560		4.8		126		4270		0.11	U	6.8	J
9812	13	1.2	U	3.2	U	2250		1.4		16.7		20900		0.12	U	4.5	J
9813	13	1.5	J	4.1	U	2800		3.8		25.7		21100		0.12	U	4.8	J
9814	13	2.3	J	3	U	4560		2.7		59.4		7930		0.11	U	5.9	J
9815	5	3.5	J	6.4	U	6280		4.6		126		3480		0.11	U	7.1	J
9816	5	3.5	J	4.5	U	4950		4		92.7		2870		0.11	U	5.2	J
9817	9	3.1	J	12		6860		5.8		94.1		5410		0.11	U	6.8	J
9818	11	1.3	J	8		2330		1.3		18.1		12800		0.12	U	3.3	J
9820	6	2.3	J	3.5	J	4370		4.5		73.1		2950		0.11	U	4.3	J
9821	9	2.7	J	5.5	U	4830	J	4.9	J	76.7	J	2820		0.11	U	7.5	J
9821	17	2.4	J	3.8	U	2940		2.4	J	32.9		8870		0.12	U	5.2	J
9821	23	2	J	5.9	U	3890		1.1	J	28.9		35300		0.12	U	7	J
9822	14	1.2	U	3.5	J	3160		2	J	24.1		12800		0.12	U	3.6	J
9824	14	4.2	J	5	J	5470		6.1	J	115		4510		0.11	U	6.4	J
9830	6	1.8	J	2.2	J	3290		2.8		33.7		3170		0.12	U	3.7	J
9831	7	2.9	J	3.1	J	4080		3.1		67.9		4350		0.11	U	5.3	J
9832	12	2.2	J	4.3	U	2840		3.6	J	28.9		4930		0.12	U	5.3	J
9833	10	2.8	J	6	U	4640		3.7	J	47.3		4810		0.12	U	6.7	J
9835	10	3.6	J	4.7	J	5080		4.3		69.7		3850		0.11	U	6.8	J
9837	11	2.9	J	5.1	J	5660		5.1		108		3130		0.11	U	6.2	J
9838	9	3	J	7.5	U	3590		2.7		43.8		4900		0.11	U	5.5	J
9839	9	3	J	12.7		5970		4		76.7		4010		0.11	U	7.1	J
9840	9	2.4	J	6.8		3700		3.8		55.2		3560		0.11	U	6.4	J

Page 2 of 3

Source: Woodward-Clyde, 1992

Table 50-1
Metal Concentrations (1) in Soil Samples
SWMU 98

Boring Number	Sample Depth (Ft-BGS)	Element															
		Potassium		Selenium		Silver		Sodium		Thallium		Vanadium		Zinc	
9801	20	2340		0.23	UJ	0.91	U	301	U	0.23	UJ	21.4		16.8	
9802	17	1800		0.23	UJ	0.91	U	300	U	0.23	UJ	19.6		16	
9803	12	2530		2.3	UJ	0.93	U	306	U	0.23	UJ	20.3		16.1	
9804	14	1060	J	0.24	UJ	0.94	U	350	J	2.4	UJ	17.6		7.6	
9806	17	1690		0.21	UJ	0.85	U	282	U	0.21	UJ	15.4		12.6	
9808	8	1160		0.23	UJ	0.9	U	297	U	0.23	UJ	16.9		11.5	
9810	15	2630		2.3	UJ	0.92	U	302	U	0.23	UJ	17.7		19.5	
9812	13	861	J	2.4	UJ	0.96	U	317	U	0.24	UJ	18.5		6.6	U
9813	13	1010	J	2.3	UJ	0.93	U	307	U	0.23	UJ	18.6		8.8	
9814	13	1720		2.2	UJ	0.9	U	296	U	0.22	UJ	23.3		12	
9815	5	1770		2.3	UJ	0.92	U	303	U	2.3	UJ	20.2		18	
9816	5	1530		2.2	UJ	0.88	U	290	U	0.22	UJ	17.2		13.6	
9817	9	2700		0.22	UJ	0.9	U	297	U	2.2	UJ	20.2		17.4	
9818	11	824	J	0.23	UJ	0.92	U	304	U	0.23	UJ	20		4.3	J
9820	6	1680		2.2	UJ	0.87	U	287	U	0.22	UJ	13.2		10.4	
9821	9	1090	J	0.23	UJ	1	J	330	J	0.23	UJ	23		12.8	U
9821	17	823	J	0.23	UJ	0.92	U	305	U	0.23	UJ	18.2		6.8	U
9821	23	1120	J	0.24	U	0.95	U	314	U	0.24	UJ	23.3		7.2	U
9822	14	1200		2.4	UJ	0.95	U	315	U	2.4	UJ	13.1		6.6	
9824	14	2220		2.3	UJ	0.91	U	300	U	0.23	UJ	14.7		14.2	
9830	6	1350		2.3	UJ	0.92	U	304	U	0.23	UJ	9.9	J	8.3	
9831	7	1630		2.3	UJ	0.92	U	302	U	2.3	UJ	13.6		10	
9832	12	1400		0.23	UJ	0.94	J	427	J	2.3	UJ	13.7		6.8	U
9833	10	1800		0.24	UJ	0.97	U	371	J	0.24	UJ	18.8		11	U
9835	10	1620		0.22	UJ	0.9	U	297	U	0.22	J	16.7		12.1	
9837	11	1590		0.23	UJ	0.92	U	303	U	0.23	J	18.7		12.7	
9838	9	1440	J	0.22	UJ	1.8	U	591	U	2.2	UJ	13.2	J	9.4	U
9839	9	2210		2.2	UJ	0.89	U	294	U	0.22	UJ	16.2		14.1	
9840	9	1460		0.23	UJ	0.92	U	303	U	0.23	J	15.2		12.4	

Ft-BGS = Feet below ground surface
U = Not detected
J = Estimated value
UJ = Estimated as non-detect at the CRQL
(1) All concentrations are in milligrams per kilogram (mg/kg)

Page 3 of 3

Source: Woodward-Clyde, 1992

Table 50-2a
Selection of COCs
SWMU 98

Media	Soils
Chemicals Detected:	Aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), nickel (Ni), thallium (Th), silver (Ag), vanadium (V), zinc (Zn), MEK, acetone, methylene chloride, toluene
Chemicals Discarded:	*Sb
	***As, Be, Cd, Cr, Co, Pb, Ni, Ag, V, Zn, Al
	**Mn, Th
	+Cu, Fe, Mg
	Lab contaminants: MEK, methylene chloride
Chemicals of Concern:	Ba, toluene, acetone
Exceed RFI Criteria:	None
Exposure Scenario:	Intrusive (worker) no surficial soil data
	0-23 ft bgs soil data
	Area > ½ acres, no residential construction is feasible due to narrow width; sewage maintenance worker is the plausible scenario

Legend:
*Lower than site background but > regional background.
**Lower than regional and/or comparable to site background.
***Lower than site regional background.
+Low toxicity chemicals.

Source: Woodward-Clyde, 1992

Table 50-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB - Soil and Groundwater
SWMU 98

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 50-2b
Proposed Corrective Action Levels and RFI Criteria for Noncarcinogens Detected at Cannon AFB - Soil and Groundwater
SWMU 98

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 51-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 104

Sample ID	Depth, ft.	Target Metals, mg/kg											
		Aluminum	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Mercury	Potassium	Vanadium	Zinc
Background UTL		12000	5.3	230	1.1	15	2.2	4.4	10000	0.12	2800	24	15
1985 Samples [a]													
4A-1	1-2	–	–	–	–	–	–	–	–	–	–	–	94
4A-2	7-9	–	–	–	–	–	–	–	–	–	–	–	45
4A-3	62.5-63	–	–	–	–	–	–	–	–	–	–	–	54
4B-1	1-3	–	–	–	–	–	–	–	–	–	–	–	29
4C-1	3-4.5	–	–	–	–	–	–	–	–	–	–	–	70
4C-2	9.4-6	–	–	–	–	–	–	–	–	–	–	–	26
4D-2	15-17	–	–	–	–	–	–	–	–	–	–	–	260
4D-3	27.5-28.5	–	–	240	–	–	–	–	–	–	–	–	–
4D-4	47.9-49	–	–	320	–	–	–	–	–	–	–	–	–
4E-1	3-4.5	–	–	–	–	–	–	–	–	–	–	–	85
4E-3	52.5-54	–	–	–	–	–	–	–	–	–	–	–	31
4F-1	2-3.5	–	–	–	–	–	–	–	–	–	–	–	32
4F-2	8-9	–	–	290	–	–	–	–	–	–	–	–	15
4F-3	57.9-59	–	–	–	–	–	–	–	–	–	–	–	190
4G-1	2-4	–	–	–	–	–	–	6.5	–	–	–	–	16
4G-2	52.5-53	–	–	–	–	–	–	–	–	–	–	–	31

Page 1 of 5

Source: Radian Corp., 1994

Table 51-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 104

Sample ID	Depth, ft.	Target Metals, mg/kg											
		Aluminum	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Mercury	Potassium	Vanadium	Zinc
Background UTL		12000	5.3	230	1.1	15	2.2	4.4	10000	0.12	2800	24	15
1992 Samples													
CAN-104-4H-01	15-16.7	–	–	–	–	–	3.8	–	–	–	–	–	–
CAN-104-4H-13[b]	15-16.7	–	–	–	–	–	3.4	–	–	–	–	–	–
CAN-104-4H-02	20-20.7	–	–	–	–	–	3.8	–	–	–	–	–	19
CAN-104-4H-03	25-27	–	–	–	–	–	3.2	–	–	–	–	–	–
CAN-104-4H-05	35-37	–	–	–	–	–	2.5	–	–	–	–	–	–
CAN-104-4H-06	40-41	–	–	–	–	–	–	–	–	–	–	–	–
CAN-104-4H-07	45-46	–	–	–	–	–	2.6	–	–	–	–	–	–
CAN-104-4H-08	50-51.3	–	–	–	–	–	2.2	–	–	–	–	–	–
CAN-104-4I-01	15-17	–	–	–	–	–	3.2	–	–	–	–	–	–
CAN-104-4I-02	20-22	–	–	–	–	–	4.0	–	–	–	–	–	16
CAN-104-4I-03	32.5-33.1	–	–	–	–	–	2.4	–	–	–	–	–	–
CAN-104-4I-04	35-36.5	–	–	230	–	–	–	–	–	–	–	–	–
CAN-104-4H-01	Surface	15000	5.6[j]	–	–	–	4.1	6.6	11000	–	2800	–	29
CAN-104-4J-01	15-17	–	–	–	–	–	2.3	–	–	–	–	–	–
CAN-104-4J-02	20-22	–	–	560	–	–	2.4	–	–	–	–	–	–
CAN-104-4J-03	25-27	–	–	310	–	–	3.0	–	–	–	–	–	–
CAN-104-4J-04	27.5-28	–	–	420	–	–	2.4	5.0[B]	–	–	–	–	–
CAN-104-4J-05	30-32	–	–	–	–	–	2.5	–	–	–	–	–	–
CAN-104-4J-06	35-35.7	–	–	–	–	–	–	–	–	–	–	–	–
CAN-104-4J-07	45-46.8	–	–	350	–	–	2.6	–	–	–	–	–	–
CAN-104-4J-08	50-50.8	–	–	950	–	–	–	–	–	–	–	–	–

Page 2 of 5

Source: Radian Corp., 1994

Table 51-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 104

Sample ID	Depth, ft	Target Metals, mg/kg											
		Aluminum	Arsenic[c]	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Mercury	Potassium	Vanadium	Zinc
Background UTL		12000	5.3	230	1.1	15	2.2	4.4	10000	0.12	2800	24	15
CAN-104-4JJ-01	Surface	13000	6.2[j]	250	--	--	4.4	--	--	--	--	--	25
CAN-104-4K-01	15-17	--	--	--	--	--	3.9	4.4[B]	--	--	--	--	16
CAN-104-4K-13[e]	15-17	--	--	--	--	--	3.6	--	--	--	--	--	--
CAN-104-4K-02	20-22	--	--	360	--	--	3.0	--	--	--	--	--	--
CAN-104-4K-07	45-47	--	--	--	--	--	2.3	--	--	--	--	--	--
CAN-104-4L-01	15-17	--	--	350	--	--	2.7	--	--	--	--	--	--
CAN-104-4L-13[d]	15-17	--	--	--	--	--	2.4	--	--	--	--	--	--
CAN-104-4L-02	20-22	--	--	--	--	--	3.4	--	--	--	--	--	--
CAN-104-4L-03	25-27	--	--	--	--	--	3.3	--	--	--	--	--	--
CAN-104-4L-05	35-37	--	--	--	--	--	2.6	--	--	--	--	--	--
CAN-104-4L-06	37.5-37.6	--	--	--	--	--	4.0	--	--	--	--	--	--
CAN-104-4L-07	40-42	--	--	--	--	--	2.2	--	--	--	--	--	--
CAN-104-4L-08	45-47	--	--	--	--	--	2.7	--	--	--	--	--	--
CAN-104-4L-09	50-52	--	--	--	--	--	2.6	--	--	--	--	--	--
CAN-104-4LL-01	Surface	14000	7.3[j]	--	--	--	3.9	5.6	--	--	2900	--	25
CAN-104-4M-01	15-16.3	--	--	--	4.8	--	2.3	--	--	--	--	--	--
CAN-104-4M-02	20-22	--	--	360	--	--	--	--	--	--	--	--	--
CAN-104-4M-03	22.5-23.2	--	--	1100	--	--	--	--	--	--	--	--	--
CAN-104-4M-04	25-27	--	--	820	--	--	--	--	--	0.12[B]	--	--	--
CAN-104-4M-05	30-31	--	--	400	--	--	2.7	--	--	--	--	--	--
CAN-104-4M-06	35-37	--	--	580	--	--	--	--	--	--	--	--	--
CAN-104-4M-08	45-47	--	--	390	--	--	--	--	--	--	--	--	--

Page 3 of 5

Source: Radian Corp., 1994

Table 51-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 104

Sample ID	Depth, ft.	Target Metals, mg/kg											
		Aluminum	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Mercury	Potassium	Vanadium	Zinc
Background UTL		12000	5.3	230	1.1	15	2.2	4.4	10000	0.12	2800	24	15
CAN-104-4M-09	50-51.5	--	--	--	--	--	2.3	--	--	--	--	--	--
CAN-104-4M-13[e]	50-51.5	--	--	--	--	--	2.2	--	--	--	--	--	--
CAN-104-4N-01	15-17	16000	--	570	--	--	3.7	6.5	--	--	2900	--	21
CAN-104-4N-02	17.5-19.5	15000	--	--	--	--	3.8	5.2	--	--	3200	--	20
CAN-104-4N-03	20-21.7	--	--	230	--	--	3.1	4.7	--	--	--	--	17
CAN-104-4N-13[f]	20-21.7	15000	--	--	--	--	3.7	4.9	--	--	3200	--	19
CAN-104-4N-04	25-26	--	--	--	--	--	2.2	--	--	--	--	--	--
CAN-104-4N-05	30-31.5	--	--	1300	--	--	2.2	--	--	--	--	--	--
CAN-104-4N-07	40-40.5	--	--	--	--	16	2.4	--	--	--	--	--	--
CAN-104-4N-08	45-47	--	--	--	--	--	2.4	--	--	--	--	--	--
CAN-104-4P-01	15-17	16000	--	--	--	--	4.1	4.6	--	--	3100	--	21
CAN-104-4P-13[g]	15-17	16000	--	260	--	--	3.9	4.7	--	--	3000	--	22
CAN-104-4P-02	17.5-18.1	--	--	--	--	--	2.7	--	--	--	--	27	--
CAN-104-4P-03	20-22	--	--	--	--	--	2.3	--	--	--	--	--	46
CAN-104-4P-14[h]	20-22	--	--	--	--	--	2.5	--	--	--	--	--	48
CAN-104-4P-04	25-27	--	--	970	--	--	2.7	--	--	--	--	--	18
CAN-104-4P-05	30-32	--	--	230	--	--	2.3	--	--	--	--	--	--
CAN-104-4P-06	32.5-34.5	--	--	--	--	--	3.0	--	--	--	--	--	--
CAN-104-4Q-01	15-17	--	--	750	--	--	3.0	--	--	--	--	--	--
CAN-104-4Q-02	20-22	--	--	--	--	--	2.6	--	--	--	--	--	--
CAN-104-4Q-05	40-40.5	--	--	--	--	--	2.3	--	--	0.12[i]	--	--	--
CAN-104-4QQ-01	0-0.5	13000	7.7[j]	--	--	--	4.3	5.5	--	--	--	--	24

Page 4 of 5

Source: Radian Corp., 1994

Table 51-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 104

Sample ID	Depth, ft.	Target Metals, mg/kg											
		Aluminum	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Mercury	Potassium	Vanadium	Zinc
Background UTL		12000	5.3	230	1.1	15	2.2	4.4	10000	0.12	2800	24	15
CAN-104-4R-01	15-17	–	–	260	–	–	2.7	–	–	–	–	–	–
CAN-104-4R-13[i]	15-17	–	–	–	–	–	2.5	–	–	–	–	–	–
CAN-104-4R-06	30-32	–	–	330	–	–	–	–	–	–	–	–	–
CAN-104-4RR-01	Surface	15000	–	–	–	–	3.7	5.3	–	–	–	–	24
CAN-104-4RR-02[k]	Surface	15000	–	–	–	–	3.9	5.5	11000	–	–	–	25
CAN-104-BG-01	Surface	–	–	–	–	–	3.3	5.2	–	–	–	–	23

[a] - Radian, 1986.
[b] - CAN-104-4H-13 is a field duplicate of CAN-104-4H-01.
[c] - CAN-104-4K-13 is a field duplicate of CAN-104-4K-01.
[d] - CAN-104-4L-13 is a field duplicate of CAN-104-4H-01.
[e] - CAN-104-4M-13 is a field duplicate of CAN-104-4H-09.
[f] - CAN-104-4N-13 is a field duplicate of CAN-104-4H-03.
[g] - CAN-104-4P-13 is a field duplicate of CAN-104-4H-01.
[h] - CAN-104-4P-13 is a field duplicate of CAN-104-4H-03.
[i] - CAN-104-4R-13 is a field duplicate of CAN-104-4H-01.
[j] - Data have been corrected for a 30% low bias determined by matrix spike analyses.
[k] - CAN-104-4RR-02 is a field duplicate of CAN-104-4RR-01.
[l] - Analyte was observed in the method blank associated with this sample. Sample results have not been corrected for the concentration in the blank.

Note: Atomic absorption data were used to compare arsenic, lead, and selenium data (1992) to the UTLs. All field samples were anlayzed for antimony and thallium by ICPES. Due to the high concentrations of calcium in these samples, the antimony and thallium results were biased high. Ten percent of the field samples (the 17 exhibiting the highest apparent concentrations or detection limits for Sb and Tl) were submitted for analyses by graphite atomic absorption spectroscopy. These analyses indicate Sb and Tl results (corrected for bias) are below the UTLs for this site.

Page 5 of 5

Source: Radian Corp., 1994

Table 51-1b
Samples Reanalyzed for Antimony and Thallium
SWMU 104

Sample ID	Depth, ft	Sb mg/kg	Tl mg/kg
CAN-104-4H-01	15-16.7	<0.61	<0.51
CAN-104-4H-13 [a]	15-16.7	<0.62	<0.52
CAN-104-4I-03	32.5-33	<0.58	<0.49
CAN-104-4J-02	20-22	<0.52	<0.55
CAN-104-4J-04	27.5-28	<0.46	<0.45
CAN-104-4JJ-01	Surface	<0.47	NA
CAN-104-4K-03	25-27	<0.57	NA
CAN-104-4K-04	30-32	<0.57	<0.47
CAN-104-4L-04	30-30.5	<0.55	<0.46
CAN-104-4M-02	20-22	<0.57	<0.61
CAN-104-4M-04	25-27	<0.61	<0.51
CAN-104-4N-03	20-21.7	<0.57 [b]	<0.48 [c]
CAN-104-4N-05	30-31.5	<0.56	<0.47
CAN-104-4N-07	40-40.5	<0.58	<0.46
CAN-104-4P-02	17.5-18.1	<0.58	<0.48
CAN-104-4Q-03	25-25.7	<0.56	<0.46
CAN-104-4R-07	35-36.5	<0.52	<0.44

[a] - CAN-104-4H-13 is a field duplicate of CAN-104-4H-01.
[b] - MS/MSD recoveries 18% and 20 percent.
[c] - MS/MSD recoveries both 70 percent.

Source: Radian Corp., 1994

Table 51-1c
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	Organochlorine Pesticides and PCBs (8080), µg/kg										
		4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan II	Endrin	Heptachlor Epoxide	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-104-4H-01	15-16.7	<0.38	<0.38	<0.75	<0.38	<1.1	<0.38	<0.38	<7.5	<.38	0.57 @	<0.38
CAN-104-4H-13[a]	15.16.7	<0.38	<0.38	<0.75	<0.38	<1.1	<0.38	<0.38	<7.5	<0.38	0.7 @	<0.38
CAN-104-4H-02	20-20.7	<0.36	<0.36	<0.73	<0.36	<1.1	<0.36	33G	7.3 @	<0.36	<0.36	0.62G @
CAN-104-4H-09	52.5-54	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	16G	<7.0	<0.35	0.38 @	<0.35
CAN-104-4I-07	47.5-48.8	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	<0.35	<7.0	<0.35	<0.35	1
CAN-104-4I-13[b]	47.5-48.8	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	<0.35	<7.0	<0.35	<0.35	<0.35
CAN-104-4I-10	55-57	<0.34	<0.34	<0.69	<0.34	<1.0	<0.34	<0.34	<6.9	<0.34	1.5G @	0.95G @
CAN-104-4II-01	Surface	<0.36	0.97 @	<0.73	0.67G @	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	<0.36
CAN-104-4J-04	27.5-28	<0.35	<0.35	<0.71	<0.35	<1.1	<0.35	<0.35	<7.1	<0.35	0.71 @	<0.35
CAN-104-4K-03	25-27	<0.36	<0.36	<0.73	<0.36	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	0.38 @
CAN-104-4K-04	30-32	<0.36	<0.36	<0.72	<0.36	<1.1	<0.36	<0.36	<7.2	<0.36	<0.36	0.38 @
CAN-104-4LL-01	Surface	<0.37	0.88 @	<0.74	<0.37	<1.1	<0.37	<0.37	<7.4	<0.37,	<0.37	<0.37
CAN-104-4M-01	15-16.3	64G	23	670	<0.35	<1.1	1.3 @	<0.35	<7.0	<0.35	<0.35	0.57 @
CAN-104-4M-02	20-22	5.4G	1.4 @	42	<0.36	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	<0.36
CAN-104-4M-03	22.5-23.2	0.59G @	<0.37	10	<0.37	<1.1	<0.37	<0.37	<7.4	<0.37	<0.37	<0.37
CAN-104-4M-05	30-31	5.3G	1.8 @	54	<0.37	<1.1	<0.37	<0.37	<7.3	<0.37	<0.37	<0.37
CAN-104-4N-01	15-17	<0.36	1.8	<0.73	<0.36	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	<0.36
CAN-104-4NN-01	40-42	<0.37	<0.37	<0.73	<0.37	<1.1	<0.37	<0.37	<7.3	1.6G @	0.55 @	0.57 @
CAN-104-4NN-03	50-52	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	<0.35	<7.0	<0.35	0.38 @	<0.35

Page 1 of 2

Source: Radian Corp., 1994

Table 51-1c
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	Organochlorine Pesticides and PCBs (8080), µg/kg										
		4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan II	Endrin	Heptachlor Epoxide	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-104-4NN-04	55-57	<0.35	<0.35	<0.69	<0.35	<1.0	<0.35	<0.35	<6.9	<0.35	0.37G @	<0.35
CAN-104-4NN-05	60-62	<0.34	<0.34	<0.68	<0.34	<1.0	<0.34	<0.34	<6.8	<0.34	<0.34	0.68G @
CAN-104-4P-10	50-52	<0.35	<0.35	<0.69	<0.35	<1.0	<0.35	<0.35	<6.9	<0.35	0.48G @	<0.35
CAN-104-4Q-08	55-57	<0.34	<0.34	<0.68	<0.34	<1.0	<0.34	<0.34	<6.8	<0.34	0.49 @	<0.34
CAN-104-4Q-14 [c]	55-57	<0.34	<0.34	<0.68	<0.34	<1.0	<0.34	<0.34	<6.8	<0.34	<0.34	<0.34
CAN-104-4RR-03	60-62	<0.34	<0.34	<0.69	<0.34	<1.0	<0.34	<0.34	<6.9	<0.34	0.4G @	<0.34
CAN-104-BG-01	Surface	<0.35	1.9	<0.69	0.58G @	1.2G @	<0.35	<0.35	<6.9	<0.35	<0.35	<0.35

[a] - CAN-104-4H-13 is a field duplicate of CAN-104-4H-01.
[b] - CAN-104-4I-13 is a field duplicate of CAN-104-4I-07.
[c] - CAN-104-4Q-14 is a field duplicate of CAN-104-4Q-08.
@ - Result listed is leess than five times the method detection limit.
G - Result is estimated due to matrix interferences.

Page 2 of 2

Source: Radian Corp., 1994

Table 51-1d
VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4H-01	15-16.7	<28					<110	11@	<5.6	<5.6
CAN-104-4H-13[c]	15-16.7	<28					<110	17@	<5.7	<5.7
CAN-104-4H-02	20-20.7	<27					<110	13@	<5.5	<5.5
CAN-104-4H-03	25-27	<27	6200 G@[B]	<6.2	<24	<7000	<110	15@	<5.5	<5.5
CAN-104-4H-04	30-31	<27					<110	16@	<5.5	<5.5
CAN-104-4H-05	35-37	<27	5000 G@[B]	<6.1	<23	<6900	<110	11@	<5.4	<5.4
CAN-104-4H-14[d]	35-37	<27	4800 G@[B]	<6.1	<23	<6900	<110	14@	<5.4	<5.4
CAN-104-4H-06	40-41	<28					<110	11@	<5.6	<5.6
CAN-104-4H-07	45-46	<27					<110	16@	<5.4	<5.4
CAN-104-4H-08	50-51.3	<26					<100	11@	<5.2	<5.2
CAN-104-4H-09	52.5-54	<26					<110	12@	<5.3	<5.3
CAN-104-4H-10	55-56	28@	4200 G@[B]	<5.8	<22	<6600	<100	12@	<5.2	<5.2
CAN-104-4H-11	60-62	<26					<100	11@	<5.2	<5.2
CAN-104-4I-01	15-17	<26	4400 G@[B]	<5.9	<23	<6700	<110	6.8@[C]	<5.3	<5.3
CAN-104-4I-03	32.5-33	34@					<110	6.5@[C]	<5.6	<5.6
CAN-104-4I-04	35-36.5	<27	4800 G@[B]	<6.2	<24	<7000	<110	6.7@[C]	<5.5	<5.5
CAN-104-4I-05	40-41	<28					<110	7.6@[C]	9.7@	<5.7
CAN-104-4I-06	45-46.8	<27					<110	6.9@[C]	<5.3	<5.3
CAN-104-4I-13[e]	47.5-48.8	<26					<110	9.2@[C]	<5.3	<5.3

Page 1 of 6

Source: Radian Corp., 1994

Table 51-1d
VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg [a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4I-08	50-51.8	<27	4000 G@[B]	<6.0	<23	<6800	<110	<5.3[C]	<5.3	<5.3
CAN-104-4I-09	52.5-54.5	29@	4300 G@[B]	<6.0	<23	<6800	<100	<5.2[C]	<5.2	<5.2
CAN-104-4I-14[f]	52.5-54.5	<26	4200 G@[B]	<5.8	<22	<6600	<100	5.5@[C]	<5.2	<5.2
CAN-104-4I-10	55-57	32@					<100	5.4@[C]	<5.2	<5.2
CAN-104-4I-11	60-62	<26					<100	9@[C]	<5.2	<5.2
CAN-104-4I1-01	Surface	28@	8000 G@[B]	12@	<24	11000@	<110	8.7@	<5.5	<5.5
CAN-104-4J-01	15-17	<27	4100 G@[B]	<6.0	<23	<6800	<110	<5.4	<5.4	<5.4
CAN-104-4J-13[g]	15-17	<26	4500 G@[B]	<6.0	<23	<6800	<110	6.9@	<5.3	<5.3
CAN-104-4J-05	30-32	29@	4600 G@[B]	<6.0	<23	<6800	<110	<5.3	<5.3	<5.3
CAN-104-4J-08	50-50.8	44@					<110	<5.4	<5.4	<5.4
CAN-104-4J-09	55-57	33@	3300 G@[B]	<5.8	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4J-10	60-62	47@					<100	<5.1	<5.1	<5.1
CAN-104-4JJ-01	Surface	36@	12000 G@[B]	<6.2	<24	<6900	<110	<5.5	<5.5	<5.5
CAN-104-4K-01	15-17	<26	5300 G@[B]	<6.0	<23	<6800	<110	<5.3[C]	<5.3	<5.3
CAN-104-4K-13[h]	15-17	<26	4700 G@[B]	<6.0	<23	<6800	<110	<5.3[C]	<5.3	<5.3
CAN-104-4K-02	20-22	<27					170@	<5.4[C]	<5.4	<5.4
CAN-104-4K-03	25-27	42@					<110	<5.4[C]	<5.4	<5.4
CAN-104-4K-04	30-32	28@					<110	<5.4[C]	<5.4	<5.4
CAN-104-4K-05	35-37	35@					<110	7.2@	<5.4	<5.4

Page 2 of 6

Source: Radian Corp., 1994

Table 51-1d
VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[A,B]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4K-06	40-41	<27					<110	5.4@	<5.4	<5.4
CAN-104-4K-07	45-47	49@					<110	<5.3	<5.3	<5.3
CAN-104-4K-08	50-51.7	29@					<110	<5.3	<5.3	<5.3
CAN-104-4K-09	57.5-59.5	50@					<100	<5.1	<5.1	<5.1
CAN-104-4K-10	60-62	34@					<100	<5.2	<5.2	<5.2
CAN-104-4L-01	15-17	<27	11000 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4L-13[I]	15-17	58@[B]	9300 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4L-02	20-22	<27					<110	8@	<5.5	<5.5
CAN-104-4L-03	25-27	41@	7800 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4L-04	30-30.5	49@					<110	<5.3	<5.3	<5.3
CAN-104-4L-05	35-37	<27					<110	7.9@	<5.4	<5.4
CAN-104-4L-07	40-42	<27					<110	7.4@	<5.4	<5.4
CAN-104-4L-08	45-47	49@					<110	<5.3	<5.3	<5.3
CAN-104-4L-10	55-57	<26	6700 G@[B]				<100	<5.2	<5.2	<5.2
CAN-104-4L-14[J]	55-57	42@	7400 G@[B]				<100	<5.2	<5.2	<5.2
CAN-104-4L-11	60-62	28@[B]					<100	22@	<5.2	<5.2
CAN-104-4LL-01	Surface	58@	11000 G@[B]	<6.3	<24	<7100	<110	<5.5	<5.5	<5.5
CAN-104-4M-01	15-16.3	41@[B]					<110	11@	<5.3	<5.3
CAN-104-4M-02	20-22	28@[B]	8000 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5

Page 3 of 6

Source: Radian Corp., 1994

Table 51-1d
VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4M-03	22.5-23.2	41@[B]					<110	7.6@	<5.6	<5.6
CAN-104-4M-04	25-27	41@[B]					<110	<5.6	<5.6	<5.6
CAN-104-4M-05	30-31	<27	7300 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-4M-06	35-37	<27					<110	7.3@	<5.4	<5.4
CAN-104-4M-07	40-42	27@[B]					<110	<5.3	<5.3	<5.3
CAN-104-4M-08	45-47	37@[B]					<110	<5.5	<5.5	<5.5
CAN-104-4M-09	50-51.5	<26	8700 G@[B]	<6.0	<23	<6800	<110	<5.3	<5.3	<5.3
CAN-104-4M-13[1]	50-51.5	30@[B]	7300 G@[B]	<6.0	<23	<6800	<110	<5.3	<5.3	<5.3
CAN-104-4M-11	60-62	32@[B]					<100	<5.2	<5.2	<5.2
CAN-104-4N-01	15-17	<27	9400 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-4N-02	17.5-19.5	77@					130@	<6.3	18@	<6.3
CAN-104-4N-03	20-21.7	37@	8800 G@[B]	<6.2	<24	<7000	<110	<5.5	13@	<5.5
CAN-104-4N-13[1]	20-21.7	<27	8300 G@[B]	<6.2	<24	<7000	<110	12@	<5.5	<5.5
CAN-104-4N-04	25-26	38@					<110	11@	5.7	<5.7
CAN-104-4N-05	30-31.5	<27					<110	8.2@	<5.4	<5.4
CAN-104-4N-07	40-40.5	29@					<120	10@	5.8	<5.8
CAN-104-4N-08	45-47	<26	8600 G@[B]	<5.9	<22	<6600	<110	5.7@	<5.3	<5.3
CAN-104-4N-09	50-52	<26					<100	7.5@	<5.2	<5.2
CAN-104-4N-10	55-57	<26	7900 G@[B]	<5.8	<22	<6600	<100	<5.2	<5.2	<5.2

Page 4 of 6

Source: Radian Corp., 1994

Table 51-1d
VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg [a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4N-14[m]	55-57	49@	8100 G@[B]	<5.8	<22	<6600	<100	<5.2	<5.2	<5.2
CAN-104-4N-11	60-62	87@					<100	<5.1	<5.1	<5.1
CAN-104-4P-01	15-17	<27	10000 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4P-13[n]	15-17	<27	7500 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4P-02	17.5-18.1	38@[B]					<110	<5.5	<5.5	<5.5
CAN-104-4P-03	20-22	38@[B]	7700 G@[B]	<6.2	<24	<7000	<110	6.7@	7.4@	<5.5
CAN-104-4P-14[o]	20-22	38@[B]	10000 G@[B]	<6.2	188 G	<7000	<110	5.6@	14@	<5.5
CAN-104-4P-04	25-27	<27					<110	5.5@	<5.4	<5.4
CAN-104-4P-05	30-32	<27					<110	6.3@	<5.5	<5.5
CAN-104-4P-06	32.5-34.5	<28					<110	5.9@	<5.5	<5.5
CAN-104-4P-07	35-36	31@[B]					<110	<5.7	<5.7	<5.7
CAN-104-4P-09	45-47	39@[B]					<120	9.5@	<6.0	<6.0
CAN-104-4P-11	55-57	30@[B]					<100	<5.1	<5.1	<5.1
CAN-104-4P-12	60-62	27@[B]					<100	<5.1	<5.1	<5.1
CAN-104-4Q-02	20-22	45@					<110	<5.4	<5.4	<5.4
CAN-104-4Q-03	25-25.7	<27					<110	5.9@	<5.4	<5.4
CAN-104-4Q-04	30-32	<26	8800 G@[B]	<6.1	<23	<6900	<100	<5.2	<5.2	<5.2
CAN-104-4Q-13[p]	30-32	<26	9400 G@[B]	<5.8	<22	<6600	<100	<5.2	<5.2	<5.2
CAN-104-4Q-05	40-40.5	60@					<110	<5.4	<5.4	<5.4

Page 5 of 6

Source: Radian Corp., 1994

Table 51-1d
VOCs, Herbicides, Diesel, and TRPH Found in Soil Samples
SWMU 104

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4Q-06	50-50.5	<27					<110	6.1@	<5.3	<5.3
CAN-104-4Q-07	52.5-54.5	29@	8900 G@[B]	<5.7	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4Q-10	60-62	26@	5200 G@[B]	<5.7	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4QQ-01	Surface	30@	9900 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4R-01	15-17	<27	9300 G@[B]	<6.1	<23	<6800	<110	<5.4	<5.4	<5.4
CAN-104-4R-13[q]	15-17	<27	16000 G@[B]	<6.0	<23	<6800	<110	<5.4	<5.4	<5.4
CAN-104-4R-02	17.5-19	<27	19000 G@[B]	<6.5	<25	<7300	<110	5.3@	<5.3	<5.3
CAN-104-4R-05	27.5-29.5	27@					<110	<5.3	<5.3	<5.3
CAN-104-4R-10	55-57	26@	9000 G@[B]	<5.7	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4RR-01	Surface	<27	8300 G@[B]	8.3@	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-4RR-02[r]	Surface	<27	14000 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-BG-01	Surface	<26	4800 G@[B]	<5.9	<22	8000@	<100	<5.2	72	7.7@

[a] - 8240 TICs include 2-ethyl-1-hexanol, 2-propanol, decanal, ethyl acetate, methyl acetate, nonanal, and bromocyclohexane. Ethyl acetate was present in most samples at concentrations ranging from 0 to 210 ug/kg.
[b] - 8270 TICs include 1,2-cyclohexanediol, cyclohexenone, trichloropropene, alpha-pinene, DDD, and hydroxymethyl pentanone. Cyclohexenone was present in roughly half the samples at concentrations ranging from 140 to 380 ug/kg.
[c] - CAN-104-4H-13 is a field duplicate of CAN-104-4H-01.
[d] - CAN-104-4H-14 is a field duplicate of CAN-104-4H-05.
[e] - CAN-104-4I-13 is a field duplicate of CAN-104-4I-07. No target analytes were detected in CAN-104-4I-07.
[f] - CAN-104-4I-14 is a field duplicate of CAN-104-4I-09.
[g] - CAN-104-4J-13 is a field duplicate of CAN-104-4J-01.
[h] - CAN-104-4K-13 is a field duplicate of CAN-104-4K-01.
[i] - CAN-104-4L-13 is a field duplicate of CAN-104-4L-01.
[j] - CAN-104-4L-14 is a field duplicate of CAN-104-4L-10.
[k] - CAN-104-4M-13 is a field duplicate of CAN-104-4M-09.
[l] - CAN-104-4N-13 is a field duplicate of CAN-104-4N-03.
[m] - CAN-104-4N-14 is a field duplicate of CAN-104-4N-10.
[n] - CAN-104-4P-13 is a field duplicate of CAN-104-4P-01.
[o] - CAN-104-4P-14 is a field duplicate of CAN-104-4P-03.

[q] - CAN-104-4R-13 is a field duplicate of CAN-104-4R-01.
[r] - CAN-104-4RR-02 is a field duplicate of CAN-104-4RR-02.
[B] - Presence may be due to laboratory contamination. Analyte was found in the associated blanks. The sample results were not corrected for the concentration in the blank.
[C] - Presence of the analyte was observed in the trip blank associated with this sample. Sample results have not been corrected for the concentration in the blank.
@ - Result listed is less than five times the method detection limit.
G - Result does not match the characteristic diesel pattern but elutes in the retention time window, so result is quantitated as diesel.

Note: When no result is listed, the sample was not analyzed for that parameter.

Page 6 of 6

Source: Radian Corp., 1994

Table 51-2a

Summary of Compounds Detected in Groundwater Samples

SWMU 104

LOCATOR	CAN104-MW0N-01			CAN104-MW0N-02		
LAB SAMPLE NUMBER	0401810001SA			0401810002SA		
COLLECT DATE	01/15/95			01/15/95		
	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/L)						
Acetone	25	10		22	10	
Methylene chloride	2.1	5	J	1.7	5	J
Toluene	5.7	5		6.4	5	
Semivolatile Organics (µg/L)						
Acetophenone	2.7	10	J	2.9	10	J
bis(2-Ethylhexyl)phthalate	51	10		59	10	
Metals (mg/L)						
Arsenic	0.003	0.01	J	0.003	0.01	J
Barium	0.047	0.01		0.049	0.01	
Copper	0.006	0.02	J	0.006	0.02	J
Selenium	0.007	0.01	J	0.005	0.01	J
Tin	0.32	0.1		<	0.1	U
Vanadium	0.019	0.01		0.021	0.01	
Zinc	0.013	0.02	J	0.015	0.02	J
TPH (µg/L)						
Gasoline Range Organics	17	10	J	14	10	J

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.

R = Rejected value.

U = Nondetected value.

D = Sample was diluted for analysis.

RL = Reporting Limit.

Source: Woodward-Clyde, 1995

Table 51-2b
Comparison of Compounds Detected in Groundwater Samples to MCLs
SWMU 104

LOCATION	Landfill 4 SWMU 104 CAN104-MW0N-01			Landfill 4 SWMU 104 CAN104-MW0N-02			Landfill 3 SWMU 105 CAN105-MW00-01			MCLs (µg/L)	Are MCLS Exceeded
LAB SAMPLE NUMBER	0401810001SA			0401810002SA			0401990001SA				
COLLECT DATE	01/15/95			01/15/95			01/16/95				
	Result	RL	Qua	Result	RL	Qual	Result	RL	Qual		
Volatile Organics (µg/L)											
Acetone	25	10		22	10		<	10	U	NA	NA
Carbon tetrachloride	<	5	U	<	5	U	1.6	5	J	5	NO
Methylene chloride	2.1	5	J	1.7	5	J	<	5	U	5	NO
Toluene	5.7	5		6.4	5		6.8	5		1000	NO
Semivolatile Organics (µg/L)											
Acetophenone	2.7	10	J	2.9	10	J	<	10	U	NA	NO
bis(2-Ethylhexyl)phthalate	51	10		59	10		2	10	J	6	YES
Metals (mg/L)											
Arsenic	0.0033	0.01	J	0.0034	0.01	J	0.0022	0.005	J	50	NO
Barium	0.047	0.01		0.049	0.01		0.064	0.01		2000	NO
Copper	0.0059	0.02	J	0.0056	0.02	J	<	0.02	U	1300	NO
Selenium	0.0068	0.01	J	0.0054	0.01	J	0.0025	0.005	J	50	NO
Tin	0.32	0.1		<	0.1	U	<	0.1	U	NA	NA
Vanadium	0.019	0.01		0.021	0.01		0.018	0.01		NA	NA
Zinc	0.013	0.02	J	0.015	0.02	J	<	0.02	U	NA	NA
TPH (µg/L)											
Gasoline Range Organics	17	10	J	14	10	J	16	10		NA	NA

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed

J = Estimated value.
R = Rejected value.
U = Nondetected value.
A=Action Level
D = Sample was diluted for analysis.
RL = Reporting Limit.
NA = Not Applicable

Source: Woodward-Clyde, 1995

Table 52-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 105

Sample ID	Metals (mg/Kg)													
	Al	Ba	Be	Ca	Cr	Co	Cu	Fe	Mg	Ni	K	Se	V	Zn
Background Soil UTLs	12240	228	0.81	241000	15	5.7	<4.4	10000	14500	10	2790	<2.2	24	<15
1985 Samples [a]														
3A-1 (4.5)	–	–	–	–	–	–	–	–	–	–	–	–	–	19
3A-2 (11.0)	–	310	–	–	–	–	–	–	–	–	–	–	–	–
3C-1 (4.0)	–	–	–	–	–	–	–	–	–	–	–	–	–	17
3C-2 (10.0)	–	–	–	–	–	–	–	–	–	–	–	–	–	23
3D-2 (11.0)	–	260	–	–	–	–	–	–	–	–	–	–	–	–
3E-1 (4.0)	–	240	–	–	–	–	–	–	–	–	–	–	–	–
3G-1 (4.5)	–	–	–	–	–	–	–	–	–	–	–	–	–	110
3G-2 (10.5)	–	–	–	–	–	–	–	–	–	–	–	–	–	43
3H-2 (11.0)	–	540	–	–	–	–	–	–	–	–	–	–	–	–
1992 Samples														
CAN-105-3J-21	–	250	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3J-30DUP	–	250	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3K-20	–	490	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3K-25	–	390	–	–	–	–	–	–	20000	–	–	–	–	–
CAN-105-3K-30	–	270	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3K-56	–	580	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3L-23.5	–	270	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3L-25	–	250	–	–	–	–	–	–	–	–	–	–	–	–

Page 1 of 3

Source: Radian Corp., 1994

Table 52-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 105

Sample ID	Metals (mg/Kg)													
	Al	Ba	Be	Ca	Cr	Co	Cu	Fe	Mg	Ni	K	Se	V	Zn
Background Soil UTLs	12240	228	0.81	241000	15	5.7	<4.4	10000	14500	10	2790	<2.2	24	<15
CAN-105-3L-30	–	980	–	–	–	–	–	–	–	–	3100	–	–	22
CAN-105-3M-SFC	–	–	–	–	–	–	–	–	–	–	–	–	–	17
CAN-105-3M-23.5	22000	340	1.1	460000	–	8.3	9.8	15000	18000	30	4400	–	49	39
CAN-105-3MM-30.5	–	1500	–	–	–	–	–	–	–	–	–	–	–	17
CAN-105-3M-40	–	–	–	–	–	–	–	–	3500	–	–	–	–	–
CAN-105-3N-27	–	310	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3N-30	25000	910	–	300000	26	–	–	16000	22000	21	4900	–	44	28
CAN-105-3NN-20	–	320	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3P-21	–	320	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3P-26	–	620	–	–	16	–	–	–	–	–	–	–	–	–
CAN-105-3Q-SFC	–	–	–	–	–	–	6.4	–	–	–	–	–	–	21
CAN-105-3Q-21	–	390	–	–	–	–	–	–	–	–	–	–	–	17
CAN-105-3Q-26	–	550	–	–	–	–	8.7	–	21000	–	–	–	–	–
CAN-105-3Q-30	–	460	–	–	–	–	8.1	–	19000	–	–	–	–	–
CAN-105-3R-25	–	280	–	–	–	–	10	–	–	–	–	–	–	–
CAN-105-3R-36	–	–	–	–	–	–	4.4	–	–	–	–	–	–	–
CAN-105-3R-41	–	–	–	–	–	–	–	–	15000	–	–	–	–	–
CAN-105-3R-51	–	230	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3S-21	–	410	–	–	–	–	–	–	18000	–	–	3.3	–	–
CAN-105-3S-25	–	270	–	–	–	–	–	–	–	–	–	2.2	–	–

Page 2 of 3

Source: Radian Corp., 1994

Table 52-1a
Metals Found at Concentrations Greater Than Background Soil UTLs in Field Samples
SWMU 105

Sample ID	Metals (mg/Kg)													
	Al	Ba	Be	Ca	Cr	Co	Cu	Fe	Mg	Ni	K	Se	V	Zn
Background Soil UTLs	12240	228	0.81	241000	15	5.7	<4.4	10000	14500	10	2790	<2.2	24	<15
CAN-105-3S-31	–	2400	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3S-31DUP	–	2200	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3S-36	–	240	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3S-43	–	–	–	–	–	–	–	–	15000	–	–	–	–	–
CAN-105-3S-45	–	–	–	–	18	–	–	–	–	–	–	–	–	–
CAN-105-3T-20	–	510	–	–	–	–	–	–	–	–	–	–	–	–
CAN-105-3U-20	13000	–	–	–	–	–	–	–	–	–	–	–	–	17
CAN-105-3U-25	14000	–	–	–	17	–	–	–	–	–	2800	–	–	26
CAN-105-3U-30	–	–	–	–	–	–	–	–	–	–	–	–	–	17
CAN-105-3U-32.5	–	–	–	–	–	–	–	–	–	–	–	2.3	–	–
CAN-105-3U-33.5	–	–	–	–	–	–	–	–	–	–	–	2.3	–	–
CAN-105-3U-35	–	–	–	–	20	–	–	–	–	–	–	–	–	–
CAN-105-3V-20.5	–	470	–	–	–	–	–	–	–	–	–	2.6	–	–
CAN-105-3V-25.5	–	–	–	–	–	–	–	–	–	–	–	2.6	–	–
CAN-105-3VV-30	–	–	–	–	–	–	–	–	–	–	–	2.6	–	46
CAN-105-3VV-35	–	560	–	–	–	–	–	–	–	–	–	2.5	–	–

[a] - Radian, 1986

NOTE: Atomic absorption data were used to compare arsenic, lead, antimony, selenium, and thallium data to the UTLs. All field samples were analyzed for antimony and thallium by ICPES. Due to the high concentrations of calcium in these samples, the antimony and thallium results were biased high. Ten percent of the field samples (those exhibiting the highest apparent concentrations or detection limits for Sb and Tl) were submitted for analyses by graphite atomic absorption spectroscopy (GFAAS). All results were corrected for analytical biases at this site. All corrected GFAAS results are below the Cannon AFB background UTLs.

Page 3 of 3

Source: Radian Corp., 1994

Table 52-1b
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 105

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg*													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3J-21	<0.36	<0.36	<0.72	0.72 G@	<0.36	<0.36	<0.72	3.1 G	<1.8	<7.2	<7.2	<0.36	4 G	<0.36
CAN-105-3J-30	<0.36	<0.36	<0.73	0.51 G@	<0.36	<0.36	<0.73	<0.36	<1.8	<7.3	<7.3	<0.36	3.8 G	<0.36
CAN-105-3J-35	<0.35	<0.35	<0.70	0.75 G@	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	<0.35	<0.35
CAN-105-3J-52.5	<0.35	<0.35	<0.69	1.6 G@	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3J-61	<0.34	<0.34	<0.68	0.6 G@	<0.34	<0.34	<0.68	<0.34	<1.7	<6.8	<6.8	<0.34	3.8 G	<0.34
CAN-105-3K-20	<0.36	<0.36	<0.71	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	1.3 G@	<0.36	2.8 G
CAN-105-3K-25	<0.38	<0.38	1.2 G@	<0.38	<0.3	<0.38	<0.75	<0.38	<1.9	<7.5	<7.5	<0.38	<0.38	<0.38
CAN-105-3K-30	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	<0.36	5.3 G
CAN-105-3K-36	<0.35	<0.35	1 G@	1.2 G@	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	<0.35	<0.35
CAN-105-3K-DUP10 (3K-40)	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	<0.35	0.65 @
CAN-105-3K-45	<0.35	<0.35	<0.71	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	<0.35	0.75 @
CAN-105-3K-51	<0.36	<0.36	<0.72	0.65 G@	<0.36	<0.36	<0.72	0.42 G@	<1.8	<7.2	<7.2	<0.36	<0.36	<0.36
CAN-105-3K-59	<0.34	<0.34	<0.69	0.54 G@	<0.34	<0.34	<0.69	<0.34	<1.7	<6.9	<6.9	<0.34	<0.34	<0.34
CAN-105-3L-23.5	0.6 G@	0.71 @	5.1	<0.37	<0.37	<0.37	<0.74	<0.37	<1.9	<7.4	<7.4	<0.37	<0.37	<0.37

Page 1 of 5

Source: Radian Corp., 1994

Table 52-1b
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 105

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg[a]													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3L-25	<0.39	<0.39	<0.77	0.42 G@	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	<0.39	3.2 G	<0.39
CAN-105-3L-56	<0.35	<0.35	<0.69	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	5.9 G	7.1 G
CAN-105-3L-61	<0.35	<0.35	0.97 @	1.1 G@	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	6.2 G	1.5 @
CAN-105-3M-40	<0.35	<0.35	<0.69	0.35 G@	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3MM-21	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	110	<7.2	<0.36	<0.36	<0.36
CAN-105-3N-27	1.1 G@	0.61 G@	1.7 @	2.1 G	<0.36	<0.36	0.81 @	<0.36	<1.8	<7.1	<7.1	<0.36	<0.36	<0.36
CAN-105-3N-30	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	0.86 @	<0.36	<1.8	<7.2	<7.2	<0.36	<0.36	<0.36
CAN-105-3NN-20	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	0.64 G@	<0.36	0.36 @
CAN-105-3NN-45	<0.37	<0.37	<0.73	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	1.3 @	<0.37
CAN-105-3NN-61	<0.35	<0.35	0.83 @	<0.35	<0.35	<0.35	<0.70	1.6 G@	<1.7	<7.0	<7.0	<0.35	6.6 G	<0.35
CAN-105-3P-40	<0.36	<0.36	3.1 G@	<0.36	0.89 G@	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	<0.36	<0.36
CAN-105-3P-45	<0.35	<0.35	0.88 G@	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	<0.35	<0.35
CAN-105-3P-51	<0.35	<0.35	<0.69	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	2 G	<0.35
CAN-105-3P-DUP7 (3P-56)	<0.34	<0.34	1.2 G@	<0.34	<0.34	<0.34	<0.69	<0.34	<1.7	<6.9	<6.9	<0.34	<0.34	<0.34
CAN-105-3Q-26	<0.39	<0.39	0.88 G@	<0.39	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	<0.39	<0.39	<0.39
CAN-105-3Q-36	<0.35	<0.35	0.76 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	<0.35	<0.35
CAN-105-3Q-41	<0.35	<0.35	0.78 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	15 G	<0.35	<0.35
CAN-105-3Q-46	<0.36	<0.36	0.8 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	18 G	<0.36	<0.36

Page 2 of 5

Source: Radian Corp., 1994

Table 52-1b
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 105

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg*													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3Q-53.5	<0.35	<0.35	0.8 G@	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3R-25	0.75 G@	<0.36	<0.72	0.75 G@	<0.36	<0.36	<0.72	<0.36	2.2 @	<7.2	<7.2	37 G	0.72 @	<0.36
CAN-105-3R-31	<0.36	<0.36	<0.71	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	0.6 G@	<0.36
CAN-105-3R-32.5	2.1 G	<0.39	1.5 @	<0.39	<0.39	<0.39	<0.78	<0.39	<1.9	<7.8	<7.8	<0.39	0.71 G@	<0.39
CAN-105-3R-35	<0.38	<0.38	1 G@	<0.38	<0.38	<0.38	<0.76	<0.38	<1.9	<7.6	<7.6	<0.38	<0.38	<0.38
CAN-105-3R-41	<0.38	<0.38	1 G@	<0.38	<0.38	<0.38	<0.76	<0.38	<1.9	<7.6	<7.6	<0.38	<0.38	<0.38
CAN-105-3R-DUP5 (3R-52.5)	<0.35	<0.35	1 @	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	0.57 G@	<0.35
CAN-105-3R-61	<0.35	<0.35	0.93 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	0.58 G@	<0.35
CAN-105-3S-21	<0.37	1.8 @	<0.74	<0.37	2.6 G	<0.37	<0.74	<0.37	<1.8	<7.4	160	<0.37	0.6 @	<0.37
CAN-105-3S-25	<0.38	<0.38	1 G@	<0.38	<0.38	<0.38	<0.76	<0.38	<1.9	<7.6	<7.6	<0.38	<0.38	<0.38
CAN-105-3S-36	<0.36	<0.36	0.94 G@	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	0.59 G@	<0.36
CAN-105-3S-43	<0.38	<0.38	1.3 @	<0.38	<0.38	<0.38	<0.77	<0.38	<1.9	<7.7	<7.7	<0.38	0.69 G@	<0.38
CAN-105-3S-51	<0.35	<0.35	0.9 G@	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	0.56 G@	<0.35
CAN-105-3T-20	<0.36	<0.36	0.94 @	<0.36	<0.36	<0.36	<0.72	2.6 G	<1.8	<7.2	<7.2	<0.36	6.4 G	<0.36
CAN-105-3T-28.5	<0.35	<0.35	<0.70	0.9 G@	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	5.5 G	<0.35
CAN-105-3T-31	<0.36	<0.36	<0.71	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	<0.36	0.81 @
CAN-105-3T-35	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	<0.36	0.69 @
CAN-105-3T-40	<0.36	<0.36	0.75 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	0.37 G@	<0.36	1.3 G@
CAN-105-3T-46	<0.35	<0.35	0.75 @	1.2 G@	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	<0.35	1.5 G@

Page 3 of 5

Source: Radian Corp., 1994

Table 52-1b
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 105

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg*													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3T-48	<0.35	<0.35	<0.69	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	3.8 G
CAN-105-3T-52	<0.39	<0.39	1.5 G@	<0.39	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	0.41 G@	<0.39	2.7 G
CAN-105-3T-56	<0.36	<0.36	2 G@	<0.36	<0.36	<0.36	<0.73	<0.36	<1.8	<7.3	<7.3	0.52 G@	5.5 G	4 G
CAN-105-3T-DUP13 (3T-60)	<0.35	<0.35	0.81 @	1.2 G@	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	0.49 G@	6.2 G	2 G
CAN-105-3T-60	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	<0.35	3.4 G
CAN-105-3U-20	1.3 G@	<0.37	1.2 @	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	0.61 G@	<0.37
CAN-105-3U-25	<0.36	<0.36	1.6 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	0.74 G@	<0.36
CAN-105-3U-DUP2 (3U-30)	<0.36	<0.36	1.6 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	0.7 G@	<0.36
CAN-105-3U-30	<0.38	<0.38	1.1 G@	<0.38	<0.38	<0.38	<0.75	<0.38	<1.9	<7.5	<7.5	<0.38	0.62 G@	<0.38
CAN-105-3U-32.5	<0.36	<0.36	1 G@	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	0.59 G@	<0.36
CAN-105-3U-35	<0.37	<0.37	<0.73	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	2.2 G	<0.37
CAN-105-3U-43.5	<0.39	<0.39	<0.77	<0.39	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	0.42 G@	<0.39	<0.39
CAN-105-3U-55	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	0.41 G@	<0.35	<0.35
CAN-105-3V-25.5	<0.37	<0.37	1 @	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	0.62 @	<0.37
CAN-105-3V-45	<0.36	<0.36	1.2 @	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	0.59 G@	<0.36
CAN-105-3V-52	<0.35	<0.35	1.1 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	0.65 @	<0.35

Page 4 of 5

Source: Radian Corp., 1994

Table 52-1b
Organochlorine Pesticides and PCBs Found in Soil Samples
SWMU 105

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg[a]													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3V-50	<0.35	<0.35	1.4 G@	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	0.74 G@	<0.35
CAN-105-3V-55	<0.35	<0.35	1.6 @	<0.35	<0.35	<0.35	<0.69	<0.35	<1.8	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3V-61	1.6 G@	<0.34	1.2 @	<0.34	<0.34	<0.34	<0.69	<0.34	<1.7	<6.9	<6.9	<0.34	0.62 G@	<0.34
CAN-105-3VV-30	<0.35	8.4	7.6	0.41 G@	<0.35	6.1 G	<0.70	<0.35	4.2 G@	<7.0	<7.0	9.1 G	1 @	0.68 @
CAN-105-3VV-35	1.5 G@	0.54 G@	1.4 @	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	0.61 @	<0.35
CAN-105-3VV-41	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.35	<1.8	<7.0	<7.0	<0.35	0.7 G@	<0.35

[a] - Heptachlor and alpha-BHC were not detected above the reporting level in the field samples, and are therefore not included in this table. These compounds were included in the risk assessment based on J-flagged data.

@ - Reported value is within a factor of five of the detection limit.

G - Second column confirmation denotes the presence of this compound but the result is estimated due to matrix interferences.

Page 5 of 5

Source: Radian Corp., 1994

Table 52-1c
TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples
SWMU 105

Sample ID	TRPH (9071/418.1) mg/kg	Diesel (8015ME) mg/kg	Volatile Organic Compounds (8240), mg/kg							SVOCs (8270), mg/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene chloride	Tetra hydrofuran *	Toluene	Xylenes	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Trichloropropene(s) **
CAN-105-3J-21	31 B@	5300 GB@	<110		240	<5.4		<5.4	<5.4	<360		
CAN-105-3J-25.5	31 B@		<110		87	<5.5		29	<5.5	<370	220	
CAN-105-3J-DUP11 (3J-30)	46 B@		<110		82	5.8 @		10 @	<5.5	<370		
CAN-105-3J-30	<27		<110		150	5.6 @		<5.5	<5.5	<370		
CAN-105-3J-35	33 B@	4400 GB@	<100		110	<5.2		<5.2	<5.2	<350		
CAN-105-3J-40	27 B@	5800 GB@	240 @		180	5.3 @		<5.2	<5.2	<350		
CAN-105-3J-45	<26		<100		220	<5.2		<5.2	<5.2	<350		
CAN-105-3J-50	31 B@		<110		81	<5.4		<5.4	<5.4	<360		
CAN-105-3J-52.5	<26		<100		71	<5.2		<5.2	<5.2	<350		
CAN-105-3J-55	<26		<100		60	<5.2		<5.2	<5.2	<350		
CAN-105-3J-61	<26		<100		170	<5.1		<5.1	<5.1	<340		
CAN-105-3K-20	50 B@		<110		6.4	<5.4		<5.4	<5.4	<360	360	
CAN-105-3K-22.5	38 B@	3700 GB@	<110		28	<5.7		<5.7	<5.7	<380	150	230
CAN-105-3K-25	<28	2900 GB@	<110		64	<5.7		<5.7	<5.7	<380	260	150
CAN-105-3K-30	53 B@		<110		73	<5.4		<5.4	<5.4	<360	180	1400
CAN-105-3K-36	30 @		<110		120	<5.3		<5.3	<5.3	<350	240	1970
CAN-105-3K-DUP10 (3K-40)	<26	3300 GB@	<110		82	<5.3		<5.3	<5.3	<350	770	170
CAN-105-3K-40	<26	3100 GB@	<110		73	<5.3		<5.3	<5.3	<350	240	2840
CAN-105-3K-45	36 B@	4100 GB@	<110		160	<5.3		<5.3	<5.3	300	280	1400
CAN-105-3K-51	36 B@		<110		54	<5.4		<5.4	<5.4	<360		
CAN-105-3K-56	38 B@		<100		140	<5.2		<5.2	<5.2	<350		
CAN-105-3K-59	27 B@		<100		77	<5.2		<5.2	<5.2	<340		

Page 1 of 7

Source: Radian Corp., 1994

Table 52-1c
TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples
SWMU 105

Sample ID	TRPH (8077/418.1) mg/kg	Diesel (8015MOD) mg/kg	Volatile Organic Compounds (8240), ug/kg							SVOCs (8270), ug/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene chloride	Tetra-hydrofuran *	Toluene	Xylene	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Trichloropropane) *
CAN-105-3K-61	<26		<100		14	<5.2		<5.2	<5.2	<350	280	2170
CAN-105-3L-21	34 @	3300 GB@	<110		110	<5.5		<5.5	<5.5	<370	150	
CAN-105-3L-23.5	35 @		<110		92	<5.6		<5.6	<5.6	<370		
CAN-105-3L-25	39 @	6300 GB@	<120		180	<5.8		<5.8	<5.8	<390	150	
CAN-105-3L-30	<28		<110		260	<5.6		<5.6	<5.6	<370	190	
CAN-105-3L-DUP9 (3L-38)	41 @		<110		190	<5.3		<5.3	<5.3	<360		
CAN-105-3L-38	31 @		<110		99	<5.4		<5.4	<5.4	<360		
CAN-105-3L-41	34 @	<2700	<110		180	<5.4		<5.4	<5.4	<360	220	
CAN-105-3L-43	28 @		<110		300	<5.4		<5.4	<5.4	<360		570
CAN-105-3L-48.5	34 @		<110		330	<5.4		<5.4	<5.4	<360	140	690
CAN-105-3L-52.5	61 @		<110		180	<5.3		<5.3	<5.3	<350		
CAN-105-3L-56	43 B@		<100		140	<5.2		<5.2	<5.2	<340	210	170
CAN-105-3L-61	38 B@		<100		190	<5.2		<5.2	<5.2	<350	280	2170
CAN-105-3M-23.5	<27		<110		190	7.3 B@		<5.4	<5.4	<360		
CAN-105-3M-40	33 @		<100		180	<5.2		<5.2	<5.2	<350		
CAN-105-3M-50	31 @		<110		110	<5.4		11@	<5.4	530B@		140
CAN-105-3M-52.5	39 @		<110		240	<5.3		<5.3	<5.3	<360		
CAN-105-3M-56	45 @		<100		230	<5.1		<5.1	<5.1	<340		
CAN-105-3M-61	54 @		<100		190	<5.2		<5.2	<5.2	<350		140
CAN-105-3M-SFC			<100			<5.1		63	<5.1	<340	200	
CAN-105-3MM-21	<27	8000 GB@	<110			<5.4		<5.4	<5.4	<360		
CAN-105-3MM-25	<27		<110			7.2 B@		<5.5	<5.5	<360	180	
CAN-105-3MM-30.5	<27		<110		24	<5.5		<5.5	<5.5	<360	140	
CAN-105-3MM-35	<27	8600 GB@	<110		130	<5.4		23@	<5.4	<360		

Page 2 of 7

Source: Radian Corp., 1994

Table 52-1c
TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples
SWMU 105

Sample ID	TRPH (9071/418.1) mg/kg	Diesel (8015MD), mg/kg	Volatile Organic Compounds (8240), ug/kg							SVOCs (8270), ug/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene chloride	Tetra-hydrofuran *	Toluene	Xylenes	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Trichloropropane(?) *
CAN-105-3MM-37.5	<26		<110		99	<5.3		<5.3	<5.3	<350		
CAN-105-3MM-DUP 8 (3M-37.5)	<26		<110		130	<5.3		<5.3	<5.3	<350		
CAN-105-3N-27	<26		<110		78	<5.3		<5.3	<5.3	<350	140	
CAN-105-3N-30	<27	6100 GB@	<110		160	<5.4		<5.4	<5.4	<360	250	
CAN-105-3N-36	<26		<100		89	5.5 B@		<5.2	<5.2	<350	240	240
CAN-105-3N-SFC			<100			<5.1		26	<5.1	<340	170	
CAN-105-3NN-20	<27		<110		54	<5.4		<5.4	<5.4	<360		250
CAN-105-3NN-41	<27		<110		180	<5.4		<5.4	<5.4	<360		280
CAN-105-3NN-DUP1 4 (3NN-45)	<27	5500 GB@	<110		92	<5.5		6.2@	<5.5	<370	150	150
CAN-105-3NN-45	<27	7100 GB@	<110		200	<5.5		40	<5.5	<370		
CAN-105-3NN-50	<26	5600 GB@	<100			<5.3		<5.3	<5.3	<360		430
CAN-105-3NN-53	<26		<110		370	<5.3		<5.3	<5.3	<350	180	320
CAN-105-3NN-55	<26		<110		250	<5.3		<5.3	<5.3	<350	170	
CAN-105-3NN-61	<26		<110		33	<5.2		<5.2	<5.2	<350		
CAN-105-3P-21	35 B@		<110		41	<5.4		<5.4	<5.4	<360	140	
CAN-105-3P-26	43 B@		<110			5.5 B@		<5.5	<5.5	<370		
CAN-105-3P-31	<26	6300 GB@	<110		31	<5.4		<5.4	<5.4	<360	180	
CAN-105-3P-36	<26		<100		130	<5.2		<5.2	<5.2	<350		
CAN-105-3P-40	29 B@		<110		110	<5.3		<5.3	<5.3	<360		
CAN-105-3P-45	<26		<110		60	<5.3		<5.3	<5.3	<350	170	
CAN-105-3P-51	<25	5200 GB@	<100		84	<5.2		<5.2	<5.2	<350		
CAN-105-3P-53	<25		<100		31	<5.1		<5.1	<5.1	<340	240	
CAN-105-3P-56	<26		<100		7.2	<5.2		<5.2	<5.2	<340	240	

Page 3 of 7

Source: Radian Corp., 1994

Table 52-1c
TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples
SWMU 105

Sample ID	TRPH (9071/418.1) mg/kg	Diesel (8015M(E)) mg/kg	Volatile Organic Compounds (8240), ug/kg							SVOCs (8270) ug/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene chloride	Tetra. hydrofuran *	Toluene	Xylenes	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Trichlorophenol(s) *
LAN-105-3P-DUP7 (3P-56)	<25	<100				<5.2		<5.2	<5.2	<340		410
CAN-105-3P-61	26 B@	<5200	<100		43	<5.1		<5.1	<5.1	<340	200	
CAN-105-3Q-21	<27	5900 G@	<110		21	36 B		<5.3	<5.3	<360	320	
CAN-105-3Q-26	41 B@		<120		88	15 B@		<5.8	<5.8	430@		
CAN-105-3Q-30	32 B@		<130		84	19 B@		<6.4	<6.4	<430	260	
CAN-105-3Q-36	<26		<100		8.4	<5.2		<5.2	<5.2	<350		
CAN-105-3Q-41	34 B@		<100			<5.2		<5.2	<5.2	<350		
CAN-105-3Q-46	<27	8800 GB@	<110		91	<5.4		<5.4	<5.4	<360		
CAN-105-3Q-DUP6 (3Q-51)	<27		<110		84	<5.3		<5.3	<5.3	<350	180	
CAN-105-3Q-51	<27		<100		32	<5.3		<5.3	<5.3	<360	180	390
CAN-105-3Q-53.5	<27		<110		9.4	<5.2		<5.2	<5.2	<350	140	
CAN-105-3Q-55	<26	7300 GB@	<100		87	<5.2		<5.2	<5.2	<350		
CAN-105-3Q-60	<26		<100		57	<5.2		<5.2	<5.2	<350		
CAN-105-3Q-SFC			<100			22 B@		<5.2	<5.2	<350	240	
CAN-105-3R-21	<27		<110			<5.4		<5.4	<5.4	<360	220	
CAN-105-3R-25	<27	17000 G@	<110			<5.4		<5.4	<5.4	<360		
CAN-105-3R-31	<27		<110	4.9		<5.3		<5.3	<5.3	<360		
CAN-105-3R-35	<28		<110			<5.7		<5.7	<5.7	<380	190	260
CAN-105-3R-41	<28	10000 G@	<110	5.2		<5.7		<5.7	<5.7	<380		
CAN-105-3R-45	<27		<120	6.2		10 B@		<6.1	<6.1	<410		
CAN-105-3R-51	<26		<100			<5.2		<5.2	<5.2	<350	170	
CAN-105-3R-DUP5 (3R-52.5)	<26	11000 G@	<100			<5.2		<5.2	<5.2	<350		
CAN-105-3R-52.5	<25	8300 G@	<100	2.9		<5.2		<5.2	<5.2	<340	440	270

Page 4 of 7

Source: Radian Corp., 1994

Table 52-1c
TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples
SWMU 105

Sample ID	TRPH (9071/418.1) mg/kg	Diesel (8015M(E)) mg/kg	Volatile Organic Compounds (8240), mg/kg							SVOCs (8270), mg/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene chloride	Tetra-hydrofuran *	Toluene	Xylene	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Thiophenol *
CAN-105-3R-56	<26		<100			<5.2		<5.2	<5.2	400@		
CAN-105-3R-61	<26		<100			37 B		<5.2	<5.2	<350		
CAN-105-3S-21	320		<110			<5.5		<5.5	<5.5	680@		
CAN-105-3S-25	<28		<110			5.9 B@	5.7	<5.7	<5.7	<380		
CAN-105-3S-DUP4 (3S-31)	<26		<110			<5.3		<5.3	<5.3	<350	320	
CAN-105-3S-31	<26		<110			<5.3		<5.3	<5.3	<350	210	
CAN-105-3S-36	<26		<110	21		<5.3		<5.3	<5.3	<360	280	
CAN-105-3S-40	<26	6400 G@	<110	480		5.5 B@	11	<5.3	<5.3	<350		
CAN-105-3S-43	<29		<110	16		15 B@	5.7	<5.7	<5.7	<380	270	
CAN-105-3S-45	<27	5500 G@	<110	20		13 B@		<5.4	<5.4	<360	220	
CAN-105-3S-51	<26		<100			<5.2		<5.2	<5.2	<350	340	
CAN-105-3S-55	<26	6800 G@	<100			<5.2		<5.2	<5.2	<350	310	
CAN-105-3S-60	<26		<100	6.4		<5.2		<5.2	<5.2	<340	340	
CAN-105-3T-20	<27	4100 GB@	<110		320	<5.4		<5.4	<5.4	<360		
CAN-105-3T-DUP12 (3T-25)	<27	4700 GB@	<110		110	<5.4		<5.4	<5.4	<360		
CAN-105-3T-25	<27	4100 GB@	<110		130	<5.4		<5.4	<5.4	<360		
CAN-105-3T-28.5	<26		<110		260	<5.3		<5.3	<5.3	<350	210	
CAN-105-3T-31	<27		<110			<5.4		<5.4	<5.4	<360		210
CAN-105-3T-35	<27		230@			<5.4		<5.4	<5.4	<360		
CAN-105-3T-40	<27		<110			<5.4		17@	<5.4	<360	140	320
CAN-105-3T-46	<26	6600 GB@	<110			<5.3		19@	<5.3	<350		420
CAN-105-3T-48	<26		<100			<5.2		9.2@	<5.2	<350		350
CAN-105-3T-52	<29		<120		75	<5.8		<5.8	<5.8	<390		270

Page 5 of 7

Source: Radian Corp., 1994

Table 52-1c
TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples
SWMU 105

Sample ID	TRPH (8071/418.1) mg/kg	Diesel (8015MEI) mg/kg	Volatile Organic Compounds (8240), ug/kg							SVOCs (8270), ug/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene chloride	Tetra-hydrofuran *	Toluene	Xylenes	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Tris(dichloropropyl)*
CAN-105-3T-56	<27		<110			<5.4		7.6@	<5.4	<360		
CAN-105-3T-DUP13 (3T-60)	<26		<100			<5.2		<5.2	<5.2	<350		
CAN-105-3T-60	<26		<100			<5.2		8.5@	<5.2	<350		
CAN-105-3U-20	<27	5900 G@	<110		8.8	5.9 B@	14	<5.5	<5.5	<370	330	
CAN-105-3U-25	<27		<110		13	<5.4	15	<5.4	<5.4	<360	180	
CAN-105-3U-30	<28		<110		6.8	<5.7	7.9	<5.7	<5.7	<380	190	
CAN-105-3U-DUP2 (3U-30)	<26		<110		16	<5.4	8.6	<5.4	<5.4	<360	220	900
CAN-105-3U-32.5	<27		<110		20	<5.4	9.8	<5.4	<5.4	510 B@	250	760
CAN-105-3U-33.5	<27		<110		20	<5.5	6.5	<5.5	<5.5	<360	220	
CAN-105-3U-35	<27	7800 G@	<110			<5.5		<5.5	32	<370	400	
CAN-105-3U-41	<27		<110			<5.4		<5.4	<5.4	<360	180	540
CAN-105-3U-43.5	<29	8900 G@	<120			6.5 B@	13	<5.8	<5.8	<390		580
CAN-105-3U-46	<30		<120	640		8.6 B@	11	<6.0	<6.0	<400	240	
CAN-105-3U-51	<27		<110	33		5.5 B@	5.5	<5.5	<5.5	<360	510	
CAN-105-3U-55	<26		<100			<5.2		<5.2	<5.2	<350	280	
CAN-105-3U-DUP3 (3U-55)	<26		<100			<5.2		<5.2	<5.2	<350	350	
CAN-105-3U-61	<26		<100			<5.1		<5.1	<5.1	<340	270	
CAN-105-3V-20.5	<27	8200 GB@	<110		19	<5.6	28	<5.6	<5.6	<370	330	
CAN-105-3V-25.5	<27		<110		79	<5.5	23	<5.5	<5.5	<370	220	890
CAN-105-3V-45	<26		<110		67	<5.3	16	<5.3	<5.3	<360	210	
CAN-105-3V-52	<26	7200 GB@	<110		51	5.4 B@	14	<5.3	<5.3	<350	320	
CAN-105-3V-50	<27	8900 GB@	<110		68	<5.3	14	<5.3	<5.3	<360	1000	
CAN-105-3V-55	<26		<100		23	<5.2	14	<5.2	<5.2	390 B@	240	

Page 6 of 7

Source: Radian Corp., 1994

Table 52-1c

TRPH, Diesel, VOCs, and SVOCs Concentrations Found in Soil Samples

SWMU 105

Sample ID	TRPH (9071/418.1) mg/kg	Diesel (8015MD) mg/kg	Volatile Organic Compounds (8240), ug/kg							SVOCs (8270), ug/kg		
			Acetone	Acetonitrile *	Ethyl acetate *	Methylene Chloride	Tetra-hydrofuran *	Toluene	Xylenes	bis(2-Ethylhexyl) phthalate	Cyclohexanone *	Trichloropropane(s) *
CAN-105-3V-61	<26	<5200	<100		13	<5.2	16	<5.2	<5.2	<340	210	
CAN-105-3VV-30	72@		<110			5.7 B@	24	<5.3	<5.3	<350		250
CAN-105-3VV-35	<26		<110			<5.3	21	<5.3	<5.3	<350	210	
CAN-105-3VV-41	<26		<110		83	<5.3	32	<5.3	<5.3	<350	490	210

* - Compound is a tentatively identified compound (TIC).
@ - Reported value is within a factor of five of the detection limit.
B - Presence may be due to laboratory contamination. Flag indicates that the analyte was found in the associated blanks. The sample results were not corrected for the concentration in the blank.
Cl - Result does not match the characteristic diesel pattern but elutes in the retention time window, so is quantitated as diesel

Note: Blank space indicates that the sample was not analyzed for TRPH or diesel, or that the listed compound is a TIC and was not found in all the samples. TIC results are semi-quantitative, therefore a reporting limit is not available.

The remaining target organic compounds were not detected above the reporting levels in these field samples and are therefore not included in this table. J-flagged data was also used to evaluate the chemicals of concern for the risk assessment.

Page 7 of 7

Source: Radian Corp., 1994

Table 52-2a
Summary of Compounds Detected in Groundwater Samples
SWMU 105

LOCATOR	CAN105-MW00-01		
LAB SAMPLE NUMBER	0401990001SA		
COLLECT DATE	01/16/95		
	Result	RL	Qual
Volatile Organics (µg/L)			
Carbon tetrachloride	1.6	5	J
Toluene	6.8	5	
Semivolatile Organics (µg/L)			
bis(2-Ethylhexyl)phthalate	2	10	J
Metals (mg/L)			
Arsenic	0.002	0.005	J
Barium	0.064	0.01	
Selenium	0.003	0.005	J
Vanadium	0.018	0.01	
TPH (µg/L)			
Gasoline-Range Organics	16	10	

Source: Woodward-Clyde, 1995

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data re
J = Estimated value.
R = Rejected value.
U = Nondetected value.
D = Sample was diluted for analysis.
RL = Reporting Limit.

Table 52-2b
Comparison of Compounds Detected in Groundwater Samples to MCLs
SWMU 105

LOCATION	Landfill 4 SWMU 104 CAN104-MW0N-01			Landfill 4 SWMU 104 CAN104-MW0N-02			Landfill 3 SWMU 105 CAN105-MW00-01			MCLs (µg/L)	Are MCLS Exceeded
LAB SAMPLE NUMBER	0401810001SA			0401810002SA			0401990001SA				
COLLECT DATE	01/15/95			01/15/95			01/16/95				
	Result	RL	Qua	Result	RL	Qual	Result	RL	Qual		
Volatile Organics (µg/L)											
Acetone	25	10		22	10		<	10	U	NA	NA
Carbon tetrachloride	<	5	U	<	5	U	1.6	5	J	5	NO
Methylene chloride	2.1	5	J	1.7	5	J	<	5	U	5	NO
Toluene	5.7	5		6.4	5		6.8	5		1000	NO
Semivolatile Organics (µg/L)											
Acetophenone	2.7	10	J	2.9	10	J	<	10	U	NA	NO
bis(2-Ethylhexyl)phthalate	51	10		59	10		2	10	J	6	YES
Metals (mg/L)											
Arsenic	0.0033	0.01	J	0.0034	0.01	J	0.0022	0.005	J	50	NO
Barium	0.047	0.01		0.049	0.01		0.064	0.01		2000	NO
Copper	0.0059	0.02	J	0.0056	0.02	J	<	0.02	U	1300	NO
Selenium	0.0068	0.01	J	0.0054	0.01	J	0.0025	0.005	J	50	NO
Tin	0.32	0.1		<	0.1	U	<	0.1	U	NA	NA
Vanadium	0.019	0.01		0.021	0.01		0.018	0.01		NA	NA
Zinc	0.013	0.02	J	0.015	0.02	J	<	0.02	U	NA	NA
TPH (µg/L)											
Gasoline Range Organics	17	10	J	14	10	J	16	10		NA	NA

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed
J = Estimated value.
R = Rejected value.
U = Nondetected value.
A=Action Level
D = Sample was diluted for analysis.
RL = Reporting Limit.
NA = Not Applicable

Source: Woodward-Clyde, 1995

Table 53-1a
Analytical Results of Soil Samples Collected by Radian
SWMU 106

Sample Number	Sample Depth (Ft-BGS)	Oil and Grease (mg/kg)	Lead (mg/kg)	Purgeable Organic Compounds (EPA 8010/8020) (μg/kg)
7-1	1.0-2.5	1000	3.1	ND
7-2	5.0-6.0	3400	3.9	ND
7-3	57.4-58.0	8600 (80)	3.9	NA

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
μg/kg = Micrograms per kilogram
( ) = Re-analysis using infrared methods
ND = Not detected
NA = Not analyzed, sample discarded

Source: Final Report, IRP Phase II (Radian 1986)

Source: Woodward-Clyde, 1992

Table 53-1b
Chromium and Lead Concentrations in Soil Samples
SWMU 106

Sample	Sample Depth (Ft-BGS)	Chromium[1] (mg/kg)	Lead[2] (mg/kg)
1061	0 - 0.5	19.2	31.4
	4	5.6	4.5
	10	11.4	7.4
	20	4.3	2.6
	30	6.2	3.2
1062	0 - 0.5	11.4	11.1J
	6	3.4	3.0
	10	6.3	5.8
	20	2.9	1.0
	30	3.6	2.4
1063	0 - 0.5	8.9	41.0
	4	4.0	3.8
	10	10.9	8.8
	20	6.4	3.2
	30	4.7	1.8
1064	0 - 0.5	9.8	10.3
	4	6.7	3.5
	10	8.1	5.8
	20	4.6	2.4
	30	7.6	3.9

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
J = Estimated value

1 Background range for chromium is 2.67 to 9.31 mg/kg
2 Background range for lead is 1.76 to 8.64 mg/kg

Source: Woodward-Clyde, 1992

Table 53-1c
TPH Concentrations in Soil Samples
SWMU 106

Boring Number (Redrill Boring Number)	Sample Depth (Ft-BGS)	TPH (mg/kg)
1061	0-0.5	102
(1065)	4-6	45.1U
	10-12	47U
	20-22	44.5U
	30-32	45.4U
1062	0-0.5	177
	6-8	45.6U
	10-12	45.6U
	20-22	44.9U
	30-32	44.4U
1063	0-0.5	232
(1066)	4-6	44.1U
	10-12	45.4U
	20-22	42.9U
	30-32	44.2U
1064	0-0.5	49.6
	4-6	45.6U
	10-12	44.1U
	20-22	44U
	30-32	44.2U

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
U = Not detected at the reporting limit

Source: Woodward-Clyde, 1992

Table 53-2a
Selection of COCs
SWMU 106

Media	Soils
Chemicals Detected	Chromium (Cr), lead (Pb), benzene, toluene, acetone, methylene chloride, trichloroethylene (TCE), total xylenes, MEK, 2-hexanone, ethylbenzene
Chemicals Discarded:	Acetone, methylene chloride, MEK, 2-hexanone, (lab contaminants)
Chemicals of Concern:	Cr, Pb, benzene, toluene, TCE, xylene, ethylbenzene
Exceeded RFI Criteria:	None
Exposure Scenario:	For fire training areas - intrusive action > ½ acre (worker/residents soil ingestion, dermal contact and inhalation of VOCs and particulates plus potential groundwater ingestion)
	Landfill - None, landfill has been capped. Groundwater monitoring (ongoing). No direct contact.

Source: Woodward-Clyde, 1992

Table 53-2b

Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater

SWMU 106

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 53-2b
Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 106

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 54-1a
Analytical Results of Soil Samples Collected by Radian
SWMU 107

Sample Number	Sample Depth (Ft-BGS)	Oil and Grease (mg/kg)	Lead (mg/kg)	Purgeable Organic Compounds (EPA 8010/8020) (μg/kg)
8-1	1.5-2.0	1700	3.7	ND
8-2	7.5-9.5	3800	2.9	ND
8-3	59.8-61.5	2600	1.7	ND

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
μg/kg = Micrograms per kilogram
ND = Not detected

Source: Woodward-Clyde, 1992

Table 54-1b
TPH and BTEX Concentrations in Soil Samples
SWMU 107

Boring Number (Redrill Boring Number)	Sample Depth (Ft-BGS)	TPH (mg/kg)	Ethyl Benzene (ug/kg)	Xylene (ug/kg)	Benzene (ug/kg)	Toluene (ug/kg)
1071	0-0.5	2870	52U	52U	1100U	1100U
	5-7	74.2	11U	11U	11U	11U
	10-12	43.8U	11U	11U	11U	11U
	20-22	44.6U	11U	11U	11U	11U
	30-32	43.5U	11U	11U	11U	11U
1072	0-0.5	963	54U	54U	54U	54UJ
	4-6	46.4U	11U	11U	11U	11U
	10-12	44.1U	11U	11U	11U	11U
	20-22	43.5U	54U	54U	54U	54U
	30-32	43U	27U	27U	27U	27U
1073	0-0.5	6080	53U	53U	53U	73J
(1076)	4-6	46.3U	(11U)	(11U)	(11U)	(11U)
	10-12	43.7U	11U	11U	11U	11U
	20-22	44.6U	11U	11U	11U	11U
	30-32	43.9U	(27U)	(27U)	(27U)	(27U)
1074	0-0.5	3610	55U	55U	55U	55UJ
(1075)	4-6	18300	13000J	94000	29000U	6900J
	10-12	9220	(15000J)	(87000)	(36000U)	(36000U)
	20-22	11500	5800	28000	2700U	2700J
	30-32	4710	14000U	4900J	14000U	14000U
	45-47	41.9	11U	11U	11U	11U
	50-52	43U	(11U)	(11U)	(11U)	(11U)
	60-62	41.9U	11U	11U	11U	4J

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram
U = Not detected
J = Estimated value
UJ = Estimate as non-detect at the CRQL
( ) = The values in parentheses are results from samples collected from the redrill borings due to laboratory missed holding times.

Source: Woodward-Clyde, 1992

Table 54-1c
Chromium and Lead Concentrations in Soil Samples
SWMU 107

Boring Number	Sample Depth (Ft-BGS)	Chromium[1] (mg/kg)	Lead[2] (mg/kg)
1071	0 - 0.5	5.1	151
	5	5.7	3.3
	10	7.7	4.8
	20	5.6	2.1
	30	6.4	3.8
1072	0 - 0.5	3.5	6.4 J
	4	3.3	2.1
	10	5.0	5.3
	20	4.9	2.7
	30	10.3	1.6
1073	0 - 0.5	3.2	8.7
	4	6.1	2.9
	10	8.2	4.8
	20	7.3	4.1
	30	4.8	1.9
1074	0 - 0.5	11.1	322
	4	5.7	10.4
	10	5.2	5.8
	20	7.3	3.7
	30	8.3	3.6
	45	4.4	1.8
	50	5.2	1.5
	60	2.7	0.73

Ft-BGS = Feet below ground surface
mg/kg = Milligrams per kilogram
J = Estimated value
[1] Background range for chromium is 2.67 to 9.31 mg/kg
[2] Background range for lead is 1.76 to 8.64 mg/kg

Source: Woodward-Clyde, 1992

Table 54-2a
Selection of COCs
SWMU 107

Media	Soils
Chemicals Detected	Chromium (Cr), lead (Pb), benzene, toluene, acetone, methylene chloride, trichloroethylene (TCE), total xylenes, MEK, 2-hexanone, ethylbenzene
Chemicals Discarded:	Acetone, methylene chloride, MEK, 2-hexanone, (lab contaminants)
Chemicals of Concern:	Cr, Pb, benzene, toluene, TCE, xylene, ethylbenzene
Exceeded RFI Criteria:	None
Exposure Scenario:	For fire training areas - intrusive action > ½ acre (worker/residents soil ingestion, dermal contact and inhalation of VOCs and particulates plus potential groundwater ingestion)
	Landfill - None, landfill has been capped. Groundwater monitoring (ongoing). No direct contact.

Source: Woodward-Clyde, 1992

Table 54-2b
Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 107

	Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Volatiles:	1,1,1-Trichloroethane	9.0E-02	7200	7200	0.2*	0.2*
	2-Butanone (MEK)	5.0E-02	4000	4000	1.75	1.75
	Acetone	1.0E-01	8000	8000	3.5	3.5
	Bromoform	2.0E-02	1600	1600	0.1*,(1)	0.1*,(1)
	Carbon Disulfide	1.0E-01	8000	8000	3.5	3.5
	Chloroform	1.0E-02	800	800	7	7
	Dibromomethane	1.0E-02	800	800	0.35	0.35
	Ethylbenzene	1.0E-01	8000	8000	0.7*,(2)	0.7*,(2)
	Toluene	2.0E-01	16000	16000	1*	1*
	Xylenes (total)	2.0E+00	160000	160000	10*,(2)	10*,(2)
Semi-Volatiles:	3-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	4-Methylphenol	5.0E-02	4000	4000	1.75	1.75
	2,4,5-Trichlorophenol	1.0E-01	8000	8000	3.5	3.5
	4-Chloroaniline	4.0E-03	320	320	0.14	0.14
	Anthracene	3.0E-01	24000	24000	10.5	10.5
	Butyl benzyl phthalate	2.0E-01	16000	16000	7	7
	Di-n-butylphthalate	1.0E-01	8000	8000	3.5	3.5
	Fluoranthene	4.0E-02	3200	3200	1.4	1.4
	Naphthalene	4.0E-03	320	320	0.14	0.14
	Phenol	6.0E-01	48000	48000	21	21
	Pyrene	3.0E-02	2400	2400	1.05	1.05
Pesticides:	Methoxychlor	5.0E-03	400	400	0.04*	0.04*
Metals:	Antimony	4.0E-04	32	32	0.014	0.014
	Barium	7.0E-02	5600	5600	2*	2*

Page 1 of 2

Source: Woodward-Clyde, 1992

Table 54-2b
Proposed Corrective Action Levels and RFI Criteria for Non-Carcinogens Detected at Cannon AFB – Soil and Groundwater
SWMU 107

Chemicals	Chronic Oral RfD (mg/kg/day)	Soil RCRA Action Level (mg/kg)	Soil RFI Criterion (mg/kg)	Groundwater RCRA Action Level (mg/L)	Groundwater RFI Criterion (mg/L)
Cadmium, food	1.0E-03	80	80		
Cadmium, water	5.0E-04			0.005*,(2)	0.005*,(2)
Chromium III	1.0E+00	80000	80000	35	35
Chromium VI	5.0E-03	400	400	0.175	0.175
Chromium, total				0.1*,(2)	0.1*,(2)
Copper	3.7E-02	2960	2960	1.3**	1.3**
Lead				0.015**	0.015**
Manganese	1.0E-01	8000	8000	3.5	3.5
Mercury	3.0E-04	24	24	0.002*	0.002*
Nickel	2.0E-02	1600	1600	0.7	0.7
Selenium	5.0E-03	400	400	0.05*,(2)	0.05*,(2)
Silver	5.0E-03	400	400	0.175	0.175
Thallium	7.0E-05	5.6	5.6	0.00245	0.00245
Vanadium	7.0E-03	560	560	0.245	0.245
Zinc	2.0E-01	16000	16000	7	7

* = final MCL
** = SDWA action level
(1) = MCL for total trihalomethanes
(2) = effective July 30, 1992

Page 2 of 2

Source: Woodward-Clyde, 1992

Table 58-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 127

LOCATOR	CAN127-1271-0000			CAN127-1271-0002			CAN127-1272-0000			CAN127-1272-0002			CAN127-1273-0000			CAN127-1273-0002		
LAB SAMPLE NUMBER	0313740003SA			0313740004SA			0313740007SA			0313740008SA			0312160001SA			0312160002SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/23/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.8	U	<	5.8	U	<	5.8	U	<	6	U	<	5.2	U	<	5.5	U
1,2-Dichloropropane	<	5.8	U	<	5.8	U	<	5.8	U	<	6	U	<	5.2	U	<	5.5	U
Toluene	<	5.8	U	<	5.8	U	<	5.8	U	<	6	U	12	5.2		<	5.5	U
Xylenes (total)	<	5.8	U	<	5.8	U	<	5.8	U	<	6	U	3.4	5.2	J	<	5.5	U
Semivolatile Organics (ug/kg)																		
Acenaphthene	<	380	U				<	380	U	<	400	U	<	350	U			
Anthracene	<	380	U				<	380	U	<	400	U	48	350	J			
Benzo(a)anthracene	<	380	U				<	380	U	<	400	U	510	350				
Benzo(a)pyrene	<	380	U				<	380	U	<	400	U	550	350				
Benzo(b)fluoranthene	<	380	U				<	380	U	<	400	U	960	350				
Benzo(g,h,i)perylene	<	380	U				<	380	U	<	400	U	470	350				
Carbazole	<	380	U				<	380	U	<	400	U	46	350	J			
Chrysene	<	380	U				<	380	U	<	400	U	720	350				
Fluoranthene	<	380	U				<	380	U	<	400	U	1500	350				
Fluorene	<	380	U				<	380	U	<	400	U	<	350	U			
Indeno(1,2,3-cd)pyrene	<	380	U				<	380	U	<	400	U	390	350				
2-Methylnaphthalene	<	380	U				<	380	U	<	400	U	<	350	U			
Phenanthrene	<	380	U				<	380	U	<	400	U	570	350				
Pyrene	<	380	U				<	380	U	<	400	U	1400	350				
Metals (mg/kg)																		
Aluminum	9270	11.5		3830	23.1		7220	11.6		3110	60.5		7650	10.5		11600	10.9	
Antimony	<	6.9	U	<	13.8	U	<	6.9	U	<	36.3	U	<	6.3	U	<	6.5	U
Arsenic	2	0.58		2.1	0.58		1.9	0.58		1.6	0.6		2.2	0.52		2.4	0.55	
Barium	91.7	1.2		971	2.3		91.9	1.2		206	6		115	1		99	1.1	
Beryllium	0.67	0.23		0.33	0.46	J	0.53	0.23		<	1.2	U	0.46	0.21		0.7	0.22	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 6

Source: Woodward-Clyde, 1994

Table 58-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 127

LOCATOR	CAN127-1271-0000			CAN127-1271-0002			CAN127-1272-0000			CAN127-1272-0002			CAN127-1273-0000			CAN127-1273-0002		
LAB SAMPLE NUMBER	0313740003SA			0313740004SA			0313740007SA			0313740008SA			0312160001SA			0312160002SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/23/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Cadmium	<	0.58	UJ	3	1.2		1.1	0.58		4.2	3		<	0.52	U	<	0.55	U
Calcium	19200	23.1	J	191000	46.1		56900	23.1		247000	121		10300	20.9		14000	21.8	
Chromium	9.9	1.2		4.5	2.3		7.3	1.2		7	6		16.9	1		10.3	1.1	
Cobalt	4.5	1.2		2.5	2.3		3.7	1.2		<	6	U	3.4	1		4.8	1.1	
Copper	8.9	2.3		2.8	4.6	J	7.3	2.3		2.6	12.1	J	6.8	2.1		7.9	2.2	
Iron	8610	11.5		3350	23.1		6380	11.6		2760	60.5		7770	10.5		10500	10.9	
Lead	7.3	0.58		2.7	2.9	J	4.4	2.9		1.6	6	J	30.8	10.5		8	1.1	
Magnesium	2030	23.1		2690	46.1		1890	23.1		2930	121		1570	20.9		2360	21.8	
Manganese	179	1.2		46.9	2.3		138	1.2		37.4	6		166	1		206	1.1	
Mercury	<	0.12	U	<	0.12	U	<	0.12	U	<	0.12	U	<	0.1	U	<	0.11	U
Nickel	10.4	4.6		5.8	9.2	J	8	4.6		5.1	24.2	J	7	4.2		11.4	4.4	
Potassium	1680	577		744	1150	J	1410	579		468	3020	J	1910	523		2400	545	
Selenium	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ	<	0.52	UJ	<	1.1	UJ
Silver	0.69	1.2	J	1.1	2.3	J	0.68	1.2	J	3.6	6	J	<	1	U	<	1.1	U
Thallium	<	2.3	U	<	1.2	UJ	<	1.2	UJ	<	1.2	UJ	<	0.52	U	0.13	0.55	J
Vanadium	17.9	1.2		14.8	2.3		14.2	1.2		12.4	6		17.6	1		21.4	1.1	
Zinc	21.9	2.3		12.3	4.6		17.4	2.3		6.3	12.1	J	25.4	2.1		24.4	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	46.1	U	<	46.1	U	93.2	46.3		48.7	48.4		66.8	41.9		<	43.6	U
Water Quality (percent)																		
Water	13	0.1		13	0.1		14	0.1		17	0.1		4.5	0.1		8.3	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 6

Source: Woodward-Clyde, 1994

Table 58-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 127

LOCATOR	CAN127-1274-0000			CAN127-1274-0002			CAN127-1275-0000			CAN127-1275-0002			CAN127-1276-0000			CAN127-1276-0002		
LAB SAMPLE NUMBER	0312770001SA			0312770002SA			0312770011SA			0312770012SA			0312160012SA			0312160013SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
1,2-Dichloroethane	<	5.5	U	<	5.5	U	<	5.2	U	<	5.8	U	1.9	5.2	J	<	5.4	U
1,2-Dichloropropane	<	5.5	U	<	5.5	U	4.6	5.2	J	<	5.8	U	<	5.2	U	<	5.4	U
Toluene	2.3	5.5	J	2.8	5.5	J	5.2	5.2		<	5.8	U	15	5.2		<	5.4	U
Xylenes (total)	1.5	5.5	J	<	5.5	U	<	5.2	U	<	5.8	U	12	5.2		<	5.4	U
Semivolatile Organics (ug/kg)																		
Acenaphthene	<	370	U				150	1400	J	<	380	U	<	340	U			
Anthracene	<	370	U				<	1400	U	<	380	U	<	340	U			
Benzo(a)anthracene	83	370	J				8000	1400		<	380	U	160	340	J			
Benzo(a)pyrene	120	370	J				8600	1400		<	380	U	230	340	J			
Benzo(b)fluoranthene	270	370	J				17000	1400		<	380	U	410	340				
Benzo(g,h,i)perylene	72	370	J				5100	1400		<	380	U	190	340	J			
Carbazole	<	370	U				1500	1400		<	380	U	<	340	U			
Chrysene	210	370	J				14000	1400		<	380	U	300	340	J			
Fluoranthene	300	370	J				17000	1400		<	380	U	570	340				
Fluorene	<	370	U				290	1400	J	<	380	U	<	340	U			
Indeno(1,2,3-cd)pyrene	68	370	J				5100	1400		<	380	U	160	340	J			
2-Methylnaphthalene	<	370	U				<	1400	U	<	380	U	<	340	U			
Phenanthrene	120	370	J				8100	1400		<	380	U	210	340	J			
Pyrene	230	370	J				17000	1400		<	380	U	550	340				
Metals (mg/kg)																		
Aluminum	7490	11.1		9560	11		6530	10.5		8570	23		7170	10.4		11400	10.8	
Antimony	<	6.6	U	<	6.6	U	7.8	6.3		<	13.8	U	<	6.2	U	<	6.5	U
Arsenic	2.9	0.55		2.3	0.55		2.1	0.52		2.1	0.58		2	0.52		2.4	0.54	
Barium	125	1.1	J	75.7	1.1	J	245	1	J	104	2.3	J	74.3	1		105	1.1	
Beryllium	0.82	0.22		0.83	0.22		0.45	0.21		0.65	0.46		0.43	0.21		0.7	0.22	

(1) Results presented here are

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 3 of 6

Source: Woodward-Clyde, 1994

Table 58-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 127

LOCATOR	CAN127-1274-0000			CAN127-1274-0002			CAN127-1275-0000			CAN127-1275-0002			CAN127-1276-0000			CAN127-1276-0002		
LAB SAMPLE NUMBER	0312770001SA			0312770002SA			0312770011SA			0312770012SA			0312160012SA			0312160013SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Cadmium	0.49	0.55	J	<	0.55	U	0.53	0.52		<	1.2	U	<	0.52	U	<	0.54	U
Calcium	7210	22.2		4820	22		45300	21		106000	46.1		6630	20.8		4740	21.6	
Chromium	9.4	1.1		10	1.1		15.3	1		5.8	2.3		9.9	1		9.3	1.1	
Cobalt	5.3	1.1		5.2	1.1		2.8	1		4.3	2.3		2.9	1		4.9	1.1	
Copper	8.5	2.2		8	2.2		25.9	2.1		5.9	4.6		6.3	2.1		8.4	2.2	
Iron	8420	11.1		9250	11		7650	10.5		7920	23		5990	10.4		8990	10.8	
Lead	12.6	2.8		8.4	0.55		29.2	5.2		6.7	0.58		48.2	10.4		9.2	1.1	
Magnesium	1800	22.2		2180	22		1850	21		2640	46.1		1300	20.8		2510	21.6	
Manganese	246	1.1		213	1.1		332	1		127	2.3		141	1		218	1.1	
Mercury	<	0.11	U	<	0.11	U	<	0.1	U	<	0.12	U	<	0.1	U	<	0.11	U
Nickel	9.5	4.4		12.4	4.4		6.8	4.2		10.1	9.2		6.2	4.2		10.5	4.3	
Potassium	1390	554		1760	550		1180	524		1550	1150		2060	519		2520	540	
Selenium	0.27	0.55	J	<	0.55	UJ	<	0.52	UJ	<	1.2	UJ	<	0.52	UJ	<	0.54	UJ
Silver	<	1.1	U	<	1.1	U	<	1	U	<	2.3	U	<	1	U	<	1.1	U
Thallium	<	0.55	U	<	0.55	U	<	0.52	U	<	0.58	UJ	<	0.52	U	0.14	0.54	J
Vanadium	23	1.1		19.2	1.1		16.5	1		15.8	2.3		12.9	1		17.7	1.1	
Zinc	20.4	2.2		21.7	2.2		38.5	2.1		18	4.6		25.3	2.1		24	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	253	44.3	J	<	44	U	344	83.9		<	46.1	U	80.5	41.6		<	43.2	U
Water Quality (percent)																		
Water	9.7	0.1		9.1	0.1		4.6	0.1		13	0.1		3.8	0.1		7.4	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 4 of 6

Source: Woodward-Clyde, 1994

Table 58-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 127

LOCATOR	CAN127-1277-0000			CAN127-1277-0002			CAN127-1278-0000			CAN127-1278-0002		
LAB SAMPLE NUMBER	0311840009SA			0311840010SA			0311840001SA			0311840002SA		
COLLECT DATE	09/12/93			09/12/93			09/12/93			09/12/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)												
1,2-Dichloroethane	<	5.3	U	<	5.4	U	<	5.3	U	<	5.4	U
1,2-Dichloropropane	<	5.3	U	<	5.4	U	<	5.3	U	<	5.4	U
Toluene	5.5	5.3	J	3.8	5.4	J	<	5.3	U	<	5.4	U
Xylenes (total)	5.9	5.3		1.5	5.4	J	<	5.3	U	<	5.4	U
Semivolatile Organics (ug/kg)												
Acenaphthene	<	350	U				<	1400	U			
Anthracene	<	350	U				<	1400	U			
Benzo(a)anthracene	190	350	J				150	1400	J			
Benzo(a)pyrene	180	350	J				180	1400	J			
Benzo(b)fluoranthene	390	350					380	1400	J			
Benzo(g,h,i)perylene	91	350	J				<	1400	U			
Carbazole	<	350	U				<	1400	U			
Chrysene	240	350	J				260	1400	J			
Fluoranthene	470	350					440	1400	J			
Fluorene	<	350	U				<	1400	U			
Indeno(1,2,3-cd)pyrene	93	350	J				<	1400	U			
2-Methylnaphthalene	250	350	J				<	1400	U			
Phenanthrene	190	350	J				190	1400	J			
Pyrene	440	350					360	1400	J			
Metals (mg/kg)												
Aluminum	5640	10.5		8800	10.8		6790	10.5		8050	10.9	
Antimony	<	6.3	U	<	6.5	U	<	6.3	U	<	6.5	U
Arsenic	2.2	0.53		2.8	0.54		2.3	0.53		2.6	1.1	
Barium	84.1	1.1		102	1.1		83.8	1.1		79.4	1.1	
Beryllium	0.49	0.21		0.72	0.22		0.45	0.21		0.68	0.22	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 5 of 6

Source: Woodward-Clyde, 1994

Table 58-1a
Summary of Chemicals Reported for Near-Surface Soil Samples
SWMU 127

LOCATOR	CAN127-1277-0000			CAN127-1277-0002			CAN127-1278-0000			CAN127-1278-0002		
LAB SAMPLE NUMBER	0311840009SA			0311840010SA			0311840001SA			0311840002SA		
COLLECT DATE	09/12/93			09/12/93			09/12/93			09/12/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Cadmium	<	0.53	U	<	0.54	U	<	0.53	U	<	0.54	U
Calcium	18200	21		16700	21.6		5730	21.1		43500	21.8	
Chromium	9.9	1.1		9.5	1.1		11.3	1.1		8.8	1.1	
Cobalt	3.4	1.1		4.8	1.1		3.3	1.1		4.4	1.1	
Copper	7.1	2.1		9.9	2.2		7.3	2.1		9.1	2.2	
Iron	6260	10.5		8960	10.8		7060	10.5		7800	10.9	
Lead	43.2	5.3		9.2	1.1		42.4	5.3		7.5	0.54	
Magnesium	1340	21		2270	21.6		1220	21.1		2300	21.8	
Manganese	154	1.1		189	1.1		151	1.1		168	1.1	
Mercury	<	0.11	U	<	0.11	U	0.11	0.11		<	0.11	U
Nickel	6.6	4.2		10.4	4.3		6.9	4.2		9.8	4.4	
Potassium	1540	526		1760	539		1630	527		1650	545	
Selenium	<	0.53	UJ	<	1.1	UJ	<	0.53	U	<	1.1	UJ
Silver	0.43	1.1	J	0.47	1.1	J	0.53	1.1	J	0.45	1.1	J
Thallium	<	0.53	U	<	0.54	U	<	0.53	U	<	0.54	U
Vanadium	14.6	1.1		18.6	1.1		14.6	1.1		16.9	1.1	
Zinc	24.1	2.1		21	2.2		22.1	2.1		19.4	2.2	
TPH (mg/kg)												
Total Petroleum Hydrocarbons	44.1	42.1		<	43.1	U	<	42.2	U	<	43.6	U
Water Quality (percent)												
Water	4.9	0.1		7.2	0.1		5.2	0.1		8.2	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 6 of 6

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1271-0004			CAN127-1271-0008			CAN127-1272-0004			CAN127-1272-0008			CAN127-1273-0004			CAN127-1273-0008		
LAB SAMPLE NUMBER	0313740005SA			0313740006SA			0313740009SA			0313740010SA			0312160004SA			0312160003SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/23/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
2-Butanone (MEK)	<	12	U	<	11	U	<	12	U	<	12	U	<	11	U	<	11	U
Carbon tetrachloride	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Chlorobenzene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
1,1-Dichloroethene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
1,2-Dichloroethene (total)	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
1,2-Dichloropropane	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Ethylbenzene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Tetrachloroethene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Toluene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
1,1,1-Trichloroethane	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Trichloroethene	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Xylenes (total)	<	5.8	U	<	5.7	U	<	5.9	U	<	5.9	U	<	5.5	U	<	5.5	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate	110	380	J													<	360	U
Metals (mg/kg)																		
Aluminum	5370	23.1	J	4000	22.8		4240	58.8		4180	23.8		7780	21.8		4420	11	
Arsenic	2.2	0.58	J	1.1	0.57		1.3	0.59		1.1	0.59		2.3	0.55		1.5	0.55	
Barium	285	2.3		163	2.3		435	5.9		98.4	2.4		255	2.2		93.9	1.1	
Beryllium	0.46	0.46		0.28	0.46	J	<	1.2	U	0.34	0.48	J	0.35	0.44	J	0.3	0.22	
Cadmium	2.1	1.2		2	1.1		2.9	2.9		1.8	1.2		<	1.1	U	<	0.55	U
Calcium	137000	46.2		132000	45.7		248000	118		148000	47.5		135000	43.7		85200	22	
Chromium	6	2.3	J	3.5	2.3		<	5.9	U	3.9	2.4		4	2.2		3.4	1.1	
Cobalt	2.9	2.3	J	1.8	2.3	J	<	5.9	U	1.3	2.4	J	3.6	2.2		2	1.1	
Copper	5	4.6	J	2.2	4.6	J	1.9	11.8	J	2.2	4.8	J	5.2	4.4		2.6	2.2	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 1 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1271-0004			CAN127-1271-0008			CAN127-1272-0004			CAN127-1272-0008			CAN127-1273-0004			CAN127-1273-0008		
LAB SAMPLE NUMBER	0313740005SA			0313740006SA			0313740009SA			0313740010SA			0312160004SA			0312160003SA		
COLLECT DATE	09/23/93			09/23/93			09/23/93			09/23/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	4940	23.1	J	3360	22.8		3180	58.8		3210	23.8		6370	21.8		3360	11	
Lead	3.2	1.2		2.5	2.9	J	2.4	2.9	J	2.4	3	J	4.2	0.55		3.2	0.55	
Magnesium	2830	46.2		3330	45.7		4110	118		3370	47.5		3270	43.7		2570	22	
Manganese	69.6	2.3	J	41.4	2.3		43.9	5.9		42.5	2.4		93	2.2		55.8	1.1	
Nickel	7.4	9.2	J	5.2	9.1	J	<	23.5	U	5.2	9.5	J	8.3	8.7	J	4.5	4.4	
Potassium	1010	1160	J	999	1140	J	695	2940	J	1060	1190	J	1740	1090		1270	549	
Silver	1.2	2.3	J	0.84	2.3	J	2.6	5.9	J	1.4	2.4	J	<	2.2	U	<	1.1	U
Vanadium	19.8	2.3	J	11.8	2.3		11.3	5.9		11.2	2.4		17.9	2.2		12.4	1.1	
Zinc	11.8	4.6	J	10	4.6		11.2	11.8	J	9.9	4.8		15.8	4.4		9	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	46.6	46.2		48.6	45.7		50.1	47.1		<	47.5	U	<	43.7	U	<	43.9	U
Water Quality (percent)																		
Water	14	0.1		12	0.1		15	0.1		16	0.1		8.5	0.1		8.9	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 2 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1273-0018			CAN127-1273-0028			CAN127-1273-0038			CAN127-1273-0048			CAN127-1273-0058			CAN127-1274-0004		
LAB SAMPLE NUMBER	0312160005SA			0312160006SA			0312160007SA			0312160008SA			0312160009SA			0312770003SA		
COLLECT DATE	09/13/93			09/13/93			09/13/93			09/13/93			09/13/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Carbon tetrachloride	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Chlorobenzene	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
1,1-Dichloroethene	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
1,2-Dichloroethene (total)	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
1,2-Dichloropropane	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Ethylbenzene	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Tetrachloroethene	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Toluene	3.5	5.6	J	<	5.5	U	<	5.5	U	<	5.5	U	1.2	5.4	J	<	5.5	U
1,1,1-Trichloroethane	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Trichloroethene	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Xylenes (total)	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate																		
Metals (mg/kg)																		
Aluminum	5740	22.4		6020	11.1		6610	11.1		5830	11		3840	10.7		3650	22.1	
Arsenic	1.2	0.56		1.3	0.55		1.7	0.55		1.3	0.55		1.1	0.54		2.5	0.55	
Barium	110	2.2		137	1.1		61.9	1.1		106	1.1		12.9	1.1		517	2.2	
Beryllium	0.24	0.45	J	0.23	0.22		0.29	0.22		0.17	0.22	J	0.16	0.21	J	0.4	0.44	J
Cadmium	<	1.1	U	<	0.55	U	<	0.55	U	<	0.55	U	<	0.54	U	<	1.1	U
Calcium	135000	44.8		77500	22.1		50100	22.1		45000	21.9		6730	21.4		149000	44.1	
Chromium	2.8	2.2		2.9	1.1		6.3	1.1		6.2	1.1		3.3	1.1		2.3	2.2	
Cobalt	2.4	2.2		1.2	1.1		1.9	1.1		1.4	1.1		1.4	1.1		2.7	2.2	
Copper	2.3	4.5	J	2	2.2	J	2.2	2.2		1.5	2.2	J	1.3	2.1	J	2.5	4.4	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 3 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1273-0018			CAN127-1273-0028			CAN127-1273-0038			CAN127-1273-0048			CAN127-1273-0058			CAN127-1274-0004		
LAB SAMPLE NUMBER	0312160005SA			0312160006SA			0312160007SA			0312160008SA			0312160009SA			0312770003SA		
COLLECT DATE	09/13/93			09/13/93			09/13/93			09/13/93			09/13/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	4290	22.4		3310	11.1		4680	11.1		4100	11		3020	10.7		3780	22.1	
Lead	4	0.56		3.1	2.8		2.9	0.55		2.3	0.55		1.6	0.54		4.6	0.55	
Magnesium	5250	44.8		6820	22.1		6550	22.1		4660	21.9		2630	21.4		2630	44.1	
Manganese	60.9	2.2		30.5	1.1		58.6	1.1		45.9	1.1		28.7	1.1		62	2.2	
Nickel	5.2	9	J	3.6	4.4	J	4.3	4.4	J	3.7	4.4	J	2.8	4.3	J	6	8.8	J
Potassium	1910	1120		1530	553		1730	553		1470	548		957	535		741	1100	J
Silver	<	2.2	U	<	1.1	U	<	1.1	U	<	1.1	U	<	1.1	U	<	2.2	U
Vanadium	11.2	2.2		13.7	1.1		17.8	1.1		14.6	1.1		13	1.1		15.8	2.2	
Zinc	11.2	4.5		9.8	2.2		11.3	2.2		9.3	2.2		6.8	2.1		8.7	4.4	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	44.8	U	<	44.2	U	<	44.2	U	<	43.9	U	<	42.8	U	<	44.1	U
Water Quality (percent)																		
Water	11	0.1		9.6	0.1		9.6	0.1		8.8	0.1		6.6	0.1		9.3	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 4 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1274-0008			CAN127-1274-0018			CAN127-1274-0028			CAN127-1274-0038			CAN127-1274-0048			CAN127-1274-0058		
LAB SAMPLE NUMBER	0312770004SA			0312770005SA			0312770007SA			0312770008SA			0312770009SA			0312770010SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/14/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Carbon tetrachloride	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
Chlorobenzene	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
1,1-Dichloroethene	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
1,2-Dichloroethene (total)	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
1,2-Dichloropropane	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	5.7	5.5		13	5.4	
Ethylbenzene	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
Tetrachloroethene	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
Toluene	<	5.7	U	<	5.5	U	<	5.6	U	2	5.6	J	3.3	5.5	J	1.6	5.4	J
1,1,1-Trichloroethane	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
Trichloroethene	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
Xylenes (total)	<	5.7	U	<	5.5	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.4	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate													<	360	U			
Metals (mg/kg)																		
Aluminum	3730	22.7		6270	11		4710	22.3		4730	11.2		4870	11		3310	10.8	
Arsenic	1.1	0.57		2.1	0.55		1.3	0.56		1.1	0.56		1.3	0.55		1	0.54	
Barium	100	2.3	J	68.2	1.1	J	74.4	2.2	J	42.6	1.1	J	56.1	1.1	J	17.1	1.1	J
Beryllium	0.35	0.45	J	0.39	0.22		0.26	0.45	J	0.29	0.22		0.22	0.22		0.18	0.22	J
Cadmium	<	1.1	U	<	0.55	U	<	1.1	U	<	0.56	U	<	0.55	U	<	0.54	U
Calcium	154000	45.3		71700	22		102000	44.7		61000	22.4		38100	22		16100	21.6	
Chromium	<	2.3	U	5	1.1		1.9	2.2	J	4.8	1.1		4.8	1.1		3.3	1.1	
Cobalt	2	2.3	J	2.6	1.1		2	2.2	J	1.3	1.1		1.5	1.1		1.5	1.1	
Copper	1.1	4.5	J	3	2.2		1.3	4.5	J	1.3	2.2	J	1.2	2.2	J	1.1	2.2	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 5 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1274-0008			CAN127-1274-0018			CAN127-1274-0028			CAN127-1274-0038			CAN127-1274-0048			CAN127-1274-0058		
LAB SAMPLE NUMBER	0312770004SA			0312770005SA			0312770007SA			0312770008SA			0312770009SA			0312770010SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/14/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	3260	22.7		5510	11		3450	22.3		3820	11.2		4150	11		3750	10.8	
Lead	3.2	0.57		4.4	1.1		2.9	0.56		2.4	0.56		2.3	0.55		2	0.54	
Magnesium	3390	45.3		3810	22		4490	44.7		5530	22.4		4410	22		3450	21.6	
Manganese	47.8	2.3		78.7	1.1		39.4	2.2		37.9	1.1		56.9	1.1		48.6	1.1	
Nickel	5.3	9.1	J	5.7	4.4		5.6	8.9	J	4	4.5	J	3.7	4.4	J	3.5	4.3	J
Potassium	874	1130	J	1740	550		910	1120	J	856	561		951	549		562	539	
Silver	<	2.3	U	<	1.1	U	<	2.2	U	<	1.1	U	<	1.1	U	<	1.1	U
Vanadium	10.4	2.3		20.1	1.1		15.8	2.2		18.3	1.1		17.3	1.1		16.2	1.1	
Zinc	7.2	4.5		11.1	2.2		7.1	4.5		8.6	2.2		9.2	2.2		6.1	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	45.3	U	<	44	U	<	44.7	U	<	44.9	U	<	43.9	U	<	43.1	U
Water Quality (percent)																		
Water	12	0.1		9.1	0.1		10	0.1		11	0.1		9	0.1		7.3	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 6 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1275-0004			CAN127-1275-0008			CAN127-1275-0018			CAN127-1275-0028			CAN127-1275-0038			CAN127-1275-0048		
LAB SAMPLE NUMBER	0312770013SA			0312770014SA			0312770015SA			0312770016SA			0312770017SA			0312770018SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/14/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.7	U	<	5.8	U	1.2	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
2-Butanone (MEK)	<	11	U	<	12	U	<	12	U	<	11	U	<	11	U	<	11	U
Carbon tetrachloride	<	5.7	U	<	5.8	U	2.7	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
Chlorobenzene	<	5.7	U	<	5.8	U	1.3	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
1,1-Dichloroethene	<	5.7	U	<	5.8	U	1.9	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
1,2-Dichloroethene (total)	<	5.7	U	<	5.8	U	1.3	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
1,2-Dichloropropane	<	5.7	U	<	5.8	U	<	5.8	U	<	5.6	U	7.7	5.5		<	5.6	U
Ethylbenzene	<	5.7	U	<	5.8	U	1.3	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
Tetrachloroethene	<	5.7	U	<	5.8	U	2.9	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
Toluene	5.4	5.7	J	18	5.8		6.2	5.8		<	5.6	U	7.2	5.5		12	5.6	
1,1,1-Trichloroethane	<	5.7	U	<	5.8	U	1.8	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
Trichloroethene	<	5.7	U	<	5.8	U	2.3	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
Xylenes (total)	<	5.7	U	<	5.8	U	2.4	5.8	J	<	5.6	U	<	5.5	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate																		
Metals (mg/kg)																		
Aluminum	5030	57.2		3630	23.3		10100	57.7		4470	22.5		4860	11.1		4570	11.1	
Arsenic	1.5	0.57		1.3	0.58		1.7	0.58		1	0.56		1	0.55		1.1	0.56	
Barium	435	5.7	J	167	2.3	J	445	5.8	J	65.4	2.2	J	148	1.1	J	36.6	1.1	J
Beryllium	<	1.1	U	0.28	0.47	J	<	1.2	U	0.27	0.45	J	0.33	0.22		0.29	0.22	
Cadmium	<	2.9	U	<	1.2	U	<	2.9	U	<	1.1	U	<	0.55	U	<	0.56	U
Calcium	238000	114		181000	46.6		238000	115		150000	44.9		58900	22.1		76300	22.3	
Chromium	<	5.7	U	<	2.3	U	<	5.8	U	2.1	2.2	J	4.3	1.1		3.4	1.1	
Cobalt	<	5.7	U	2.4	2.3		<	5.8	U	1.5	2.2	J	1.6	1.1		1.5	1.1	
Copper	<	11.4	U	1.8	4.7	J	3.2	11.5	J	1.7	4.5	J	2.7	2.2		1.9	2.2	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 7 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1275-0004			CAN127-1275-0008			CAN127-1275-0018			CAN127-1275-0028			CAN127-1275-0038			CAN127-1275-0048		
LAB SAMPLE NUMBER	0312770013SA			0312770014SA			0312770015SA			0312770016SA			0312770017SA			0312770018SA		
COLLECT DATE	09/14/93			09/14/93			09/14/93			09/14/93			09/14/93			09/14/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	4210	57.2		3300	23.3		5960	57.7		3200	22.5		3900	11.1		3770	11.1	
Lead	3	0.57		2.7	0.58		3.1	0.58		1.7	0.56		1.9	0.55		2.2	0.56	
Magnesium	3940	114		3590	46.6		11900	115		4840	44.9		5590	22.1		5470	22.3	
Manganese	51.4	5.7		34	2.3		46.4	5.8		28	2.2		42.1	1.1		43.1	1.1	
Nickel	<	22.9	U	6.1	9.3	J	7.9	23.1	J	3.5	9	J	4.7	4.4		3.3	4.5	J
Potassium	612	2860	J	854	1160	J	2080	2880	J	700	1120	J	916	554		810	556	
Silver	<	5.7	U	<	2.3	U	<	5.8	U	<	2.2	U	<	1.1	U	<	1.1	U
Vanadium	11.2	5.7		11.1	2.3		18.2	5.8		14.4	2.2		17.2	1.1		19	1.1	
Zinc	5.2	11.4	J	7.3	4.7		<	11.5	U	6.4	4.5		8.2	2.2		8.5	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	45.8	U	<	46.6	U	<	46.1	U	<	44.9	U	<	44.3	U	<	44.5	U
Water Quality (percent)																		
Water	13	0.1		14	0.1		13	0.1		11	0.1		9.7	0.1		10	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 8 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1275-0058			CAN127-1276-0004			CAN127-1276-0008			CAN127-1276-0018			CAN127-1276-0028			CAN127-1276-0038		
LAB SAMPLE NUMBER	0312770019SA			0312150009SA			0312150010SA			0312150011SA			0312150012SA			0312150013SA		
COLLECT DATE	09/14/93			09/13/93			09/13/93			09/13/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Carbon tetrachloride	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Chlorobenzene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
1,1-Dichloroethene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
1,2-Dichloroethene (total)	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
1,2-Dichloropropane	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Ethylbenzene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Tetrachloroethene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Toluene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
1,1,1-Trichloroethane	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Trichloroethene	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Xylenes (total)	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate										<	360	U						
Metals (mg/kg)																		
Aluminum	4270	11.2		6670	21.6		3640	22.1		4530	11		4370	10.9		4500	11	
Arsenic	1.2	0.56		2.5	0.54		1.1	0.55		1.8	0.55		1.9	0.55		1.3	0.55	
Barium	545	1.1	J	107	2.2		95.7	2.2		302	1.1		96.4	1.1		23.7	1.1	
Beryllium	0.3	0.22		0.29	0.43	J	<	0.44	U	0.47	0.22		0.3	0.22		0.23	0.22	
Cadmium	<	0.56	U	<	1.1	U	<	1.1	U	<	0.55	U	<	0.55	U	<	0.55	U
Calcium	73800	22.3		113000	43.3		152000	44.1		68500	21.9		76500	21.8		39300	22.1	
Chromium	2.6	1.1		3.9	2.2		<	2.2	U	2.9	1.1		3	1.1		3.4	1.1	
Cobalt	1.1	1.1		3.3	2.2		2.1	2.2	J	1.9	1.1		1.7	1.1		1.2	1.1	
Copper	1.5	2.2	J	4.8	4.3		1.5	4.4	J	2.7	2.2		2.8	2.2		1.8	2.2	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 9 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1275-0058			CAN127-1276-0004			CAN127-1276-0005			CAN127-1276-0018			CAN127-1276-0028			CAN127-1276-0038		
LAB SAMPLE NUMBER	0312770019SA			0312150009SA			0312150010SA			0312150011SA			0312150012SA			0312150013SA		
COLLECT DATE	09/14/93			09/13/93			09/13/93			09/13/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	3020	11.2		6140	21.6		3050	22.1		3620	11		3250	10.9		3280	11	
Lead	2.5	0.56		5.8	1.1		3.1	1.1		4.5	1.1		3.1	0.55		2.5	1.1	
Magnesium	4490	22.3		3020	43.3		2710	44.1		3320	21.9		5100	21.8		6940	22.1	
Manganese	43.2	1.1		98.5	2.2		31.1	2.2		47.2	1.1		42.5	1.1		32.6	1.1	
Nickel	2.9	4.5	J	9.7	8.7		5.8	8.8	J	4.4	4.4		3.9	4.4	J	3.9	4.4	J
Potassium	787	559		1540	1080		1150	1100		1510	549		1130	546		967	552	
Silver	<	1.1	U	<	2.2	U	<	2.2	U	<	1.1	U	<	1.1	U	<	1.1	U
Vanadium	17.5	1.1		16.4	2.2		10	2.2		12.6	1.1		12.8	1.1		16	1.1	
Zinc	7.9	2.2		14.5	4.3		6.8	4.4		7.8	2.2		7.1	2.2		8.3	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	44.7	U	<	43.3	U	<	44.1	U	<	43.9	U	<	43.7	U	<	44.1	U
Water Quality (percent)																		
Water	10	0.1		7.6	0.1		9.3	0.1		8.8	0.1		8.4	0.1		9.4	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 10 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1276-0048			CAN127-1276-0058			CAN127-1277-0004			CAN127-1277-0008			CAN127-1277-0018			CAN127-1277-0028		
LAB SAMPLE NUMBER	0312150014SA			0312150015SA			0311840011SA			0311840012SA			0311840013SA			0311840014SA		
COLLECT DATE	09/13/93			09/13/93			09/12/93			09/12/93			09/12/93			09/12/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Carbon tetrachloride	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Chlorobenzene	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
1,1-Dichloroethene	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
1,2-Dichloroethene (total)	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
1,2-Dichloropropane	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Ethylbenzene	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Tetrachloroethene	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Toluene	<	5.5	U	2.5	5.4	J	2.1	5.5	J	<	5.5	U	<	5.7	U	<	5.6	U
1,1,1-Trichloroethane	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Trichloroethene	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Xylenes (total)	<	5.5	U	<	5.4	U	<	5.5	U	<	5.5	U	<	5.7	U	<	5.6	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate										<	360	U						
Metals (mg/kg)																		
Aluminum	4660	11		3630	10.8		6130	10.9		3780	11		6250	11.3		5360	11.1	
Arsenic	1.5	0.55		1.1	0.54		2.8	0.55		1.5	0.55		2.4	0.57		1.4	0.56	
Barium	27.8	1.1		20.6	1.1		72.9	1.1		98.4	1.1		101	1.1		157	1.1	
Beryllium	0.22	0.22		0.16	0.22	J	0.49	0.22		0.37	0.22		0.71	0.23		0.38	0.22	
Cadmium	<	0.55	U	<	0.54	U	1.5	0.55		0.92	0.55		1.1	0.57		1.2	0.56	
Calcium	37000	22		8970	21.6		103000	21.8		104000	22.1		91000	22.7		76300	22.3	
Chromium	3.1	1.1		3.6	1.1		6.1	1.1		<	4.2	U	5.2	1.1	U	5.6	1.1	
Cobalt	2.9	1.1		1.4	1.1		3.2	1.1		2.3	1.1		3.2	1.1		1.4	1.1	
Copper	2	2.2	J	2.7	2.2		5.4	2.2		2.8	2.2		5.5	2.3		2.4	2.2	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 11 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1276-0048			CAN127-1276-0058			CAN127-1277-0084			CAN127-1277-4088			CAN127-1277-0018			CAN127-1277-0028		
LAB SAMPLE NUMBER	0312150014SA			0312150015SA			0311840011SA			0311840012SA			0311840013SA			0311840014SA		
COLLECT DATE	09/13/93			09/13/93			09/12/93			09/12/93			09/12/93			09/12/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	3760	11		3430	10.8		5800	10.9		3540	11		5200	11.3		3780	11.1	
Lead	2.6	1.1		2.6	1.1		<	6.1	U	4.6	0.55		7.4	1.1		3.1	0.56	
Magnesium	5240	22		3760	21.6		2630	21.8		2370	22.1		3970	22.7		6170	22.3	
Manganese	111	1.1		30.6	1.1		78.5	1.1		58.3	1.1		93	1.1		35	1.1	
Nickel	4.6	4.4		3.8	4.3	J	7.8	4.4		5.2	4.4		6.7	4.5		4.6	4.5	
Potassium	1010	549		816	540	J	1310	545		1050	552		2010	567		1050	557	
Silver	<	1.1	U	<	1.1	U	0.47	1.1	J	0.54	1.1	J	<	1.1	U	0.43	1.1	J
Vanadium	18.2	1.1		16.3	1.1		18.7	1.1		12.1	1.1		16.2	1.1		15	1.1	
Zinc	8.8	2.2		6.4	2.2		14.4	2.2		9.4	2.2		12.8	2.3		9	2.2	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	43.9	U	<	43.2	U	<	43.6	U	<	44.2	U	<	45.4	U	<	44.6	U
Water Quality (percent)																		
Water	8.9	0.1		7.4	0.1		8.3	0.1		9.4	0.1		12	0.1		10	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 12 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1277-0038			CAN127-1277-0048			CAN127-1277-0058			CAN127-1278-0004			CAN127-1278-0008			CAN127-1278-0018		
LAB SAMPLE NUMBER	0311840015SA			0311840016SA			0311840017SA			0311840004SA			0311840005SA			0311840006SA		
COLLECT DATE	09/12/93			09/12/93			09/12/93			09/12/93			09/12/93			09/12/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)																		
Benzene	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	6.6	11	J	<	11	U
Carbon tetrachloride	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Chlorobenzene	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
1,1-Dichloroethene	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
1,2-Dichloroethene (total)	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
1,2-Dichloropropane	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Ethylbenzene	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Tetrachloroethene	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Toluene	1.7	5.5	J	2	5.5	J	2.6	5.5	J	<	5.5	U	<	5.6	U	<	5.7	U
1,1,1-Trichloroethane	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Trichloroethene	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Xylenes (total)	<	5.5	U	<	5.5	U	<	5.5	U	<	5.5	U	<	5.6	U	<	5.7	U
Semivolatile Organics (ug/kg)																		
Butyl benzyl phthalate													<	370	U			
Metals (mg/kg)																		
Aluminum	4470	11		4580	11		4370	11.1		4270	21.8		4500	11.1		5730	22.9	
Arsenic	1.3	0.55		1.1	0.55		1.2	0.55		2	0.55		1.7	0.56		2.2	0.57	
Barium	158	1.1		41.7	1.1		84.6	1.1		227	2.2		204	1.1		242	2.3	
Beryllium	0.31	0.22		0.28	0.22		0.27	0.22		0.42	0.44	J	0.46	0.22		0.44	0.46	J
Cadmium	0.86	0.55		<	0.55	U	1.1	0.55		2.6	1.1		1.2	0.56		2.4	1.1	
Calcium	77800	22		58200	22		68400	22.1		166000	43.6		83100	22.2		154000	45.7	
Chromium	6.1	1.1		4.9	1.1	U	6.3	1.1		4	2.2	U	4.9	1.1	U	6.7	2.3	U
Cobalt	1.5	1.1		1.2	1.1		1.7	1.1		2.6	2.2		2.2	1.1	J	2.7	2.3	
Copper	2.2	2.2		2.1	2.2	J	54.9	2.2		4.1	4.4	J	4	2.2		3.7	4.6	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 13 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1277-0038			CAN127-1277-0048			CAN127-1277-0058			CAN127-1278-0004			CAN127-1278-0008			CAN127-1278-0018		
LAB SAMPLE NUMBER	0311840015SA			0311840016SA			0311840017SA			0311840004SA			0311840005SA			0311840006SA		
COLLECT DATE	09/12/93			09/12/93			09/12/93			09/12/93			09/12/93			09/12/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	3430	11		3570	11		3370	11.1		4170	21.8		4570	11.1		4780	22.9	
Lead	3.4	0.55		3	0.55		3.9	0.55		4.9	0.55		5.8	0.56		5.1	0.57	
Magnesium	4870	22		5890	22		5920	22.1		2460	43.6		2500	22.2		4940	45.7	
Manganese	40.3	1.1		47.5	1.1		41.3	1.1		57.1	2.2		71.6	1.1		71.1	2.3	
Nickel	4.3	4.4	J	4	4.4	J	4.6	4.4		6.4	8.7	J	6	4.4		7.6	9.1	J
Potassium	891	551		917	550		812	553		850	1090	J	1130	555		1540	1140	
Silver	0.51	1.1	J	0.48	1.1	J	0.35	1.1	J	1.2	2.2	J	0.8	1.1	J	1.6	2.3	J
Vanadium	14.9	1.1		18.2	1.1		20.9	1.1		15.4	2.2		15.2	1.1		17	2.3	
Zinc	7.9	2.2		8.8	2.2		11	2.2		11.1	4.4		11.1	2.2		10.4	4.6	
TPH (mg/kg)																		
Total Petroleum Hydrocarbons	<	44.1	U	<	44	U	<	44.2	U	<	43.6	U	170	44.4		55.9	45.7	
Water Quality (percent)																		
Water	9.2	0.1		9.2	0.1		9.5	0.1		8.3	0.1		10	0.1		13	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 14 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1278-0028			CAN127-1278-0038			CAN127-1278-0048			CAN127-1278-0058		
LAB SAMPLE NUMBER	0311840007SA			0311840008SA			0312160010SA			0312160011SA		
COLLECT DATE	09/12/93			09/12/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (ug/kg)												
Benzene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	7.1	11	J
Carbon tetrachloride	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Chlorobenzene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
1,1-Dichloroethene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
1,2-Dichloroethene (total)	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
1,2-Dichloropropane	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Ethylbenzene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Tetrachloroethene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Toluene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
1,1,1-Trichloroethane	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Trichloroethene	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Xylenes (total)	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Semivolatile Organics (ug/kg)												
Butyl benzyl phthalate												
Metals (mg/kg)												
Aluminum	7380	11.2		4530	11.1		4490	11.1		4430	11.3	
Arsenic	1.9	0.56		1.3	0.55		1.1	0.56		1.2	0.56	
Barium	189	1.1		74.4	1.1		113	1.1		31.6	1.1	
Beryllium	0.46	0.22		0.31	0.22		<	0.22	U	0.17	0.23	J
Cadmium	0.71	0.56		0.88	0.55		<	0.56	U	<	0.56	U
Calcium	89600	22.5		64200	22.1		58900	22.2		30800	22.6	
Chromium	5.6	1.1		4.7	1.1	U	3.2	1.1		2.7	1.1	
Cobalt	2.4	1.1		1.6	1.1		1.5	1.1		1.4	1.1	
Copper	3.1	2.2		2	2.2	J	1.6	2.2	J	1.8	2.3	J

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.

QUAL=Qualification
RL = Reporting Limit.

Page 15 of 16

Source: Woodward-Clyde, 1994

Table 58-1b
Summary of Chemicals Reported for Subsurface Soil Samples
SWMU 127

LOCATOR	CAN127-1278-0028			CAN127-1278-0038			CAN127-1278-0048			CAN127-1278-0058		
LAB SAMPLE NUMBER	0311840007SA			0311840008SA			0312160010SA			0312160011SA		
COLLECT DATE	09/12/93			09/12/93			09/13/93			09/13/93		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Iron	5230	11.2		3430	11.1		2990	11.1		2840	11.3	
Lead	4	0.56		4.2	0.55		2.1	0.56		2.3	0.56	
Magnesium	4850	22.5		3730	22.1		4960	22.2		4400	22.6	
Manganese	68.5	1.1		37.4	1.1		37	1.1		39.5	1.1	
Nickel	6.6	4.5		4.5	4.4		3.7	4.4	J	3.6	4.5	J
Potassium	1580	561		925	553		987	555		1000	564	
Silver	0.48	1.1	J	0.62	1.1	J	<	1.1	U	<	1.1	U
Vanadium	19.8	1.1		14.5	1.1		16.3	1.1		15.7	1.1	
Zinc	11.7	2.2		7.3	2.2		7.2	2.2		7.3	2.3	
TPH (mg/kg)												
Total Petroleum Hydrocarbons	<	44.9	U	<	44.2	U	<	44.4	U	<	45.1	U
Water Quality (percent)												
Water	11	0.1		9.6	0.1		10	0.1		11	0.1	

(1) Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
QUAL=Qualification
RL = Reporting Limit.

Page 16 of 16

Source: Woodward-Clyde, 1994

Table 58-2a
Comparison of Maximum Detected Concentration with RBCs(1)
SWMU 127

Field ID	Analyte	Result mg/kg	RBC mg/kg	Maximum Detected Exceed RBC?
CAN127-1275-0018	1,1,1-Trichloroethane	0.0018	700	N
CAN127-1275-0018	1,1-Dichloroethene	0.0019	0.1	N
CAN127-1276-0000	1,2-Dichloroethane	0.0019	0.8	N
CAN127-1275-0018	1,2-Dichloroethene ^(total)	0.0013	200	N
CAN127-1274-0058	1,2-Dichloropropane	0.013	30	N
CAN127-1277-0000	2-Methylnaphthalene	0.25	NTF	N
CAN127-1275-0000	Acenaphthene	0.15	500	N
CAN127-1273-0002	Aluminum	11600	NTF	N
CAN127-1273-0000	Anthracene	0.048	2000	N
CAN127-1275-0000	**Antimony**	**7.8**	**3**	**Y**
CAN127-1271-0002	**Barium**	**971**	**600**	**Y**
CAN127-1275-0018	Benzene	0.0012	2	N
CAN127-1275-0000	**Benzo(a)anthracene**	**8**	**0.07**	**Y**
CAN127-1275-0000	**Benzo(a)pyrene**	**8.6**	**0.01**	**Y**
CAN127-1275-0000	**Benzo(b)fluoranthene**	**17**	**0.07**	**Y**
CAN127-1275-0000	Benzo(g,h,i)perylene	5.1	NTF	N
CAN127-1274-0002	**Beryllium**	**0.83**	**0.02**	**Y**
CAN127-1271-0004	Butyl benzyl phthalate	0.11	2000	N
CAN127-1272-0002	Cadmium	4.2	8	N
CAN127-1275-0000	Carbazole	1.5	4	N
CAN127-1275-0018	Carbon tetrachloride	0.0027	0.5	N
CAN127-1275-0018	Chlorobenzene	0.0013	200	N
CAN127-1273-0000	Chromium	16.9	40	N
CAN127-1275-0000	**Chrysene**	**14**	**2**	**Y**
CAN127-1274-0000	Cobalt	5.3	NTF	N
CAN127-1277-0058	Copper	54.9	300	N
CAN127-1275-0018	Ethylbenzene	0.0013	800	N
CAN127-1275-0000	Fluoranthene	17	300	N
CAN127-1275-0000	Fluorene	0.29	300	N
CAN127-1275-0000	**Indeno(1,2,3-cd)pyrene**	**5.1**	**0.04**	**Y**
CAN127-1276-0000	Lead	48.2	500	N
CAN127-1278-0000	Mercury	0.11	2	N
CAN127-1274-0002	Nickel	12.4	200	N
CAN127-1275-0000	Phenanthrene	8.1	NTF	N
CAN127-1275-0000	Pyrene	17	200	N
CAN127-1272-0002	Silver	3.6	20	N
CAN127-1275-0018	Tetrachloroethene	0.0029	1	N
CAN127-1276-0002	Thallium	0.14	6	N
CAN127-1275-0008	Toluene	0.018	2000	N
CAN127-1278-0008	Total Petroleum Hydrocarbons	170	1000	N
CAN127-1275-0018	Trichloroethene	0.0023	6	N
CAN127-1276-0000	Xylenes (total)	0.012	20000	N
CAN127-1275-0000	Zinc	38.5	2000	N

NTF = No Established EPA Toxicity Factor

(1) All units in mg/kg

(2) Risk-based concentration

(3) EPA suggests 500-1,000 mg/kg as allowable concentration for residential soils based on EPA's IUBK Lead Model (EPA 1990)

(4) New Mexico recommended soil cleanup level for fuel contaminated soil.

Note: Only metlas that exceeded background appear in this table

Source: Woodward-Clyde, 1994

Table 58-2b
Risk Characterization Summary
SWMU 127

Chemical	Sample Number											
	CAN127-1271-0000	CAN127-1272-0000	CAN127-1273-0000	CAN127-1273-0002	CAN127-1274-0000	CAN127-1274-0002	CAN127-1275-0000	CAN127-1275-0002	CAN127-1276-0000	CAN127-1276-0002	CAN127-1277-0000	CAN127-1277-0002
Volatile Organics												
1,2-Dichloroethane	0.0029 U	0.0029 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U	0.0026 U	0.0029 U	0.0019 J	0.0027 U	0.0027 U	0.0027 U
1,2-Dichloropropane	0.0029 U	0.0029 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U	0.0046 J	0.0029 U	0.0026 U	0.0027 U	0.0027 U	0.0027 U
Toluene	0.0029 U	0.0029 U	0.012	0.0028 U	0.0023 J	0.0028 J	0.0052	0.0029 U	0.015	0.0027 U	0.0055 J	0.0038 J
Xylenes (total)	0.0029 U	0.0029 U	0.0034 J	0.0028 U	0.0015 J	0.0028 U	0.0026 U	0.0029 U	0.012	0.0027 U	0.0059	0.0015 J
Semivolatile Organics												
Acenaphthene	0.19 U	0.19 U	0.175 U		0.185 U		0.15 J	0.19 U	0.17 U		0.175 U	
Anthracene	0.19 U	0.19 U	0.048 J		0.185 U		0.7 U	0.19 U	0.17 U		0.175 U	
Benzo(a)anthracene	0.19 U	0.19 U	0.51		0.083 J		8	0.19 U	0.16 J		0.19 J	
Benzo(a)pyrene	0.19 U	0.19 U	0.55		0.12 J		8.6	0.19 U	0.23 J		0.18 J	
Benzo(b)fluoranthene	0.19 U	0.19 U	0.96		0.27 J		17	0.19 U	0.41		0.39	
Benzo(g,h,i)perylene	0.19 U	0.19 U	0.47		0.072 J		5.1	0.19 U	0.19 J		0.091 J	
Carbazole	0.19 U	0.19 U	0.046 J		0.185 U		1.5	0.19 U	0.17 U		0.175 U	
Chrysene	0.19 U	0.19 U	0.72		0.21 J		14	0.19 U	0.3 J		0.24 J	
Fluoranthene	0.19 U	0.19 U	1.5		0.3 J		17	0.19 U	0.57		0.47	
Fluorene	0.19 U	0.19 U	0.175 U		0.185 U		0.29 J	0.19 U	0.17 U		0.175 U	
Ideno(1,2,3-cd)pyrene	0.19 U	0.19 U	0.39		0.068 J		5.1	0.19 U	0.16 J		0.093 J	
2-Methylnaphthalene	0.19 U	0.19 U	0.175 U		0.185 U		0.7 U	0.19 U	0.17 U		0.25 J	
Phenanthrene	0.19 U	0.19 U	0.57		0.12 J		8.1	0.19 U	0.21 J		0.19 J	
Pyrene	0.19 U	0.19 U	1.4		0.23 J		17	0.19 U	0.55		0.44	
Metals												
Aluminum	9270	7220	7650	11600	7490	9560	6530	8570	7170	11400	5640	8800
Antimony	3.5 U	3.5 U	3.2 U	3.3 U	3.3 U	3.3 U	7.8	6.9 U	3.1 U	3.3 U	3.2 U	3.3 U
Cadmium	0.29 UJ	1.1	0.26 U	0.28 U	0.49 J	0.28 U	0.53	0.6 U	0.26 U	0.27	0.27 U	0.27 U
Copper	8.9	7.3	6.8	7.9	8.5	8	25.9	5.9	6.3	8.4	7.1	9.9
Lead	7.3	4.4	30.8	8	12.6	8.4	29.2	6.7	48.2	9.2	43.2	9.2
Selenium	0.6 UJ	0.6 UJ	0.26 UJ	0.6 UJ	0.27 J	0.28 UJ	0.26 UJ	0.6 UJ	0.26 UJ	0.27 UJ	0.27 UJ	0.06 UJ
Silver	0.69 J	0.68 J	0.5 U	0.6 U	0.6 U	0.6 U	0.5 U	1.15 U	0.5 U	0.6 U	0.43 J	0.47 J
Thallium	1.2 U	0.6 UJ	0.26 U	0.13 J	0.28 U	0.28 U	0.26 U	0.29 UJ	0.26 U	0.14 J	0.27 U	0.27 U
TPH	23.1 U	93.2	66.8	21.8 U	253 J	22 U	344	23.1 U	80.5	21.6 U	44.1	21.6 U

** Mean soil concentration multiplied by BAF of 4.6 (Cd) and 12 (Se).
R Rejected
J Estimated value below reporting limit or estimated based on data quality criteria
U Non-detect, value shown is one-half the reporting limit

Page 1 of 2

Source: Woodward-Clyde, 1994

Table 58-2b
Risk Characterization Summary
SWMU 127

Chemical	CAN127-1278-0000	CAN127-1278-0002	N	Arithmetic Mean (mg/kg)	Robin Benchmark Dietary Level (mg/kg)	Risk?
Volatile Organics						
1,2-Dichloroethane	0.0027 U	0.0027 U	14	0.003	312.5	--
1,2-Dichloropropane	0.0027 U	0.0027 U	14	0.003	1000	--
Toluene	0.0027 U	0.0027 U	14	0.005	12500	--
Xylenes (total)	0.0027 U	0.0027 U	14	0.004	5000	--
Semivolatile Organics						
Acenaphthene	0.7 U		9	0.236	0.4	--
Anthracene	0.7 U		9	0.283	5000	--
Benzo(a)anthracene	0.15 J		9	1.074	0.4	--
Benzo(a)pyrene	0.18 J		9	1.159	0.002	Possible
Benzo(b)fluoranthene	0.38 J		9	2.220	8	--
Benzo(g,h,i)perylene	0.7 U		9	0.799	375	--
Carbazole	0.7 U		9	0.372	250	--
Chrysene	0.26 J		9	1.811	12	--
Fluoranthene	0.44 J		9	2.317	625	--
Fluorene	0.7 U		9	0.252	625	--
Ideno(1,2,3-cd)pyrene	0.7 U		9	0.787	14.4	--
2-Methylnaphthalene	0.7 U		9	0.306	815	--
Phenanthrene	0.19 J		9	1.106	150	--
Pyrene	0.36 J		9	2.283	375	--
Metals						
Aluminum	6790	8050	14	8267	1500	Possible
Antimony	3.2 U	3.3 U	14	3.9	16.5	--
Cadmium	0.27 U	0.27 U	14	1.79**	10.5	--
Copper	7.3	9.1	14	9.1	260	--
Lead	42.4	7.5	14	19.1	87.5	--
Selenium	0.27 U	0.6 UJ	14	4.8**	5	--
Silver	0.53 J	0.45 J	14	0.59	41	--
Thallium	0.27 U	0.27 U	14	0.34	600	--
TPH	21.2 U	21.8 U	14	75.6	241	--

* Between 0 and 2 feet deep
** Mean soil concentration multiplied by BAF of 4.6 (Cd) and 12 (Se).
R Rejected
J Estimated value below reporting limit or estimated based on data quality criteria
U Non-detect, value shown i s one-half the reporting limit

Page 2 of 2

Source: Woodward-Clyde, 1994

Table 58-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2709-0000			CAN127-2709-0005			CAN127-2709-0010			CAN127-2710-0000			CAN127-2710-0005			CAN127-2710-0010		
LAB SAMPLE NUMBER	0398710011SA			0398710009SA			0398710008SA			0398710005SA			0398710003SA			0398710007SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	5000	14000	J	7.3	12	J	11	11		7500	14000	J	12	12		11	11	
Benzene	<	7000	U	<	5.8	U	<	5.7	U	3800	7200	J	<	5.9	U	<	5.5	U
Ethylbenzene	3900	7000	J	<	5.8	U	<	5.7	U	54000	7200		<	5.9	U	<	5.5	U
Methylene chloride	<	7000	U	<	5.8	U	<	5.7	U	<	7200	U	<	5.9	U	<	5.5	U
Toluene	14000	7000		<	5.8	U	<	5.7	U	82000	7200		<	5.9	U	<	5.5	U
Xylenes (total)	33000	7000		<	5.8	U	<	5.7	U	260000	7200		<	5.9	U	<	5.5	U
Semivolatile Organics (µg/kg)																		
Acenaphthene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Anthracene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Benzo(a)anthracene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Benzo(a)pyrene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Benzo(b)fluoranthene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Benzo(g,h,i)perylene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Benzo(k)fluoranthene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Carbazole	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Chrysene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Dibenz(a,h)anthracene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Fluoranthene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Fluorene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Indeno(1,2,3-cd)pyrene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
2-Methylnaphthalene	4900	37000	J	<	380	U	<	380	U	40000	38000		<	390	U	<	360	U
Naphthalene	<	37000	U	<	380	U	<	380	U	21000	38000	J	<	390	U	<	360	U
Phenanthrene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Pyrene	<	37000	U	<	380	U	<	380	U	<	38000	U	<	390	U	<	360	U
Metals (mg/kg)																		
Aluminum	9240	11.2		7350	23.1		6950	22.8		11100	11.5		4530	58.8		4900	11	
Arsenic	3	0.56		2.3	0.58		1.3	0.57		2.4	0.58		1.6	0.59		0.88	0.55	
Barium	638	1.1	J	866	2.3	J	1540	2.3	J	205	1.2	J	329	5.9	J	128	1.1	J
Beryllium	0.43	0.22		0.43	0.46	J	0.4	0.46	J	0.55	0.23		<	1.2	U	0.34	0.22	

Page 1 of 6

Source: URS Greiner Woodward Clyde, 2000

Table 58-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2709-0000			CAN127-2709-0005			CAN127-2709-0010			CAN127-2710-0000			CAN127-2710-0005			CAN127-2710-0010		
LAB SAMPLE NUMBER	0398710011SA			0398710009SA			0398710008SA			0398710005SA			0398710003SA			0398710007SA		
COLLECT DATE	12/13/94			12/13/94			12/13/94			12/13/94			12/13/94			12/13/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Cadmium	0.64	0.56		<	1.2	U	<	1.1	U	<	0.58	U	<	2.9	U	<	0.55	U
Calcium	53500	22.4		204000	46.2		135000	45.5		20500	23		254000	118		75700	22	
Chromium	11.3	1.1		4.4	2.3		4.6	2.3		10.5	1.2		<	5.9	U	3.9	1.1	
Cobalt	8	1.1		3.2	2.3		<	2.3	U	5.3	1.2		3	5.9	J	2.5	1.1	
Copper	8.5	2.2		4.5	4.6	J	3	4.6	J	8.8	2.3		<	11.8	U	2.1	2.2	J
Iron	10800	11.2		5780	23.1		5300	22.8		10400	11.5		3560	58.8		4120	11	
Lead	6.4	0.56	J	3.9	0.58	J	3.5	0.57	J	7.6	0.58	J	3.1	0.59	J	3.3	0.55	J
Magnesium	2220	22.4		3480	46.2		3490	45.5		2000	23		3600	118		2520	22	
Manganese	340	1.1		80.1	2.3		47	2.3		174	1.2		36.5	5.9		60.8	1.1	
Nickel	10.5	4.5		6.9	9.2	J	4.9	9.1	J	9	4.6		6.5	23.5	J	5.5	4.4	
Potassium	1330	560		1330	1150		1730	1140		1920	576		735	2940	J	1300	550	
Sodium	<	560	U	<	1150	U	<	1140	U	<	576	U	<	2940	U	<	550	U
Thallium	<	1.1	UJ	<	1.2	UJ	<	2.3	UJ	<	1.2	UJ	<	2.4	UJ	<	1.1	UJ
Vanadium	18.5	1.1		15.3	2.3		12.9	2.3		19.8	1.2		11.1	5.9		11.7	1.1	
Zinc	25.2	2.2		14.2	4.6		12	4.6		25.4	2.3		9.8	11.8	J	10	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	<	44.8	U	<	46.2	U	<	45.5	U	11600	1150		<	47	U	<	44	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value D = Sample was diluted for analysis
U = Nondetected value RL = Reporting Limit
(1) Duplicate for preceding sample number.

Page 2 of 6

Source: URS Greiner Woodward Clyde, 2000

Table 58-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2711-0000			CAN127-2711-0005			CAN127-2711-0010			CAN127-2711-0015			CAN127-2711-0020		
LAB SAMPLE NUMBER	0397370007SA			0397370008SA			0397370009SA			0397370010SA			0397370011SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	11	U	4.6	11	J	5.3	11	J	7	11	J	5	11	J
Benzene	<	5.4	U	<	5.3	U	<	5.7	U	<	5.5	U	<	5.6	U
Ethylbenzene	<	5.4	U	<	5.3	U	<	5.7	U	<	5.5	U	<	5.6	U
Methylene chloride	<	5.4	U	<	5.3	U	1.3	5.7	J	<	5.5	U	1.2	5.6	J
Toluene	<	5.4	U	<	5.3	U	<	5.7	U	<	5.5	U	<	5.6	U
Xylenes (total)	<	5.4	U	<	5.3	U	<	5.7	U	<	5.5	U	<	5.6	U
Semivolatile Organics (µg/kg)															
Acenaphthene	<	360	U	<	350	U	<	370	U	<	370	U	<	370	U
Anthracene	68	360	J	<	350	U	<	370	U	<	370	U	<	370	U
Benzo(a)anthracene	910	360		<	350	U	<	370	U	<	370	U	<	370	U
Benzo(a)pyrene	1100	360		<	350	U	<	370	U	<	370	U	<	370	U
Benzo(b)fluoranthene	1100	360	J	<	350	UJ	<	370	UJ	<	370	UJ	<	370	UJ
Benzo(g,h,i)perylene	700	360		<	350	U	<	370	U	<	370	U	<	370	U
Benzo(k)fluoranthene	1600	360		<	350	U	<	370	U	<	370	U	<	370	U
Carbazole	170	360	J	<	350	U	<	370	U	<	370	U	<	370	U
Chrysene	1500	360		<	350	U	<	370	U	<	370	U	<	370	U
Dibenz(a,h)anthracene	280	360	J	<	350	U	<	370	U	<	370	U	<	370	U
Fluoranthene	2800	360		<	350	U	<	370	U	<	370	U	<	370	U
Fluorene	<	360	U	<	350	U	<	370	U	<	370	U	<	370	U
Indeno(1,2,3-cd)pyrene	700	360		<	350	U	<	370	U	<	370	U	<	370	U
2-Methylnaphthalene	<	360	U	<	350	U	<	370	U	<	370	U	<	370	U
Naphthalene	<	360	U	<	350	U	<	370	U	<	370	U	<	370	U
Phenanthrene	1100	360		<	350	U	<	370	U	<	370	U	<	370	U
Pyrene	2300	360		<	350	U	<	370	U	<	370	U	<	370	U
Metals (mg/kg)															
Aluminum	11000	10.8	J	7000	10.6	J	6940	22.7	J	10200	11.1	J	6390	11.2	J
Arsenic	2.4	0.54		1.6	0.53		1.5	0.57		2	0.55		1.9	0.56	
Barium	105	1.1	J	86.2	1.1	J	232	2.3	J	241	1.1	J	54.9	1.1	J
Beryllium	0.5	0.22		0.3	0.21		0.47	0.45		0.5	0.22		0.58	0.22	

Page 3 of 6

Source: URS Greiner Woodward Clyde, 2000

Table 58-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2711-0000			CAN127-2711-0005			CAN127-2711-0010			CAN127-2711-0015			CAN127-2711-0020		
LAB SAMPLE NUMBER	0397370007SA			0397370008SA			0397370009SA			0397370010SA			0397370011SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)															
Cadmium	<	0.54	U	<	0.53	U	<	1.1	U	<	0.55	U	<	0.56	U
Calcium	19300	21.6		63300	21.1		161000	45.3		63500	22.2		57400	22.4	
Chromium	15.5	1.1		6.4	1.1		4.7	2.3		7.4	1.1		5.3	1.1	
Cobalt	3.4	1.1		2.1	1.1		2.5	2.3		3	1.1		3.3	1.1	
Copper	7.5	2.2		4.5	2.1		2.6	4.5	J	4.8	2.2		4.7	2.2	
Iron	9760	10.8	J	6140	10.6	J	5560	22.7	J	7640	11.1	J	5610	11.2	J
Lead	83.9	5.4		4.5	0.53		4.1	0.57		6.9	0.55		6.2	0.56	
Magnesium	1980	21.6		2070	21.1		4690	45.3		4600	22.2		3890	22.4	
Manganese	183	1.1	J	83.9	1.1	J	55.9	2.3	J	111	1.1	J	111	1.1	J
Nickel	8.1	4.3		6.3	4.2		8.5	9.1	J	8	4.4		7.2	4.5	
Potassium	2030	541		1310	528		1600	1130		2620	554		2040	559	
Sodium	<	541	U	<	528	U	<	1130	U	248	554	J	<	559	U
Thallium	<	0.54	U	<	0.53	U	<	1.1	UJ	<	1.1	UJ	<	0.56	U
Vanadium	17.8	1.1		12.5	1.1		13.5	2.3		15.4	1.1		15.6	1.1	
Zinc	34.7	2.2		15.1	2.1		13.3	4.5		20.8	2.2		13.7	2.2	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbon	130	43.3		<	42.2	U	<	45.3	U	<	44.3	U	<	44.7	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value D = Sample was diluted for analysis
U = Nondetected value RL = Reporting Limit
(1) Duplicate for preceding sample number.

Page 4 of 6

Source: URS Greiner Woodward Clyde, 2000

Table 58-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2711-0025			CAN127-2711-0030			CAN127-2711-0035			CAN127-2711-0040			CAN127-2711-0050			CAN127-2711-0060		
LAB SAMPLE NUMBER	0397370012SA			0397370013SA			0397740013SA			0397740014SA			0397740015SA			0397740016SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	8.6	11	J	<	11	U	1.3	11	J	<	11	U	<	11	U	<	11	U
Benzene	<	5.6	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Ethylbenzene	<	5.6	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Methylene chloride	<	5.6	U	<	5.6	U	1.6	5.6	UJ	1.2	5.5	UJ	1.5	5.6	UJ	1.6	5.6	UJ
Toluene	<	5.6	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Xylenes (total)	<	5.6	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.6	U	<	5.6	U
Semivolatile Organics (µg/kg)																		
Acenaphthene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Anthracene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Benzo(a)anthracene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Benzo(a)pyrene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Benzo(b)fluoranthene	<	370	UJ	<	370	UJ	<	370	U	<	360	U	<	370	U	<	370	U
Benzo(g,h,i)perylene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Benzo(k)fluoranthene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Carbazole	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Chrysene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Dibenz(a,h)anthracene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Fluoranthene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Fluorene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
2-Methylnaphthalene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Naphthalene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Phenanthrene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Pyrene	<	370	U	<	370	U	<	370	U	<	360	U	<	370	U	<	370	U
Metals (mg/kg)																		
Aluminum	2880	22.3	J	7120	11.3	J	7040	11.2		5410	10.9		4770	11.1		3590	11.1	
Arsenic	1.7	0.56		1.4	0.56		1.3	0.56		2.2	0.55		1.6	0.56		1.8	0.56	
Barium	109	2.2	J	144	1.1	J	27	1.1		22.5	1.1		42.7	1.1		24.5	1.1	
Beryllium	0.29	0.45	J	0.21	0.23	J	0.27	0.22		0.27	0.22		0.24	0.22		0.19	0.22	J

Page 5 of 6

Source: URS Greiner Woodward Clyde, 2000

Table 58-3a
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2711-0025			CAN127-2711-0030			CAN127-2711-0035			CAN127-2711-0040			CAN127-2711-0050			CAN127-2711-0060		
LAB SAMPLE NUMBER	0397370012SA			0397370013SA			0397740013SA			0397740014SA			0397740015SA			0397740016SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Cadmium	<	1.1	U	<	0.56	U	<	0.56	U	<	0.55	U	<	0.56	U	<	0.56	U
Calcium	190000	44.6		81300	22.6		30700	22.3		30400	21.9		64400	22.3		32400	22.2	
Chromium	2.7	2.2		5.4	1.1		6.4	1.1		4.5	1.1		5.5	1.1		3.2	1.1	
Cobalt	<	2.2	U	1.1	1.1		1.3	1.1		1.7	1.1		2.3	1.1		1.4	1.1	
Copper	1.6	4.5	J	1.8	2.3	J	2.1	2.2	J	2.1	2.2	J	2.2	2.2		2.1	2.2	J
Iron	2190	22.3	J	4590	11.3	J	5200	11.2		4690	10.9		3930	11.1		3450	11.1	
Lead	3	0.56		3.3	0.56		2.8	0.56	J	3.5	0.55	J	2.3	0.56	J	1.9	0.56	J
Magnesium	5440	44.6		6760	22.6		6810	22.3	J	3670	21.9		5350	22.3	J	3520	22.2	J
Manganese	15.7	2.2	J	36.5	1.1	J	40.7	1.1		50.9	1.1		46.3	1.1		35.8	1.1	
Nickel	3.3	8.9	J	5.7	4.5		4.6	4.5		4	4.4	J	4.2	4.5	J	2	4.4	J
Potassium	842	1120	J	1250	564		1310	558		1180	547		936	557		665	556	
Sodium	<	1120	U	<	564	U	<	558	U	<	547	U	<	557	U	<	556	U
Thallium	<	1.1	UJ	0.16	0.56	J	<	1.1	UJ	<	1.1	UJ	<	0.56	UJ	<	0.56	UJ
Vanadium	11.8	2.2		17.1	1.1		23.2	1.1		17	1.1		19.8	1.1		15.1	1.1	
Zinc	5.6	4.5		10.7	2.3		10.8	2.2		10.6	2.2		8.8	2.2		7.8	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbo	<	44.6	U	<	45.1	U	<	44.7	UJ	<	43.8	UJ	<	44.6	UJ	<	44.4	UJ

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value D = Sample was diluted for analysis
U = Nondetected value RL = Reporting Limit
(1) Duplicate for preceding sample number.

Page 6 of 6

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2712-0000			CAN127-2712-0005			CAN127-2712-0010			CAN127-2712-0015			CAN127-2712-0020		
LAB SAMPLE NUMBER	0397130001SA			0397130002SA			0397130003SA			0397130004SA			0397130005SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	11	U	<	11	U	14	11		<	11	U	<	11	U
4-Methyl-2-pentanone (MIBK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methylene chloride	<	6	U	<	6.1	U	<	5.7	U	<	5.5	U	<	6.9	U
Toluene	<	5.5	U	<	5.5	U	<	5.4	U	<	5.5	U	<	5.6	U
Semivolatile Organics (µg/kg)															
Anthracene	56	360	J	<	370	U	<	360	U	<	360	U	<	370	U
Benzo(a)anthracene	660	360		<	370	U	<	360	U	<	360	U	<	370	U
Benzo(a)pyrene	800	360		<	370	U	<	360	U	<	360	U	<	370	U
Benzo(b)fluoranthene	1600	360		<	370	U	<	360	U	<	360	U	<	370	U
Benzo(g,h,i)perylene	640	360		<	370	U	<	360	U	<	360	U	<	370	U
bis(2-Ethylhexyl)phthalate	68	360	J	<	370	U	<	360	U	<	360	U	<	370	U
Carbazole	120	360	J	<	370	U	<	360	U	<	360	U	<	370	U
Chrysene	1000	360		<	370	U	<	360	U	<	360	U	<	370	U
Dibenz(a,h)anthracene	120	360	J	<	370	U	<	360	U	<	360	U	<	370	U
Fluoranthene	1800	360		<	370	U	<	360	U	<	360	U	<	370	U
Indeno(1,2,3-cd)pyrene	570	360		<	370	U	<	360	U	<	360	U	<	370	U
Phenanthrene	880	360		<	370	U	<	360	U	<	360	U	<	370	U
Pyrene	1900	360		<	370	U	<	360	U	<	360	U	<	370	U
Metals (mg/kg)															
Aluminum	11800	11	J	6970	22.1	J	4560	10.9	J	4270	11	J	9520	22.6	J
Arsenic	2.4	0.55		2.3	0.55		1.5	0.54		1.7	0.55		1.8	0.56	
Barium	108	1.1		197	2.2		169	1.1		360	1.1		337	2.3	
Beryllium	0.43	0.22		0.57	0.44		0.27	0.22		0.29	0.22		0.64	0.45	
Calcium	12200	21.9	J	173000	44.3	J	96200	21.7	J	80500	22	J	195000	45.1	J
Chromium	21.4	1.1	J	6	2.2	J	3.8	1.1	J	4	1.1	J	7	2.3	J
Cobalt	3.7	1.1		3.4	2.2		2.1	1.1		2.4	1.1		<	2.3	U
Copper	7.4	2.2		5.7	4.4		2.5	2.2		2.1	2.2	J	3.9	4.5	J
Iron	9550	11	J	6380	22.1	J	3870	10.9	J	3700	11	J	6720	22.6	J

Page 1 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2712-0000			CAN127-2712-0005			CAN127-2712-0010			CAN127-2712-0015			CAN127-2712-0020		
LAB SAMPLE NUMBER	0397130001SA			0397130002SA			0397130003SA			0397130004SA			0397130005SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.															
Lead	60.9	5.5	J	6.4	1.1	J	3.9	0.54	J	4.2	0.55	J	3.8	0.56	J
Magnesium	1880	21.9		3290	44.3		2640	21.7		2690	22		7850	45.1	
Manganese	167	1.1	J	99.2	2.2	J	62.9	1.1	J	65.8	1.1	J	61.5	2.3	J
Nickel	7.5	4.4		8.8	8.9	J	5.3	4.3		5.3	4.4		4.8	9	J
Potassium	2090	548		1410	1110		1200	543		1230	551		2470	1130	
Thallium	0.16	0.55	J	0.12	1.1	J	0.12	1.1	J	0.11	1.1	J	0.11	1.1	J
Vanadium	17.5	1.1	J	17	2.2	J	12.5	1.1	J	10.9	1.1	J	15.7	2.3	J
Zinc	41.1	2.2		18.3	4.4		9.6	2.2		9.9	2.2		16.4	4.5	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbon	168	43.9		<	44.3	U	<	43.4	U	48	44.1		293	45.1	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value
U = Nondetected value
D = Sample was diluted for analysis
RL = Reporting Limit

Page 2 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2712-0025			CAN127-2712-0030			CAN127-2712-0035			CAN127-2712-0040			CAN127-2712-0050			CAN127-2712-0060		
LAB SAMPLE NUMBER	0397130006SA			0397130007SA			0397130008SA			0397130009SA			0397130010SA			0397130011SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	<	11	U	<	12	U	<	11	U	<	11	U	<	11	U
4-Methyl-2-pentanone (MIBK)	<	11	U	<	11	U	<	12	U	<	11	U	<	11	U	<	11	U
Methylene chloride	<	6	U	<	6.7	U	<	5.8	U	<	6	U	<	6	U	<	5.6	U
Toluene	<	5.6	U	<	5.6	U	<	5.8	U	<	5.6	U	<	5.6	U	<	5.6	U
Semivolatile Organics (µg/kg)																		
Anthracene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Benzo(a)anthracene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Benzo(a)pyrene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Benzo(b)fluoranthene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Benzo(g,h,i)perylene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
bis(2-Ethylhexyl)phthalate	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Carbazole	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Chrysene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Dibenz(a,h)anthracene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Fluoranthene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Phenanthrene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Pyrene	<	370	U	<	370	U	<	380	U	<	370	U	<	370	U	<	370	U
Metals (mg/kg)																		
Aluminum	6100	11.1	J	6870	11.3	J	5210	11.5	J	5330	11.1	J	5480	11.3	J	4600	11.2	J
Arsenic	2	0.56		1.8	0.56		1.3	0.58		1.1	0.56		1.4	0.56		1.8	0.56	
Barium	108	1.1		91.4	1.1		28.6	1.2		24	1.1		59.9	1.1		28.4	1.1	
Beryllium	0.21	0.22	J	0.32	0.23		0.15	0.23	J	0.17	0.22	J	0.19	0.23	J	0.15	0.22	J
Calcium	88400	22.2	J	66000	22.6	J	66700	23	J	35500	22.2	J	51100	22.5	J	26900	22.3	J
Chromium	4.8	1.1	J	5.4	1.1	J	4.2	1.2	J	5.8	1.1	J	6.1	1.1	J	5.2	1.1	J
Cobalt	2	1.1		2.2	1.1		1.5	1.2		1.5	1.1		2.7	1.1		1.2	1.1	
Copper	2.8	2.2		2.7	2.3		1.8	2.3	J	3.6	2.2		2.7	2.3		2.3	2.2	
Iron	4350	11.1	J	5080	11.3	J	3520	11.5	J	3690	11.1	J	4050	11.3	J	3700	11.2	J

Page 3 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2712-0025			CAN127-2712-0030			CAN127-2712-0035			CAN127-2712-0040			CAN127-2712-0050			CAN127-2712-0060		
LAB SAMPLE NUMBER	0397130006SA			0397130007SA			0397130008SA			0397130009SA			0397130010SA			0397130011SA		
COLLECT DATE	12/08/94			12/08/94			12/08/94			12/08/94			12/08/94			12/08/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Lead	3.8	0.56	J	3.3	0.56	J	2.3	0.58	J	1.9	0.56	J	2.5	0.56	J	2	2.8	J
Magnesium	6090	22.2		5900	22.6		6920	23		9070	22.2		15000	22.5		10000	22.3	
Manganese	56.5	1.1	J	57.8	1.1	J	34.2	1.2	J	48.4	1.1	J	80.8	1.1	J	37.1	1.1	J
Nickel	5.7	4.4		5.9	4.5		3.9	4.6	J	4.5	4.4		4.3	4.5	J	3.8	4.5	J
Potassium	1640	556		1630	565		1040	576		1040	555		1070	563		936	558	
Thallium	<	0.56	U	<	0.56	U	0.12	0.58	J	<	0.56	U	<	0.56	U	<	0.56	U
Vanadium	13.3	1.1	J	20.5	1.1	J	16.1	1.2	J	18.6	1.1	J	21.5	1.1	J	16	1.1	J
Zinc	10.5	2.2		12	2.3		8.1	2.3		9.8	2.2		9.5	2.3		14	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbo	<	44.5	U	<	45.2	U	<	46	U	67.4	44.4		<	45.1	U	<	44.6	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value D = Sample was diluted for analysis
U = Nondetected value RL = Reporting Limit

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0000			CAN127-2713-0000			CAN127-2713-0005			CAN127-2713-0010			CAN127-2713-0010			CAN127-2713-0015		
LAB SAMPLE NUMBER	0397380001SA			0397380013SA			0397380002SA			0397380003RA			0397380003SA			0397380004RA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U				<	11	U				<	11	U			
4-Methyl-2-pentanone (MIBK)	<	11	U				<	11	U				<	11	U			
Methylene chloride	6.7	6.7					<	6.5	U				<	7	U			
Toluene	1.3	5.5	J				<	5.5	U				1.2	5.6	J			
Semivolatile Organics (µg/kg)																		
Anthracene	<	360	U	<	360	UJ	<	360	UJ	<	370	UJ	<	370	U	<	380	UJ
Benzo(a)anthracene	95	360	J	89	360	J	91	360	J	<	370	UJ	<	370	U	<	380	UJ
Benzo(a)pyrene	130	360	J	110	360	J	100	360	J	<	370	UJ	<	370	U	<	380	UJ
Benzo(b)fluoranthene	310	360	J	230	360	J	250	360	J	<	370	UJ	<	370	U	<	380	UJ
Benzo(g,h,i)perylene	100	360	J	<	360	UJ	<	360	UJ	<	370	UJ	<	370	U	<	380	UJ
bis(2-Ethylhexyl)phthalate	<	780	U	<	360	UJ	<	360	UJ	<	370	UJ	<	370	U	<	380	UJ
Carbazole	<	360	U	<	360	UJ	<	360	UJ	<	370	UJ	<	410	U	<	380	UJ
Chrysene	190	360	J	160	360	J	150	360	J	<	370	UJ	<	370	U	<	380	UJ
Dibenz(a,h)anthracene	43	360	J	<	360	UJ	<	360	UJ	<	370	UJ	<	370	U	<	380	UJ
Fluoranthene	310	360	J	310	360	J	310	360	J	<	370	UJ	<	370	U	<	380	UJ
Indeno(1,2,3-cd)pyrene	88	360	J	<	360	UJ	<	360	UJ	<	370	UJ	<	370	U	<	380	UJ
Phenanthrene	110	360	J	100	360	J	100	360	J	<	370	UJ	<	370	U	<	380	UJ
Pyrene	260	360	J	260	360	J	250	360	J	<	370	UJ	<	370	U	<	380	UJ
Metals (mg/kg)																		
Aluminum	14500	11	J				11700	10.9	J				6930	22.4	J			
Arsenic	2.6	0.55					2.6	0.55					2.5	0.56				
Barium	170	1.1	J				176	1.1	J				253	2.2	J			
Beryllium	0.71	0.22	J				0.76	0.22	J				<	0.45	UJ			
Calcium	41400	21.9	J				40100	21.9	J				135000	44.8	J			
Chromium	12.9	1.1	J				11.6	1.1	J				11.7	2.2	J			
Cobalt	4.6	1.1	J				4.7	1.1	J				3	2.2	J			
Copper	8.5	2.2	J				8.6	2.2	J				5.6	4.5	J			
Iron	11500	11	J				10900	10.9	J				6410	22.4	J			

Page 5 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0000			CAN127-2713-0000			CAN127-2713-0005			CAN127-2713-0010			CAN127-2713-0010			CAN127-2713-0015		
LAB SAMPLE NUMBER	0397380001SA			0397380013SA			0397380002SA			0397380003RA			0397380003SA			0397380004RA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Lead	13.4	2.7	J				12.5	2.7	J				4.9	0.56	J			
Magnesium	2760	21.9					2560	21.9					2960	44.8				
Manganese	187	1.1	J				200	1.1	J				84.6	2.2	J			
Nickel	10.4	4.4					9.4	4.4					7	9	J			
Potassium	2390	548	J				2080	547	J				1360	1120	J			
Thallium	0.12	0.55	J				<	0.55	U				<	0.56	U			
Vanadium	20.8	1.1					22	1.1					16.1	2.2				
Zinc	30.3	2.2	J				26.4	2.2	J				15.8	4.5	J			
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons	66.5	43.9					52.3	43.8					<	44.8	U			

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value D = Sample was diluted for analysis
U = Nondetected value RL = Reporting Limit

Page 6 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0015			CAN127-2713-0020			CAN127-2713-0020			CAN127-2713-0025			CAN127-2713-0025		
LAB SAMPLE NUMBER	0397380004SA			0397380005RA			0397380005SA			0397380006RA			0397380006SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	11	U				<	11	U				<	12	U
4-Methyl-2-pentanone (MIBK)	<	11	U				<	11	U				<	12	U
Methylene chloride	<	6.3	U				<	5.5	U				<	6.3	U
Toluene	<	5.7	U				<	5.5	U				<	5.8	U
Semivolatile Organics (µg/kg)															
Anthracene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Benzo(a)anthracene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Benzo(a)pyrene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Benzo(b)fluoranthene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Benzo(g,h,i)perylene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
bis(2-Ethylhexyl)phthalate	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Carbazole	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Chrysene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Dibenz(a,h)anthracene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Fluoranthene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Indeno(1,2,3-cd)pyrene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Phenanthrene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Pyrene	<	380	U	<	360	UJ	<	360	U	<	380	UJ	<	380	U
Metals (mg/kg)															
Aluminum	4600	22.8	J				7190	22.1	J				14700	23.3	J
Arsenic	1.8	0.57					1.7	0.55					2.3	0.58	
Barium	404	2.3	J				238	2.2	J				241	2.3	J
Beryllium	0.39	0.46	J				0.56	0.44	J				0.51	0.47	J
Calcium	218000	45.6	J				121000	44.2	J				180000	46.5	J
Chromium	3.2	2.3	J				6.7	2.2	J				7.1	2.3	J
Cobalt	2.1	2.3	J				3.1	2.2	J				2.1	2.3	J
Copper	2.3	4.6	J				4.1	4.4	J				3.5	4.7	J
Iron	3720	22.8	J				6340	22.1	J				8010	23.3	J

Page 7 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3b
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0015			CAN127-2713-0020			CAN127-2713-0020			CAN127-2713-0025			CAN127-2713-0025		
LAB SAMPLE NUMBER	0397380004SA			0397380005RA			0397380005SA			0397380006RA			0397380006SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)															
Lead	3.8	0.57	J				4.9	0.55	J				4.4	0.58	J
Magnesium	4300	45.6					4560	44.2					12600	46.5	
Manganese	46.5	2.3	J				89.2	2.2	J				49.7	2.3	J
Nickel	6.5	9.1	J				5.4	8.8	J				9.2	9.3	J
Potassium	1230	1140	J				1990	1110	J				3230	1160	J
Thallium	<	1.1	UJ				<	0.55	U				<	1.2	UJ
Vanadium	12.5	2.3					16.3	2.2					22.2	2.3	
Zinc	10	4.6	J				16.2	4.4	J				19.4	4.7	J
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarb	<	45.6	U				<	44.2	U				<	46.5	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value
U = Nondetected value
D = Sample was diluted for analysis
RL = Reporting Limit

Page 8 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0030			CAN127-2713-0030			CAN127-2713-0035			CAN127-2713-0035			CAN127-2713-0040			CAN127-2713-0040		
LAB SAMPLE NUMBER	0397380007RA			0397380007SA			0397380008RA			0397380008SA			0397380009RA			0397380009SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone				<	11	U				<	11	U				5.6	11	J
2-Butanone (MEK)				<	11	U				<	11	U				<	11	U
Methylene chloride				<	5.7	U				<	5.7	U				<	5.6	U
Toluene				1.6	5.6	J				9	5.7					<	5.6	U
Semivolatile Organics (µg/kg)																		
Anthracene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Benzo(a)anthracene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Benzo(a)pyrene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Benzo(b)fluoranthene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Benzo(g,h,i)perylene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Benzo(k)fluoranthene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
bis(2-Ethylhexyl)phthalate	<	370	UJ	<	950	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Carbazole	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Chrysene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Di-n-butyl phthalate	<	370	UJ	77	370	J	<	380	UJ	58	380	J	<	370	UJ	<	370	U
Dibenz(a,h)anthracene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Fluoranthene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Indeno(1,2,3-cd)pyrene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Phenanthrene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Pyrene	<	370	UJ	<	370	U	<	380	UJ	<	380	U	<	370	UJ	<	370	U
Metals (mg/kg)																		
Aluminum				8550	22.4	J				7010	23	J				6710	11.1	J
Antimony				<	13.4	UJ				<	13.8	UJ				<	6.7	UJ
Arsenic				1.9	0.56					1.4	0.57					1.4	0.56	
Barium				290	2.2	J				445	2.3	J				62.3	1.1	J
Beryllium				0.5	0.45	J				0.25	0.46	J				0.32	0.22	J

Page 1 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0030			CAN127-2713-0030			CAN127-2713-0035			CAN127-2713-0035			CAN127-2713-0040			CAN127-2713-0040		
LAB SAMPLE NUMBER	0397380007RA			0397380007SA			0397380008RA			0397380008SA			0397380009RA			0397380009SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Calcium				186000	44.8	J				149000	45.9	J				30900	22.2	J
Chromium				8.8	2.2	J				4.4	2.3	J				7.2	1.1	J
Cobalt				2.2	2.2	J				1.2	2.3	J				1.9	1.1	J
Copper				4.6	4.5	J				2	4.6	J				2.1	2.2	J
Iron				5670	22.4	J				4510	23	J				5290	11.1	J
Lead				3	0.56	J				3	0.57	J				2.9	0.56	J
Magnesium				6630	44.8					6520	45.9					4540	22.2	
Manganese				38.7	2.2	J				36.3	2.3	J				47.2	1.1	J
Nickel				6.9	9	J				3.7	9.2	J				4.3	4.4	J
Potassium				1730	1120	J				1250	1150	J				1270	556	J
Sodium				521	1120	J				<	1150	U				<	556	U
Thallium				<	1.1	UJ				<	0.57	U				<	0.56	U
Vanadium				19.3	2.2					18	2.3					18.9	1.1	
Zinc				13.1	4.5	J				10.1	4.6	J				11.1	2.2	J
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbons				47.1	44.8					<	45.9	U				<	44.5	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value
U = Nondetected value
D = Sample was diluted for analysis
RL = Reporting Limit

Page 2 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0050			CAN127-2713-0050			CAN127-2713-0060			CAN127-2713-0060		
LAB SAMPLE NUMBER	0397380010RA			0397380010SA			0397380011RA			0397380011SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)												
Acetone				3.1	11	J				25	11	
2-Butanone (MEK)				<	11	U				6.2	11	J
Methylene chloride				<	5.7	U				<	5.6	U
Toluene				<	5.7	U				<	5.6	U
Semivolatile Organics (µg/kg)												
Anthracene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Benzo(a)anthracene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Benzo(a)pyrene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Benzo(b)fluoranthene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Benzo(g,h,i)perylene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Benzo(k)fluoranthene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
bis(2-Ethylhexyl)phthalate	<	370	UJ	<	600	U	<	370	UJ	<	590	U
Carbazole	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Chrysene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Di-n-butyl phthalate	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Dibenz(a,h)anthracene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Fluoranthene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Indeno(1,2,3-cd)pyrene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Phenanthrene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Pyrene	<	370	UJ	<	370	U	<	370	UJ	<	370	U
Metals (mg/kg)												
Aluminum				5550	11.3	J				5450	11.1	J
Antimony				<	6.8	UJ				<	6.7	UJ
Arsenic				1.9	0.57					1.8	0.56	
Barium				23.8	1.1	J				132	1.1	J
Beryllium				0.29	0.23	J				0.28	0.22	J

Page 3 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2713-0050			CAN127-2713-0050			CAN127-2713-0060			CAN127-2713-0060		
LAB SAMPLE NUMBER	0397380010RA			0397380010SA			0397380011RA			0397380011SA		
COLLECT DATE	12/09/94			12/09/94			12/09/94			12/09/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)												
Calcium				39800	22.7	J				53600	22.2	J
Chromium				6.1	1.1	J				13.4	1.1	J
Cobalt				1.4	1.1	J				2.2	1.1	J
Copper				2.7	2.3	J				9.3	2.2	J
Iron				4390	11.3	J				6110	11.1	J
Lead				3.2	0.57	J				3.1	0.56	J
Magnesium				6500	22.7					4910	22.2	
Manganese				48.2	1.1	J				75.4	1.1	J
Nickel				4.2	4.5	J				6.1	4.4	
Potassium				1110	566	J				1110	555	J
Sodium				<	566	U				<	555	U
Thallium				<	0.57	U				<	0.56	U
Vanadium				21.6	1.1					20.2	1.1	
Zinc				9.9	2.3	J				9.6	2.2	J
TRPH (mg/kg)												
Total Recoverable Petroleum Hydrocarbons				47.9	45.3					<	44.4	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value

R = Rejected value

U = Nondetected value

D = Sample was diluted for analysis

RL = Reporting Limit

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2714-0000			CAN127-2714-0005			CAN127-2714-0010			CAN127-2714-0015			CAN127-2714-0020			CAN127-2714-0025		
LAB SAMPLE NUMBER	0396880006SA			0396880008SA			0396880009SA			0396880010SA			0396880011SA			0396880012SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<		U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	1.3	11	J
Methylene chloride	<	5.6	U	4.4	5.4		<	8	U	4.2	5.4	J	<	5.5	U	<	5.5	J
Toluene	<	5.6	U	<	5.4	U	<	5.4	U	<	5.4	U	<	5.5	U	<	5.5	U
Semivolatile Organics (µg/kg)																		
Anthracene	52	370	J	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Benzo(a)anthracene	450	370		96	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Benzo(a)pyrene	640	370		140	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Benzo(b)fluoranthene	750	370		150	360	J	37	360	J	<	360	U	<	360	U	<	360	U
Benzo(g,h,i)perylene	340	370	J	90	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Benzo(k)fluoranthene	800	370		170	360	J	<	360	U	<	360	U	<	360	U	<	360	U
bis(2-Ethylhexyl)phthalate	450	370		300	360	J	290	360	J	290	360	J	310	360	J	550	360	
Carbazole	100	370	J	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Chrysene	820	370		170	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Di-n-butyl phthalate	<	370	U	<	360	U	<	360	U	<	360	U	<	360	U	<	360	U
Dibenz(a,h)anthracene	150	370	J	43	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Fluoranthene	1400	370		330	360	J	50	360	J	<	360	U	<	360	U	<	360	U
Indeno(1,2,3-cd)pyrene	360	370	J	94	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Phenanthrene	570	370		160	360	J	<	360	U	<	360	U	<	360	U	<	360	U
Pyrene	1300	370		290	360	J	41	360	J	<	360	U	<	360	U	<	360	U
Metals (mg/kg)																		
Aluminum	7050	11.2		9210	10.9		6200	21.8		6230	10.8		7840	11		4610	22.1	
Antimony	<	6.7	UJ	<	6.5	UJ	<	13.1	UJ	<	6.5	UJ	4.6	6.6	UJ	<	13.3	UJ
Arsenic	1.9	0.56		2	0.54	J	1.3	0.54		1.3	0.54	J	11.4	0.55	J	0.84	0.55	J
Barium	92.4	1.1	J	96.1	1.1	J	161	2.2	J	115	1.1	J	78.5	1.1	J	119	2.2	J
Beryllium	0.39	0.22		0.51	0.22		0.35	0.44	J	0.35	0.22		0.5	0.22		<	0.44	U

Page 5 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2714-0000			CAN127-2714-0005			CAN127-2714-0010			CAN127-2714-0015			CAN127-2714-0020			CAN127-2714-0025		
LAB SAMPLE NUMBER	0396880006SA			0396880008SA			0396880009SA			0396880010SA			0396880011SA			0396880012SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)																		
Calcium	18100	22.4		23600	21.7		135000	43.6		52600	21.6		69200	22.1		206000	44.2	
Chromium	9.2	1.1		11.9	1.1		3.7	2.2		5.5	1.1		6.4	1.1		5.8	2.2	
Cobalt	2.9	1.1		3.6	1.1		<	2.2	U	2.2	1.1		3.1	1.1		<	2.2	U
Copper	6.8	2.2		8.3	2.2		3.7	4.4	J	2.8	2.2		5	2.2		8.8	4.4	
Iron	7130	11.2		8550	10.9		4450	21.8		5640	10.8		6510	11		4210	22.1	
Lead	<		R	<		R	<		R	<		R	<		R	<		R
Magnesium	1470	22.4		1950	21.7		2780	43.6		2790	21.6		3840	22.1		5030	44.2	
Manganese	160	1.1		172	1.1		61.7	2.2		94.3	1.1		117	1.1		30.8	2.2	
Nickel	6.7	4.5		8.6	4.3		4.7	8.7	J	5.7	4.3		7	4.4		3.9	8.8	J
Potassium	1790	560		1830	543		1140	1090		1630	540		2040	552		959	1110	J
Sodium	<	560	U	<	543	U	<	1090	U	<	540	U	<	552	U	<	1110	U
Thallium	<	0.56	U	0.11	0.54	J	<	0.54	U	<	0.54	U	<	0.55	U	0.38	0.55	J
Vanadium	13.4	1.1		15.1	1.1		9.4	2.2		14.5	1.1		14.4	1.1		9.3	2.2	
Zinc	31.5	2.2		25.5	2.2		11.9	4.4		13.5	2.2		16.7	2.2		10.3	4.4	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocar	<	44.8	U	69.4	43.4		<	43.6	U	<	43.2	U	<	44.2	U	<	44.2	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value. D = Sample was diluted for analysis.
U = Nondetected value. RL = Reporting Limit.

Page 6 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2714-0030			CAN127-2714-0035			CAN127-2714-0040			CAN127-2714-0050			CAN127-2714-0060		
LAB SAMPLE NUMBER	0396880013SA			0396880014SA			0396880015SA			0396880016SA			0396880017SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	11	U	<	13	U	<	11	U	<	11	U	<	11	U
2-Butanone (MEK)	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methylene chloride	<	5.5	U	<	5.5	U	<	5.4		<	5.4	U	<	5.4	U
Toluene	<	5.5	U	<	5.5	U	<	5.4	U	<	5.4	U	<	5.4	U
Semivolatile Organics (µg/kg)															
Anthracene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Benzo(a)anthracene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Benzo(a)pyrene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Benzo(b)fluoranthene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Benzo(g,h,i)perylene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Benzo(k)fluoranthene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
bis(2-Ethylhexyl)phthalate	270	360	J	710	360		550	360		830	360		640	350	
Carbazole	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Chrysene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Di-n-butyl phthalate	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Dibenz(a,h)anthracene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Fluoranthene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Indeno(1,2,3-cd)pyrene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Phenanthrene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Pyrene	<	360	U	<	360	U	<	360	U	<	360	U	<	350	U
Metals (mg/kg)															
Aluminum	6230	11		6000	11		5460	10.9		4980	10.9		4500	10.7	
Antimony	<	6.6	UJ	<	6.6	UJ	<	6.5	U	<	6.5	UJ	<	6.4	UJ
Arsenic	1.1	0.55	J	0.77	0.55	J	0.98	0.54	J	0.9	0.54	J	1.3	0.54	J
Barium	92.2	1.1	J	90.3	1.1	J	26.7	1.1		97.8	1.1	J	23.8	1.1	J
Beryllium	0.2	0.22	J	0.17	0.22	J	0.16	0.22	J	0.17	0.22	J	0.19	0.21	J

Page 7 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3c
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2714-0030			CAN127-2714-0035			CAN127-2714-0040			CAN127-2714-0050			CAN127-2714-0060		
LAB SAMPLE NUMBER	0396880013SA			0396880014SA			0396880015SA			0396880016SA			0396880017SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg)															
Calcium	104000	22.1		50300	22.1		49300	21.8		38400	21.8		18300	21.5	
Chromium	5.2	1.1		7.4	1.1		6.6	1.1		6.3	1.1		4.5	1.1	
Cobalt	1.3	1.1		1	1.1	J	1.3	1.1		1.6	1.1		2.2	1.1	
Copper	2.6	2.2		7.4	2.2		6.5	2.2		3.3	2.2		1.7	2.1	J
Iron	4080	11		4690	11		4500	10.9		4260	10.9		4150	10.7	
Lead	<		R	3.1	1.1	R	<		R	<		R	<		R
Magnesium	8130	22.1		7920	22.1		7530	21.8		5310	21.8		3610	21.5	
Manganese	33.7	1.1		37	1.1		49.5	1.1		50.5	1.1		58.2	1.1	
Nickel	4.4	4.4		4.8	4.4		5.1	4.4		3.1	4.4	J	3.3	4.3	J
Potassium	1110	552		1110	552		1030	545		949	545		908	537	
Sodium	<	552	U	<	552	U	<	545	U	<	545	U	<	537	U
Thallium	0.21	0.55	J	0.18	1.1	J	<	0.54	U	<	1.1	J	<	0.54	U
Vanadium	13.9	1.1		16.7	1.1		16.7	1.1		18.9	1.1		15.9	1.1	
Zinc	9.9	2.2		10.6	2.2		10.4	2.2		10.5	2.2		8.9	2.1	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarb	<	44.2	U	182	44.2		50.9	43.6		83.6	43.6		<	43	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value.
R = Rejected value.
U = Nondetected value.
D = Sample was diluted for analysis.
RL = Reporting Limit.

Page 8 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2715-0000			CAN127-2715-0005			CAN127-2715-0010			CAN127-2715-2762[1]			CAN127-2715-0015		
LAB SAMPLE NUMBER	0396860001SA			0396860002SA			0396860003SA			0396860011SA			0396860004SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)															
Acetone	<	11	U	<	11	U	<	11	U	<	16	U	<	19	U
Methylene chloride	<	5.5	U	<	5.3	U	<	5.5		<	5.4	U	4.4	5.5	J
Toluene	<	5.5	U	<	5.3	U	<	5.5	U	<	5.4	U	<	5.5	U
Semivolatile Organics (µg/kg)															
Anthracene	<	360	U	<	350	U	<	360	U	<	360	U	<	360	U
Benzo(a)anthracene	260	360	J	<	350	U	<	360	U	<	360	U	<	360	U
Benzo(a)pyrene	400	360		43	350	J	<	360	U	<	360	U	<	360	U
Benzo(b)fluoranthene	420	360		74	350	J	<	360	U	<	360	U	<	360	U
Benzo(g,h,i)perylene	270	360	J	<	350	U	<	360	U	<	360	U	<	360	U
Benzo(k)fluoranthene	470	360		<	350	U	<	360	U	<	360	U	<	360	U
Benzoic acid	48	1800	J	<	1700	U	<	1700	U	<	1700	U	<	1800	U
bis(2-Ethylhexyl)phthalate	44	360	J	<	350	U	<	360	U	44	360	J	<	360	U
Carbazole	45	360	J	<	350	U	<	360	U	<	360	U	<	360	U
Chrysene	46	360	J	59	350	J	<	360	U	<	360	U	<	360	U
Di-n-butyl phthalate	<	360	U	<	350	U	<	360	U	<	360	U	<	360	U
Di-n-octyl phthalate	<	360	U	64	350	J	<	360	U	<	360	U	<	360	U
Dibenz(a,h)anthracene	<	360	U	<	350	U	<	360	U	<	360	U	<	360	U
Diethyl phthalate	<	360	U	<	350	U	<	360	U	<	360	U	<	360	U
Fluoranthene	860	360		110	350	J	<	360	U	<	360	U	<	360	U
Indeno(1,2,3-cd)pyrene	260	360	J	<	350	U	<	360	U	<	360	U	<	360	U
Phenanthrene	380	360		53	350	J	<	360	U	<	360	U	<	360	U
Pyrene	710	360		77	350	J	<	360	U	<	360	U	<	360	U
Metals (mg/kg)															
Aluminum	7730	11		7500	21.2		7090	10.9		5760	10.8		5900	11	
Arsenic	2.1	0.55	J	1.7	0.53	J	2.2	0.55	J	1.6	0.54	J	1.2	0.55	J
Barium	93	1.1	J	152	2.1	J	148	1.1	J	162	1.1	J	146	1.1	J
Beryllium	0.44	0.22		0.34	0.42	J	0.38	0.22		0.3	0.22		0.34	0.22	

Page 1 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2715-0000			CAN127-2715-0005			CAN127-2715-0010			CAN127-2715-2762[1]			CAN127-2715-0015		
LAB SAMPLE NUMBER	0396860001SA			0396860002SA			0396860003SA			0396860011SA			0396860004SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.															
Cadmium	<	0.55	U	0.77	1.1	J	<	0.55	U	<	0.54	U	<	0.55	U
Calcium	17800	22		141000	42.5		73600	21.8		78200	21.6		100000	22.1	
Chromium	9.2	1.1	J	6.9	2.1	J	6.4	1.1	J	5	1.1	J	4.7	1.1	J
Cobalt	3	1.1		2.1	2.1		2.8	1.1		2.4	1.1		1.7	1.1	
Copper	7.1	2.2		5.1	4.2		4.1	2.2		3.4	2.2		2.5	2.2	
Iron	7840	11		6140	21.2		5720	10.9		4730	10.8		4800	11	
Lead	36.4	5.5		7.6	5.3		5.1	0.55		4.8	0.54		3.9	0.55	
Magnesium	1550	22	J	2420	42.5	J	2940	21.8	J	2580	21.6	J	3080	22.1	J
Manganese	175	1.1		77.6	2.1		85.6	1.1		70.3	1.1		68	1.1	
Nickel	7.2	4.4		5.6	8.5	J	6.2	4.4		5.1	4.3		5.5	4.4	
Potassium	1830	550		1310	1060		1540	546		1220	540		1460	552	
Selenium	0.25	1.1	J	<		R	<		R	<		R	<		R
Thallium	0.3	0.55	J	0.2	0.53	J	0.13	0.55	J	0.13	0.54	J	0.13	0.55	J
Vanadium	14.5	1.1		13.7	2.1		15.2	1.1		12.7	1.1		13.5	1.1	
Zinc	30	2.2		17	4.2		14.8	2.2		12.6	2.2		12.3	2.2	
TRPH (mg/kg)															
Total Recoverable Petroleum Hydrocarbo	80.8	44		<	42.5	U	<	43.6	U	<	43.2	U	<	44.2	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value
U = Nondetected value
D = Sample was diluted for analysis
RL = Reporting Limit

Page 2 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2715-0020			CAN127-2715-0025			CAN127-2715-0030			CAN127-2715-0035			CAN127-2715-0040			CAN127-2715-0050		
LAB SAMPLE NUMBER	0396860005SA			0396860006SA			0396860007SA			0396860008SA			0396860009SA			0396860010SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	9.5	11	J	8.5	11	J	26	11		<	11	U	15	11	
Methylene chloride	<	5.6	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U
Toluene	<	5.6	U	<	5.6	U	<	5.6	U	<	5.5	U	<	5.5	U	<	5.5	U
Semivolatile Organics (µg/kg)																		
Anthracene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(a)anthracene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(a)pyrene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(b)fluoranthene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(g,h,i)perylene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(k)fluoranthene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzoic acid	<	1800	U	<	1800	U	<	1800	U	<	1700	U	<	1700	U	<	1700	U
bis(2-Ethylhexyl)phthalate	<	370	U	170	370	J	40	370	J	<	360	U	190	360	J	54	360	J
Carbazole	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Chrysene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Di-n-butyl phthalate	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Di-n-octyl phthalate	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Dibenz(a,h)anthracene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Diethyl phthalate	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Fluoranthene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Indeno(1,2,3-cd)pyrene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Phenanthrene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Pyrene	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U	<	360	U
Metals (mg/kg)																		
Aluminum	9530	11.2		5640	22.2		5630	11.2		5480	10.9		5240	10.9		4640	10.9	
Arsenic	2.4	0.56	J	1.4	0.56	J	1.1	1.1	J	1	1.1	J	1.2	0.55	J	1.2	0.55	J
Barium	146	1.1	J	88.6	2.2	J	265	1.1	J	24.6	1.1	J	33.8	1.1	J	63.1	1.1	J
Beryllium	0.65	0.22		0.24	0.44	J	0.21	0.22	J	0.2	0.22	J	0.23	0.22		0.17	0.22	J

Page 3 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2715-0020			CAN127-2715-0025			CAN127-2715-0030			CAN127-2715-0035			CAN127-2715-0040			CAN127-2715-0050		
LAB SAMPLE NUMBER	0396860005SA			0396860006SA			0396860007SA			0396860008SA			0396860009SA			0396860010SA		
COLLECT DATE	12/07/94			12/07/94			12/07/94			12/07/94			12/07/94			12/07/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Cadmium	<	0.56	U	<	1.1	U	<	0.56	U	<	0.55	U	<	0.55	U	<	0.55	U
Calcium	69900	22.5		156000	44.4		85300	22.3		30500	21.8		46800	21.8		40700	21.9	
Chromium	6.8	1.1	J	4.3	2.2	J	5.2	1.1	J	5.9	1.1	J	5.2	1.1	J	5.7	1.1	J
Cobalt	3	1.1		2.1	2.2	J	<	1.1	U	1.2	1.1		1.3	1.1		0.87	1.1	J
Copper	5.5	2.2		2.8	4.4	J	2.1	2.2	J	2.3	2.2		1.9	2.2	J	2	2.2	J
Iron	7710	11.2		3970	22.2		3790	11.2		4490	10.9		4250	10.9		3850	10.9	
Lead	6.4	0.56		3.3	0.56		2.1	1.1		2.2	1.1		2.2	0.55		2.1	1.1	
Magnesium	4880	22.5	J	4120	44.4	J	5290	22.3	J	4590	21.8	J	5380	21.8	J	4660	21.9	J
Manganese	139	1.1		37.9	2.2		29	1.1		38.5	1.1		56.8	1.1		50.3	1.1	
Nickel	8.3	4.5		3.8	8.9	J	3.8	4.5	J	5.1	4.4		3.6	4.4	J	2.9	4.4	J
Potassium	2510	561		1220	1110		1000	558		1020	545		1020	546		879	547	
Selenium	0.16	1.1	J	<		R	<		R	<		R	<		R	<		R
Thallium	0.11	0.56	J	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ	<	0.55	U	<	0.55	U
Vanadium	17.7	1.1		12.6	2.2		15.9	1.1		17	1.1		15.7	1.1		16.8	1.1	
Zinc	19.9	2.2		11.1	4.4		8.2	2.2		10.1	2.2		9.4	2.2		8.8	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbo	<	44.9	U	<	44.4	U	<	44.7	U	171	43.6		<	43.7	U	<	43.7	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value
U = Nondetected value
D = Sample was diluted for analysis
RL = Reporting Limit

Page 4 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2715-0060			CAN127-2716-0000			CAN127-2716-0005			CAN127-2716-0010			CAN127-2716-0015			CAN127-2716-0020		
LAB SAMPLE NUMBER	03971300012SA			03965500007SA			03965500008SA			03965500009SA			03965500010SA			03965500011SA		
COLLECT DATE	12/07/94			12/06/94			12/06/94			12/06/94			12/06/94			12/06/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	11	U	<	11	U	6	12	J	4.6	11	J	<	14	U	4	11	J
Methylene chloride	4.6	5.5	J	<	5.6	U	<	5.8	U	<	5.5	U	<	5.5	U	<	5.6	U
Toluene	<	5.5	U	<	5.6	U	<	5.8	U	2.8	5.5	J	<	5.5	U	<	5.6	U
Semivolatile Organics (µg/kg)																		
Anthracene	<	370	U	<	370	U	<	380	U	<	360	U	<	360	U	<	370	U
Benzo(a)anthracene	<	370	U	84	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Benzo(a)pyrene	<	370	U	110	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Benzo(b)fluoranthene	<	370	U	100	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Benzo(g,h,i)perylene	<	370	U	88	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Benzo(k)fluoranthene	<	370	U	190	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Benzoic acid	<	1800	U	<	1800	U	<	1800	U	<	1800	U	<	1800	U	<	1800	U
bis(2-Ethylhexyl)phthalate	<	370	U	41	370	J	<	380	U	<	360	U	<	360	U	4700	370	
Carbazole	<	370	U	<	370	U	<	380	U	<	360	U	<	360	U	<	370	U
Chrysene	<	370	U	140	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Di-n-butyl phthalate	<	370	U	190	370	J	170	380	J	<	360	U	170	360	J	130	370	J
Di-n-octyl phthalate	<	370	U	<	370	U	<	380	U	<	360	U	<	360	U	310	370	J
Dibenz(a,h)anthracene	<	370	U	<	370	U	<	380	U	<	360	U	<	360	U	<	370	U
Diethyl phthalate	<	370	U	<	370	U	<	380	U	<	360	U	<	360	U	<	370	U
Fluoranthene	<	370	U	270	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Indeno(1,2,3-cd)pyrene	<	370	U	83	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Phenanthrene	<	370	U	120	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Pyrene	<	370	U	260	370	J	<	380	U	<	360	U	<	360	U	<	370	U
Metals (mg/kg)																		
Aluminum	3480	11.1		10600	11.3	J	10300	23.1	J	8940	11	J	9340	11	J	7330	22.5	J
Arsenic	1.4	1.1		2.6	0.56		2.2	0.58		1.6	0.55		2	0.55		2.1	0.56	
Barium	11.8	1.1		93	1.1	J	203	2.3	J	81.2	1.1	J	396	1.1	J	306	2.2	J
Beryllium	<	0.22	U	0.57	0.23		0.43	0.46	J	0.47	0.22		0.54	0.22		0.46	0.45	

Page 5 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2715-0060			CAN127-2716-0000			CAN127-2716-0005			CAN127-2716-0010			CAN127-2716-0015			CAN127-2716-0020		
LAB SAMPLE NUMBER	0397130012SA			0396550007SA			0396550008SA			0396550009SA			0396550010SA			0396550011SA		
COLLECT DATE	12/07/94			12/06/94			12/06/94			12/06/94			12/06/94			12/06/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Cadmium	<	0.55	U	<	0.56	U	<	1.2	U	<	0.55	U	<	0.55	U	<	1.1	U
Calcium	2490	22.1		9170	22.5		130000	46.1		79500	22		43800	22		126000	44.9	
Chromium	4.1	1.1		11.7	1.1		8.6	2.3		6.6	1.1		7.7	1.1		5.4	2.2	
Cobalt	0.84	1.1	J	4	1.1		2.6	2.3		2.6	1.1		3.2	1.1		1.9	2.2	J
Copper	1.2	2.2	J	8.3	2.3		6.3	4.6		4.4	2.2		4.9	2.2		5.6	4.5	
Iron	3320	11.1		9750	11.3		7880	23.1		6910	11		7990	11		5780	22.5	
Lead	2	0.55		20.8	5.6	J	7.4	0.58	J	4.8	0.55	J	5.4	0.55	J	4.3	1.1	J
Magnesium	3590	22.1		1820	22.5		2840	46.1		3430	22		3340	22		4180	44.9	
Manganese	22.8	1.1		207	1.1		100	2.3		99.1	1.1		144	1.1		89.9	2.2	
Nickel	2.6	4.4	J	9.6	4.5		9.9	9.2		7.5	4.4		7.6	4.4		5.9	9	J
Potassium	726	553		2350	563		1740	1150		1630	549		2040	550		1820	1120	
Selenium	<	1.1	U	<	1.1	UJ	<	2.3	UJ	<	1.1	UJ	<	1.1	UJ	<	2.2	UJ
Thallium	<	0.55	U	<	0.56	UJ	<	1.2	UJ	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ
Vanadium	16.7	1.1		16.8	1.1	J	15.5	2.3	J	17.4	1.1	J	19.7	1.1	J	14.8	2.2	J
Zinc	6.9	2.2		29.2	2.3		21.3	4.6		17.7	2.2		20.4	2.2		15.5	4.5	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbo	<	44.3	U	45.7	45		<	46.1	U	<	43.9	U	<	44	U	60.7	44.9	

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value
U = Nondetected value
D = Sample was diluted for analysis
RL = Reporting Limit

Page 6 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2716-0025			CAN127-2716-0030			CAN127-2716-0035			CAN127-2716-0040			CAN127-2716-0050			CAN127-2716-0060		
LAB SAMPLE NUMBER	0396550012SA			0396550013SA			0396550003SA			0396550004SA			0396550005SA			0396550006SA		
COLLECT DATE	12/06/94			12/06/94			12/06/94			12/06/94			12/06/94			12/06/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Volatile Organics (µg/kg)																		
Acetone	<	13	U	3.6	11	J	6.5	11	J	<	11	U	5.3	11	J	4.8	11	J
Methylene chloride	<	6.4	U	<	5.5	U	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U
Toluene	<	6.4	U	<	5.5	U	<	5.6	U	<	5.4	U	<	5.5	U	<	5.5	U
Semivolatile Organics (µg/kg)																		
Anthracene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Benzo(a)anthracene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Benzo(a)pyrene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Benzo(b)fluoranthene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Benzo(g,h,i)perylene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Benzo(k)fluoranthene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Benzoic acid	<	2000	U	<	1700	U	<	1800	U	<	1700	U	<	1700	U	<	1800	U
bis(2-Ethylhexyl)phthalate	<	420	U	<	360	U	<	370	U	<	350	U	90	360	J	<	360	U
Carbazole	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Chrysene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Di-n-butyl phthalate	<	420	U	<	360	U	<	370	U	<	350	U	160	360	J	160	360	J
Di-n-octyl phthalate	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Dibenz(a,h)anthracene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Diethyl phthalate	<	420	U	<	360	U	<	370	U	<	350	U	46	360	J	<	360	U
Fluoranthene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Indeno(1,2,3-cd)pyrene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Phenanthrene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Pyrene	<	420	U	<	360	U	<	370	U	<	350	U	<	360	U	<	360	U
Metals (mg/kg)																		
Aluminum	8030	25.5	J	4940	10.9	J	6340	11.1	J	5800	10.8	J	5870	10.9	J	5800	11	J
Arsenic	1.7	0.64		2.1	0.55		2.1	0.56		1.4	0.54		[1]1.4	0.55		1.4	0.55	
Barium	341	2.6	J	51.2	1.1	J	147	1.1	J	26.8	1.1	J	30.7	1.1	J	32.6	1.1	J
Beryllium	0.32	0.51	J	0.2	0.22	J	0.27	0.22		0.18	0.22	J	0.21	0.22	J	0.18	0.22	J

Page 7 of 8

Source: URS Greiner Woodward Clyde, 2000

Table 58-3d
Summary of Compounds Detected in Phase II Soil Samples
SWMU 127

LOCATOR	CAN127-2716-0025			CAN127-2716-0030			CAN127-2716-0035			CAN127-2716-0040			CAN127-2716-0050			CAN127-2716-0060		
LAB SAMPLE NUMBER	0396550012SA			0396550013SA			0396550003SA			0396550004SA			0396550005SA			0396550006SA		
COLLECT DATE	12/06/94			12/06/94			12/06/94			12/06/94			12/06/94			12/06/94		
	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Metals (mg/kg), cont.																		
Cadmium	<	1.3	U	<	0.55	U	<	0.56	U	<	0.54	U	<	0.55	U	<	0.55	U
Calcium	138000	51		76400	21.8		89000	22.2		14200	21.5		26500	21.8		14200	22.1	
Chromium	6	2.6		3.8	1.1		5.1	1.1		5.8	1.1		10.1	1.1		7.2	1.1	
Cobalt	<	2.6	U	1.7	1.1		0.94	1.1	J	1.4	1.1		1.6	1.1		1.7	1.1	
Copper	2.9	5.1	J	2.3	2.2		2.4	2.2		2.2	2.2		45.8	2.2		2	2.2	J
Iron	5600	25.5		4020	10.9		4460	11.1		4950	10.8		5250	10.9		5160	11	
Lead	3.2	0.64		2.6	0.55	J	3.3	0.56	J	2.5	0.54	J	3.1	0.55	J	5.5	0.55	J
Magnesium	5070	51		2460	21.8		4280	22.2		3870	21.5		4510	21.8		4660	22.1	
Manganese	42.4	2.6		46.4	1.1		43.8	1.1		48.6	1.1		60.5	1.1		54	1.1	
Nickel	5.4	10.2	J	4.1	4.4	J	3.1	4.4	J	4.7	4.3		5.7	4.4		4.6	4.4	
Potassium	1680	1280		1070	546		1240	555		1180	538		1180	546		1100	552	
Selenium	<	1.3	UJ	<	2.2	UJ	<	1.1	U	<	1.1	UJ	<	1.1	UJ	<	1.1	UJ
Thallium	<	1.3	UJ	<	1.1	UJ	<	1.1	UJ	<	0.54	UJ	<	1.1	UJ	<	0.55	U
Vanadium	14.2	2.6	J	13.6	1.1	J	16.2	1.1	J	16.5	1.1	J	17.3	1.1	J	17.9	1.1	J
Zinc	13.7	5.1		9.8	2.2		10.6	2.2		10.2	2.2		12.2	2.2		10.7	2.2	
TRPH (mg/kg)																		
Total Recoverable Petroleum Hydrocarbo	<	51	U	<	43.7	U	<	44.4	U	53.9	43		1700	436		<	44.2	U

Results presented here are only those chemicals which were detected at least once at this SWMU and have passed data review.

J = Estimated value
R = Rejected value D = Sample was diluted for analysis
U = Nondetected value RL = Reporting Limit

Source: URS Greiner Woodward Clyde, 2000

Table 58-4a
Comparison of Maximum Soil Concentrations to MSSLs
SWMU 127

Chemical	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?
VOLATILE ORGANICS				
1,1,1-Trichloroethane	0.0018		690	NO
1,1-Dichloroethene	0.0019		0.53	NO
1,2-Dichloroethane	0.0019		0.34	NO
1,2-Dichloroethene (total)**	0.0013		42	NO
1,2-Dichloropropane	0.013		0.35	NO
2-Butanone	0.0062		6900	NO
Acetone	7.5		1400	NO
Benzene	3.8		0.62	YES
Carbon Tetrachloride	0.0027		0.23	NO
Chlorobenzene	0.0013		54	NO
Ethylbenzene	54		230	NO
Methylene Chloride	0.0067		8.5	NO
Tetrachloroethene	0.0029		4.7	NO
Toluene	82		520	NO
Trichloroethene	0.0023		2.7	NO
Xylenes	260		210	YES
SEMIVOLATILE ORGANICS				
2-Methylnaphthalene*	40		55	NO
Acenaphthene	0.15		2600	NO
Anthracene	0.068		14000	NO
Benzo(a)anthracene	8.00		0.56	YES
Benzo(a)pyrene	8.60		0.056	YES
Benzo(b)fluoranthene	17.00		0.56	YES
Benzo(g,h,i)perylene*	5.1		55	NO
Benzo(k)fluoranthene	1.60		5.6	NO
Benzoic acid	0.048		100,000	NO
Bis(2-ethylhexyl)phthalate	4.7		32	NO
Butylbenzylphthalate	0.110		240	NO
Carbazole	1.500		22	NO
Chrysene	14.0		56	NO
Dibenzo(a,h)anthracene	0.280		0.056	YES
Di-n-Butyl phthalate	0.19		5500	NO
Di-n-octyl phthalate	0.31		1100	NO
Diethylphthalate	0.046		44000	NO
Fluoranthene	17		2000	NO
Fluorene	0.29		1800	NO
Indeno(1,2,3)pyrene	5.1		0.56	NO
Phenanthrene*	8.1		55	NO
Pyrene	17		1500	NO
TRPH	11600		NA	

Page 1 of 2

Source: URS Greiner Woodward Clyde, 2000

Table 58-4a
Comparison of Maximum Soil Concentrations to MSSLs
SWMU 127

Chemical	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?
METALS				
Antimony	7.8		30	NO
Barium	2840		5200	NO
Beryllium	0.83		150	NO
Cadmium	4.2		37	NO
Chromium	25.4		30	NO
Copper	14.5		2800	NO
Iron	11,500		22,000	NO
Lead	48.5		400	NO
Manganese	440		3100	NO
Selenium	0.27		370	NO
Silver	3.6		370	NO
Zinc	73.8		22000	NO

(1) EPA Region Media-Specific Screening Levels for Residential Soil (EPA 1998)

* The MSSL for naphthalene was used as a surrogate for these PAHs. See text.

** The MSSL for cis-1,2-dichloroethylene was used as a surrogate. See text.

mg/kg = milligrams per kilogram

Page 2 of 2

Source: URS Greiner Woodward Clyde, 2000

Table 58-4b
Model-Predicted Concentrations
SWMU 127

Chemical	Source Conditions			Active Transport Processes			C_s (mg/kg)	C_w (mg/L)	Unsaturated Zone		Saturated Zone		Screening Levels	
	Steady-State	Pulse*	Decay**	Dispersion	Adsorption	Biodegradation			AF	$(C_w)_u$ (mg/L)	DAF	$(C_w)_s$ (mg/L)	Region VI Tap Water MSSL (mg/L)	MCL (mg/L)
Benzene	✓			✓			3.8	19	1.0	19	6.0	3	0	0
	✓			✓		✓			2.0E+17	0	1.2E+28	0		
		✓		✓	✓				1.1	17	8.0	2		
		✓		✓	✓	✓			1.9E+17	0	-	0		
			✓	✓	✓				31	1	196	0		
			✓	✓	✓	✓			2.9E+18	0	-	0		
Xylenes	✓			✓			260	821	1.0	821	6.0	137	1	10
	✓			✓		✓			8.6E+34	0	-	0		
		✓		✓	✓				2.5	332	23	36		
		✓		✓	✓	✓			2.6E+35	0	9.1E+37	0		
			✓	✓	✓				88	9	561	1		
			✓	✓	✓	✓			-	0	-	0		
Benzo(a)anthracene	✓			✓			8.0	0.050						
	✓			✓		✓								
		✓		✓	✓									
		✓		✓	✓	✓								
			✓	✓	✓									
			✓	✓	✓	✓								
Benzo(a)pyrene	✓			✓			8.6	0.021	1.0	0.021	6.0	0.004	0	0.0002
	✓			✓		✓			-	0	-	0		
		✓		✓	✓				5,131	4.1E-06	37,439	5.6E-07		
		✓		✓	✓	✓			-	0	-	0		
			✓	✓	✓				37,258	5.7E-07	-	-		
			✓	✓	✓	✓			-	0	-	0		

Page 1 of 2

Source: URS Greiner Woodward Clyde, 2000

Table 58-4b
Model-Predicted Concentrations
SWMU 127

Benzo(b)fluoranthene	✓			✓			17	0.035	1.0	0.035	6.0	0.006	0	-
	✓			✓		✓			-	0	-	0		
		✓		✓	✓				6,188	5.6E-06	45,147	7.7E-07		
		✓		✓	✓	✓			-	0	-	0		
			✓	✓	✓				44,944	7.7E-07	-	-		
			✓	✓	✓	✓			-	0	-	0		
Dibenzo(a,h)anthracene	✓			✓			0.28	0.000184	1.0	0.000	6.0	0.000	0	-
	✓			✓		✓			-	0	-	0		
		✓		✓	✓				19,113	9.6E-09	139,470	1.3E-09		
		✓		✓	✓	✓			-	0	-	0		
			✓	✓	✓				138,812	1.3E-09	-	-		
			✓	✓	✓	✓			-	0	-	0		

* Pulse duration = 100 years.

** Decay half-life = 2 years for VOCs and 10 years for SVOCs.

C_s = maximum detected soil concentration

C_w = initial leachate concentration based on equilibrium partitioning

AF = attenuation factor for unsaturated zone calculated from MULTIMED results

$(C_w)_u$ = soil water concentration at bottom of unsaturated zone (= C_w / AF)

DAF = dilution-attenuation factor for initial groundwater mixing zone calculated from MULTIMED results

$(C_w)_s$ = groundwater concentration at water table after initial mixing (= C_w / DAF)

"-" indicates factor is not applicable or factor/concentration could not be calculated based on model results

indicates predicted concentration exceeds highlighted screening level

Page 2 of 2

Source: URS Greiner Woodward Clyde, 2000

Table 63-1a
Detected Compounds in Surface Soils
AOC E

FIELD ID			CAE-HA01-001			CAE-HA04-002			CAE-SB01-002			CAE-SB02-002		
COLLECT DATE			12/04/98			12/04/98			04/30/98			04/30/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)														
Toluene	10	1/8	<	34	U	<	34	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)														
Phenol	120	1/8	<	380	U	<	370	U	<	370	U	<	380	U
PESTICIDES/PCB (µg/kg)														
DDE	3.4	1/8	3.4	3.8	J	<	3.7	U	<	7.4	U	<	7.5	U
DDT	3.9	2/8	3.7	3.8	J	<	3.7	U	<	7.4	U	<	7.5	U
METALS (mg/kg)														
Aluminum	19900	8/8	12400	21		12900	20		19900	21		17900	22	
Antimony	3.2	3/8	2.6	6.2	J	3.2	6	J	<	6.3	U	<	6.5	U
Arsenic	4.6	8/8	4.6	4.9	J	4.5	0.98		2.6	2		3.5	2.1	
Barium	163	8/8	97	21		163	20		104	21	J	100	22	J
Beryllium	0.87	8/8	0.71	0.51		0.73	0.5		0.87	0.53		0.87	0.55	
Cadmium	0.46	3/8	<	0.51	U	<	0.5	U	0.22	0.53	J	0.32	0.55	J
Calcium	9450	8/8	2540	510		6580	500		5570	530		2710	550	
Chromium	14.3	8/8	10.7	1		10.2	1		14.3	1.1		13.4	1.1	
Cobalt	5.6	8/8	4.6	5.1	J	4.3	5	J	5.2	5.3	J	5.6	5.5	
Copper	9.2	8/8	8.8	2.6		6.8	2.5		8.4	2.6		9.2	2.7	
Iron	14700	8/8	11800	10		10900	10		14400	11		14700	11	
Lead	11.9	8/8	10	1.5		8.1	0.29		8.3	0.3		9	0.32	
Magnesium	2580	8/8	1800	510		2280	500		2540	530		2320	550	
Manganese	284	8/8	222	1.5		122	1.5		198	1.6		205	1.6	
Mercury	0.04	1/8	<	0.043	U	<	0.041	U	<	0.23	U	<	0.2	UJ
Nickel	12.5	8/8	10.1	4.1		10.9	4		12.3	4.2		11.8	4.4	
Potassium	3140	8/8	2290	510		2280	500		3140	530		2590	550	
Sodium	43.7	8/8	23.8	510	J	29.5	500	J	38.6	530	J	35	550	J
Thallium	0.25	4/8	0.16	0.98	J	0.25	0.98	J	0.23	0.99	J	<	1.1	U
Vanadium	30.1	8/8	23.8	5.1		21.8	5		29.4	5.3		30.1	5.5	
Zinc	36	8/8	25.7	2.1	J	22.4	2		34.1	2.1		36	2.2	

mg/kg - milligram per killogram
µg/kg - microgram per killogram
J - Estimated
U - Nondetect

Page 1 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 63-1a
Detected Compounds in Surface Soils
AOC E

FIELD ID			CAE-SB03-002			CAE-SB04-002			CAE-SB05-002			CAE-SB06-002		
COLLECT DATE			04/30/98			04/30/98			05/01/98			05/01/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)														
Toluene	10	1/8	<	11	U	<	12	U	<	11	U	10	11	
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)														
Phenol	120	1/8	120	380		<	390	U	<	370	U	<	370	U
PESTICIDES/PCB (µg/kg)														
DDE	3.4	1/8	<	7.5	U	<	7.7	U	<	7.4	U	<	7.3	U
DDT	3.9	2/8	<	7.5	U	<	7.7	U	<	7.4	U	3.9	7.3	
METALS (mg/kg)														
Aluminum	19900	8/8	15900	21		16200	21		18200	21		16900	21	
Antimony	3.2	3/8	<	6.4	U	<	6.4	U	<	6.3	U	<	6.3	U
Arsenic	4.6	8/8	3	2.2		3.6	2		3.6	2.1		2.9	2.2	
Barium	163	8/8	112	21	J	52	21		109	21		81.7	21	
Beryllium	0.87	8/8	0.66	0.53		0.71	0.53		0.79	0.52		0.7	0.52	
Cadmium	0.46	3/8	0.46	0.53	J	<	0.53	U	<	0.52	U	<	0.52	U
Calcium	9450	8/8	9450	530		4960	530		4720	520		2370	520	
Chromium	14.3	8/8	12.8	1.1		12.1	1.1		12.6	1		12.3	1	
Cobalt	5.6	8/8	5.1	5.3	J	4.9	5.3	J	4.8	5.2	J	4.6	5.2	J
Copper	9.2	8/8	7.6	2.7		9.2	2.6		8.1	2.6		7.7	2.6	
Iron	14700	8/8	12500	11		12600	11		13100	10		12200	10	
Lead	11.9	8/8	11.9	0.33		9.3	0.59		8.4	0.32		7.6	0.32	
Magnesium	2580	8/8	2170	530		2140	530		2580	520		2170	520	
Manganese	284	8/8	284	1.6		205	1.6		156	1.6		161	1.6	
Mercury	0.04	1/8	<	0.22	U	<	0.22	U	0.04	0.22	J	<	0.21	U
Nickel	12.5	8/8	10.2	4.3		10.6	4.2		12.3	4.2		12.5	4.2	
Potassium	3140	8/8	2790	530		2650	530		3010	520		2690	520	
Sodium	43.7	8/8	43.7	530	J	34.4	530	J	35.2	520	J	42.5	520	J
Thallium	0.25	4/8	<	1.1	UJ	0.22	0.99	J	<	1.1	U	<	1.1	U
Vanadium	30.1	8/8	26	5.3		26.3	5.3		25.3	5.2		22.5	5.2	
Zinc	36	8/8	32.9	2.1		29.8	2.1		29.4	2.1		27.6	2.1	

mg/kg - milligram per killogram
µg/kg - microgram per killogram
J - Estimated
U - Nondetect

Page 2 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-HA01-005			CAE-HA01-010			CAE-HA02-005			CAE-HA02-008			CAE-HA02-013		
COLLECT DATE			12/04/98			12/04/98			12/04/98			12/04/98			12/04/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	7	1/52	<	34	U	<	32	U	<	33	U	<	32	U	<	32	U
Methyl Ethyl Ketone	46	3/52	<	57	U	<	53	U	<	56	U	<	53	U	<	54	U
Methyl Isobutyl Ketone	72	5/52	<	57	U	<	53	U	<	56	U	<	53	U	<	54	U
Toluene	12	2/52	<	34	U	<	32	U	<	33	U	<	32	U	<	32	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Di-N-Butyl Phthalate	300	1/52	<	380	U	<	350	U	<	370	U	<	350	U	<	360	U
Di-N-Octylphthalate	170	1/52	<	380	U	<	350	U	<	370	U	<	350	U	<	360	U
N-Nitrosodiphenylamine	43	2/52	<	380	U	<	350	U	<	370	U	<	350	U	<	360	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/52	<	3.8	U	<	3.5	U	<	3.7	U	<	3.5	U	<	3.5	U
DDT	4.6	1/52	<	3.8	U	<	3.5	U	<	3.7	U	<	3.5	U	<	3.5	U
METALS (mg/kg)																	
Aluminum	19000	52/52	5240	21		7460	19		13400	19		9790	19		9620	19	
Antimony	2.8	7/52	2.5	6.2	J	<	5.8	U	2.8	5.7	J	<	5.7	U	2.8	5.8	J
Arsenic	4.4	52/52	3.3	0.98		2.3	0.9		4.3	0.96		4.3	0.91		4	0.93	
Barium	1740	52/52	163	21		396	19		95.2	19		441	19		65.7	19	
Beryllium	0.8	52/52	0.31	0.51	J	0.5	0.48		0.74	0.48		0.56	0.48		0.64	0.48	
Cadmium	0.38	16/52	<	0.51	U	<	0.48	U	<	0.48	U	<	0.48	U	<	0.48	U
Calcium	338000	52/52	226000	5100		133000	4800		2270	480		77800	4800		82100	4800	
Chromium, Total	26.7	52/52	18.4	1		11.9	0.96		10.3	0.95		11.2	0.96		11.6	0.97	
Cobalt	4.7	51/52	2.1	5.1	J	1.6	4.8	J	4.6	4.8	J	3.4	4.8	J	3.3	4.8	J
Copper	10.5	52/52	2.9	2.6		2.4	2.4		8.5	2.4		4.8	2.4		4.9	2.4	
Iron	12100	52/52	3750	10		4170	9.6		11400	9.5		7840	9.6		7380	9.7	
Lead	9.1	52/52	3.1	3.1		4.7	0.27		9.1	0.29		7.6	0.27		7.6	0.28	
Magnesium	17600	52/52	2820	510		3880	480		2190	480		3310	480		3810	480	
Manganese	180	52/52	42.4	1.5		50.5	1.4		180	1.4		125	1.4		126	1.5	
Mercury	0.07	8/52	<	0.042	U	<	0.041	U	<	0.043	U	<	0.042	U	<	0.042	U
Nickel	11.9	52/52	5	4.1		4.7	3.9		10.7	3.8		8.5	3.8		7.1	3.9	
Potassium	3020	52/52	952	13		1450	480		2250	480		1800	480		1920	480	
Selenium	0.81	3/52	<	9.8	U	<	4.5	U	<	4.8	U	<	4.5	U	<	4.6	U
Sodium	353	52/52	53.9	510	J	332	480	J	43	480	J	216	480	J	268	480	J
Thallium	0.25	3/52	<	0.98	U	<	0.9	U	<	0.96	U	<	0.91	U	<	0.93	U
Vanadium	32.2	52/52	11.2	5.1		9.3	4.8		21.1	4.8		24.8	4.8		22.5	4.8	
Zinc	29.7	52/52	9.3	2.1		11.5	1.9		27.8	1.9		19.2	1.9		18.2	1.9	

mg/kg - milligram per kilogram J - Estimated
µg/kg - microgram per kilogram U - Nondetect

Page 1 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-HA03-003			CAE-HA03-008			CAE-HA03-13			CAE-HA04-006			CAE-HA04-010		
COLLECT DATE			12/04/98			12/04/98			12/04/98			12/04/98			12/05/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	7	1/52	<	34	U	<	33	U	<	32	U	<	32	U	<	33	U
Methyl Ethyl Ketone	46	3/52	<	56	U	<	54	U	<	54	U	<	53	U	<	56	U
Methyl Isobutyl Ketone	72	5/52	<	56	U	<	54	U	<	54	U	<	53	U	<	56	U
Toluene	12	2/52	<	34	U	<	33	U	<	32	U	<	32	U	<	33	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Di-N-Butyl Phthalate	300	1/52	<	370	U	<	360	U	<	360	U	<	350	U	<	370	U
Di-N-Octylphthalate	170	1/52	<	370	U	<	360	U	<	360	U	<	350	U	<	370	U
N-Nitrosodiphenylamine	43	2/52	<	370	U	<	360	U	<	360	U	<	350	U	<	370	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/52	<	3.7	U	<	3.6	U	<	3.5	U	<	3.5	U	<	3.7	U
DDT	4.6	1/52	<	3.7	U	<	3.6	U	<	3.5	U	<	3.5	U	<	3.7	U
METALS (mg/kg)																	
Aluminum	19000	52/52	13600	20		7480	20		7490	18		3660	89		8670	19	
Antimony	2.8	7/52	2.9	6	J	<	6	U	2	5.3	J	<	27	U	2.2	5.8	J
Arsenic	4.4	52/52	4.4	0.94		3.3	0.93		2.9	0.92		2.7	0.92		4.4	0.96	
Barium	1740	52/52	97.6	20		237	20		201	18		1310	89		150	19	
Beryllium	0.8	52/52	0.75	0.5		0.43	0.5	J	0.52	0.44		0.31	2.2	J	0.51	0.48	
Cadmium	0.38	16/52	<	0.5	U	0.19	0.5	J	<	.0.44	U	<	2.2	U	0.2	0.48	J
Calcium	338000	52/52	4850	500		197000	5000		59000	4400		121000	2200		95800	4800	
Chromium, Total	26.7	52/52	10.3	0.99		17.5	0.99		9.1	0.89		9.4	4.4		12.4	0.97	
Cobalt	4.7	51/52	4.7	5	J	2.4	5	J	2.9	4.4	J	<	22	U	3.1	4.8	J
Copper	10.5	52/52	7.8	2.5		3.5	2.5		3.3	2.2		2.2	11	J	4.7	2.4	
Iron	12100	52/52	11400	9.9		5240	9.9		6010	8.9		2340	44		6530	9.7	
Lead	9.1	52/52	8.5	0.28		4.2	0.28		6.4	0.28		3.5	0.27		6.2	0.29	
Magnesium	17600	52/52	2190	500		3160	500		3250	440		2620	2200		3050	480	
Manganese	180	52/52	155	1.5		57.3	1.5		104	1.3		30.2	6.6		77.6	1.4	
Mercury	0.07	8/52	<	0.039	U	<	0.041	U	<	0.038	U	<	0.041	U	<	0.04	U
Nickel	11.9	52/52	11.2	4		6	4		6.7	3.6		3.5	3.5	J	8.1	3.9	
Potassium	3020	52/52	2340	500		1350	500		1760	440		675	2200	J	1680	480	
Selenium	0.81	3/52	<	24		<	9.3	U	<	4.6	U	<	9.2	U	<	24	U
Sodium	353	52/52	42.4	500	J	64.9	500	J	127	440	J	132	2200	J	46.9	480	J
Thallium	0.25	3/52	0.18	0.94	J	<	0.93	U	<	0.92	U	<	0.92	U	<	0.96	U
Vanadium	32.2	52/52	21.5	5		15.5	5		14.6	4.4		4.8	22	J	19.5	4.8	
Zinc	29.7	52/52	24	2		12.6	2		14.9	1.8		5.9	8.9	J	15.3	1.9	

mg/kg - milligram per killogram
µg/kg - microgram per killogram

J - Estimated
U - Nondetect

Page 2 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB01-005			CAE-SB01-010			CAE-SB01-020			CAE-SB01-030			CAE-SB01-040			CAE-SB02-005		
COLLECT DATE			04/30/98			04/30/98			04/30/98			04/30/98			04/30/98			04/30/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
Carbon Disulfide	7	1/52	<	11	U	<	12	U	<	12	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone	46	3/52	<	19	UJ	<	20	UJ	<	19	UJ	<	18	UJ	<	18	UJ	<	18	UJ
Methyl Isobutyl Ketone	72	5/52	<	19	U	<	20	U	<	19	U	<	18	U	<	18	U	<	18	U
Toluene	12	2/52	<	11	U	<	12	U	<	12	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Di-N-Butyl Phthalate	300	1/52	<	370	U	<	390	U	<	390	U	<	360	U	<	360	U	<	360	U
Di-N-Octylphthalate	170	1/52	<	370	U	<	390	U	<	390	U	<	360	U	<	360	U	<	360	U
N-Nitrosodiphenylamine	43	2/52	<	370	U	<	390	U	<	390	U	<	360	U	<	360	U	<	360	U
PESTICIDES/PCB (µg/kg)																				
DDE	3.6	1/52	<	7.4	U	<	7.8	U	<	7.7	U	<	7.2	U	<	7.1	U	<	7.2	U
DDT	4.6	1/52	<	7.4	U	<	7.8	U	<	7.7	U	<	7.2	U	<	7.1	U	<	7.2	U
METALS (mg/kg)																				
Aluminum	19000	52/52	16700	21		8260	24		4000	22		10700	20	J	5260	19		18500	21	
Antimony	2.8	7/52	<	6.2	UJ	<	7.1	UJ	<	6.7	UJ	<	6	UJ	<	5.8	UJ	<	6.3	UJ
Arsenic	4.4	52/52	1.9	2	J	1.6	2.1	J	1.8	2.1	J	1.1	2.1	J	0.89	1.9	J	2.2	2.1	
Barium	1740	52/52	144	21	J	98.9	24	J	560	22	J	1290	20	J	28.7	19	J	130	21	J
Beryllium	0.8	52/52	0.69	0.52		0.39	0.59	J	0.16	0.56	J	0.38	0.5	J	0.23	0.48	J	0.74	0.53	
Cadmium	0.38	16/52	0.15	0.52	J	<	0.59	U	<	0.56	U	<	0.5	U	<	0.48	U	0.37	0.53	
Calcium	338000	52/52	58000	520		212000	2900		338000	5600		55500	2500	J	29700	480		7280	530	
Chromium, Total	26.7	52/52	14.6	1		18	1.2	J	26.7	1.1		9.1	0.99		6.1	0.96		13.5	1.1	
Cobalt	4.7	51/52	4.3	5.2	J	1.8	5.9	J	1.8	5.6	J	1.2	5	J	1.5	4.8	J	4.2	5.3	
Copper	10.5	52/52	7.9	2.6		2.3	2.9	J	3.1	2.8		1.8	2.5	J	1.2	2.4	J	7.1	2.6	
Iron	12100	52/52	11200	10		5010	12		2260	11		6200	9.9	J	4140	9.6		12100	11	
Lead	9.1	52/52	5.8	0.3		3.4	0.32		0.92	0.32		3	0.31		2.3	0.29		7.5	0.31	
Magnesium	17600	52/52	2730	520		3670	590		6010	560		6330	500		4010	480		2970	530	
Manganese	180	52/52	166	1.5		49.2	1.8		20.4	1.7		42.5	1.5		45	1.4		134	1.6	
Mercury	0.07	8/52	<	0.15	U	<	0.19	UJ	<	0.18	U	<	0.17	UJ	<	0.21	UJ	<	0.19	U
Nickel	11.9	52/52	10.6	4.1		6.2	4.7		4	4.5	J	5.6	4		3.7	3.9	J	11.5	4.2	
Potassium	3020	52/52	2760	520		1560	590		858	560		2220	500		1090	480		2930	530	
Selenium	0.81	3/52	<	2.7	U	<	2.6	U	<	2.2	U	<	2.5	U	<	2.5	U	<	2.5	U
Sodium	353	52/52	47.1	520	J	141	590	J	197	560	J	173	500	J	72.8	480	J	48.1	530	
Thallium	0.25	3/52	<	1	UJ	<	1.1	U	<	1.1	U	<	1	U	<	0.96	U	<	1	U
Vanadium	32.2	52/52	23.3	5.2		13.6	5.9		8.9	5.6		16.6	5		12.4	4.8		24.3	5.3	
Zinc	29.7	52/52	28.5	2.1		13.3	2.4		7.4	2.2		13.9	2	J	9	1.9		28.9	2.1	

mg/kg - milligram per kilogram
µg/kg - microgram per kilogram

J - Estimated
U - Nondetect

Page 3 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB02-010			CAE-SB02-020			CAE-SB02-030			CAE-SB02-040			CAE-SB03-005			CAE-SB03-010		
COLLECT DATE			04/30/98			04/30/98			04/30/98			04/30/98			04/30/98			04/30/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
Carbon Disulfide	7	1/52	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	12	U
Methyl Ethyl Ketone	46	3/52	<	18	UJ	<	18	UJ	<	18	UJ	<	18	UJ	<	19	UJ	<	21	UJ
Methyl Isobutyl Ketone	72	5/52	<	18	U	<	18	U	<	18	U	<	18	U	<	19	U	<	21	U
Toluene	12	2/52	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	12	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Di-N-Butyl Phthalate	300	1/52	<	360	U	<	360	U	<	350	U	<	350	U	<	380	U	<	410	U
Di-N-Octylphthalate	170	1/52	<	360	U	<	360	U	<	350	U	<	350	U	<	380	U	<	410	U
N-Nitrosodiphenylamine	43	2/52	<	360	U	<	360	U	<	350	U	<	350	U	<	380	U	43	410	
PESTICIDES/PCB (µg/kg)																				
DDE	3.6	1/52	<	7.1	U	<	7.1	U	<	7	U	<	6.9	U	<	7.4	U	<	8.2	U
DDT	4.6	1/52	<	7.1	U	<	7.1	U	<	7	U	<	6.9	U	<	7.4	U	<	8.2	U
METALS (mg/kg)																				
Aluminum	19000	52/52	17600	21		4210	21		4250	20		4260	19		16600	22		10900	24	
Antimony	2.8	7/52	<	6.2	UJ	<	6.3	UJ	<	6.1	UJ	<	5.8	UJ	<	6.5	UJ	<	7.2	UJ
Arsenic	4.4	52/52	2.9	2		1.9	2	J	1.3	1.9	J	1	2	J	2.6	2.2		3.1	2.4	
Barium	1740	52/52	352	21	J	1650	21	J	355	20	J	32.6	19	J	130	22	J	366	24	J
Beryllium	0.8	52/52	0.72	0.52		0.16	0.52	J	0.16	0.51	J	0.2	0.48	J	0.67	0.54		0.72	0.6	
Cadmium	0.38	16/52	0.15	0.52	J	<	0.52	U	0.22	0.51	J	0.13	0.48	J	0.34	0.54	J	0.17	0.6	J
Calcium	338000	52/52	84500	2600		254000	2600		235000	2500		36800	480		70900	2700		203000	3000	
Chromium, Total	26.7	52/52	16.2	1		19.7	1		18.8	1		5.8	0.96		16.4	1.1		19.3	1.2	
Cobalt	4.7	51/52	4.7	5.2	J	0.66	5.2	J	1.6	5.1	J	1.9	4.8	J	4.3	5.4	J	3.1	6	J
Copper	10.5	52/52	6	2.6		1.7	2.6	J	2.1	2.5	J	1.3	2.4	J	7.4	2.7		4.4	3	
Iron	12100	52/52	11300	10		2170	10		2260	10		3260	9.6		10600	11		6810	12	
Lead	9.1	52/52	5.5	0.3		1.1	0.3		1.2	0.28		2.2	0.29		6.5	0.33		7	0.36	
Magnesium	17600	52/52	5120	520		13700	520		13500	510		3480	480		3010	540		4370	600	
Manganese	180	52/52	180	1.6		16.3	1.6		20.1	1.5		42	1.4		123	1.6		96.4	1.8	
Mercury	0.07	8/52	<	0.2	UJ	<	0.16	UJ	<	0.16	UJ	<	0.2	UJ	<	0.18	U	<	0.24	U
Nickel	11.9	52/52	10.5	4.2		5.7	4.2		4.8	4.1		3.6	3.9	J	10.5	4.3		7	4.8	
Potassium	3020	52/52	2890	520		662	520		608	510		915	480		2840	540		1970	600	
Selenium	0.81	3/52	<	2.4	UJ	<	2.4	U	<	2.4	U	<	2.4	U	<	2.3	U	<	3.1	U
Sodium	353	52/52	353	520	J	251	520	J	180	510	J	73.1	480	J	43.3	540	J	227	600	J
Thallium	0.25	3/52	<	0.99	U	<	1	U	<	0.94	U	<	0.98	U	<	1.1	UJ	<	1.2	UJ
Vanadium	32.2	52/52	32.2	5.2		14	5.2		15.8	5.1		8.5	4.8		24	5.4		20.1	6	
Zinc	29.7	52/52	29.7	2.1		6	2.1		6.6	2		8.4	1.9		29.5	2.2		19.3	2.4	

mg/kg - milligram per kilogram J - Estimated
µg/kg - microgram per kilogram U - Nondetect

Page 4 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB03-020			CAE-SB03-030			CAE-SB03-040			CAE-SB04-005			CAE-SB04-010		
COLLECT DATE			04/30/98			04/30/98			04/30/98			04/30/98			04/30/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	7	1/52	<	13	U	<	11	U	<	12	U	<	11	U	<	11	U
Methyl Ethyl Ketone	46	3/52	<	22	UJ	<	19	UJ	<	20	UJ	<	18	U	<	18	U
Methyl Isobutyl Ketone	72	5/52	<	22	U	<	19	U	<	20	U	<	18	U	<	18	U
Toluene	12	2/52	<	13	U	<	11	U	<	12	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Di-N-Butyl Phthalate	300	1/52	<	440	U	<	380	U	<	410	U	<	360	U	<	360	U
Di-N-Octylphthalate	170	1/52	<	440	U	<	380	U	<	410	U	<	360	U	<	360	U
N-Nitrosodiphenylamine	43	2/52	<	440	U	38	380		<	410	U	<	360	U	<	360	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/52	<	8.7	U	<	7.5	U	<	8.1	U	<	7.2	U	<	7.1	U
DDT	4.6	1/52	<	8.7	U	<	7.5	U	<	8.1	U	<	7.2	U	<	7.1	U
METALS (mg/kg)																	
Aluminum	19000	52/52	15000	25		5750	21		5770	24		14800	20		9050	18	
Antimony	2.8	7/52	<	7.6	UJ	<	6.4	UJ	<	7.1	UJ	<	5.9	U	<	5.4	U
Arsenic	4.4	52/52	2.6	2.6		1.2	2.2	J	1.3	2.3	J	2.7	2.1		2.5	1.8	
Barium	1740	52/52	155	25	J	169	21	J	81	24	J	65	20		238	18	
Beryllium	0.8	52/52	0.64	0.63		0.2	0.53	J	0.26	0.59	J	0.6	0.49		0.46	0.45	
Cadmium	0.38	16/52	0.38	0.63	J	<	0.53	U	<	0.59	U	<	0.49	U	0.13	0.45	J
Calcium	338000	52/52	117000	3200		233000	2700		116000	2900		29000	490		118000	4500	
Chromium, Total	26.7	52/52	16.9	1.3		18.8	1.1		12.5	1.2		11.2	0.98		11.9	0.89	
Cobalt	4.7	51/52	3.2	6.3	J	3.1	5.3	J	1.3	5.9	J	3.6	4.9	J	2.1	4.5	J
Copper	10.5	52/52	4.5	3.2		1.5	2.7	J	5.9	2.9		6.2	2.5		3.1	2.2	
Iron	12100	52/52	9320	13		3100	11		4390	12		9530	9.8		5300	8.9	
Lead	9.1	52/52	6.5	0.39		1.7	0.33		2.4	0.35		7.4	0.32		4.7	0.27	
Magnesium	17600	52/52	6210	630		6850	530		5220	590		2710	490		2730	450	
Manganese	180	52/52	110	1.9		83.5	1.6		39.4	1.8		82.8	1.5		57.5	1.3	
Mercury	0.07	8/52	<	0.25	U	<	0.2	U	<	0.22	U	<	0.19	U	<	0.19	U
Nickel	11.9	52/52	9.3	5		4.2	4.3	J	4.2	4.7	J	10.5	3.9		5.8	3.6	
Potassium	3020	52/52	2720	630		972	530		1070	590		2450	490		1530	450	
Selenium	0.81	3/52	<	3.1	U	<	2.7	U	<	2.8	U	<	2.6	U	<	2.2	U
Sodium	353	52/52	277	630	J	147	530	J	104	590	J	37.5	490	J	132	450	J
Thallium	0.25	3/52	<	1.3	UJ	<	1.1	UJ	<	1.2	UJ	<	1.1	U	<	0.88	U
Vanadium	32.2	52/52	24.4	6.3		11.1	5.3		11.1	5.9		19.7	4.9		14.6	4.5	
Zinc	29.7	52/52	25.9	2.5		8.3	2.1		11.5	2.4		22.6	2		14.1	1.8	

mg/kg - milligram per killogram J - Estimated
µg/kg - microgram per killogram U - Nondetect

Page 5 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB04-020			CAE-SB04-030			CAE-SB04-040			CAE-SB05-005			CAE-SB05-010		
COLLECT DATE			04/30/98			04/30/98			04/30/98			05/01/98			05/01/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	7	1/52	<	11	U	<	11	U	7	11		<	11	U	<	11	U
Methyl Ethyl Ketone	46	3/52	<	19	U	<	18	U	<	18	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	72	5/52	<	19	U	<	18	U	<	18	U	<	18	U	<	18	U
Toluene	12	2/52	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Di-N-Butyl Phthalate	300	1/52	<	370	U	300	360		<	360	U	<	360	U	<	350	U
Di-N-Octylphthalate	170	1/52	<	370	U	<	360	U	<	360	U	<	360	U	<	350	U
N-Nitrosodiphenylamine	43	2/52	<	370	U	<	360	U	<	360	U	<	360	U	<	350	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/52	<	7.4	U	<	7.1	U	<	7.1	U	<	7.1	U	<	7	U
DDT	4.6	1/52	<	7.4	U	<	7.1	U	<	7.1	U	<	7.1	U	<	7	U
METALS (mg/kg)																	
Aluminum	19000	52/52	4350	21		4000	21		4910	21		17600	21		7370	21	
Antimony	2.8	7/52	<	6.4	U	<	6.3	U	<	6.4	U	1.2	6.2	J	<	6.2	U
Arsenic	4.4	52/52	1.4	2.1	J	0.12	1.7	J	1.4	2.1	J	3	2.1		2.6	2.1	
Barium	1740	52/52	166	21		232	21		52.6	21		370	21		356	21	
Beryllium	0.8	52/52	0.19	0.53	J	0.14	0.52	J	0.16	0.54	J	0.66	0.52		0.38	0.51	J
Cadmium	0.38	16/52	<	0.53	U	<	0.52	U	<	0.54	U	<	0.52	U	<	0.51	U
Calcium	338000	52/52	271000	5300		141000	5200		72100	5400		48300	520		223000	5100	
Chromium, Total	26.7	52/52	19.6	1.1		11.8	1		7.9	1.1		14.3	1		18.6	1	
Cobalt	4.7	51/52	1.5	5.3	J	0.53	5.2	J	1	5.4	J	3.9	5.2	J	2.6	5.1	J
Copper	10.5	52/52	1.1	2.7	J	1.6	2.6	J	1.2	2.7	J	6.8	2.6		3	2.6	
Iron	12100	52/52	2100	11		2310	10		3120	11		11000	10		4430	10	
Lead	9.1	52/52	1.5	0.32		0.12	0.25	J	2.1	0.32		8	0.31		4.1	0.31	
Magnesium	17600	52/52	6510	530		4320	520		4410	540		3390	520		3190	510	
Manganese	180	52/52	17.9	1.6		20.9	1.6		31.5	1.6		126	1.6		44.3	1.5	
Mercury	0.07	8/52	<	0.2	U	<	0.19	U	0.04	0.2	UJ	0.07	0.15		0.05	0.17	J
Nickel	11.9	52/52	3.8	4.3	J	2.8	4.2	J	2.8	4.3	J	10.4	4.2		5.8	4.1	
Potassium	3020	52/52	679	530		734	520		1060	540		3020	520		1450	510	
Selenium	0.81	3/52	0.81	0.53	J	<	2.1	U	<	2.7	U	<	2.6	U	<	2.6	U
Sodium	353	52/52	209	530	J	134	520	J	101	540	J	53.6	520	J	170	510	J
Thallium	0.25	3/52	<	1.1	U	<	0.83	U	<	1.1	U	<	1	U	<	1	U
Vanadium	32.2	52/52	10	5.3		7.3	5.2		7.9	5.4		27.3	5.2		11.7	5.1	
Zinc	29.7	52/52	5.8	2.1		6.4	2.1		7.5	2.1		26	2.1		12.9	2.1	

mg/kg - milligram per kilogram J - Estimated
µg/kg - microgram per kilogram U - Nondetect

Page 6 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB05-020			CAE-SB05-030			CAE-SB05-040			CAE-SB06-005			CAE-SB06-010			CAE-SB06-020		
COLLECT DATE			05/01/98			05/01/98			05/01/98			05/01/98			05/01/98			05/01/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
Carbon Disulfide	7	1/52	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone	46	3/52	<	18	U	<	18	U	<	18	U	<	18	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	72	5/52	<	18	U	<	18	U	<	18	U	<	18	U	<	18	U	<	18	U
Toluene	12	2/52	<	11	U	<	11	U	<	11	U	12	11		<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Di-N-Butyl Phthalate	300	1/52	<	360	U	<	370	U	<	350	U	<	370	U	<	360	U	<	360	U
Di-N-Octylphthalate	170	1/52	<	360	U	<	370	U	<	350	U	<	370	U	<	360	U	<	360	U
N-Nitrosodiphenylamine	43	2/52	<	360	U	<	370	U	<	350	U	<	370	U	<	360	U	<	360	U
PESTICIDES/PCB (µg/kg)																				
DDE	3.6	1/52	<	7.1	U	<	7.2	U	<	7	U	3.6	1.9	J	<	7.2	U	<	7.2	U
DDT	4.6	1/52	<	7.1	U	<	7.2	U	<	7	U	4.6	7.3	J	<	7.2	U	<	7.2	U
METALS (mg/kg)																				
Aluminum	19000	52/52	11400	21		5240	21		5580	20		12200	20		9100	21		10500	19	
Antimony	2.8	7/52	<	6.2	U	<	6.4	U	<	6	U	<	6.1	U	<	6.4	U	<	5.6	U
Arsenic	4.4	52/52	3	2.1		1.2	2.1	J	1.4	1.8	J	3.5	1.9		2.8	2.1		2.1	1.8	
Barium	1740	52/52	135	21		118	21		48.1	20		201	20		108	21		338	19	
Beryllium	0.8	52/52	0.58	0.51		0.18	0.54	J	0.2	0.5	J	0.5	0.51	J	0.43	0.54	J	0.45	0.46	J
Cadmium	0.38	16/52	0.17	0.51	J	<	0.54	U	0.16	0.5	J	<	0.51	U	0.31	0.54	J	<	0.46	U
Calcium	338000	52/52	81200	5100		173000	5400		78500	5000		105000	5100		98500	5400		83700	4600	
Chromium, Total	26.7	52/52	12.2	1		15.6	1.1		8.9	1		14.1	1		12.4	1.1		11.5	0.93	
Cobalt	4.7	51/52	3.6	5.1	J	1.3	5.4	J	1	5	J	2.8	5.1	J	2.7	5.4	J	2.5	4.6	J
Copper	10.5	52/52	4.3	2.6		2.6	2.7	J	2.6	2.5		5.1	2.5		3.9	2.7		2.8	2.3	
Iron	12100	52/52	7560	10		2740	11		3770	10		7590	10		6280	11		6550	9.3	
Lead	9.1	52/52	5.9	0.32		2.3	0.31		2.5	0.27		6.6	0.29		4.7	0.31	J	4.2	0.26	
Magnesium	17600	52/52	4500	510		10600	540		5990	500		3010	510		3130	540		3960	460	
Manganese	180	52/52	132	1.5		23.8	1.6		35.4	1.5		77.6	1.5		76.6	1.6		75.6	1.4	
Mercury	0.07	8/52	<	0.21	U	<	0.19	U	<	0.21	U	0.04	0.17	J	<	0.21	U	<	0.19	U
Nickel	11.9	52/52	7.8	4.1		4.6	4.3		3.7	4	J	8.8	4.1		6.9	4.3		6.6	3.7	
Potassium	3020	52/52	2590	510		918	540		1200	500		1980	510		1780	540		2350	460	
Selenium	0.81	3/52	<	2.7	U	<	2.6	U	<	2.3	U	<	2.4	U	<	2.6	U	0.66	2.2	J
Sodium	353	52/52	311	510	J	202	540		127	500	J	36.4	510	J	37.3	540	J	74.6	460	J
Thallium	0.25	3/52	<	1.1	U	<	1	U	<	0.9	U	<	0.97	U	<	1	U	<	0.88	U
Vanadium	32.2	52/52	20.2	5.1		14	5.4		11.3	5		18.8	5.1		15.8	5.4		16.6	4.6	
Zinc	29.7	52/52	21.5	2.1		8.6	2.1		8.7	2		18.5	2		15.6	2.1		15.5	1.9	

mg/kg - milligram per kilogram J - Estimated
µg/kg - microgram per kilogram U - Nondetect

Page 7 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB06-030			CAE-SB06-040			CAE-SB07-005			CAE-SB07-010			CAE-SB07-015			CAE-SB07-025		
COLLECT DATE			05/01/98			05/01/98			05/01/98			05/01/98			05/01/98			05/01/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
Carbon Disulfide	7	1/52	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone	46	3/52	<	18	U	<	18	U	26	19		32	18		46	18		<	18	U
Methyl Isobutyl Ketone	72	5/52	<	18	U	<	18	U	49	19		55	18		72	18		14	18	
Toluene	12	2/52	<	11	U	<	11	U	<	11	U	5	11		<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Di-N-Butyl Phthalate	300	1/52	<	360	U	<	350	U	<	370	U	<	360	U	<	360	U	<	370	U
Di-N-Octylphthalate	170	1/52	<	360	U	<	350	U	<	370	U	<	360	U	<	360	U	<	370	U
N-Nitrosodiphenylamine	43	2/52	<	360	U	<	350	U	<	370	U	<	360	U	<	360	U	<	370	U
PESTICIDES/PCB (µg/kg)																				
DDE	3.6	1/52	<	7.1	U	<	7	U	<	3.7	U	<	3.5	U	<	3.5	U	<	3.6	U
DDT	4.6	1/52	<	7.1	U	<	7	U	<	3.7	U	<	3.5	U	<	3.5	U	<	3.6	U
METALS (mg/kg)																				
Aluminum	19000	52/52	7860	21		3670	19		19000	21		13200	21		11900	20		5580	21	
Antimony	2.8	7/52	<	6.4	U	<	5.8	U	<	6.2	U	<	6.3	U	<	6	U	<	6.3	U
Arsenic	4.4	52/52	1.3	1.9	J	0.92	0.83	J	2.9	2		3.2	1.9		1.9	2	J	1.4	1.9	J
Barium	1740	52/52	1000	21		20.9	19		145	21		267	21		177	20		129	21	
Beryllium	0.8	52/52	0.28	0.53	J	0.15	0.49	J	0.8	0.52		0.62	0.52		0.57	0.5		0.25	0.52	J
Cadmium	0.38	16/52	<	0.53	U	<	0.49	U	<	0.52	U	<	0.52	U	<	0.5	U	<	0.52	U
Calcium	338000	52/52	86000	5300		31900	490		71300	5200		116000	5200		108000	5000		193000	5200	
Chromium, Total	26.7	52/52	10.2	1.1		4.6	0.97		15.6	1		15.1	1		13.6	1		16.1	1	
Cobalt	4.7	51/52	1.2	5.3	J	0.85	4.9	J	4.1	5.2	J	3.3	5.2	J	3.2	5	J	2.2	5.2	J
Copper	10.5	52/52	2.3	2.7	J	0.95	2.4	J	8.7	2.6		5.1	2.6		3.4	2.5		2.3	2.6	J
Iron	12100	52/52	4330	11		2670	9.7		11600	10		8590	10		6910	10		3000	10	
Lead	9.1	52/52	2.7	0.29		2.1	0.25		6.3	0.3		6.3	0.29		4.7	0.3		2	0.29	
Magnesium	17600	52/52	7370	530		2830	490		3410	520		3360	520		4010	500		8880	520	
Manganese	180	52/52	36.4	1.6		28.8	1.5		94.3	1.6		113	1.6		83.4	1.5		30.7	1.6	
Mercury	0.07	8/52	<	0.19	U	<	0.2	U	0.04	0.19	J	<	0.21	U	0.04	0.16	J	<	0.2	U
Nickel	11.9	52/52	4.9	4.3		2.5	3.9	J	11.9	4.2		8.1	4.2		6.8	4		4.6	4.2	
Potassium	3020	52/52	1650	530		814	490		2930	520		2200	520		2250	500		958	520	
Selenium	0.81	3/52	<	2.4	U	<	2.1	U	<	2.5	U	0.56	2.4	J	<	2.5	U	<	2.4	U
Sodium	353	52/52	181	530	J	85.9	490	J	82.7	520	J	209	520	J	282	500	J	206	520	J
Thallium	0.25	3/52	<	0.95	U	<	0.83	U	<	1	U	0.25	0.97	J	<	0.99	U	<	0.95	U
Vanadium	32.2	52/52	10.3	5.3		6.3	4.9		24.8	5.2		22.4	5.2		16.6	5		15.2	5.2	
Zinc	29.7	52/52	10.3	2.1		6.3	1.9		29.2	2.1		21.7	2.1		18.5	2		8.9	2.1	

mg/kg - milligram per kilogram J - Estimated
µg/kg - microgram per kilogram U - Nondetect

Page 8 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB07-035			CAE-SB07-045			CAE-SB08-005			CAE-SB08-010			CAE-SB08-015		
COLLECT DATE			05/01/98			05/01/98			05/01/98			05/01/98			05/01/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	7	1/52	<	11	U	<	11	U	<	12	U	<	12	U	<	12	U
Methyl Ethyl Ketone	46	3/52	<	18	U	<	18	U	<	20	U	<	20	U	<	20	U
Methyl Isobutyl Ketone	72	5/52	37	18		<	18	U	<	20	U	<	20	U	<	20	U
Toluene	12	2/52	<	11	U	<	11	U	<	12	U	<	12	U	<	12	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Di-N-Butyl Phthalate	300	1/52	<	350	U	<	350	U	<	360	U	<	360	U	<	360	U
Di-N-Octylphthalate	170	1/52	<	350	U	<	350	U	<	360	U	<	360	U	<	360	U
N-Nitrosodiphenylamine	43	2/52	<	350	U	<	350	U	<	360	U	<	360	U	<	360	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/52	<	3.5	U	<	3.5	U	<	3.6	U	<	3.5	U	<	3.5	U
DDT	4.6	1/52	<	3.5	U	<	3.5	U	<	3.6	U	<	3.5	U	<	3.5	U
METALS (mg/kg)																	
Aluminum	19000	52/52	6080	20		4310	20		14600	2.4		9230	2.7		11500	2.6	
Antimony	2.8	7/52	<	5.9	U	<	6	U	<	1.1	U	<	1.2	U	<	1.2	U
Arsenic	4.4	52/52	1.3	1.9	J	1.3	1.9	J	2.1	0.22		1.9	0.23	J	1.6	0.22	J
Barium	1740	52/52	59.1	20		45.7	20		70.4	0.072		1740	0.079		286	0.078	
Beryllium	0.8	52/52	0.25	0.49	J	0.2	0.5	J	0.71	0.027		0.43	0.03	J	0.49	0.029	
Cadmium	0.38	16/52	<	0.49	U	<	0.5	U	<	0.13	U	<	0.14	U	0.19	0.14	J
Calcium	338000	52/52	101000	4900		119000	5000		6140	2.5		217000	28		91000	27	
Chromium, Total	26.7	52/52	10.3	0.98		12.7	1		10.3	0.58		19.5	0.63		13.4	0.62	
Cobalt	4.7	51/52	1.9	4.9	J	1.8	5	J	4.4	0.26	J	2.6	0.29	J	3.4	0.28	J
Copper	10.5	52/52	1.7	2.4	J	10.5	2.5		6.7	0.19		3.4	0.21		3.2	0.2	
Iron	12100	52/52	3720	9.8		3360	10		10600	0.48		4850	0.52		7100	0.52	
Lead	9.1	52/52	2.3	0.29		2.3	0.29		6.9	0.18		4	0.19		4.4	0.18	
Magnesium	17600	52/52	3560	490		3870	500		2330	2		3650	2.2		4320	2.1	
Manganese	180	52/52	39.7	1.5		34.8	1.5		152	0.081		72.9	0.089		87.2	0.087	
Mercury	0.07	8/52	<	0.19	U	0.04	0.18	J	<	0.037	U	<	0.039	U	<	0.037	U
Nickel	11.9	52/52	3.9	3.9		3.1	4	J	9.8	0.33		5.7	0.35		7.6	0.35	
Potassium	3020	52/52	1220	490		823	500		2420	9.9		1440	11		2280	11	
Selenium	0.81	3/52	<	2.4	U	<	2.4	U	<	0.89	U	<	0.93	U	<	0.88	U
Sodium	353	52/52	134	490	J	93.1	500	J	35.7	2.4	J	183	2.6	J	276	2.5	J
Thallium	0.25	3/52	<	0.97	U	<	0.96	U	0.24	0.2	J	<	0.21	U	<	0.2	U
Vanadium	32.2	52/52	8.5	4.9		8.3	5		20	0.18		14.3	0.2		20	0.19	
Zinc	29.7	52/52	8.5	2		8	2		25.4	0.39		12.7	0.42		18	0.42	

mg/kg - milligram per kilogram J - Estimated
µg/kg - microgram per kilogram U - Nondetect

Page 9 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1b
Detected Compounds in Subsurface Soils
AOC E

FIELD ID			CAE-SB08-025			CAE-SB08-035			CAE-SB08-045		
COLLECT DATE			05/01/98			05/01/98			05/01/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)											
Carbon Disulfide	7	1/52	<	12	U	<	12	U	<	12	U
Methyl Ethyl Ketone	46	3/52	<	20	U	<	20	U	<	20	U
Methyl Isobutyl Ketone	72	5/52	<	20	U	<	20	U	<	20	U
Toluene	12	2/52	<	12	U	<	12	U	<	12	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)											
Di-N-Butyl Phthalate	300	1/52	<	360	U	<	360	U	<	360	U
Di-N-Octylphthalate	170	1/52	<	360	U	<	360	U	170	360	
N-Nitrosodiphenylamine	43	2/52	<	360	U	<	360	U	<	360	U
PESTICIDES/PCB (µg/kg)											
DDE	3.6	1/52	<	3.6	U	<	3.6	U	<	3.5	U
DDT	4.6	1/52	<	3.6	U	<	3.6	U	<	3.5	U
METALS (mg/kg)											
Aluminum	19000	52/52	4820	2.8		4860	2.8		4410	2.7	
Antimony	2.8	7/52	<	1.2	U	<	1.3	U	<	1.2	U
Arsenic	4.4	52/52	1.6	0.22	J	1.4	0.24	J	0.77	0.22	J
Barium	1740	52/52	194	0.082		139	0.084		43.9	0.081	
Beryllium	0.8	52/52	0.18	0.031	J	0.17	0.032	J	0.18	0.03	J
Cadmium	0.38	16/52	<	0.14	U	0.2	0.15	J	<	0.14	U
Calcium	338000	52/52	240000	29		168000	29		72500	28	
Chromium, Total	26.7	52/52	19.9	0.66		15.3	0.67		8.9	0.65	
Cobalt	4.7	51/52	1.7	0.3	J	1.2	0.3	J	1.5	0.29	J
Copper	10.5	52/52	2.6	0.22		3.7	0.22		1.8	0.21	J
Iron	12100	52/52	2360	0.55		2840	0.56		3290	0.54	
Lead	9.1	52/52	1.5	0.18		1.7	0.2		1.9	0.18	
Magnesium	17600	52/52	17600	2.3		12600	2.3		5000	2.2	
Manganese	180	52/52	22.1	0.093		27.5	0.095		33.8	0.091	
Mercury	0.07	8/52	<	0.039	U	0.04	0.039	J	<	0.041	U
Nickel	11.9	52/52	4.8	0.37		4.2	0.38		2.8	0.37	J
Potassium	3020	52/52	748	11		902	11		854	11	
Selenium	0.81	3/52	<	0.89	U	<	0.99	U	<	0.88	U
Sodium	353	52/52	269	2.7	J	228	2.7	J	119	2.6	J
Thallium	0.25	3/52	<	0.2	U	<	0.22	U	<	0.2	U
Vanadium	32.2	52/52	17.3	0.21		12.9	0.21		11.4	0.2	
Zinc	29.7	52/52	5.4	0.44		8.6	0.45		7.3	0.44	

mg/kg - milligram per killogram J - Estimated
µg/kg - microgram per killogram U - Nondetect

Page 10 of 10

Source: URS Greiner Woodward Clyde, 1999

Table 63-1c
Comparison of Maximum Surface Soil Concentrations to MSSLs
AOC E

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Industrial Soil MSSL Concentration[2] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of Residential MSSL	Frequency of Exceedance of Industrial MSSL	Estimated Risk: Excess Cancer [2]	Estimated Risk: Hazard Quotient [3]
VOLATILE ORGANICS											
Toluene	1/8	CAE-SB06-002	0.010		520	520	NO				**
SEMIVOLATILE ORGANICS											
Phenol	1/8	CAE-SB03-002	0.120		33,000	100,000	NO				***
PESTICIDES											
DDE	1/8	CAE-HA04-002	0.0034		0.2		NO			1.70E-08	
METALS											
Aluminum	8/8	CAE-SB01-002	19900		75,000	100,000	NO				***
Antimony	2/8	CAE-HA01-001	3.2		30		NO				0.1067
Arsenic	8/8	CAE-HA01-001	4.6	J	0.38	3.0	YES	8/8	5/8	1.21E-05	
Beryllium	8/8	CAE-SB01-002	0.87		150	3,400	NO			5.80E-09	
Cadmium	3/8	CAE-SB03-002	0.46	J	37	930	NO				0.0124
Chromium	8/8	CAE-SB01-002	14.3		210	450	NO			6.81E-08	
Iron	8/8	CAE-SB02-002	14,700		22,000		NO				0.67
Nickel	8/8	CAE-SB06-002	12.5		1,500	37,000	NO				0.0083
Vanadium	8/8	CAE-SB02-002	30.1		520	13,000	NO				0.0579
Zinc	8/8	CAE-SB02-002	36		22,000	100,000	NO				***
Total Excess Cancer Risk[4]										1E-05	
Hazard Index[5]											0.85

(1) EPA Region VI Media-Specific Screening Levels for Residential Soil (EPA 1998)
(2) These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/MSSL*1×10^{-6}.
(3) These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/MSSL*1.0.
(4) Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
(5) Hazard Index = Sum of all hazard quotients at the site.
** The MSSL for toluene is based on a soil saturation concentration and is not based on risk. Therefore, a potential risk from toluene could not be estimated using the MSSLs. A MSSL calculated based on risk would be higher than the saturation concentration; therefore, the exclusion of toluene from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
***MSSL is the maximum allowable concentration and not based on risk. Therefore, a potential risk could not be estimated using the MSSL. A MSSL calculated based on risk would be higher than the maximum concentration. Exclusion of this compound from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
mg/kg = Milligrams per Kilogram

Source: URS Greiner Woodward Clyde, 1999

Table 63-1d
Comparison of Maximum Subsurface Soil Concentrations to MSSLs
AOC E

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Industrial Soil MSSL Concentration[2] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of Residential MSSL	Frequency of Exceedance of Industrial MSSL	Estimated Risk: Excess Cancer [2]	Estimated Risk: Hazard Quotient [3]
VOLATILE ORGANICS											
Carbon Disulfide	1/52	CAE-SB04-040	0.007		350	1,200	NO				0.00002
Methyl Ethyl Ketone (2-Butanone	3/52	CAE-SB07-015	0.046		6,900	27,000	NO				0.00001
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5/52	CAE-SB07-015	0.072		750	2,800	NO				0.0001
Toluene	2/52	CAE-SB06-005	0.012		520	520	NO				**
SEMIVOLATILE ORGANICS											
Di-n-butyl phthalate	1/52	CAE-SB04-030	0.300		5,500	110,000	NO				0.0001
Di-n-octyl phthalate	1/52	CAE-SB08-045	0.170		1,100	10,000	NO				0.0002
N-nitrosodiphenylamine	5/52	CAE-SB03-010	0.043		91	610	NO			5E-10	
PESTICIDES											
DDE	1/52	CAE-SB06-005	0.0036		0.2		NO			2E-08	
DDT	1/52	CAE-SB06-005	0.0046		0.2		NO			2E-08	
METALS											
Arsenic	52/52	CAE-SB06-005	4		0.38	3.0	YES	52/52	10/52	1E-05	
Aluminum	52/52	CAE-SB07-005	19,000		75,000	100,000	NO				***
Barium	52/52	CAE-SB08-010	1,740		5,200	100,000	NO				***
Beryllium	52/52	CAE-SB07-005	0.8		150	3,400	NO				0.0053
Chromium	52/52	CAE-SB01-020	26.7		210	450	NO			1E-07	
Copper	52/52	CAE-SB07-045	10.5		2,800	70,000	NO				0.0038
Lead	52/52	CAE-SB05-005	9.1		400		NO				****

Page 1 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 63-1d
Comparison of Maximum Subsurface Soil Concentrations to MSSLs
AOC E

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Industrial Soil MSSL Concentration[(2)] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of Residential MSSL	Frequency of Exceedance of Industrial MSSL	Estimated Risk: Excess Cancer [(2)]	Estimated Risk: Hazard Quotient [(3)]
METALS, cont.											
Mercury	8/52	CAE-SB05-005	0.07		22	NA	NO				0.0032
Total Excess Cancer Risk[(4)]										1E-05	
Hazard Index[(5)]											0.01

[(1)] EPA Region Media-Specific Screening Levels for Residential Soil (EPA 1998)
[(2)] These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/MSSL*$1x10^{-6}$.
[(3)] These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/MSSL*1.0.
[(4)] Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
[(5)] Hazard Index = Sum of all hazard quotients at the site.
** The MSSL for toluene is based on a soil saturation concentration and is not based on risk. Therefore, a potential risk from toluene could not be estimated using the MSSLs. A MSSL calculated based on risk would be higher than the saturation concentration; therefore, the exclusion of toluene from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
***The MSSLs for aluminum and barium are the maximum allowable concentrations and not risk-based. Therefore, a potential risk from aluminum and barium could not be estimated using the MSSLs. A MSSL calculated based on risk would be higher than the maximum concentration. Exclusion of these compounds from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
****Lead does not have an EPA-established toxicity factor; therefore, an MSSL has not be calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).
mg/kg = Milligrams per Kilogram

Page 2 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 64-1a
Detected Compounds in Surface Soils
AOC F

FIELD ID			CAF-HA01-001			CAF-HA01-002			CAF-HA02-001			CAF-HA02-002			CAF-HA03-001			CAF-HA03-002			CAF-HA04-001		
COLLECT DATE			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
METALS (mg/kg)																							
Antimony	0.19	8/27	<	0.16	UJ	<	0.16	U	<	0.16	U	<	0.14	U	0.19	0.16		<	0.2	U	0.16	0.15	
Arsenic	5	27/27	2.2	0.1		2.1	0.16		2.4	0.11		1.9	0.1		2.4	0.11		2.2	0.1		5	0.1	
Lead	151	27/27	7.8	2.2		2.3	2.1		10	2.1		8	1.9		16.4	2		6.6	2		11.9	2	

J - Estimated Value
RL - Reporting Limit
Qual - Qualifier
U - Value reported as nondetect
UJ - Value is estimated nondetect
mg/kg = Milligrams per Kilogram

Page 1 of 4

Source: URS Greiner Woodward Clyde, 1999

Table 64-1a
Detected Compounds in Surface Soils
AOC F

FIELD ID			CAF-HA04-002			CAF-HA05-001			CAF-HA05-002			CAF-HA06-001			CAF-HA06-002			CAF-HA07-001			CAF-HA07-002		
COLLECT DATE			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
METALS (mg/kg)																							
Antimony	0.19	8/27	<	0.15	U	<	0.15	U	<	0.15	UJ	<	0.15	U	0.16	0.15		<	0.15	U	0.17	0.2	J
Arsenic	5	27/27	2.6	0.1		2.7	0.1		2.9	0.1		2.6	0.1		3.5	0.1		2.6	0.1		2.6	0.1	
Lead	151	27/27	12.7	1.9		10.6	2		151	1.8		7.8	1.9		5.3	1.7		6.6	2.2		6.4	2	

J - Estimated Value
RL - Reporting Limit
Qual - Qualifier
U - Value reported as nondetect
UJ - Value is estimated nondetect
mg/kg = Milligrams per Kilogram

Page 2 of 4

Source: URS Greiner Woodward Clyde, 1999

Table 64-1a
Detected Compounds in Surface Soils
AOC F

FIELD ID			CAF-HA08-001			CAF-HA08-002			CAF-HA09-001			CAF-HA09-002			CAF-SS01-002			CAF-SS02-002			CAF-SS03-002		
COLLECT DATE			4/29/98			4/29/98			4/29/98			4/29/98			4/28/98			4/28/98			4/28/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
METALS (mg/kg)																							
Antimony	0.19	8/27	<	0.15	U	<	0.15	U	<	0.15	U	<	0.15	U	<	0.16	UJ	0.18	0.16	J	<	0.16	U
Arsenic	5	27/27	2.6	0.1		2.5	0.1		2.4	0.1		2.6	0.1		2.9	0.11		2.7	0.11		2.6	0.11	
Lead	151	27/27	5.9	2.1		4.2	2.1		4.4	2		4.5	1.9		23.4	2.2		4.4	2.1		5.4	2.2	

J - Estimated Value
RL - Reporting Limit
Qual - Qualifier
U - Value reported as nondetect
UJ - Value is estimated nondetect
mg/kg = Milligrams per Kilogram

Page 3 of 4

Source: URS Greiner Woodward Clyde, 1999

Table 64-1a
Detected Compounds in Surface Soils
AOC F

FIELD ID			CAF-SS04-002			CAF-SS05-002			CAF-SS06-002			CAF-SS07-002			CAF-SS08-002			CAF-SS09-002		
COLLECT DATE			4/28/98			4/28/98			4/28/98			4/28/98			4/28/98			4/28/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
METALS (mg/kg)																				
Antimony	0.19	8/27	<	0.15	U	<	0.15	U	<	0.14	U	0.18	0.15		0.17	0.16		0.17	0.16	
Arsenic	5	27/27	2.4	0.1		2.2	0.1		2.2	0.1		2.8	0.1		2.8	0.11		2.5	0.11	
Lead	151	27/27	8.9	2		7	2		8.8	1.9		17.1	2		15.4	2.2		6	2.1	

J - Estimated Value
RL - Reporting Limit
Qual - Qualifier
U - Value reported as nondetect
UJ - Value is estimated nondetect
mg/kg = Milligrams per Kilogram

Page 4 of 4

Source: URS Greiner Woodward Clyde, 1999

Table 64-1b
Detected Compounds in Subsurface Soils
AOC F

FIELD ID			CAF-HA01-004			CAF-HA02-004			CAF-HA03-004			CAF-HA04-004			CAF-HA05-004		
COLLECT DATE			4/29/98			4/29/98			4/29/98			4/29/98			4/29/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
METALS (mg/kg)																	
Antimony	0.27	3/9	0.14	0.16	J	<	0.14	U	<	0.15	U	0.15	0.15		0.27	0.15	
Arsenic	3.1	9/9	2.4	0.11		2	0.09		3.1	0.1		2.6	0.1		2.8	0.1	
Lead	38.9	9/9	7.8	1.9		4.9	1.9		15.1	2		10.8	2		38.9	2.1	

J - Estimated Value
RL - Reporting Limit
Qual - Qualifier
U - Value reported as nondetect
mg/kg = Milligrams per Kilogram

Page 1 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 64-1b
Detected Compounds in Subsurface Soils
AOC F

FIELD ID			CAF-HA06-004			CAF-HA07-004			CAF-HA08-004			CAF-HA09-004		
COLLECT DATE			4/29/98			4/29/98			4/29/98			4/29/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
METALS (mg/kg)														
Antimony	0.27	3/9	<	0.15	U	<	0.15	U	<	0.15	U	<	0.15	U
Arsenic	3.1	9/9	2.4	0.1		2.4	0.1		2.4	0.1		2.5	0.1	
Lead	38.9	9/9	4.5	2.1		5.6	2		2.2	1.7		4.4	1.9	

J - Estimated Value
RL - Reporting Limit
Qual - Qualifier
U - Value reported as nondetect
mg/kg = Milligrams per Kilogram

Page 2 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 64-1c
Comparison of Maximum Surface Soil Concentrations to MSSLs
AOC F

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Industrial Soil MSSL Concentration[2] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of MSSL	Estimated Risk: Excess Cancer[3]	Estimated Risk: Hazard Quotient[4]
METALS										
Arsenic	27/27	CAF-HA04-001	5		0.38	3.0	YES	2/27	1.67E-06	
Lead	27/27	CAF-HA05-002	151		400	1,000	NO		NA	NA
Total Excess Cancer Risk[5]									2E-06	
Hazard Index[6]										0.0

(1) EPA Region VI Media-Specific Screening Levels for Residential Soil (EPA 1998)
(2) EPA Region VI Media-Specific Screening Levels for Industrial Soil (EPA 1998)
(3) These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/Industrial MSSL*$1x10^{-6}$.
(4) These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/Industrial MSSL*1.0.
(5) Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
(6) Hazard Index = Sum of all hazard quotients at the site.
NA = Not applicable.
mg/kg = Milligrams per Kilogram
* Lead does not have an EPA-established toxicity factor; therefore, an MSSL has not been calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).

Source: URS Greiner Woodward Clyde, 1999

Table 64-1d
Comparison of Maximum Subsurface Soil Concentrations to MSSLs
AOC F

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Industrial Soil MSSL Concentration[2] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of MSSL	Estimated Risk: Excess Cancer[3]	Estimated Risk: Hazard Quotient[4]
METALS										
Lead	9/9	CAF-HA05-002	38.9		400	1,000	NO		NA	NA
Total Excess Cancer Risk[4]									0E+00	
Hazard Index[5]										0.0

[1] EPA Region VI Media-Specific Screening Levels for Residential Soil (EPA 1998)
[2] EPA Region VI Media-Specific Screening Levels for Industrial Soil (EPA 1998)
[3] These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/Industrial MSSL*$1x10^{-6}$.
[4] These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/Industrial MSSL*1.0.
[5] Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
[6] Hazard Index = Sum of all hazard quotients at the site.
mg/kg = Milligrams per Kilogram
NA = Not Applicable.
* Lead does not have an EPA-established toxicity factor; therefore, a MSSL has not been calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).

Source: URS Greiner Woodward Clyde, 1999

Table 65-1a
Detected Compounds in Surface Soils
AOC G

FIELD ID			CAG-SB01-002			CAG-SB02-002			CAG-SB03-003			CAG-SB04-003		
COLLECT DATE			5/3/98			5/3/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)														
Methyl Ethyl Ketone (2-Butanone)	38	1/8	38	19		<	18	U	<	19	U	<	21	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	74	3/8	74	19		<	18	U	6	19		6	21	
Toluene	6	3/8	6	11		4	11		4	11		<	13	U
METALS (mg/kg)														
Aluminum	21300	8/8	11900	21		17000	19		13200	22		15400	23	
Arsenic	3.6	8/8	2.4	2		3.6	2.1		2.4	2.1		2.9	2.4	
Barium	247	8/8	69	21		106	19		133	22		247	23	
Beryllium	0.94	8/8	0.56	0.53		0.79	0.48		0.65	0.55		0.75	0.57	
Cadmium	0.61	2/8	<	0.53	U	0.35	0.48		<	0.55	U	<	0.57	U
Calcium	140000	8/8	2360	530		3090	480		114000	5500		140000	5700	
Chromium, Total	20.6	8/8	8.9	1.1		11.9	0.96		17.1	1.1		20.6	1.1	
Cobalt	6.4	8/8	3.2	5.3		5.3	4.8		4.1	5.5		4	5.7	
Copper	10.9	8/8	5.6	2.7		8.1	2.4		6.9	2.8		8.1	2.9	
Iron	15400	8/8	8640	11	E	13200	9.6		9010	11		10700	11	
Lead	14.9	8/8	6.4	0.29		13	10		6.1	10	J	6.2	10	
Magnesium	4110	8/8	1490	530		2390	480		3350	550		4110	570	
Manganese	278	8/8	135	1.6	E	211	1.4	E	131	1.7	J	131	1.7	
Mercury	0.41	3/8	<	0.19	U	0.04	0.21		0.05	0.21		0.41	0.24	
Nickel	13.8	8/8	7	4.3		10.7	3.8		9.2	4.4		10.4	4.6	
Potassium	3280	8/8	1970	530		2640	480		2110	550		2400	570	
Sodium	336	8/8	43.4	530		41.9	480		63.5	550		138	570	
Thallium	0.45	4/8	<	0.98	U	0.3	1		<	1	U	<	1	U
Vanadium	32.6	8/8	19	5.3	E	27	4.8		19.5	5.5		24.3	5.7	
Zinc	42.6 E	8/8	22.6	2.1		32.5	1.9		24.6	2.2	E	29.8	2.3	E

J = Estimated
Qual = Qualifier
RL = Reporting Limit
U = Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 1 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 65-1a
Detected Compounds in Surface Soils
AOC G

FIELD ID			CAG-SB05-002			CAG-SB06-002			CAG-SB07-002			CAG-SB08-002		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/5/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)														
Methyl Ethyl Ketone (2-Butanone)	38	1/8	<	18	U	<	18	U	<	19	U	<	18	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	74	3/8	<	18	U	<	18	U	<	19	U	<	18	U
Toluene	6	3/8	<	11	U	<	11	U	<	11	U	<	11	U
METALS (mg/kg)														
Aluminum	21300	8/8	21300	21		20900	20		14300	21		16100	21	
Arsenic	3.6	8/8	2.9	1.7		2.5	0.97		3.4	2		3.3	1.5	
Barium	247	8/8	112	21		144	20		159	21		133	21	
Beryllium	0.94	8/8	0.94	0.51		0.94	0.49		0.84	0.53		0.92	0.53	
Cadmium	0.61	2/8	0.61	0.51		<	0.49	U	<	0.53	U	<	0.53	U
Calcium	140000	8/8	4300	510		5430	490		11800	530		2880	530	
Chromium, Total	20.6	8/8	15.4	1		14.2	0.98		12	1.1		12.4	1.1	
Cobalt	6.4	8/8	6.3	5.1		6.4	4.9		6.1	5.3		6.1	5.3	
Copper	10.9	8/8	10.3	2.6		10.3	2.5		9.6	2.6		10.9	2.7	
Iron	15400	8/8	15400	10		15400	9.8		12300	11		14100	11	
Lead	14.9	8/8	12.2	19		5.1	19		14.9	20		4.6	15	
Magnesium	4110	8/8	3120	510		3350	490		2630	530		2600	530	
Manganese	278	8/8	250	1.5		268	1.5		247	1.6		278	1.6	
Mercury	0.41	3/8	<	0.22	U	<.	0.17	U	<	0.22	U	<	0.2	U
Nickel	13.8	8/8	13.4	4.1		13.8	3.9		12.5	4.2		12.1	4.3	
Potassium	3280	8/8	3240	510		3280	490		2500	530		2590	530	
Sodium	336	8/8	331	510		189	490		336	530		49.9	530	
Thallium	0.45	4/8	<	0.95	U	0.43	0.97		0.41	0.99		0.45	0.75	
Vanadium	32.6	8/8	32.6	5.1		29.4	4.9		24.6	5.3		29.2	5.3	
Zinc	42.6 E	8/8	42.6	2.1	E	36.5	2		29.7	2.1		32.9	2.1	

J = Estimated
Qual = Qualifier
RL = Reporting Limit
U = Not detected at specified reporting limit
'E = Estimated since result exceeded the calibration curve
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 2 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB01-005			CAG-SB01-010			CAG-SB01-020			CAG-SB01-030			CAG-SB01-040		
COLLECT DATE			5/3/98			5/3/98			5/3/98			5/3/98			5/3/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	12	U	<	12	U
Chloromethane	10	1/40	<	11	U	10	11		<	11	U	<	12	U	<	12	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	15	18		36	18		<	19	U	<	19	U	<	19	U
Methyl Isobutyl Ketone	52	9/40	36	18		49	18		48	19		45	19		52	19	
Toluene	6	2/40	4	11		<	11	U	<	11	U	<	12	U	<	12	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Benzo(a)pyrene	52	2/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Benzo(b)fluoranthene	55	2/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Benzo(k)fluoranthene	46	1/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Chrysene	51	2/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Di-N-Butyl Phthalate	560	4/40	<	360	U	<	360	U	<	380	U	560	390		<	390	U
Di-N-Octylphthalate	150	2/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Fluoranthene	69	3/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
Pyrene	53	3/40	<	360	U	<	360	U	<	380	U	<	390	U	<	390	U
METALS (mg/kg)																	
Aluminum	16700	40/40	10400	18		9710	21		8270	21		5440	22		4150	22	
Antimony	1.1	1/40	<	5.4	U	<	6.3	U	<	6.2	U	<	6.5	U	<	6.6	U
Arsenic	3.1	40/40	2.1	1.9		1.7	1.9		1.6	2.1		1.9	2.2		1.5	2.2	
Barium	1280	40/40	64	18		106	21		102	21		650	22		115	22	
Beryllium	0.7	40/40	0.52	0.45		0.41	0.53		0.45	0.52		0.21	0.54		0.13	0.55	
Cadmium	0.29	12/39	<	0.45	U	<	0.53	U	<	0.52	U	<	0.54	U	<	0.55	U
Calcium	265000	40/40	3150	450		120000	5300		252000	5200		200000	5400		129000	5500	
Chromium, Total	22.6	40/40	8.8	0.89		13.1	1.1		20.9	1		16.2	1.1		11.2	1.1	
Cobalt	4.3	40/40	3.2	4.5		3	5.3		2	5.2		1.1	5.4		1.2	5.5	
Copper	12.8	38/40	5.8	2.2		2.5	2.6		2.8	2.6		4.5	2.7		<	2.7	U
Iron	9620	40/40	8170	8.9	E	6080	11	E	4160	10	E	2670	11	E	2640	11	E
Lead	9.2	40/40	5.9	0.29		4.2	0.29		2.8	0.32		1.5	0.33		1.6	0.33	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	1430	450		3270	530		7890	520		24000	540		13600	550	

Page 1 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB01-005			CAG-SB01-010			CAG-SB01-020			CAG-SB01-030			CAG-SB01-040		
COLLECT DATE			5/3/98			5/3/98			5/3/98			5/3/98			5/3/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	142	1.3	E	73.8	1.6	E	40.1	1.5	E	26.4	1.6	E	31.7	1.6	E
Mercury	0.14	8/40	0.04	0.18		<	0.21	U	<	0.19	U	<	0.21	U	<	0.21	U
Nickel	9.8	40/40	7.1	3.6		6.8	4.2		3.9	4.1		4.1	4.3		2.4	4.4	
Potassium	3930	40/40	1770	450		2100	530		1610	520		1010	540		739	550	
Selenium	0.74	1/40	<	2.4	U	<	2.4	U	0.74	2.7		<	2.8	U	<	2.7	U
Sodium	575	40/40	37.3	450		178	530		240	520		290	540		150	550	
Thallium	0.41	13/40	<	0.96	U	<	0.96	U	<	1.1	U	0.22	1.1		<	1.1	U
Vanadium	28.4	40/40	17.4	4.5	E	16.1	5.3	E	16.3	5.2	E	20	5.4	E	15	5.5	E
Zinc	22.1	40/40	20.7	1.8		16	2.1		12.3	2.1		7.9	2.2		6.1	2.2	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 2 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB02-005			CAG-SB02-010			CAG-SB02-020			CAG-SB02-030			CAG-SB02-040		
COLLECT DATE			5/3/98			5/3/98			5/3/98			5/3/98			5/3/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	18	U	<	18	U	<	18	U	<	19	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	18	U	<	18	U	<	18	U	<	19	U	<	18	U
Toluene	6	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Benzo(a)pyrene	52	2/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Benzo(b)fluoranthene	55	2/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Benzo(k)fluoranthene	46	1/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Chrysene	51	2/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Di-N-Butyl Phthalate	560	4/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Di-N-Octylphthalate	150	2/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Fluoranthene	69	3/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
Pyrene	53	3/40	<	350	U	<	360	U	<	360	U	<	380	U	<	370	U
METALS (mg/kg)																	
Aluminum	16700	40/40	9510	20		7720	21		6170	21		4640	21		4720	21	
Antimony	1.1	1/40	<	5.9	U	<	6.2	U	<	6.2	U	<	6.3	U	<	6.3	U
Arsenic	3.1	40/40	2.8	1.8		2.1	1		1.6	2		1.8	2		1.4	2.1	
Barium	1280	40/40	224	20		295	21		227	21		117	21		79.6	21	
Beryllium	0.7	40/40	0.44	0.5		0.39	0.52		0.29	0.52		0.17	0.52		0.17	0.53	
Cadmium	0.29	12/39	0.18	5		0.26	5.2		0.28	5.2		<	5.2	U	<	5.3	U
Calcium	265000	40/40	140000	500		163000	520		265000	520		171000	520		99300	530	
Chromium, Total	22.6	40/40	15.1	0.99		15.2	1		22.6	1		14.3	1		13.1	1.1	
Cobalt	4.3	40/40	3	5		2.4	5.2		1.5	5.2		2.6	5.2		1.5	5.3	
Copper	12.8	38/40	3.8	2.5		2.3	2.6		3.3	2.6		2.4	2.6		12.8	2.6	
Iron	9620	40/40	6370	9.9		4960	10		3180	10		2540	10		3100	11	
Lead	9.2	40/40	5.5	9.2		4.7	10	J	3.2	9.9		1.6	9.8		2.5	10	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	3170	500		3340	520		9980	520		18600	520		13000	530	

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB02-005			CAG-SB02-010			CAG-SB02-020			CAG-SB02-030			CAG-SB02-040		
COLLECT DATE			5/3/98			5/3/98			5/3/98			5/3/98			5/3/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	74.4	1.5	E	56.3	1.5	E	29.9	1.6	E	75.4	1.6	E	40.8	1.6	E
Mercury	0.14	8/40	0.06	0.2		<	0.17	U	<	0.2	U	<	0.18	U	<	0.21	U
Nickel	9.8	40/40	6.3	4		5.3	4.1		4.3	4.2		4.1	4.2		3.6	4.2	
Potassium	3930	40/40	1590	500		1520	520		1270	520		910	520		909	530	
Selenium	0.74	1/40	<	9.2	U	<	10	U	<	9.9	U	<	9.8	U	<	10	U
Sodium	575	40/40	64.8	500		262	520		346	520		247	520		164	530	
Thallium	0.41	13/40	<	0.92	U	<	1	U	<	0.99	U	<	0.98	U	<	1	U
Vanadium	28.4	40/40	16.6	5		13.8	5.2		12.1	5.2		14.9	5.2		14.2	5.3	
Zinc	22.1	40/40	16.4	2		12.8	2.1		10.1	2.1		6	2.1		8	2.1	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 4 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB03-006			CAG-SB03-011			CAG-SB03-021			CAG-SB03-031			CAG-SB03-041		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	13	U	<	11	U
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	13	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	18	U	<	18	U	<	18	U	<	21	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	18	U	4	18		5	18		9	21		<	18	U
Toluene	6	2/40	6	11		<	11	U	<	11	U	<	13	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	370	U	<	360	U	<	370	U	<	420	U	<	370	U
Benzo(a)pyrene	52	2/40	<	370	U	<	360	U	<	370	U	<	420	U	<	370	U
Benzo(b)fluoranthene	55	2/40	<	370	U	<	360	U	<	370	U	<	420	U	<	370	U
Benzo(k)fluoranthene	46	1/40	<	370	U	<	360	U	<	370	U	<	420	U	<	370	U
Chrysene	51	2/40	<	370	U	<	360	U	<	370	U	<	420	U	<	370	U
Di-N-Butyl Phthalate	560	4/40	<	370	U	<	360	U	<	370	U	<	420	U	<	370	U
Di-N-Octylphthalate	150	2/40	<	370	U	100	360		<	370	U	<	420	U	<	370	U
Fluoranthene	69	3/40	46	370		<	360	U	<	370	U	<	420	U	<	370	U
Pyrene	53	3/40	48	370		<	360	U	<	370	U	<	420	U	<	370	U
METALS (mg/kg)																	
Aluminum	16700	40/40	10300	20		9040	20		5890	18		8560	25		5280	20	
Antimony	1.1	1/40	<	6	U	<	6	U	<	5.3	U	<	7.5	U	<	6.1	U
Arsenic	3.1	40/40	3.1	2		1.7	1.9		2.1	2.1		1.9	2.4		0.72	0.98	
Barium	1280	40/40	490	20		62.1	20		338	18		163	25		62.8	20	
Beryllium	0.7	40/40	0.57	0.5		0.41	0.5		0.28	0.44		0.35	0.62		0.22	0.5	
Cadmium	0.29	12/39	<	0.5	U	<	0.5	U	<	0.44	U	<	0.62	U	<	0.5	U
Calcium	265000	40/40	63900	5000		60300	5000		179000	4400		86500	6200		22100	500	
Chromium, Total	22.6	40/40	11.9	0.99		10.3	0.99		17.2	0.89		11	1.2		6.1	1	
Cobalt	4.3	40/40	3.7	5		2.6	5		2.5	4.4		1.7	6.2		1.8	5	
Copper	12.8	38/40	5.2	2.5		2.6	2.5		2.7	2.2		2.6	3.1		2.3	2.5	
Iron	9620	40/40	8310	9.9		6260	9.9		3570	8.9		5040	12		3880	10	
Lead	9.2	40/40	5.6	9.2		3.9	11		2	9.5		2.4	12		2.1	9.8	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	3330	500		3080	500		5420	440		8530	620		7750	500	

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB03-006			CAG-SB03-011			CAG-SB03-021			CAG-SB03-031			CAG-SB03-041		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	120	1.5		75.5	1.5		51.6	1.3		41.6	1.9		47.5	1.5	
Mercury	0.14	8/40	<	0.22	U	<	0.2	U	0.07	0.21		0.14	0.25		<	0.2	U
Nickel	9.8	40/40	8.1	4		5.4	4		4.9	3.6		5.1	5		3.4	4	
Potassium	3930	40/40	1690	500		2050	500		1140	440		1740	620		1030	500	
Selenium	0.74	1/40	<	5	U	<	4.8	U	<	5.3	U	<	5.9	U	<	2.5	U
Sodium	575	40/40	60.6	500		167	500		134	440		182	620		137	500	
Thallium	0.41	13/40	<	0.92	U	<	1.1	U	<	0.95	U	<	1.2	U	<	0.98	U
Vanadium	28.4	40/40	23.8	5		15.8	5		11.2	4.4		13.4	6.2		13.8	5	
Zinc	22.1	40/40	21.3	2	E	17	2	E	11.1	1.8	E	12	2.5	E	8.1	2	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 6 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB04-006			CAG-SB04-011			CAG-SB04-021			CAG-SB04-031			CAG-SB04-041		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	19	U	<	19	U	<	19	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	19	U	6	19		<	19	U	<	18	U	<	18	U
Toluene	6	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	39	380		<	370	U	<	370	U	<	360	U	<	360	U
Benzo(a)pyrene	52	2/40	52	380		47	370		<	370	U	<	360	U	<	360	U
Benzo(b)fluoranthene	55	2/40	55	380		46	370		<	370	U	<	360	U	<	360	U
Benzo(k)fluoranthene	46	1/40	46	380		<	370	U	<	370	U	<	360	U	<	360	U
Chrysene	51	2/40	51	380		43	370		<	370	U	<	360	U	<	360	U
Di-N-Butyl Phthalate	560	4/40	<	380	U	<	370	U	<	370	U	<	360	U	<	360	U
Di-N-Octylphthalate	150	2/40	<	380	U	150	370		<	370	U	<	360	U	<	360	U
Fluoranthene	69	3/40	69	380		67	370		<	370	U	<	360	U	<	360	U
Pyrene	53	3/40	49	380		53	370		<	370	U	<	360	U	<	360	U
METALS (mg/kg)																	
Aluminum	16700	40/40	11300	20		9270	20		5840	21		3570	20		4170	21	
Antimony	1.1	1/40	<	6	U	<	6.1	U	<	6.3	U	<	6	U	<	6.2	U
Arsenic	3.1	40/40	2	2.3		1.9	2.1		1.6	2.1		1.2	2		1.3	1.9	
Barium	1280	40/40	1250	20		257	20		296	21		835	20		120	21	
Beryllium	0.7	40/40	0.62	0.5		0.42	0.51		0.24	0.53		0.18	0.5		0.19	0.51	
Cadmium	0.29	12/39	<	0.5	U	<	0.51	U	<	0.53	U	<	0.5	U	<	0.51	U
Calcium	265000	40/40	174000	5000		156000	5100		225000	5300		65500	5000		108000	5100	
Chromium, Total	22.6	40/40	17.9	1		16.5	1		19	1.1		7	1		14.5	1	
Cobalt	4.3	40/40	3.1	5		2.9	5.1		2	5.3		1	5		1.3	5.1	
Copper	12.8	38/40	4.3	2.5		2.7	2.5		1.8	2.6		<	2.5	U	2	2.6	
Iron	9620	40/40	6510	10		5490	10		3060	11		2970	10		2950	10	
Lead	9.2	40/40	4.2	10		3.4	10		1.6	11		1.6	10		1.8	9.5	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	5110	500		3650	510		8090	530		2750	500		4660	510	

Page 7 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB04-006			CAG-SB04-011			CAG-SB04-021			CAG-SB04-031			CAG-SB04-041		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	72	1.5		64.4	1.5		31.5	1.6		34.8	1.5		32	1.5	
Mercury	0.14	8/40	0.07	0.2		0.04	0.2		<	0.22	U	0.04	0.15		<	0.16	U
Nickel	9.8	40/40	7	4		5.6	4		4.2	4.2		2.7	4		3.5	4.1	
Potassium	3930	40/40	1760	500		1750	510		954	530		748	500		795	510	
Selenium	0.74	1/40	<	5.7	U	<	5.2	U	<	5.3	U	<	4.9	U	<	4.7	U
Sodium	575	40/40	221	500		210	510		217	530		131	500		149	510	
Thallium	0.41	13/40	<	1	U	<	1	U	<	1.1	U	<	1	U	<	0.95	U
Vanadium	28.4	40/40	18.8	5		16.4	5.1		14.5	5.3		7	5		8.5	5.1	
Zinc	22.1	40/40	19.4	2	E	16	2	E	9.3	2.1	E	6.7	2	E	9.1	2.1	E

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB05-005			CAG-SB05-010			CAG-SB05-020			CAG-SB05-030			CAG-SB05-040		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	19	U	<	18	U	<	19	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	19	U	<	18	U	<	19	U	<	18	U	<	18	U
Toluene	6	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Benzo(a)pyrene	52	2/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Benzo(b)fluoranthene	55	2/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Benzo(k)fluoranthene	46	1/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Chrysene	51	2/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Di-N-Butyl Phthalate	560	4/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Di-N-Octylphthalate	150	2/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Fluoranthene	69	3/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
Pyrene	53	3/40	<	380	U	<	360	U	<	370	U	<	370	U	<	360	U
METALS (mg/kg)																	
Aluminum	16700	40/40	8590	20		10400	21		5970	20		6610	21		5110	21	
Antimony	1.1	1/40	<	6.1	U	<	6.2	U	<	6.1	U	<	6.2	U	<	6.3	U
Arsenic	3.1	40/40	2.2	2.1		2.3	0.97		1.5	0.98		1.2	0.99		1.1	0.97	
Barium	1280	40/40	162	20		177	21		762	20		151	21		96.8	21	
Beryllium	0.7	40/40	0.43	0.51		0.65	0.52		0.22	0.51		0.27	0.52		0.22	0.52	
Cadmium	0.29	12/39				0.22	0.52		0.14	0.51		<	0.52	U	0.15	0.52	
Calcium	265000	40/40	216000	5100		87400	5200		195000	5100		138000	5200		75300	5200	
Chromium, Total	22.6	40/40	20.1	1		12.1	1		18	1		14.5	1		10.8	1	
Cobalt	4.3	40/40	2.8	5.1		4	5.2		2.3	5.1		2	5.2		1.5	5.2	
Copper	12.8	38/40	4.2	2.5		4.5	2.6		3.5	2.6		2.2	2.6		2.8	2.6	
Iron	9620	40/40	5130	10		7070	10		3030	10		3660	10		3520	10	
Lead	9.2	40/40	2.7	11		6.3	9.7	J	1.6	9.8		2.7	9.9		1.9	9.7	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	3810	510		4000	520		16900	510		8790	520		7240	520	

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB05-005			CAG-SB05-010			CAG-SB05-020			CAG-SB05-030			CAG-SB05-040		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	51.9	1.5		113	1.6		31.9	1.5		31.9	1.6		38	1.6	
Mercury	0.14	8/40	0.1	0.18		<	0.19	U	<	0.31	U	<	0.2	U	<	0.2	U
Nickel	9.8	40/40	5.6	4.1		8.2	4.2		6.7	4.1		4.8	4.1		4.2	4.2	
Potassium	3930	40/40	1250	510		1940	520		1090	510		1200	520		1020	520	
Selenium	0.74	1/40	<	5.2	U	<	2.4	U	<	2.5	U	<	2.5	U	<	2.4	U
Sodium	575	40/40	273	510		351	520		289	510		240	520		168	520	
Thallium	0.41	13/40	<	1.1	U	0.28	0.97		0.22	0.98		0.39	0.99		0.27	0.97	
Vanadium	28.4	40/40	15.3	5.1		22.8	5.2		15	5.1		12.9	5.2		12.7	5.2	
Zinc	22.1	40/40	14.7	2	E	19.4	2.1		7.7	2		8	2.1		8.6	2.1	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 10 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB06-005			CAG-SB06-010			CAG-SB06-020			CAG-SB06-030			CAG-SB06-040		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	18	U	<	19	U	<	18	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	18	U	<	19	U	<	18	U	<	18	U	<	18	U
Toluene	6	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(a)pyrene	52	2/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(b)fluoranthene	55	2/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Benzo(k)fluoranthene	46	1/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Chrysene	51	2/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Di-N-Butyl Phthalate	560	4/40	<	360	U	39	370		<	360	U	<	360	U	<	360	U
Di-N-Octylphthalate	150	2/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Fluoranthene	69	3/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
Pyrene	53	3/40	<	360	U	<	370	U	<	360	U	<	360	U	<	360	U
METALS (mg/kg)																	
Aluminum	16700	40/40	10100	21		16700	21		8280	21		11700	20		5540	19	
Antimony	1.1	1/40	<	6.2	U	<	6.2	U	<	6.3	U	<	6	U	<	5.7	U
Arsenic	3.1	40/40	2.3	0.96		2.5	0.98		2.4	0.97		1.2	0.98		0.78	0.95	
Barium	1280	40/40	329	21		322	21		70.1	21		271	20		30.1	19	
Beryllium	0.7	40/40	0.51	0.52		0.69	0.52		0.41	0.52		0.4	0.5		0.25	0.48	
Cadmium	0.29	12/39	0.25	0.52		0.24	0.52		<	0.52	U	<	0.5	U	<	0.48	U
Calcium	265000	40/40	158000	5200		80000	5200		43300	520		18200	500		17700	480	
Chromium, Total	22.6	40/40	16.9	1		14.6	1		7.5	1		9.2	1		5.2	0.95	
Cobalt	4.3	40/40	3.8	5.2		2.5	5.2		2.3	5.2		1.9	5		1.9	4.8	
Copper	12.8	38/40	4.6	2.6		3.2	2.6		2.2	2.6		3	2.5		1.7	2.4	
Iron	9620	40/40	6560	10		9620	10		6110	10		7220	10		4050	9.5	
Lead	9.2	40/40	6	9.6		6.1	9.8		6.6	9.7		3.3	9.8		2.4	9.5	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	3600	520		9470	520		4570	520		10400	500		6190	480	

Page 11 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB06-005			CAG-SB06-010			CAG-SB06-020			CAG-SB06-030			CAG-SB06-040		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	72.1	1.5		66.2	1.6		77.7	1.6		48.2	1.5		52.7	1.4	
Mercury	0.14	8/40	<	0.16	U	<	0.2	U	<	0.21	U	<	0.19	U	<	0.3	U
Nickel	9.8	40/40	6.5	4.1		9.8	4.1		6	4.2		5.9	4		4.2	3.8	
Potassium	3930	40/40	1650	520		3930	520		2120	520		2360	500		1220	480	
Selenium	0.74	1/40	<	2.4	U	<	2.4	U	<	2.4	U	<	2.4	U	<	2.4	U
Sodium	575	40/40	202	520		575	520		303	520		245	500		102	480	
Thallium	0.41	13/40	0.31	0.96		0.41	0.98		<	0.97	U	0.26	0.98		<	0.95	U
Vanadium	28.4	40/40	18.7	5.2		28.4	5.2		23.7	5.2		18.4	5		13.3	4.8	
Zinc	22.1	40/40	16.7	2.1		21.4	2.1		13.8	2.1		13.4	2		8.9	1.9	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 12 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB07-005			CAG-SB07-010			CAG-SB07-020			CAG-SB07-030			CAG-SB07-040		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	19	U	<	19	U	<	19	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	19	U	<	19	U	<	19	U	<	18	U	<	18	U
Toluene	6	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Benzo(a)pyrene	52	2/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Benzo(b)fluoranthene	55	2/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Benzo(k)fluoranthene	46	1/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Chrysene	51	2/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Di-N-Butyl Phthalate	560	4/40	19	370		<	370	U	<	370	U	<	360	U	<	360	U
Di-N-Octylphthalate	150	2/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Fluoranthene	69	3/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
Pyrene	53	3/40	<	370	U	<	370	U	<	370	U	<	360	U	<	360	U
METALS (mg/kg)																	
Aluminum	16700	40/40	10900	19		9230	21		8450	21		5010	19		4040	21	
Antimony	1.1	1/40	<	5.8	U	<	6.2	U	<	6.2	U	<	5.7	U	<	6.4	U
Arsenic	3.1	40/40	2.6	0.99		1.9	0.82		1.2	0.98		0.94	0.94		0.54	0.97	
Barium	1280	40/40	1280	19		219	21		557	21		52.3	19		26.2	21	
Beryllium	0.7	40/40	0.51	0.49		0.44	0.52		0.33	0.51		0.18	0.47		0.2	0.53	
Cadmium	0.29	12/39	0.2	0.49		0.16	0.52		<	0.51	U	<	0.47	U	<	0.53	U
Calcium	265000	40/40	133000	4900		175000	5200		107000	5100		89100	4700		29500	530	
Chromium, Total	22.6	40/40	15.2	0.97		17.3	1		14.8	1		8.7	0.94		5.2	1.1	
Cobalt	4.3	40/40	2.8	4.9		3.5	5.2		2	5.1		1.2	4.7		1.2	5.3	
Copper	12.8	38/40	4.5	2.4		4	2.6		2.2	2.6		1.2	2.4		1.3	2.7	
Iron	9620	40/40	7170	9.7		6040	10		4610	10		3200	9.4		2950	11	
Lead	9.2	40/40	9.2	9.9		4.9	8.2		3	9.8		2	9.4		1.7	9.7	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	3550	490		3590	520		10500	510		4710	470		6210	530	

Page 13 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB07-005			CAG-SB07-010			CAG-SB07-020			CAG-SB07-030			CAG-SB07-040		
COLLECT DATE			5/4/98			5/4/98			5/4/98			5/4/98			5/4/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	79.4	1.5		64.2	1.5		38.8	1.5		27.7	1.4		35.1	1.6	
Mercury	0.14	8/40	<	0.2	U	<	0.16	U	<	0.2	U	<	0.21	U	<	0.19	U
Nickel	9.8	40/40	7.4	3.9		6.8	4.1		5.7	4.1		2.6	3.8		3.5	4.2	
Potassium	3930	40/40	1730	490		1500	520		1460	510		1000	470		761	530	
Selenium	0.74	1/40	<	2.5	U	<	2	U	<	2.5	U	<	2.4	U	<	2.4	U
Sodium	575	40/40	281	490		270	520		356	510		183	470		88.4	530	
Thallium	0.41	13/40	0.32	0.99		<	0.82	U	0.41	0.98		<	0.94	U	<	0.97	U
Vanadium	28.4	40/40	21	4.9		17.4	5.2		18.4	5.1		9.5	4.7		10.8	5.3	
Zinc	22.1	40/40	17.9	1.9		15.3	2.1		10	2.1		6.7	1.9		6.2	2.1	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 14 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB08-005			CAG-SB08-010			CAG-SB08-020			CAG-SB08-030			CAG-SB08-040		
COLLECT DATE			5/5/98			5/5/98			5/5/98			5/5/98			5/5/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
Carbon Disulfide	22	2/40	<	11	U	<	11	U	<	11	U	22	11		11	11	
Chloromethane	10	1/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	36	2/40	<	18	U	<	18	U	<	18	U	<	18	U	<	18	U
Methyl Isobutyl Ketone	52	9/40	<	18	U	<	18	U	<	18	U	<	18	U	<	18	U
Toluene	6	2/40	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzo(a)anthracene	39	1/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Benzo(a)pyrene	52	2/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Benzo(b)fluoranthene	55	2/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Benzo(k)fluoranthene	46	1/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Chrysene	51	2/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Di-N-Butyl Phthalate	560	4/40	<	350	U	<	350	U	<	360	U	<	370	U	270	350	
Di-N-Octylphthalate	150	2/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Fluoranthene	69	3/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
Pyrene	53	3/40	<	350	U	<	350	U	<	360	U	<	370	U	<	350	U
METALS (mg/kg)																	
Aluminum	16700	40/40	10400	18		8500	18		11700	19		13300	19		5200	18	
Antimony	1.1	1/40	<	5.3	U	<	5.4	U	<	5.6	U	1.1	5.6		<	5.4	U
Arsenic	3.1	40/40	1.7	0.95		1	0.92		1.5	0.94		0.87	0.96		0.81	0.93	
Barium	1280	40/40	108	18		493	18		221	19	J	125	19		43.6	18	
Beryllium	0.7	40/40	0.61	0.44		0.43	0.45		0.7	0.47		0.46	0.47		0.22	0.45	
Cadmium	0.29	12/39	0.22	0.44		0.29	0.45		<	0.47	U	<	0.47	U	<	0.45	U
Calcium	265000	40/40	56000	4400		100000	450		63700	470		48700	470		38900	450	
Chromium, Total	22.6	40/40	11.6	0.88		13.6	0.91		10.9	0.94		12.1	0.94		6.4	0.9	
Cobalt	4.3	40/40	4.3	4.4		3.4	4.5		3.7	4.7		2.7	4.7		1.2	4.5	
Copper	12.8	38/40	7.3	2.2		4.1	2.3		4.3	2.3		3.5	2.3		2	2.3	
Iron	9620	40/40	8460	8.8		6450	9.1		7820	9.4		6980	9.4		3420	9	
Lead	9.2	40/40	8	9.5		3.5	9.2		5.6	9.4		3.6	9.6		2.1	9.3	
METALS (mg/kg) (continued)																	
Magnesium	24000	40/40	2810	440		3140	450		4880	470		15300	470		7300	450	

Source: URS Greiner Woodward Clyde, 1999

Table 65-1b
Detected Compounds in Subsurface Soils
AOC G

FIELD ID			CAG-SB08-005			CAG-SB08-010			CAG-SB08-020			CAG-SB08-030			CAG-SB08-040		
COLLECT DATE			5/5/98			5/5/98			5/5/98			5/5/98			5/5/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
Manganese	156	40/40	156	1.3		91	1.4		115	1.4		54.4	1.4		34.9	1.4	
Mercury	0.14	8/40	<	0.19	U	<	0.2	U	<	0.21	U	<	0.21	U	<	0.21	U
Nickel	9.8	40/40	9.4	3.5		6.7	3.6		6.7	3.7		5.9	3.8		3.7	3.6	
Potassium	3930	40/40	1930	440		1960	450	E	2790	470	E	2780	470	E	1080	450	E
Selenium	0.74	1/40	<	2.4	U	<	0.46	U	<	0.47	U	<	0.48	U	<	0.46	U
Sodium	575	40/40	76.3	440		202	450	E	358	470	E	302	470	E	142	450	E
Thallium	0.41	13/40	<	0.95	U	0.18	0.92		0.31	0.94		0.25	0.96		<	0.93	U
Vanadium	28.4	40/40	18	4.4		16.9	4.5		18.4	4.7		18.5	4.7		10.8	4.5	
Zinc	22.1	40/40	22.1	1.8		16.3	1.8		20.8	1.9		14.8	1.9		7.6	1.8	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E - Estimated since result exceeded the calibration curve.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Page 16 of 16

Source: URS Greiner Woodward Clyde, 1999

Table 65-1c
Comparison of Maximum Surface Soil Concentrations to MSSLs
AOC G

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of MSSL	Estimated Risk: Excess Cancer[2]	Estimated Risk: Hazard Quotient[3]
VOLATILE ORGANICS									
Methyl Ethyl Ketone (2-Butanone)	1/8	CAG-SB01-002	0.038		6,900	NO			0.000006
Methyl Isobutyl Ketone	3/8	CAG-SB01-002	0.074		750	NO			0.000099
Toluene	3/8	CAG-SB01-002	0.006		520	NO			**
METALS									
Aluminum	8/8	CAG-SB05-002	21300		75,000	NO			0.28
Beryllium	8/8	CAG-SB06-002	0.94		150	NO		6.27E-09	
Chromium	8/8	CAG-SB04-003	20.6		210	NO		9.81E-08	
Iron	8/8	CAG-SB05-002	15,400		22,000	NO			0.70
Lead	8/8	CAG-SB07-002	14.9		400	NO			*
Mercury	3/8	CAG-SB04-003	0.41		22	NO			0.02
Nickel	8/8	CAG-SB06-002	13.8		1,500	NO			0.009
Vanadium	8/8	CAG-SB05-002	32.6		520	NO			0.06
Zinc	8/8	CAG-SB05-002	42.6	E	22,000	NO			0.002
Total Excess Cancer Risk[4]								1E-07	
Hazard Index[5]									1.08

(1) EPA Region Media-Specific Screening Levels for Residential Soil (EPA 1998)
(2) These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/MSSL*$1x10^{-4}$.
(3) These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/MSSL*1.0.
(4) Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
(5) Hazard Index = Sum of all hazard quotients at the site.
* Lead does not have an EPA-established toxicity factor; therefore, a MSSL has not been calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).
mg/kg = milligrams per kilogram
** The MSSL for toluene is based on a soil saturation concentration and not based on risk.
Therefore, a potential risk from these chemicals could not be estimated using the MSSLs. A MSSL calculated based on risk would be higher than the saturation concentration; therefore, the exclusion of these chemicals from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.

Source: URS Greiner Woodward Clyde, 1999

Table 65-1d
Comparison of Maximum Subsurface Soil Concentrations to MSSLs
AOC G

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?	Estimated Risk: Excess Cancer[3]	Estimated Risk: Hazard Quotient[4]
VOLATILE ORGANICS								
Carbon Disulfide	2/40	CAG-SB08-030	0.022		350	NO		0.00006
Chloromethane	1/40	CAG-SB01-010	0.01		1.2	NO	8.33E-09	
Methyl Ethyl Ketone (2-Butanone)	2/40	CAG-SB01-010	0.036		6900	NO		0.00001
Methyl Isobutyl Ketone	9/40	CAG-SB01-040	0.052		750	NO		0.00007
Toluene	2/40	CAG-SB03-006	0.006		520	NO		**
SEMIVOLATILE ORGANICS								
Benzo(a)anthracene	1/40	CAG-SB04-006	0.039		0.56	NO	6.96E-08	
Benzo(a)pyrene	2/40	CAG-SB04-006	0.052		0.056	NO	9.29E-07	
Benzo(b)fluoranthene	2/40	CAG-SB04-006	0.055		0.56	NO	9.82E-08	
Benzo(k)fluoranthene	1/40	CAG-SB04-006	0.046		5.6	NO	8.21E-09	
Chrysene	2/40	CAG-SB04-006	0.051		56	NO	9.11E-10	
Di-n-butylphthalate	4/40	CAG-SB01-030	0.56		5500	NO		0.0001
Di-n-octylphthalate	2/40	CAG-SB04-011	0.15		1100	NO		**
Fluoranthene	3/40	CAG-SB04-006	0.069		2000	NO		0.00003
Pyrene	3/40	CAG-SB04-011	0.053		1500	NO		0.00004
METALS								
Aluminum	40/40	CAG-SB06-010	16700		75000	NO		***
Barium	40/40	CAG-SB07-005	1280		5200	NO		***
Chromium	40/40	CAG-SB02-020	22.6		210	NO	1.08E-07	
Copper	38/40	CAG-SB02-040	12.8		2800	NO		0.005
Lead	40/40	CAG-SB07-005	9.2		400	NO		*
Mercury	8/40	CAG-SB03-031	0.14		22	NO		0.006
Total Excess Cancer Risk[5]							1E-06	
Hazard Index[6]								0.01

(1) EPA Region Media-Specific Screening Levels for Residential Soil (EPA 1998)
(2) EPA Region Media-Specific Screening Levels for Industrial Soil (EPA 1998)
(3) These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/MSSL*1x10-6.
(4) These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/MSSL*1.0.
(5) Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
(6) Hazard Index = Sum of all hazard quotients at the site.
** The MSSL for toluene is based on a soil saturation concentration and not based on risk.
Therefore, a potential risk from these chemicals could not be estimated using the MSSLs. A MSSL calculated based on risk would be higher than the saturation concentration; therefore, the exclusion of these chemicals from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
mg/kg = milligrams per kilogram
*** The MSSL is a maximum allowable concentration and not based on risk. Therefore, a potential risk from these chemicals could not be estimated using the MSSLs.
A MSSL calculated based on risk would be greater than the MSSL. The exclusion of these chemicals from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
* Lead does not have an EPA-established toxicity factor; therefore, a MSSL has not been calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).

Source: URS Greiner Woodward Clyde, 1999

Table 66-1a
Detected Compounds in Surface Soils
AOC H

LOCATION FIELD ID COLLECT DATE	Maximum	Frequency	CAH-SB01-002 5/1/98 Result	RL	Qual	CAH-SB02-002 5/2/98 Result	RL	Qual	CAH-SB03-002 5/2/98 Result	RL	Qual	CAH-SB04-002 5/2/98 Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)														
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	17	1/6	<	20	U	17	19	J	<	18	U	<	20	U
Toluene	4	1/6	<	12	U	<	12	U	<	11	U	4	12	J
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)														
Di-N-Octylphthalate	40	1/6	40	370		<	380	U	<	360	U	<	390	U
PESTICIDES/PCB (µg/kg)														
DDE (1,1-bis(Chlorophenyl)-2,2-Dichloroethene)	10.7 J	2/6	<	7.4	U	4.1	3.8		10.7	1.9		<	7.7	U
DDT (1,1-bis(Chlorophenyl)-2,2,2-Trichloroethane)	2.1 J	1/6	<	7.4	U	<	3.8	U	2.1	7.2	J	<	7.7	U
METALS (mg/kg)														
Aluminum	17400	6/6	11800	2.7		17200	22		11500	21		9060	21	
Antimony	3.8	1/6	<	1.2	U	<	6.6	U	<	6.4	U	<	6.2	U
Arsenic	3.9 J	6/6	2.2	0.22		2.5	1.9		2.4	1.6		2.8	2.2	
Barium	97.1	6/6	74.2	0.079		92.8	22		72.7	21		63.8	21	
Beryllium	0.77	6/6	0.48	0.03		0.76	0.55		0.52	0.53	J	0.45	0.51	J
Cadmium	0.28	3/6	0.25	0.14		<	0.55	U	0.15	0.53	J	0.28	0.51	J
Calcium	4870	6/6	4870	2.8		3090	550		2830	530		2330	510	
Chromium, Total	12.9	6/6	9.9	0.63		12.4	1.1		9.2	1.1		8.1	1	
Cobalt	5.2	6/6	3.1	0.29		5.2	5.5	J	3.7	5.3	J	3.3	5.1	J
Copper	8.7	6/6	6.2	0.21		8.2	2.8		6.2	2.7		5.1	2.6	
Iron	12900	6/6	9190	0.53		12500	11	E	9450	11		8600	10	
Lead	20.3	6/6	20.3	0.45		8	0.28		9.7	16	J	7.3	11	J
Magnesium	2540	6/6	1570	2.2		2210	550		1590	530		1280	510	
Manganese	210 E	6/6	152	0.089		210	1.7	E	160	1.6	E	147	1.5	E
Mercury	0.07	2/6	<	0.041	U	<	0.19	U	<	0.21	U	<	0.2	U
Nickel	10.6	6/6	7.1	0.36		10.6	4.4		7.5	4.2		6.5	4.1	
Potassium	2910	6/6	2080	11		2670	550		1980	530		1720	510	
Sodium	188	6/6	24.1	2.6		32.6	550	J	37.1	530	J	22.2	510	J
Thallium	0.36	3/6	0.21	0.2		<	0.94	U	<	0.82	U	<	1.1	U
Vanadium	27.9	6/6	19.2	0.2		26.4	5.5	E	19.3	5.3		18.3	5.1	
Zinc	31.9 E	6/6	27.2	0.43	E	31.2	2.2		23.8	2.1		19.6	2.1	

J = Estimated
Qual = Qualifier
RL = Reporting Limit
U = Not detected at specified reporting limit
E = Estimated since result exceeded calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 1 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 66-1a
Detected Compounds in Surface Soils
AOC H

LOCATION FIELD ID COLLECT DATE	Maximum	Frequency	CAH-SB05-002 5/2/98 Result	RL	Qual	CAH-SB06-002 5/2/98 Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)								
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	17	1/6	<	18	U	<	22	U
Toluene	4	1/6	<	11	U	<	13	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)								
Di-N-Octylphthalate	40	1/6	<	360	U	<	440	U
PESTICIDES/PCB (µg/kg)								
DDE (1,1-bis(Chlorophenyl)-2,2-Dichloroethene)	10.7 J	2/6	<	7.2	U	<	8.7	U
DDT (1,1-bis(Chlorophenyl)-2,2,2-Trichloroethane)	2.1 J	1/6	<	7.2	U	<	8.7	U
METALS (mg/kg)								
Aluminum	17400	6/6	16300	20		17400	25	
Antimony	3.8	1/6	<	5.9	U	3.8	7.5	J
Arsenic	3.9 J	6/6	3.9	1	J	2.9	1.2	
Barium	97.1	6/6	91	20		97.1	25	
Beryllium	0.77	6/6	0.73	0.49		0.77	0.62	
Cadmium	0.28	3/6	<	0.49	U	<	0.62	U
Calcium	4870	6/6	3430	490		2430	620	
Chromium, Total	12.9	6/6	12	0.98		12.9	1.2	
Cobalt	5.2	6/6	5.1	4.9		4.8	6.2	J
Copper	8.7	6/6	7.8	2.5		8.7	3.1	
Iron	12900	6/6	12500	9.8		12900	12	
Lead	20.3	6/6	8.7	10	J	9.7	12	J
Magnesium	2540	6/6	2170	490		2540	620	
Manganese	210 E	6/6	200	1.5		204	1.9	
Mercury	0.07	2/6	0.04	0.17	J	0.07	0.25	J
Nickel	10.6	6/6	10	3.9		10.5	5	
Potassium	2910	6/6	2470	490		2910	620	
Sodium	188	6/6	188	490	J	126	620	J
Thallium	0.36	3/6	0.27	1	J	0.36	1.2	J
Vanadium	27.9	6/6	25.6	4.9		27.9	6.2	
Zinc	31.9 E	6/6	28.9	2	E	31.9	2.5	E

J = Estimated
Qual = Qualifier
RL = Reporting Limit
U = Not detected at specified reporting limit
E = Estimated since result exceeded calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 2 of 2

Source: URS Greiner Woodward Clyde, 1999

Table 66-1b
Detected Compounds in Subsurface Soils
AOC H

FIELD ID			CAH-SB01-005			CAH-SB01-010			CAH-SB01-020			CAH-SB01-030			CAH-SB01-040			CAH-SB02-005		
COLLECT DATE			5/1/98			5/1/98			5/1/98			5/1/98			5/1/98			5/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																				
2-Hexanone	7	1/30	<	21	U	7	24	J	<	20	U	<	18	U	<	18	U	<	19	U
Benzene	4	1/30	<	13	U	<	14	U	<	12	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	37	3/30	<	21	U	23	24		<	20	U	<	18	U	<	18	U	37	19	
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	66	5/30	<	21	U	41	24		<	20	U	<	18	U	<	18	U	59	19	
Toluene	22	5/30	<	13	U	<	14	U	<	12	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																				
Benzyl Butyl Phthalate	16	1/30	<	420	U	<	470	U	<	400	U	<	370	U	<	350	U	<	370	U
Di-N-Butyl Phthalate	15	1/30	<	420	U	<	470	U	<	400	U	<	370	U	<	350	U	<	370	U
PESTICIDES/PCB (µg/kg)																				
DDE	3.6	1/30	3.6	0.83		<	0.94	U	<	0.8	U	<	0.73	U	<	0.7	U	<	3.7	U
METALS (mg/kg)																				
Aluminum	17500	30/30	14600	24		13000	25		7350	24		5790	19		6000	19		16000	21	
Antimony	1.8	1/30	<	7.1	U	<	7.5	U	<	7.2	U	<	5.8	U	<	5.8	U	<	6.2	UJ
Arsenic	3.1	30/30	2.5	2.4		2.8	2.8		1.6	2.3	J	1.3	2.1	J	1.2	1.9	J	2.5	2	
Barium	2240	30/30	81.6	24		736	25		133	24		90.6	19		31.4	19		89.2	21	
Beryllium	0.75	30/30	0.67	0.59		0.65	0.62		0.37	0.6	J	0.23	0.49	J	0.24	0.48	J	0.74	0.52	
Cadmium	0.4	7/30	<	0.59	U	<	0.62	U	<	0.6	U	<	0.49	U	<	0.48	U	<	0.52	U
Calcium	312000	30/30	9430	590		153000	6200		81500	6000		111000	4900		57500	480		28900	520	
Chromium, Total	24.1	30/30	11.4	1.2		20	1.2		10.8	1.2		12.8	0.97		8	0.97		13.1	1	
Cobalt	5.3	30/30	4.3	5.9	J	3.5	6.2	J	2.4	6	J	1.2	4.9	J	1.6	4.8	J	5.3	5.2	
Copper	9	27/30	9	2.9		4.9	3.1		2.6	3	J	2.3	2.4	J	<	2.4	U	8	2.6	
Iron	12700	30/30	10700	12		7790	12		5060	12		3520	9.7		3860	9.7		11200	10	E
Lead	11.3	30/30	10.2	12	J	4.5	12	J	3.2	11	J	2	10	J	2.9	9.2	J	8.3	0.31	
Magnesium	11500	30/30	2170	590		5110	620		3170	600		9250	490		5300	480		2960	520	
Manganese	190	30/30	158	1.8		92.8	1.9		58	1.8		28.2	1.5		37.6	1.5		174	1.6	E
Mercury	0.34	7/30	0.34	0.24		0.16	0.23	J	0.04	0.22	J	<	0.2	U	0.16	0.2	J	<	0.21	U
Nickel	11.6	30/30	9.4	4.7		7.5	5		5.7	4.8		4.1	3.9		3.5	3.9	J	11.1	4.2	
Potassium	2840	30/30	2490	590		2150	620		1570	600		1020	490		1200	480		2660	520	
Sodium	348	30/30	41.2	590	J	192	620	J	120	600	J	166	490	J	111	480	J	40.7	520	J
Thallium	0.35	3/30	<	1.2	U	<	1.2	U	<	1.1	U	<	1	U	<	0.92	U	0.35	1	J
Vanadium	25.9	30/30	20.9	5.9		20.9	6.2		15.2	6		21.2	4.9		15.6	4.8		22.3	5.2	E
Zinc	35.4 E	30/30	35.4	2.4	E	22.3	2.5	E	14.2	2.4	E	8.7	1.9	E	9.3	1.9	E	28.9	2.1	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 1 of 6

Source: URS Greiner Woodward Clyde, 1999

Table 66-1b
Detected Compounds in Subsurface Soils
AOC H

FIELD ID			CAH-SB02-010			CAH-SB02-020			CAH-SB02-030			CAH-SB02-040			CAH-SB03-005		
COLLECT DATE			5/2/98			5/2/98			5/2/98			5/2/98			5/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
2-Hexanone	7	1/30	<	18	U	<	20	U	<	19	U	<	18	U	<	17	U
Benzene	4	1/30	<	11	U	<	12	U	<	11	U	<	11	U	<	10	U
Methyl Ethyl Ketone (2-Butanone)	37	3/30	<	18	U	34	20		<	19	U	<	18	U	<	17	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	66	5/30	8	18	J	66	20		14	19	J	<	18	U	<	17	U
Toluene	22	5/30	6	11	J	22	12		<	11	U	<	11	U	12	10	
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzyl Butyl Phthalate	16	1/30	<	360	U	<	390	U	<	370	U	<	370	U	<	360	U
Di-N-Butyl Phthalate	15	1/30	<	360	U	<	390	U	<	370	U	<	370	U	<	360	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/30	<	3.5	U	<	3.9	U	<	3.7	U	<	3.7	U	<	7.1	U
METALS (mg/kg)																	
Aluminum	17500	30/30	10500	19		9660	20		6720	21		4610	19		9020	19	
Antimony	1.8	1/30	<	5.6	U	<	6.1	U	<	6.3	U	<	5.7	U	<	5.7	U
Arsenic	3.1	30/30	2.4	2		1.4	2.2	J	1.4	2	J	1.2	2	J	2.1	2	
Barium	2240	30/30	159	19		186	20		386	21		43.3	19		74.9	19	
Beryllium	0.75	30/30	0.52	0.47		0.4	0.5	J	0.26	0.53	J	0.17	0.47	J	0.41	0.48	J
Cadmium	0.4	7/30	<	0.47	U	<	0.5	U	<	0.53	U	<	0.47	U	0.29	0.48	J
Calcium	312000	30/30	123000	4700		97500	5000		125000	5300		56700	470		7920	480	
Chromium, Total	24.1	30/30	15.1	0.94		12.4	1		12	1.1		7.1	0.95		7.5	0.95	
Cobalt	5.3	30/30	3.3	4.7	J	1.9	5	J	1	5.3	J	1.1	4.7	J	2.7	4.8	J
Copper	9	27/30	4	2.4		2.7	2.5		<	2.6	U	<	2.4	U	5.1	2.4	
Iron	12700	30/30	6650	9.4	E	5590	10	E	3500	11	E	3110	9.5	E	7630	9.5	
Lead	11.3	30/30	5.6	0.3		4	0.33		2.8	0.3		2.1	0.29		11.3	20	J
Magnesium	11500	30/30	3660	470		5300	500		10000	530		6510	470		1370	480	
Manganese	190	30/30	95.8	1.4	E	55.3	1.5	E	31.1	1.6	E	30.3	1.4	E	126	1.4	E
Mercury	0.34	7/30	<	0.15	U	<	0.23	U	<	0.2	U	<	0.19	U	<	0.21	U
Nickel	11.6	30/30	6.4	3.8		4.6	4		3.4	4.2	J	3.2	3.8	J	5.6	3.8	
Potassium	2840	30/30	1900	470		1840	500		1220	530		1010	470		1880	480	
Sodium	348	30/30	180	470	J	149	500	J	157	530	J	126	470	J	22	480	J
Thallium	0.35	3/30	<	1	U	<	1.1	U	<	1	U	<	0.98	U	<	1	U
Vanadium	25.9	30/30	18.2	4.7	E	18.4	5	E	17.7	5.3	E	11.8	4.7	E	16.4	4.8	
Zinc	35.4 E	30/30	18.3	1.9		15.8	2		9.5	2.1		7.6	1.9		20.3	1.9	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 2 of 6

Source: URS Greiner Woodward Clyde, 1999

Table 66-1b
Detected Compounds in Subsurface Soils
AOC H

FIELD ID			CAH-SB03-010			CAH-SB03-020			CAH-SB03-030			CAH-SB03-040			CAH-SB04-005		
COLLECT DATE			5/2/98			5/2/98			5/2/98			5/2/98			5/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
2-Hexanone	7	1/30	<	20	U	<	20	U	<	19	U	<	18	U	<	18	U
Benzene	4	1/30	<	12	U	<	12	U	<	12	U	4	11	J	<	11	U
Methyl Ethyl Ketone (2-Butanone)	37	3/30	<	20	U	<	20	U	<	19	U	<	18	U	<	18	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	66	5/30	<	20	U	<	20	U	<	19	U	<	18	U	<	18	U
Toluene	22	5/30	<	12	U	<	12	U	<	12	U	13	11		<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzyl Butyl Phthalate	16	1/30	<	400	U	<	410	U	<	390	U	<	360	U	<	370	U
Di-N-Butyl Phthalate	15	1/30	<	400	U	<	410	U	<	390	U	<	360	U	15	370	J
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/30	<	7.9	U	<	8.1	U	<	7.7	U	<	7.1	U	<	7.3	U
METALS (mg/kg)																	
Aluminum	17500	30/30	11700	23		9800	23		10600	22		4700	20		17500	20	
Antimony	1.8	1/30	<	7	U	<	6.9	U	<	6.7	U	<	5.9	U	<	5.9	U
Arsenic	3.1	30/30	2.8	2.1		1.2	2.4	J	1.6	2.2	J	1.2	1.6	J	3.1	2	
Barium	2240	30/30	351	23		412	23		2240	22		72	20		210	20	
Beryllium	0.75	30/30	0.55	0.58	J	0.36	0.58	J	0.31	0.56	J	0.16	0.49	J	0.73	0.49	J
Cadmium	0.4	7/30	0.3	5.8	J	<	5.8	U	0.17	5.6	J	<	4.9	U	0.2	0.49	J
Calcium	312000	30/30	181000	580		126000	580		97700	560		115000	490		22000	490	
Chromium, Total	24.1	30/30	18.5	1.2		15	1.2		13.9	1.1		11	0.98		12.9	0.99	
Cobalt	5.3	30/30	3.2	5.8	J	2.2	5.8	J	2.4	5.6	J	1.3	4.9	J	4.6	4.9	J
Copper	9	27/30	4	2.9		2.1	2.9	J	2	2.8	J	2	2.5	J	7.9	2.5	
Iron	12700	30/30	7670	12		5670	12		5670	11		2860	9.8		12000	9.9	
Lead	11.3	30/30	6.4	10		3.9	12	J	2.8	11	J	1.9	8.1	J	10	9.9	
Magnesium	11500	30/30	4800	580		8830	580		11500	560		9610	490		2700	490	
Manganese	190	30/30	97.1	1.7	E	47	1.7	E	38.7	1.7	E	25.5	1.5	E	155	1.5	E
Mercury	0.34	7/30	<	0.23	U	<	0.22	U	<	0.2	U	<	0.19	U	<	0.2	U
Nickel	11.6	30/30	7.1	4.7		5.4	4.6		5.6	4.4		3.3	3.9	J	10.6	3.9	
Potassium	2840	30/30	2230	580		1890	580		1930	560		915	490		2720	490	
Sodium	348	30/30	272	580	J	265	580	J	216	560	J	91.5	490	J	69.3	490	J
Thallium	0.35	3/30	<	1	U	<	1.2	U	<	1.1	U	<	0.81	U	<	0.99	U
Vanadium	25.9	30/30	22.4	5.8		24	5.8		23	5.6		13.8	4.9		24	4.9	
Zinc	35.4 E	30/30	22.5	2.3		14.7	2.3		12.5	2.2		9	2		29.1	2	

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 3 of 6

Source: URS Greiner Woodward Clyde, 1999

Table 66-1b
Detected Compounds in Subsurface Soils
AOC H

FIELD ID			CAH-SB04-010			CAH-SB04-020			CAH-SB04-030			CAH-SB04-040			CAH-SB05-005		
COLLECT DATE			5/2/98			5/2/98			5/2/98			5/2/98			5/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
2-Hexanone	7	1/30	<	18	U	<	18	U	<	18	U	<	18	U	<	21	U
Benzene	4	1/30	<	11	U	<	11	U	<	11	U	<	11	U	<	13	U
Methyl Ethyl Ketone (2-Butanone)	37	3/30	<	18	U	<	18	U	<	18	U	<	18	U	<	21	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	66	5/30	<	18	U	<	18	U	<	18	U	<	18	U	<	21	U
Toluene	22	5/30	<	11	U	<	11	U	7	11	J	<	11	U	<	13	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzyl Butyl Phthalate	16	1/30	<	350	U	<	360	U	<	360	U	<	360	U	<	430	U
Di-N-Butyl Phthalate	15	1/30	<	350	U	<	360	U	<	360	U	<	360	U	<	430	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/30	<	7	U	<	7.1	U	<	7.1	U	<	7.1	U	<	8.5	U
METALS (mg/kg)																	
Aluminum	17500	30/30	15800	19		7860	20		9530	19		6460	19		16900	24	
Antimony	1.8	1/30	1.8	5.8	J	<	6	U	<	5.8	U	<	5.7	U	<	7.2	U
Arsenic	3.1	30/30	2.6	1.9		1.8	1.9	J	2.1	1.8		1.6	1.9	J	2.7	1.1	
Barium	2240	30/30	686	19		217	20		447	19		372	19		103	24	
Beryllium	0.75	30/30	0.75	0.48		0.4	0.5	J	0.4	0.48	J	0.25	0.47	J	0.74	0.6	
Cadmium	0.4	7/30	0.4	4.8	J	0.21	5	J	<	4.8	U	0.13	0.47	J	<	0.6	U
Calcium	312000	30/30	105000	480		79500	500		118000	480		37400	470		10200	600	
Chromium, Total	24.1	30/30	15.5	0.96		10.6	1		14.7	0.96		6.8	0.95		13.2	1.2	
Cobalt	5.3	30/30	3.5	4.8	J	2.4	5	J	2.6	4.8	J	1.4	4.7	J	4.8	6	J
Copper	9	27/30	4.8	2.4		2.4	2.5	J	3.1	2.4		2.4	2.4		8.6	3	
Iron	12700	30/30	9090	9.6		5870	10		5760	9.6		3780	9.5		12700	12	
Lead	11.3	30/30	5.9	9.4	J	3.9	9.5	J	4.2	9.2	J	2.3	9.6	J	7.8	11	J
Magnesium	11500	30/30	4340	480		3500	500		9530	480		8930	470		2700	600	
Manganese	190	30/30	113	1.4	E	81.8	1.5	E	71.2	1.4	E	33.4	1.4	E	190	1.8	
Mercury	0.34	7/30	<	0.19	U	<	0.19	U	<	0.19	U	<	0.21	U	<	0.24	U
Nickel	11.6	30/30	8.4	3.9		5.5	4		5.7	3.9		4	3.8		11.6	4.8	
Potassium	2840	30/30	2280	480		1960	500		2150	480		1390	470		2840	600	
Sodium	348	30/30	149	480	J	219	500	J	241	480	J	102	470	J	127	600	J
Thallium	0.35	3/30	<	0.94	U	<	0.95	U	<	0.92	U	<	0.96	U	0.3	1.1	J
Vanadium	25.9	30/30	22.9	4.8		14.3	5		18.2	4.8		15.1	4.7		25.9	6	
Zinc	35.4 E	30/30	23.1	1.9		16.3	2		15.6	1.9		9.1	1.9		29.2	2.4	E

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 4 of 6

Source: URS Greiner Woodward Clyde, 1999

Table 66-1b
Detected Compounds in Subsurface Soils
AOC H

FIELD ID			CAH-SB05-010			CAH-SB05-020			CAH-SB05-030			CAH-SB05-040			CAH-SB06-005		
COLLECT DATE			5/2/98			5/2/98			5/2/98			5/2/98			5/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)																	
2-Hexanone	7	1/30	<	18	U	<	19	U	<	18	U	<	18	U	<	19	U
Benzene	4	1/30	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	37	3/30	<	18	U	<	19	U	<	18	U	<	18	U	<	19	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	66	5/30	<	18	U	<	19	U	<	18	U	<	18	U	<	19	U
Toluene	22	5/30	<	11	U	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)																	
Benzyl Butyl Phthalate	16	1/30	<	360	U	<	370	U	<	360	U	<	360	U	16	370	J
Di-N-Butyl Phthalate	15	1/30	<	360	U	<	370	U	<	360	U	<	360	U	<	370	U
PESTICIDES/PCB (µg/kg)																	
DDE	3.6	1/30	<	7	U	<	7.3	U	<	7.2	U	<	7.2	U	<	7.3	U
METALS (mg/kg)																	
Aluminum	17500	30/30	3780	19		9850	20		6650	21		11800	21		13400	19	
Antimony	1.8	1/30	<	5.8	U	<	6	U	<	6.4	U	<	6.3	U	<	5.6	U
Arsenic	3.1	30/30	1.8	1		1.4	1		1.3	0.92		1.8	0.88		2	1	
Barium	2240	30/30	345	19		134	20		229	21		244	21		79.1	19	
Beryllium	0.75	30/30	0.15	0.49	J	0.39	0.5	J	0.24	0.53	J	0.45	0.52	J	0.6	0.47	
Cadmium	0.4	7/30	<	0.49	U	<	0.5	U	<	0.53	U	<	0.52	U	<	0.47	U
Calcium	312000	30/30	312000	490		107000	500		115000	530		98800	520		13700	470	
Chromium, Total	24.1	30/30	24.1	0.97		13.6	0.99		14	1.1		22.6	1		10.7	0.93	
Cobalt	5.3	30/30	1.4	4.9	J	1.8	5	J	2	5.3	J	2.9	5.2	J	4.1	4.7	J
Copper	9	27/30	2.3	2.4	J	2.2	2.5	J	2.2	2.6	J	3.5	2.6		7.4	2.3	
Iron	12700	30/30	2070	9.7		5530	9.9		3840	11		6830	10		10400	9.3	
Lead	11.3	30/30	1.5	10	J	3.4	10	J	2.1	9.2	J	4	8.8	J	8.8	10	J
Magnesium	11500	30/30	3870	490		6950	500		6210	530		7430	520		2270	470	
Manganese	190	30/30	18.1	1.5		52.1	1.5		43.9	1.6		82.3	1.6		156	1.4	
Mercury	0.34	7/30	0.06	0.2	J	<	0.21	U	<	0.19	U	<	0.22	U	0.04	0.18	J
Nickel	11.6	30/30	4	3.9		5.2	4		4.3	4.2		11.2	4.2		9.3	3.7	
Potassium	2840	30/30	780	490		1960	500		1290	530		2510	520		2300	470	
Sodium	348	30/30	210	490	J	334	500	J	202	530	J	348	520	J	131	470	J
Thallium	0.35	3/30	<	1	U	<	1	U	<	0.92	U	<	0.88	U	0.21	1	J
Vanadium	25.9	30/30	8	4.9		24.4	5		16.7	5.3		24.1	5.2		21.5	4.7	
Zinc	35.4 E	30/30	6.1	1.9	E	13.8	2	E	10.1	2.1	E	21.1	2.1	E	24.9	1.9	E

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Page 5 of 6

Source: URS Greiner Woodward Clyde, 1999

Table 66-1b
Detected Compounds in Subsurface Soils
AOC H

FIELD ID			CAH-SB06-010			CAH-SB06-020			CAH-SB06-030			CAH-SB06-040		
COLLECT DATE			5/2/98			5/2/98			5/2/98			5/2/98		
	Maximum	Frequency	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual	Result	RL	Qual
VOLATILE ORGANICS (METHOD 8260) (µg/kg)														
2-Hexanone	7	1/30	<	18	U	<	18	U	<	19	U	<	18	U
Benzene	4	1/30	<	11	U	<	11	U	<	11	U	<	11	U
Methyl Ethyl Ketone (2-Butanone)	37	3/30	<	18	U	<	18	U	<	19	U	<	18	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	66	5/30	<	18	U	<	18	U	<	19	U	<	18	U
Toluene	22	5/30	<	11	U	<	11	U	<	11	U	<	11	U
SEMIVOLATILE ORGANICS (METHOD 8270) (µg/kg)														
Benzyl Butyl Phthalate	16	1/30	<	370	U	<	360	U	<	380	U	<	370	U
Di-N-Butyl Phthalate	15	1/30	<	370	U	<	360	U	<	380	U	<	370	U
PESTICIDES/PCB (µg/kg)														
DDE	3.6	1/30	<	7.3	U	<	7.1	U	<	7.5	U	<	7.3	U
METALS (mg/kg)														
Aluminum	17500	30/30	16200	19		3650	19		6140	21		3730	21	
Antimony	1.8	1/30	<	5.6	U	<	5.8	U	<	6.3	U	<	6.2	U
Arsenic	3.1	30/30	2.2	0.97		1.1	1		1.5	1.1		0.9	0.96	J
Barium	2240	30/30	103	19		845	19		177	21		79.9	21	
Beryllium	0.75	30/30	0.66	0.47		0.14	0.48	J	0.19	0.53	J	0.13	0.52	J
Cadmium	0.4	7/30	<	0.47	U	<	0.48	U	<	0.53	U	<	0.52	U
Calcium	312000	30/30	57900	470		188000	480		152000	530		57600	520	
Chromium, Total	24.1	30/30	14.6	0.93		15	0.97		14.1	1.1		7.8	1	
Cobalt	5.3	30/30	4.1	4.7	J	1.2	4.8	J	1.1	5.3	J	1.2	5.2	J
Copper	9	27/30	7.3	2.3		3.4	2.4		1.5	2.6	J	1.2	2.6	J
Iron	12700	30/30	10800	9.3		1900	9.7		3360	11		2520	10	
Lead	11.3	30/30	6.4	9.7	J	1.3	10	J	1.8	11	J	1.9	9.6	J
Magnesium	11500	30/30	3470	470		7660	480		6470	530		5680	520	
Manganese	190	30/30	145	1.4		18.8	1.5		32.5	1.6		29.5	1.5	
Mercury	0.34	7/30	<	0.18	U	0.04	0.18	J	<	0.19	U	<	0.15	U
Nickel	11.6	30/30	10.6	3.7		3.5	3.9	J	4.4	4.2		2.5	4.1	J
Potassium	2840	30/30	2750	470		609	480		1210	530		697	520	
Sodium	348	30/30	202	470	J	138	480	J	164	530	J	67.9	520	J
Thallium	0.35	3/30	<	0.97	U	<	1	U	<	1.1	U	<	0.96	U
Vanadium	25.9	30/30	24	4.7		9	4.8		12.8	5.3		11.9	5.2	
Zinc	35.4 E	30/30	26.4	1.9	E	5.4	1.9	E	9	2.1	E	6.2	2.1	E

J - Estimated
Qual - Qualifier
RL - Reporting Limit
U - Not detected at specified reporting limit
E = Estimated since result exceeded the calibration curve
µg/kg = Microgram per Kilogram
mg/kg = Milligram per Kilogram

Source: URS Greiner Woodward Clyde, 1999

Table 66-1c
Comparison of Maximum Surface Soil Concentrations to MSSLs
AOC H

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of MSSL	Estimated Risk: Excess Cancer[2]	Estimated Risk: Hazard Quotient[3]
VOLATILE ORGANICS									
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	1/6	CAH-SB02-002	0.017	J	750	NO			0.000023
Toluene	1/6	CAH-SB04-002	0.004	J	520	NO			**
SEMIVOLATILE ORGANICS									
Di-n-octylphthalate	1/6	CAH-SB01-002	0.040		1,100	NO			0.00004
PESTICIDES									
DDE	2/6	CAH-SB02-002	0.0107	J	1.7	NO		6.29E-09	0.006
METALS									
Aluminum	6/6	CAH-SB06-002	17400		75,000	NO			0.2
Antimony	1/6	CAH-SB06-002	3.8		30	NO			0.1
Arsenic	6/6	CAH-SB05-002	3.9	J	0.38	YES	6/6	1.03E-05	
Chromium	6/6	CAH-SB06-002	12.9		210	NO		6.14E-08	
Iron	6/6	CAH-SB06-002	12,900		22,000	NO			0.6
Lead	6/6	CAH-SB01-002	20.3		400	NO			*
Mercury	2/6	CAH-SB06-002	0.07		22	NO			0.003
Vanadium	6/6	CAH-SB06-002	27.9		520	NO			0.05
Total Excess Cancer Risk[4]								1E-05	
Hazard Index[5]									1

(1) EPA Region VI Media-Specific Screening Levels for Residential Soil (EPA 1998)
(2) These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/MSSL*1x10-6.
(3) These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/MSSL*1.0.
(4) Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
(5) Hazard Index = Sum of all hazard quotients at the site.
mg/kg = Milligram per Kilogram
J = Estimated
** The MSSL for toluene is based on the soil saturation concentration and are not based on risk.
Therefore, a potential risk from toluene could not be estimated using the MSSL. A MSSL calculated based on risk would be higher than the saturation concentration; therefore, the exclusion of toluene from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
* Lead does not have an EPA-established toxicity factor; therefore, a MSSL has not been calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).

Source: URS Greiner Woodward Clyde, 1999

Table 66-1d
Comparison of Maximum Subsurface Soil Concentrations to MSSLs
AOC H

Chemical	Frequency Detected	Field Sample ID for Maximum Hit	Maximum Detected Concentration (mg/kg)	Qual	Residential Soil MSSL Concentration[1] (mg/kg)	Exceeds MSSL?	Frequency of Exceedance of MSSL	Estimated Risk: Excess Cancer[2]	Estimated Risk: Hazard Quotient[3]
VOLATILE ORGANICS									
2-Hexanone	1/30	CAH-SB01-010	0.007		NA	NA			
Benzene	1/30	CAH-SB03-040	0.004		0.62	NO		6.45E-09	
Methyl Ethyl Ketone (2-Butanone)	3/30	CAH-SB02-005	0.037		6900	NO			0.000005
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	5/30	CAH-SB02-020	0.066		750	NO			0.00009
Toluene	5/30	CAH-SB02-020	0.022		520	NO			**
SEMIVOLATILE ORGANICS									
Butylbenzylphthalate	1/30	CAH-SB06-005	0.016		930	NO			**
Di-n-butylphthalate	1/30	CAH-SB04-005	0.015		5500	NO			0.000003
PESTICIDES									
DDE	1/30	CAH-SB01-005	0.0036		1.7	NO		2.12E-09	
METALS									
Aluminum	30/30	CAH-SB04-005	17500		75000	NO			***
Barium	30/30	CAH-SB03-030	2240		5200	NO			***
Beryllium	30/30	CAH-SB04-010	0.75		150	NO			0.005
Chromium	30/30	CAH-SB05-010	24.1		210	NO		1.15E-07	
Cobalt	30/30	CAH-SB02-005	5.3		3300	NO			0.002
Copper	27/30	CAH-SB01-005	9		2800	NO			0.003
Lead	30/30	CAH-SB03-005	11.3		400	NO			*
Mercury	7/30	CAH-SB01-005	0.34		22	NO			0.02
Zinc	30/30	CAH-SB01-005	35.4	E	22000	NO			***
Total Excess Cancer Risk[4]								1E-07	
Hazard Index[5]									0.03

(1) EPA Region VI Media-Specific Screening Levels for Residential Soil (EPA 1998).
(2) These chemicals are known carcinogens. Excess Cancer Risk = Maximum Detected Concentration/MSSL*1x10-6.
(3) These chemicals are noncarcinogens. Hazard Quotient = Maximum Detected Concentration/MSSL*1.0.
(4) Total Excess Cancer Risk = Sum of all excess cancer risks at the site.
(5) Hazard Index = Sum of all hazard quotients at the site.
NA = Not Available (see Section 9.9.4)
mg/kg = Milligrams per Kilogram
* Lead does not have an EPA-established toxicity factor; therefore, a MSSL has not been calculated for it. The concentration presented as the MSSL for lead is based on an EPA exposure model (EPA 1994).
** The MSSL for toluene is based on the soil saturation concentration and are not based on risk.
Therefore, a potential risk from toluene could not be estimated using the MSSL. A MSSL calculated based on risk would be higher than the saturation concentration; therefore, the exclusion of toluene from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.
*** The MSSL is a maximum allowable concentration and not based on risk. Therefore, a potential risk from these chemicals could not be estimated using the MSSLs. A MSSL calculated based on risk would be greater than the MSSL. The exclusion of these chemicals from the cumulative risk estimate is not likely to significantly affect the conclusions of the risk screening evaluation.

Source: URS Greiner Woodward Clyde, 1999

A.T. Kearney, Inc. 1987. Preliminary Review/VSI Report RCRA Facility Assessment. Cannon Air Force Base; Clovis, New Mexico. July.

CH2M Hill. 1983. Installation Restoration Program Records Search for Cannon Air Force Base, New Mexico. August.

Department of the Air Force. 1994. Letter from Brigadier General William M. Guth, Commander to William K. Honker, USEPA Region VI, regarding AOC36. June 29.

Foothill Engineering Consultants, Inc. 1999. Annual Summary Report Assessment Monitoring, Long-Term Monitoring Landfill No. 3 (SWMU 105) and Landfill No. 4 (SWMU 104). Draft. Cannon Air Force Base; Clovis, New Mexico. May.

Geoscience Consultants, Ltd. 1985. Cannon AFB, New Mexico, Landfill Core Drilling Project.

Groundwater Services, Inc. 1999. RBCA Tool Kit for Chemical Releases.

Gutentag, Edwin D., et al. 1984. Geohydrology of the High Plains Aquifer in Parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. USGS Professional Paper 1400-B.

IMS, P.C. 1997. Site Inspection Report, Area of Concern – D. Final. Cannon Air Force Base, New Mexico. June.

IT Corporation. 1995. Final Project Report, Rapid Response Corrective Action, DP-33 Drum Removal. January.

Lee Wan and Associates, Inc. 1990. RCRA Facility Investigation Work Plan, Volumes I & II – Cannon AFB, New Mexico. June.

Lee Wan & Associates, Inc. 1990. RCRA Facility Investigation Field Sampling Plan. Cannon Air Force Base, New Mexico. June.

LRL Sciences, Inc. 1993. Appendix II RCRA Facility Investigation. RFI Report, Volume 1 and Risk Assessment, Volume 2.

Radian Corporation. 1986. Installation Restoration Program Phase II – Confirmation/Quantification Stage I, Cannon Air Force Base, New Mexico. September.

Radian Corporation. 1987. Soil Removal Investigation Report, AGE Drainage Ditch – Site 15, Cannon Air Force Base, NM 88103. June.

Radian Corp. 1994. RCRA Facility Investigation. Final Report, SWMU No. 105, Landfill No. 4, IRP Site LF-3. Cannon AFB, N.M. Vol. I. February.

Remediation Services, Incorporated. 1994. Closure Report: DACA 45-94-B-0100. September.

Salhotra, A.M., P. Mineart, s. Sharp-Hansen, t. Allison, R. Johns, and W. B. Mills. 1995. Multimedia Exposure Assessment Model (MULTIMED 2.0) for Evaluating the land disposal of Wastes – Model Theory. U.S. Environmental Protection Agency. Athens, GA. April.

Schroeder, P.R., T.S. Dozier, P.A. Zappi, B.M. McEnroe, J.W. Sjostrom, and R.L. Peyton. 1994. The Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering Documentation for Version 3. EPA/600/R-94/168b. U.S. Environmental Protection Agency, Risk Reduction Engineering Laboratory, Cincinnati, OH. September.

State of New Mexico Environment Department, Ground Water Protection and Remediation Bureau. 1996. Letter from Julie A. Jacobs to Col. W.P. Ard, Commander 27th Support Group, regarding closure of DP-33 Drum Removal. December 12.

State of New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. 1997. Letter from Robert S. Dinwiddie, Ph.D. to Col. David E. Clary, Commander, regarding Site Inspection Report for AOC-D. November 6.

State of New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. 1998. Letter from Robert S. Dinwiddie, Ph.D. to Col. David E. Clary, Commander, regarding Phase I RCRA Facility Investigation Report for Landfill No. 5. February 17.

United States Air Force (USAF). 1990. Final Environmental Impact Statement, Realignment of Cannon AFB, Curry County, New Mexico. May.

United States Army Corps of Engineers, Albuquerque District. 1999. Corrective Measure Completion Report, Appendices II and III Solid Waste Management Units. Cannon Air Force Base, Clovis, New Mexico. Volume 1. July.

United States Army Corps of Engineers, Tulsa District. 1988. Cannon Air Force Base Oil/Water Separators Sampling and Analytical Report.

United States Department of Agriculture (USDA) Soil Conservation Service. 1958. Soil Survey of Curry County, New Mexico, Soil Survey Series 1953, No. 4. United States Government Printing Office.

United States Environmental Protection Agency. 1979. Water-Related Environmental Fate of 129 Priority Pollutants. EPA-440/4-79-029a.

United States Environmental Protection Agency. 1987. Resource Conservation and Recovery Act Facility Assessment Guidance.

United States Environmental Protection Agency. 1989a. RCRA Facility Assessment Guidance, Volume I. May.

United States Environmental Protection Agency. 1989b. Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual.

United States Environmental Protection Agency. 1991a. Update on OSWER Soil Lead Cleanup Guidance. Memorandum by Don R. Clay, Assistant Administrator. USEPA Office of Solid Waste and Emergency Response. Washington D.C. August 29.

United States Environmental Protection Agency. 1991b. Guidance Manual for Site-Specific Use of USEPA Land Model. USEPA Office of Emergency and Remedial Response. December.

United States Environmental Protection Agency. 1994a. Region III. Risk-Based Concentration Table, Fourth Quarter 1994.

United States Environmental Protection Agency. 1994b. Revised Interim Soil Lead Evidence for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response. July.

United States Environmental Protection Agency. 1996. Region VI. Human Health Media-Specific Screening Levels. October.

United States Geological Survey Water Resources Division. 1993. Geology and Analytical Results for Soils at the Open Burn/Open Detonation Thermal Treatment Facility. Melrose Air Force Range, New Mexico. August.

United States Geological Survey Water Resources Division. 1997. Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326. Cannon Air Force Base, New Mexico. December.

United States Geological Survey Water Resources Division. 1999. Annual Evaluation of Bioventing Soil Remediation at SWMU #70, Oil/Water Separator No. 326. Analytical Results for Samples Collected August 10-11, 1998. Cannon Air Force Base, New Mexico. May.

URS Greiner Woodward Clyde. 1999a. CERCLA Site Inspections at AOCs E, F. G, and H. Cannon AFB, New Mexico. March.

URS Greiner Woodward Clyde. 1999b. Corrective Measures Study, Site SD-11 (SWMUs 86-90). Cannon AFB, New Mexico. July.

URS Greiner Woodward Clyde. 2000. Corrective Measures Study at SWMUs 31, 48A, 77, and 127. Draft. Cannon AFB, New Mexico. January.

Walk, Haydel & Associates, Inc. 1990. Remedial Investigation Report. Final Volume I. Cannon Air Force Base, New Mexico. January.

Woodward-Clyde. 1991. Field Sampling Plan. Remedial Investigation. Phase I (18 SWMUs). Cannon Air Force Base, New Mexico.

Woodward-Clyde. 1992. Remedial Investigation Report for 18 Solid Waste Management Units. Final Volumes Ia and Ib. Cannon Air Force Base; Clovis, New Mexico. October.

Woodward-Clyde. 1993. RCRA Facility Investigation Report for Landfill No. 1 (SWMU No. 74/IRP No. LF-1) and Landfill No. 2 (SWMU 82/IRP No. LF-2). Final Volume I. Cannon Air Force Base; Clovis, New Mexico. January.

Woodward-Clyde. 1994a. RCRA Facility Investigation Report for Appendix III SWMUs – Phase I, Cannon Air Force Base, New Mexico. February.

Woodward-Clyde. 1994b. Baseline Risk Assessment for Appendix III SWMUs – Phase I, Cannon Air Force Base, New Mexico. February.

Woodward-Clyde. 1994c. RCRA Facility Investigation Activities Phase II to Appendix I (Old Entomology Rinse Area Boring). Supplemental RFI Report (19 SWMU Boundary Survey). Final. Cannon Air Force Base, New Mexico. September.

Woodward Clyde. 1995a. Phase II RCRA Facility Investigation Landfills 3 and 4 SWMUs 105 and 104, Cannon Air Force Base, New Mexico. March.

Woodward-Clyde. 1995b. RCRA Facility Investigation Activities Phase II to Appendix I Solid Waste Management Units Supplemental RFI Report. Final (Revised). Cannon Air Force Base, New Mexico. January.

Woodward-Clyde. 1995c. Management Action Plan, Cannon Air Force Base, Clovis, New Mexico. August.

Woodward-Clyde. 1996. Site Inspection Geophysical Survey Report Area of Concern – D, Cannon Air Force Base, Clovis, New Mexico. May.

Woodward-Clyde. 1997a. Naturally Occurring Concentrations of Inorganics and Background Concentrations of Pesticides at Cannon Air Force Base, New Mexico. Final Report. September.

Woodward-Clyde. 1997b. Phase I RCRA Facility Investigation Report for Landfill No. 1. Final Volume I. Cannon Air Force Base; Clovis, New Mexico. September.

Woodward-Clyde. 1997c. RCRA Facility Investigation, Appendix II SWMUs – Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1997d. RCRA Facility Investigation, Appendix III SWMUs – Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1997e. RCRA Facility Investigation, Appendix I SWMUs 86-90 (IRP Site SD-11), Phase II. Cannon Air Force Base, New Mexico. November.

Woodward-Clyde. 1998. Final Phase I RCRA Facility Investigation for Landfill No. 5 (SWMU No. 113/ IRP No. LF-5), Cannon Air Force Base, Clovis, New Mexico. Volume I. May.