Nevada
Environmental
Restoration
Project

DOE/NV--1274

National Nuclear Security Administration

Post-Closure Inspection Report for the Tonopah Test Range, Nevada

For Calendar Year 2007

Controlled Copy No.:_____

Revision: 0

June 2008

Environmental Restoration
Project

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

DISCLAIMER

DOE/NV--1274

POST-CLOSURE INSPECTION REPORT FOR THE TONOPAH TEST RANGE, NEVADA

FOR CALENDAR YEAR 2007

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Las Vegas, Nevada

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POST-CLOSURE INSPECTION REPORT FOR THE TONOPAH TEST RANGE, NEVADA

FOR CALENDAR YEAR 2007

/s/ K Cabble

Approved By: _____ Date: 6-3-08

Kevin J. Cabble
Federal Sub-Project Director
Industrial Sites Sub-Project

/s/ R Boehlecke

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Robert F. Boehlecke
Federal Project Director
Environmental Restoration Project

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ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

CADD	Corrective Action Decision Document
CAS	Corrective Action Site
CAU	Corrective Action Unit
CR	Closure Report
DOE/NV	U.S. Department of Energy, Nevada Operations Office
NDEP	Nevada Division of Environmental Protection
NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
ROTC	Record of Technical Change
TTR	Tonopah Test Range

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EXECUTIVE SUMMARY

This report provides the results of the semiannual post-closure inspections conducted at the closed Corrective Action Unit (CAU) sites located on the Tonopah Test Range (TTR), Nevada. This report covers calendar year 2007 and includes inspection and repair activities completed at the following nine CAUs:

- CAU 400: Bomblet Pit and Five Points Landfill (TTR)
- CAU 404: Roller Coaster Lagoons and Trench (TTR)
- CAU 407: Roller Coaster RadSafe Area (TTR)
- CAU 423: Area 3 Underground Discharge Point, Building 0360 (TTR)
- CAU 424: Area 3 Landfill Complexes (TTR)
- CAU 426: Cactus Spring Waste Trenches (TTR)
- CAU 427: Area 3 Septic Waste Systems 2, 6 (TTR)
- CAU 453: Area 9 UXO Landfill (TTR)
- CAU 487: Thunderwell Site (TTR)

In a letter from the Nevada Division of Environmental Protection (NDEP) dated December 5, 2006, NDEP concurred with the request to reduce the frequency of post-closure inspections of CAUs at TTR to an annual frequency. This letter is included in Attachment B. Post-closure inspections were conducted on May 15-16, 2007. All inspections were conducted according to the post-closure plans in the approved Closure Reports. The post-closure inspection plan for each CAU is included in Attachment B, with the exception of CAU 400. CAU 400 does not require post-closure inspections, but inspections of the vegetation and fencing are conducted as a best management practice. The inspection checklists for each site inspection are included in Attachment C, the field notes are included in Attachment D, and the site photographs are included in Attachment E. Vegetation monitoring of CAU 400, CAU 404, CAU 407, and CAU 426 was performed in May 2007, and the vegetation monitoring report is included in Attachment F.

Maintenance and/or repairs were performed at CAU 453. Animal burrows observed during the annual inspection at CAU 453 were backfilled on August 1, 2007.

At this time, the TTR post-closure site inspections should continue as scheduled. Any potential problem areas previously identified (e.g., areas of erosion, subsidence) should be monitored closely, and periodic vegetation surveys of the vegetated covers should continue.

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1.0 INTRODUCTION

1.1 SCOPE AND OBJECTIVES

This post-closure inspection report includes the results of inspections, maintenance and repair activities, and conclusions and recommendations for calendar year 2007 for nine Corrective Action Units (CAUs) located on the Tonopah Test Range (TTR), Nevada. The locations of the CAUs are shown in Figure 1 of Attachment A. The CAUs and Corrective Action Sites (CASs) covered in this report include the following:

- **CAU 400: Bomblet Pit and Five Points Landfill (TTR)**
  - CAS TA-19-001-05PT: Ordnance Disposal Pit
  - CAS TA-55-001-TAB2: Ordnance Disposal Pit
- **CAU 404: Roller Coaster Lagoons and Trench (TTR)**
  - CAS TA-03-001-TARC: Roller Coaster Lagoons
  - CAS TA-21-001-TARC: Roller Coaster N. Disposal Trench
- **CAU 407: Roller Coaster RadSafe Area (TTR)**
  - CAS TA-23-001-TARC: Roller Coaster RadSafe Area
- **CAU 423: Area 3 Underground Discharge Point, Building 0360 (TTR)**
  - CAS 03-02-002-0308: Underground Discharge Point
- **CAU 424: Area 3 Landfill Complexes (TTR)**
  - CAS 03-08-001-A301: Landfill Cell A3-1
  - CAS 03-08-002-A302: Landfill Cell A3-2
  - CAS 03-08-002-A303: Landfill Cell A3-3
  - CAS 03-08-002-A304: Landfill Cell A3-4
  - CAS 03-08-002-A305: Landfill Cell A3-5
  - CAS 03-08-002-A306: Landfill Cell A3-6
  - CAS 03-08-002-A308: Landfill Cell A3-8
- **CAU 426: Cactus Spring Waste Trenches (TTR)**
  - CAS RG-08-001-RGCS: Waste Trenches
- **CAU 427: Area 3 Septic Waste Systems 2, 6 (TTR)**
  - CAS 03-05-002-SW02: Septic Waste System
  - CAS 03-05-002-SW06: Septic Waste System
- **CAU 453: Area 9 UXO Landfill (TTR)**
  - CAS 09-55-001-0952: Area 9 Landfill
- **CAU 487: Thunderwell Site (TTR)**
  - CAS RG-26-001-RGRV: Thunderwell Site

In a letter from the Nevada Division of Environmental Protection (NDEP) dated December 5, 2006, NDEP concurred with the request to reduce the frequency of post-closure inspections of CAUs at TTR from a semiannual to an annual frequency. This letter is included in Attachment B. Post-closure inspections consist of the following activities to evaluate and document the condition of the closed units. CAU-specific inspection requirements are included in Attachment B.

- Site inspections and photographs to verify site conditions and note variances from previous inspections
- Inspection of fencing, signs, monuments, and/or markers to determine if repairs and/or maintenance are needed
- Inspection of soil covers for indications of subsidence, erosion, or unauthorized use
- Vegetation survey to quantify the condition of vegetative covers
- Subsidence survey to indicate any cover subsidence
- Preparation and submittal of an annual report

This Post-Closure Inspection Report includes the following sections:

- Section 1.0 - Introduction
- Section 2.0 - Post-Closure Inspections
- Section 3.0 - Summary
- Section 4.0 - References
- Attachment A - Figures
- Attachment B - Post-Closure Inspection Plans
- Attachment C - Post-Closure Inspection Checklists
- Attachment D - Field Notes
- Attachment E - Photographs
- Attachment F - Post-Closure Vegetation Monitoring Report
- Library Distribution List

2.0 POST-CLOSURE INSPECTIONS

Post-closure site inspections of TTR CAUs for the period January 2007 through December 2007 were conducted on May 15 and May 16, 2007. Copies of post-closure inspection plans as previously published in the applicable Closure Report (CR) for each CAU are included in Attachment B. Copies of the site inspection checklists are included in Attachment C, field notes are included in Attachment D, and site photographs are included in Attachment E.

2.1 CAU 400: BOMBLET PIT AND FIVE POINTS LANDFILL (TTR)

2.1.1 Introduction

There are no specific post-closure requirements in the CR for CAU 400, Bomblet Pit and Five Points Landfill (TTR); however, when the sites were vegetated in 1997 under the *Tonopah Test Range Closure Sites Revegetation Plan* (U.S. Department of Energy, Nevada Operations Office [DOE/NV], 1997), fencing was installed at the Bomblet Pit (CAS TA-55-001-TAB2, Ordnance Disposal Pit) and the Five Points Landfill (CAS TA-19-001-05PT, Ordnance Disposal Pit). As stated in Section 3.5.4 of the revegetation plan (DOE/NV, 1997), fencing is required at both CASs for a minimum of 5 years in order to give the plants sufficient time to become established. Therefore, inspections are conducted at CAU 400 to document vegetation growth and inspect the integrity of the fences. Removal of site fencing may be proposed in the future, once vegetation on the covers is well established. Vegetation monitoring of CAU 400 was conducted in May 2007, and the results are included in Attachment F.

2.1.2 CAU 400 Inspection Results

Bomblet Pit (CAS TA-55-001-TAB2, Ordnance Disposal Pit): The Bomblet Pit is presented in Figure 2 of Attachment A. The annual inspection was conducted on May 15, 2007. The cover vegetation was healthy, well established, and similar to the surrounding area outside the fence. The fence, signs, and cover were in good condition. No issues or concerns were observed.

Five Points Landfill (CAS TA-19-001-05PT, Ordnance Disposal Pit): The Five Points Landfill is presented in Figure 3 of Attachment A. The annual inspection was conducted on May 15, 2007. All signs and fencing were in good condition. The cover vegetation appeared normal, and the vegetation located on the area that was flooded in 2003 and 2006 was showing signs of regrowth. No issues or concerns were observed.

2.1.3 CAU 400 Maintenance and Repairs

No maintenance or repairs at CAU 400 were required in 2007.

2.1.4 CAU 400 Conclusions and Recommendations

The Bomblet Pit and Five Points Landfill were observed to be in good condition. Site inspections should continue as scheduled. The sites exceeded the revegetation standards; however, it is recommended to continue vegetation monitoring.

2.2 CAU 404: ROLLER COASTER LAGOONS AND TRENCH (TTR)

2.2.1 Introduction

CAU 404, Roller Coaster Lagoons and Trench (TTR), consists of two CASs (CAS TA-03-001-TARC, Roller Coaster Lagoons, and CAS TA-21-001-TARC, Roller Coaster N. Disposal Trench). Post-closure requirements are described in the CR for CAU 404 (DOE/NV, 1998a), which was approved by NDEP on May 18, 1999.

A diagram showing the site location and configuration is presented as Figure 4 of Attachment A. The site inspections are conducted according to the CAU 404 post-closure inspection plan (Attachment B). In addition to site inspections, vegetation monitoring of the site was conducted in May 2007, and the results are included in Attachment F.

2.2.2 CAU 404 Inspection Results

The annual inspection was conducted on May 15, 2007. This site was in good condition. No damage was noted to the fencing, signs, or cover. The vegetation was healthy and well established. No issues or concerns were observed.

2.2.3 CAU 404 Maintenance and Repairs

No maintenance or repairs at CAU 404 were required in 2007.

2.2.4 CAU 404 Conclusions and Recommendations

The site was observed to be in good condition. Site inspections should continue as scheduled. The site exceeded the revegetation standards; however, it is recommended to continue vegetation monitoring.

2.3 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)

2.3.1 Introduction

CAU 407, Roller Coaster RadSafe Area (TTR), consists of one CAS (CAS TA-23-001-TARC, Roller Coaster RadSafe Area). The post-closure requirements for CAU 407 are described in the CR (DOE/NV, 2001a). Revision 1 of the CR was approved by NDEP on February 22, 2002. Section 5.2 of the CR called for site inspections to be conducted within the first 6 months following completion of cover construction. After the first 6 months, site inspections were to be conducted twice yearly for 2 years. In December 2006, NDEP agreed to reduce the frequency of post-closure inspections from semiannual to annual. Previous inspections have noted erosion rills on the cover margins, and subsequent maintenance was completed to repair the rills and help prevent future erosion; consequently, inspections will continue until the site stabilizes.

A diagram showing the site location and configuration is presented in Figure 5 of Attachment A. The site inspections are conducted according to the CAU 407 post-closure inspection plan (Attachment B). In addition to site inspections, vegetation monitoring of the site was conducted in May 2007, and the results are included in Attachment F.

2.3.2 CAU 407 Inspection Results

The annual inspection was conducted on May 15, 2007. The inspection indicated the cover, fence, and warning signs were in good condition. No issues or concerns were observed.

2.3.3 CAU 407 Maintenance and Repairs

No maintenance or repairs at CAU 407 were required in 2007.

2.3.4 CAU 407 Conclusions and Recommendations

This site was observed to be in good condition. The site inspections should continue as scheduled, and the health of the vegetation and integrity of the cover should continue to be monitored until the site has stabilized.

2.4 CAU 423: AREA 3 UNDERGROUND DISCHARGE POINT, BUILDING 0360 (TTR)

2.4.1 Introduction

CAU 423, Area 3 Underground Discharge Point, Building 0360 (TTR), consists of one CAS (CAS 03-02-002-0308, Underground Discharge Point). CAU 423 was closed in place, with one warning sign and one at-grade monument installed, as detailed in the CR (DOE/NV, 1999a). The CR did not originally require post-closure inspections. A Record of Technical Change (ROTC) to the CR (NNSA/NSO, 2005), specifying the post-closure inspection requirements, was approved by NDEP on June 6, 2005 (Attachment B). A diagram showing the site location and configuration is presented in Figure 6 of Attachment A.

2.4.2 CAU 423 Inspection Results

The annual inspection was conducted on May 15, 2007. The warning sign and at-grade monument were in good condition. No issues or concerns were observed.

2.4.3 CAU 423 Maintenance and Repairs

No maintenance or repairs at CAU 423 were required in 2007.

2.4.4 CAU 423 Conclusions and Recommendations

The site was observed to be in good condition. The site inspections should continue as scheduled.

2.5 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)

2.5.1 Introduction

CAU 424, Area 3 Landfill Complexes (TTR), consists of eight CASs. Seven landfill cells (CAS 03-08-001-A301, Landfill Cell A3-1; CAS 03-08-002-A302, Landfill Cell A3-2; CAS 03-08-002-A303, Landfill Cell A3-3; CAS 03-08-002-A304, Landfill Cell A3-4; CAS 03-08-002-A305, Landfill Cell A3-5; CAS 03-08-002-A306, Landfill Cell A3-6; and CAS 03-08-002-A308, Landfill Cell A3-8) were closed with soil covers and require post-closure inspections. CAS 03-08-002-A307, Landfill Cell A3-7, was not used as a landfill site and was

closed without taking any corrective action. CAU 424 closure activities included removing small volumes of soil containing petroleum hydrocarbons, repairing cell covers that were cracked and/or had subsided, and installing above-grade and at-grade monuments to mark the corners of the landfill cells. Post-closure requirements for CAU 424 are detailed in the CR, which was approved by NDEP on August 24, 1999 (DOE/NV, 1999b).

The site inspections are conducted according to the CAU 424 post-closure inspection plan (Attachment B). A diagram showing the landfill locations is presented in Figure 7 of Attachment A.

2.5.2 CAU 424 Inspection Results

The annual inspection was conducted on May 15 and May 16, 2007.

Landfill Cell A3-1 (CAS 03-08-001-A301): Landfill Cell A3-1 is located at the north end of CAU 424 and is the largest of the landfill cells. The cover and seven above-grade concrete monuments that demarcate the landfill cell were examined. All signs, survey markers, and monuments were in good condition. Vegetation is established throughout the site, and no cracking, erosion, or subsidence of the cover was noted. No issues or concerns were observed.

Landfill Cell A3-2 (CAS 03-08-002-A302): Landfill Cell A3-2 is located due south of Landfill Cell A3-1. The overall condition of the unit was good. All four above-grade monuments and the landfill cover were examined and found to be in good condition. All signs and brass survey markers were legible and intact. No signs of erosion, subsidence, or evidence of unauthorized use were noted. No issues or concerns were observed.

Landfill Cell A3-3 (CAS 03-08-002-A303): Landfill Cell A3-3 straddles the western fence of the TTR Area 3 Compound, with the portion of the landfill outside the fence marked by three above-grade monuments, and the portion inside the fence marked by three at-grade monuments. The overall condition of the site was good. All six monuments were located and inspected. All monuments, brass survey markers, and warning signs were in good condition. No subsidence, cracking, or erosion was noted. No issues or concerns were observed.

Landfill Cell A3-4 (CAS 03-08-002-A304): Landfill Cell A3-4 is located south of Dykes Drive at the south end of the CAU. The overall condition of the site was good, and vegetation was established throughout the site. Five above-grade monuments and one at-grade brass survey marker were located and inspected. All monuments, the brass survey marker, and warning signs were in good condition. No issues or concerns were observed.

Landfill Cell A3-5 (CAS 03-08-002-A305): Landfill Cell A3-5 is located west of Moody Avenue inside a fenced area in Area 10 south of the Air Force First-Aid Station. All four above-grade monuments and attached warning signs and brass survey markers were located and found to be in good condition. No evidence of subsidence, cracking, or erosion was noted, and sparse vegetation was present. The overall condition of the site was good. No issues or concerns were observed.

Landfill Cell A3-6 (CAS 03-08-002-A306): Landfill Cell A3-6 is located immediately west and outside of the fence of the TTR Area 3 Compound. All four above-grade monuments and attached warning signs and brass survey markers were located and found to be in good condition. The overall condition of the landfill cover was good. No evidence of subsidence, cracking, or erosion was noted. No issues or concerns were observed.

Landfill Cell A3-8 (CAS 03-08-002-A308): Landfill Cell A3-8 is located southwest of the Area 3 Compound in the boxcar storage yard. Three of the four at-grade brass markers were located and determined to be in good condition. The southwest corner monument was not located due to its location in a posted radioactive materials area and the presence of surface debris. There was no indication that the debris was impacting the condition of the monument. The monument will be examined in future inspections when the surface debris is removed. No erosion, subsidence, or evidence of unauthorized use was noted at the site. The overall condition of the cover was good. No issues or concerns were observed.

2.5.3 CAU 424 Maintenance and Repairs

No maintenance or repairs at CAU 424 were required in 2007.

2.5.4 CAU 424 Conclusions and Recommendations

All seven CASs in CAU 424 were observed to be in good condition. The site inspections should continue as scheduled.

2.6 CAU 426: CACTUS SPRING WASTE TRENCHES (TTR)

2.6.1 Introduction

CAU 426, Cactus Spring Waste Trenches (TTR), consists of one CAS (CAS RG-08-001-RGCS, Waste Trenches). The post-closure requirements are described in the CR for CAU 426 (DOE/NV, 1998b), which was approved by NDEP on May 13, 1999.

A diagram showing the site location and configuration is presented in Figure 8 of Attachment A. The site inspections are conducted according to the CAU 426 post-closure inspection plan (Attachment B). In addition to site inspections, vegetation monitoring of the site was conducted in May 2007, and the results are included in Attachment F.

2.6.2 CAU 426 Inspection Results

The annual inspection was conducted on May 15, 2007. The fence perimeter was walked, and the site was found to be in good condition. No erosion, subsidence, or evidence of unauthorized use was noted. Vegetation was well established and healthy throughout the site. No issues or concerns were observed.

2.6.3 CAU 426 Maintenance and Repairs

No maintenance or repairs at CAU 426 were required in 2007.

2.6.4 CAU 426 Conclusions and Recommendations

The site was observed to be in good condition. Site inspections should continue as scheduled. The site met the revegetation standards; however, it is recommended to continue vegetation monitoring.

2.7 CAU 427: AREA 3 SEPTIC WASTE SYSTEMS 2, 6 (TTR)

2.7.1 Introduction

CAU 427, Area 3 Septic Waste Systems 2, 6 (TTR), consists of two CASs (CAS 03-05-002-SW02, Septic Waste System; and CAS 03-05-002-SW06, Septic Waste System). The closed leachfields are located in the TTR Area 3 compound in a high-traffic area. For this reason, the leachfield corners are marked by subsurface metal markers each covered with red cinder rock to the ground surface. The red rock aids in visually locating the markers during site inspections. Post-closure requirements for CAU 427 are detailed in the CR for CAU 427 (DOE/NV, 1999c), which was approved by NDEP on August 27, 1999.

A diagram showing the site location and configuration is presented in Figure 9 of Attachment A. The site inspections are conducted according to the CAU 427 post-closure inspection plan (Attachment B).

2.7.2 CAU 427 Inspection Results

The annual inspection was conducted on May 15, 2007. All 21 subsurface metal markers, including four markers at Leachfield A, four markers at Leachfield B, four markers at the Abandoned Leachfield, four markers at the Pre-1965 Leachfield, and five markers at Septic Tank 33-5, were located. The five warning signs were intact, in place, and legible. The site was observed to be in good condition, and no maintenance or repairs were recommended. No issues or concerns were observed.

2.7.3 CAU 427 Maintenance and Repairs

No maintenance or repairs at CAU 427 were required in 2007.

2.7.4 CAU 427 Conclusions and Recommendations

The site was observed to be in good condition. Site inspections should continue as scheduled.

2.8 CAU 453: AREA 9 UXO LANDFILL (TTR)

2.8.1 Introduction

CAU 453, Area 9 UXO Landfill (TTR), consists of one CAS (CAS 09-55-001-0952, Area 9 Landfill). Post-closure requirements for CAU 453 are described in the CR for CAU 453 (DOE/NV, 1999d), which was approved by NDEP on September 10, 1999.

A diagram showing the site location and configuration is presented in Figure 10 of Attachment A. The site inspections are conducted according to the CAU 453 post-closure inspection plan (Attachment B).

2.8.2 CAU 453 Inspection Results

The annual inspection was conducted on May 15, 2007. The fence, signs, 16 aboveground monuments, and covers were all in excellent condition. There was evidence of animal burrowing at the site that required follow-up action.

2.8.3 CAU 453 Maintenance and Repairs

Animal burrows observed during the annual inspection were backfilled on August 1, 2007.

2.8.4 CAU 453 Conclusions and Recommendations

The site was observed to be in good condition. The site inspections should continue as scheduled.

2.9 CAU 487: THUNDERWELL SITE (TTR)

2.9.1 Introduction

CAU 487, Thunderwell Site (TTR), consists of one CAS (CAS RG-26-001-RGRV, Thunderwell Site). The Corrective Action Decision Document (CADD)/CR was approved by NDEP on December 17, 2001 (DOE/NV, 2001b). Buried waste and debris were present at the site but no contamination was found. Use restrictions were implemented at the site as explained in the CADD/CR, but no post-closure inspections were proposed. Two separate use restrictions were implemented to address areas associated with subsurface geophysical anomalies (anomalies A-8 and A-17). Concrete monuments were installed at both locations of buried waste. A ROTC to modify the CADD/CR to include post-closure inspections and use restriction information was approved by NDEP on July 30, 2004 (NNSA/NSO, 2004).

A diagram showing the site location and configuration is presented in Figure 11 of Attachment A.

2.9.2 CAU 487 Inspection Results

The annual inspection was conducted on May 15, 2007. All warning signs were in place, intact, and legible. No issues or concerns were observed.

2.9.3 CAU 487 Maintenance and Repairs

No maintenance or repairs at CAU 487 were required in 2007.

2.9.4 CAU 487 Conclusions and Recommendations

The site was observed to be in good condition. Site inspections should continue as scheduled.

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3.0 SUMMARY

3.1 CAU 400: BOMBLET PIT AND FIVE POINTS LANDFILL (TTR)

Site inspections at CAS TA-55-001-TAB2, Ordnance Disposal Pit (Bomblet Pit), and CAS TA-19-001-05PT, Ordnance Disposal Pit (Five Points Landfill), indicated the sites were in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled, and an ecological specialist should continue to evaluate vegetation conditions.

3.2 CAU 404: ROLLER COASTER LAGOONS AND TRENCH (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled, and an ecological specialist should continue to evaluate vegetation conditions.

3.3 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled, and an ecological specialist should continue to evaluate vegetation conditions.

3.4 CAU 423: AREA 3 UNDERGROUND DISCHARGE POINT, BUILDING 0360 (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled.

3.5 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled.

3.6 CAU 426: CACTUS SPRING WASTE TRENCHES (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled, and an ecological specialist should continue to evaluate vegetation conditions.

3.7 CAU 427: AREA 3 SEPTIC WASTE SYSTEMS 2, 6 (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled.

3.8 CAU 453: AREA 9 UXO LANDFILL (TTR)

The site inspection indicated that the site was in good condition. Animal burrows observed during the annual inspection were backfilled on August 1, 2007. Site inspections should continue as scheduled.

3.9 CAU 487: THUNDERWELL SITE (TTR)

The site inspection indicated that the site was in good condition. No maintenance or repairs were required. Site inspections should continue as scheduled.

4.0 REFERENCES

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

NNSA/NSO, see U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004. *Record of Technical Change No. 2 for the Final Corrective Action Decision Document/Closure Report for Corrective Action Unit 487: Thunderwell Site, Tonopah Test Range, Nevada,* Revision 0, November 2001. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2005. *Record of Technical Change No. CR-1 for the Final Closure Report for Corrective Action Unit 423: Area 3 Building 0360 Underground Discharge Point, Tonopah Test Range, Nevada,* Revision 0, July 1999. Las Vegas, NV.

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ATTACHMENT A
FIGURES

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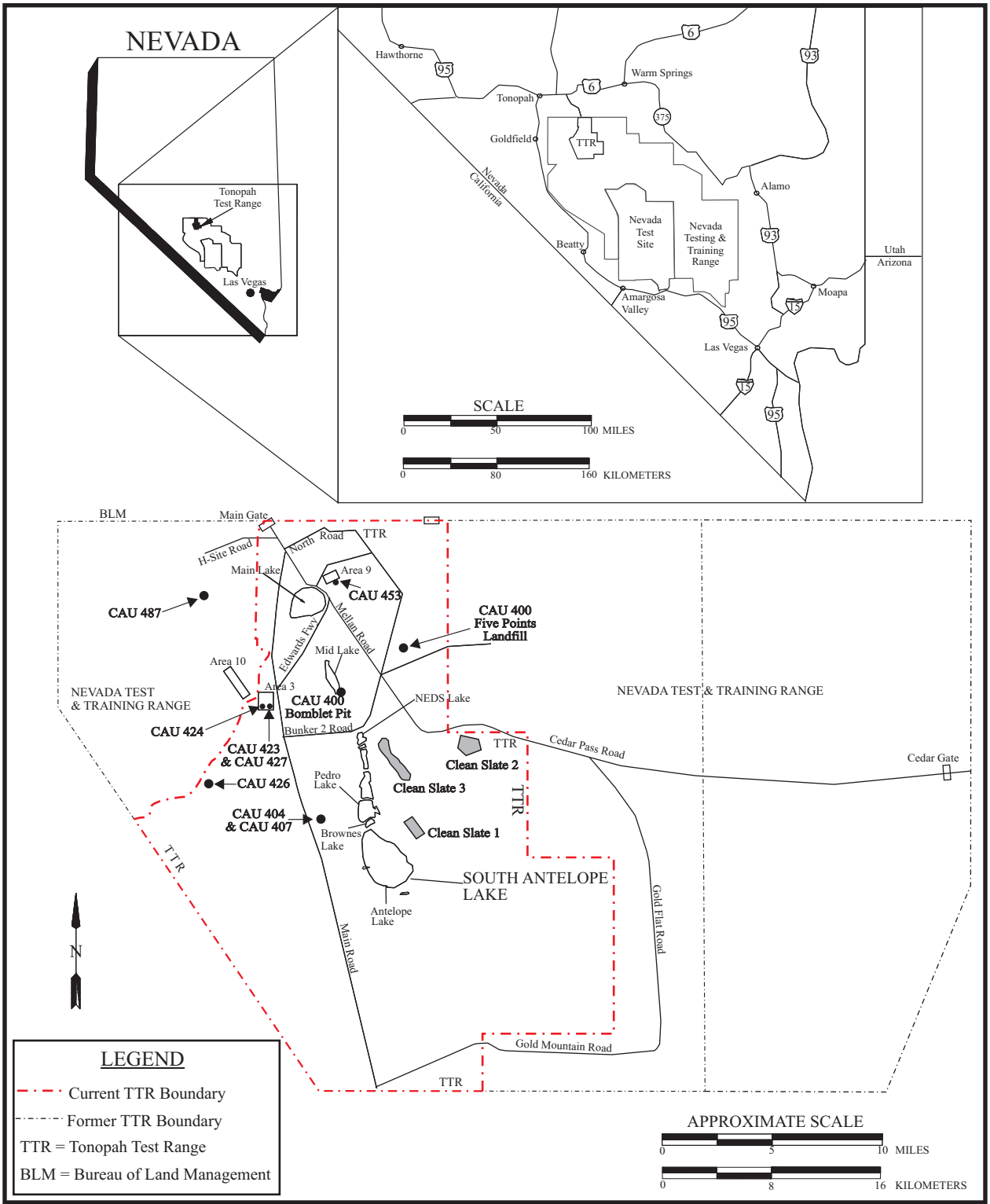

FIGURE 1
TONOPAH TEST RANGE
POST-CLOSURE MONITORING SITES LOCATION MAP

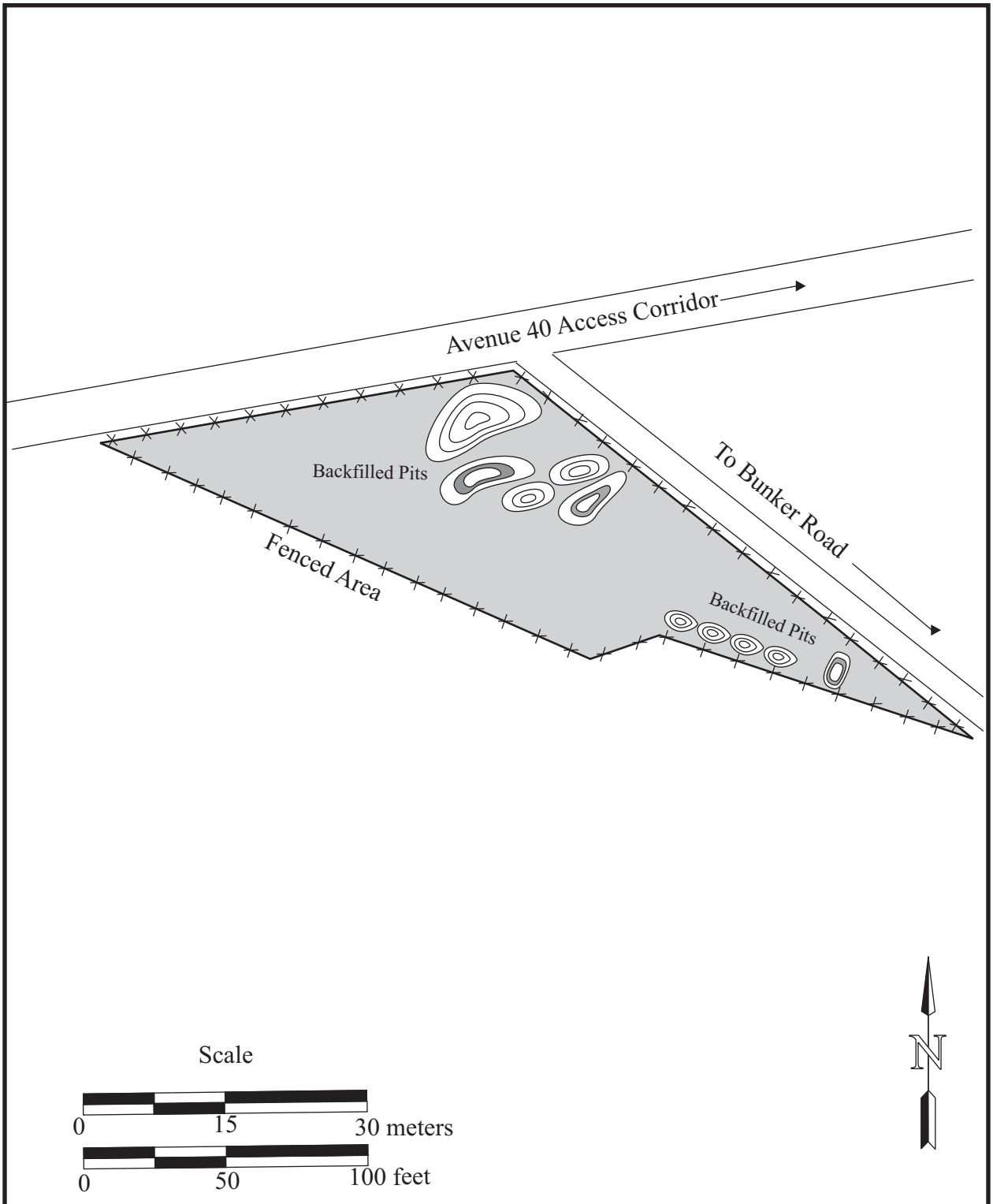

FIGURE 2
CAU 400 BOMBLET PIT LOCATION MAP

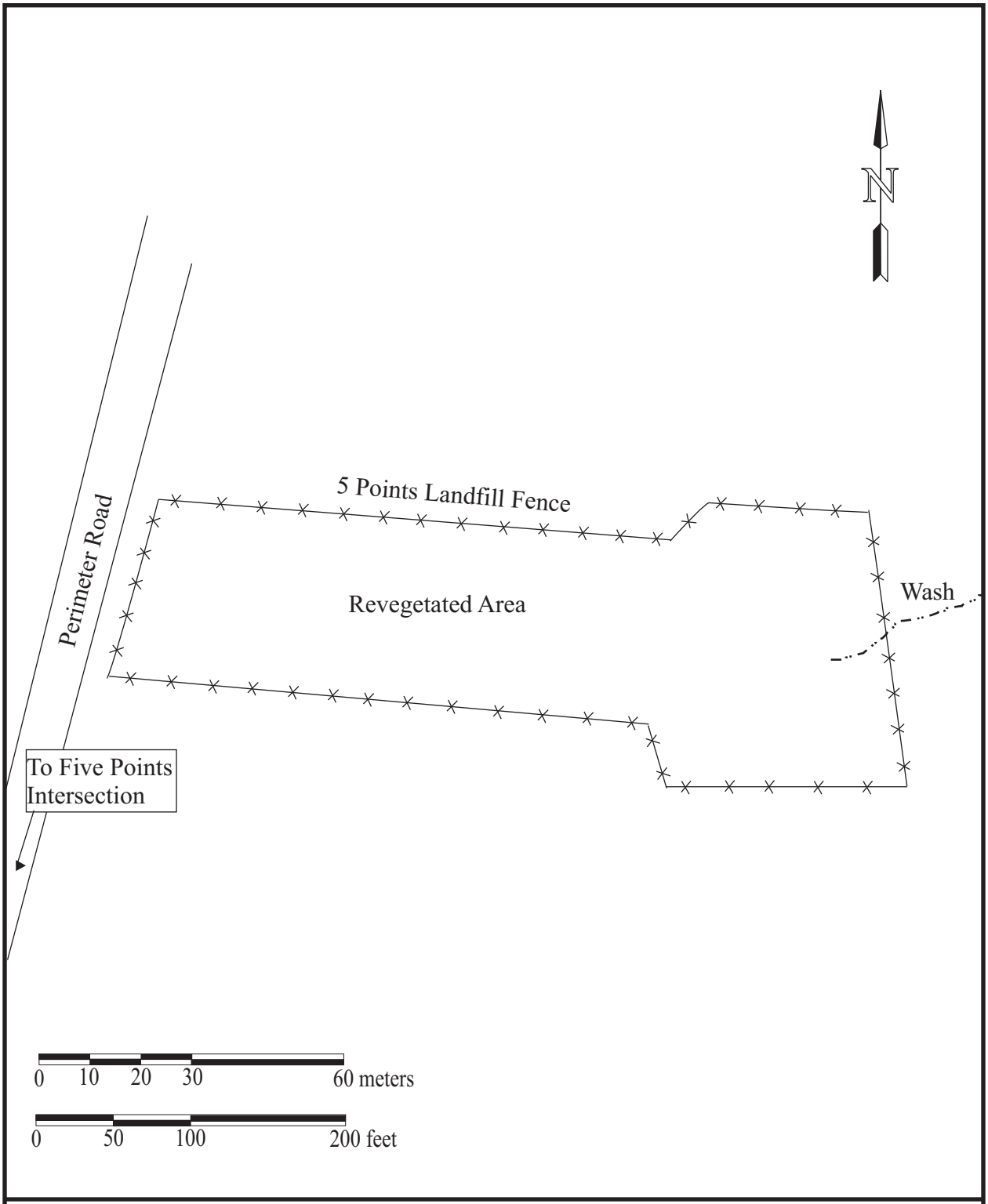

FIGURE 3
CAU 400 FIVE POINTS LANDFILL LOCATION MAP

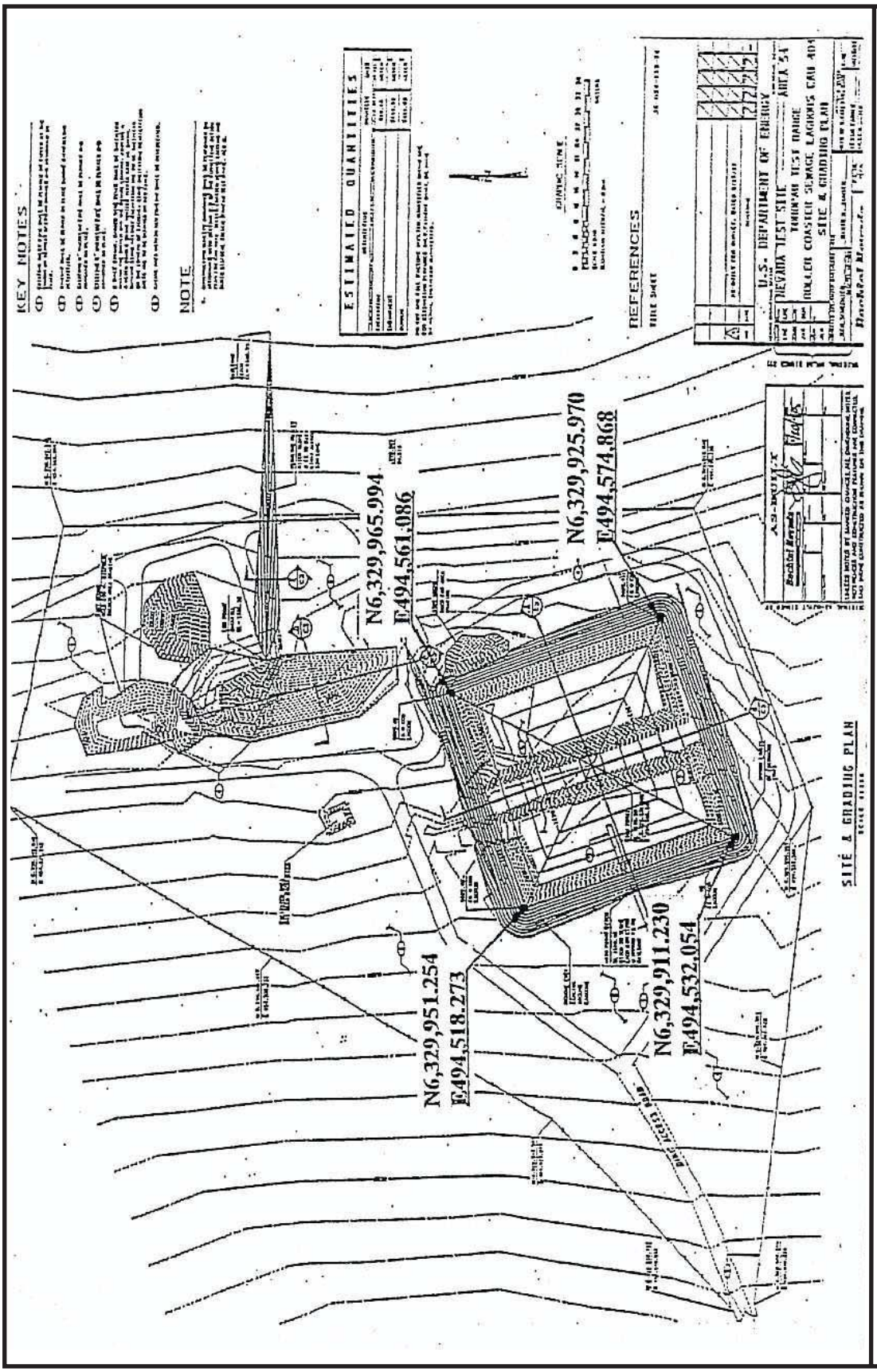

FIGURE 4
CAU 404 ROLLER COASTER LAGOONS AND TRENCH LOCATION MAP

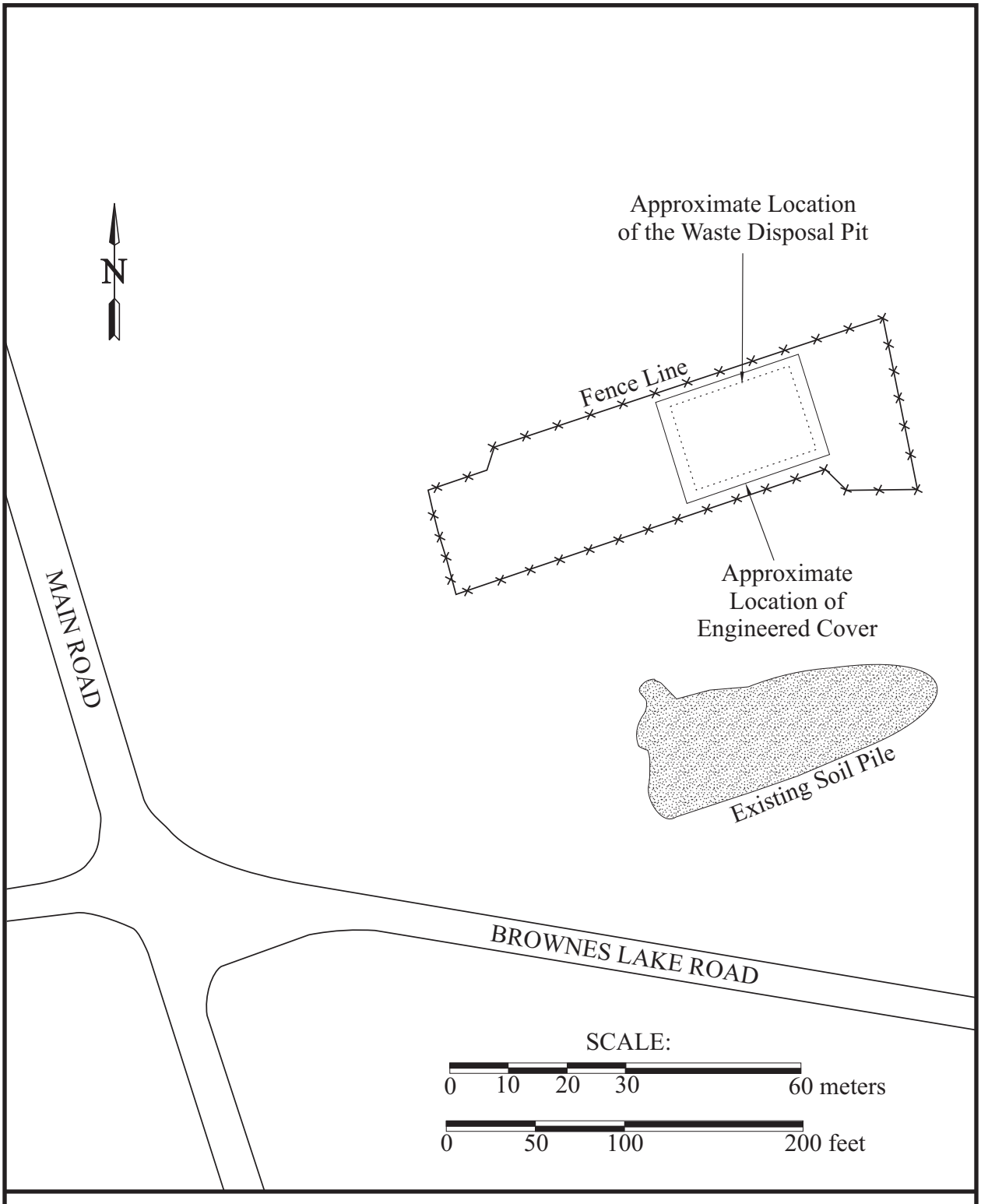

FIGURE 5
CAU 407 ROLLER COASTER RADSAFE AREA LOCATION MAP

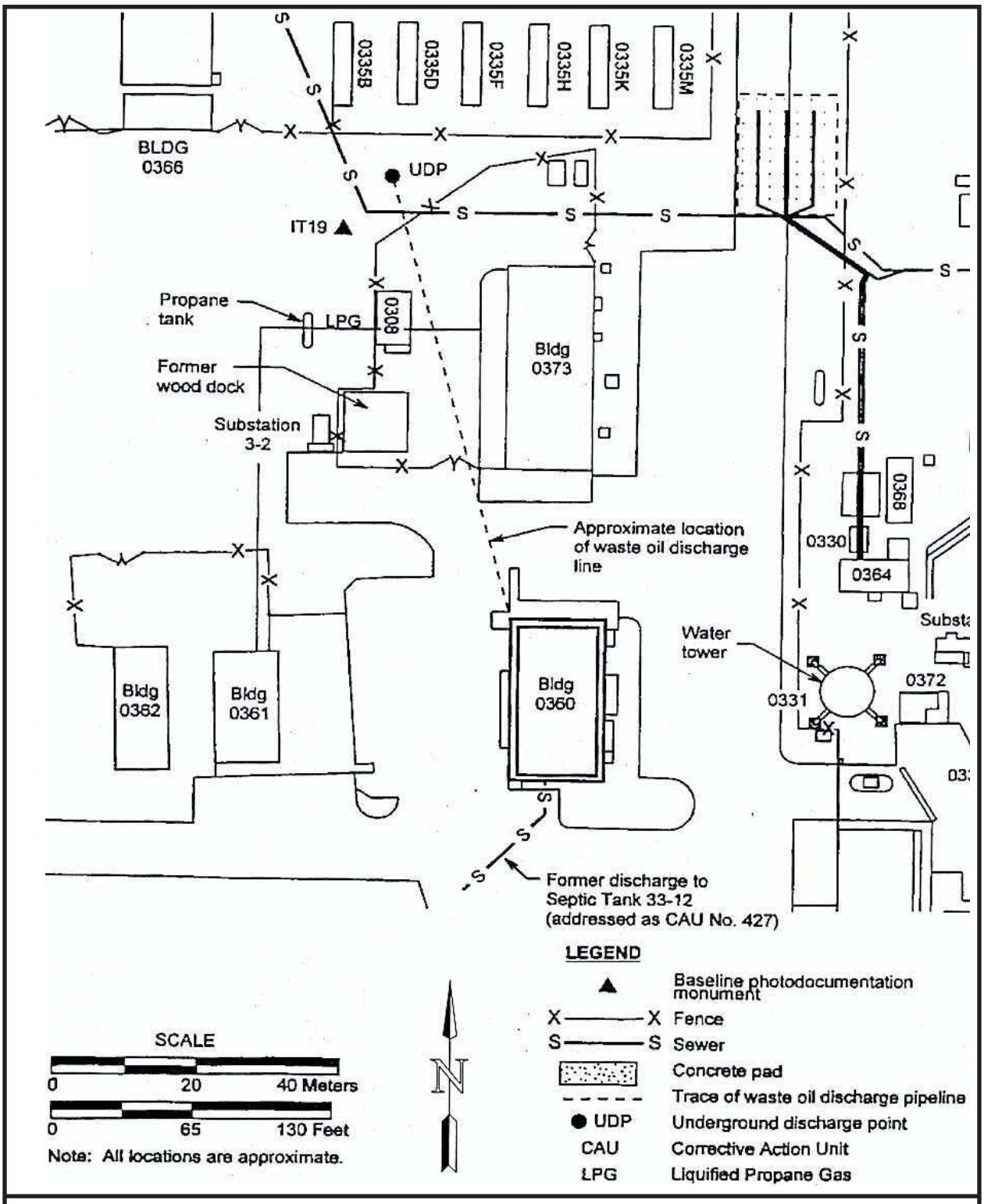

FIGURE 6
CAU 423 AREA 3 UNDERGROUND DISCHARGE POINT,
BUILDING 0360 LOCATION MAP

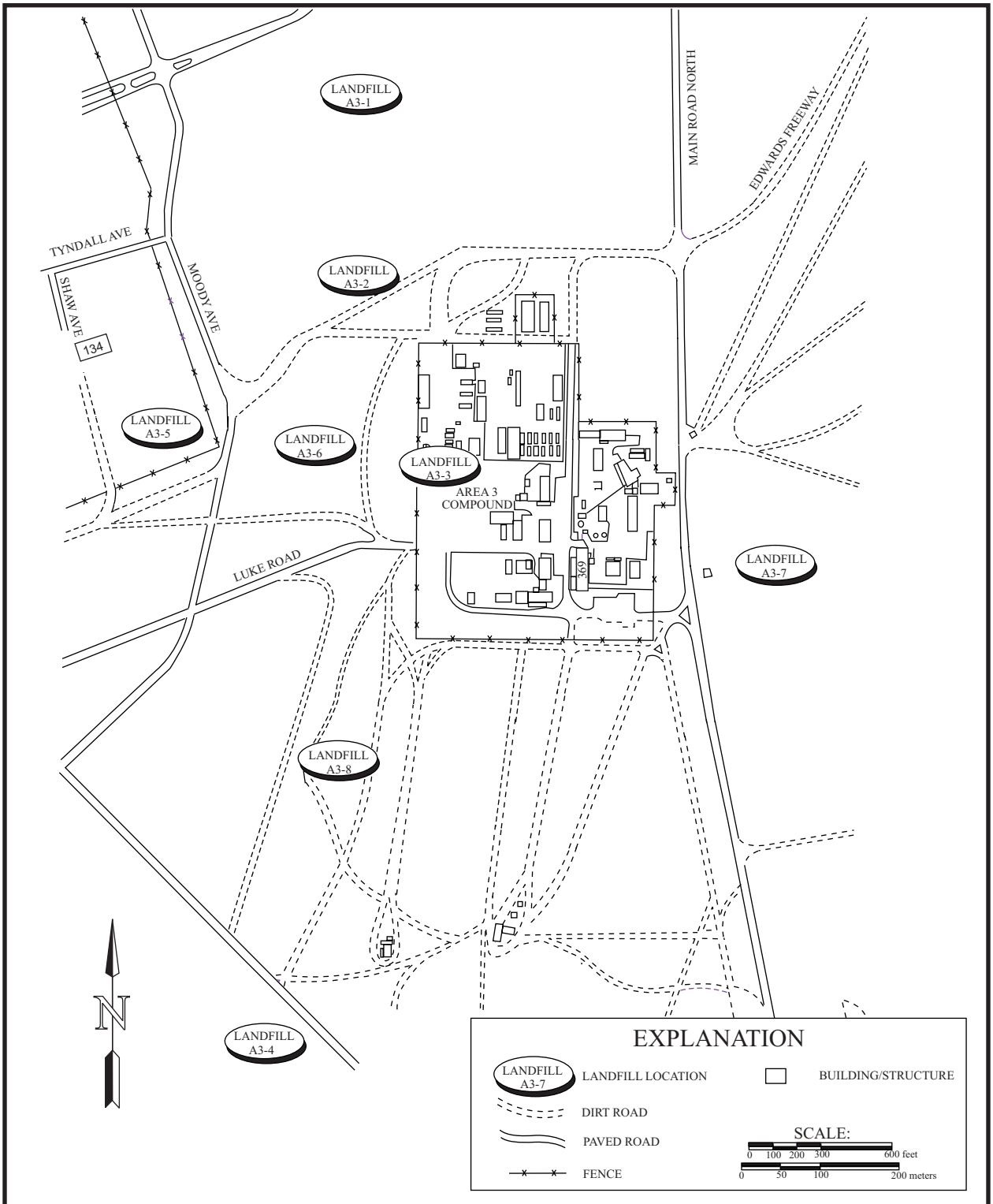

FIGURE 7
CAU 424 AREA 3 LANDFILL COMPLEXES LOCATION MAP

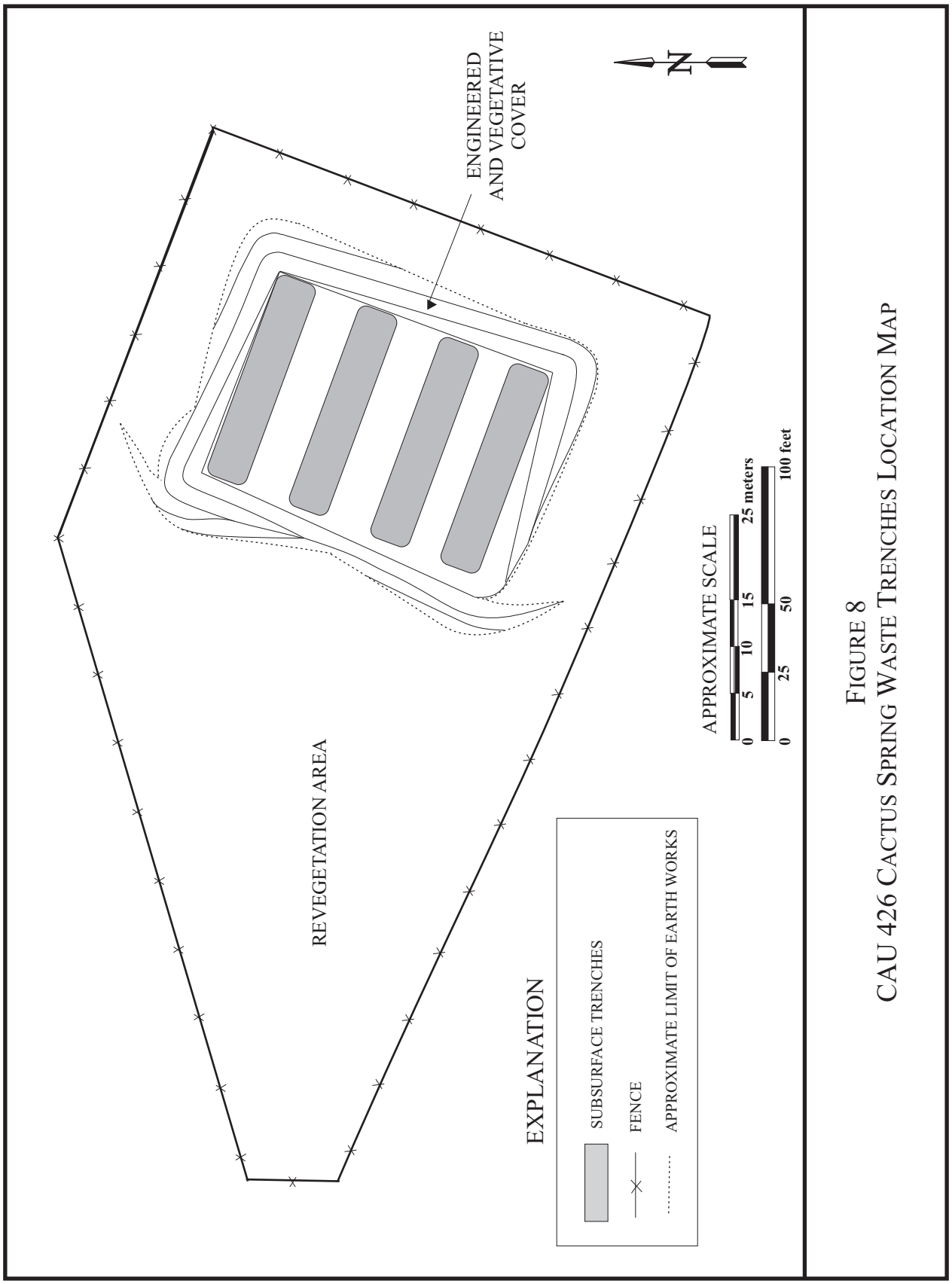

FIGURE 8
CAU 426 CACTUS SPRING WASTE TRENCHES LOCATION MAP

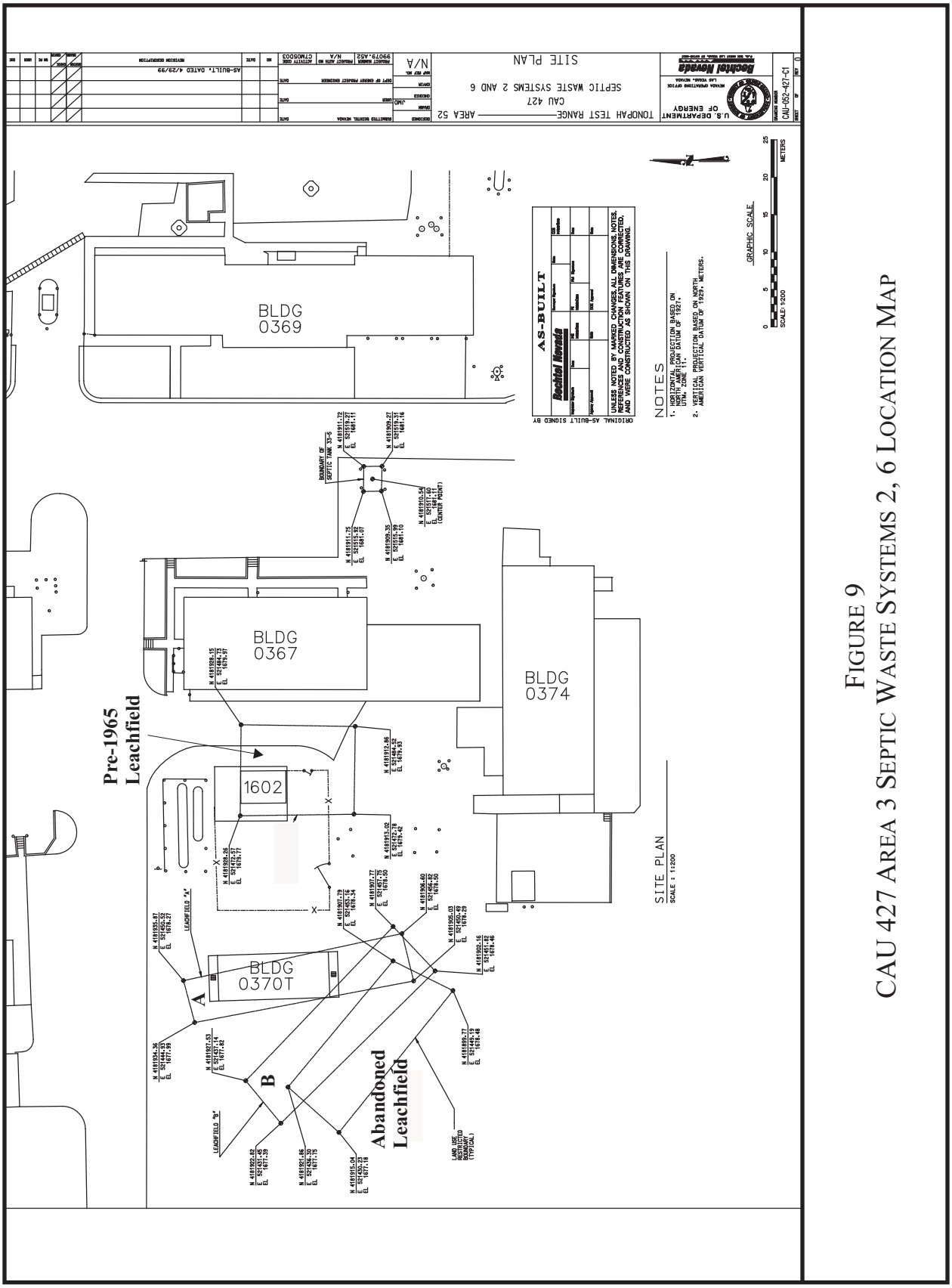

FIGURE 9
CAU 427 AREA 3 SEPTIC WASTE SYSTEMS 2, 6 LOCATION MAP

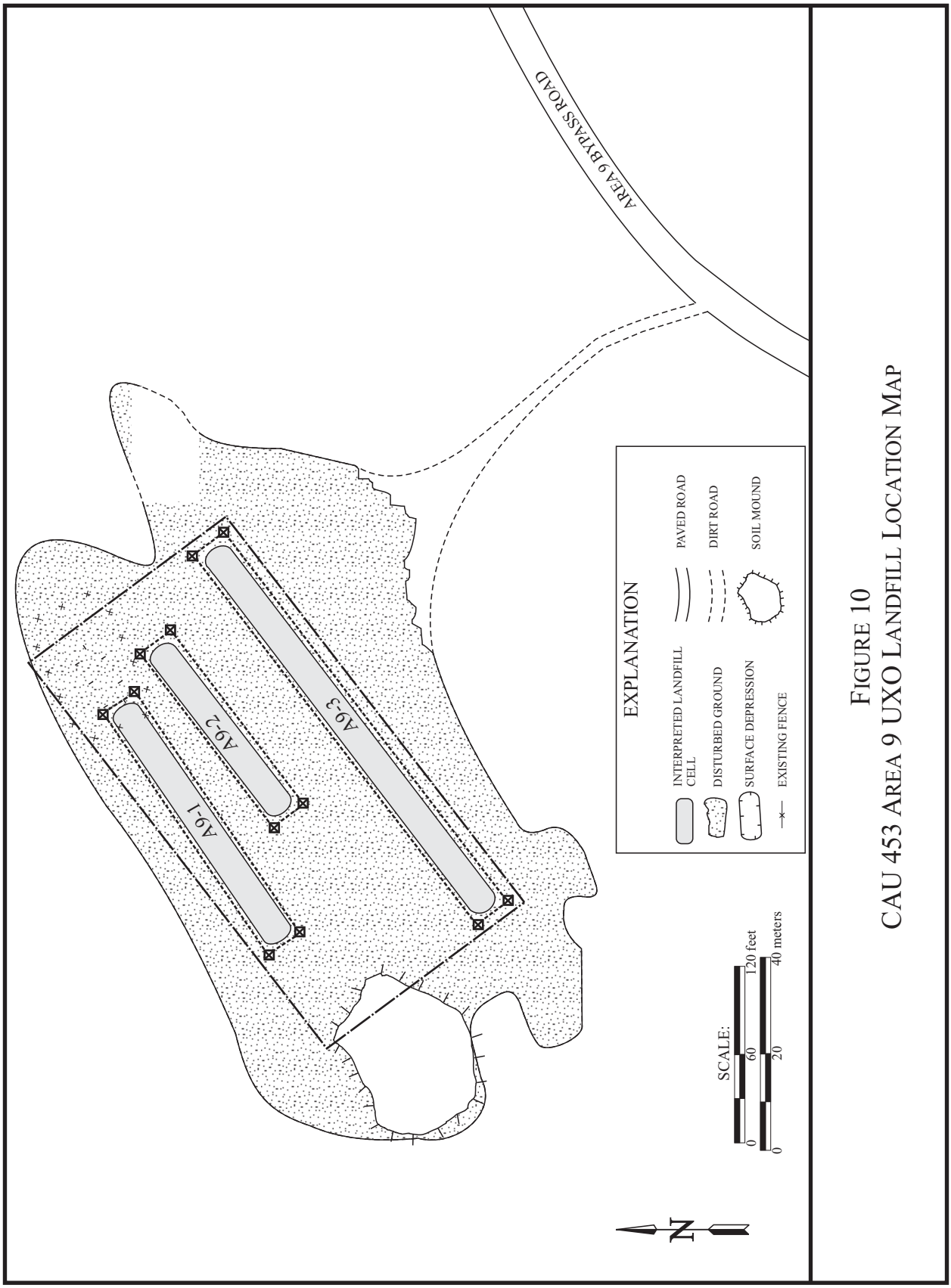

FIGURE 10
CAU 453 AREA 9 UXO LANDFILL LOCATION MAP

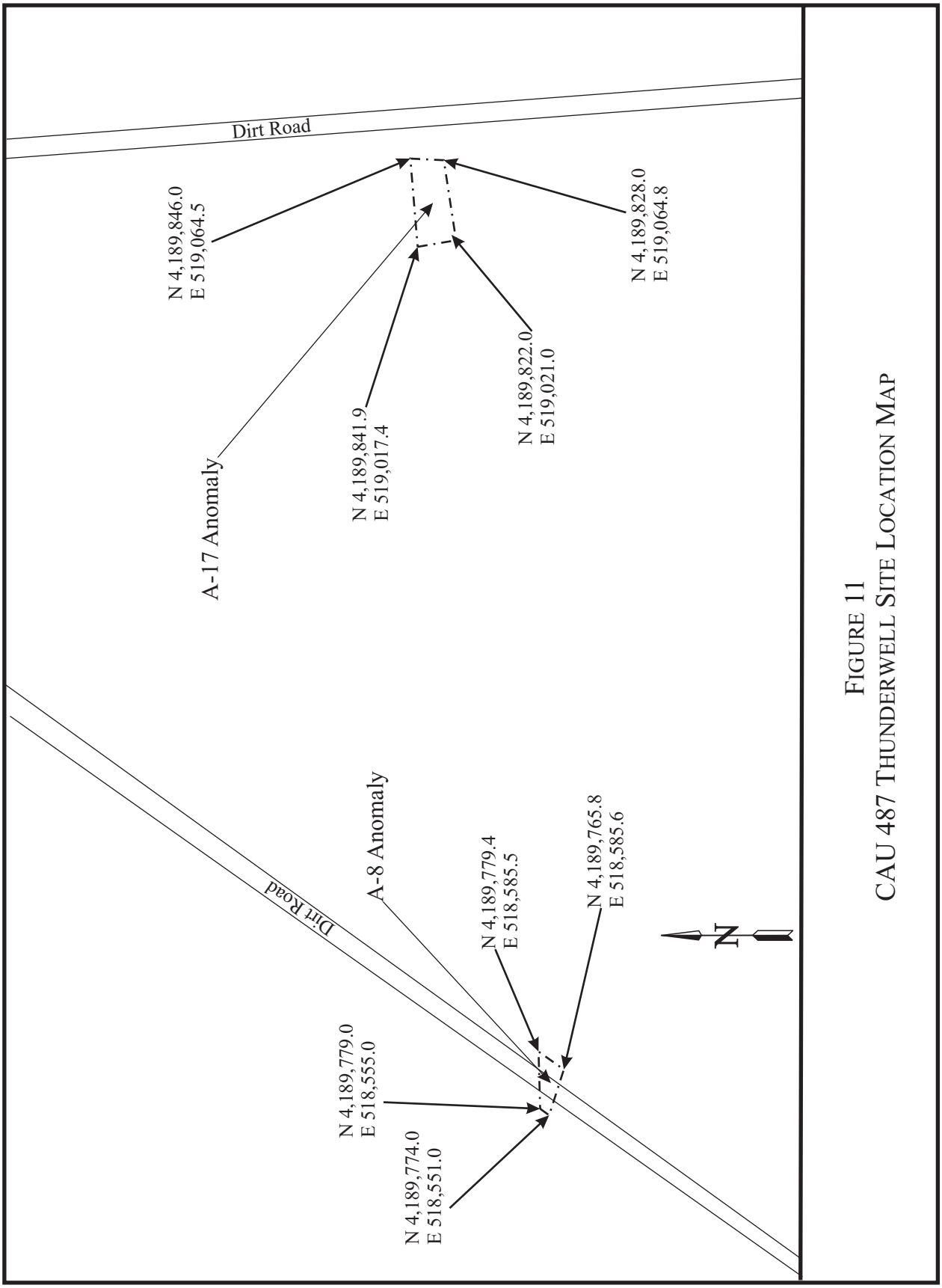

FIGURE 11
CAU 487 THUNDERWELL SITE LOCATION MAP

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ATTACHMENT B.
POST-CLOSURE INSPECTION PLANS

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CORRECTIVE ACTION UNIT (CAU) 404: ROLLER COASTER LAGOONS AND TRENCH POST-CLOSURE INSPECTION PLAN

The following text appeared in the published and approved CAU 404 CR, Closure Report for Corrective Action Unit 404: Roller Coaster Sewage Lagoons and North Disposal Trench, Tonopah Test Range, Nevada, Revision 0, September 1998, DOE/NV-11718-187 UC-702. Las Vegas, Nevada

Post-Closure monitoring of the covers is intended to determine:

- If maintenance repairs to the perimeter fence are required.
- If remedial action is necessary to establish a vegetative cover.
- If maintenance and repairs to the engineered cover is required.
- When a cessation to post-closure monitoring can be proposed.

POST-CLOSURE MONITORING

The monitoring will consist of biannual (twice per year) visual inspections of:

- The cover for condition (subsidence, significant erosion, unauthorized excavation, etc.) and plant development.
- The fence and signs to determine if repairs are required.

Additional, nonscheduled inspections may be required after severe weather events such as heavy rainfall, flash flooding, and high winds. Any identified maintenance and repair requirements will be remediated within 90 days of discovery and documented in writing at the time of repair. Additional revegetation work would be conducted during the next revegetation window (October to February).

Intrusion into or sampling of the impacted materials in the East or West Sewage Lagoon is not proposed during the post-closure monitoring period.

Monitoring of the vegetative cover will be conducted during the first, third, and fifth year after revegetation. Monitoring during the first year will determine if germination of seeded plant species has occurred. By the third year, plant establishment will be evaluated. By the fifth year, the objective of determining if burrowing animals have moved onto the site and to what depth they might be expected to penetrate the cover. The erosion condition of the soil will be evaluated using a qualitative erosion condition classification developed by the Bureau of Land Management. Information gathered will be compared to natural conditions and will be used in assessing whether or not remedial action is necessary so that a viable vegetative cover is established.

ANNUAL REPORTING

An annual report will be prepared that will provide the observations and describe modifications and/or repairs made to the cover and cover area. The annual report will be prepared following

the second inspection of each year that post-closure monitoring is conducted. The annual reports will include the following information:

- Discussion of observations
- Inspection checklist and maintenance record
- Conclusions and recommendations

A copy of each annual report will be submitted to the NDEP.

DURATION

The biannual inspections will be performed for five years after the planting of the vegetative covers, and will be documented on inspection forms.

Completion of post-closure monitoring of CAU 404 may be proposed after two consecutive years of visual inspections have not indicated the need to revegetate or provide maintenance to the vegetative covers. Completion of post-closure monitoring may be proposed within five years after the original revegetation of the site and include the removal of the fence since the plants will have attained a maturity to not be significantly affected by the grazing of wild horses.

CAU 407: ROLLER COASTER RADSAFE POST-CLOSURE INSPECTION PLAN

The following text appeared in the published and approved CAU 407 CR, Closure Report for Corrective Action Unit 407: Roller Coaster RADSAFE Area, Tonopah Test Range, Nevada, Revision 1, December 2001, DOE/NV--694-REV-1. Las Vegas, Nevada

INSPECTIONS

Inspections consist of visually inspecting the cover for signs of erosion, animal burrows, cracks, water ponding, vegetation, and inspecting the fencing and postings. Inspections will be performed twice during the first six months after construction of the cover has been completed. After completion of the quarterly inspections, the cover systems will be inspected and monitored semiannually (twice per year) for the next two years. The frequency after the second year will be determined by NDEP, based on the results of the previous inspections. Any identified maintenance and repair requirements will be remedied within 90 working days of discovery and documented in writing at the time of repair.

Results of all inspections in a given year will be addressed in a single annual report. The annual report will include the following information:

- Discussion of observations.
- Inspection checklist and maintenance record.
- Conclusions and recommendations.

A copy of each annual report will be submitted to the NDEP. A copy of the inspection checklist is provided in Attachment B.

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CAU 423: AREA 3 BUILDING 0360 UNDERGROUND DISCHARGE POINT POST-CLOSURE INSPECTION PLAN

The following text appeared in the approved and published Record of Technical Change Number CR-1 to the CAU 423 CR, Closure Report for Corrective Action Unit 423: Area 3 Building 03-60 Underground Discharge Point, Tonopah Test Range, Nevada, Revision 0, July 1999, DOE/NV/11718--319. Las Vegas, Nevada

Post-closure monitoring at CAU 423 will consist of biannual inspections (twice per year) to verify that the warning sign and concrete marker are in good condition and that the Use Restriction has been maintained. Any identified maintenance or repair requirements will be remedied within 90 working days of discovery and documented in writing at the time of repair. Results of all inspections in a given year will be addressed in a single annual report. The annual report will include the following information:

- Discussion of observations
- Inspection checklist and maintenance record
- Conclusions and recommendations

A copy of each annual report will be submitted to the NDEP.

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CAU 424: AREA 3 LANDFILL COMPLEXES POST-CLOSURE INSPECTION PLAN

The following text appeared in the published and approved CAU 424 CR, Closure Report for Corrective Action Unit 424: Area 3 Landfill Complexes, Tonopah Test Range, Nevada, Revision 0, July 1999, DOE/NV/11718--283. Las Vegas, Nevada

Post-closure inspection of the Area 3 Landfill sites is intended to determine:

- If maintenance repairs to the landfill soil covers are needed.
- If maintenance and repairs to the landfill markers and warning signs are needed.
- If modifications to the Use Restriction administrative controls are needed.
- If termination of post-closure inspection can be proposed in the future.

POST-CLOSURE INSPECTION

The inspection will consist of biannual (twice per year) visual inspections of:

- The soil cover for indications of subsidence, erosion, unauthorized use, etc.
- The landfill markers and warning signs, to verify they are in-place, intact, and readable.
- The inspections will be documented on a checklist and with photography, if needed.

If damage to the soil covers, landfill markers, or warning signs is noted, then maintenance will be performed and may include placement and compaction of additional backfill, and repair or replacement of markers and signs. Additional nonscheduled inspections may be required after severe weather events such as heavy rainfall, flash flooding, and high winds. Any identified maintenance and repair requirements will be remedied within 90 days of discovery and documented in writing at the time of repair.

ANNUAL REPORTING

An annual report will be prepared that will provide the observations and describe modifications and/or repairs made to the cover and cover area. The annual post-closure inspection report will be prepared and submitted to NDEP following the second inspection of each year that post-closure inspection is conducted. The annual reports will include the following information:

- Discussion of observations.
- Inspection checklist and maintenance record.
- Conclusions and recommendations.

DURATION

The biannual inspections will be performed for five years after the completion of closure activities, and will be documented on inspection forms.

Completion of post-closure inspection of CAU 424 may be proposed by DOE/NV to the NDEP after two consecutive years of visual inspections have not indicated recurrence of subsidence. Completion of post-closure monitoring may be proposed by DOE/NV to the NDEP within five years after the completion of closure activities.

CAU 426: CACTUS SPRING WASTE TRENCHES POST-CLOSURE INSPECTION PLAN

The following text appeared in the published and approved CAU 426 CR, Closure Report for Corrective Action Unit 426: Cactus Spring Waste Trenches, Tonopah Test Range, Nevada, Revision 0, August 1998, DOE/NV/11718-226 UC-702. Las Vegas, Nevada

Post-Closure of the covers is intended to determine:

- If maintenance repairs to the perimeter fence are required.
- If remedial action is necessary to establish a vegetative cover.
- If maintenance and repairs to the engineered cover is required.
- When a cessation to post-closure monitoring can be proposed.

POST-CLOSURE MONITORING

The monitoring will consist of biannual (twice per year) visual inspections of:

- The cover for condition (subsidence, significant erosion, unauthorized excavation, etc.) and plant development.
- The fence and signs to determine if repairs are required.

Additional, nonscheduled inspections may be required after severe weather events such as heavy rainfall, flash flooding, and high winds. Any identified maintenance and repair requirements will be remediated within 90 days of discovery and documented in writing at the time of repair. Additional revegetation work would be conducted during the next revegetation window (October to February).

Intrusion into or sampling of the trench contents is not proposed during the post-closure monitoring period.

Monitoring of the vegetative cover will be conducted during the first, third, and fifth year after revegetation. Monitoring during the first year will determine if germination of seeded plant species has occurred. By the third year, plant establishment will be evaluated. By the fifth year, the objective of determining if burrowing animals have moved onto the site and to what depth they might be expected to penetrate the cover. The erosion condition of the soil will be evaluated using a qualitative erosion condition classification developed by the Bureau of Land Management. Information gathered will be compared to natural conditions and will be used in assessing whether or not remedial action is necessary so that a viable vegetative cover is established.

ANNUAL REPORTING

An annual report will be prepared that will provide the observations and describe modifications and/or repairs made to the cover and cover area. The annual report will be prepared following

the second inspection of each year that post-closure monitoring is conducted. The annual reports will include the following information:

- Discussion of observations.
- Inspection checklist and maintenance record.
- Conclusions and recommendations.

A copy of each annual report will be submitted to the NDEP.

DURATION

The biannual inspections will be performed for five years after the planting of the vegetative covers, and will be documented on inspection forms.

Completion of post-closure monitoring of CAU 426 may be proposed after two consecutive years of visual inspections have not indicated the need to revegetate or provide maintenance to the vegetative covers. Completion of post-closure monitoring may be proposed within five years after the original revegetation of the site and include the removal of the fence since the plants will have attained a maturity to not be significantly affected by the grazing of wild horses.

CAU 427: AREA 3 SEPTIC WASTE SYSTEMS 2, 6 POST-CLOSURE INSPECTION PLAN

The following text appeared in the published and approved CAU 427 CR, Closure Report for Corrective Action Unit 427 Area 3 Septic Waste Systems 2 and 6, Tonopah Test Range, Nevada, Revision 0, August 1999, DOE/NV--561. Las Vegas, Nevada

Post-Closure inspection of CAU 427 use restricted land is intended to determine:

- If maintenance and repairs to the closed leachfield or septic tank soil and asphalt covers are needed.
- If maintenance and repairs to the closed leachfield and septic tank markers and warning signs are needed.
- If modifications to the Use Restriction administrative controls are needed.
- If termination of post-closure inspection can be proposed in the future.

POST-CLOSURE INSPECTION

The inspection will consist of annual (once per year) visual inspections of:

- The soil and asphalt cover for indications of subsidence, erosion, unauthorized use, etc.
- The leachfield and septic tank markers and warning signs to verify they are in-place, intact, and readable
- The inspections will be documented on a checklist (Attachment C) and, if needed, with photography

Repairs to the soil covers (placement and compaction of additional backfill), landfill markers, and warning signs (repair, reposition, and/or replacement) may be required.

Inspections are not required after severe weather events such as heavy rainfall, flash floods, and high winds, because the leachfield waste is buried in the subsurface. However, any identified maintenance and repair requirements noted before or after a inspection will be remedied within 90 days of discovery and documented in writing at the time of repair.

ANNUAL REPORTING

An annual report will provide the inspector's observations of CAU 427s land-use-restricted areas and describe modifications and/or repairs made to Leachfield A, Leachfield B, Pre-1965 Leachfield, 1965-1975 Leachfield, and/or Septic Tank 33-5. The annual post-closure inspection report will be prepared and submitted to NDEP before the completion of the fiscal year in which the inspection was conducted. The annual reports will include the following information:

- Discussion of observations.
- Inspection checklist and maintenance record.
- Conclusions and recommendations.

DURATION

The biannual inspections will be performed for five years after the completion of closure activities, and will be documented on inspection forms.

Completion of post-closure monitoring of CAU 427 may be proposed by the DOE/NV to the NDEP if after two consecutive years of visual inspections, indications of subsidence depression recurrences have not been detected. Completion of post-closure inspection may be proposed by DOE/NV to the NDEP within five years after the completion of closure activities.

CAU 453: AREA 9 UXO LANDFILL INSPECTION PLAN

The following text appeared in the published and approved CAU 453 CR, Closure Report for Corrective Action Unit 453: Area 9 UXO-Landfill, Tonopah Test Range, Nevada, Revision 0, July 1999, DOE/NV/11718--284. Las Vegas, Nevada

Post-Closure of the covers is intended to determine:

- If maintenance and repairs to the cell soil covers are needed.
- If maintenance and repairs to the perimeter fence, warning signs, and monuments are needed.
- If modifications to the administrative Use Restrictions are needed.
- If termination of post-closure inspection can be proposed in the future.

POST-CLOSURE INSPECTION

The inspection will consist of biannual (once per year) visual inspections of:

- The cell soil cover, for indications of subsidence, erosion, unauthorized use, etc.
- The perimeter fence, warning signs, and monuments, for signs of wear disturbance, etc.

The inspections will be documented on a checklist and with photography, if needed. Repairs to the cell soil covers (placement and compaction of additional fill), perimeter fence, warning signs, and monuments (repair, reposition, and/or replacement) may be required. Additional, nonscheduled inspections may be required after severe weather events such as heavy rainfall, flash flooding, and high winds. Any identified maintenance and repair requirements will be remediated within 90 days of discovery and documented in writing at the time of repair.

ANNUAL REPORTING

An annual post-closure inspection report will be prepared that will provide the observations and describe modifications and/or repairs made to the cover and cover area. The annual report will be prepared and submitted to NDEP following the second inspection of each year that post-closure inspection is conducted. The annual reports will include the following information:

- Discussion of observations.
- Inspection checklist and maintenance record.
- Conclusions and recommendations.

DURATION

The biannual inspections will be performed for five years after the completion of closure activities, and will be documented on inspection forms.
Completion of post-closure inspection of CAU 453 may be proposed by DOE/NV to NDEP within five years after the completion of closure activities. Completion of post-closure

inspection may also be proposed by DOE/NV to NDEP if two consecutive years of visual inspections do not indicate the recurrence of subsidence depressions.

CAU 487: THUNDERWELL SITE, POST-CLOSURE INSPECTION PLAN

The following text appeared in the published and approved Record of Technical Change Number 2 for the final Corrective Action Decision Document/Closure Report for Corrective Action Unit 487: Thunderwell Site, Tonopah Test Range, Nevada, Revision 0, November 2001, DOE/NV--761. Las Vegas, Nevada

The post-closure inspection of CAS RG-26-001-RGRV will consist of semi-annual (twice per year) visual inspections of the monument markers and postings to verify that they are in-place, intact, and readable. Visual inspections of the monuments and signage, and indications of ground disturbance within the Use Restriction area will be conducted. Observations and any modifications and/or repairs to the monuments or postings will be included in the annual Post-Closure Inspection Report for the Tonopah Test Range, Nevada.

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ndep
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations

STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Kenny C. Guinn, Governor
Allen Biaggi, Director
Leo M. Drozdoff, P.E., Administrator

ERD.061208.0001

December 5, 2006

John B. Jones, Acting Federal Project Director
Environmental Restoration Project
National Nuclear Security Administration
Nevada Site Office (NNSA/NSO)
P.O. Box 98518
Las Vegas, NV 89193-8518

Subject: NNSA/NSO Request to Reduce the Frequency of Post-Closure Monitoring of Corrective Action Units (CAU) 400, 404, 407, 423, 424, 426, 427, 453, and 487 at Tonopah Test Range (TTR), Nevada

Dear Mr. Jones:

The Nevada Division of Environmental Protection, Bureau of Federal Facilities staff (NDEP) has received and reviewed the referenced request, dated November 28, 2006. The sites have been monitored for various lengths of time beginning in 1997 for CAU 400, 1998 for CAUs 404 and 426, 1999 for CAUs 423, 424, 427, and 453, 2001 for CAU 487, and 2002 for CAU 407. Some of the sites have not been required to conduct post-closure monitoring or have only been required to conduct inspections for a short period of time but all sites have continued to be monitored as a best management practice. Past monitoring has demonstrated that a once per year inspection would be sufficient for soil cover, fencing, monuments and signs at these sites.

NDEP concurs with the NNSA/NSO request to reduce the frequency of the post-closure monitoring inspections of the subject CAUs to an annual frequency. Maintenance and repair requirements must continue to be made within ninety (90) days of discovery and documented in writing at the time of repair. Annual reports to NDEP must also continue.

Address any questions regarding this matter to either Ted Zaferatos at (702) 486-2850, ext. 234, Don Elle at (702) 486-2850, ext. 229, or me at (702) 486-2850, ext. 231.

Sincerely,

/s/ T Murphy

T.H. Murphy
Chief
Bureau of Federal Facilities

ACTION	ERP
INFO	WMP AMSP
NSO/MGR	L
AMEM	L
AMNS	
AMSO	
AMSP	L
AMSS	

1771 E. Flamingo Road, Suite 121-A • Las Vegas, Nevada 89119

DRE/TZ

cc: K.J. Cabble, ERP, NNSA/NSO
E.F. Di Sanza, WMP, NNSA/NSO
K.A. Hoar, Director, AD/AMSP, NNSA/NSO
D.C. Loewer, DTRA/CXT1, M/S 645, Mercury, NV
T.A. Lantow, DTRA/CXT1, M/S 645, Mercury, NV
W.R. Griffin, SNJV/DTRA, M/S 645, Mercury, NV
Glenn Richardson, NSTec, NTS 306, Mercury, NV
J.L. Smith, NSTec, Las Vegas, NV
R.F. Boehlecke, SNJV, Las Vegas, NV
Pete Sanders, ERP, NNSA/NSO
Sabine Curtis, ERP, NNSA/NSO
FFACO Group, PSG, NNSA/NSO, Las Vegas, NV
Eloise Hopper, Nellis AFB
Vern Gabbard, SNL/TTR
98 RANW/CC, 3770 Duffer Drive, Las Vegas, NV 89191
98 RANW/XPL, 3770 Duffer Drive, Las Vegas, NV 89191

ATTACHMENT C.
POST-CLOSURE INSPECTION CHECKLISTS

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CAU 400: BOMBLET PIT, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/2007	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson Task Manager NSTec	
Assistant Inspector (name, title, organization): M. L. Tilford ETL NSTec	

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	✓		
2. Previous inspection reports reviewed.	✓		
a. Were anomalies or trends detected on previous inspections?		✓	
b. Was maintenance performed?		✓	
3. Site maintenance and repair records reviewed.	✓		
a. Has site repair resulted in a change from as-built conditions?		✓	
b. Are revised as-builts available that reflect repair changes?			

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		✓	
b. Are there any new roads or trails?		✓	
c. Has there been a change in the position of nearby washes?		✓	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		✓	
e. Are there new drainage channels?		✓	
f. Change in surrounding vegetation?		✓	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		✓	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		✓	
c. Were gates locked?	✓		

CAU 400: BOMBLET PIT, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Do natural processes threaten to integrity of any cover or site marker?		X	
g. Other?		N/A	
4. Vegetative cover.			
a. Is perimeter fence or mesh fencing damaged?		X	
b. Is there evidence of horses or rabbits on site?		X	
c. Is organic mulch and/or plants adequate to prevent erosion?		X	
d. Are weedy annual plants present? If yes, are they a problem?		X	
e. Are seeded plant species found on site?		X	
f. Is there evidence of plant mortality?		X	
5. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (2)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	

6. Rationale for field conclusions: Site was found to be in good condition.

E. CERTIFICATION

I have conducted an inspection of the Bomblet Pit, CAU 400, at the TTR in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: TASK MANAGER	Date: 5/15/2007

CAU 400: 5 POINTS LANDFILL, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/07	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/16/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson Task Manager NSTec	
Assistant Inspector (name, title, organization): Mike Lloyd ETL NSTec	

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	X		

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		X	
c. Were gates locked?	X		

CAU 400: 5 POINTS LANDFILL, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Do natural processes threaten to integrity of any cover or site marker?		X	
g. Other?		N/A	
4. Vegetative cover.			
a. Is perimeter fence or mesh fencing damaged?		X	
b. Is there evidence of horses or rabbits on site?		X	
c. Is organic mulch and/or plants adequate to prevent erosion?		X	
d. Are weedy annual plants present? If yes, are they a problem?		X	
e. Are seeded plant species found on site?		X	
f. Is there evidence of plant mortality?		X	
5. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (2)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	

6. Rationale for field conclusions: Flood Impacted area vegetation is showing signs of Regrowth within the area.

E. CERTIFICATION

I have conducted an inspection of the 5 Points Landfill, CAU 400, at the TTR in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/15/07

/s/ G Richardson

CAU 404: ROLLER COASTER LAGOONS & N. DISPOSAL TRENCH, POST-CLOSURE MONITORING CHECKLIST

Inspection Date: 5/15/2007	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson Task Manager N-I STec	
Assistant Inspector (name, title, organization): Mike Fiske FTL N-I STec	

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	X		

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		X	
c. Were gates locked?	X		

CAU 404: ROLLER COASTER LAGOONS & N. DISPOSAL TRENCH, POST-CLOSURE MONITORING CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Do natural processes threaten to integrity of any cover or site marker?		X	
g. Other?		N/A	
4. Vegetative cover.			
a. Is perimeter fence or mesh fencing damaged?		X	
b. Is there evidence of horses or rabbits on site?		X	
c. Is organic mulch adequate to prevent erosion?	X		
d. Are weedy annual plants present? If yes, are they a problem?		X	
e. Are seeded plant species found on site?		X	
f. Is there evidence of plant mortality?		X	
5. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (1)			

D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	

6. Rationale for field conclusions: Site was found to be in good condition

E. CERTIFICATION

I have conducted an inspection of the Roller Coaster Sewage Lagoons & North Disposal Trench, CAU 404, at the TTR in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/15/2007

CAU 407: ROLLER COASTER RADSAFE AREA, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/2007	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Rena Richardson	Task Manager NSTec
Assistant Inspector (name, title, organization): Mike Floyd	FTC NSTec

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	✓		
2. Previous inspection reports reviewed.	✓		
a. Were anomalies or trends detected on previous inspections?		✓	
b. Was maintenance performed?		✓	
3. Site maintenance and repair records reviewed.	✓		
a. Has site repair resulted in a change from as-built conditions?		✓	
b. Are revised as-builts available that reflect repair changes?	✓		
C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		✓	
b. Are there any new roads or trails?		✓	
c. Has there been a change in the position of nearby washes?		✓	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		✓	
e. Are there new drainage channels?		✓	
f. Change in surrounding vegetation?		✓	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		✓	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		✓	
c. Were gates locked?	✓		

CAU 407: ROLLER COASTER RADSAFE AREA, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Do natural processes threaten to integrity of any cover or site marker?		X	
f. Other?		N/A	
4. Vegetative cover.			
a. Is perimeter fence or mesh fencing damaged?		X	
b. Is there evidence of horses or rabbits on site?		X	
c. Is organic mulch adequate to prevent erosion?	X	X Mulch	
d. Are weedy annual plants present? If yes, are they a problem?		X	
e. Are seeded plant species found on site?		X	
f. Is there evidence of plant mortality?		X	
5. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (2)			

D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	

6. Rationale for field conclusions: Site was found to be in good condition

E. CERTIFICATION

I have conducted an inspection of the Roller Coaster RadSafe Area, CAU 407, at the TTR in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/15/2007

CAU 423: AREA 3 UNDERGROUND DISCHARGE POINT, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/18/2007	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson	Task Manager NSTec
Assistant Inspector (name, title, organization): Mike Floyd	FTL NSTec

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	N/A		
C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: __________)		X	

CAU 423: AREA 3 UNDERGROUND DISCHARGE POINT, POST-CLOSURE INSPECTION CHECKLIST

3. Use Restricted Area:	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Is there vegetation in the area?		X	
g. Do natural processes threaten to integrity of any cover or site marker?		X	
h. Other?		N/A	
4. Photo Documentation			
a. Has a photo log been prepared?	X		
b. Number of photos exposed (1)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of the site satisfactory?		X	
6. Rationale for field conclusions: Site was found to be in Good Condition.			

E. CERTIFICATION

I have conducted an inspection of the Area 3 Underground Discharge Point, CAU 423, at the TTR in accordance with the Post-Closure Inspection Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager.	Date: 5/15/2007

CAU 424: AREA 3 LANDFILL COMPLEX, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15 and 5/16/2007

Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson	Task Manager NSTec
Assistant Inspector (name, title, organization): Mike Floyd	FTL NSTec

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	N/A		
C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		X	
c. Were gates locked?	N/A		

CAU 424: AREA 3 LANDFILL COMPLEX, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Is the vegetation on the cover?		X	
g. Do natural processes threaten to integrity of any cover or site marker?		X	
h. Other?		N/A	
4. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (1) Per CAS			

D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		No	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	

6. Rationale for field conclusions: All Sites Found to Be in Good Condition A-3-3 2 Separate Photos Collected, 1 of Surface Monuments and 1 of Above Ground Monuments

E. CERTIFICATION

I have conducted an inspection of the Area 3 Landfill Complex, CAU 424, at the TTR in accordance with the Post-Closure Inspection Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/18/2007

CAU 426: CACTUS SPRING WASTE TRENCHES, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/2007	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson Task Manager MSTec	
Assistant Inspector (name, title, organization): M.L. Lloyd ESL NSTec	

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	X		

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		X	
c. Were gates locked?	X		

CAU 426: CACTUS SPRING WASTE TRENCHES, POST-CLOSURE INSPECTION CHECKLIST

	YES	NO	EXPLANATION
3. Waste Unit cover.			
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Do natural processes threaten to integrity of any cover or site marker?		X	
g. Other?		N/A	
4. Vegetative cover.			
a. Is perimeter fence or mesh fencing damaged?		X	
b. Is there evidence of horses or rabbits on site?		X	
c. Is organic mulch and/or plants adequate to prevent erosion?	X		
d. Are weedy annual plants present? If yes, are they a problem?		X	
e. Are seeded plant species found on site?		X	
f. Is there evidence of plant mortality?		X	
5. Photo Documentation			
a. Has a photo log been prepared?	No		
c. Number of photos exposed (1)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		No	
5. Is current status/condition of vegetative cover satisfactory?		Yes	
6. Rationale for field conclusions: Site was found to be in good condition			

E. CERTIFICATION

I have conducted an inspection of the Cactus Spring Waste Trenches, CAU 426, at the TTR in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/16/2007

CAU 427: AREA 3 SEPTIC WASTE SYSTEMS 2 & 6, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/2007

Responsible Agency: NNSA/NSO ER | NNSA Project Manager: Kevin Cabble

Date of Last Inspection: ~~5/1/2006~~ 11/15/2006 | Reason for Last Inspection: ANNUAL

Inspector (name, title, organization): Glenn Richardson T&E manager NSTec

Assistant Inspector (name, title, organization): Mike Flynn FTL NSTec

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	X		

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.		X	
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
2. Security signs.			
a. Displacement of site markers, boundary markers, or monuments? (disturbed by man or natural processes?)		X	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		X	
c. Were all subsurface markers detected? (i.e., using a magnatometer or equivalent)	X		

CAU 427: AREA 3 SEPTIC WASTE SYSTEMS 2 & 6, POST-CLOSURE INSPECTION CHECKLIST

3. Soil/aspharlt cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion near use restriction boundaries?		X	
d. Is there evidence of animal burrowing?		X	
e. Is there vegetation?		X	
f. Do natural processes threaten to integrity of any cover or site marker?		X	
g. Is there evidence suggesting unauthorized excavations have taken place?		X	
e. Other?		N/A	
4. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (2)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Rationale for field conclusions: Site was found to be in good condition			

E. CERTIFICATION

I have conducted an inspection of the Area 3 Septic Waste Systems 2 & 6, CAU 427, at the TTR in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: TASK Manager NSTec	Date: 5/15/2007

CAU 453: AREA 9 UXO LANDFILL, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/2007	
Responsible Agency: NNSA/NSO ER	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: ~~5/11/2006~~ 11/15/2006	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn R. Chandler	Task Manager NSTec
Assistant Inspector (name, title, organization): M. Le Cloud	F-TL NSTec

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	X		

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: _____)		X	
c. Were gates locked?	X		

CAU 453: AREA 9 UXO LANDFILL, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Is vegetation present?			
g. Do natural processes threaten to integrity of any cover or site marker?		X	
h. Other?		N/A	
4. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (6)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	

6. Rationale for field conclusions: Site found to Be in good Condition, ~~NOT~~ There was evidence of animal Borrowing within the Site, Photo Documentation of Borrows were collected.

E. CERTIFICATION

I have conducted an inspection of the Area 9 UXO Landfill, CAU 453, at the TTR in accordance with the Post-Closure Inspection Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/15/2007

CAU 487: THUNDERWELL SITE, POST-CLOSURE INSPECTION CHECKLIST

Inspection Date: 5/15/2007	
Responsible Agency: NNSA/NSO ER NSF	NNSA Project Manager: Kevin Cabble
Date of Last Inspection: 5/9/2006 10/18/07	Reason for Last Inspection: Annual
Inspector (name, title, organization): Glenn Richardson Task Manager NSTec	
Assistant Inspector (name, title, organization): Mike Flora Field Tech Lead NSTec	

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is provided. Attach the additional pages and number all pages upon completion of the inspection.
2. Any checklist line item marked by an inspector in a SHADED BOX, must be fully explained or an appropriate reference to previous reports provided. The purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, and annotated site maps.
3. The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to examine the entire surface and all features specifically described in the checklist.
4. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
5. This unit will be inspected biannually with formal reporting to the Nevada Division of Environmental Protection to be done annually. The annual report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?	X		

C. SITE INSPECTION (To be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced:_____)		X	

CAU 487: THUNDERWELL SITE, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there evidence of animal burrowing?		X	
c. Have the site markers been disturbed by man or natural processes?		X	
d. Other?		N/A	
4. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (2)			
D. FIELD CONCLUSIONS			
1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of vegetative cover satisfactory?		X	
6. Rationale for field conclusions: Site was found to be in good condition			

E. CERTIFICATION

I have conducted an inspection of the Area 9 UXO Landfill, CAU 453, at the TTR in accordance with the Post-Closure Inspection Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: /s/ G Richardson	Printed Name: Glenn Richardson
Title: Task Manager	Date: 5/15/2007

ATTACHMENT D.
FIELD NOTES

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ANNUAL - TTR Post Closure Inspections - May 15, 2007
(As of FY07)

Personnel: Glenn Richardson, Task Manager
Mike Floyd, Field Support Tech Lead

Weather: Clear Skies
57°

Scope: Perform Post Closure inspections for the following:
400, 404, 407, 423, 424, 426, 427, 453, & 487.

Equipment: Digital Camera (Temporary Permit Provided for Use)

Tailgate Briefing: 8:00AM
We discussed slips/trips/falls. Buddy system.
Driving safety on roads and pathways. Use a spotter whenever backing up is necessary.
Heat Stress. Always try to stay hydrated with water
Be conscious of animals on roadways.
Contact ASI Security for access control in areas with gates and barricades.

TTR Photo Log

CAU	CAS	Photos	CAU	CAS	Photos
427	03-05-02 SW-02	Looking north BR 2	407	TA-23-001-TARC	Looking east Looking ~~southwest~~ BR 2
"	03-05-02 SW-06	Looking South			
487	A-8 anomaly	Looking ~~north west~~ BR 2	404	TA-03-001-TARC → ∅ TA-21-001-TARC →	Looking east 1 required
"	A-17 "	Looking ~~South West~~ BR	423	03-02-002-0308	Looking East 1
453	09-55-001-0952	Looking west 6 includes animal burrows discovered onsite.	424	03-08-001-A301	Looking Southeast 1
			"	03-08-002-A302	Looking North 1
			"	03-08-002-A303	Looking West - (Surface Monuments) Looking Northwest - (Aboveground Monument) 2
400	(E. Pits. Landfill) TA-19-001-05PT	Looking east Looking west 2	"	03-08-002-A304	Looking north 1
"	(Bomblet Pit) TA-55-001-TAB2	Looking South " North 2	"	03-08-002-A305	Looking Southeast 1
426	RG-08-001-RGCS	Looking ~~West~~ North BR 1	"	03-08-002-A306	Looking northwest 1
			"	03-08-002-A308	Looking West 1

SIGNATURE	/s/ G Richardson		DATE 5/15/07
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

Work continued from Page ~~160~~ KR 158

8:10AM - Checked in with (John) Washington Group P.O.C to notify him of our planned inspections, pick-up a TTR radio, and confirm areas for inspections are accessible.

8:15AM - Performed inspection at CAU 427. Surface grade monuments are visible with red rock. Monuments appear to be in good condition at the leachfields and septic tank area. No issues at this site. Required photos were taken looking north and south.
Left site at 8:30AM. Heading to CAU 487.

8:43AM - Arrived at CAU 487 (Thunderwell site) to perform inspection. Aboveground monuments at A-8 and A-17 anomaly sites are in good condition. Signage remains legible and visible. Overall conditions at these two sites is excellent.
Leaving site at 9:04AM. Heading to Area 9 UXO Landfill (CAU 453)

9:25AM - Arrived at CAU 453 (Area 9 - UXO Landfill) to perform inspection. Signage and Chain-link fencing were in good condition. Aboveground monuments remain stable and in good condition. Noticed large size animal burrows on the northeast end of Trench A-9-1 and A9-2. Washington Group P.O.C. will be notified about animal burrows. Leaving site at 10:09AM. Heading to CAU 400 - 5 Pts. Landfill.

10:25AM - Arrived at CAU 400 (5 Points Landfill) to perform inspection. Barb-wire Fencing is in good condition. Chicken-wire fencing is not damaged and is also in good condition. The vegetation, originally impacted by flooding last year, appears to be growing back. Two photos were taken of the site area.
Leaving site at 10:52AM. Heading to CAU 400 - Bomblet Pit.

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SIGNATURE /s/ G Richardson			DATE 5/15/07
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

 TITLE

PROJECT NO.

BOOK NO.

Work continued from Page ~~161~~ 159

11:18AM - Arrived at CAU 400 (Bomblet Pit) site to perform inspection. Overall site conditions were great. The barb.wire and chicken wire (mesh) fencing were not damaged and in good condition. There were no signs of animal intrusion. Required photo documentation was taken.

Leaving site at 11:29AM. Headed to Lunch at TTR Cafeteria.

12:37 PM - Met Brian Konrad to retrieve keys for office trailer to pick-up fuel key. Plan to refuel vehicle and resume post closure inspections.

1:20 PM - Refueled vehicle and headed back to office trailer. Placed fuel keys back in designated location and heading back to return office keys to B. Konrad. In route back to return office keys we stopped by CAU 426 - Cactus Springs.

1:37 PM - Arrived at CAU 426 (Cactus Springs) to perform inspection. Signage and fencing were in good condition. There were no signs of animal burrowing inside fenced area. No issues at this site. One photo was taken looking north.

Leaving site at 1:49 PM. Heading to CAU 407 after providing office keys to B. Konrad.

2:13 PM - Arrived at CAU 407 (Rollercoaster RadSafe Area) to perform inspection. URMA signage was visible and the barb-wire fencing were in good condition. Vegetation growth is occurring on the cover. There are no issues at this site. Two photos were taken looking southwest and east direction.

Leaving site at 2:50 PM. Heading to CAU 404.

2:54 PM - Arrived at CAU 404 (Rollercoaster Lagoons and N. Disposal Trench) to perform inspection. Drove around the site boundary and identified no issues. Fencing and signage look great. One photo

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SIGNATURE /s/ G Richardson

DATE 5/15/07

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was taken at this site. There was no evidence of animal burrowing. Vegetation was very mature and in good condition. Leaving site at ~~3:03~~ 3:07 PM. Heading to CAU 423 (UDP).

3:21 PM - Arrived at CAU 423 (Underground Discharge Point) Signage is legible and in good condition. One photo was taken. There are no issues at this site location. Removal of underground discharge piping is planned as a best management practice in the near future.

Leaving site at 3:28 PM. Heading to CAU 424 sites.

3:39 PM - Arrived at CAU 424 (A3-5 Landfill Cell). Aboveground monuments are stable and in good condition. One photo was taken.

3:53 PM Arrived at A3-1 Landfill Cell. Aboveground monuments are stable and in good condition. One photo was taken.

4:13 PM Arrived at A3-2 Landfill Cell. Monuments are stationary and in good condition.

4:15 PM - Noticed the lense of our camera ~~did not~~ did not open fully. ~~At~~ this time, we verified that previous photos taken were visible and clear. Unfortunately, several photos need to be re-taken at the following CAUs: 400 (Bomblet Pit), 404, 407, 426, and 423. All other photos taken previously are clear and visible.

4:52 PM - Arrived at CAU 423 to retake photo. Heading back to CAU 424 sites.

4:58 PM - Arrived at A3-3 Landfill Cell. Surface monuments are visible and in good condition. One photo was taken looking west.

5:04 PM - Arrived at A3-3 Landfill Cell to take photos of aboveground monuments. Monuments are in good condition.

5:15 PM - Ended inspections. Will resume on Wed., 5/16/07.

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SIGNATURE /s/ G Richardson			DATE 5/15/07
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

Continuing TTR Post Closure Inspections - 5/16/07

7:26 AM - Left ER Office Trailer to resume post closure inspections.

7:44 AM - Arrived at Bemblet Pit site - CAU 400 to retake photos.

Reviewed Tailgate Safety Briefing

Reviewed Scope of Work and discussed Potential Hazards.

Weather: 60°
Clear Skies

Leaving CAU 400 at 7:54 AM. Heading to CAU 404 to retake photos.

8:08 AM - Arrived at CAU 404. One photo was retaken. Heading back to CAU 407 to retake photos.

8:15 AM - Arrived at CAU 407. Two photos were re-taken. Heading back to CAU 426 to re-take photos.

8:38 AM - Arrived at CAU 426. One photo was re-taken looking west. All photos that did not come out clearly on 5/15/07 have been retaken. Leaving CAU 426 site at 8:52. Heading back to CAU 424 sites to resume site inspections.

9:15 AM - Headed to the ER Office for a brief moment. Camera battery is very low and the replacement battery is the wrong type for use. Contacted Field Ops to see if another compatible battery is available. Another battery was not available. Fortunately B. Jackson had a camera for our brief use.

10:03 AM - Arrived at A3-8 Landfill Cell. Surface monuments are in good condition. One photo was taken looking west.

10:12 AM - Arrived at A3-4 Landfill Cell. Aboveground monuments are in good condition. One photo was taken looking north.

10:25 AM - Arrived at A3-6 Landfill Cell. Aboveground monuments are stable and in good condition. One photo was taken looking northwest.

10:30 AM - End of TTR Post Inspections - Refuel, return camera, head back to Mercury.

Work continued to Page _____

SIGNATURE /s/ G Richardson			DATE 5/16/07
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

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ATTACHMENT E
PHOTOGRAPHS

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PHOTOGRAPH LOG

PHOTOGRAPH	DATE	DESCRIPTION
1	05/16/2007*	CAU 400 Bomblet Pit, looking south
2	05/16/2007*	CAU 400 Bomblet Pit, looking north
3	05/15/2007	CAU 400 Five Points Landfill, looking east
4	05/15/2007	CAU 400 Five Points Landfill, looking west
5	05/16/2007*	CAU 404, looking east
6	05/16/2007*	CAU 407, looking east
7	05/16/2007*	CAU 407, looking southwest
8	05/15/2007	CAU 423, looking east
9	05/15/2007	CAU 424, Landfill Cell A3-1, looking southeast
10	05/15/2007	CAU 424, Landfill Cell A3-2, looking north
11	05/15/2007	CAU 424, Landfill Cell A3-3, looking west
12	05/15/2007	CAU 424, Landfill Cell A3-3, looking northwest
13	05/16/2007	CAU 424, Landfill Cell A3-4, looking north
14	05/16/2007*	CAU 424, Landfill Cell A3-5, looking southeast
15	05/16/2007	CAU 424, Landfill Cell A3-6, looking northwest
16	05/16/2007	CAU 424, Landfill Cell A3-8, looking west
17	05/16/2007*	CAU 426, looking west
18	05/15/2007	CAU 427, looking north
19	05/15/2007	CAU 427, looking south
20	05/15/2007	CAU 453, looking west
21	05/15/2007	CAU 487, A-8 anomaly, looking north
22	05/15/2007	CAU 487, A-17 anomaly, looking southwest

* Inspection was conducted on 05/15/2007. At the end of the day, the camera's lens cover was observed to not be fully opening. Several photographs needed to be retaken because they were not visible and clear. These photographs were retaken on 05/16/2007. CAU 424 Landfill Cell A3-5 (photograph 14) was retaken on 05/16/2007; however, this was not noted in the field notes.

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Photograph 1: CAU 400 Bomblet Pit, looking south, 05/16/2007

Photograph 2: CAU 400 Bomblet Pit, looking north, 05/16/2007

Photograph 3: CAU 400 Five Points Landfill, looking east, 05/15/2007

Photograph 4: CAU 400 Five Points Landfill, looking west, 05/15/2007

Photograph 5: CAU 404, looking east, 05/16/2007

Photograph 6: CAU 407, looking east, 05/16/2007

Photograph 7: CAU 407, looking southwest 05/16/2007

Photograph 8: CAU 423, looking east, 05/15/2007

Photograph 9: CAU 424, Landfill Cell A3-1, looking southeast 05/15/2007

Photograph 10: CAU 424, Landfill Cell A3-2, looking north, 05/15/2007

Photograph 11: CAU 424, Landfill Cell A3-3, looking west, 05/15/2007

Photograph 12: CAU 424, Landfill Cell A3-3, looking northwest, 05/15/2007

Photograph 13: CAU 424, Landfill Cell A3-4, looking north, 05/16/2007

Photograph 14: CAU 424, Landfill Cell A3-5, looking southeast, 05/16/2007

Photograph 15: CAU 424, Landfill Cell A3-6, looking northwest, 05/16/2007

Photograph 16: CAU 424, Landfill Cell A3-8, looking west, 05/16/2007

Photograph 17: CAU 426, looking west 05/16/2007

Photograph 18: CAU 427, looking north, 05/15/2007

Photograph 19: CAU 427, looking south, 05/15/2007

Photograph 20: CAU 453, looking west, 05/15/2007

Photograph 21: CAU 487, A-8 anomaly, looking north 05/15/2007

Photograph 22: CAU 487, A-17 anomaly, looking southwest, 05/15/2007

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ATTACHMENT F
POST-CLOSURE VEGETATION MONITORING REPORT

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POST-CLOSURE VEGETATION MONITORING REPORT FOR CORRECTIVE ACTION UNITS:

400, FIVE POINTS LANDFILL (TTR)

400, BOMBLET PIT (TTR)

404, ROLLER COASTER LAGOONS AND TRENCH (TTR)

407, ROLLER COASTER RADSAFE AREA (TTR)

426, CACTUS SPRING WASTE TRENCHES (TTR)

Field Work Completed
May 14–16, 2007

Report Prepared
by
Dave Anderson
Ecological Services

September 2007

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LIST OF TABLES

1.0 INTRODUCTION

In the fall of 1997, Corrective Action Units (CAUs) 400 (Bomblet Pit and Five Points Landfill), 404 (Roller Coaster Lagoons and Trench), and 426 (Cactus Spring Waste Trenches) were seeded with a mix of seeds of native shrubs and grasses. Each site was mulched with straw, and the straw was crimped into the soil. The sites have been protected from grazing animals (e.g., horses and rabbits) since that time with a 4-foot high perimeter barbed wire fence with 2-foot high chicken wire along the base of the fence. In the fall of 2000, the cover at CAU 407 (Roller Coaster RadSafe Area) was revegetated using similar revegetation techniques.

Remedial revegetation has occurred at two of the sites. A flash flood swept through the center of the CAU 400 Five Points Landfill site in the summer of 2003. The perimeter fence was damaged, and much of the vegetation through the center of the site was lost. The fence was repaired, and the site was reseeded in the fall of 2004. The site was flooded again in 2006, covering much of the lower portions of the site with several inches of sediment.

After CAU 407 was revegetated in 2000, cover repairs resulted in the loss of the vegetation that had become established. In the fall of 2004, erosion channels on the cover were repaired, and the site was reseeded. An erosion blanket was used to minimize erosion.

Each site has been monitored periodically since revegetation occurred to document the success of reclamation efforts and identify any problems. The first year of monitoring was designed to determine if germination of seeded plant species had occurred and included plant density estimates and photographic documentation. Monitoring in subsequent years evaluated plant establishment and long-term vegetation survival, and compared plant cover and density with adjacent reference areas (undisturbed sites).

2.0 OBJECTIVES

This report documents the methodology and results of monitoring conducted in May 2007 at CAU 400, CAU 404, CAU 407, and CAU 426, which are located on the Tonopah Test Range in central Nevada. The status of the vegetation is described and compared with adjacent undisturbed areas. Concerns and issues are identified, and remedial actions are recommended to ensure that a viable vegetative cover is maintained at each site.

3.0 METHODS

Ecological Services staff scientists inspected the sites May 14–16, 2007. Plant cover and density estimates were made, wildlife usage was noted, and soil erosion conditions were evaluated. Plant cover was estimated using an optical point projection device, or cover scope. Cover sample points were taken at given intervals along a permanently placed linear transect. Plant density was estimated using one meter square quadrats, which are located at given intervals along each transect. The total number of individual plants located within the boundaries of each quadrat was recorded. The data were averaged over all quadrats to obtain average plant densities (plants per square meter [m^2]). Wildlife usage was determined by noting any wildlife or wildlife signs (i.e., burrows) observed during sampling. The erosion condition of the soil was determined using a modified Bureau of Land Management erosion condition classification (Appendix F-2).

Reference areas were similarly sampled, and respective data were used as standards to evaluate revegetation success.

Revegetation is typically considered successful when a predetermined percentage of the perennial plant cover and density on adjacent, undisturbed plant communities is achieved. A percentage was not established for these sites; however, a typical percentage used to determine reclamation success is 70 percent. The success of revegetation is evaluated after plants have had sufficient time to become established. The time varies depending on such factors as degree of disturbance, soil types, and climate. The year 2007 is the tenth year since revegetation occurred at CAUs 400, 404, and 426.

4.0 RESULTS

The 2007 plant density and cover estimate data collected were summarized and compared to data collected from previous years and with data collected from adjacent reference areas. Based on perennial plant density and perennial plant cover, the sites are considered successfully reclaimed if 70 percent of the density and cover on the respective reference areas was attained.

4.1 CAU 400, Five Points Landfill, Results

The Five Points Landfill was remediated and revegetated in the fall of 1997. Five transects, two on the section revegetated in the fall of 2000 and not damaged from flooding, and three in the area that was revegetated in the fall of 2004 after flooding, were sampled in 2007. Plant cover, density, and diversity were averaged over the two transects and three transects respectively. The reference area, located north of the revegetated area, was also sampled. Plant cover and density for the two transects in the non-flooded areas are presented for 2007 in Tables 1, 2, and 3.

4.1.1 Plant Cover

Although overall plant cover was the second lowest recorded since the site was revegetated, perennial plant cover, which includes perennial shrubs and grasses, was the highest it has been since 2003. The amount of shrub cover in 2007 was the highest ever recorded at the site. Grass cover, although not as high as the first 3 years after revegetation, was the highest it has been since 2003. There were no annual forbs or grasses in 2007, which also occurred in 2003 (Table 1).

TABLE 1. PLANT COVER (%) ON CAU 400, FIVE POINTS LANDFILL

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	2.5	8.3	9.2	8.1	9.0	8.5	10.6	11.7	8.2
Grasses	10.0	22.5	10.0	3.7	1.3	3.3	3.8	7.5	5.3
Forbs/Annuals	3.3	1.7	0.0	2.2	9.0	6.0	0.0	0.0	0.0
Total Plant Cover	**15.8**	**32.5**	**19.2**	**14.0**	**19.3**	**17.8**	**14.4**	**19.2**	**13.5**

Note: Data for 2007 are for areas originally seeded and not those areas seeded in the fall of 2004 which were flooded in 2006.

4.1.2 Plant Density

Plant density for perennial species was 2.1 plants/m^2 in 2007, which was similar to density estimates in 2005 (Table 2). These 2 years represent the lowest density values recorded for this site. Shrub density has decreased over the last 5 years. Fourwing saltbush continued to be the most dominant shrub at the site. Only two other species, bud sagebrush and winterfat, have been found on the site. Winterfat was present in 2006 but was not encountered in 2007. Bud sagebrush has never been abundant. Average bud sagebrush density has only been 0.1 plants/m^2 since 2005. Density for fourwing saltbush has ranged from 0.7 to 1.4 plants/m^2 over the previous 6 years, but it dropped to 0.5 plants/m^2 in 2007. Overall shrub density was 0.6 plants/m^2 in 2007, which is the lowest shrub density recorded to date.

TABLE 2. PLANT DENSITY (PLANTS PER M^2) ON CAU 400, FIVE POINTS LANDFILL

		2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	Bud Sagebrush	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	--
	Fourwing Saltbush	0.7	1.0	1.4	1.1	1.4	1.0	0.5	0.0	--
	Greene's Rabbitbrush	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	--
	Winterfat	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	--
Total Shrubs		**0.7**	**1.1**	**1.5**	**1.1**	**1.4**	**1.6**	**0.6**	**0.6**	**0.4**
Grasses	Squirreltail	2.2	0.3	0.8	0.4	0.1	1.5	0.4	0.1	--
	Galleta	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	--
	Indian Ricegrass	4.8	3.2	2.1	1.0	0.4	0.6	1.0	1.2	--
Total Grasses		**7.0**	**3.5**	**2.9**	**1.5**	**0.5**	**2.1**	**1.5**	**1.3**	**0.9**
Total Forbs/Annuals		**10.2**	**0.4**	**1.3**	**13.5**	**56.4**	**42.0**	**0.0**	**0.0**	**0.0**
Total Plant Density		**17.7**	**5.0**	**5.7**	**16.1**	**58.3**	**45.7**	**2.1**	**1.9**	**1.3**
Wildlife Use		--	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	--	--
Erosion Classification		--	Stable	Stable	Critical	Critical	Stable	Stable	--	--

Note: Scientific names of plants are listed in Appendix F-1.
Note: Erosion Classification Chart included in Appendix F-2.

4.1.3 Plant Diversity

Diversity, which is a measurement of the number of different plant species on the site, is used as a measure of plant community vigor. The diversity of shrubs experienced its largest decline since the site was revegetated; however, grass diversity was about same as in 2006 (Table 3).

TABLE 3. DIVERSITY OF PERENNIAL PLANT SPECIES ON CAU 400, FIVE POINTS LANDFILL

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	0.4	0.5	0.6	0.6	0.7	0.9	0.4	0.5	0.4
Grasses	1.8	1.2	1.4	0.6	0.5	1.0	0.9	0.8	0.6
Total Number of Perennial Species per m^2	**2.2**	**1.7**	**2.0**	**1.2**	**1.2**	**1.9**	**1.3**	**1.3**	**1.0**
Forbs/Annuals	3.0	0.2	0.7	3.8	6.0	1.4	0.0	0.0	0.0

4.1.4 Summary

Wildlife use of the site was evident the first few years after revegetation was completed (Table 2). Small mammal burrows were located throughout the site but were most abundant in the southeastern section of the site, which is out of path of flooding.

There was no evidence of erosion until 2004 (Table 2). The lower areas were flooded in 2003, and the site experienced several months of standing water that resulted in the loss of all plants. After the flooded area was re-seeded in the fall of 2004, there has again been some standing water in the lower areas, but there did not appear to be any damage to the vegetation. The upstream check dams were in place, and there were no signs of flooding. There was a small layer of silts and sands in the bottom areas, suggesting some overland erosion, but plants were still growing and surviving, and no erosion gullies were observed.

The site exceeds the revegetation standard of 70 percent plant cover and plant density. Shrub cover exceeds the cover standard, and grass cover is slightly less than the standard. Both shrub and grass densities exceed the standard for reclamation success.

CAU 400, FIVE POINTS LANDFILL, PHOTOGRAPHIC REFERENCE

JUNE 1998

JUNE 2000

JUNE 2002

SEPTEMBER 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

4.2 CAU 400, Bomblet Pit, Results

The Bomblet Pit was seeded in the fall of 1997. The site was heavily disturbed and dominated by halogeton prior to restoration efforts. The revegetated area and the undisturbed area directly east of the site were sampled in 2007 as has been done in previous years.

4.2.1 Plant Cover

Perennial plant cover has steadily increased over the last few years to a high of 22.5 percent in 2007 (Table 4). As in previous years, all of the plant cover is shrubs. Grasses were found on the site the first few years after revegetation but have not established on the site in subsequent years. Grasses were present on the reference area, but the cover was relatively low.

TABLE 4. PLANT COVER (%) ON CAU 400, BOMBLET PIT

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	15.8	18.8	10.0	7.5	8.8	17.5	22.5	11.3	7.9
Grasses	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.5	1.8
Forbs/Annuals	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0
Total Plant Cover	**18.4**	**18.8**	**10.0**	**7.5**	**12.6**	**17.5**	**22.5**	**13.8**	**9.7**
Bare Ground	63.2	61.3	73.8	78.8	72.5	62.5	60.0	65.0	--
Litter	18.4	20.0	16.3	13.8	15.0	20.0	17.5	21.3	--

4.2.2 Plant Density

Shrub density decreased from 2006 to 2007 (Table 5), mainly due to a decrease in the density of shadscale. Bud sagebrush remained approximately the same, and fourwing saltbush was present as it was in 2006. There were no grasses encountered in 2007 on the revegetated site. Some Indian ricegrass was found on the site in 2006 for the first time in the last 5 years. There were no annual forbs on the revegetated site, and only a few forbs were found.

TABLE 5. PLANT DENSITY (PLANTS PER M^2) ON CAU 400, BOMBLET PIT

		2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	Bud Sagebrush	3.8	2.5	2.6	0.8	0.9	1.7	1.8	3.6	--
	Fourwing Saltbush	0.5	0.3	0.2	0.2	0.1	0.0	0.1	0.0	--
	Shadscale	6.8	6.5	6.4	5.3	4.7	4.8	3.7	1.3	--
	Winterfat	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	--
Total Shrubs		**11.4**	**9.3**	**9.3**	**6.3**	**5.7**	**6.5**	**5.6**	**4.9**	**3.4**
Grasses	Squirreltail	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
	Galleta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	--
	Indian Ricegrass	2.5	0.2	0.4	0.0	0.0	0.1	0.0	0.4	--
Total Grasses		**5.6**	**0.2**	**0.4**	**0.0**	**0.0**	**0.1**	**0.0**	**0.6**	**0.4**
Total Forbs/Annuals		**5.4**	**0.3**	**0.1**	**1.1**	**56.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Plant Density		**22.4**	**9.8**	**9.8**	**7.4**	**61.7**	**6.6**	**5.6**	**5.5**	**3.8**
Wildlife Use		Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	--	--
Erosion Classification		--	Stable	Stable	Stable	Stable	Stable	Stable	--	--

Note: Scientific names of plants are listed in Appendix F-1.
Note: Erosion Classification Chart included in Appendix F-2.

4.2.3 Summary

Perennial plant cover at the site was approximately double the amount of cover on the reference area. When considering cover by lifeform, however, there were deficiencies. Grasses were absent, and neither grass cover nor density met reclamation success criteria. Possibly with consecutive favorable growing seasons over time, grasses may reestablish at the site. The fact that there were some Indian ricegrass plants present in 2006 was encouraging.

CAU 400, BOMBLET PIT, PHOTOGRAPHIC REFERENCE

JUNE 1998

JUNE 2000

JUNE 2002

JUNE 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

4.3 CAU 404, Staging Area, Results

Approximately three-fourths of CAU 404 is the staging area used during remediation activities and was revegetated along with the cover in the fall of 1997.

4.3.1 Plant Cover

Plant cover decreased from 2006 to 2007. The value of 17.3 percent cover recorded in 2007 is the approximate average value for plant cover on the staging area at the site over the last 5 years (Table 6). Shrub cover decreased slightly, and grass cover was zero. There was no grass cover recorded during only one other year, 2004.

TABLE 6. PLANT COVER (%) ON CAU 404, STAGING AREA

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	9.0	18.5	13.6	17.0	19.5	19.4	16.7	13.5	9.5
Grasses	3.5	0.5	0.5	0.0	0.5	1.1	0.0	2.1	1.5
Forbs/Annuals	0.0	0.0	0.0	0.0	3.5	1.1	0.6	0.0	0.0
Total Plant Cover	**12.5**	**19.0**	**14.1**	**17.0**	**23.5**	**21.6**	**17.3**	**15.6**	**11.0**
Bare Ground	56.5	53.0	69.3	61.5	69.0	56.1	61.7	64.6	--

4.3.2 Plant Density

Density for the two dominant shrubs continued to decrease in 2007 from 2002. Shadscale and bud sagebrush continued to be important components of the plant community. Overall, there was a 30 percent decrease in the density of shrubs from 2006 to 2007. The total plant density for the site in 2007 (5.5 plant/m^2) exceeded the total plant density of the reference area (5.3 plants/m^2), so this site has met the reclamation success standard.

TABLE 7. PLANT DENSITY (PLANTS PER M^2) ON CAU 404, STAGING AREA

		2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	Bud Sagebrush	1.7	1.2	0.8	0.6	0.6	1.6	1.4	2.9	--
	Fourwing Saltbush	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	--
	Shadscale	10.0	6.9	5.5	5.4	5.4	5.3	3.9	0.6	--
	Winterfat	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	--
Total Shrubs		**12.0**	**8.4**	**6.5**	**6.2**	**6.2**	**7.0**	**5.3**	**3.5**	**2.5**
Grasses	Low Woolygrass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	--
	Squirreltail	6.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	--
	Galleta	0.8	0.3	0.2	0.1	0.2	0.1	0.1	0.9	--
	Indian Ricegrass	2.5	0.5	0.0	0.1	0.0	0.1	0.1	0.4	--
Total Grasses		**9.5**	**0.9**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**1.5**	**1.1**
Total Forbs/Annuals		**3.5**	**0.7**	**0.7**	**1.9**	**25.3**	**0.8**	**0.0**	**0.3**	**0.2**
Total Plant Density		**25.0**	**10.0**	**7.4**	**8.3**	**31.7**	**8.0**	**5.5**	**5.3**	**3.8**
Wildlife Use		Burrows	Burrows	Burrows	Burrows	Burrows	Burrows	Burrows	--	--
Erosion Classification		Stable	Slight	Slight	Stable	Stable	Stable	Stable	--	--

Note: Scientific names of plants are listed in Appendix F-1.
Note: Erosion Classification Chart included in Appendix F-2.

4.3.3 Plant Diversity

Species richness of the revegetated site (four species) exceeded the success standard of 70 percent of the reference area (five species) (Table 8).

TABLE 8. DIVERSITY OF PERENNIAL PLANT SPECIES ON CAU 404, STAGING AREA

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	2.0	1.7	1.6	1.5	1.4	1.8	1.6	1.5	1.1
Grasses	2.2	0.6	0.2	0.1	0.1	0.1	0.1	0.3	0.2
Forbs/Annuals	0.6	0.4	0.2	0.6	1.3	0.4	0.0	0.2	0.1
Total	**4.8**	**2.7**	**2.0**	**2.2**	**2.8**	**2.3**	**1.7**	**2.0**	**1.4**

4.3.4 Summary

Galleta grass and Indian ricegrass were the only perennial grasses found at the site. Squirreltail grass was found the first few years after revegetation but has not established on the site. The density of grasses has decreased slightly over the last 5 years (Table 7). There were no annual forbs or grasses encountered in 2007. The total plant density for the site in 2007 (5.5 plants/m^2) exceeded the total plant density of the reference area (5.3 plants/m^2), so this site has met the reclamation success standard.

CAU 404, ROLLER COASTER LAGOONS AND TRENCH, STAGING AREA, PHOTOGRAPHIC REFERENCE

JUNE 1998

JUNE 2000

JUNE 2002

SEPTEMBER 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

4.4 CAU 404, Cover, Results

The CAU 404 cover was revegetated in the fall of 1997 using a seed mix of species native to the area. The site has been monitored periodically since it was revegetated.

4.4.1 Plant Cover

Plant cover on the CAU 404 cover decreased from 2006 to 2007 (Table 9). Shrub cover and annual forb cover both continued to decrease from 2005 levels, and grass cover decreased to the same level as 2005. Forbs have only contributed to overall cover for 2 of the 6 years of monitoring. At most sites, shrubs were the most dominant, and grasses contributed less to overall plant cover.

TABLE 9. PLANT COVER (%) ON CAU 404, COVER

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	6.3	10.0	12.5	10.0	18.8	13.4	7.5	13.5	9.5
Grasses	12.5	16.3	10.0	3.8	10.0	12.2	10.0	2.1	1.5
Forbs/Annuals	0.0	0.0	0.0	1.3	7.5	0.0	0.0	0.0	0.0
Total Plant Cover	**18.8**	**26.3**	**22.5**	**15.1**	**36.3**	**25.6**	**17.5**	**15.6**	**11.0**
Bare Ground	73.8	65.0	71.3	77.5	57.5	65.9	67.5	64.6	--
Litter	7.5	8.8	6.3	7.5	6.3	8.4	9.2	19.8	--

4.4.2 Plant Density

Plant density was lower in 2007 than it has ever been on the CAU 404 cover (Table 10). However, there were still approximately six shrubs and five grasses found within 1 m^2. Shadscale continued to be the most dominant species. Bud sagebrush and fourwing saltbush were present, but at lower densities. Galleta was the most common grass. The only other grass encountered was Indian ricegrass, which declined slightly in 2007 in comparison to 2004. In 2005, there were a few plants of squirreltail grass found, but there were none encountered in 2007.

There has been a gradual decline in the density of shrubs and grasses since the site was revegetated. The density of shrubs was 4.1 plants/m^2 in 2007, the lowest density recorded to date. A similar decline occurred for grasses. The decrease from 2005 to 2007 appears to be a result of a decrease in the density of fourwing saltbush, shadscale, and galleta grass.

TABLE 10. PLANT DENSITY (PLANTS PER M^2) ON CAU 404, COVER

		2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	Bud Sagebrush	2.1	1.7	1.2	1.0	0.9	0.8	0.8	2.9	--
	Fourwing Saltbush	0.9	0.6	0.3	0.5	0.6	0.3	0.3	0.0	--
	Shadscale	10.9	7.0	7.0	5.9	6.6	5.1	3.0	0.6	--
	Winterfat	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	--
Total Shrubs		**14.2**	**9.4**	**8.5**	**7.4**	**8.1**	**6.3**	**4.1**	**3.5**	**2.5**
Grasses	Low Woolygrass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	--
	Squirreltail	10.8	1.6	0.1	0.0	0.1	0.0	0.0	0.0	--
	Galleta	8.6	4.7	4.9	5.2	5.1	4.4	2.8	0.9	--
	Indian Ricegrass	3.8	2.8	1.1	0.6	0.2	0.3	0.3	0.4	--
Total Grasses		**23.2**	**9.1**	**6.1**	**5.8**	**5.4**	**4.7**	**3.1**	**1.5**	**1.1**
Total Forbs/Annuals		**0.5**	**0.3**	**0.2**	**1.9**	**31.5**	**0.5**	**0.1**	**0.3**	**0.2**
Total Plant Density		**37.9**	**18.8**	**14.8**	**15.1**	**45.0**	**11.5**	**7.3**	**5.3**	**3.8**
Wildlife Use		Burrows	Burrows	Burrows	Burrows	Burrows	Burrows	Burrows	--	--
Erosion Classification		Stable	Slight	Slight	Stable	Stable	Stable	Stable	--	--

Note: Scientific names of plants are listed in Appendix F-1.
Note: Erosion Classification Chart included in Appendix F-2.

4.4.3 Plant Diversity

Species richness of the revegetated site (six species) exceeded species richness on the reference area (five species), so the reclamation success criteria for species richness was met at this site (Table 11).

TABLE 11. DIVERSITY OF PERENNIAL PLANT SPECIES ON CAU 404, COVER

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	2.5	2.1	1.8	2.0	2.0	1.8	1.4	1.5	1.1
Grasses	3.0	2.7	1.8	1.4	1.3	1.3	0.9	0.3	0.2
Forbs/Annuals	0.4	0.3	0.2	0.6	1.7	0.2	0.1	0.2	0.1
Total	**5.9**	**5.1**	**3.8**	**4.0**	**5.0**	**3.3**	**2.4**	**2.0**	**1.4**

4.4.4 Summary

Total plant cover exceeded the amount of cover found on the reference site (Table 9). Shrub cover was, however, just 55 percent of the shrub cover on the reference area, whereas grass cover was five times the amount of cover found on the reference site. Shrub and grass densities, although the lowest reported to date, were still well above the density reported for the reference area (Table 10). Shrubs were slightly more abundant on the cover than on the reference area, and grass densities were about twice what they were on the reference area.

CAU 404, ROLLER COASTER LAGOONS AND TRENCH, COVER, PHOTOGRAPHIC REFERENCE

JUNE 1998

JUNE 2000

JUNE 2002

JUNE 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

4.5 CAU 407 Results

4.5.1 Plant Cover

Plant cover data was not recorded in 2007 at CAU 407. Plant cover is typically first recorded the fifth year after revegetation is completed, which will be in 2009.

4.5.2 Plant Density

Overall, there was a decrease of approximately 20 percent in shrub density and approximately 50 percent in grass density. All species of shrubs except bud sagebrush declined from 2006 to 2007. There was a decrease in squirreltail grass, and no galleta grass was found on the site. However, there was an increase in Indian ricegrass density. In comparison to the reference site, overall plant density was high. Plant density on the reference area was 4.9 plants/m^2, compared to 46.8 plants/m^2 on the CAU 407 cover (Table 12).

TABLE 12. PLANT DENSITY (PLANTS PER M^2) ON CAU 407

		2005	2006	2007	Reference
Shrubs	Bud Sagebrush	2.9	1.3	1.3	2.6
	Fourwing Saltbush	2.3	3.2	2.4	0.0
	Shadscale	17.5	17.9	14.2	0.8
	Rubber Rabbitbrush	0.0	0.3	0.0	0.0
	Winterfat	0.7	2.0	1.2	0.1
Total Shrubs		**23.4**	**24.7**	**19.1**	**3.5**
Grasses	Squirreltail	42.9	53.3	22.3	0.0
	Galleta	0.0	0.0	0.0	0.8
	Indian Ricegrass	16.4	1.1	5.4	0.3
Total Grasses		**59.3**	**54.4**	**27.7**	**1.1**
Total Forbs/Annuals		**1.4**	**7.3**	**0.0**	**0.3**
Total Plant Density		**84.1**	**86.4**	**46.8**	**4.9**

Note: Scientific names of plants are listed in Appendix F-1.

4.5.3 Plant Diversity

Diversity decreased from 2006 to 2007 but is still approximately equivalent to plant diversity on the reference area (Table 13).

TABLE 13. DIVERSITY OF PERENNIAL PLANT SPECIES ON CAU 407

	2005	2006	2007	Reference
Shrubs	2.5	3.4	2.2	1.7
Grasses	1.1	1.6	1.3	0.5
Forbs	0.8	0.4	0.0	1.2
Total	**4.4**	**5.4**	**3.5**	**3.4**

CAU 407, ROLLER COASTER RADSAFE AREA, PHOTOGRAPHIC REFERENCE

JUNE 2002

SEPTEMBER 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

4.6 CAU 426, Staging Area, Results

The CAU 426 staging area and waste trench cover were revegetated in the fall of 1997.

4.6.1 Plant Cover

Perennial plant cover on the staging area was the lowest it has been since 2000. Shrub cover decreased to 2.5 percent in 2007, which is about half what plant cover has been since 2004 (Table 14). Grass cover was the lowest it has been since monitoring began in 2000. There were still grasses present at the site, but there was not much growth in 2007.

TABLE 14. PLANT COVER (%) ON CAU 426, STAGING AREA

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	0.8	5.0	2.5	3.3	5.1	5.0	2.5	17.5	12.3
Grasses	5.8	12.5	6.7	10.8	17.1	10.8	5.0	0.0	0.0
Forbs/Annuals	0.0	1.7	5.0	2.5	10.3	1.7	0.0	0.0	0.0
Total Plant Cover	**6.6**	**19.2**	**14.2**	**16.6**	**32.5**	**17.5**	**7.5**	**17.5**	**12.3**
Bare Ground	50.0	42.5	50.0	59.2	47.0	50.0	67.5	63.8	--
Litter	43.3	38.3	35.8	24.2	20.5	32.5	25.0	18.8	--

4.6.2 Plant Density

Overall perennial plant density was about half what it has been the last 2 years. Shrub density has been approximately unchanged since 2000. The decrease from 2006 to 2007 is due to the absence of both shadscale and Douglas' rabbitbrush (Table 15). The density of Nevada jointfir and rubber rabbitbrush was the same as in 2006. The fluctuations from year to year in overall perennial plant density has been the result of the changes in grass density. Grass density has ranged from 1.3 plants/m^2 in 2003 to over 6 plants/m^2 in 2000 and 2005 (Table 15). There was a decrease in 2007 for all three grass species.

TABLE 15. PLANT DENSITY (PLANTS PER M^2) ON CAU 426, STAGING AREA

		2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	Black Sagebrush	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.8	--
	Bud Sagebrush	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	--
	Fourwing Saltbush	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	--
	Shadscale	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	--
	Douglas' Rabbitbrush	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.0	--
	Nevada Jointfir	0.3	0.2	0.3	0.1	0.3	0.4	0.4	0.0	--
	Rubber Rabbitbrush	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	--
	Winterfat	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	--
Total Shrubs		**0.7**	**0.5**	**0.6**	**0.4**	**0.7**	**0.7**	**0.6**	**1.1**	**0.8**
Grasses	Squirreltail	5.2	2.9	0.6	1.9	5.1	3.1	2.1	0.0	--
	Galleta	0.2	0.1	0.0	0.3	0.0	0.2	0.1	1.6	--
	Indian Ricegrass	1.4	0.6	0.7	0.4	1.3	0.6	0.2	0.2	--
Total Grasses		**6.8**	**3.6**	**1.3**	**2.6**	**6.4**	**3.9**	**2.4**	**1.8**	**1.3**
Total Forbs/Annuals		**16.9**	**1.8**	**3.9**	**3.2**	**16.6**	**7.3**	**0.1**	**0.0**	**0.0**
Total Plant Density		**24.4**	**5.9**	**5.8**	**6.2**	**23.7**	**11.9**	**3.1**	**2.9**	**2.1**
Wildlife Use		--	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	Small Mammal Burrows	**--**	**--**
Erosion Classification		--	Stable	Stable	Stable	Stable	Stable	Stable	--	--

Note: Scientific names of plants are listed in Appendix F-1.
Note: Erosion Classification Chart included in Appendix F-2.

4.6.3 Plant Diversity

Plant diversity declined from the highest diversity recorded in 2006. The decrease in diversity was due to the decrease in forbs and annual plant species (Table 16). Diversity, although lower than in previous years, still met reclamation standards. The diversity of shrubs has ranged from a high of 0.6 plants/m^2 in 2000 to a low of 0.2 plants/m^2 in 2005. Other years have ranged from 0.4 to 0.5 plants/m^2.

TABLE 16. DIVERSITY OF PERENNIAL PLANT SPECIES ON CAU 426, STAGING AREA

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	0.6	0.4	0.5	0.4	0.2	0.5	0.4	0.5	0.4
Grasses	1.2	0.9	0.6	0.9	0.4	1.3	1.1	0.5	0.4
Forbs/Annuals	0.9	0.4	1.1	1.3	1.1	1.3	0.1	0.0	0.0
Total	**2.7**	**1.7**	**2.2**	**2.6**	**1.7**	**3.1**	**1.6**	**1.0**	**0.8**

CAU 426, CACTUS SPRING WASTE TRENCHES, STAGING AREA, PHOTOGRAPHIC REFERENCE

JUNE 1998

JUNE 2000

JUNE 2002

SEPTEMBER 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

4.7 CAU 426, Cover, Results

The CAU 426 cover was revegetated in the fall of 1997 using a mix of seeds native to the area. The site has been monitored periodically since it was revegetated.

4.7.1 Plant Cover

Plant cover on the CAU 426 cover increased from 2006 to 2007. Total plant cover at 23.3 percent (Table 17) is the highest amount recorded to date. Shrub cover increased from 16.7 percent in 2006 to 20.0 percent in 2007. Grass cover was unchanged from 2006. The amount of plant cover on the CAU 426 cover exceeded revegetation standards.

TABLE 17. PLANT COVER (%) ON CAU 426, COVER

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	0.0	6.7	15.0	10.0	10.0	16.7	20.0	17.5	12.3
Grasses	3.3	8.3	1.7	6.7	0.0	3.3	3.3	0.0	0.0
Forbs/Annuals	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Total Plant Cover	**3.3**	**15.0**	**16.7**	**16.7**	**20.0**	**20.0**	**23.3**	**17.5**	**12.3**
Bare Ground	85.0	78.3	80.0	80.0	75.0	76.7	66.7	63.8	--
Litter	11.7	6.7	3.3	3.3	5.0	3.3	10.0	18.8	--

4.7.2 Plant Density

Perennial plant density decreased from 2006 to 2007. The density of shrubs was approximately 30 percent less in 2007 than in 2006, and grass density was only approximately 20 percent of what it was in 2006. Overall plant density of 1.9 plants/m^2 was the lowest recorded to date (Table 18). Shrub density was the lowest it has been since 2000, and grass density was the lowest it has ever been. The density of rubber rabbitbrush was only 25 percent of what it was in 2006. Squirreltail grass and galleta grass were completely absent in 2007 for the first time since the site was revegetated. The density of Indian ricegrass was a third of what it was in 2006.

The revegetation success standard for plant density was achieved. Shrub density exceeded the standard, but the density of grasses was only about a third of the standard.

TABLE 18. PLANT DENSITY (PLANTS PER M^2) ON CAU 426, COVER

		2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	Black Sagebrush	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	--
	Bud Sagebrush	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	--
	Fourwing Saltbush	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
	Shadscale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	--
	Nevada Jointfir	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.0	--
	Douglas' Rabbitbrush	1.0	1.3	1.3	1.5	1.3	1.0	0.9	0.0	--
	Rubber Rabbitbrush	0.1	1.1	0.5	0.9	1.5	0.8	0.2	0.0	--
	Winterfat	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Total Shrubs		**1.3**	**2.5**	**1.9**	**2.5**	**3.1**	**2.0**	**1.4**	**1.1**	**0.8**
Grasses	Squirreltail	1.0	0.2	0.3	0.3	1.0	0.7	0.0	0.0	--
	Galleta	1.4	0.7	0.4	0.0	0.3	0.4	0.0	1.6	--
	Indian Ricegrass	1.3	0.7	0.6	0.7	2.0	1.4	0.4	0.2	--
Total Grasses		**3.7**	**1.6**	**1.3**	**1.0**	**3.3**	**2.5**	**0.4**	**1.8**	**1.3**
Total Forbs/Annuals		**0.1**	**1.1**	**0.3**	**0.0**	**2.9**	**0.6**	**0.0**	**0.0**	**0.0**
Total Plant Density		**5.1**	**5.2**	**3.5**	**3.5**	**9.3**	**5.1**	**1.9**	**2.9**	**1.9**
Wildlife Use		--	Burrows	Burrows	Burrows	Burrows	Burrows	Burrows	--	--
Erosion Classification		--	Stable	Stable	Stable	Stable	Stable	Stable	--	--

Note: Scientific names of plants are listed in Appendix F-1.
Note: Erosion Classification Chart included in Appendix F-2.

4.7.3 Plant Diversity

There was a decrease in shrub diversity and grass diversity in 2007. The overall diversity in 2007 was approximately half what it was in 2006 and was the lowest recorded to date. There were no forbs encountered in 2007, which was also the situation in 2004 (Table 19).

TABLE 19. DIVERSITY OF PERENNIAL PLANT SPECIES ON CAU 426, COVER

	2000	2002	2003	2004	2005	2006	2007	Reference	Standard
Shrubs	0.9	1.5	1.1	1.4	1.6	1.4	1.2	0.5	0.4
Grasses	1.1	0.6	0.5	0.3	0.7	0.8	0.4	0.4	0.3
Forbs/Annuals	0.1	0.7	0.2	0.0	1.1	0.5	0.0	0.0	0.0
Total	**2.1**	**2.8**	**1.8**	**1.7**	**3.4**	**2.7**	**1.6**	**0.9**	**0.7**

CAU 426, CACTUS SPRING WASTE TRENCHES, COVER, PHOTOGRAPHIC REFERENCE

JUNE 1998

JUNE 2000

JUNE 2002

SEPTEMBER 2003

JUNE 2004

JUNE 2005

JUNE 2006

MAY 2007

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APPENDIX F-1

Common and scientific names of plant species encountered at TTR or included in original seed mix

	Scientific Name	Common Name
Shrubs	*Artemisia nova*	Black sagebrush
	Artemisia spinescens	Bud sagebrush
	Atriplex canescens	Fourwing saltbush
	Atriplex confertifolia	Shadscale saltbush
	Chrysothamnus greenei	Greene's rabbitbrush
	Chrysothamnus viscidiflorus	Low rabbitbrush
	Ephedra nevadensis	Nevada jointfir
	Ericameria nauseosa	Rubber rabbitbrush
	Gutierrezia sarothrae	Broom snakeweed
	Hymenoclea salsola	White burrobrush
	Krascheninnikovia lanata	Winterfat
	Menodora spinescens	Spiny menodora
	Opuntia pulchella	Sand cholla
	Sarcobatus vermiculatus	Black greasewood
Grasses	*Achnatherum hymenoides*	Indian ricegrass
	Elymus elymoides	Bottlebrush squirreltail
	Bromus tectorum	Cheatgrass
	Dasyochloa pullchella	Low woollygrass
	Pleuraphus jamesii	Galleta grass
	Sporobolus airoides	Alkali sacatoon
	Sporobolus cryptandrus	Sand dropseed
Forbs/Annuals	*Ambrosia* species	Ragweed
	Astragalus lentiginosa var. *fremontii*	Fremont's milkvetch
	Astragalus species	Milkvetch
	Camissonia boothii	Booth's suncup
	Camissonia species	Suncup
	Chaneactis xantiana	Xantus pincushion
	Chenactis steviodes	Steve's pincushion
	Chenopodium album	Lambsquarters
	Cryptantha circumscissa	Cushion cryptantha
	Cryptantha micrantha	Red root cyrptantha
	Cryptantha species	Cryptantha
	Cymopterus species	Springparsley
	Descurania pinnata	Pinnate tansymustard
	Eriastrum eremicum	Desert woolstar
	Eriastrum sparsiflorum	Fewflower woolstar
	Eriogonum deflexum	Flatcrown buckwheat
	Eriogonum nidularium	Birdnest buckwheat

	Scientific Name	Common Name
Forbs/Annuals (continued)	*Eriogonum* species	Buckwheat
	Erodium cicutarium	Filaree
	Gilia nyensis	Nye gilia
	Gilia species	Gilia
	Halogeton glomeratus	Halogeton
	Ipomopsis polycladon	Manybranched gilia
	Lepedium flavum	Yellow pepperweed
	Lepedium lasiocarpum	Shaggyfruit pepperweed
	Lepedium montanum	Mountain pepperweed
	Lepedium species	Pepperweed
	Lupinus species	Lupine
	Macheranthera canescens	Hoary macharanthra
	Mentzelia albomarginatus	White blazingstar
	Mirabilus biglovei	Bigelow's four-o'clock
	Oenothera species	Evening primrose
	Phacelia crenulata	Cleftleaf wildheliotrope
	Phacelia species	Phacelia
	Salsola tragus	Prickly Russian thistle
	Sphaeralcea ambigua	Desert globemallow
	Stephanomeria exigua	Small wirelettuce
	Tiquilia plicatas	Fanleaf tiquilia

APPENDIX F-2

Erosion Condition Classification							
Surface Litter		**Pedestalling**		**Rills <9″**		**Rills >9″**	
1	Accumulating in Place	1	No Visual Evidence	1	No Visual Evidence	1	No Visual Evidence
2	Slight Movement	2	Slight Pedestalling	2	Rills at Intervals >10′	2	Rills at Intervals >10′
3	Moderate Movement	3	Small Rock and Plant Pedestalling	3	Rills at 10′ Intervals	3	Rills at 10′ Intervals
4	Extreme Movement	4	Pedestalling Plants; Roots Exposed	4	Rills at 5–10′ Intervals	4	Rills at 5–10′ Intervals
5	Very Little Remaining Litter	5	Most Plants and Rocks Pedestalled; Roots Exposed	5	Rills at Intervals <5′	5	Rills at Intervals <5′
Rating: ___		Rating: ___		Rating: ___		Rating: ___	
						Total: ___	

Numerical Rating Total	Erosion Condition Class
0.0 to 4.0	Stable
4.1 to 8.0	Slight
8.1 to 12.0	Moderate
12.1 to 16.0	Critical
16.1 to 20.0	Severe

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