Nevada
Environmental
Restoration
Project

DOE/NV--1473

National Nuclear Security Administration

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

For Calendar Year 2011

Controlled Copy No.:_____

Revision: 0

February 2012

Environmental Restoration
Project

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

DISCLAIMER

DOE/NV--1473

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

FOR CALENDAR YEAR 2011

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

Controlled Copy No.____
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POST-CLOSURE INSPECTION REPORT FOR THE TONOPAH TEST RANGE, NEVADA

FOR CALENDAR YEAR 2011

Approved By: /s/: Kevin J. Cabble Date: 2-7-12

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

Approved By: /s/: Robert F. Boehlecke Date: 2/7/12

Robert F. Boehlecke
Federal Project Director
Environmental Restoration Project

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APPENDICES

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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
TTR	Tonopah Test Range

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EXECUTIVE SUMMARY

This report provides the results of the annual post-closure inspections conducted at the closed Corrective Action Units (CAUs) located on the Tonopah Test Range (TTR), Nevada. This report covers calendar year 2011 and includes inspection and repair activities completed at the following CAUs:

- CAU 400: Bomblet Pit and Five Points Landfill (TTR)
- CAU 407: Roller Coaster RadSafe Area (TTR)
- CAU 424: Area 3 Landfill Complexes (TTR)
- CAU 453: Area 9 UXO Landfill (TTR)
- CAU 487: Thunderwell Site (TTR)

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 Appendix B. The inspection checklists are included in Appendix C, field notes are included in Appendix D, and photographs taken during inspections are included in Appendix E.

The annual post-closure inspections were conducted May 3 and 4, 2011. Maintenance was performed at CAU 424, CAU 453, and CAU 487. At CAU 424, two surface grade monuments at Landfill Cell A3-3 could not be located during the inspection. The two monuments were located and marked with lava rock on July 13, 2011. At CAU 453, there was evidence of animal burrowing. Animal burrows were backfilled on July 13, 2011. At CAU 487, one use restriction warning sign was missing, and wording was faded on the remaining signs. A large animal burrow was also present. The signs were replaced, and the animal burrow was backfilled on July 12, 2011. As a best management practice, the use restriction warning signs at CAU 407 were replaced with standard *Federal Facility Agreement and Consent Order* signs on July 13, 2011.

Vegetation monitoring was performed at the CAU 400 Five Points Landfill and CAU 407 in June 2011, and the vegetation monitoring report is included in Appendix F.

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1.0 INTRODUCTION

1.1 SCOPE AND OBJECTIVES

This report includes inspection results, maintenance and repair activities, and recommendations for calendar year 2011 for Corrective Action Units (CAUs) on the Tonopah Test Range (TTR), Nevada. The CAUs are shown in Figure 1 of Appendix A. The CAUs and Corrective Action Sites (CASs) in this report include the following:

- **CAU 400: Bomblet Pit and Five Points Landfill (TTR)**
  - CAS TA-19-001-05PT: Ordnance Disposal Pit
- **CAU 407: Roller Coaster RadSafe Area (TTR)**
  - CAS TA-23-001-TARC: Roller Coaster RadSafe Area
- **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 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

Inspection requirements for each CAU are included in Appendix B. Inspections consist of the following activities to evaluate and document the condition of the units:

- Photographs to document current 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

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2.0 INSPECTION RESULTS

Inspections were conducted on May 3 and 4, 2011. The post-closure inspection plans as previously published in the applicable Closure Report (CR) for each CAU are included in Appendix B. The inspection checklists are included in Appendix C, field notes are included in Appendix D, and photographs taken during inspections are included in Appendix E.

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

The Bomblet Pit (CAS TA-55-001-TAB2, Ordnance Disposal Pit) and Five Points Landfill (CAS TA-19-001-05PT, Ordnance Disposal Pit) 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 required for a minimum of 5 years, and inspections of the fencing are conducted as a best management practice. The Nevada Division of Environmental Protection (NDEP) approved the request to discontinue vegetation monitoring and inspections at the Bomblet Pit on July 15, 2010.

The Five Points Landfill is shown in Figure 2 of Appendix A. Vegetation monitoring was conducted in June 2011, and the results are included in Appendix F. The annual inspection was conducted on May 4, 2011. Fencing was in good condition, and the vegetation appeared healthy. No issues or concerns were noted, and maintenance and repairs were not required. Inspections and vegetation monitoring at the Five Points Landfill should continue as scheduled.

2.2 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)

Post-closure requirements for CAU 407, Roller Coaster RadSafe Area (TTR), CAS TA-23-001-TARC, Roller Coaster RadSafe Area, are described in the CR (DOE/NV, 2001a). Inspections are conducted according to the post-closure plan (Appendix B).

The site is shown in Figure 3 of Appendix A. Vegetation monitoring was conducted in June 2011, and the results are included in Appendix F. The annual inspection was conducted on May 3, 2011. The signs, fencing, and cover were in good condition, and the vegetation appeared healthy. No issues or concerns were noted, and maintenance and repairs were not required. As a best management practice, the use restriction warning signs were replaced with standard *Federal Facility Agreement and Consent Order* signs on July 13, 2011. Inspections and vegetation monitoring should continue as scheduled.

2.3 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)

Post-closure requirements for 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; and CAS 03-08-002-A308, Landfill Cell A3-8), are described in the CR (DOE/NV, 1999a). Inspections are conducted according to the post-closure plan (Appendix B).

The landfill locations are shown in Figure 4 of Appendix A. The annual inspection was conducted on May 3, 2011.

Landfill Cell A3-1 (CAS 03-08-001-A301): The signs, survey markers, monuments, and cover were in good condition. No issues or concerns were noted, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-2 (CAS 03-08-002-A302): The signs, brass survey markers, concrete monuments, and landfill cover were in good condition. No issues or concerns were noted, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-3 (CAS 03-08-002-A303): The monuments, brass survey markers, signs, and cover were in good condition. Two of the three surface grade monuments at the eastern cell of the landfill could not be located during the inspection. The two monuments were located and marked with lava rock on July 13, 2011. Inspections should continue as scheduled.

Landfill Cell A3-4 (CAS 03-08-002-A304): The monuments, brass survey marker, and signs were in good condition. No issues or concerns were noted, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-5 (CAS 03-08-002-A305): The monuments and attached signs, brass survey markers, and cover were in good condition. No issues or concerns were noted, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-6 (CAS 03-08-002-A306): The monuments and attached signs, brass survey markers, and cover were in good condition. No issues or concerns were noted, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-8 (CAS 03-08-002-A308): The brass markers and cover were in good condition. No issues or concerns were noted, and maintenance and repairs were not required. Inspections should continue as scheduled.

2.4 CAU 453: AREA 9 UXO LANDFILL (TTR)

Post-closure requirements for CAU 453, Area 9 UXO Landfill (TTR), CAS 09-55-001-0952, Area 9 Landfill, are described in the CR (DOE/NV, 1999b). Inspections are conducted according to the post-closure plan (Appendix B).

The site is shown in Figure 5 of Appendix A. The annual inspection was conducted on May 4, 2011. The fence, signs, and monuments were in good condition. There was evidence of animal burrowing. Animal burrows were backfilled on July 13, 2011. Inspections should continue as scheduled.

2.5 CAU 487: THUNDERWELL SITE (TTR)

Post-closure requirements for CAU 487, Thunderwell Site (TTR), CAS RG-26-001-RGRV, Thunderwell Site, are described in the Corrective Action Decision Document (CADD)/CR (DOE/NV, 2001b) and Record of Technical Change (NNSA/NSO, 2004). Inspections are conducted according to the post-closure plan (Appendix B).

The site is shown in Figure 6 of Appendix A. The annual inspection was conducted on May 4, 2011. One use restriction warning sign was missing, and wording was faded on the remaining signs. A large animal burrow was also present. The signs were replaced, and the animal burrow was backfilled on July 12, 2011. Inspections should continue as scheduled.

3.0 SUMMARY

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

The Five Points Landfill was in good condition. No maintenance or repairs were required. Inspections and vegetation monitoring will continue as scheduled.

3.2 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)

The site was in good condition. No maintenance or repairs were required. As a best management practice, the use restriction warning signs were replaced with standard *Federal Facility Agreement and Consent Order* signs on July 13, 2011. Inspections and vegetation monitoring will continue as scheduled.

3.3 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)

Two surface grade monuments at Landfill Cell A3-3 could not be located during the inspection. The two monuments were located and marked with lava rock on July 13, 2011. No other maintenance or repairs were required. Inspections will continue as scheduled.

3.4 CAU 453: AREA 9 UXO LANDFILL (TTR)

Animal burrows observed during the annual inspection were backfilled on July 13, 2011. Inspections will continue as scheduled.

3.5 CAU 487: THUNDERWELL SITE (TTR)

One use restriction warning sign was missing, and wording was faded on the remaining signs. A large animal burrow was also present. The signs were replaced, and the animal burrow was backfilled on July 12, 2011. No other maintenance or repairs were required. Inspections will continue as scheduled.

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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, Nevada Operations Office. 1997. *Tonopah Test Range Closure Sites Revegetation Plan*, DOE/NV/11718-115 UC-702. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1999a. *Closure Report for Corrective Action Unit 424: Area 3 Landfill Complexes, Tonopah Test Range, Nevada*, DOE/NV/11718--283. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1999b. *Closure Report for Corrective Action Unit 453: Area 9 UXO Landfill, Tonopah Test Range, Nevada*, DOE/NV/11718--284. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 2001a. *Closure Report for Corrective Action Unit 407: Roller Coaster RadSafe Area, Tonopah Test Range, Nevada*, DOE/NV--694-REV-1. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 2001b. *Corrective Action Decision Document/Closure Report for Corrective Action Unit 487: Thunderwell Site, Tonopah Test Range, Nevada*, DOE/NV--761. Las Vegas, NV.

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APPENDIX A
FIGURES

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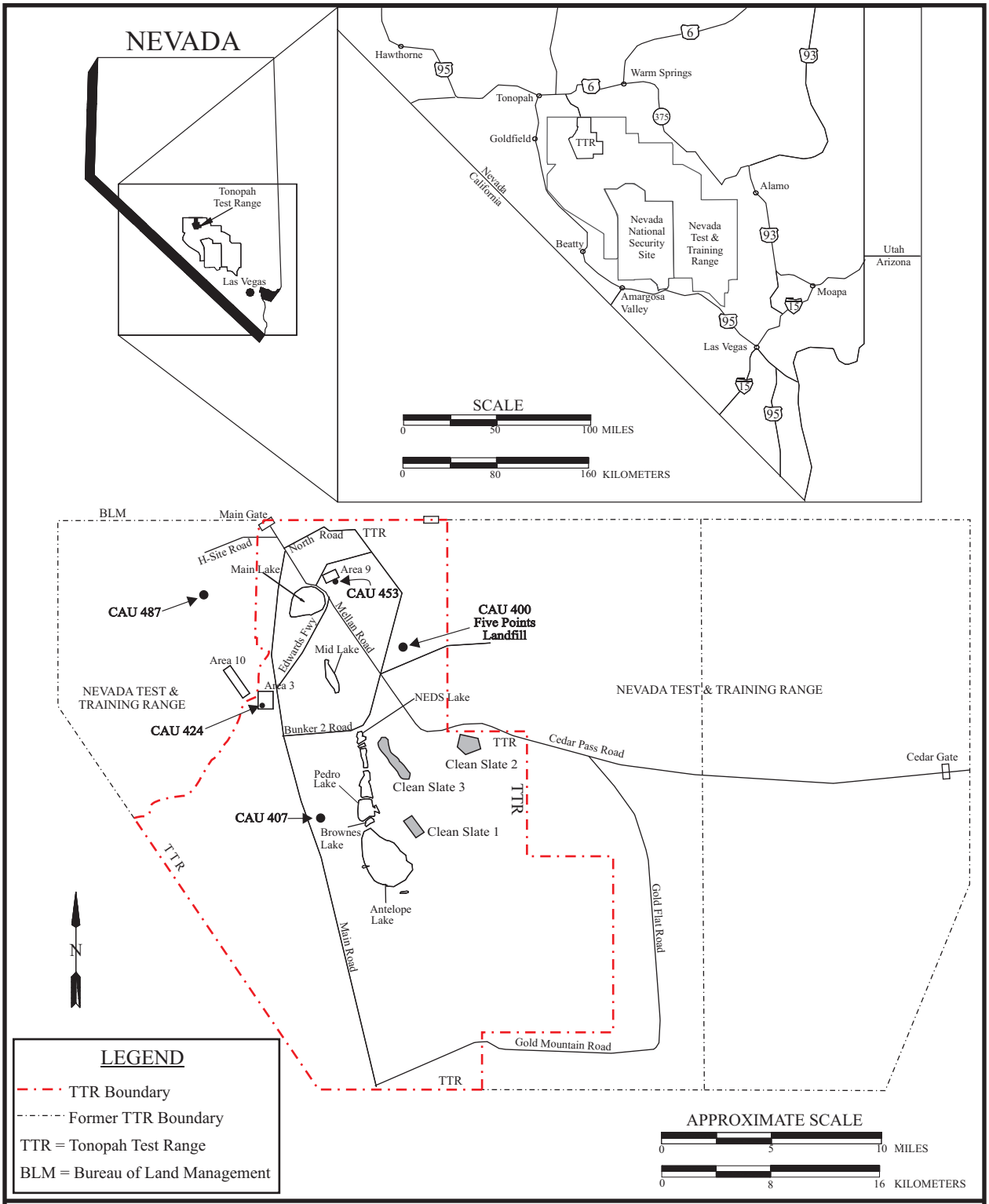

FIGURE 1
TONOPAH TEST RANGE
POST-CLOSURE MONITORING SITES LOCATION MAP

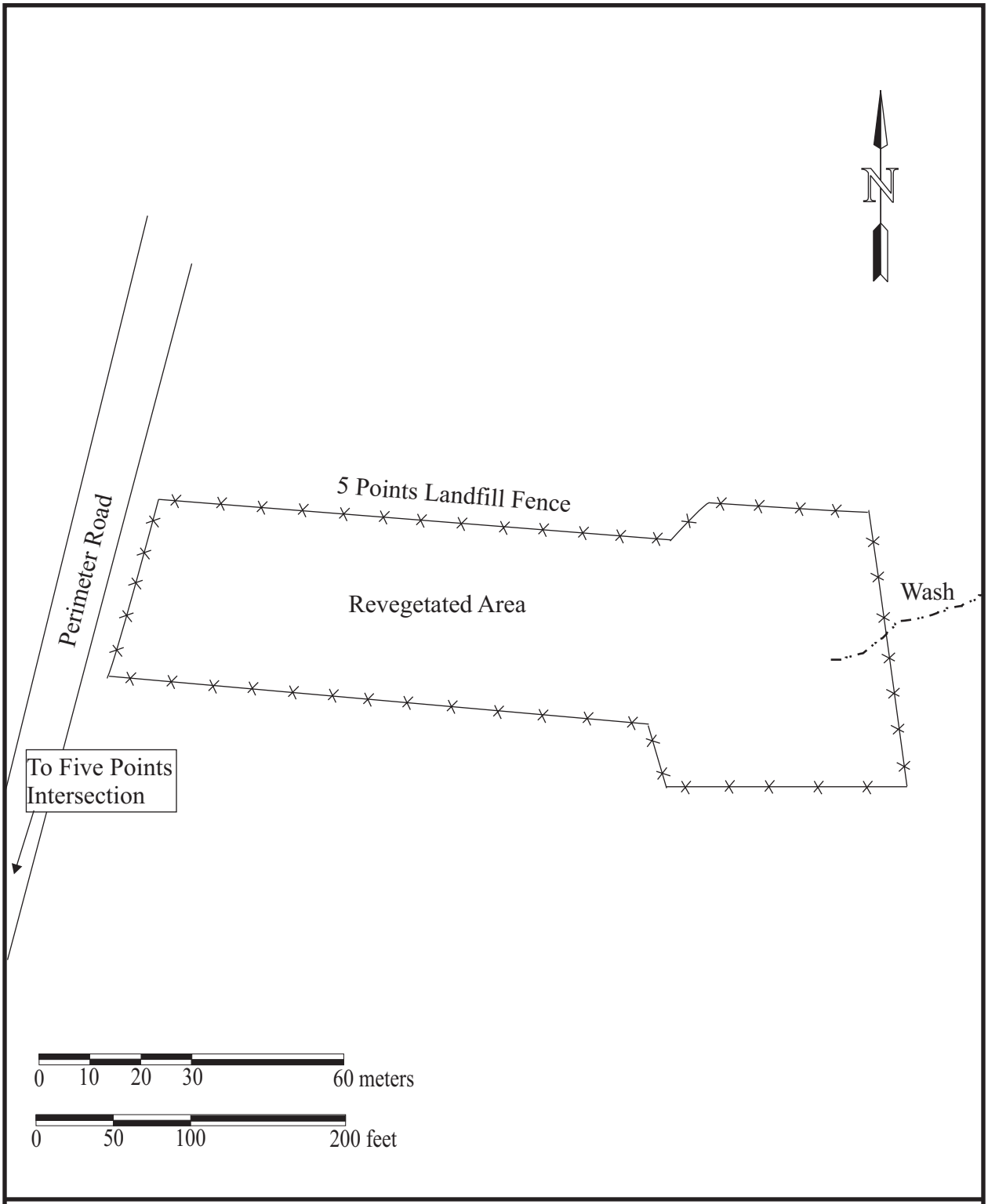

FIGURE 2
CAU 400 FIVE POINTS LANDFILL LOCATION MAP

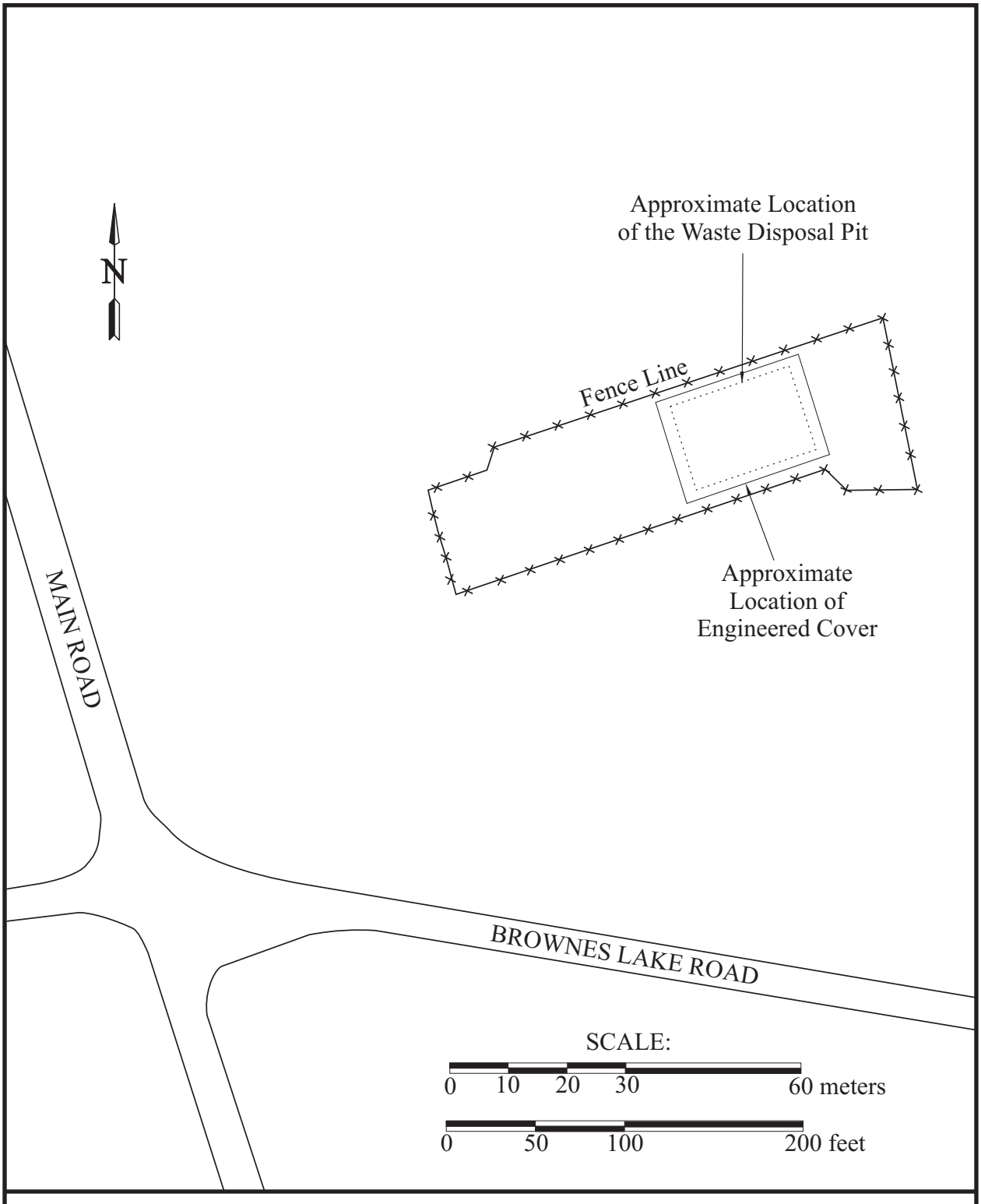

FIGURE 3
CAU 407 ROLLER COASTER RADSAFE AREA LOCATION MAP

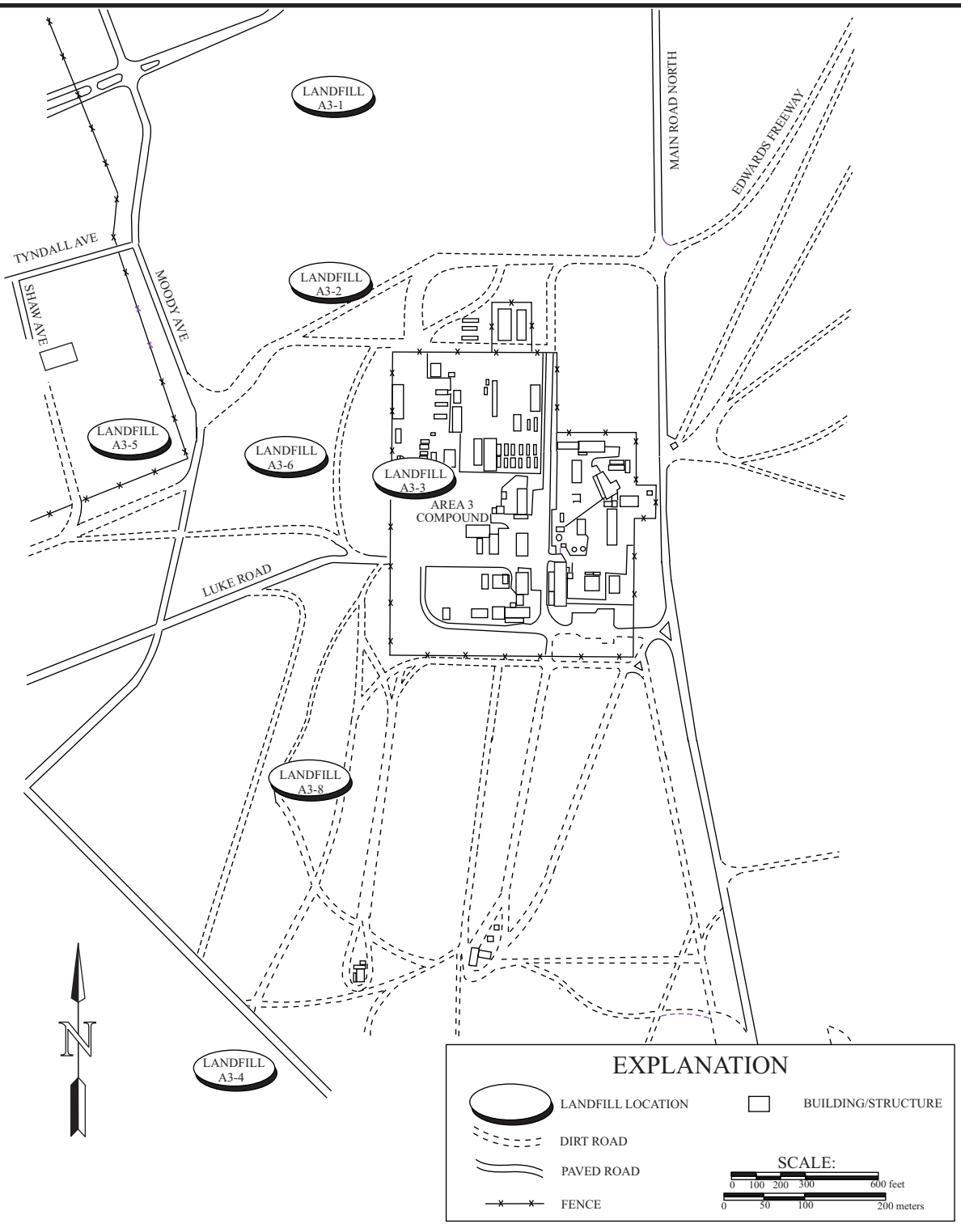

FIGURE 4
CAU 424 AREA 3 LANDFILL COMPLEXES LOCATION MAP

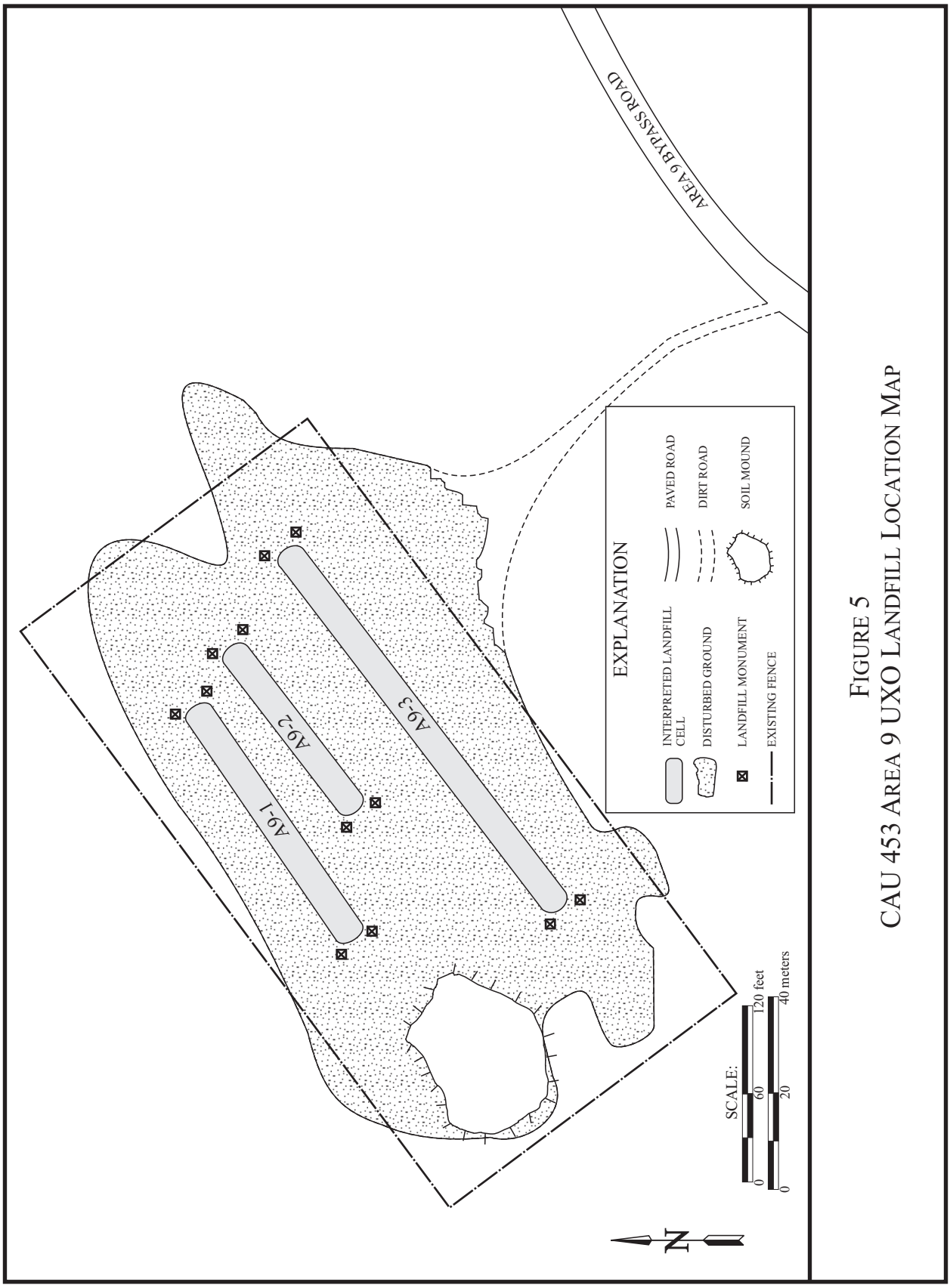

FIGURE 5
CAU 453 AREA 9 UXO LANDFILL LOCATION MAP

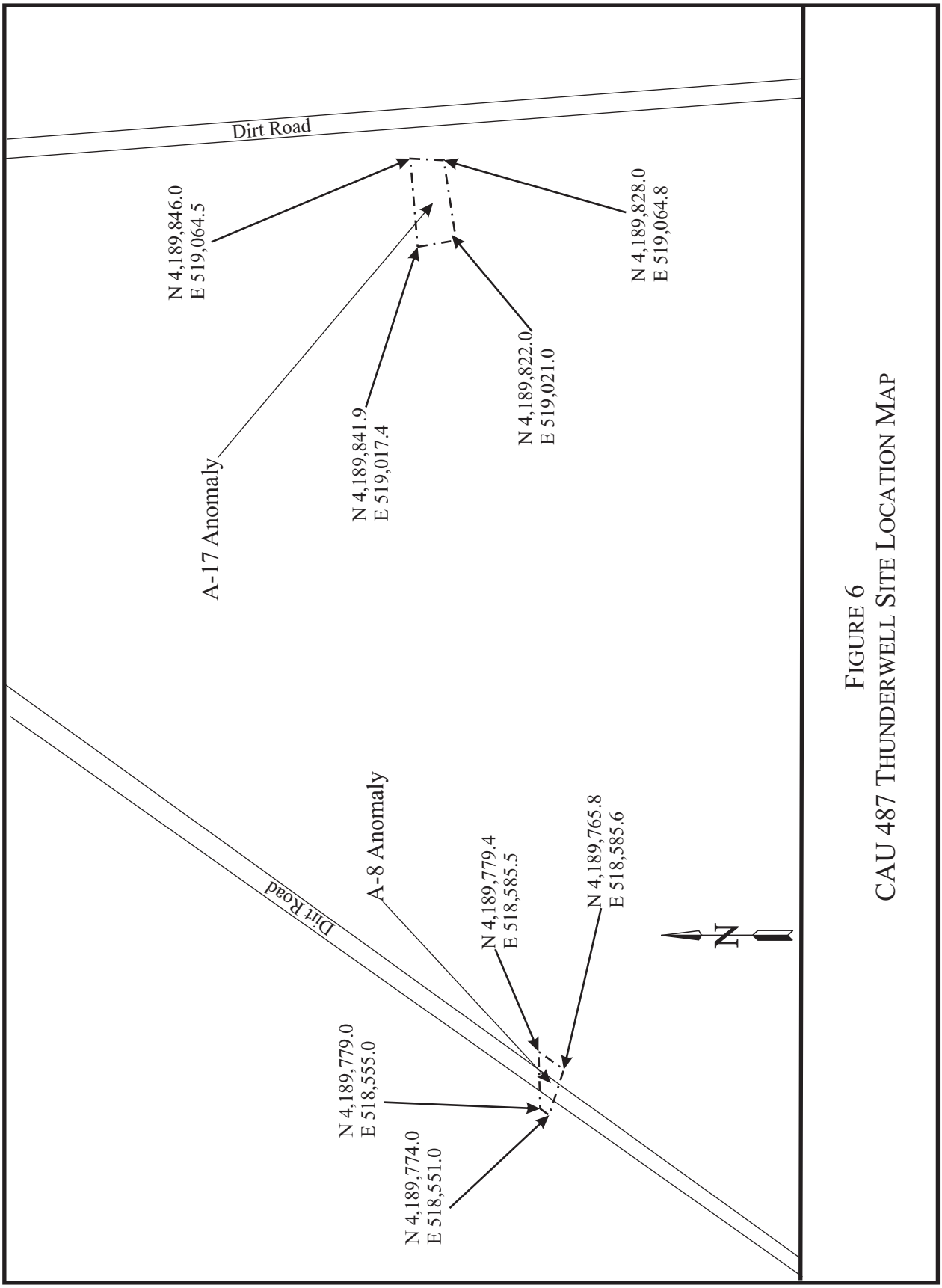

FIGURE 6
CAU 487 THUNDERWELL SITE LOCATION MAP

APPENDIX B
POST-CLOSURE INSPECTION PLANS

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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*.

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 Appendix B.

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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*.

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 453: AREA 9 UXO LANDFILL POST-CLOSURE 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*.

Post-closure inspection of the Area 9 UXO Landfill 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 (twice per year) visual inspections of:

- The cell soil cover for indications of subsidence, erosion, unauthorized excavation, 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 closure activities have completed, 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*.

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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APPENDIX C
POST-CLOSURE INSPECTION CHECKLISTS

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Inspection Requirement: **Annual**

POST-CLOSURE INSPECTION CHECKLIST

CAU 400: BOMBLET PIT AND **FIVE POINTS LANDFILL - CAS TA-19-001-05PT, ORDNANCE DISPOSAL PIT**

Inspection Date and Time: 5/4/11 9:35 AM	Reason for Inspection: Annual
Date of Last Post-Closure Inspection: 5/10/10	Reason for Last Post-Closure Inspection: Annual
Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada	
Chief Inspector: Glenn R. Richardson	Title: TASK Manager
Assistant Inspector: Dudley Elmer	Title: Sr. Scientist

A. GENERAL INSTRUCTIONS

- Complete all checklist items.
- If a SHADED BOX is checked, provide detailed information regarding what was found and/or appropriate references to other documents that have the information (e.g., Maintenance Order Form for CAS 05-16-01 dated 2/15/2008).
- All documentation must be legible and clear.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION (required if shaded box is checked)
1. Have the previous inspection reports been reviewed?	✓		
2. Were anomalies or trends detected on previous inspections?		✓	
3. Were maintenance or repairs performed since last inspection?		✓	

C. SITE INSPECTION PREPARATION

Advance coordination with TTR Security is required for access to the site. Assemble the following, as needed, to conduct inspections:

a. TTR radio, pager, etc.
b. Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
c. Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
d. Tape measure
e. Other miscellaneous support equipment

D. SITE INSPECTION

- ***The annual inspection is to document vegetation growth and inspect the integrity of the fence. The inspection can be conducted from outside the perimeter fence.*** The checklist should be completed during the site inspection.
- If a shaded box is checked, add detailed comments to document the results of the site inspection. Information provided should be of sufficient detail to enable reconstruction of observations regarding field conditions. Information can take the form of written narrative, sketches, measurements, and annotated site maps, all of which should be placed on additional attachments (if needed) and cross-reference appropriately. Attach the additional pages and number all pages upon completion of the inspection. The completed checklist is part of the field record of the inspection.
- Field notes taken to assist in completion of this checklist will become part of the inspection record. No form is specified for field notes, and additional field notes are not required if the checklist and associated attachments adequately describe site conditions.

1. Site markers:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is the barbed wire fence damaged?		✓	
b. Have any posts been damaged or their anchoring weakened?		✓	
2. Waste Unit cover:	**YES**	**NO**	**EXPLANATION (required if shaded box is checked)**
a. Is there evidence of human intrusion onto the site?		✓	

POST-CLOSURE INSPECTION CHECKLIST

CAU 400: BOMBLET PIT AND FIVE POINTS LANDFILL - CAS TA-19-001-05PT, ORDNANCE DISPOSAL PIT

2. Waste Unit cover (continued):	YES	NO	EXPLANATION (required if shaded box is checked)
b. Is there evidence of horses or rabbits on site?		✓	
c. Are weedy annual plants present?		✓	
If yes, are they a problem?			NA —
d. Are seeded plant species found on site?	✓		
e. Is there evidence of plant mortality?		✓	Good growth

Photograph Instructions:

- ***A standard set of photographs is needed for the post-closure report. Take two photos from the approximate location where photos were taken the previous year (as found in the previous year's post-closure report).***
- Photographs should be taken to document maintenance/repair needs at the site. These will be used to plan maintenance/repair activities and are not intended for use in the post-closure annual report.
- Anomalous features or new features (such as changes in adjacent area land use) should be photographed.
- Other photographs are optional.
- A photograph log entry will be made for each photograph taken.

3. Photograph Documentation:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have photographs been taken of the sites?	✓		
If yes, how many photos were taken?	10		Drainage at SE of site hay Bales
If yes, has a photographic log been prepared?	✓		

E. FIELD CONCLUSIONS	YES	NO	EXPLANATION (required if shaded box is checked)
1. Are more frequent inspections required?		✓	
2. Are existing maintenance/repair actions satisfactory?	✓		
3. Are maintenance/repair actions necessary?		✓	If "yes", describe in field conclusions/recommendations
4. Is there an imminent hazard to the integrity of the landfill cover?		✓	If "yes", describe below and the Task Manager must complete the "Follow-up Actions" (not part of checklist)

5. Field conclusions/recommendations: Re-Vegetation looks Good
Fence is Excellent Condition
Hay Bales used for drainage (Control)
largely gone.

POST-CLOSURE INSPECTION CHECKLIST

CAU 400: BOMBLET PIT AND **FIVE POINTS LANDFILL - CAS TA-19-001-05PT, ORDNANCE DISPOSAL PIT**

F. CERTIFICATION

I have conducted an inspection of CAS TA-19-001-05PT, Ordnance Disposal Pit (Five Points Landfill), in accordance with the procedures of the Post-Closure Plan as recorded on this checklist, attached sheets, field notes, photographs, and photograph logs.

Chief Inspector's Signature: /s/: Glenn Richardson	Date: 5/4/11
Printed Name: Glenn Richardson	Title: Task Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\ Photos\TTR PCM Inspections\2011\05-04-2011

Distribution: Original – Industrial Sites Project Manager
Copy – Task Manager

G. VERIFICATION

I have reviewed this checklist and attachments and have verified that it is complete.

Signature: /s/: Reed Poderis	Date: 5/25/2011
Printed Name: Thomas A. Thiele (or designee)	

Distribution: Original – Task Manager

Inspection Requirement: **Annual**

POST-CLOSURE INSPECTION CHECKLIST

CAU 407: ROLLER COASTER RADSAFE AREA
CAS TA-23-001-TARC, ROLLER COASTER RADSAFE AREA

Inspection Date and Time: 5/3/11 2:28 PM	Reason for Inspection: Annual
Date of Last Post-Closure Inspection: 5/11/10	Reason for Last Post-Closure Inspection: Annual
Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada	
Chief Inspector: Glenn Richardson	Title: TA & Manager
Assistant Inspector: Dudley Emer	Title: Sr. Scientist

A. GENERAL INSTRUCTIONS

- Complete all checklist items.
- If a SHADED BOX is checked, provide detailed information regarding what was found and/or appropriate references to other documents that have the information (e.g., Maintenance Order Form for CAS 05-16-01 dated 2/15/2008).
- All documentation must be legible and clear.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION (required if shaded box is checked)
1. Has the Post-Closure Plan been reviewed?	✓		
2. Have the previous inspection reports been reviewed?	✓		
3. Were anomalies or trends detected on previous inspections?		✓	
4. Were maintenance or repairs performed since last inspection?		✓	
a. If yes, has site repair resulted in a change from as-built conditions?			NA
b. If yes (to 4a), are revised as-built plans available that reflect repair changes?			NA

C. SITE INSPECTION PREPARATION

Advance coordination with TTR Security is required for access to the site. Assemble the following, as needed, to conduct inspections:

a. TTR radio, pager, etc.
b. Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
c. Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
d. Tape measure
e. Other miscellaneous support equipment

D. SITE INSPECTION

- ***The site inspection is a walking inspection of the perimeter fencing, viewing the entire site. Inspections consist of visually inspecting the cover for signs of erosion, animal burrows, cracks, water ponding, vegetation, and inspecting the fencing and postings.*** The checklist should be completed during the site inspection.
- If a shaded box is checked, add detailed comments to document the results of the site inspection. Information provided should be of sufficient detail to enable reconstruction of observations regarding field conditions. Information can take the form of written narrative, sketches, measurements, and annotated site maps, all of which should be placed on additional attachments (if needed) and cross-reference appropriately. Attach the additional pages and number all pages upon completion of the inspection. The completed checklist is part of the field record of the inspection.
- Field notes taken to assist in completion of this checklist will become part of the inspection record. No form is specified for field notes, and additional field notes are not required if the checklist and associated attachments adequately describe site conditions.

1. Site markers:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is the perimeter (barbed wire) fence damaged?		✓	

POST-CLOSURE INSPECTION CHECKLIST

CAU 407: ROLLER COASTER RADSAFE AREA
CAS TA-23-001-TARC, ROLLER COASTER RADSAFE AREA

1. Site markers (continued):	YES	NO	EXPLANATION (required if shaded box is checked)
b. Is the mesh wire fence damaged?		✓	
c. Have any posts been damaged or their anchoring weakened?		✓	
d. Are the URMA signs damaged or missing?		✓	
e. Are the signs legible?	✓		
f. How many of the signs need to be replaced?	0		

2. Waste Unit cover:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) on or around the cap?		✓	
d. Is there evidence of ponding on the waste cover?		✓	
e. Is there evidence of human intrusion onto the site?		✓	
f. Is there evidence of animal burrowing?		✓	
g. Is there evidence of horses or rabbits on site?		✓	
h. Is organic mulch adequate to prevent erosion?	✓		
i. Are weedy annual plants present? (If yes, are they a problem?)		✓	
j. Are seeded plant species found on site?	✓		
k. Is there evidence of plant mortality?		✓	

Photograph Instructions:

- ***A standard set of photographs is needed for the post-closure report. Take two photos from the approximate location where photos were taken the previous year (as found in the previous year's post-closure report).***
- Photographs should be taken to document maintenance/repair needs at the site. These will be used to plan maintenance/repair activities and are not intended for use in the post-closure annual report.
- Anomalous features or new features (such as changes in adjacent area land use) should be photographed.
- Other photographs are optional.
- A photograph log entry will be made for each photograph taken.

3. Photograph Documentation:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have photographs been taken of the sites?	✓		
If yes, how many photos were taken?	3		
If yes, has a photographic log been prepared?	✓		

POST-CLOSURE INSPECTION CHECKLIST

CAU 407: ROLLER COASTER RADSAFE AREA
CAS TA-23-001-TARC, ROLLER COASTER RADSAFE AREA

E. FIELD CONCLUSIONS	YES	NO	EXPLANATION (required if shaded box is checked)
1. Are more frequent inspections required?		✓	
2. Are existing maintenance/repair actions satisfactory?	✓		
3. Are maintenance/repair actions necessary?		✓	If "yes", describe in field conclusions/recommendations
4. Is there an imminent hazard to the integrity of the landfill cover?		✓	If "yes", describe below and the Task Manager must complete the "Follow-up Actions" (not part of checklist)

5. Field conclusions/recommendations: Site & Signage in excellent condition. Vegetation good condition. No issues noted.

F. CERTIFICATION

I have conducted an inspection of CAS TA-23-001-TARC, Roller Coaster RadSafe Area, in accordance with the procedures of the Post-Closure Plan as recorded on this checklist, attached sheets, field notes, photographs, and photograph logs.

Chief Inspector's Signature: /s/: Glenn Richardson Date: 5/3/11

Printed Name: Glenn Richardson Title: Task Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\Photos\TTR PCM Inspections\2011\05-03-2011)

Distribution: Original – Industrial Sites Project Manager
Copy – Task Manager

G. VERIFICATION

I have reviewed this checklist and attachments and have verified that it is complete.

Signature: /s/: Reed Poderis Date: 5/25/2011

Printed Name: Thomas A. Thiele (or designee)

Distribution: Original – Task Manager

POST-CLOSURE INSPECTION CHECKLIST

CAU 424: AREA 3 LANDFILL COMPLEX
- **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**

Inspection Date and Time: 5/3/11 15:55	Reason for Inspection: Annual
Date of Last Post-Closure Inspection: 5/11/10	Reason for Last Post-Closure Inspection: Annual
Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada	
Chief Inspector: Glenn R. Lawson	Title: Task Manager
Assistant Inspector: Dudley Ernst	Title: Sr. Scientist

A. GENERAL INSTRUCTIONS

- Complete all checklist items.
- If a SHADED BOX is checked, provide detailed information regarding what was found and/or appropriate references to other documents that have the information (e.g., Maintenance Order Form for CAS 05-16-01 dated 2/15/2008).
- All documentation must be legible and clear.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION (required if shaded box is checked)
1. Has the Post-Closure Plan been reviewed?	✓		
2. Have the previous inspection reports been reviewed?	✓		
3. Were anomalies or trends detected on previous inspections?		✓	
4. Were maintenance or repairs performed since last inspection?		✓	
a. If yes, at which sites?	NA ✓		
b. If yes, has site repair resulted in a change from as-built conditions?			NA ✓
c. If yes (to 4b), are revised as-built plans available that reflect repair changes?			NA ✓

C. SITE INSPECTION PREPARATION

Advance coordination with TTR Security is required for access to the site. Assemble the following, as needed, to conduct inspections:

a. TTR radio, pager, etc.
b. Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
c. Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
d. Tape measure
e. Other miscellaneous support equipment

D. SITE INSPECTION

- ***The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist.*** The checklist should be completed during the site inspection.
- If a shaded box is checked, add detailed comments to document the results of the site inspection. Information provided should be of sufficient detail to enable reconstruction of observations regarding field conditions. Information can take the form of written narrative, sketches, measurements, and annotated site maps, all of which should be placed on additional attachments (if needed) and cross-reference appropriately. Attach the additional pages and number all pages upon completion of the inspection. The completed checklist is part of the field record of the inspection.
- Field notes taken to assist in completion of this checklist will become part of the inspection record. No form is specified for field notes, and additional field notes are not required if the checklist and associated attachments adequately describe site conditions.

POST-CLOSURE INSPECTION CHECKLIST

CAU 424: AREA 3 LANDFILL COMPLEX
- 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

D. SITE INSPECTION (continued)

1. Site markers (Landfill A3-1):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the seven (7) boundary monuments been disturbed?		✓	
b. Are all boundary monuments in good condition?	✓		
c. Are all brass survey markers in good condition?	✓		
d. Are any of the warning signs damaged or missing?		✓	
e. Are all signs legible?	✓		
f. How many signs need to be replaced?	0		

2. Use-restricted area (Landfill A3-1):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

3. Site markers (Landfill A3-2):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the four (4) boundary monuments been disturbed?		✓	
b. Are all boundary monuments in good condition?	✓		
c. Are all brass survey markers in good condition?	✓		
d. Are any of the warning signs damaged or missing?		✓	
e. Are all signs legible?	✓		
f. How many signs need to be replaced?	0		

4. Use-restricted area (Landfill A3-2):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

POST-CLOSURE INSPECTION CHECKLIST

CAU 424: AREA 3 LANDFILL COMPLEX
- **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**

5. Site markers (Landfill A3-3, western 2 cells):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the three (3) boundary monuments been disturbed?		✓	
b. Are all boundary monuments in good condition?	✓		
c. Are all brass survey markers in good condition?	✓		
d. Are any of the warning signs damaged or missing?		✓	
e. Are all signs legible?	✓		
f. How many signs need to be replaced?	0		
g. Are all three (3) surface markers in good condition?	✓		

6. Use-restricted area (Landfill A3-3, western 2 cells):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

7. Site markers (Landfill A3-3, eastern cell):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the three (3) boundary monuments been disturbed?		✓	
b. Are all brass survey markers in good condition?		✓	Cannot verify if all brass survey markers are in good condition. Only 1 of 3 surface markers located.

8. Use-restricted area (Landfill A3-3, eastern cell):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

9. Site markers (Landfill A3-4):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the five (5) boundary monuments been disturbed?		✓	
b. Are all boundary monuments in good condition?	✓		
c. Are all brass survey markers in good condition?	✓		

POST-CLOSURE INSPECTION CHECKLIST

CAU 424: AREA 3 LANDFILL COMPLEX
- 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

9. Site markers (Landfill A3-4), continued:	YES	NO	EXPLANATION (required if shaded box is checked)
d. Are any of the warning signs damaged or missing?		✓	
e. Are all signs legible?	✓		
f. How many signs need to be replaced?	0		
g. Is the surface marker in good condition?	✓		

10. Use-restricted area (Landfill A3-4):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

11. Site markers (Landfill A3-5):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the four (4) boundary monuments been disturbed?		✓	
b. Are all boundary monuments in good condition?	✓		
c. Are all brass survey markers in good condition?	✓		
d. Are any of the warning signs damaged or missing?		✓	
e. Are all signs legible?	✓		
f. How many signs need to be replaced?	0		

12. Use-restricted area (Landfill A3-5):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

13. Site markers (Landfill A3-6):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have any of the four (4) boundary monuments been disturbed?		✓	
b. Are all boundary monuments in good condition?	✓		

POST-CLOSURE INSPECTION CHECKLIST

CAU 424: AREA 3 LANDFILL COMPLEX
- 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

13. Site markers (Landfill A3-6), continued:	YES	NO	EXPLANATION (required if shaded box is checked)
c. Are all brass survey markers in good condition?	✓		
d. Are any of the warning signs damaged or missing?		✓	
e. Are all signs legible?	✓		
f. How many signs need to be replaced?	0		

14. Use-restricted area (Landfill A3-6):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

15. Site markers (Landfill A3-8):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Are all four (4) surface markers in good condition?	✓		
b. Are all brass survey markers in good condition?	✓		
c. Are any of the warning signs damaged or missing?			
d. Are all signs legible?	✓		
e. How many signs need to be replaced?	0		

16. Use-restricted area (Landfill A3-8):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) through or around the cover?		✓	
d. Is there evidence of animals burrowing into the cover?		✓	
e. Is there evidence of human intrusion into the cover?		✓	

Photograph Instructions:

- ***A standard set of photographs is required. Take a minimum of one photograph at each site from the approximate locations where photos were taken the previous year (as found in the previous year's post-closure report).***
- Photographs should be taken to document maintenance/repair needs at the site. These will be used to plan maintenance/repair activities and are not intended for use in the post-closure annual report.
- Anomalous features or new features (such as changes in adjacent area land use) should be photographed.
- Other photographs are optional.
- A photograph log entry will be made for each photograph taken.

POST-CLOSURE INSPECTION CHECKLIST

CAU 424: AREA 3 LANDFILL COMPLEX
- 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

17. Photograph Documentation:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have photographs been taken of the sites?	✓		
If yes, how many photos were taken?	20		
If yes, has a photographic log been prepared?	✓		Log number: Photos are logged electronically on the ER Shared drive.

E. FIELD CONCLUSIONS	YES	NO	EXPLANATION (required if shaded box is checked)
1. Are more frequent inspections required?		✓	
2. Are existing maintenance/repair actions satisfactory?	✓		
3. Are maintenance/repair actions necessary?	✓		If "yes", describe in field conclusions/recommendations
4. Is there an imminent hazard to the integrity of the landfill cover?		✓	If "yes", describe below and the Task Manager must complete the "Follow-up Actions" (not part of checklist)

5. Field conclusions/recommendations: Overall site conditions associated with all landfill cells for CAU 424 appear to be great. Two (2) of three surface grade markers at the eastern cell of Landfill Cell A3-3 could not be located in the field. A follow-up action will be taken to re-inspect the two surface grade markers that were previously missed. In addition, more lava rock will be used in this high volume traffic area to clearly delineate the specific location of each surface grade marker at Landfill Cell A3-3.

F. CERTIFICATION

I have conducted an inspection of CASs 03-08-001-A301 through A306 and A308, Landfills A3-1 through A3-6 and A3-8, in accordance with the procedures of the Post-Closure Plan as recorded on this checklist, attached sheets, field notes, photographs, and photograph logs.

Chief Inspector's Signature: /s/: Glenn Richardson	Date: 5/3/11
Printed Name: Glenn Richardson	Title: Task Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\Photos\TTR PCM Inspections\2011\05-03-2011)
  S:\NTS\ER Share\Photos\TTR PCM Inspections\2011\05-04-2011

Distribution: Original – Industrial Sites Project Manager
Copy – Task Manager

POST-CLOSURE INSPECTION CHECKLIST	
CAU 424: AREA 3 LANDFILL COMPLEX	**- CAS 03-08-001-A301, LANDFILL A3-1**
- CAS 03-08-001-A302, LANDFILL A3-2	**- CAS 03-08-001-A303, LANDFILL A3-3**
- CAS 03-08-001-A304, LANDFILL A3-4	**- CAS 03-08-001-A305, LANDFILL A3-5**
- CAS 03-08-001-A306, LANDFILL A3-6	**- CAS 03-08-001-A308, LANDFILL A3-8**

G. VERIFICATION

I have reviewed this checklist and attachments and have verified that it is complete.

Signature: /s/: Reed Poderis

Date: 5/25/2011

Printed Name: Thomas A. Thiele (or designee)

Distribution: Original – Task Manager

Inspection Requirement: **Annual**

POST-CLOSURE INSPECTION CHECKLIST

CAU 453: AREA 9 UXO LANDFILL - CAS 09-55-001-0952, AREA 9 LANDFILL

Inspection Date and Time: 5/4/11 9:50 AM	Reason for Inspection: Annual
Date of Last Post-Closure Inspection: 5/12/10	Reason for Last Post-Closure Inspection: Annual
Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada	
Chief Inspector: Glenn Richardson	Title: Task Manager
Assistant Inspector: Dudley Emer	Title: Sr. Scientist

A. GENERAL INSTRUCTIONS

- Complete all checklist items.
- If a SHADED BOX is checked, provide detailed information regarding what was found and/or appropriate references to other documents that have the information (e.g., Maintenance Order Form for CAS 05-16-01 dated 2/15/2008).
- All documentation must be legible and clear.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION (required if shaded box is checked)
1. Has the Post-Closure Plan been reviewed?	✓		
2. Have the previous inspection reports been reviewed?	✓		
3. Were anomalies or trends detected on previous inspections?		✓	
4. Were maintenance or repairs performed since last inspection?	✓		Animal burrows filled

C. SITE INSPECTION PREPARATION

Advance coordination with TTR Security is required for access to the site. Assemble the following, as needed, to conduct inspections:

a. TTR radio, pager, etc.
b. Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
c. Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
d. Tape measure
e. Other miscellaneous support equipment

D. SITE INSPECTION

- ***The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist.*** The checklist should be completed during the site inspection.
- If a shaded box is checked, add detailed comments to document the results of the site inspection. Information provided should be of sufficient detail to enable reconstruction of observations regarding field conditions. Information can take the form of written narrative, sketches, measurements, and annotated site maps, all of which should be placed on additional attachments (if needed) and cross-reference appropriately. Attach the additional pages and number all pages upon completion of the inspection. The completed checklist is part of the field record of the inspection.
- Field notes taken to assist in completion of this checklist will become part of the inspection record. No form is specified for field notes, and additional field notes are not required if the checklist and associated attachments adequately describe site conditions.

1. Site markers:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is the gate damaged?		✓	
b. Is the gate lock in place and functional?	✓		
c. Is the fence damaged?		✓	

POST-CLOSURE INSPECTION CHECKLIST

CAU 453: AREA 9 UXO LANDFILL - CAS 09-55-001-0952, AREA 9 LANDFILL

1. Site markers (continued):	YES	NO	EXPLANATION (required if shaded box is checked)
d. Have any posts been damaged or their anchoring weakened?		✓	
e. Have boundary monuments been disturbed?		✓	
f. Are boundary monuments in good condition?	✓		
g. Are any of the use restriction warning signs damaged or missing?		✓	
h. Are all signs legible?	✓		
i. How many signs need to be replaced?	0		

2. Use-restricted area:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?		✓	
b. Is there cracking?		✓	
c. Is there evidence of erosion (wind or water) over trenches A9-1, A9-2, or A9-3?		✓	Erosion on Soil Pile (Unused) not trench Related
d. Is there evidence of human intrusion onto the site?		✓	
e. Is there evidence of animal burrowing into trenches A9-1, A9-2, or A9-3?	✓		Numerous burrows

Photograph Instructions:

- ***A standard set of photographs is needed for the post-closure report. Take one photo from the approximate location where the photo was taken the previous year (as found in the previous year's post-closure report).***
- Photographs should be taken to document maintenance/repair needs at the site. These will be used to plan maintenance/repair activities and are not intended for use in the post-closure annual report.
- Anomalous features or new features (such as changes in adjacent area land use) should be photographed.
- Other photographs are optional.
- A photograph log entry will be made for each photograph taken.

3. Photograph Documentation:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have photographs been taken of the sites?	✓		
If yes, how many photos were taken?	8		
If yes, has a photographic log been prepared?	✓		

E. FIELD CONCLUSIONS	YES	NO	EXPLANATION (required if shaded box is checked)
1. Are more frequent inspections required?		✓	
2. Are existing maintenance/repair actions satisfactory?	✓		
3. Are maintenance/repair actions necessary?	✓		If "yes", describe in field conclusions/recommendations
4. Is there an imminent hazard to the integrity of the landfill cover?		✓	If "yes", describe below and the Task Manager must complete the "Follow-up Actions" (not part of checklist)

POST-CLOSURE INSPECTION CHECKLIST

CAU 453: AREA 9 UXO LANDFILL - CAS 09-55-001-0952, AREA 9 LANDFILL

E. FIELD CONCLUSIONS (continued)

5. Field conclusions/recommendations: Site & fencing in Good condition.
Signage legible.
Numerous burrows were noted along fence boundary & in the immediate area of all trenches.
Recommend Maintence to fill burrows.

F. CERTIFICATION

I have conducted an inspection of CAS 09-55-001-0952, Area 9 Landfill, in accordance with the procedures of the Post-Closure Plan as recorded on this checklist, attached sheets, field notes, photographs, and photograph logs.

Chief Inspector's Signature: /s/: Glenn Richardson	Date: 5/4/11
Printed Name: Glenn Richardson	Title: Task Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\Photos\TTR PCM Inspections\2011\05-04-2011

Distribution: Original – Industrial Sites Project Manager
Copy – Task Manager

G. VERIFICATION

I have reviewed this checklist and attachments and have verified that it is complete.

Signature: /s/: Reed Poderis	Date: 5/25/2011
Printed Name: Thomas A. Thiele (or designee)	

Distribution: Original – Task Manager

Inspection Requirement: **Annual**

POST-CLOSURE INSPECTION CHECKLIST

CAU 487: THUNDERWELL SITE - CAS RG-26-001-RGRV, THUNDERWELL SITE

Inspection Date and Time: 5/4/11 10:55 AM	Reason for Inspection: Annual
Date of Last Post-Closure Inspection: 5/12/10	Reason for Last Post-Closure Inspection: Annual
Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada	
Chief Inspector: Glenn Richardson	Title: Task Manager
Assistant Inspector: Dudley Elmer	Title: Sr. Scientist

A. GENERAL INSTRUCTIONS

- Complete all checklist items.
- If a SHADED BOX is checked, provide detailed information regarding what was found and/or appropriate references to other documents that have the information (e.g., Maintenance Order Form for CAS 05-16-01 dated 2/15/2008).
- All documentation must be legible and clear.

B. PREPARATION (To be completed prior to site visit)	YES	NO	EXPLANATION (required if shaded box is checked)
1. Has the Post-Closure Plan been reviewed?	✓		
2. Have the previous inspection reports been reviewed?	✓		
3. Were anomalies or trends detected on previous inspections?		✓	
4. Were maintenance or repairs performed since last inspection?		✓	

C. SITE INSPECTION PREPARATION

Advance coordination with TTR Security is required for access to the site. Assemble the following, as needed, to conduct inspections:

a. TTR radio, pager, etc.
b. Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
c. Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
d. Tape measure
e. Other miscellaneous support equipment

D. SITE INSPECTION

- ***The site inspection is a walking inspection of the entire site including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist.*** The checklist should be completed during the site inspection.
- If a shaded box is checked, add detailed comments to document the results of the site inspection. Information provided should be of sufficient detail to enable reconstruction of observations regarding field conditions. Information can take the form of written narrative, sketches, measurements, and annotated site maps, all of which should be placed on additional attachments (if needed) and cross-reference appropriately. Attach the additional pages and number all pages upon completion of the inspection. The completed checklist is part of the field record of the inspection.
- Field notes taken to assist in completion of this checklist will become part of the inspection record. No form is specified for field notes, and additional field notes are not required if the checklist and associated attachments adequately describe site conditions.

1. Site markers (A8 Anomalies Area):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have boundary monuments been disturbed?		✓	
b. Are boundary monuments in good condition?	✓		
c. Are any of the use restriction warning signs damaged or missing?	✓		1 missing

POST-CLOSURE INSPECTION CHECKLIST

CAU 487: THUNDERWELL SITE - CAS RG-26-001-RGRV, THUNDERWELL SITE

1. Site markers (A8 Anomalies Area):	YES	NO	EXPLANATION (required if shaded box is checked)
d. Are all signs legible?		✓	"WARNING" on all faded lettering illegible
e. How many signs need to be replaced?	8		Recommend Replace 8 Signs
2. Use-restricted area (A8 Anomalies Area):	**YES**	**NO**	**EXPLANATION (required if shaded box is checked)**
a. Is there evidence of human intrusion onto the site?		✓	
b. Is there evidence of large animal intrusion into the cover?		✓	
3. Site markers (A17 Anomalies Area):	**YES**	**NO**	**EXPLANATION (required if shaded box is checked)**
a. Have boundary monuments been disturbed?		✓	
b. Are boundary monuments in good condition?	✓		
c. Are any of the use restriction warning signs damaged or missing?		✓	
d. Are all signs legible?		✓	Faded "Warning"
e. How many signs need to be replaced?	8		
4. Use-restricted area (A17 Anomalies):	**YES**	**NO**	**EXPLANATION (required if shaded box is checked)**
a. Is there evidence of human intrusion onto the site?		✓	
b. Is there evidence of large animal intrusion into the cover?	✓		Large burrow in Mound Lot

Photograph Instructions:

- ***A standard set of photographs is needed for the post-closure report. Take two photos – one from each site – at the approximate locations where photos were taken the previous year (as found in the previous year's post-closure report).***
- Photographs should be taken to document maintenance/repair needs at the site. These will be used to plan maintenance/repair activities and are not intended for use in the post-closure annual report.
- Anomalous features or new features (such as changes in adjacent area land use) should be photographed.
- Other photographs are optional.
- A photograph log entry will be made for each photograph taken.

5. Photograph Documentation:	YES	NO	EXPLANATION (required if shaded box is checked)
a. Have photographs been taken of the sites?	✓		
If yes, how many photos were taken?	9		
If yes, has a photographic log been prepared?	✓		✓

E. FIELD CONCLUSIONS	YES	NO	EXPLANATION (required if shaded box is checked)
1. Are more frequent inspections required?		✓	
2. Are existing maintenance/repair actions satisfactory?	✓		
3. Are maintenance/repair actions necessary?	✓		If "yes", describe in field conclusions/recommendations

POST-CLOSURE INSPECTION CHECKLIST

CAU 487: THUNDERWELL SITE - CAS RG-26-001-RGRV, THUNDERWELL SITE

E. FIELD CONCLUSIONS (continued)

4. Field conclusions/recommendations: A-8 Missing Sign
all 8 Signs have faded "Warning"
all other Legible
8 faded A-14 Signs
1 Large burrow at A-14 in Soil Mound
needs Filling

F. CERTIFICATION

I have conducted an inspection of CAS RG-26-001-RGRV, Thunderwell Site, in accordance with the procedures of the Post-Closure Plan as recorded on this checklist, attached sheets, field notes, photographs, and photograph logs.

Chief Inspector's Signature: /s/: Glenn Richardson	Date: 5/4/11
Printed Name: Glenn Richardson	Title: Task Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\Photos\TTR PCM Inspections\2011\05-04-2011)

Distribution: Original – Industrial Sites Project Manager
Copy – Task Manager

G. VERIFICATION

I have reviewed this checklist and attachments and have verified that it is complete.

Signature: /s/: Reed Poderis	Date: 5/25/2011
Printed Name: Thomas A. Thiele (or designee)	

Distribution: Original – Task Manager

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APPENDIX D
FIELD NOTES

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Annual TTR Post Closure Inspections

Personnel: Glenn Richardson, Task Manager (NSTec) NSO: Kevin Cabble
Dudley Emer, Sr. Scientist NDEP: Ted Zaferatos

Equipment: Digital Camera (Special Permit Provided for use at TTR)
Weather: Cloudy, Light Breeze, Mid - High 60's

Scope: Perform post closure site inspections for the following: 400, 407, 424, 426, 453, 487, and inspect 404 as a best management practice. Also, verify site closure for CAU 484.

12:15 PM - Met with Jerry (Washington Group POC) to notify him of our planned inspections, pick-up TTR Radios, and confirm inspection areas are accessible. Also, met NSO and NDEP to start site inspections.
1:40 PM - Per NSO direction, all 484 sites were visited on Antelope Lake to verify site closure activities were complete. CAU 484 sites were clean closed by NNES ~~4/25/11~~ and are no longer part of TTR post closure sites. 484 sites included: CA-1, SA-4, SA-5-9, and SA-12-15.
2:28 PM - Arrived at CAU 407 to perform inspection. Prior to the inspection, a brief tailgate safety mtg. was conducted. We discussed slips/trips/falls. Buddy system at all times. Be aware of heat stress conditions even though we're at a higher elevation. Continue to stay hydrated with water. Be aware of biological hazards. Contact ASI Security for access control in areas with gates and barricades. Results of the CAU 407 site inspection confirmed the radiological postings were intact and the barb-wire fencing was in great condition. Also, the vegetation growth appeared to be maturing at

Work continued to Page 112

SIGNATURE /s/: Glenn Richardson			DATE 5/3/11
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

Work continued from Page 111

a rapid rate. Photo documentation was taken. There was no evidence of intrusion at the site. As a BMP, use restriction signs will be installed at the site.

2:40 PM - Arrived at CAU 404 to perform a BMP inspection. Overall site conditions at this site are excellent. No damage to the fencing and no evidence of intrusion on the vegetative cover. Photo documentation was taken. As a BMP, administrative UR signs will be installed at the site.

3:10 PM - Arrived at CAU 426 (Cactus Springs Trenches) to perform an inspection. The signage and fencing remain in good condition. There was no evidence of animal intrusion on the vegetative cover. Photos were taken at the site. As a BMP, UR signs will be installed at the site.

3:53 PM - Arrived at CAU 424 A3-1 Landfill Cell. The aboveground monuments are stable and in good condition. Two photos were taken.

4:04 PM - Arrived at CAU 424 A3-2 Landfill Cell. Above ground monuments are stationary and in good condition. A photo was taken.

4:15 PM - Arrived at CAU 424 A3-3 Landfill Cell. Located the aboveground monuments and adjacent surface monuments inside the Washington Group equipment yard; however, had difficulty locating the surface grade monuments representing the use restriction boundary for a historical spill that occurred in the equipment yard. Only one of three surface grade monuments could be found. An attempt was made with receiving GPS coordinates, using a metal detector, etc. but was not successful. The lava rock originally in place to delineate the surface monument locations had been spreaded out over time because of this area being one with high traffic volume. As a corrective action, more lava rock needs to be used to delineate these areas once they are identified. The original UR maps will be used to support this effort.

Work continued to Page 113

SIGNATURE /s/: Glenn Richardson			DATE 5/3/11
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

4:30 PM - Arrived at CAU 424 A3-4 Landfill Cell. Inspected the aboveground monuments to find them in good condition. Two photos were taken. No issues or concerns.

4:35 PM - Arrived at CAU 424 A3-5 Landfill Cell. The aboveground monuments are stable and in good condition. Photos were taken. This site has no issues.

4:50 PM - Arrived at CAU 424 A3-8 Landfill Cell. All four (4) surface grade markers were located. As a BMP, consider using lava rock to better delineate the monument locations. No issues or concerns.

5:00 PM - Arrived at CAU 424 A3-6 Landfill Cell. The aboveground monuments show no evidence of damage and remain stable in good condition. No issues at this site.

5:05 PM - Ended Inspections. Will Resume on 5/4/11.

5/3/11

/s/: Glenn Richardson

Work continued to Page 114

SIGNATURE /s/: Glenn Richardson			DATE 5/3/11
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

114 PROJECT NO.
BOOK NO.

TITLE

Work continued from Page 113

Continue TTR Post Closure Inspections 5/4/11

9:05 AM - Arrived at CAU 400 Bomblet Pit. Reviewed the Tailgate Safety Briefing. Reviewed Scope of Work and discussed potential hazards. Noticed that a large section of the vegetative cover was disturbed by construction equipment. NSO + NDEP noticed the same discovery. It was determined that an external UXO contractor disturbed the area in an effort to clear the target zones for potential anomalies. This was scope that NSTec was not involved with and had no knowledge of the anticipated outcome. Observations of the site were documented and follow-up actions are pending NSO/NDEP determination. A vegetation monitoring by NSTec is still planned in June 2011 to assess the potential impacts and estimate a path to recover vegetation in areas that if was removed. Multiple photos were taken.

9:35 AM - Arrived at CAU 400 5 Points Landfill. Inspected the site to confirm the barb-wire and chicken wire fencing are in good condition. The vegetation appears to be growing at a rapid rate. Overall site conditions are great. There are no issues or concerns.

9:50 AM - Arrived at CAU 453 Area 9 UXO Landfill to perform a inspection. To be expected, a few animal burrows were noticed at the surface of the landfill cover. The aboveground monuments and chain-link fencing were in great condition. The animal burrows will need to be backfilled. No need to replace the signage at this site. It is still viewed as adequate signage by the client.

10:35 AM - Arrived at CAU 487 (Thunderwell sites) to perform an inspection. The aboveground monuments at A-8 Anomaly site and A-17 Anomaly are sturdy and intact. However, the UR signage at both sites shows evidence of faded text at each concrete monument. All UR signage needs to be replaced.

11:30 End of TTR Inspections

Work continued to Page

SIGNATURE /s/: Glenn Richardson			DATE 5/4/11
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

APPENDIX E
PHOTOGRAPHS

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PHOTOGRAPH LOG

PHOTOGRAPH	DATE	DESCRIPTION
1	05/04/2011	CAU 400 Five Points Landfill, Looking West
2	05/03/2011	CAU 407, Looking East
3	05/03/2011	CAU 424, Landfill Cell A3-1, Looking Southeast
4	05/03/2011	CAU 424, Landfill Cell A3-2, Looking North
5	05/03/2011	CAU 424, Landfill Cell A3-3, Looking Northwest
6	05/03/2011	CAU 424, Landfill Cell A3-4, Looking North
7	05/03/2011	CAU 424, Landfill Cell A3-5, Looking Southeast
8	05/03/2011	CAU 424, Landfill Cell A3-6, Looking East
9	05/03/2011	CAU 424, Landfill Cell A3-8, Surface Monument
10	05/04/2011	CAU 453, Looking Northwest
11	05/04/2011	CAU 487, A-8 Anomaly, Looking North
12	05/04/2011	CAU 487, A-17 Anomaly, Looking West

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Photograph 1: CAU 400 Five Points Landfill, Looking West, 05/04/2011

Photograph 2: CAU 407, Looking East, 05/03/2011

Photograph 3: CAU 424, Landfill Cell A3-1, Looking Southeast, 05/03/2011

Photograph 4: CAU 424, Landfill Cell A3-2, Looking North, 05/03/2011

Photograph 5: CAU 424, Landfill Cell A3-3, Looking Northwest, 05/03/2011

Photograph 6: CAU 424, Landfill Cell A3-4, Looking North, 05/03/2011

Photograph 7: CAU 424, Landfill Cell A3-5, Looking Southeast, 05/03/2011

Photograph 8: CAU 424, Landfill Cell A3-6, Looking East, 05/03/2011

Photograph 9: CAU 424, Landfill Cell A3-8, Surface Monument, 05/03/2011

Photograph 10: CAU 453, Looking Northwest, 05/04/2011

Photograph 11: CAU 487, A-8 Anomaly, Looking North, 05/04/2011

Photograph 12: CAU 487, A-17 Anomaly, Looking West, 05/04/2011

APPENDIX F
POST-CLOSURE VEGETATION MONITORING REPORT

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POST-CLOSURE VEGETATION MONITORING REPORT

CORRECTIVE ACTION UNIT 400, FIVE POINTS LANDFILL (TTR)

CORRECTIVE ACTION UNIT 407, ROLLER COASTER RADSAFE AREA (TTR)

Field Work Completed
June 9, 2011

Report Prepared
by
David C. Anderson, Sr. Scientist
Ecological Services

August 2011

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TABLE OF CONTENTS

TABLES

ATTACHMENTS

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1.0 INTRODUCTION

This report documents the methods and results of monitoring conducted in June 2011 at Corrective Action Units (CAUs) 400 and 407 on the Tonopah Test Range (TTR). The status of vegetation is described and compared to adjacent undisturbed areas. Concerns and issues are identified, and remedial actions are recommended to ensure the cover is maintained.

In 1997, CAU 400, Five Points Landfill, was seeded with a mix of native shrubs and grasses. The site was mulched with straw that was crimped into the soil. The site was protected from grazing animals (e.g., horses and rabbits) with a 4-foot barbed wire fence and 2 feet of chicken wire along the base of the fence. In 2000, CAU 407 was revegetated using similar techniques.

Remedial revegetation has been completed at these sites. A flash flood swept through CAU 400, Five Points Landfill, in 2003. The 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 2004. The site flooded again in 2006, and much of the lower portions of the site were covered with several inches of sediment. No remedial action was taken. After CAU 407 was revegetated in 2000, cover repairs resulted in the loss of vegetation. In 2004, erosion channels on the cover were repaired, and the site was reseeded. An erosion blanket was used to minimize erosion.

2.0 OBJECTIVES

The objective of revegetation is to accelerate the reestablishment of native plants and return the site to pre-disturbance conditions. Vegetation affords protection from wind and water erosion to maintain the integrity of the site. It also impedes noxious, weedy species and provides cover and food for wildlife. The objective of monitoring is to document the success of revegetation and to identify any issues that may need to be addressed to maintain the integrity of the sites.

3.0 METHODS

Monitoring was performed on June 9, 2011. Plant cover and density were recorded, wildlife usage was noted, and erosion was evaluated. Plant cover was estimated using an optical point projection device. Samples were taken at intervals along a permanent linear transect. Cover was recorded by species. Density was estimated using 1-square meter (m^2) quadrats at intervals along each transect. The total number of individual plants within each quadrat was recorded. The data were averaged over all quadrats. Species richness was calculated from density data. The number of different plant species within each quadrat was averaged over all quadrats. This provides indication of the diversity or heterogeneity of the plant community. Wildlife usage was determined from the presence of animal burrows or scat, browsing by animals, and the observation of animals. Erosion was measured by observing erosion channels or exposed plant roots.

Revegetation is considered successful when a pre-determined percentage of plant cover and density on an adjacent area that represents an undisturbed plant community is achieved. A typical percentage used to determine success is 70 percent. The time needed for reestablishment of a native plant community on a disturbed location ranges from 5 to 10 years; however, this depends on factors such as degree of disturbance, soil types, climate conditions, precipitation amounts and patterns, and temperature extremes. Revegetation success is achieved after several consecutive years of meeting, or exceeding, success criteria.

4.0 CAU 400, FIVE POINTS LANDFILL, SURVEY RESULTS

In 2011, six transects were sampled, two in the area that had not flooded, three in the area that was re-seeded in 2004, and one in the reference area.

4.1 PLANT COVER

Plant cover on the staging area was a mix of annual forbs and perennial shrubs and grasses (Table 1). Fourwing saltbush was the single shrub species and made up approximately 59 percent of total plant cover. Two perennial grasses, Indian ricegrass and squirreltail, made up approximately 23 percent of total plant cover. Two forbs, Hoary tansyaster and whitestem blazingstar, made up the remaining 18 percent of total plant cover.

Plant cover on the re-seeded area was less than 6 percent and was made up of one perennial shrub, fourwing saltbush.

The 9-year average for plant cover on the reference area is 17 percent, which includes 8 percent shrubs, 5 percent grasses, and 4 percent forbs. Two shrubs contributed to cover, Green's rabbitbrush and fourwing saltbush. Shrubs made up approximately 47 percent of total plant cover. Indian ricegrass, the only grass, made up 28 percent of total plant cover. Non-invasive forbs made up 23 percent of total plant cover. Twelve non-invasive forbs contributed to total plant cover. Whitestem blazingstar, Esteve's pincushion, and Nye gilia were the most common and made up two-thirds of total forb cover. Prickly Russian thistle was the only noxious weed and accounted for approximately 2 percent of total plant cover.

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

		Staging	Re-Seeded	Reference	Standard
SHRUBS	Fourwing saltbush	8.13	5.83	1.60	
	Greene's rabbitbrush	0.00	0.00	6.60	
	Total Shrub Cover	**8.13**	**5.83**	**8.20**	**5.74**
GRASSES	Indian ricegrass	2.50	0.00	4.90	
	Squirreltail grass	0.63	0.00	0.00	
	Total Grass Cover	**3.13**	**0.00**	**4.90**	**3.43**
FORBS	Buckwheat	0.00	0.00	0.20	
	Cryptantha	0.00	0.00	0.20	
	Desert woollystar	0.00	0.00	0.10	
	Eggleaf fiddleleaf	0.00	0.00	0.20	
	Esteve's pincushion	0.00	0.00	1.00	
	Flatcrown buckwheat	0.00	0.00	0.10	
	Hoary tansyaster	1.25	0.00	0.00	
	Lupine	0.00	0.00	0.10	
	Nye gilia	0.00	0.00	0.60	
	Springparsley	0.00	0.00	0.10	
	Tufted evening primrose	0.00	0.00	0.30	
	Western tansymustard	0.00	0.00	0.10	
	Whitestem blazingstar	1.25	0.00	1.10	
	Total Forb Cover	**2.50**	**0.00**	**4.10**	**2.87**
INVASIVE WEEDS	Prickly Russian thistle	0.00	0.00	0.30	
	Total Invasive Weed Cover	**0.00**	**0.00**	**0.30**	
TOTAL PLANT COVER		**13.8**	**5.83**	**17.5**	**12.3**
Bare Ground		70.6	82.5	68.0	
Litter		15.6	11.7	14.5	

4.2 PLANT DENSITY

Plant density on the staging area was 5.85 plants/m^2, which included 0.78 shrubs/m^2, 0.48 grasses/m^2, 4.16 forbs/m^2, and 0.43 invasive weeds/m^2 (Table 2). There were four perennial species, including two shrubs (fourwing saltbush and bud sagebrush) and two grasses (Indian ricegrass and squirreltail grass). Forb density was higher than shrub and grass density. Whitestem blazingstar had the highest density, followed by desert woollystar and small wirelettuce. These three forbs accounted for approximately 96 percent of total forb density. Prickly Russian thistle was the only noxious weed and had a density of 0.43 plants/m^2.

Plant density on the re-seeded area was 0.11 plants/m^2. Shrub density was 0.07 plants/m^2. There were no perennial grasses and 0.03 forbs/m^2. There was one shrub (fourwing saltbush), one forb (Esteve's pincushion), and one noxious weed (prickly Russian thistle).

Plant density on the reference area was 25.8 plants/m^2. There were 0.80 shrubs/m^2. Greene's rabbitbrush had the highest density, followed by fourwing saltbush and winterfat. Grass density was 1.60 grasses/m^2 and was mostly made up of Indian ricegrass with a few isolated plants of squirreltail and galleta grass. Forb density was 21.7 forbs/m^2. The most common species was Esteve's pincushion, followed by hoary tansyaster, ragweed, red root cryptantha, Nye gilia, eggleaf fiddleleaf, and cushion cryptantha.

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

		Staging	Re-Seeded	Reference	Standard
SHRUBS	Bud sagebrush	0.05	0.00	0.00	
	Fourwing saltbush	0.73	0.07	0.13	
	Greene's rabbitbrush	0.00	0.00	0.65	
	Winterfat	0.00	0.00	0.02	
	Total Shrub Density	**0.78**	**0.07**	**0.80**	**0.56**
GRASSES	Indian ricegrass	0.33	0.00	1.57	
	Galleta grass	0.00	0.00	0.01	
	Squirreltail grass	0.15	0.00	0.02	
	Total Grass Density	**0.48**	**0.00**	**1.60**	**1.12**
FORBS	Birdnest buckwheat	0.00	0.00	0.02	
	Buckwheat	0.00	0.00	1.14	
	Cryptantha	0.00	0.00	0.17	
	Cushion cryptantha	0.00	0.00	1.21	
	Desert globemallow	0.00	0.00	0.82	
	Desert woollystar	1.20	0.00	0.28	
	Eggleaf fiddleleaf	0.00	0.00	1.38	
	Esteve's pincushion	0.00	0.03	3.93	
	Herb sophia	0.00	0.00	0.31	
	Hoary tansyaster	0.05	0.00	3.62	
	Lupine	0.00	0.00	0.18	
	Nye gilia	0.05	0.00	1.62	
	Ragweed	0.05	0.00	2.54	
	Red root cryptantha	0.00	0.00	1.80	
	Small wirelettuce	0.48	0.00	0.02	
	Sowthistle desert dandelion	0.00	0.00	0.27	
	Springparsley	0.00	0.00	0.09	
	Suncup	0.00	0.00	0.53	
	Tufted evening primrose	0.00	0.00	0.10	
	Western tansymustard	0.00	0.00	0.73	
	Whitestem blazingstar	2.33	0.00	0.91	
	Total Forb Density	**4.16**	**0.03**	**21.7**	**15.2**
INVASIVE WEEDS	Halogeton	0.00	0.00	0.07	
	Prickly Russian thistle	0.43	0.01	1.65	
	Total Invasive Weed Density	**0.43**	**0.01**	**1.72**	
TOTAL PLANT DENSITY		**5.85**	**0.11**	**25.8**	**18.1**

4.3 SPECIES RICHNESS

Species richness varies based on the timing and amount of precipitation. Precipitation was close to average this year, but less precipitation was received in early spring, resulting in a decrease in forbs. On the staging area, there was an average of 2.77 species per quadrat (Table 3). Two shrubs, fourwing saltbush and bud sagebrush, were found. There were two species of grasses. Indian ricegrass was the most common. The same species of forbs are commonly found on the staging area but abundance varies. This year whitestem blazingstar was the most common forb.

Species richness on the re-seeded area was less than one species per quadrat. Several species have become re-established following the flooding events of the last 5 years. Fourwing saltbush was the only perennial species found on the re-seeded area. Indian ricegrass and squirreltail have been present in previous years, but none were encountered this year. The only other species on the re-seeded area were Esteve's pincushion and prickly Russian thistle.

Species richness on the reference area was 4.14 plants per quadrat. Greene's rabbitbrush, fourwing saltbush, winterfat, and Indian ricegrass were common. There was an average of 2.66 forbs per quadrat. The most common was Esteve's pincushion.

TABLE 3. SPECIES RICHNESS (SPECIES PER M^2) ON CAU 400, FIVE POINTS LANDFILL

	Staging	Re-Seeded	Reference	Standard
Shrubs	0.48	0.20	0.57	0.40
Grasses	0.38	0.10	0.91	0.64
Forbs	1.91	0.03	2.66	1.86
Total Species	**2.77**	**0.33**	**4.14**	**2.90**

4.4 REVEGETATION SUCCESS

4.4.1 Staging Area

The plant community on the Five Points Landfill staging area appeared viable. Total plant cover was close to 14 percent, less than 2009 and 2010, but similar to 2007 and 2008. Shrub cover was 8 percent, similar to the previous 4 years. Grasses continued to struggle. Grass cover was close to 5 percent in 2006, dropped to 0 percent in 2008 and 2010, and increased to 3 percent this year. Forbs are typically abundant, but forb cover was less than 3 percent this year, as in 2007 and 2009. Total plant cover exceeded the standard due to consistency of shrubs and increase in grass cover. Shrub cover was higher than the standard, but grass and forb covers were below standards.

Perennial plant density on the staging area was the second lowest in 5 years. Shrub density ranged from a low of 0.6 shrubs/m^2 in 2007 to a high of 1.0 shrubs/m^2 in 2008. Grass density has shown a similar pattern, ranging from a high of 1.4 grasses/m^2 in 2007 to a low of 0.2 grasses/m^2 in 2008 and 2010. The average grass density over the last 5 years was 0.5 grasses/m^2, which was close to this year. Forb density was the second lowest recorded in 5 years. In 2010, 58.3 forbs/m^2 was the highest recorded in 5 years. There continued to be a small number of invasive weeds.

Species richness decreased to values similar to those in 2009. This followed 2 years of six species per quadrat. However, five of the six species were forbs. The number of shrub species has been level for 5 years. Grasses declined from 2007 to 2008 and has since fluctuated from a low of 0.1 to a high of 0.4 species per quadrat this year. Forbs decreased from a 5-year high of 5.5 last year to 1.9 species per quadrat this year. Overall diversity was lower than the standard. On average there were 2.77 species per quadrat compared to the standard of 2.9.

Of the three parameters used to evaluate revegetation success, only plant cover exceeded the standard. Shrub density exceeded the standard, but grass and forb density did not. Overall species richness was less than the standard, primarily due to the lack of grasses.

Although density and species richness fell short of standards, the plant community on the Five Points Landfill staging area appeared stable. Shrub cover was high, and grass cover, although less than the standard, was the highest it has been in 4 years. Shrub density also remained high. Grass and forb density were less than the standards, but grass density was the highest it has been in 4 years. Growing conditions have not been optimal for several years, and grasses seemed the most affected by the drier conditions. Forbs were lacking compared to the previous 3 years.

4.4.2 Reseeded Area

Plant cover on the re-seeded area was the second lowest in 4 years due to the lack of grasses and forbs. Shrub cover was the second highest recorded since 2008 and almost twice the shrub cover in 2009 and 2010. Fourwing saltbush continued to be the only shrub found on the re-seeded area.

Plant density was the lowest in 5 years. Shrub density was about the same as last year. Fourwing saltbush was the only shrub found. The density of grasses dropped to its lowest in 5 years. Indian ricegrass and squirreltail, two native grasses, were present in previous years, but only a few squirreltail plants were found this year. There were no forbs on the site this year.

There was an average of 0.3 species per quadrat compared to the standard of 2.9. Shrub species richness was approximately equal to last year, but grass and forb species richness declined.

The re-seeded area was deficient in plant cover and density. Plant cover has fluctuated from no cover in 2007, after the area was submerged during the summer of 2006, to a high of 23 percent last year. This year was close to 6 percent total plant cover, which was approximately 50 percent of the standard. Shrub cover met the standard, but there was no grass or forb cover.

4.5 WILDLIFE USE

There appeared to be a normal amount of small mammal activity on the Five Points Landfill as indicated by the presence of small burrows. There were no signs of excessive browsing of shrubs and no indication that large animals, such as horses or antelope, had been present on the site.

4.6 SOIL EROSION

There were no signs of additional flooding on the site. The water channel entering the site from the east appeared stable and showed no signs of excessive water flow. The finer soils in the bottom areas have not changed significantly.

4.7 SUMMARY/RECOMMENDATIONS

There were no new concerns or issues. The plant community on the staging area appeared stable, although lacking in perennial grasses and forbs. Shrubs were well established, and there were more grasses present than in previous years. There is a potential for more flooding at this site. The accumulation of water in the bottom areas could result in the loss of vegetation. Corrective actions are considered labor intensive and costly. It is recommended that the plant community continue to be monitored to document changes and identify conditions that may affect plant establishment and growth.

5.0 CAU 407 SURVEY RESULTS

Three transects were sampled in 2011.

5.1 PLANT COVER

Plant cover on CAU 407 was approximately 16 percent (Table 4). Shrub cover was approximately 14 percent. Shadscale saltbush was the most common at approximately 13 percent. Fourwing saltbush was less common at approximately 1 percent cover. Esteve's pincushion, an annual forb, accounted for less than 1 percent cover, and halogeton, an invasive weed, made up about 2 percent cover.

Success standards were established using data collected over the last 9 years from the reference area. Average total plant cover on the reference area was approximately 13 percent. Shrub cover was 9.4 percent, grass cover was 1.8 percent, forb cover was 1.9 percent, and invasive weed cover was 0.1 percent. Bud sagebrush, the most common species, accounted for over half of total shrub cover. Fourwing saltbush accounted for 40 percent of total shrub cover. Grass on the reference area was a good mix of species. Galleta grass, the most common, accounted for over half of total grass cover. Indian ricegrass accounted for 40 percent of total grass cover. Three forbs contributed to plant cover on the reference area. As on the cover, Esteve's pincushion was the most common. Halogeton, an invasive weed, was present at 0.1 percent cover.

TABLE 4. PLANT COVER (PERCENT) ON CAU 407

		Cover	Reference	Standard
SHRUBS	Bud sagebrush	0.00	5.30	
	Fourwing saltbush	0.80	3.80	
	Shadscale saltbush	13.3	0.00	
	Yellow rabbitbrush	0.00	0.10	
	Winterfat	0.00	0.20	
	Total Shrub Cover	**14.1**	**9.40**	**6.58**
GRASSES	Indian ricegrass	0.00	0.70	
	Woolly tuftgrass	0.00	0.10	
	Galleta grass	0.00	1.00	
	Total Grass Cover	**0.00**	**1.80**	**1.26**
FORBS	Esteve's pincushion	0.40	1.50	
	Filaree	0.00	0.20	
	Milkvetch	0.00	0.20	
	Total Forb Cover	**0.40**	**1.90**	**1.33**
INVASIVE WEEDS	Halogeton	1.70	0.10	
	Total Invasive Weed Cover	**1.70**	**0.10**	
TOTAL PLANT COVER		**16.2**	**13.2**	**9.24**
Bare Ground		63.8	69.6	
Litter		20.0	17.2	

5.2 PLANT DENSITY

Plant density on CAU 407 was 12.7 plants/m^2 and was made up of shrubs and an invasive weed (Table 5). The most abundant species was shadscale saltbush, followed by halogeton, fourwing saltbush, and bud sagebrush. Forbs and grasses were not encountered.

Average plant density on the reference area was 16 plants/m^2. There was a more even distribution of lifeforms on the reference area than on the cover. There were 4 shrubs/m^2, 1.7 grasses/m^2, and 9.8 forbs/m^2. The most abundant shrub was bud sagebrush followed by shadscale saltbush. Galleta grass was the most common grass species followed by woolly tuftgrass and Indian ricegrass. Esteve's pincushion had the highest density of all species.

TABLE 5. PLANT DENSITY (PLANTS PER M^2) ON CAU 407

		Cover	Reference	Standard
SHRUBS	Bud sagebrush	0.10	3.10	
	Fourwing saltbush	0.50	0.00	
	Shadscale saltbush	10.2	0.80	
	Sagebrush cholla	0.00	0.03	
	Winterfat	0.00	0.10	
	Total Shrub Density	**10.8**	**4.03**	**2.82**
GRASSES	Indian ricegrass	0.00	0.40	
	Woolly tuftgrass	0.00	0.40	
	Squirreltail grass	0.00	0.04	
	Galleta grass	0.00	0.90	
	Total Grass Density	**0.00**	**1.74**	**1.22**
FORBS	Buckwheat species	0.00	0.10	
	Desert globemallow	0.00	0.30	
	Esteve's pincushion	0.00	8.70	
	Freckled milkvetch	0.00	0.10	
	Gooseberryleaf globemallow	0.00	0.10	
	Hoary tansyaster	0.00	0.04	
	Lambsquarter	0.00	0.10	
	Milkvetch	0.00	0.20	
	Pepperweed	0.00	0.20	
	Total Forb Density	**0.00**	**9.84**	**6.89**
INVASIVE WEEDS	Halogeton	1.90	0.30	
	Total Invasive Weed Cover	**1.90**	**0.30**	
TOTAL PLANT DENSITY		**12.7**	**15.9**	**11.1**

5.3 SPECIES RICHNESS

There was an average of 1.3 species encountered per quadrat on CAU 407 (Table 6). This was the lowest value recorded at the site. Species richness was composed of 0.9 shrubs and 0.3 forbs. There have been no grasses on the site since 2009.

TABLE 6. SPECIES RICHNESS (SPECIES PER M^2) ON CAU 407

	Cover	Reference	Standard
Shrubs	0.93	1.61	1.13
Grasses	0.00	0.50	0.35
Forbs	0.33	1.07	0.75
Total Species	**1.26**	**3.18**	**2.23**

5.4 REVEGETATION SUCCESS

Total plant cover exceeded the standard. Shrub cover was lower than last year but higher than 2008 and 2009. Shrub cover was more than twice the standard. The lack of grasses is a concern. Grass cover was approximately 1 percent in 2008 and 2009, but there has been no grass cover for 2 years. The first year after revegetation, there was an abundance of grasses, but grasses have not survived the relatively dry conditions, and grass cover did not meet the standard. Forb cover was made up mostly of halogeton this year. Noxious weeds, such as halogeton, are not considered when evaluating revegetation success, so the standard for forbs was not achieved.

Total plant density, not including invasive weeds, was 10.8 plants/m^2, which was below the standard. Shrub density declined but shrub cover increased, suggesting fewer but larger plants on the site. Shadscale saltbush continued to be the most abundant species. Bud sagebrush and fourwing saltbush were encountered this year but in lower numbers. Grass density declined over the last 5 years to the point where no grasses were found.

The presence and abundance of forbs fluctuates based on the timing and amount of precipitation. Precipitation events did not favor forb growth this year. As a result there was only one forb, a noxious weed (halogeton), present on the site. This species was abundant the last 2 years, but its density this year was about 25 percent of what it was last year. Over time, the abundance of this species usually declines as perennial shrubs and grasses become established. Forb density did not meet the revegetation success standard.

Species richness was below the standard. Shrub species richness was approximately 1 shrub per quadrat this year, lower than the standard of 1.1. Grasses did not meet the standard. There were no native forbs present this year, so species richness for forbs also did not achieve the standard.

5.5 WILDLIFE USE

There were a number of burrows on the side slopes of the cover. The burrows appeared to be shallow and showed no signs of extensive use. Burrowing appeared to be confined to within the fill material and not subsurface soils.

5.6 SOIL EROSION

The soils on the cover cap and side slopes appeared stable and showed no signs of erosion.

5.7 SUMMARY/RECOMMENDATIONS

Plant cover on CAU 407 met the standard for revegetation success. Plant density was slightly below the standard, and species richness was less than half of the standard. The lack of perennial grasses continued to be a concern. The plant community should be monitored to assess the progression of the plant community. Monitoring efforts should focus on the re-establishment of perennial grasses and the abundance of halogeton.

Previously there has been concern about the impact of burrowing animals on the cover. There were a few burrows along the slopes of the cover. The number and size of the burrows did not appear to have changed from the previous year. They were relatively shallow, did not show signs of intensive use, and did not appear to create a means of exposing subsurface soil.

ATTACHMENT I

CAU 400, FIVE POINTS LANDFILL, COVER AND DENSITY DATA AND PHOTOGRAPHS

TABLE I.1. CAU 400, FIVE POINTS LANDFILL, PLANT COVER (PERCENT), STAGING AREA

	Year										
	2000	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Litter	17.5	17.5	23.3	26.5	11.5	28.8	28.1	16.9	30.0	15.0	15.6
Bare	43.3	49.2	47.5	58.1	52.6	48.1	57.5	56.3	58.8	61.3	70.6
Rock	23.3	0.8	10.0	1.5	16.7						
Fourwing saltbush	2.5	8.3	9.2	8.1	9.0	13.8	10.6	8.1	8.1	8.1	8.1
Indian ricegrass	10.0	22.5	10.0	3.7	1.3	5.0	3.8		0.6		2.5
Squirreltail	3.3	0.8			0.6	0.6					
Galleta grass											0.6
Buckwheat species		0.8		1.5	1.3					1.3	
Cushion cryptantha					0.6					1.3	
Eggleaf fiddleleaf				0.7	0.6				1.25		
Esteve's pincushion					1.3			16.9		8.8	
Hoary tansyaster						2.5		1.3			1.3
Prickly Russian thistle						1.3					
Western tansymustard					0.6			0.6			
Whitestem blazingstar					3.8				1.25	4.4	1.3
Shrubs	2.5	8.3	9.2	8.1	9.0	13.8	10.6	8.1	8.1	8.1	8.1
Grasses	13.3	23.3	10.0	3.7	1.9	5.6	3.8		0.6	0.0	3.1
Forbs		0.8		2.2	8.3	2.5		18.8	2.5	15.6	2.5
Invasive Weeds						1.3					
TOTAL PLANT COVER	**15.8**	**32.5**	**19.2**	**14.0**	**19.2**	**23.1**	**14.4**	**26.9**	**11.3**	**23.8**	**13.8**

TABLE I.2. CAU 400, FIVE POINTS LANDFILL, PLANT COVER (PERCENT), RE-SEEDED AREA

	Year					
	2006	**2007**	**2008**	**2009**	**2010**	**2011**
Litter	15.0		10.2	11.7	13.3	11.7
Bare	70.0	100.0	78.7	85.0	60.8	82.5
Rock	0.8					
Fourwing saltbush	3.3		6.8	2.5	2.5	5.8
Rubber rabbitbrush	0.8					
Winterfat	0.8					
Indian ricegrass	0.8		0.8			
Squirreltail	0.8				0.8	
Esteve's pincushion			3.4		0.8	
Prickly Russian thistle				0.8	0.8	
Western tansymustard					16.7	
Western blazingstar					1.7	
Shrubs	5.0		6.8	2.5	2.5	5.8
Grasses	1.7		0.8		0.8	
Forbs	7.5		3.4		18.6	
Invasive Weeds				0.8	0.8	
TOTAL PLANT COVER	**14.2**	**0.0**	**11.1**	**3.3**	**22.5**	**5.8**

TABLE I.3. CAU 400, FIVE POINTS LANDFILL, PLANT COVER (PERCENT), REFERENCE AREA

	Year										
	2000	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**10-Year Average**
Litter	9.2	13.3	15.0	16.7	12.5	22.5	20.8	8.3	14.2	12.5	14.5
Bare	67.5	65.0	70.8	63.3	65.6	63.3	60.0	74.2	75.0	60.1	68.2
Rock	5.8	5.0	1.7	2.5	0.6						
Fourwing saltbush	0.8	0.8	0.8	1.7	2.5	1.7	1.7	1.7	1.7	2.5	1.6
Greene's rabbitbrush	10.8	10.0	5.0	5.8	5.6	6.7	10.0	4.2	0.8	6.7	6.6
Indian ricegrass	5.0	5.0	5.8	3.3	3.1	5.8	7.5	2.5	5.8	5.0	4.9
Sand dropseed		0.8									0.1
Biscuitroot					0.6						0.1
Buckwheat species 1				0.8							0.1
Buckwheat species 2					0.6						0.1
Cushion cryptantha								0.8		0.8	0.2
Desert woollystar	0.8										0.1
Eggleaf fiddleleaf				0.8	1.3						0.2
Esteve's pincushion								5.0	1.7	3.3	1.0
Flatcrown buckwheat					0.6						0.1
Lupine										0.8	0.1
Nye gilia				4.2	0.6					1.7	0.6
Prickly Russian thistle			0.8	0.8	0.6				0.8		0.3
Tufted evening primrose								2.5			0.3
Western tansymustard								0.8			0.1
Whitestem blazingstar					5.6					5.8	1.1
Shrubs	11.7	10.8	5.8	7.5	8.1	8.3	11.7	5.8	2.5	9.2	8.1
Grasses	5.0	5.8	5.8	3.3	3.1	5.8	7.5	2.5	5.8	5.0	5.0
Forbs	0.8			5.9	9.4			9.2	1.7	12.5	4.0
Invasive Weeds			0.8	0.8	0.6				0.8		0.3
TOTAL PLANT COVER	**17.5**	**16.7**	**12.5**	**17.5**	**21.3**	**14.2**	**19.2**	**17.5**	**10.8**	**26.7**	**17.4**

TABLE I.4. CAU 400, FIVE POINTS LANDFILL, PLANT DENSITY (PLANTS/M^2), STAGING AREA

	Year												
	1998	**1999**	**2000**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Bud sagebrush	0.20				0.07			0.15	0.05	0.03	0.03	0.05	0.05
Fourwing saltbush	2.60	0.83	0.73	0.17	1.40	1.12	1.38	1.20	0.53	1.00	0.83	0.63	0.73
Greene's rabbitbrush				0.93									
Winterfat						0.03	0.03	0.05					
Cheatgrass			0.07										
Indian ricegrass	3.80	5.07	4.80	3.23	2.13	1.00	0.38	0.70	0.95	0.18	0.28	0.13	0.33
James' galleta			0.03			0.15		0.08	0.05		0.05	0.03	
Sand dropseed				0.03									
Squirreltail	3.60	3.87	2.17	0.33	0.80	0.41	0.14	1.05	0.40			0.03	0.15
Birdnest buckwheat													
Booth's evening primrose													
Buckwheat species 1						0.15	2.59	0.08				15.9	
Flatcrown buckwheat		0.87	0.43	0.17		0.06	27.8	0.20			4.08	0.13	
Cryptantha species			1.30			0.06		0.40					
Cushion cryptantha						0.06				1.10	4.23	3.93	
Cymopterus species						0.65							
Desert globemallow				0.03									
Desert woollystar		0.47	0.70			0.15				0.03	0.48	0.83	1.20
Eggleaf fiddleleaf		1.73	1.40				3.66	0.78			2.73	1.68	
Esteve's pincushion						0.06	2.41	0.25		36.5	5.63	27.2	
Herb sophia										0.40		0.13	
Hoary tansyaster						2.15	0.07	0.48		1.33	0.60		0.05
Lupine species							0.07						
Nye gilia						4.53	5.83			0.03	0.60	2.05	0.05
Prickly Russian thistle		3.90	1.33	0.07	0.87		0.14	0.23		0.08	0.88	0.20	0.43
Ragweed			0.60	0.03	0.37	1.41	0.21	0.25					0.05
Red root cryptantha							2.38						
Halogeton		0.10	0.10	0.10	0.03	2.24							
Small wirelettuce											0.25		0.48
Sowthistle desert dandelion												0.23	
Tufted evening primrose										0.05			
Western tansymustard		0.60	4.23			1.97	0.72				0.03		
Whitestem blazingstar		0.03	0.07				10.6	0.10			2.00	6.43	2.33
Shrubs	2.70	0.83	0.73	1.10	1.47	1.15	1.41	1.40	0.58	1.03	0.85	0.68	0.78
Grasses	7.40	8.93	7.00	3.60	2.93	1.56	0.52	1.83	1.40	0.18	0.33	0.18	0.48
Forbs		3.70	8.67	0.23	0.37	11.2	56.3	2.52		39.5	20.6	58.33	4.15
Invasive Weeds		4.00	1.50	0.17	0.90	2.24	0.14	0.23		0.08	0.88	0.20	0.43
TOTAL PLANT DENSITY	**10.2**	**17.5**	**17.9**	**5.10**	**5.67**	**16.2**	**58.4**	**5.99**	**1.98**	**40.7**	**22.7**	**59.5**	**5.85**

TABLE I.5. CAU 400, FIVE POINTS LANDFILL, PLANT DENSITY (PLANTS/M^2), RE-SEEDED AREA

	Year						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Fourwing saltbush	1.55	0.93		0.04	0.03	0.06	0.07
Shadscale saltbush		0.03					
Winterfat	1.00	0.80					
Cheatgrass	0.45						
Indian ricegrass	0.10	0.60	0.21	1.43	0.13	0.30	
Squirreltail	8.55	1.73	0.13	0.03	0.34	0.06	
Booth's suncup	0.15						
Buckwheat species	0.05					0.03	
Desert globemallow				0.09			
Herb sophia				0.07		0.03	
Lambsquarter						0.20	
Nye gilia	0.10						
Western tansymustard				0.09		1.00	
Prickly Russian thistle	3.00	67.3			0.22	1.30	0.01
Ragweed	0.15			0.02	0.03	0.40	
Red root cryptantha	0.15					0.01	
Halogeton	0.05	0.93			0.01	0.02	
Small wirelettuce	0.10						
Esteve's pincushion	0.90				0.01	0.10	0.03
Tufted evening primrose				0.05			
Whitestem blazingstar	12.9				0.02	0.70	
Shrubs	2.55	1.77		0.04	0.03	0.06	0.07
Grasses	9.10	2.33	0.33	1.46	0.47	0.30	
Forbs	12.7			0.32	0.03	3.38	0.03
Invasive Weeds	3.50	68.2			0.23	0.32	0.01
TOTAL PLANT DENSITY	**28.5**	**72.3**	**0.33**	**1.82**	**0.78**	**4.14**	**0.11**

TABLE I.6. CAU 400, FIVE POINTS LANDFILL, PLANT DENSITY (PLANTS/M^2), REFERENCE AREA

	Year										
	2000	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**10-Year Average**
Fourwing saltbush	0.17	0.17	0.10	0.27	0.07	0.10	0.03	0.03	0.17	0.17	0.13
Greene's rabbitbrush	1.37	0.93	0.87	0.37	0.50	0.40	0.57	0.60	0.57	0.30	0.65
Winterfat				0.03	0.03				0.07		0.02
Cheatgrass						0.10					
Indian ricegrass	1.50	1.63	1.77	3.07	1.13	1.70	1.23	1.40	1.17	1.13	1.57
James' galleta					0.03		0.03				0.01
Sand dropseed	0.03	0.03									0.01
Squirreltail						0.10	0.07			0.03	0.02
Ragweed	0.83	0.07					0.03		21.7	0.23	2.54
Birdnest buckwheat				0.07					0.07		0.02
Booth's suncup			0.23	1.67					1.80		0.53
Buckwheat species 1				5.20							0.74
Buckwheat species 2	0.07			1.97						1.13	0.40
Cryptantha species				0.50					0.67		0.17
Cushion catseye	3.70		0.13	0.87				1.10	2.67		1.21
Cymopterus species	0.03			0.03	0.03				0.53		0.09
Desert globemallow				5.73					0.03		0.82
Desert woollystar	0.67								0.30	1.27	0.28
Eggleaf fiddleleaf	0.37			8.67						1.97	1.38
Halogeton									0.47		0.07
Herb sophia									0.87	0.07	0.31
Hoary tansyaster				31.83		0.50		0.07		0.20	3.62
Lupine	0.10		0.10							1.27	0.18
Nye gilia								0.87		12.1	1.62
Pinnate tanseymustard	4.77			0.27				0.23	0.33	0.23	0.73
Prickly Russian thistle	0.47		0.97	5.37		2.80		4.07	0.37	0.80	1.65
Red root cryptantha				1.90				0.60	2.13	9.73	1.80
Small wirelettuce	0.03		0.03	0.03							0.02
Sowthistle desert dandelion										0.27	0.27
Steve's duskymaiden	0.17		0.10			0.10		23.1	0.10	11.8	3.93
Tufted evening primrose								0.20			0.10
Whitestem blazingstar	0.20			1.70				0.53		4.83	0.91
Shrubs	1.53	1.10	0.97	0.67	0.60	0.50	0.60	0.63	0.80	0.47	0.79
Grasses	1.53	1.67	1.77	3.07	1.17	1.70	1.33	1.40	1.17	1.16	1.61
Forbs	10.9	0.07	0.60	60.4	0.03	0.60	0.03	26.7	30.8	45.1	21.7
Invasive Weeds	0.47		0.97	5.37		2.90		4.07	1.24	0.80	1.71
TOTAL PLANT DENSITY	**14.5**	**2.83**	**4.30**	**69.5**	**1.80**	**5.75**	**1.96**	**32.8**	**34.0**	**47.5**	**25.8**

PHOTOGRAPHS

CAU 400, Five Points Landfill, 1998

CAU 400, Five Points Landfill, 2000

CAU 400, Five Points Landfill, 2002

CAU 400, Five Points Landfill, 2003

CAU 400, Five Points Landfill, 2004

CAU 400, Five Points Landfill, 2005

CAU 400, Five Points Landfill, 2006

CAU 400, Five Points Landfill, 2007

CAU 400, Five Points Landfill, 2008

CAU 400, Five Points Landfill, 2009

CAU 400, Five Points Landfill, 2010

CAU 400, Five Points Landfill, 2011

ATTACHMENT II
CAU 407 COVER AND DENSITY DATA AND PHOTOGRAPHS

TABLE II.1. CAU 407 PLANT COVER (PERCENT)

	Year				
	2006	**2008**	**2009**	**2010**	**2011**
Litter	74.2	66.7	39.2	47.5	20.0
Bare		23.3	50.8	30.8	64.2
Bud sagebrush	0.8				
Fourwing saltbush		0.8	0.8	1.7	0.8
Shadscale saltbush	15.0	7.5	8.3	18.3	13.3
Winterfat				0.8	
Indian ricegrass			0.8		
Squirreltail	9.2	0.8			
Esteve's pincushion		0.8		0.8	
Halogeton	0.8				1.7
Shrubs	15.8	8.3	9.2	20.8	14.7
Grasses	9.2	0.8	0.8		
Forbs		0.8		0.8	
Invasive Weeds	0.8				1.7
TOTAL PLANT COVER	**25.8**	**9.9**	**10.0**	**21.6**	**16.1**

TABLE II.2. CAU 407 PLANT COVER (PERCENT), REFERENCE AREA

	Year									
	2000	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**Average**
Litter	19.0	18.5	13.0	14.5	10.0	27.8	19.8	13.8	18.3	17.2
Bare	45.5	33.5	34.0	24.5	33.0	55.0	64.6	68.2	73.3	48.0
Rock	18.5	41.0	41.5	49.5	43.5					21.6
Bud sagebrush	8.0	3.0	4.0	6.0	1.5	7.2	8.3	5.6	3.9	5.3
Shadscale saltbush	5.0	1.5	5.0	3.0	5.5	3.3	4.7	3.6	2.8	3.8
Yellow rabbitbrush			0.5							0.06
Winterfat				0.5		0.6	0.5	0.5		0.2
Greasewood		0.5								0.06
Indian ricegrass	1.5	0.5	0.5	1.0	0.5	1.7	0.5			0.7
Low woollygrass	2.5	1.0	1.0	0.5	0.5				0.6	0.1
James' galleta						1.1	1.6		0.6	1.0
Esteve's pincushion								8.2		1.5
Gooseberryleaf globemallow									0.6	0.1
Milkvetch						1.7				0.2
Redstem stork's bill						1.7				0.2
Shrubs	13.0	5.0	9.5	9.5	7.0	11.1	13.5	9.7	6.7	9.5
Grasses	4.0	2.0	1.5	1.5	1.0	2.8	2.1		1.1	1.8
Forbs				0.5	5.0	3.3		8.2	0.6	2.0
Invasive Weeds										0.1
TOTAL PLANT COVER	**17.0**	**6.8**	**11.0**	**11.3**	**13.0**	**17.2**	**15.6**	**17.9**	**8.5**	**13.3**

TABLE II.3. CAU 407 PLANT DENSITY (PLANTS/M^2)

	Year						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Bud sagebrush	2.9	1.3	1.3	0.5	0.3	0.7	4.8
Fourwing saltbush	2.3	3.2	2.4	1.8	1.7	0.8	0.5
Shadscale saltbush	17.5	17.9	14.2	18.1	11.6	11.7	10.2
Rubber rabbitbrush		0.3					
Winterfat	0.7	2.0	1.2	0.7		0.7	
Indian ricegrass	16.4	1.1	5.4				
Cheatgrass	0.1	0.3					
Squirreltail	42.9	53.3	22.3	2.0	0.3		
Birdnest buckwheat	0.1						
Buckwheat	2.9	7.0				0.3	
Esteve's pincushion				13.4		14.6	
Hoary tansyaster		0.3		0.3			
Lambsquarter	1.3						
Manybranched ipomopsis	0.1						
Milkvetch	0.1						
Mountain pepperweed					0.3		
Prickly Russian thistle	0.3						
Halogeton					4.1	7.6	1.9
Shrubs	23.4	24.8	19.2	21.1	13.6	13.9	15.5
Grasses	59.3	54.5	27.6	2.0	0.3	0.0	
Forbs	4.5	7.7		13.7	0.3	14.9	
Invasive Weeds	0.3				4.1	7.6	1.9
TOTAL PLANT DENSITY	**87.5**	**86.9**	**46.8**	**36.8**	**18.3**	**36.4**	**17.4**

TABLE II.4. CAU 407 PLANT DENSITY (PLANTS/M^2), REFERENCE AREA

	Year									
	2000	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**Average**
Bud sagebrush	4.1	3.3	3.8	3.2	3.1	2.6	2.9	2.8	2.5	3.1
Shadscale saltbush	0.9	0.9	1.1	0.7	1.0	0.8	0.6	0.7	0.8	0.8
Winterfat			0.1	0.1	0.1	0.1		0.1	0.2	0.06
Sagebrush cholla				0.1						0.03
Indian ricegrass	0.8	0.5	0.2	0.3	0.2	0.3	0.4	0.3	0.2	0.4
Squirreltail	0.2	0.1		0.04		0.04	0.04			0.04
Low woollygrass	0.7	0.8	1.5	1.2	1.2	0.3	0.2	0.3	0.3	0.4
James' galleta	0.7					0.8	0.9	0.2	0.7	0.9
Birdnest buckwheat				0.1						0.01
Buckwheat	0.7	0.5	0.5	0.5	0.1					0.1
Cryptantha	0.1									0.01
Cushion cryptantha				0.1						0.01
Desert globemallow	0.3			0.5				0.2	0.1	0.3
Esteve's pincushion	1.3			2.7	36.9			31.9	5.6	8.7
Freckled milkvetch				0.1	0.9	0.0				0.1
Gooseberryleaf globemallow		0.12	0.58	0.02	0.34	0.3	0.3			0.07
Hoary tansyaster		0.5		0.2		0.2				0.04
Lambsquarter			0.5							0.06
Manybranched ipomopsis				0.5				0.1		0.01
Milkvetch						1.9				0.2
Mountain pepperweed								0.2		0.03
Pepperweed	0.1					0.9		0.1		0.2
Halogeton	1.7		0.3	0.3	0.1					0.3
Suncup					0.1					0.01
Shrubs	5.1	4.3	4.9	4.0	4.2	3.4	3.6	3.7	3.5	4.1
Grasses	2.5	1.8	2.2	2.1	1.6	1.4	1.6	0.9	1.2	1.7
Forbs	2.6	0.7	1.1	4.1	38.3	3.3	0.3	32.6	5.9	9.9
Invasive Weeds	1.7		0.3	0.6						0.3
TOTAL PLANT DENSITY	**11.8**	**6.8**	**8.5**	**10.7**	**44.1**	**8.2**	**5.4**	**37.1**	**10.5**	**15.9**

PHOTOGRAPHS

CAU 407, 2005

CAU 407, 2006

CAU 407, 2007

CAU 407, 2008

CAU 407, 2009

CAU 407, 2010

CAU 407, 2011

ATTACHMENT III
COMMON AND SCIENTIFIC NAMES OF PLANTS

TABLE III.1. COMMON AND SCIENTIFIC NAMES OF PLANTS

	Common Name	Scientific Name
SHRUBS	Black sagebrush	*Artemisia nova*
	Broom snakeweed	*Gutierrezia sarothrae*
	Bud sagebrush	*Picrothamnus desertorum*
	Fourwing saltbush	*Atriplex canescens*
	Greasewood	*Sarcobatus vermiculatus*
	Nevada jointfir	*Ephedra nevadensis*
	Greene's rabbitbrush	*Chrysothamnus greenei*
	Rubber rabbitbrush	*Ericameria nauseosa*
	Sagebrush cholla	*Grusonia pulchella*
	Shadscale saltbush	*Atriplex confertifolia*
	Winterfat	*Krascheninnikovia lanata*
GRASSES	Alkali sacaton	*Sporobolus aeroides*
	Cheatgrass	*Bromus tectorum*
	Indian ricegrass	*Achnatherum hymenoides*
	James' galleta	*Pleuraphus jamesii*
	Low woollygrass	*Dasyochloa pullchella*
	Low woollygrass	*Erioneuron pullchelum*
	Sand dropseed	*Sporobolus cryptandrus*
	Squirreltail	*Elymus elymoides*
FORBS	Birdnest buckwheat	*Eriogonum nidularium*
	Buckwheat	*Eriogonum* species
	Cleft-leaf phacelia	*Phacelia crenulata*
	Common pepperweed	*Lepedium densiflorum*
	Cryptantha	*Cryptantha* species
	Cushion cryptantha	*Cryptantha circumscissa*
	Desert evening primrose	*Camissonia boothii*
	Desert globemallow	*Sphaeralcea ambigua*
	Desert pepperweed	*Lepedium fremontii*
	Desert woollystar	*Eriastrum eremicum*
	Eggleaf fiddleleaf	*Nama pusillum*
	Esteve's pincushion	*Chaenactis steviodes*
	Flatcrown buckwheat	*Eriogonum deflexum*
	Fleshcolor pincushion	*Chaenactis xantiana*
	Freckled milkvetch	*Astragalus lentiginosus*
	Gilia	*Gilia* species
	Gooseberryleaf globemallow	*Sphaeralcea grossulariifolia*
	Great basin wollystar	*Eriastrum sparsiflorum*
	Halogeton	*Halogeton glomeratus*
	Herb sophia	*Descurania sophia*
	Hoary tansyaster	*Macheranthera canescens*
	Lambsquarter	*Chenopodium album*
	Lupine	*Lupinus* species
	Manybranched ipomopsis	*Ipomopsis polycladon*
	Milkvetch	*Astragalus* species
	Mountain pepperweed	*Lepedium montanum*
	Nye gilia	*Aliciella nyensis*
	Pepperweed	*Lepidium* species
	Phacelia	*Phacelia* species
	Prickly Russian thistle	*Salsola iberica*
	Ragweed	*Ambrosia* species
	Red root cyrptantha	*Cryptantha micrantha*
	Redstem stork's bill	*Erodium cicutarium*
	Roundleaf oxytheca	*Oxytheca perfoliata*
	Small wirelettuce	*Stephanomeria exigua*
	Sowthistle desert dandelion	*Malacothrix sonchoides*
	Springparsley	*Cymopteris* species
	Suncup	*Camissonia* species
FORBS, continued	Tall tumblemustard	*Sisymbrium altissimum*
	Tufted evening primrose	*Oenothera caespitosa*

TABLE III.1. COMMON AND SCIENTIFIC NAMES OF PLANTS, CONTINUED

	Common Name	Scientific Name
	Western tansymustard	*Descurania pinnata*
	Whitestem blazingstar	*Mentzelia albicaulis*
	Wishbone-bush	*Mirabilis laevis* var. *villosa*
	Yellow rabbitbrush	*Chrysothamnus viscidiflorus*

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