Nevada
Environmental Management
Operations Activity

DOE/NV--1495

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

For Calendar Year 2012

Controlled Copy No.: _____

Revision: 0

January 2013

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

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**POST-CLOSURE INSPECTION REPORT FOR
THE TONOPAH TEST RANGE, NEVADA
FOR CALENDAR YEAR 2012**

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

**Controlled Copy No. _____
Revision: 0
January 2013**

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**POST-CLOSURE INSPECTION REPORT FOR
THE TONOPAH TEST RANGE, NEVADA
FOR CALENDAR YEAR 2012**

Approved By: /s/: Tiffany Lantow
Tiffany A. Lantow
Industrial Sites Activity Lead

Date: 1/17/2013

Approved By: /s/: Robert Boehlecke
Robert F. Boehlecke
Environmental Management Operations Activity Manager

Date: 1/17/13

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TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	vii
EXECUTIVE SUMMARY	ix
1.0 INTRODUCTION	1
1.1 SCOPE AND OBJECTIVES	1
2.0 INSPECTION RESULTS	3
2.1 CAU 400: BOMBLET PIT AND FIVE POINTS LANDFILL (TTR)	3
2.2 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)	3
2.3 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)	3
2.4 CAU 453: AREA 9 UXO LANDFILL (TTR)	4
2.5 CAU 487: THUNDERWELL SITE (TTR)	4
3.0 SUMMARY	5
3.1 CAU 400: BOMBLET PIT AND FIVE POINTS LANDFILL (TTR)	5
3.2 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)	5
3.3 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)	5
3.4 CAU 453: AREA 9 UXO LANDFILL (TTR)	5
3.5 CAU 487: THUNDERWELL SITE (TTR)	5
4.0 REFERENCES	7

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APPENDICES

APPENDIX A. FIGURES

APPENDIX B. POST-CLOSURE INSPECTION PLANS

APPENDIX C. POST-CLOSURE INSPECTION CHECKLISTS

APPENDIX D. FIELD NOTES

APPENDIX E. PHOTOGRAPHS

APPENDIX F. POST-CLOSURE VEGETATION MONITORING REPORT

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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 2012 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 and subsequent correspondence with the Nevada Division of Environmental Protection. The post-closure inspection plans and subsequent correspondence modifying the requirements 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.

The annual post-closure inspections were conducted May 8 and 9, 2012. Maintenance was performed at CAU 400, CAU 407, CAU 424, and CAU 453. At CAU 400, a section of damaged chicken wire on the fence was repaired. At CAU 407, animal burrows were backfilled. At CAU 424, additional lava rock was placed in high traffic areas to mark the locations of the surface grade monuments at Landfill Cell A3-3 and Landfill Cell A3-8, and subsidence on the cover at Landfill Cell A3-6 was repaired. At CAU 453, two areas of subsidence and animal burrows were repaired.

Vegetation monitoring was performed at the CAU 400 Five Points Landfill and CAU 407 in June 2012, 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 2012 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 8 and 9, 2012. The post-closure inspection plans as previously published in the applicable Closure Report (CR) and subsequent correspondence with the Nevada Division of Environmental Protection (NDEP) modifying the requirements 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 Five Points Landfill (CAS TA-19-001-05PT, Ordnance Disposal Pit) was 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 Five Points Landfill is shown in Figure 2 of Appendix A. Vegetation monitoring was conducted in June 2012, and the results are included in Appendix F. The annual inspection was conducted on May 8, 2012. One section of chicken wire on the fence required repair. The chicken wire was repaired on July 11, 2012. No other issues or concerns were identified, and additional maintenance and repairs were not required. Inspections and vegetation monitoring 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) and subsequent correspondence. Inspections are conducted according to the post-closure requirements (Appendix B).

The site is shown in Figure 3 of Appendix A. Vegetation monitoring was conducted in June 2012, and the results are included in Appendix F. The annual inspection was conducted on May 9, 2012. Animal burrows were observed on the cover. The animal burrows were backfilled on July 11, 2012. No other issues or concerns were identified, and additional maintenance and repairs were not required. 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) and subsequent correspondence. Inspections are conducted according to the post-closure requirements (Appendix B).

The landfill locations are shown in Figure 4 of Appendix A. The annual inspection was conducted on May 8, 2012.

Landfill Cell A3-1 (CAS 03-08-001-A301): No issues or concerns were identified, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-2 (CAS 03-08-002-A302): No issues or concerns were identified, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-3 (CAS 03-08-002-A303): Additional lava rock was required in high traffic areas to mark the locations of the surface grade monuments. Additional lava rock was placed on the surface grade monuments on July 11, 2012. No other issues or concerns were identified, and additional maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-4 (CAS 03-08-002-A304): No issues or concerns were identified, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-5 (CAS 03-08-002-A305): No issues or concerns were identified, and maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-6 (CAS 03-08-002-A306): Subsidence was identified on the cover. The area of subsidence was repaired on July 11, 2012. No other issues or concerns were identified, and additional maintenance and repairs were not required. Inspections should continue as scheduled.

Landfill Cell A3-8 (CAS 03-08-002-A308): Additional lava rock was required in high traffic areas to mark the locations of the surface grade monuments. Additional lava rock was placed on the surface grade monuments on July 11, 2012. No other issues or concerns were identified, and additional 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) and subsequent correspondence. Inspections are conducted according to the post-closure requirements (Appendix B).

The site is shown in Figure 5 of Appendix A. The annual inspection was conducted on May 8, 2012. Two areas of subsidence were identified, and a significant amount of animal burrows were present. The areas of subsidence were repaired and animal burrows were backfilled on July 11, 2012. No other issues or concerns were identified, and additional maintenance and repairs were not required. 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), Record of Technical Change (NNSA/NSO, 2004), and subsequent correspondence. Inspections are conducted according to the post-closure requirements (Appendix B).

The site is shown in Figure 6 of Appendix A. The annual inspection was conducted on May 8, 2012. No issues or concerns were identified, and maintenance and repairs were not required. Inspections should continue as scheduled.

3.0 SUMMARY

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

A section of damaged chicken wire on the fence was repaired on July 11, 2012, and additional maintenance and repairs were not required. Inspections and vegetation monitoring should continue as scheduled.

3.2 CAU 407: ROLLER COASTER RADSAFE AREA (TTR)

Animal burrows observed during the inspection were backfilled on July 11, 2012, and additional maintenance and repairs were not required. Inspections and vegetation monitoring should continue as scheduled.

3.3 CAU 424: AREA 3 LANDFILL COMPLEXES (TTR)

Additional lava rock was placed in high traffic areas to mark the locations of the surface grade monuments at Landfill Cell A3-3 and Landfill Cell A3-8 on July 11, 2012. Subsidence identified on the cover at Landfill Cell A3-6 was repaired on July 11, 2012. Additional maintenance or repairs were not required. Inspections should continue as scheduled.

3.4 CAU 453: AREA 9 UXO LANDFILL (TTR)

Two areas of subsidence and animal burrows identified during the inspection were repaired on July 11, 2012. Inspections will continue as scheduled.

3.5 CAU 487: THUNDERWELL SITE (TTR)

No issues or concerns were identified, and maintenance and repairs were not required. Inspections should 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 4
CAU 424 AREA 3 LANDFILL COMPLEXES 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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STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Kenny C. Guinn, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

ERD.061208.0001

December 5, 2006

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

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

Dear Mr. Jones:

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

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

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

Sincerely,

T.H. Murphy
Chief
Bureau of Federal Facilities

ACTION
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AMSS

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John B. Jones, Acting Federal Project Director
Page 2
December 5, 2006

DRE/TZ

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APPENDIX C

POST-CLOSURE INSPECTION CHECKLISTS

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POST-CLOSURE INSPECTION CHECKLIST**CAU 400: BOMBLET PIT AND FIVE POINTS LANDFILL - CAS TA-19-001-05PT, ORDNANCE DISPOSAL PIT**Inspection Date and Time: 5/8/12 3:30Reason for Inspection: AnnualDate of Last Post-Closure Inspection: 5/4/11Reason for Last Post-Closure Inspection: Annual

Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada

Chief Inspector: Rebecca KingTitle: Project ManagerAssistant Inspector: R. StueckmannTitle: HP**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:

- TTR radio, pager, etc.
- Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
- Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
- Tape measure
- 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?	☒	☐	a rabbit was inside the fenced area
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?	☒	☐	larger plants fine - smaller dead

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?		5	
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: Both fences in good condition except one small area of chicken wire needs repair. Larger vegetation appear to be in fair condition. Small plants appear to be dead. One rabbit was inside the fenced area.

PAK
12/12/12

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/: Rebecca King

Date: 5/8/12

Printed Name: Rebecca King

Title: Project Manager

Required Attachments:

- Field Notes (if any)

- Photos (or note File Location: S:\NTS\ER Share\Photos\TTR Dem Inspections\2012\05-08-12)

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: 5/29/2012

Printed Name: Thomas A. Thiele (or designee)

Distribution: Original – Task Manager

POST-CLOSURE INSPECTION CHECKLIST

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

Inspection Date and Time: 5/9/12 10:55Reason for Inspection: AnnualDate of Last Post-Closure Inspection: 5/3/11Reason for Last Post-Closure Inspection: Annual

Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada

Chief Inspector: Rebecca KingTitle: Project ManagerAssistant Inspector: R. StueckradtTitle: HP**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)
☒	☐	
☒	☐	
☐	☒	
☐	☒	
☐	☐	NA ☒
☐	☐	NA ☒

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?

b. If yes (to 4a), are revised as-built plans available that reflect repair changes?

C. SITE INSPECTION PREPARATION

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

- TTR radio, pager, etc.
- Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
- Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
- Tape measure
- 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?	✓		large burrows on cover slope at east end of pad 5/9/12
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?	✓		some stressed vegetation

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?	7-26		RAK 5/9/12
If yes, has a photographic log been prepared?	✓		

POST-CLOSURE INSPECTION CHECKLIST

**CAU 407: ROLLER COASTER RADS SAFE AREA
CAS TA-23-001-TARC, ROLLER COASTER RADS SAFE 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: <i>Some stressed vegetation. No issues with vegetation, signage, fencing. Large animal burrows on east edge of cover slope in 3 areas.</i>			

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/ Rebecca King*Date: *5/9/12*Printed Name: *Rebecca King*Title: *Project Manager***Required Attachments:**

- Field Notes (if any)
- Photos (or note File Location: *S:\NTS\ER Share\Photos\TTR PCM\Inspections\2012\05-09-12*)

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: *5-29-2012*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: ~~5/8/12~~ 5/8/12 2:40 PM Reason for Inspection: Annual
 Date of Last Post-Closure Inspection: 5/3/11 Reason for Last Post-Closure Inspection: Annual

Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada

Chief Inspector: Rebecca King Title: Project Manager
 Assistant Inspector: L. Stuckrath Title: HP

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?	✓		located and marked surface grade markers @ A3-3
a. If yes, at which sites?	NA		A3-3
b. If yes, has site repair resulted in a change from as-built conditions?		✓	NA 5/8/12
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:

- TTR radio, pager, etc.
- Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
- Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
- Tape measure
- 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 03-08-002-A302, LANDFILL CELL A3-2	- CAS 03-08-001-A301, LANDFILL CELL A3-1
- CAS 03-08-002-A304, LANDFILL CELL A3-4	- CAS 03-08-002-A303, LANDFILL CELL A3-3
- CAS 03-08-002-A306, LANDFILL CELL A3-6	- CAS 03-08-002-A305, LANDFILL CELL A3-5
	- 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?	☒	☒	however need more lava rock to mark surface areas
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?	☒	☒	
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 03-08-002-A302, LANDFILL CELL A3-2
- CAS 03-08-002-A304, LANDFILL CELL A3-4
- CAS 03-08-002-A306, LANDFILL CELL A3-6

- CAS 03-08-001-A301, LANDFILL CELL A3-1
- CAS 03-08-002-A303, LANDFILL CELL A3-3
- CAS 03-08-002-A305, LANDFILL CELL A3-5
- 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 03-08-002-A302, LANDFILL CELL A3-2
- CAS 03-08-002-A304, LANDFILL CELL A3-4
- CAS 03-08-002-A306, LANDFILL CELL A3-6

- CAS 03-08-001-A301, LANDFILL CELL A3-1
- CAS 03-08-002-A303, LANDFILL CELL A3-3
- CAS 03-08-002-A305, LANDFILL CELL A3-5
- 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?	<input type="text" value="0"/>		
14. Use-restricted area (Landfill A3-6):	YES	NO	EXPLANATION (required if shaded box is checked)
a. Is there evidence of settling?	☒	☒	PAK 5/3/12 see explanation below
b. Is there cracking?	☒	☒	PAK 5/3/12 see explanation below
c. Is there evidence of erosion (wind or water) through or around the cover?	☐	☒	
d. Is there evidence of animals burrowing into the cover?	☒	☐	minor backfilled when doing subsidence repair
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?	☒	☐	however need more lava rock to identify
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?	<input type="text" value="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 03-08-002-A302, LANDFILL CELL A3-2
- CAS 03-08-002-A304, LANDFILL CELL A3-4
- CAS 03-08-002-A306, LANDFILL CELL A3-6

- CAS 03-08-001-A301, LANDFILL CELL A3-1
- CAS 03-08-002-A303, LANDFILL CELL A3-3
- CAS 03-08-002-A305, LANDFILL CELL A3-5
- 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?

29

If yes, has a photographic log been prepared?

✓

Log number:

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:

A3-1 and A3-2 in good condition. No issues.
A3-3 monuments in good condition, surface grade markers all located and in good condition.
A3-3+8 surface grade markers in high-traffic areas need additional lava rock to maintain location identification/visibility. A3-4 + 3-5 in good condition. No issues. A3-6 monuments and markers in good condition. Subsidence occurring on North edge of cover.

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/: Rebecca King

Date:

5/8/12

Printed Name:

Rebecca King

Title:

Project Mgr.

Required Attachments:

- Field Notes (if any)

- Photos (or note File Location: S:\NTS\ER Share\

Photos\TTR PCM Inspections\424\200\2012\424

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: 5/29/2012

Printed Name: Thomas A. Thiele (or designee)

Distribution: Original – Task Manager

POST-CLOSURE INSPECTION CHECKLIST**CAU 453: AREA 9 UXO LANDFILL - CAS 09-55-001-0952, AREA 9 LANDFILL**Inspection Date and Time: 5/8/12 1:45pmReason for Inspection: AnnualDate of Last Post-Closure Inspection: 5/4/11Reason for Last Post-Closure Inspection: Annual

Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada

Chief Inspector: Rebecca KingTitle: Project ManagerAssistant Inspector: R. StueckrathTitle: HP**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 backfilled**C. SITE INSPECTION PREPARATION**

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

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

Use 5000 on padlock**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

	YES	NO	EXPLANATION (required if shaded box is checked)
1. Site markers (continued):			
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:			
a. Is there evidence of settling?	✓		RA 5/16/12 see note below
b. Is there cracking?	✓		cracking 4'x1' in one area in A9-P + one in A9-3
c. Is there evidence of erosion (wind or water) over trenches A9-1, A9-2, or A9-3?		✓	
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?	✓		large burrows in A91 + A93
Photograph Instructions: <ul style="list-style-type: none"> 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:			
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
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: ^{PAK 5/8/12} NE cell has subsidence near middle monuments + burrowing. SW cell has subsidence + large burrows. Signs, fencing, monuments in good condition.

In Report include current frequency in monitoring.

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/: Rebecca King

Date: 5/8/12

Printed Name: Rebecca King

Title: Project Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\Photos\TTR PCM Inspections\2012 ^{PAK 5/8/12} 2012

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: 5/24/2012

Printed Name: Thomas A. Thiele (or designee)

Distribution: Original – Task Manager

POST-CLOSURE INSPECTION CHECKLIST

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

Inspection Date and Time: 5/8/12 12:50

Reason for Inspection: Annual

Date of Last Post-Closure Inspection: 5/4/11

Reason for Last Post-Closure Inspection: Annual

Responsible Entity: NSTec Environmental Restoration, Nevada Test Site, Mercury, Nevada

Chief Inspector: Rebecca King

Title: Project Manager

Assistant Inspector: R. Stueckrath

Title: HP

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?

✓

Replaced 5 gas and backfilled
curious

C. SITE INSPECTION PREPARATION

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

- TTR radio, pager, etc.
- Camera (requires TTR Photo/sensitive equipment pass), digital storage drive, and extra batteries
- Previous Post-Closure Report, Inspection Checklists, repair records, and as-built plans
- Tape measure
- 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?

✓

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?	☒	☐	
e. How many signs need to be replaced?	0		
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?	☐	☒	+ RAC 5/8/12
b. Are boundary monuments in good condition?	☒	☐	
c. Are any of the use restriction warning signs damaged or missing?	☐	☒	
d. Are all signs legible?	☒	☐	
e. How many signs need to be replaced?	0		
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?	☐	☒	
Photograph Instructions: <ul style="list-style-type: none"> 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?	4		
If yes, has a photographic log been prepared?	☒	☐	L
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: Monuments and signs in good condition at both sites. Covers at both sites are undisturbed. No issues

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/ Rebecca King

Date:

Project Manager ^{RAK 5/8/12} 5/8/12

Printed Name:

Rebecca King

Title:

Project Manager

Required Attachments:

- Field Notes (if any)
- Photos (or note File Location: S:\NTS\ER Share\ Photos\TTR PCM Inspections\ 2012)

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:

5/29/2012

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 2012

NSTec Personnel: Rebecca King, Project Manager,
Robert Stueckrath, Radcon manager

NSO: Kevin Cabbie, Tiffany Lantow

NDEP: Ted Zafaratos

Weather: Clear + warm

Scope: Perform PCM for the following: 400, 407,
424, 426, 453, 487 and inspect 404, 411, 412, 413 ^{RAK} as
a BMP.

11:30 Met with Washington Group to notify them of our
arrival + inspections, pick up TTR radios and met
with NSO + NDEP to start inspections

12:50 Arrived at 487, A17 Anomalies Area. Conducted
^{RAK 5/8/12}
Safety safety tailgate. Monuments, brass plates, signs
and cover in good condition at both sites.

1:45 Arrived at 453. Fence, signage and monuments
in good condition. NE cells has an area of subsidence
cracking approx 4'x1' and several large burrows.
SW (A92) has an area of subsidence ~2'x2' and
large burrows.

2:00 Arrived 424 A3-1 and A3-2 all monuments,
brass caps and covers in good condition, no issues.

2:30 Inspected A3-3 all monuments and surface grade
markers located and in good condition. More lava
rock should be placed to ^{RAK 5/8/12} clearly identify

- surface grade markers ^{RAK 5/8/12} in high traffic area of yard. Monuments and covers all in good condition at A3-4 and A3-5. A3-6 monuments and ^{RAK 5/8/12} brass markers in good condition. An area of cracking/subsidence is present on cover. Arc shaped at least 15ft in length and about 6 inches at widest point. At A3-8 markers + brass plates located. Marker in high traffic area needs more lava rock to mark.
- 10 2:30 ^{RAK 5/8/12} Arrive at 400 fence in good condition except chicken wire in one area near drainage with the hay bales is loose. Bonblett pit fence in good condition - vegetation is still stressed in area of disturbance.
- 15 3:45 Day complete

5/8/12

/s/: Rebecca King

Continuing Annual PCM Inspections: 2012

5/9/12 - Same personnel and scope as 5/8/12

5 8:30 Arrived area 71N contacted black jack and received permission to enter. No optic allowed until 0930. Conducted safety brief. Inspected fence and signs ^{at Double Backs}. Replaced 5 CA signs and hung 2 controlled area signs at gate.

10 09:35: Took 6 photos of gate area.

09:48: Exiting 71N - informed black jack.

10am Arrived 426 Site in good condition except one minor loose fence wire. No repair planned as fence will be removed.

15 11:00 Arrived ^{407 RAK 5/9/12} 400 fence and signage in good condition. Large burrows on east and south cover slopes. Backfilling of burrows recommended.

11:20 Depart for lunch. NTEP and NSO to depart after lunch.

20 11:25 Arrive 404 for BMP inspection. No issues.

12:55 Arrive Clean Slates 1. Hung controlled area signs at gates.

25 1:25 Arrive Clean Slates 2. Hung controlled area signs at gates and reattached loose corners on some CA signs.

2:20 Arrive Clean slates 3. West central side of fence has one post needing replacement. Hung controlled area

last entry

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APPENDIX E

PHOTOGRAPHS

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PHOTOGRAPH LOG

PHOTOGRAPH	DATE	DESCRIPTION
1	05/08/2012	CAU 400 Five Points Landfill, Looking West
2	05/09/2012	CAU 407, Looking East
3	05/08/2012	CAU 424, Landfill Cell A3-1, Looking Southeast
4	05/08/2012	CAU 424, Landfill Cell A3-2, Looking North
5	05/08/2012	CAU 424, Landfill Cell A3-3, Looking Northwest
6	05/08/2012	CAU 424, Landfill Cell A3-4, Looking North
7	05/08/2012	CAU 424, Landfill Cell A3-5, Looking Southeast
8	05/08/2012	CAU 424, Landfill Cell A3-6, Looking East
9	05/08/2012	CAU 424, Landfill Cell A3-8, Looking West
10	05/08/2012	CAU 453, Subsidence
11	05/08/2012	CAU 487, A-8 Anomaly, Looking East
12	05/08/2012	CAU 487, A-17 Anomaly, Looking West

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Photograph 1: CAU 400 Five Points Landfill, Looking West, 05/08/2012

Photograph 2: CAU 407, Looking East, 05/09/2012

Photograph 3: CAU 424, Landfill Cell A3-1, Looking Southeast, 05/08/2012

Photograph 4: CAU 424, Landfill Cell A3-2, Looking North, 05/08/2012

Photograph 5: CAU 424, Landfill Cell A3-3, Looking Northwest, 05/08/2012

Photograph 6: CAU 424, Landfill Cell A3-4, Looking North, 05/08/2012

Photograph 7: CAU 424, Landfill Cell A3-5, Looking Southeast, 05/08/2012

Photograph 8: CAU 424, Landfill Cell A3-6, Looking East, 05/08/2012

Photograph 9: CAU 424, Landfill Cell A3-8, Looking West, 05/08/2012

Photograph 10: CAU 453, Subsidence, 05/08/2012

Photograph 11: CAU 487, A-8 Anomaly, Looking East, 05/08/2012

Photograph 12: CAU 487, A-17 Anomaly, Looking West, 05/08/2012

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 5, 2012**

**Report Prepared
by
David C. Anderson, Sr. Scientist
Ecological & Environmental Monitoring**

August 2012

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TABLE OF CONTENTS

1.0	INTRODUCTION	F-7
2.0	OBJECTIVES	F-7
3.0	METHODS	F-7
4.0	CAU 400, FIVE POINTS LANDFILL, SURVEY RESULTS	F-8
4.1	PLANT COVER.....	F-8
4.2	PLANT DENSITY	F-9
4.3	SPECIES RICHNESS	F-10
4.4	REVEGETATION SUCCESS.....	F-10
4.4.1	Staging Area	F-10
4.4.2	Re-seeded Area.....	F-11
4.5	WILDLIFE USE	F-12
4.6	SOIL EROSION	F-12
4.7	SUMMARY/RECOMMENDATIONS.....	F-12
5.0	CAU 407 SURVEY RESULTS	F-13
5.1	PLANT COVER.....	F-13
5.2	PLANT DENSITY	F-14
5.3	SPECIES RICHNESS	F-14
5.4	REVEGETATION SUCCESS.....	F-15
5.5	WILDLIFE USE	F-15
5.6	SOIL EROSION	F-15
5.7	SUMMARY/RECOMMENDATIONS.....	F-15

TABLES

TABLE 1. PLANT COVER (PERCENT) ON CAU 400, FIVE POINTS LANDFILL	F-8
TABLE 2. PLANT DENSITY (PLANTS PER M ²) ON CAU 400, FIVE POINTS LANDFILL	F-9
TABLE 3. SPECIES RICHNESS (SPECIES PER M ²) ON CAU 400, FIVE POINTS LANDFILL	F-10
TABLE 4. PLANT COVER (PERCENT) ON CAU 407.....	F-13
TABLE 5. PLANT DENSITY (PLANTS PER M ²) ON CAU 407.....	F-14
TABLE 6. SPECIES RICHNESS (SPECIES PER M ²) ON CAU 407.....	F-14

ATTACHMENTS

ATTACHMENT I. CAU 400, FIVE POINTS LANDFILL, COVER AND DENSITY DATA AND PHOTOGRAPHS	F-16
ATTACHMENT II. CAU 407 COVER AND DENSITY DATA AND PHOTOGRAPHS.....	F-29
ATTACHMENT III. COMMON AND SCIENTIFIC NAMES OF PLANTS	F-37

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1.0 INTRODUCTION

This report documents the methods and results of monitoring conducted in June 2012 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 plant 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 and 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 re-seeded in 2004. The site flooded again in 2006, and much of the lower portion of the site was 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 re-seeded. 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 the growth of noxious, weedy species and provides cover and food for wildlife. The objective of monitoring the vegetation 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 5, 2012. 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 (m²) 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 animals, burrows, or scat, and browsing by 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 2012, five transects were sampled, two in the area that had not flooded and three in the area that was flooded and re-seeded in 2004. The reference area has been sampled from 2000 to 2010, and data collected during that period were averaged to determine reclamation success standards.

4.1 PLANT COVER

Plant cover on the staging area was a mix of perennial shrubs and grasses (Table 1). Fourwing saltbush was the single shrub species and made up approximately 86 percent of the total plant cover. Indian ricegrass, a perennial grass, made up the remaining 14 percent of the total plant cover. There were no forbs or invasive weedy species on the site this year.

Plant cover on the re-seeded area was 9 percent and was made up of one perennial shrub, fourwing saltbush. There were no perennial grasses or annual forbs, including invasive weeds, on the re-seeded area this year.

The 10-year average for plant cover on the reference area was 17 percent, which included 8 percent shrubs, 5 percent grasses, and 4 percent forbs. Green's rabbitbrush and fourwing saltbush, two perennial shrubs, made up all the shrub cover. Indian ricegrass, the only perennial grass, made up approximately 28 percent of total plant cover. Although non-invasive forbs and invasive weeds typically make up 23 percent of total plant cover, there were no forbs or invasive species on the reference area this year.

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

		Staging	Re-Seeded	Reference	Standard
SHRUBS	Fourwing saltbush	7.7	9.3	1.6	5.7
	Greene's rabbitbrush	0.0	0.0	6.6	
	Total Shrub Cover	7.7	9.3	8.2	
GRASSES	Indian ricegrass	1.3	0.0	4.9	3.5
	Sand dropseed	0.0	0.0	0.1	
	Total Grass Cover	1.3	0.0	5.0	
FORBS	Buckwheat	0.0	0.0	0.2	2.9
	Cryptantha	0.0	0.0	0.1	
	Desert woollystar	0.0	0.0	0.2	
	Eggleaf fiddleleaf	0.0	0.0	0.2	
	Esteve's pincushion	0.0	0.0	1.0	
	Flatcrown buckwheat	0.0	0.0	0.1	
	Lupine	0.0	0.0	0.1	
	Nye gilia	0.0	0.0	0.7	
	Springparsley	0.0	0.0	0.1	
	Tufted evening primrose	0.0	0.0	0.3	
	Western tansymustard	0.0	0.0	0.1	
	Whitestem blazingstar	0.0	0.0	1.1	
	Total Forb Cover	0.0	0.0	4.2	
INVASIVE WEEDS	Prickly Russian thistle	0.0	0.0	0.3	0.3
	Total Invasive Weed Cover	0.0	0.0	0.3	
TOTAL PLANT COVER		9.0	9.3	17.7	12.1*
Bare Ground		60.2	74.8	68.2	
Litter		30.8	15.9	14.5	

* Does not include invasive weeds

4.2 PLANT DENSITY

Density on the staging area was 0.9 plant/m², including 0.7 shrubs/m², 0.2 grasses/m², and 0.03 forbs/m² (Table 2). Four perennial species, fourwing saltbush, bud sagebrush, Indian ricegrass, and James' galleta grass, were encountered on the staging area. Forb density, represented by a few whitestem blazingstar plants, was 0.03 plants/m², indicative of a dry year.

Density on the re-seeded area was 0.3 plants/m². Shrub density was 0.3 plants/m². There were no perennial grasses and 0.03 forbs/m². Fourwing saltbush was the only shrub present. The only forbs present were a few desert globemallow plants.

The 10-year average density on the reference area was 25.4 plants/m². There were 0.8 shrubs/m². Greene's rabbitbrush had the highest density, followed by fourwing saltbush and winterfat. Grass density was 1.6 grasses/m² and was predominantly Indian ricegrass with a few isolated squirreltail, sand dropseed, and James' galleta grass plants. Forb density was 21.4 forbs/m².

TABLE 2. PLANT DENSITY (PLANTS PER M²) ON CAU 400, FIVE POINTS LANDFILL

		Staging	Re-Seeded	Reference	Standard
SHRUBS	Bud sagebrush	0.03	0.0	0.0	
	Fourwing saltbush	0.7	0.3	0.1	
	Greene's rabbitbrush	0.0	0.0	0.7	
	Winterfat	0.0	0.0	0.02	
	Total Shrub Density	0.7	0.3	0.8	0.6
GRASSES	Indian ricegrass	0.1	0.0	1.6	
	James' galleta grass	0.1	0.0	0.01	
	Sand dropseed	0.0	0.0	0.01	
	Squirreltail grass	0.0	0.0	0.02	
	Total Grass Density	0.2	0.0	1.6	1.1
FORBS	Birdnest buckwheat	0.0	0.0	0.02	
	Buckwheat	0.0	0.0	1.1	
	Cryptantha	0.0	0.0	0.2	
	Cushion cryptantha	0.0	0.0	1.2	
	Desert globemallow	0.0	0.03	0.7	
	Desert woollystar	0.0	0.0	0.3	
	Eggleaf fiddleleaf	0.0	0.0	1.4	
	Esteve's pincushion	0.0	0.0	3.9	
	Herb sophia	0.0	0.0	0.3	
	Hoary tansyaster	0.0	0.0	3.6	
	Lupine	0.0	0.0	0.2	
	Nye gilia	0.0	0.0	1.6	
	Ragweed	0.0	0.0	2.5	
	Red root cryptantha	0.0	0.0	1.8	
	Small wirelettuce	0.0	0.0	0.02	
	Sowthistle desert dandelion	0.0	0.0	0.3	
	Springparsley	0.0	0.0	0.1	
	Suncup	0.0	0.0	0.5	
	Tufted evening primrose	0.0	0.0	0.1	
	Western tansymustard	0.0	0.0	0.7	
	Whitestem blazingstar	0.03	0.0	0.9	
	Total Forb Density	0.03	0.03	21.4	15.1
INVASIVE WEEDS	Halogeton	0.0	0.0	0.1	
	Prickly Russian thistle	0.0	0.0	1.5	
	Cheat grass	0.0	0.0	0.02	
	Total Invasive Weed Density	0.0	0.0	1.6	
TOTAL PLANT DENSITY		0.9	0.3	25.4	13.8*

* Does not include invasive weed density

4.3 SPECIES RICHNESS

Species richness varies based on the timing and amount of precipitation. Precipitation was below the average this year, resulting in a decrease and near absence of forbs. On the staging area, there was an average of 0.8 species per quadrat (Table 3). Two shrubs, fourwing saltbush and bud sagebrush, and two grasses, Indian ricegrass and James' galleta grass, were encountered on the staging area. Forbs are typically common on the staging area, but there was only one species, whitestem blazingstar, this year.

Species richness on the re-seeded area was 0.2 species per quadrat (Table 3). Fourwing saltbush was the only perennial species found on the re-seeded area. The only other species on the re-seeded area was desert globemallow.

Species richness on the reference area averaged 4.1 plants per quadrat. Greene's rabbitbrush and fourwing saltbush are the common shrubs found. Indian ricegrass is the most common grass. Typically forbs make up over 60 percent of the species richness, averaging 2.6 forbs per quadrat, but this year there were no forbs on the reference area.

TABLE 3. SPECIES RICHNESS (SPECIES PER M²) ON CAU 400, FIVE POINTS LANDFILL

	Staging	Re-Seeded	Reference	Standard
Shrubs	0.5	0.2	0.6	0.4
Grasses	0.2	0.0	0.9	0.6
Forbs	0.1	0.03	2.6	1.8
Total Species	0.8	0.2	4.1	2.8

4.4 REVEGETATION SUCCESS

4.4.1 Staging Area

The plant community on the Five Points Landfill staging area shows no signs of plant die-off, but there was little evidence of plant growth this year. This was most evident by plant cover. Total plant cover was only 9 percent, which is the lowest recorded on the site. Shrub cover was the lowest it has been since 2002, but only 0.4 percent lower than the average shrub cover over the last 4 years. Grass cover was lower than last year, but over the last 5 years, there have been 2 years when there was no grass cover and 1 year when grass cover was half the amount found this year. There were no forbs this year, which is not unusual at this site. There was no forb cover in 2002 and 2007, which is typical of years when winter and early spring precipitation rates are below average. Shrubs and grasses were present, but there was a minimal amount of growth for both life forms.

Plant density, like cover, was the lowest ever recorded on the staging area, averaging just 0.9 plants/m². Total plant density did not exceed the standard for reclamation success (Table 2). Shrub density did exceed the standard, but grass density was a sixth of the standard. Shrubs accounted for most of the total density, even though it was the second lowest shrub density recorded for the staging area. Fourwing saltbush was the most common shrub. The only other shrub found on the site was bud sagebrush, which is uncommon. Grass density was 0.2 grasses/m², which was the same as 2008 and 2010 and the lowest recorded for the site. Indian ricegrass was the most common grass, although James' galleta grass is becoming more common.

Whitestem blazingstar was the only forb present on the site this year, and it was rarely encountered. Typically, there are several forbs present on the site, but this year was similar to

2007 when there were no forbs present. An absence of forbs is directly related to the lack of winter and early spring precipitation.

Species richness values were the lowest experienced over the last 5 years. Species richness values for shrubs over the last 5 years ranged from 0.4 to 0.6 species per quadrat, with an average for the same period of 0.5 species per quadrat, which is the value for 2012. Fourwing saltbush was by far the most abundant.

Species richness values for grasses over the last 5 years ranged from a low of 0.1 in 2008 to a high of 0.4 species per quadrat last year. The species richness for grasses was equal to the average species richness values for grasses over the last 5 years. Three species of grasses occur on the site. The most common is Indian ricegrass. Squirreltail grass has been common in previous years but has declined in abundance the last few years. More recently, James' galleta grass has occurred more frequently on the site.

Species richness values for forbs vary the most of the three life forms. The species richness for forbs of 0.05 species per quadrat recorded this year was the second lowest ever recorded on the site. There was only one forb, whitestem blazingstar, present on the site. Over the last 5 years, species richness values for forbs ranged from the 0.1 species per quadrat recorded this year to over 5 species per quadrat in 2009 and 2010. Over the last 5 years, desert woollystar, gilia, Russian thistle, and whitestem blazingstar have been the most persistent species. Cushion cryptantha, hoary tansyaster, and Esteve's pincushion are less persistent and may not be found every year; however, when present they have shown some of the highest densities for forbs.

Overall species richness on the staging area was less than the standard for reclamation success. Species richness values for shrubs exceeded the success standard but grasses did not, which was the situation in previous years.

4.4.2 Re-seeded Area

Plant cover on the re-seeded area at the Five Points Landfill improved the last few years. There were bursts of forb cover in 2008 and 2010. Shrub cover has shown a steady increase over the last 5 years, doubling from 2010 to 2011 and then again from 2011 to this year. Indian ricegrass was present right after the site was re-seeded, but it has not persisted. Forb cover has fluctuated dramatically over the last 5 years. It made up more than half of the total plant cover in 2006 and more than 85 percent in 2010, but like 2007, forbs were completely absent this year. Overall plant cover was below the standard for reclamation success.

Plant density was the lowest it has been at this site, primarily due to the absence of grasses and forbs. However, shrub density continued to improve and increased almost fourfold from last year. Indian ricegrass and squirreltail grass have been common on the site but absent the last 2 years. Even with the increase in shrub density this year, it is still only approximately half of the reclamation success standard.

Except for the 2 years when there was an abundance of annual forbs, species richness values for the re-seeded area have been low compared to the staging area and the reference site. Species richness values for shrubs was only half of the standard for reclamation success, and because there were no grasses and only one forb this year, overall species richness values were less than 10 percent of the standard.

4.5 WILDLIFE USE

There was a minimal amount of small mammal activity on the Five Points Landfill. 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 flooding on the site. The hay bales used when erosion control measures were implemented a few years ago are deteriorating, but there were no signs of excessive water flow in the small channel that enters the site from the east. The finer soils in the bottom areas have not changed significantly over the last couple years.

4.7 SUMMARY/RECOMMENDATIONS

The last 2 years, the average annual precipitation at the TTR has been below average, and the vegetation reflects the lack of adequate moisture for normal plant growth. Even in these sub-optimal growing conditions, shrubs continued to persist, whereas the grasses and forbs struggled. Overall, the plant community on the Five Points Landfill appeared to be somewhat stable, although this year the absence of grasses and forbs was noticeable. Based on the parameters being monitored at this site, the condition of the plant community was not far from reclamation success standards and with better growing conditions, those standards may quickly be met, if not exceeded.

The major concern at this site has been flooding, which has proven to have a negative impact on the plant community. Over the last couple years, there have been no major precipitation events near this site resulting in major flooding. However, the potential for flooding exists because of its location within a natural drainage. Because of the potential impact flooding could have at this site, it may be worth the effort to maintain the erosion control measures implemented previously. The hay bales deployed along the drainage are beginning to deteriorate somewhat, and their effectiveness to minimize the effects of a flash flood may be diminishing. Preventive measures may be warranted and may include the placement of additional hay bales or possibly erosion control blankets. Erosion control blankets are more resistant to the elements and may last longer than the hay bales. Such measures may prevent the need to re-seed the area, which would be more labor intensive and costly.

5.0 CAU 407 SURVEY RESULTS

Three transects were sampled in 2012. Reclamation success standards were determined by averaging data collected at a reference site from 2000 to 2009. The reference site is located less than a mile north of CAU 407.

5.1 PLANT COVER

Plant cover at CAU 407 was 11.7 percent (Table 4) in 2012. Only shrubs were present. Shadscale saltbush was the only shrub contributing to plant cover this year. Fourwing saltbush commonly contributed to plant cover previously. Forbs have not been common at this site in the past and were absent this year, as were invasive species.

Average total plant cover on the reference area was 13.2 percent (Table 4). 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 was the most common species and accounted for over half of total shrub cover. Fourwing saltbush accounted for 40 percent of total shrub cover. There was a good mix of grasses on the reference area. James' galleta grass was the most common and accounted for over half of total grass cover. Indian ricegrass accounted for 40 percent of total grass cover, and woolly tuftgrass made up the balance. Three forbs contributed to plant cover on the reference area. 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	0.0	5.3	
	Fourwing saltbush	0.0	3.8	
	Shadscale saltbush	11.7	0.0	
	Yellow rabbitbrush	0.0	0.1	
	Winterfat	0.0	0.2	
	Total Shrub Cover	11.7	9.4	6.6
GRASSES	Indian ricegrass	0.0	0.7	
	Woolly tuftgrass	0.0	0.1	
	James' galleta grass	0.0	1.0	
	Total Grass Cover	0.0	1.8	1.3
FORBS	Esteve's pincushion	0.0	1.5	
	Filaree	0.0	0.2	
	Milkvetch	0.0	0.2	
	Total Forb Cover	0.0	1.9	1.3
INVASIVE WEEDS	Halogeton	0.0	0.1	
	Total Invasive Weed Cover	0.0	0.1	
TOTAL PLANT COVER		11.7	13.2	9.2*
Bare Ground		67.5	69.6	
Litter		20.8	17.2	

* Does not include invasive weeds

5.2 PLANT DENSITY

Plant density at CAU 407 was 8.5 plants/m² this year and was all perennial shrubs (Table 5). The most abundant shrub was shadscale saltbush. The only other plant found on the site this year was fourwing saltbush.

Average plant density on the reference area was 16 plants/m². There was a more even distribution of life forms on the reference area than on the CAU 407 cover. There were 4 shrubs/m², 1.7 grasses/m², and 9.8 forbs/m². The most abundant shrub was bud sagebrush, followed by shadscale saltbush. James' 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 M²) ON CAU 407

		Cover	Reference	Standard
SHRUBS	Bud sagebrush	0.0	3.1	
	Fourwing saltbush	0.3	0.0	
	Shadscale saltbush	8.2	0.8	
	Sagebrush cholla	0.0	0.03	
	Winterfat	0.0	0.1	
	Total Shrub Density	8.5	4.0	2.8
GRASSES	Indian ricegrass	0.0	0.4	
	Woolly tuftgrass	0.0	0.4	
	Squirreltail grass	0.0	0.04	
	James' galleta grass	0.0	0.9	
	Total Grass Density	0.0	1.7	1.2
FORBS	Buckwheat species	0.0	0.1	
	Desert globemallow	0.0	0.3	
	Esteve's pincushion	0.0	8.7	
	Freckled milkvetch	0.0	0.1	
	Gooseberryleaf globemallow	0.0	0.1	
	Hoary tansyaster	0.0	0.04	
	Lambsquarter	0.0	0.1	
	Milkvetch	0.0	0.2	
	Pepperweed	0.0	0.2	
	Total Forb Density	0.0	9.8	6.9
INVASIVE WEEDS	Halogeton	0.0	0.3	
	Total Invasive Weed Cover	0.0	0.3	
TOTAL PLANT DENSITY		8.5	15.9	10.9*

* Does not include invasive weeds

5.3 SPECIES RICHNESS

There was an average of 0.9 species encountered per quadrat on the CAU 407 cover (Table 6). This was the lowest value recorded at the site. Species richness, like cover and density, was all shrubs. There were no grasses or forbs on the site this year.

TABLE 6. SPECIES RICHNESS (SPECIES PER M²) ON CAU 407

	Cover	Reference	Standard
Shrubs	0.9	1.6	1.1
Grasses	0.0	0.5	0.4
Forbs	0.0	1.1	0.8
Total Species	0.9	3.2	2.3

5.4 REVEGETATION SUCCESS

Total plant cover continued to exceed the reclamation success standard due to the abundance of shadscale saltbush. Shrub cover declined the last 3 years but still remained higher than the native plant community. Grasses were present the first few years after the site was re-seeded but have been absent the last 3 years. Forb cover was minimal, and when forbs do contribute to plant cover, it is from either Esteve's pincushion or halogeton.

Like plant cover, plant density was composed entirely of shrubs. The 8.5 shrubs/m² recorded this year was less than the 5-year average of 14.5 plants/m² and approximately half the shrub density reported for 2011. Even with the decline from last year, shrub density still exceeded the reclamation success standard. There were no grasses this year on the CAU 407 cover, so grass density did not meet the reclamation success standard.

Species richness values this year were the lowest recorded since 2008 but not significantly different from last year. The only species encountered this year were shadscale saltbush and bud sagebrush, and the species richness values for those species was approximately 0.9 shrubs per quadrat, lower than the standard of 1.1 shrubs per quadrat. When only using perennial shrubs and grasses for the reclamation success standard, the total species richness value this year fell short of the standard of 1.5 plants per quadrat.

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 soil on the cover and side slopes appeared stable and showed no signs of erosion.

5.7 SUMMARY/RECOMMENDATIONS

The primary concern at the CAU 407 site has been erosion off of the cover and the surfacing of subsurface soils as a result of burrowing activity along the edges of the cover. Corrective measures were previously implemented that have been effective in controlling erosion. Animal burrows were present, but they appeared infrequently used.

Of equal concern is the establishment of a more diverse plant community on the site. Plant density and species richness was less than the standard for reclamation success. The lack of perennial grasses continued to be a concern. It was noted that plants establishing on the cover are smaller than typical, which is probably a result of the compacted subsurface soils. With time, the soil may loosen and allow greater root penetration and better plant growth. This may also improve the growth of perennial grasses and the spread of native forbs.

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	2012
Litter	17.5	17.5	23.3	26.5	11.5	28.8	28.1	16.9	30.0	15.0	15.6	30.8
Bare	43.4	49.2	47.5	58.0	52.6	48.1	57.5	56.2	58.7	61.2	70.6	60.2
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	7.7
Indian ricegrass	10.0	22.5	10.0	3.7	1.3	5.0	3.8		0.6		2.5	1.3
Squirreltail	3.3	0.8			0.6	0.6						
James' 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	7.7
Grasses	13.3	23.3	10.0	3.7	1.9	5.6	3.8		0.6		3.1	1.3
Forbs		0.8		2.2	8.2	2.5		18.8	2.5	15.8	2.6	
Invasive Weeds						1.3						
TOTAL PLANT COVER	15.8	32.4	19.2	14.0	19.1	23.2	14.4	26.9	11.2	23.9	13.8	9.0

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

	Year						
	2006	2007	2008	2009	2010	2011	2012
Litter	15.0		10.2	11.7	13.3	11.7	15.9
Bare	70.0	100.0	78.7	85.0	63.4	82.5	74.8
Rock	0.8						
Fourwing saltbush	3.3		6.8	2.5	2.5	5.8	9.3
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	4.9		6.8	2.5	2.5	5.8	
Grasses	1.6		0.8		0.8		
Forbs	0.0		3.4		19.2		
Invasive Weeds				0.8	0.8		
TOTAL PLANT COVER	6.5	0.0	11.0	3.3	23.3	5.8	9.3

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	67.6	65.1	70.9	63.4	65.8	63.3	60.0	74.2	75.0	60.9	66.6
Rock	5.8	5.0	1.7	2.5	0.6						1.6
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	0.7
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	11.6	10.8	5.8	7.5	8.1	8.4	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			5.8	9.3			9.2	1.7	12.4	3.9
Invasive Weeds			0.8	0.8	0.6				0.8		0.3
TOTAL PLANT COVER	17.4	16.6	12.4	17.4	21.1	14.2	19.2	17.5	10.8	26.6	17.3

TABLE I.4. CAU 400, FIVE POINTS LANDFILL, PLANT DENSITY (PLANTS/M²), STAGING AREA

	Year													
	1998	1999	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Bud sagebrush	0.2				0.1			0.2	0.1	0.03	0.03	0.1	0.1	0.03
Fourwing saltbush	2.6	0.8	0.7	0.2	1.4	1.1	1.4	1.2	0.5	1.0	0.8	0.6	0.7	0.7
Greene's rabbitbrush				0.9										
Winterfat						0.03	0.03	0.1						
Cheatgrass			0.1											
Indian ricegrass	3.8	5.1	4.8	3.2	2.1	1.0	0.4	0.7	1.0	0.2	0.3	0.1	0.3	0.1
James' galleta grass			0.03			0.2		0.1	0.1		0.1	0.03		0.1
Sand dropseed				0.03										
Squirreltail	3.6	3.9	2.2	0.3	0.8	0.4	0.1	1.1	0.4			0.03	0.2	
Birdnest buckwheat														
Booth's evening primrose														
Buckwheat species 1						0.2	2.6	0.1				15.9		
Flatcrown buckwheat		0.9	0.4	0.2		0.1	27.8	0.2			4.1	0.1		
Cryptantha species			1.3			0.1		0.4						
Cushion cryptantha						0.1				1.1	4.2	3.9		
Cymopterus species						0.7								
Desert globemallow				0.03										
Desert woollystar		0.5	0.7			0.2				0.03	0.5	0.8	1.2	
Eggleaf fiddleleaf		1.7	1.4				3.7	0.8			2.7	1.7		
Esteve's pincushion						0.1	2.4	0.3		36.5	5.6	27.2		
Herb sophia										0.4		0.1		
Hoary tansyaster						2.2	0.1	0.5		1.3	0.6		0.1	
Lupine species							0.1							
Nye gilia						4.5	5.8			0.03	0.6	2.1	0.1	
Prickly Russian thistle		3.9	1.3	0.1	0.9		0.1	0.2		0.1	0.9	0.2	0.4	
Ragweed			0.6	0.03	0.4	1.4	0.2	0.3					0.1	
Red root cryptantha							2.4							
Halogeton		0.1	0.1	0.1	0.03	2.2								
Small wirelettuce											0.3		0.5	
Sowthistle desert dandelion												0.2		
Tufted evening primrose										0.1				
Western tansymustard		0.6	4.2			2.0	0.7				0.03			
Whitestem blazingstar		0.03	0.1				10.6	0.1			2.0	6.4	2.3	0.03
Shrubs	2.8	0.8	0.7	1.1	1.5	1.1	1.4	1.5	0.6	1.0	0.8	0.7	0.8	0.7
Grasses	7.4	9.0	7.0	3.6	2.9	1.6	0.5	1.9	1.5	0.2	0.4	0.2	0.5	0.2
Forbs		3.7	8.7	0.2	0.4	11.6	56.4	2.7		39.5	20.6	58.4	4.3	0.03
Invasive Weeds		4.0	1.5	0.2	0.9	2.2	0.1	0.2		0.1	0.9	0.2	0.4	0.0
TOTAL PLANT DENSITY	10.2	17.5	17.9	5.1	5.7	16.5	58.4	6.3	2.1	40.8	22.7	59.5	6.0	0.9

TABLE I.5. CAU 400, FIVE POINTS LANDFILL, PLANT DENSITY (PLANTS/M²), RE-SEEDING AREA

	Year							
	2005	2006	2007	2008	2009	2010	2011	2012
Fourwing saltbush	1.6	0.9		0.04	0.03	0.1	0.1	0.3
Shadscale saltbush		0.03						
Winterfat	1.0	0.8						
Cheatgrass	0.5							
Indian ricegrass	0.1	0.6	0.2	1.4	0.1	0.3		
Squirreltail	8.6	1.7	0.1	0.03	0.3	0.1		
Booth's suncup	0.2							
Buckwheat species	0.1					0.03		
Desert globemallow				0.1				0.03
Herb sophia				0.1		0.03		
Lambsquarter						0.2		
Nye gilia	0.1							
Western tansymustard				0.1		1.0		
Prickly Russian thistle	3.0	67.3			0.2	1.3	0.01	
Ragweed	0.2			0.02	0.03	0.4		
Red root cryptantha	0.2					0.01		
Halogeton	0.1	0.9			0.01	0.02		
Small wirelettuce	0.1							
Esteve's pincushion	0.9				0.01	0.1	0.03	
Tufted evening primrose				0.1				
Whitestem blazingstar	12.9				0.02	0.7		
Shrubs	2.6	1.7		0.04	0.03	0.1	0.1	0.3
Grasses	8.7	2.3	0.3	1.4	0.4	0.4		
Forbs	14.7			0.4	0.06	2.5	0.03	0.03
Invasive Weeds	3.6	68.2			0.2	1.3	0.01	
TOTAL PLANT DENSITY	29.6	72.2	0.3	1.8	0.7	4.3	0.1	0.3

TABLE I.6. CAU 400, FIVE POINTS LANDFILL, PLANT DENSITY (PLANTS/M²), REFERENCE AREA

	Year										
	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	10-Year Average
Fourwing saltbush	0.2	0.2	0.1	0.3	0.1	0.1	0.03	0.03	0.2	0.2	0.1
Greene's rabbitbrush	1.4	0.9	0.9	0.4	0.5	0.4	0.6	0.6	0.6	0.3	0.7
Winterfat				0.03	0.03				0.1		0.02
Cheatgrass						0.1					0.0
Indian ricegrass	1.5	1.6	1.8	3.1	1.1	1.7	1.2	1.4	1.2	1.1	1.6
James' galleta grass					0.03		0.03				0.01
Sand dropseed	0.03	0.03									0.01
Squirreltail						0.1	0.1			0.03	0.02
Ragweed	0.8	0.1					0.03		21.7	0.2	2.3
Birdnest buckwheat				0.1					0.07		0.02
Booth's suncup			0.2	1.7					1.8		0.4
Buckwheat species 1				5.2							0.5
Buckwheat species 2	0.1			2.0						1.1	0.3
Cryptantha species				0.5					0.7		0.1
Cushion catseye	3.7		0.1	0.9				1.1	2.7		0.9
Cymopterus species	0.03			0.03	0.03				0.5		0.1
Desert globemallow				5.7					0.03		0.6
Desert woollystar	0.7								0.3	1.3	0.2
Eggleaf fiddleleaf	0.4			8.7						2.0	1.1
Halogeton									0.5		0.1
Herb sophia									0.9	0.1	0.1
Hoary tansyaster				31.8		0.5		0.1		0.2	3.3
Lupine	0.1		0.1							1.3	0.2
Nye gilia								0.9		12.1	1.3
Pinnate tanseymustard	4.8			0.3				0.2	0.3	0.2	0.6
Prickly Russian thistle	0.5		1.0	5.4		2.8		4.1	0.4	0.8	1.5
Red root cryptantha				1.9				0.6	2.1	9.7	1.4
Small wirelettuce	0.03		0.03	0.03							0.01
Sowthistle desert dandelion										0.3	0.03
Steve's dusky maiden	0.2		0.1			0.1		23.1	0.1	11.8	3.5
Tufted evening primrose								0.2			0.02
Whitestem blazingstar	0.2			1.7				0.5		4.8	0.7
Shrubs	1.6	1.1	1.0	0.7	0.6	0.5	0.6	0.6	0.9	0.5	0.8
Grasses	1.5	1.6	1.8	3.1	1.1	1.8	1.3	1.4	1.2	1.1	1.6
Forbs	11.1	0.1	0.5	60.6	0.03	0.6	0.03	26.7	31.2	45.1	17.6
Invasive Weeds	0.5		1.0	5.4		2.9		4.1	0.9	0.8	1.6
TOTAL PLANT DENSITY	14.7	2.8	4.3	69.8	1.7	5.8	1.9	32.8	34.0	47.5	21.5

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

CAU 400, Five Points Landfill, 2012

ATTACHMENT II
CAU 407 COVER AND DENSITY DATA AND PHOTOGRAPHS

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

	Year					
	2006	2008	2009	2010	2011	2012
Litter	74.2	66.7	39.2	47.5	20.0	20.8
Bare		23.4	50.9	30.9	64.2	67.5
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	11.7
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	9.1	20.8	14.1	11.7
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	9.9	21.6	15.8	11.7

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	34.0	34.0	24.5	38.5	54.9	64.6	68.3	73.2	48.4
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	0.7
James' galleta grass						1.1	1.6		0.6	0.4
Esteve's pincushion								8.2		0.9
Gooseberry leaf globemallow									0.6	0.1
Milkvetch						1.7				0.2
Redstem stork's bill						1.7				0.3
Shrubs	13.0	5.0	9.0	9.5	7.0	11.1	13.5	9.7	6.7	9.4
Grasses	4.0	2.0	1.5	1.5	1.0	2.8	2.1		1.2	1.8
Forbs			0.5			3.4		8.2	0.6	1.6
Invasive Weeds										0
TOTAL PLANT COVER	17.0	6.5	11.0	11.0	8.0	17.3	15.6	17.9	8.5	12.8

TABLE II.3. CAU 407 PLANT DENSITY (PLANTS/M²)

	Year							
	2005	2006	2007	2008	2009	2010	2011	2012
Bud sagebrush	2.9	1.3	1.3	0.5	0.3	0.7	0.1	
Fourwing saltbush	2.3	3.2	2.4	1.8	1.7	0.8	0.5	0.3
Shadscale saltbush	17.5	17.9	14.2	18.1	11.6	11.7	10.2	8.2
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	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	10.8	8.5
Grasses	59.3	54.5	27.6	2.0	0.3	0.0	0.0	0.0
Forbs	4.4	7.3	0.0	13.7	0.7	14.9	0.0	0.0
Invasive Weeds	0.4	0.3	0.0	0.0	4.1	7.6	1.9	0.0
TOTAL PLANT DENSITY	87.5	86.9	46.8	36.8	18.7	36.4	12.7	8.5

TABLE II.4. CAU 407 PLANT DENSITY (PLANTS/M²), 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	0.02	0.04	0.1	0.1	0.1	0.1	0.04	0.1	0.2	0.1
Sagebrush cholla	0.02	0.02		0.1						0.01
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 grass	0.7		0.02			0.8	0.9	0.2	0.7	0.9
Birdnest buckwheat				0.1		0.02		0.04		0.01
Buckwheat	0.7	0.5	0.5	0.5	0.1				0.1	0.1
Cryptantha	0.1									0.01
Cushion cryptantha				0.1						0.01
Desert globemallow	0.3			0.1				0.2	0.1	0.3
Esteve's pincushion	1.3			2.7	36.9			31.9	5.6	8.7
Freckled milkvetch	0.02	0.04		0.1	0.9					0.1
Gooseberryleaf globemallow		0.1	0.6	0.02	0.3	0.3	0.3			0.1
Hoary tansyaster	0.02	0.5		0.2	0.03	0.2				0.04
Lambsquarter			0.5							0.1
Manybranched ipomopsis			0.3	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	0.1						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	1.3	1.7	1.6	1.5	1.4	1.6	0.9	1.2	1.5
Forbs	2.6	1.3	1.9	4.8	38.4	3.3	0.3	32.6	5.8	10.1
Invasive Weeds	1.7			0.3	0.1					0.2
TOTAL PLANT DENSITY	11.9	6.9	8.5	10.7	44.1	8.1	5.5	37.2	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

CAU 407, 2012

ATTACHMENT III

COMMON AND SCIENTIFIC NAMES OF PLANTS

TABLE III.1. COMMON AND SCIENTIFIC NAMES OF PLANTS

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

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

	Common Name	Scientific Name
continued	Whitestem blazingstar	<i>Mentzelia albicaulis</i>
	Wishbone-bush	<i>Mirabilis laevis</i> var. <i>villosa</i>
	Yellow rabbitbrush	<i>Chrysothamnus viscidiflorus</i>

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