

Postclosure Inspection and Monitoring Report for Surface Corrective Action Unit 417 at the Central Nevada Test Area, Nevada, Site

February 2020

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Contents

Abbreviations	ii
Executive Summary	iii
1.0 Introduction	1
1.1 Purpose	1
1.2 Site Location and Background	1
1.3 Geologic Setting	1
2.0 Postclosure Monitoring Requirements	5
2.1 Site Inspections	5
2.2 Maintenance and Repair	5
2.3 Reporting Requirements	6
3.0 Site Inspections, Surveys, and Maintenance	7
3.1 Biennial Site Inspection Results	7
3.1.1 UC-1 Inspection	7
3.1.2 UC-3 Inspection	7
3.1.3 UC-4 Inspection	7
4.0 Summary, Conclusions, and Recommendations	11
4.1 Summary	11
4.2 Conclusions	11
4.3 Recommendations	11
5.0 References	13

Figures

Figure 1. CNTA Location Map	2
Figure 2. CNTA Regional Map	3
Figure 3. Surface Use-Restricted Areas, CNTA	4
Figure 4. UC-1 Site Map, Showing the Surface Use-Restricted Areas	8
Figure 5. UC-3 Site Map, Showing the Surface Use-Restricted Areas	8
Figure 6. UC-4 Site Map, Showing the Surface Use-Restricted Areas	9

Appendixes

Appendix A	Record of Technical Change, 2015
Appendix B	Inspection Checklists and Site Photographs, 2018
Appendix C	NDEP Correspondence and Record of Review

Abbreviations

bgs	below ground surface
CAU	Corrective Action Unit
CMP	Central Mud Pit
CNTA	Central Nevada Test Area
DOE	U.S. Department of Energy
FFACO	Federal Facility Agreement and Consent Order
ft	feet
LM	Office of Legacy Management
NDEP	Nevada Division of Environmental Protection
ROTC	Record of Technical Change

Executive Summary

This report documents the biennial postclosure site inspections conducted in June 2018 at the surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada, Site. The UC-1, UC-3, and UC-4 sites are inspected every 2 years, in accordance with the Post-Closure Monitoring Plan provided in the CAU 417 Closure Report published in 2001. The requirements for postclosure monitoring have been modified over the years through negotiations with the Nevada Division of Environmental Protection (NDEP). Modifications were documented through three separate Records of Technical Change to the Closure Report, which were approved by NDEP in 2003, 2011, and 2015.

The UC-1, UC-3, and UC-4 sites were all observed as being in good condition during the 2018 inspections. A few minor cracks on the UC-1 Central Mud Pit cover were repaired during the UC-1 inspection. A concrete monument at the northeast corner of Mud Pit U3E at the UC-3 site had some damage near the top of the monument, but the damage has not impacted the functionality of the monument or survey pin on top of the monument. No issues were identified at the UC-4 site. No maintenance or additional repair activities are recommended at the UC-1, UC-3, and UC-4 sites.

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1.0 Introduction

This report presents results of the biennial postclosure site inspection conducted by the U.S. Department of Energy (DOE) Office of Legacy Management (LM) at the surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area (CNTA), Nevada, Site (Figure 1). The report has been prepared in accordance with the Post-Closure Monitoring Plan contained in the CAU 417 Closure Report (NNSA/NV 2001). The site closure process was completed in 2001 in accordance with the amended Federal Facility Agreement and Consent Order (FFACO) (FFACO 1996, as amended) and all applicable Nevada Division of Environmental Protection (NDEP) policies and regulations. Responsibility for environmental site restoration was transferred from the DOE National Nuclear Security Administration Nevada Field Office to LM on October 1, 2006. This report summarizes investigation activities associated with CAU 417 that LM conducted from July 2016 through September 2018. A postclosure inspection was conducted in 2018 to document the physical condition of the CAU 417 soil covers, monuments, signs, fencing, and use-restricted areas.

1.1 Purpose

The purpose of the postclosure inspection at CAU 417 is to evaluate the surface use-restricted areas to determine if:

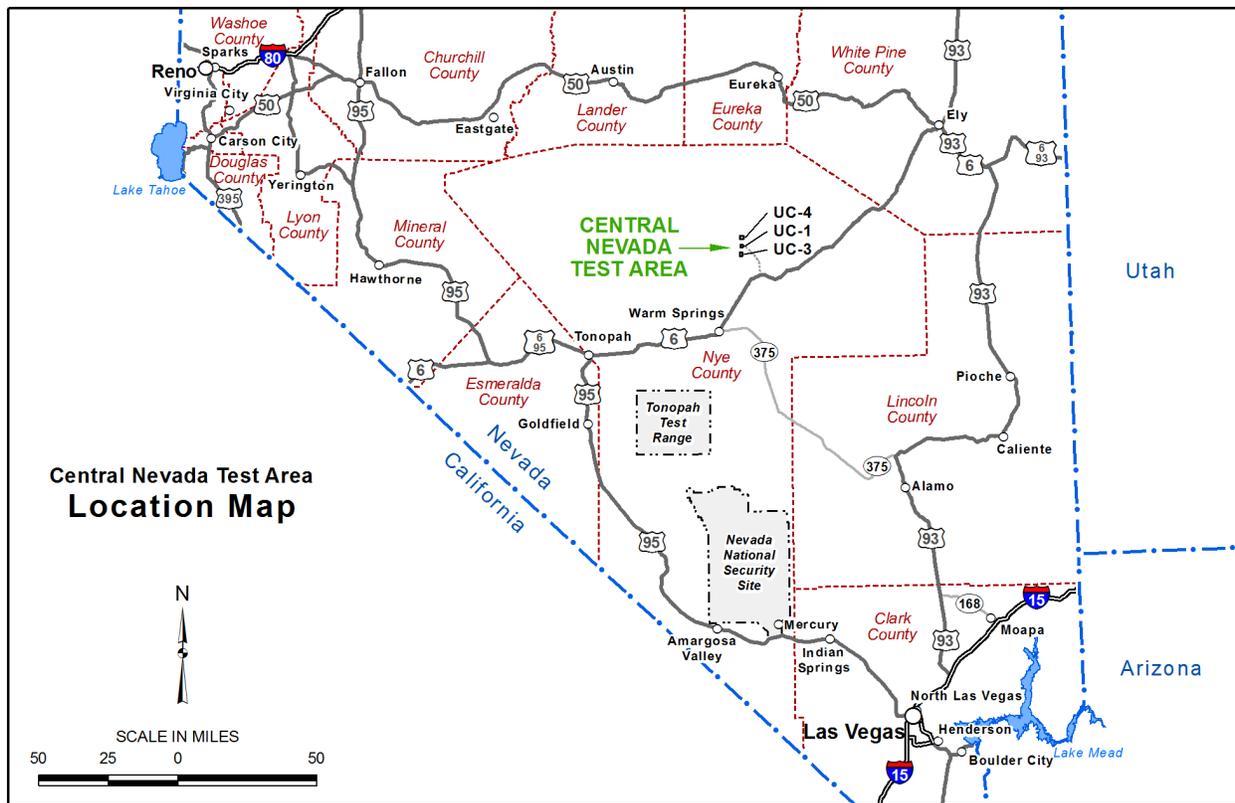
- The UC-1 Central Mud Pit (CMP) or UC-4 Mud Pit C covers, fences, or diversion channels need maintenance or repairs (Figure 2 and Figure 3).
- Vegetation on the UC-1 CMP cover is healthy.
- The aboveground monuments or warning signs associated with the surface use-restricted areas at UC-1, UC-3, and UC-4 need maintenance or repairs.
- The administrative controls need modifications.

1.2 Site Location and Background

The CNTA is approximately 14 miles north of U.S. Highway 6 and approximately 68 miles northeast of Tonopah in Nye County, Nevada (Figure 1). Three emplacement boreholes, UC-1, UC-3, and UC-4, were drilled at the CNTA for underground nuclear weapons testing. On January 19, 1968, the Faultless underground nuclear test was conducted in borehole UC-1 at a depth of 3200 feet (ft) (DOE 2015b). The other two emplacement boreholes (UC-3 and UC-4) were not used, and no further testing was conducted at the CNTA. Boreholes UC-1, UC-3, and UC-4 are on three separate land withdrawals that range in size from approximately 1 to 1.5 square miles (Figure 2). All three land withdrawals are accessible to the public.

1.3 Geologic Setting

The underground nuclear test triggered numerous small earthquakes and aftershocks that resulted in surface subsidence and surface rupture along preexisting faults, creating a subsidence graben (also referred to as a down-dropped fault block) at the UC-1 site. The southeast bounding graben fault has a maximum surface displacement of 15 ft and dips beneath the southeastern corner of the UC-1 CMP (see UC-1 site detail in Figure 2). The formation of this fault scarp disrupted normal drainage patterns, so flood diversion channels were constructed (Figure 3) to protect the cover and prevent infiltration along the fault scarp (NNSA/NV 2001).



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Figure 1. CNTA Location Map

The depth to groundwater at the UC-1 CMP is approximately 275 ft below ground surface (bgs) based on measurements obtained from well UC-1-P-1SRC¹ prior to and after its recompletion in June 2009 (Figure 2). Water levels measured before the recompletion of UC-1-P-1S had been suspect because difficulties were encountered during the well’s drilling and construction in 1968. Historically, the reported depth to water of 550 ft at the CMP was based on measurements obtained from well HTH-2. Well HTH-2 is outside the down-dropped fault block, nearly 1500 ft southwest of the CMP (Figure 2). Well UC-1-P-1SRC is inside the down-drop graben block, less than 200 ft west of the CMP. The differing depths to groundwater inside and outside the graben block (northwest and southeast of the southeast bounding fault) were confirmed by the 2009 drilling program. Wells MV-4 and MV-5 were drilled through the southeast graben fault and were dual completions with a piezometer inside the graben and a well outside the graben (DOE 2009). The depth to groundwater measured in the piezometers is consistent with that of well UC-1-P-1SRC, approximately 275 ft bgs. The depth to groundwater measured in the wells outside the graben is consistent with that of well HTH-2, approximately 550 ft bgs. Well HTH 1RC (outside the graben block) was also recompleted in 2009 with two piezometers (upper and lower alluvial aquifer) and a well (upper volcanic section). The depth to water of both HTH-1RC piezometers is approximately 550 ft bgs.

¹ “RC” in a well name indicates that the well has been recompleted.

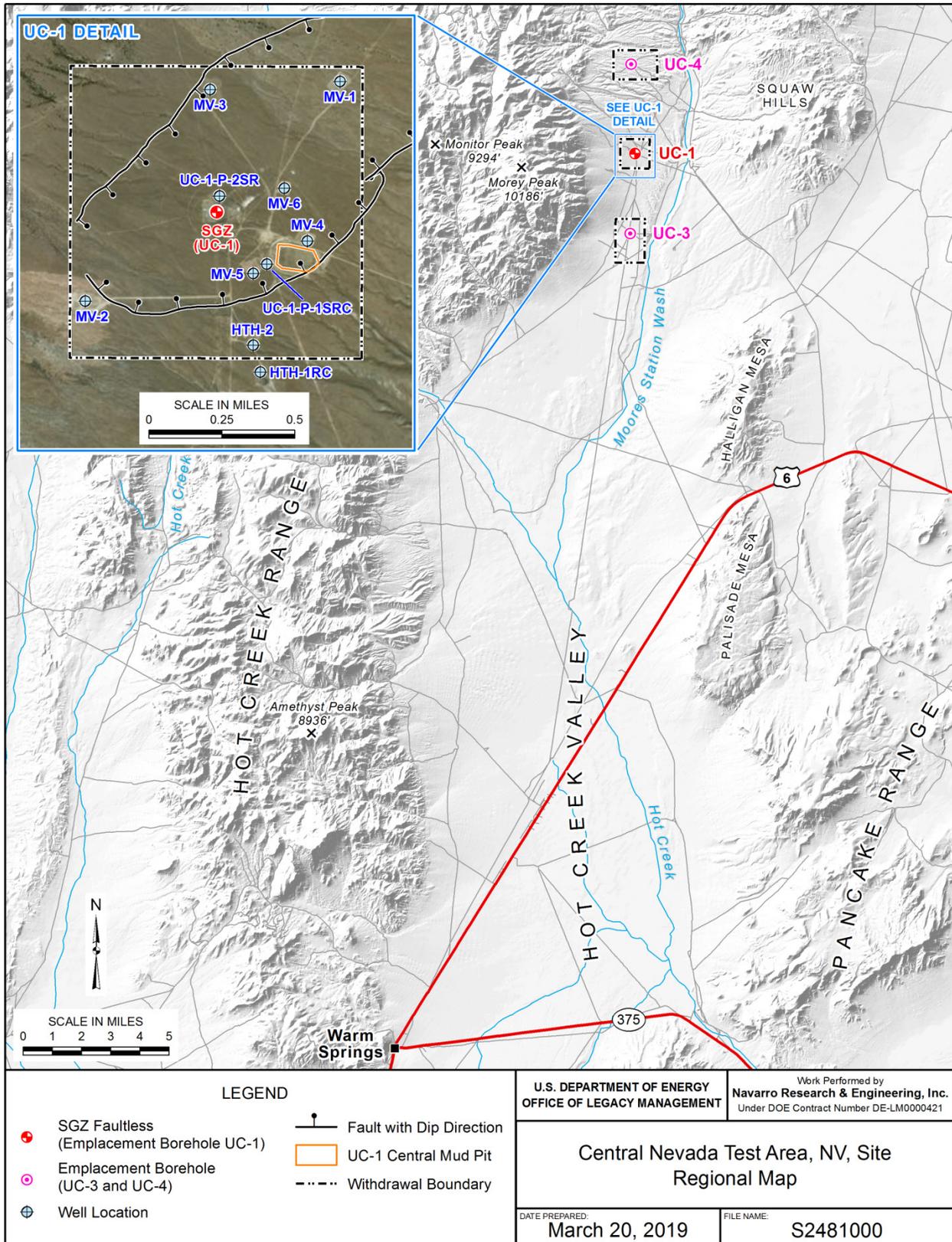
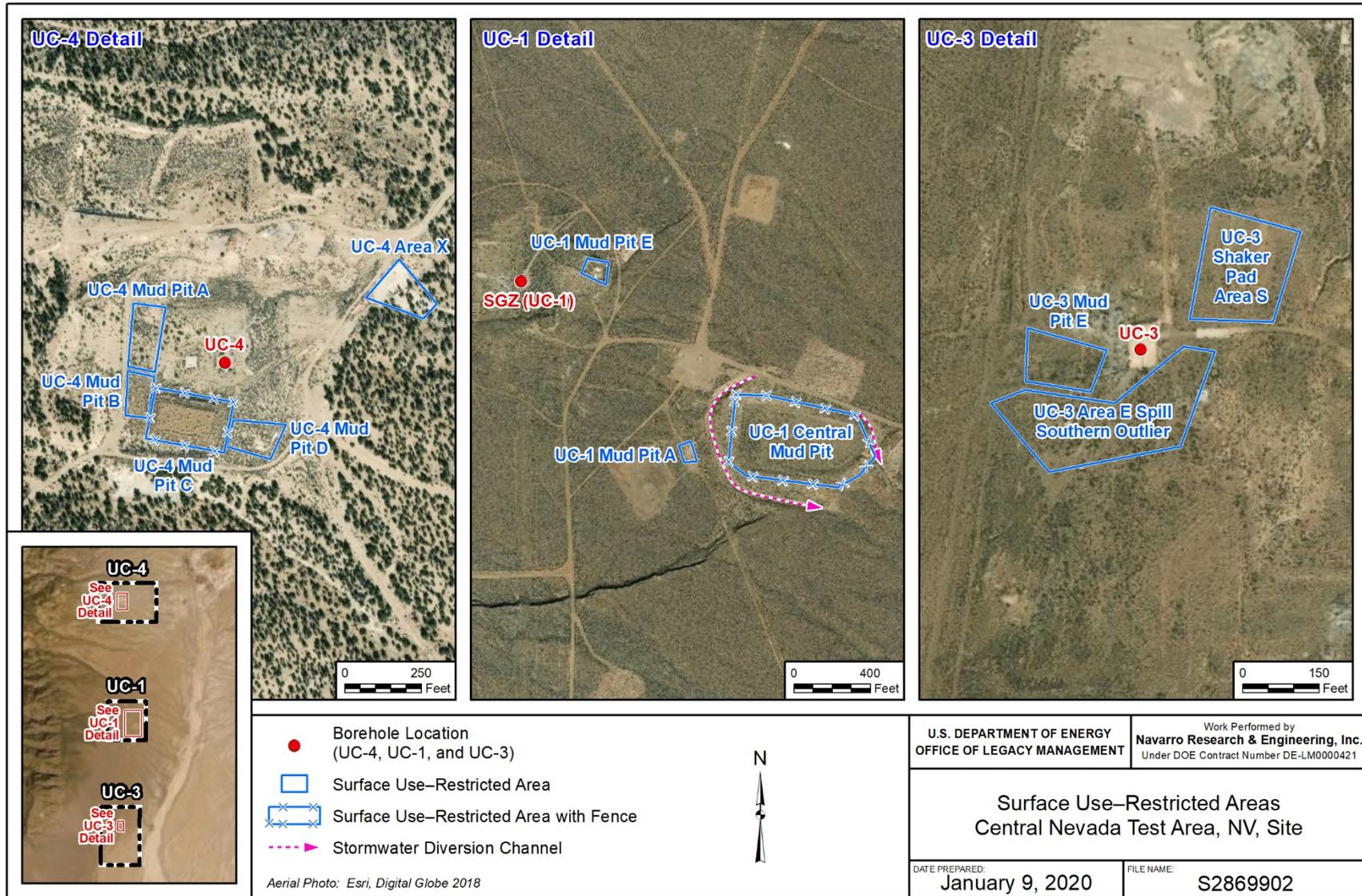


Figure 2. CNTA Regional Map



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Figure 3. Surface Use-Restricted Areas, CNTA

2.0 Postclosure Monitoring Requirements

The postclosure monitoring requirements were established in the Closure Report for CAU 417 (NNSA/NV 2001). These requirements have been modified over the years through negotiations with the NDEP. Modifications were documented through three separate Records of Technical Change (ROTCs) to the Closure Report, which were approved by NDEP in 2003, 2011, and 2015. The last ROTC removed the requirements for monitoring of soil moisture and subsidence at the UC-1 CMP cover and subsidence at the UC-4 Mud Pit C. Data supporting the removal of these requirements were presented to NDEP in the *Path Forward for Future Post Closure Inspection and Monitoring of Surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada* (DOE 2015a), which NDEP approved in a letter date March 2015 (NDEP 2015). A copy of the 2015 ROTC to the Closure Report is provided as Appendix A.

2.1 Site Inspections

Site inspections are conducted biennially at the site. The inspections are documented on an inspection checklist, with site photographs and, if applicable, field notes. The biennial postclosure site inspection consists of the following:

- Inspecting the UC-1 CMP cover and UC-4 Mud Pit C cover and fencing. This includes walking the entire perimeter of the fence and documenting the condition of the barbed wire and chicken-wire fencing, warning signs, and entrance gate.
- Inspecting all aboveground monuments, attached warning signs, and affixed survey pins placed at the UC-1, UC-3, and UC-4 sites for signs of wear, disturbance, vandalism, and other damage. Damaged monuments and attached signs are repaired during site inspections or, if necessary, later in the calendar year.
- Documenting any changes to the covers or fenced areas, including but not limited to the presence of trash and debris inside the fenced areas, erosion features on the covers or diversion channels, and any change in the health and stability of the UC-1 CMP cover vegetation.

2.2 Maintenance and Repair

If a site inspection detects that either the UC-1 CMP cover or the UC-4 Mud Pit C cover require major repairs or if any other problems in critical areas are noted, then issues will be evaluated and reported to NDEP within 60 days of detection (in compliance with the FFACO). The following guidelines apply to CAU 417 maintenance and repairs:

- Cracks, settling features, erosion rills, and animal burrows more than 6 inches deep that extend 3 ft or more and that do not compromise the UC-1 CMP or UC-4 Mud Pit C covers will be evaluated and repaired within 90 days of detection
- Noncritical cracks, settling features, erosion rills, and animal burrows less than 6 inches deep that extend less than 3 ft will be repaired during the site inspection visit
- Damage to the fencing surrounding the UC-1 CMP cover or the UC-4 Mud Pit C cover, warning signs, or monuments will be evaluated and repaired within 90 days of detection

- Major damage to use-restriction warning signs or monuments will be evaluated and repaired during subsequent site inspections
- Reports from the public of detrimental conditions at the site will be responded to within 90 days

All repair work will preserve the original as-built design and will be documented in the biennial postclosure inspection report.

2.3 Reporting Requirements

All inspection and maintenance activities conducted during the biennial monitoring period are documented and included in the biennial Postclosure Inspection Report. The biennial reporting will continue through the year 2020 per the 2015 ROTC (Appendix A), with the last biennial report planned for 2021. LM recommends additional discussions with NDEP to revise the postclosure inspection and reporting frequency for implementation after the 2020 inspection. LM submits the report to NDEP and includes the following information:

- A brief narrative and discussion of all postclosure inspection activities and observations
- Copies of all completed inspection checklists and maintenance records
- Specific recommendations for nonstandard maintenance or changes in postclosure requirements

All closure and postclosure monitoring documentation is maintained in project files and is available upon request.

3.0 Site Inspections, Surveys, and Maintenance

This section contains the results of the inspections that were done during the biennial monitoring period at the CNTA. It also includes a description of any maintenance that was performed.

3.1 Biennial Site Inspection Results

The biennial inspections of the three sites were performed on June 26–27, 2018. Copies of the inspection checklists and photographs are included in Appendix B. The following sections document the inspection results.

3.1.1 UC-1 Inspection

The UC-1 site (Figure 4) was in good condition at the time of the inspection, which was completed on June 27, 2018. The locks, fencing, and signs associated with the CMP were in good condition. A few minor cracks on the CMP cover were repaired during the inspection. No issues that affected the integrity of the cover, including new cracks, fractures, or extensions of existing cracks and fractures, were noted. The vegetation on the cover continued to look healthy and stable. All signs and monuments at Mud Pits A and E (Figure 4) were in good condition. No additional maintenance or repairs are recommended. Photographs 1 through 3 in Appendix B show the condition of the UC-1 site at the time of the inspection.

3.1.2 UC-3 Inspection

The UC-3 site (Figure 5) was in good condition at the time of the inspection, which was completed on June 26, 2018. The concrete monument at the northeast corner of Mud Pit U3E had some damage near the top of the monument (Appendix B, photograph 5). The damage appears to be the result of water that entered cracks in the concrete and through the freeze thaw process fractured and separated from the monument. The concrete monument and survey pin at the top of the monument still function as designed, but LM will repair the monument during the next inspection, planned for 2020. No other issues with the monuments or signs were identified at the time of the inspections, and no maintenance or repairs are recommended at this time. Photographs 4 through 6 in Appendix B show the condition of the UC-3 site at the time of the inspection.

3.1.3 UC-4 Inspection

The UC-4 site (Figure 6) was in good condition at the time of the inspection, which was completed on June 26, 2018. The Mud Pit C fence, signs, and monuments were in good condition at the time of the inspections. No erosion rills were identified and areas where previously identified rills showed no further signs of erosion. No issues that affected the integrity of the cover, including new cracks or fractures or extensions of existing cracks or fractures, were observed. All signs and monuments at Mud Pits A, B, and D, and Area X were in good condition (Figure 6). No maintenance or repairs are recommended. Photographs 7 through 12 in Appendix B show the condition of the UC-4 site at the time of the inspection.

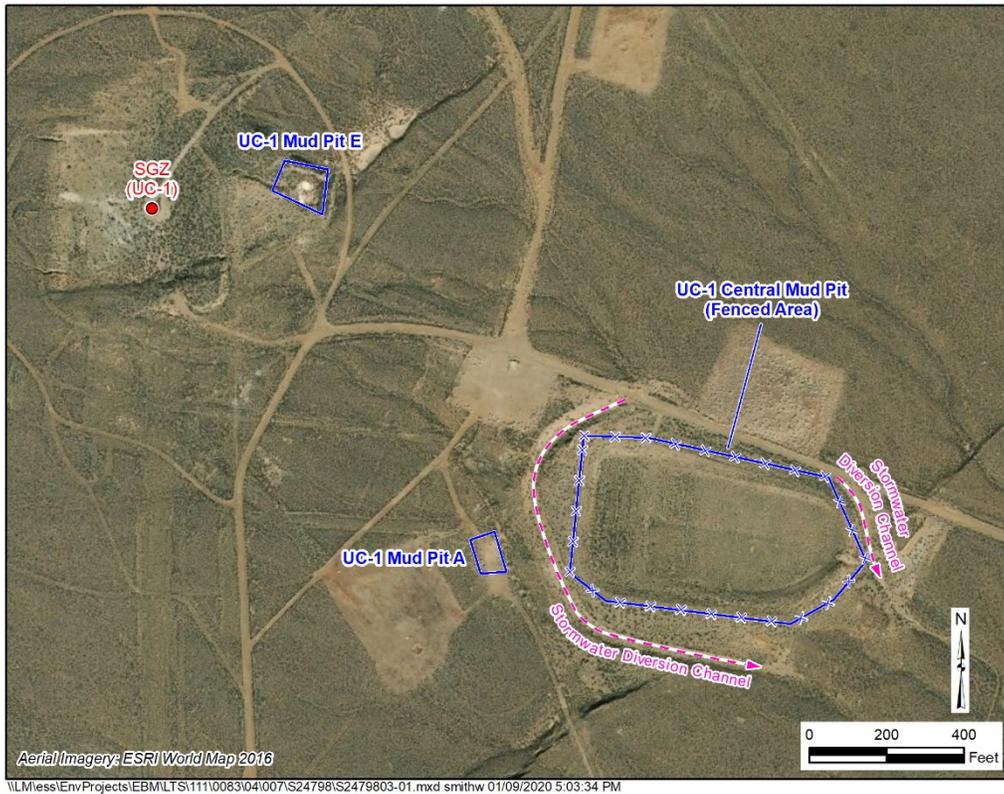


Figure 4. UC-1 Site Map, Showing the Surface Use-Restricted Areas



Figure 5. UC-3 Site Map, Showing the Surface Use-Restricted Areas

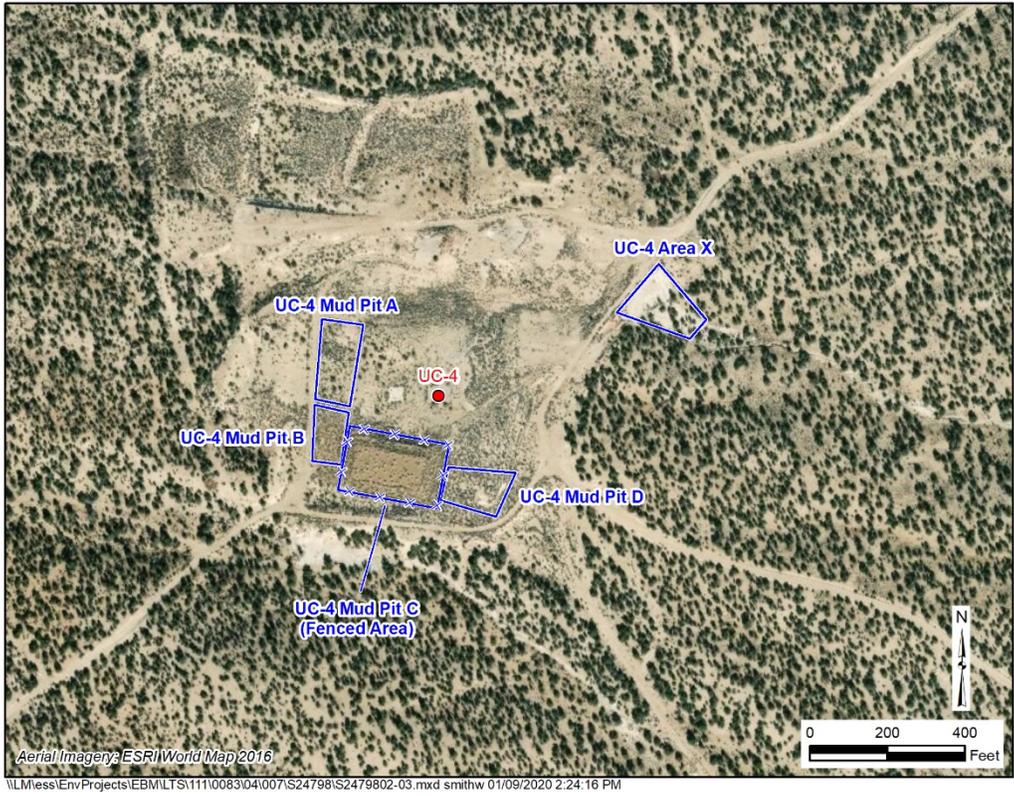


Figure 6. UC-4 Site Map, Showing the Surface Use-Restricted Areas

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4.0 Summary, Conclusions, and Recommendations

This section contains the summary, conclusions, and recommendations for the biennial monitoring period at CAU 417 at the CNTA.

4.1 Summary

The UC-1 CMP was in good condition during the 2018 inspection. A few minor cracks on the CMP cover were repaired during the inspection. No other new fractures or extensions of existing fractures were observed, and no issues with the fence, gate, monument, or signs were identified. The vegetation on the cover continued to look healthy. No other issues were identified, and no additional maintenance or repair activities are recommended at this time.

The inspection of UC-3 indicated that the site was in good condition. The concrete monument at the northeast corner of Mud Pit U3E had some damage near the top of the monument. The damage has not impacted the functionality of the survey pin at the top of the monument, but LM will repair the monument during the next inspection to prevent further deterioration. All other monuments and signs were in good condition. No other issues were identified, and no additional maintenance or repair activities are recommended at this time.

The inspection of UC-4 indicated that the site was in good condition. No erosion rills, new fractures or extension of existing fractures were observed, and no issues with the fence, monuments, or signs were identified. No issues were identified, and no maintenance or repair activities are recommended at this time.

4.2 Conclusions

The following conclusions are based on the 2018 biennial inspection:

- A few minor cracks on the UC-1 CMP cover were repaired during the inspection
- No significant concerns were noted for the UC-1, UC-3, or UC-4 sites, and only the concrete monument at UC-3 is recommended for repair. Otherwise, no further maintenance or repairs are recommended at this time

4.3 Recommendations

The following recommendations are based on the 2018 inspection:

- Continue site inspections biennially, as scheduled, to observe the condition of the covers, fence, vegetation, signs, and monuments, with the next report to be produced in 2021
- Repair the concrete monument at the northeast corner of Mud Pit U3E (Appendix B, photograph 5) during the inspection planned for 2020
- Continue the biennial reporting through the year 2020, in accordance with the 2015 ROTC
- Work with NDEP to establish a new postclosure inspection and reporting frequency to be implemented after 2020
- Continue to respond within 90 days to any reports from the public about detrimental conditions at the site

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5.0 References

DOE (U.S. Department of Energy), 2009. *Well Completion Report for Corrective Action Unit 443, Central Nevada Test Area, Nye County, Nevada*, LMS/CNT/S05827, Office of Legacy Management, Grand Junction, Colorado, December.

DOE (U.S. Department of Energy), 2015a. *Path Forward for Future Post-Closure Inspection and Monitoring of Surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada*, Office of Legacy Management, February.

DOE (U.S. Department of Energy), 2015b. *United States Nuclear Tests, July 1945 through September 1992*, DOE/NV-209, Rev. 16, National Nuclear Security Administration, Nevada Field Office, September.

FFACO (Federal Facility Agreement and Consent Order), 1996 (as amended). Agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense.

NDEP (Nevada Division of Environmental Protection), 2015. Letter of Agreement for the *Path Forward for Future Post Closure Inspection and Monitoring of Surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada*, March.

NNSA/NV (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office), 2001. *Closure Report for Corrective Action Unit 417: Central Nevada Test Area Surface, Nevada*, DOE/NV-743, Rev. 1, Las Vegas, Nevada.

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Appendix A

Record of Technical Change, 2015

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Department of Energy
National Nuclear Security Administration
Nevada Field Office
P.O. Box 98518
Las Vegas, NV 89193-8518



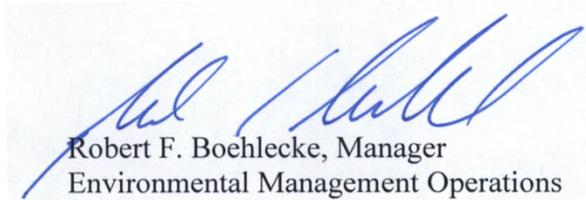
JUN 2 2015

Christine Andres, Chief
Bureau of Federal Facilities
Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, NV 89119-0818

SUBMITTAL OF THE RECORD OF TECHNICAL CHANGE (ROTC) NUMBER
DOE/NV--743 ROTC 3 FOR THE FINAL CLOSURE REPORT, REVISION 1, FOR
CORRECTIVE ACTION UNIT 417: CENTRAL NEVADA TEST AREA – SURFACE,
NEVADA, NOVEMBER 2001

Enclosed for your records is one uncontrolled copy of the Record of Technical Change
DOE/NV—743 ROTC 3 for the subject document.

Please direct comments and questions to Mark Kautsky, Office of Legacy Management, at
(970) 248-6018.



Robert F. Boehlecke, Manager
Environmental Management Operations

EMO:11306.CD

Enclosures:
As stated

cc w/o encl. via e-mail:
Mark McLane, NDEP
Mark Kautsky, DOE/LM
J. T. Fraher, DTRA/CXTS
FFACO Group, NFO
NFO Read File

RECORD OF TECHNICAL CHANGE

Technical Change No. DOE/NV-743 ROTC 3 Page 1 of 1

Activity Name Central Nevada Test Area - ROTC for CAU 417 Closure Report Date April 29, 2015

The following technical changes (including justification) are requested by:

Mark Kautsky Site Manager, Department of Energy/Office of Legacy Management
(Name) (Title)

Description of Change:

Page 50, Section 5.1.3, The following sentences shall be added to the end of the first paragraph: As per the February 2015 Path Forward letter (dated February 25, 2015), the following was decided:

- Remove requirements for continued monitoring of soil moisture and subsidence from the UC-1 CMP and UC-4 Mud Pit. (The fences and engineered soil covers provide additional controls that prevent any inadvertent intrusions to the underlying drilling mud; these engineering controls will remain in place.)
- Continue visual inspections at all the sites and provide photographs of selected sites to document the health and stability of the vegetation at the UC-1 CMP cover.
- Prepare a brief report every 2 years to document the inspections. This requirement is in accordance with ROTC DOE/NV-743 ROTC 2 dated March 23, 2011, that changed the reporting schedule to every other year for the next 10 years, starting in 2010 (first report in 2012) and ending in 2020.

Justification:

The change was made in mutual agreement with NDEP and is based on soil moisture data from the UC-1 Central Mud Pit and subsidence data from the UC-1 Central Mud Pit and UC-4 Mud Pit collected over the past 14 years.

The task time will be unchanged.

Applicable Activity-Specific Document(s):

Closure Report for Corrective Action Unit 417: Central Nevada Test Area, Surface, Nevada, Revision: 1

Approved By:

Mark Kautsky
DOE-LM Site Manager

Date 5-13-2015

Mark McDome
NDEP

Date 5-18-2015

Appendix B
Inspection Checklists
and Site Photographs, 2018

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CAU 417: CNTA UC-1 CENTRAL MUD PIT COVER, POST-CLOSURE INSPECTION CHECKLIST

Date of Last Inspection: July 27, 2016 Reason for Last Inspection: Scheduled Biennial Inspection

Responsible Agency: DOE-LM Project Manager: Rick Findlay

Inspection Date: June 27, 2018

Inspector (name, title, organization): Rick Findlay, Project Manager, Navarro

Assistant Inspector (name, title, organization): Rex Hodges, Hydrogeologist, Navarro

A. GENERAL INSTRUCTIONS

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

B. PREPARATION (To be completed prior to site visit)

YES NO EXPLANATION

1. Site as-built plans and site base map reviewed.	X		
2. Previous inspection reports reviewed.	X		
a. Were anomalies or trends detected on previous inspections?		X	
b. Was maintenance performed?		X	
3. Site maintenance and repair records reviewed.	X		
a. Has site repair resulted in a change from as-built conditions?		X	
b. Are revised as-builts available that reflect repair changes?			Not Applicable

C. SITE INSPECTION (To be completed during inspection)

YES NO EXPLANATION

1. Adjacent off-site features within watershed areas.			
a. Have there been any changes in use of adjacent area?		X	
b. Are there any new roads or trails?		X	
c. Has there been a change in the position of nearby washes?		X	
d. Has there been lateral excursion or erosion/deposition of nearby washes?		X	
e. Are there new drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security fence, signs.			
a. Displacement of fences, site markers, boundary markers, or monuments?		X	
b. Have any signs been damaged or removed? (Number of signs replaced: <u>None</u>)		X	
c. Were gates locked?	X		

CAU 417: CNTA UC-1 CENTRAL MUD PIT COVER, POST-CLOSURE MONITORING CHECKLIST

		YES	NO	EXPLANATION
3. Waste Unit cover.				
a.	Is there evidence of settling?	X		Minor cracks on the cover were repaired
b.	Is there cracking?	X		Minor cracks on the cover were repaired
c.	Is there evidence of erosion around the cap (wind or water)?		X	
d.	Is there evidence of animal burrowing?		X	
e.	Have the site markers been disturbed by man or natural processes?		X	
f.	Do natural processes threaten to integrity of any cover or site marker?		X	
g.	Other?		X	
4. Vegetative cover.				
a.	Is perimeter fence or mesh fencing damaged?		X	
b.	Is there evidence of horses or rabbits on site?		X	
c.	Is organic mulch and/or plants adequate to prevent erosion?	X		
d.	Are weedy annual plants present? If yes, are they a problem?		X	
e.	Are seeded plant species found on site?	X		
f.	Is there evidence of plant mortality?		X	
5. Photo Documentation				
a.	Has a photo log been prepared?	X		
c.	Number of photos exposed (28 digital photos & 3 videos)			
D. FIELD CONCLUSIONS				
1.	Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:				
2.	Are more frequent inspections required?		X	
3.	Are existing maintenance/repair actions satisfactory?	X		
4.	Is other maintenance/repair necessary?		X	
5.	Is current status/condition of vegetative cover satisfactory?	X		
6.	Rationale for field conclusions: The site was in good condition, with the cover observed as having only minor cracks.			
E. CERTIFICATION				
I have conducted an inspection of the UC-1 Central Mud Pit Cover, CAU 417, at the Central Nevada Test Area in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.				
Chief Inspector's Signature: 		Printed Name: <u>Richard C. Finley</u>		
Title: <u>Project Manager</u>		Date: <u>4-10-2019</u>		

CAU 417: CNTA UC-3, POST-CLOSURE INSPECTION CHECKLIST

Date of Last Inspection: July 27, 2016 Reason for Last Inspection: Scheduled Biennial Inspection

Responsible Agency: DOE-LM Project Manager: Rick Findlay

Inspection Date: June 26, 2018

Inspector (name, title, organization): Rick Findlay, Project Manager, Navarro

Assistant Inspector (name, title, organization): Rex Hodges, Hydrogeologist, Navarro

A. GENERAL INSTRUCTIONS

1. All checklist items must be completed and detailed comments made to document the results of the site inspection. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Attach the additional pages and number all pages upon completion of the inspection.
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4. 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.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.
6. This unit will be inspected every two years with formal reporting to the Nevada Division of Environmental Protection to be done within a reasonable amount of time after completion of the inspection. The report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

B. PREPARATION (To be completed prior to site visit)

YES NO EXPLANATION

1. Site as-built plans and site base map reviewed.

X

2. Previous inspection reports reviewed.

X

a. Were anomalies or trends detected on previous inspections?

X

b. Was maintenance performed?

X

3. Site maintenance and repair records reviewed.

X

a. Has site repair resulted in a change from as-built conditions?

X

b. Are revised as-builts available that reflect repair changes?

Not Applicable

C. SITE INSPECTION (To be completed during inspection)

YES NO EXPLANATION

1. Adjacent off-site features within watershed areas.

a. Have there been any changes in use of adjacent area?

X

b. Are there any new roads or trails?

X

c. Has there been a change in the position of nearby washes?

X

d. Has there been lateral excursion or erosion/deposition of nearby washes?

X

e. Are there new drainage channels?

X

f. Change in surrounding vegetation?

X

2. Security fence, signs.

a. Displacement of fences, site markers, boundary markers, or monuments?

X

No displacements were observed, but the top of the concrete boundary marker at the northeast corner of Mud Pit U3E is damaged (see photograph 5).

b. Have any signs been damaged or removed?
(Number of signs replaced: 0)

X

c. Were gates locked?

Not Applicable – No gate at the site.

CAU 417: CNTA UC-3, POST-CLOSURE INSPECTION CHECKLIST

D. FIELD CONCLUSIONS

1. Is there an imminent hazard to the integrity of the unit? (Immediate report required)		X	
Person/Agency to whom report made:			
2. Are more frequent inspections required?		X	
3. Are existing maintenance/repair actions satisfactory?	X		
4. Is other maintenance/repair necessary?		X	
5. Is current status/condition of unit satisfactory?	X		
6. Rationale for field conclusions: The concrete monument at the northeast corner of Mud Pit U3E is damaged. The damage is minor and the concrete monument and survey pin at the top of the monument still function as designed. The site was in good condition at the time of the inspection.			

E. CERTIFICATION

I have conducted an inspection of UC-3, CAU 417, at the Central Nevada Test Area in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: 	Printed Name: <i>Richard C. Field</i>
Title: <i>Project Manager</i>	Date: <i>4-10-2019</i>

CAU 417: CNTA UC-4 MUD PIT C COVER, POST-CLOSURE INSPECTION CHECKLIST

Date of Last Inspection: July 27, 2016 Reason for Last Inspection: Scheduled Biennial Inspection

Responsible Agency: DOE-LM Project Manager: Rick Findlay

Inspection Date: June 26, 2018

Inspector (name, title, organization): Rick Findlay, Project Manager, Navarro

Assistant Inspector (name, title, organization): Rex Hodges, Hydrogeologist, Navarro

A. GENERAL INSTRUCTIONS

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

B. PREPARATION (To be completed prior to site visit)

YES NO EXPLANATION

1. Site as-built plans and site base map reviewed.

X

2. Previous inspection reports reviewed.

X

a. Were anomalies or trends detected on previous inspections?

X

b. Was maintenance performed?

X

3. Site maintenance and repair records reviewed.

X

a. Has site repair resulted in a change from as-built conditions?

X

b. Are revised as-builts available that reflect repair changes?

Not Applicable

C. SITE INSPECTION (To be completed during inspection)

YES NO EXPLANATION

1. Adjacent off-site features within watershed areas.

a. Have there been any changes in use of adjacent area?

X

b. Are there any new roads or trails?

X

c. Has there been a change in the position of nearby washes?

X

d. Has there been lateral excursion or erosion/deposition of nearby washes?

X

e. Are there new drainage channels?

X

f. Change in surrounding vegetation?

X

2. Security fence, signs.

a. Displacement of fences, site markers, boundary markers, or monuments?

X

b. Have any signs been damaged or removed?
(Number of signs replaced: _____ 0 _____)

X

c. Were gates locked?

X

CAU 417: CNTA UC-4 MUD PIT C COVER, POST-CLOSURE INSPECTION CHECKLIST

3. Waste Unit cover.	YES	NO	EXPLANATION
a. Is there evidence of settling?		X	
b. Is there cracking?		X	
c. Is there evidence of erosion around the cap (wind or water)?		X	
d. Is there evidence of animal burrowing?		X	
e. Have the site markers been disturbed by man or natural processes?		X	
f. Is there vegetation on the cover?	X		Yes, vegetation has been allowed to spread across the entire cap/cover to limit erosion. See site photographs for details.
g. Do natural processes threaten to integrity of any cover or site marker?		X	
h. Other?		X	

4. Photo Documentation			
a. Has a photo log been prepared?	X		
c. Number of photos exposed (42 digital photos)			

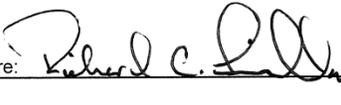
D. FIELD CONCLUSIONS

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

6. Rationale for field conclusions: The site is in good condition – no erosion rills were observed, the gate and fence are in good condition, and no signs were down.

E. CERTIFICATION

I have conducted an inspection of the UC-4 Mud Pit C Cover, CAU 417, at the Central Nevada Test Area in accordance with the Post-Closure Inspection Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

Chief Inspector's Signature: 	Printed Name: <u>Richard C. Friday</u>
Title: <u>Project Manager</u>	Date: <u>4-10-2019</u>



Photograph 1. UC-1 CMP, view from entrance gate on north fence line, looking southeast



Photograph 2. UC-1 CMP, view from southeast end of CMP, looking west



Photograph 3. UC-1 Mud Pit E, view from western monument, looking east



Photograph 4. UC-3 Area E Spill Outlier, view from northeast monument, looking southwest



Photograph 5. UC-3 Mud Pit U3E, view from northeastern monument, looking west (notice damage to the top of the monument)



Photograph 6. UC-3 Shaker Pad Area U3S, view from northwest monument, looking southeast



Photograph 7. UC-4 Area X, view from north monument, looking southwest



Photograph 8. UC-4 Mud Pit D, view from south monument, looking northwest



Photograph 9. UC-4 Mud Pit C, view from northeast corner of mud pit cover, looking west



Photograph 10. UC-4 Mud Pit C, view from southeast corner of mud pit cover, looking west



Photograph 11. UC-4 Mud Pit B, view from northeast monument, looking southwest

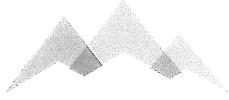


Photograph 12. UC-4 Mud Pit A, view from northwest monument, looking south

Appendix C

NDEP Correspondence and Record of Review

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NEVADA DIVISION OF
**ENVIRONMENTAL
PROTECTION**

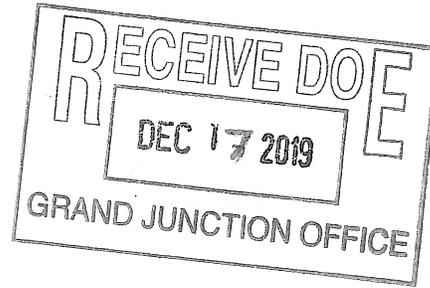
STATE OF NEVADA
Department of Conservation & Natural Resources

Steve Sisolak, Governor
Bradley Crowell, Director
Greg Lovato, Administrator

Fridlay

December 10, 2019

Mr. Mark Kautsky
UMTRCA Manager
U. S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503



RE: Submittal of Draft Post-Closure Inspection and Monitoring Report for Surface Corrective Action Unit 417 at the Central Nevada Test Area, Nevada, Site
Federal Facility Agreement and Consent Order (FFACO)

Dear Mr. Kautsky,

The Nevada Division of Environmental Protection, Bureau of Federal Facilities (NDEP) has received and reviewed the above-referenced report on the post-closure inspection and monitoring activities that the Office of Legacy Management conducted from July 2016 through September 2018. The report was received in this office on December 3, 2019. While this report was prepared in accordance with the FFACO and the Closure Report for Corrective Action Unit 417, pursuant to Subpart XXV.1 of the FFACO, the NDEP has the following comments:

1. Page 1, Section 1.1, Purpose: As this is the first mention of the UC-1, UC-3 and UC-4 locations, Figure 2 and Figures 3, 4 and 5 should be referenced in the respective bullets.
2. Page 1, Section 1.1, First Bullet and Section 1.3, First Paragraph, Last Sentence: Please add to appropriate figures or provide additional figures that show the location of the flood diversion channels as they are being evaluated as part of the inspection.
3. Page 5, Section 2.1, Site Inspections, Third Bullet: The inspection checklists and site photographs in Appendix B do not present or mention inspection of the diversion channels. Please add this information to the checklists and reports for future site inspections.
4. Page 6, Section 2.3, Reporting Requirements, Second Sentence: Explain why 2020 is the last year for reporting and what happens after 2020.
5. Page 7, Section 3.1.2, UC-3 Inspection: The second last sentence of this section will have to be changed when Comment #7 below is implemented.

Mr. Mark Kautsky
Page 2 of 2
December 10, 2019

6. Page 11, Section 4.1, Second Paragraph: The third and last sentences will have to be reworded when Comment #7 below is implemented.
7. Page 11, Section 4.3, Recommendations: The NDEP concurs with the recommendations stated in Section 4.3 of the report, but suggests that one recommendation for repairing or replacing the monument at UC-3 during the 2020 inspection be added to the list of recommendations. Another recommendation for changing the frequency of the Post Closure inspections after 2020, should also be added to the list of recommendations or modify the Second Bullet on the list to include negotiating with NDEP on post 2020 inspection frequency.

Please address any questions regarding this matter to Chris Andres at (702) 486-2850 ext. 232 or Mark McLane at ext. 226.

Sincerely,



Christine D. Andres *FOR*
Chief
Bureau of Federal Facilities

- ec: EM Records, Las Vegas, NV
Navarro Central Files
R. Findlay, Navarro, Grand Junction, CO
FFACO Group, EM Nevada, Las Vegas, NV
W. R. Wilborn, EM Nevada, Las Vegas, NV
R. F. Boehlecke, EM Nevada, Las Vegas, NV
MSTS Correspondence Management, Las Vegas, NV
K. Kreie, DOE-LM, Grand Junction, CO
- cc: EM Records, Las Vegas, NV
Jeffrey Fraher, DTRA/CXTS, Kirtland AFB, NM
J. B. Chapman, DRI, Las Vegas, NV



Contractor to the U.S. Department of Energy Office of Legacy Management

Record of Review

The Record of Review process is described in the *Quality Assurance Manual*, Section 5.0.

Document Information

Due date: 01/08/2020 Review number: 1 Project: Nevada Offsites - CNTA Charge code: LMCP.LMCP.2 A43

Document title, number, and revision: Draft "Postclosure Inspection and Monitoring Report for Surface Corrective Action Unit 417 at the Central Nevada Test Area, Nevada, Site"

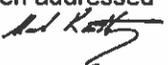
Author: Mark Kautsky Author's phone: (970) 248-6018 Author's organization: DOE-LM

Reviewer: Christine D. Andres Reviewer's phone: (702) 486-2850 Reviewer's organization: NDEP

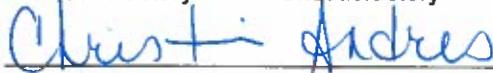
Reviewer's recommendation: Release without comment Consider comments Resolve comments and reroute for review

Reviewer signature: Refer to the NDEP letter dated December 10, 2019 Date:

Author's response: Comments have been addressed

Author's signature:  Date:

Comment resolution: Satisfactory Unsatisfactory

Reviewer's signature:  Date: Date 1/14/2020

Item Number	Reviewer's Comments and Recommendations	Required	Author's Response (if required)
1	Page 1, Section 1.1, Purpose: As this is the first mention of the UC-1, UC-3 and UC-4 locations, Figure 2 and Figures 3, 4 and 5 should be referenced in the respective bullets.	Yes	A reference to Figure 2 and Figure 3 was added to the first bullet in Section 1.1, as requested. Figure 3 is a new figure that shows the surface use-restricted areas at the UC-1, UC-3, and UC-4 sites.
2	Page 1, Section 1.1, First Bullet and Section 1.3, First Paragraph, Last Sentence: Please add to appropriate figures or provide additional figures that show the location of the flood diversion channels as they are being evaluated as part of the inspection.	Yes	A reference to Figure 3 was added to Section 1.1 and Section 1.3. The new Figure 3 shows the stormwater diversion channel and the original Figure 3 (now Figure 4) has also been revised to show the stormwater diversion channel, as requested.
3	Page 5, Section 2.1, Site Inspections, Third Bullet: The inspection checklists and site photographs in Appendix B do not present or mention inspection of the diversion channels. Please add this information to the checklists and reports for future site inspections.	Yes	The checklist will be revised to include the diversion channel and site photograph section will include a photograph of the diversion channel in following site inspection reports, as requested.



Record of Review (continued)

Item Number	Reviewer's Comments and Recommendations	Required	Author's Response (if required)
4	Page 6, Section 2.3, Reporting Requirements, Second Sentence: Explain why 2020 is the last year for reporting and what happens after 2020.	Yes	<p>The second sentence was modified, and an additional sentence was added to explain LM's plan for establishing a new monitoring and reporting frequency after the 2020 inspection, as requested. The revised sentences are provided below:</p> <p>The biennial reporting will continue through the year 2020 per the 2015 ROTC (Appendix A), with the last biennial report planned for 2021. LM recommends additional discussions with NDEP to revise the postclosure inspection and reporting frequency for implementation after the 2020 inspection.</p>
5	Page 7, Section 3.1.2, UC-3 Inspection: The second to last sentence of this section will have to be changed when Comment #7 below is implemented.	Yes	<p>The second sentence was revised, as requested. The revised sentence is provided below:</p> <p>The concrete monument and survey pin at the top of the monument still function as designed, but LM will repair the monument during the next inspection, planned for 2020.</p>
6	Page 11, Section 4.1, Second Paragraph: The third and last sentences will have to be re-worded when Comment #7 below is implemented.	Yes	<p>The third and second sentences were revised, as requested. The revised sentences are provided below:</p> <p>The damage has not impacted the functionality of the survey pin at the top of the monument, but LM will repair the monument during the next inspection to prevent further deterioration.</p>
7	Page 11, Section 4.3, Recommendations: The NDEP concurs with the recommendations stated in Section 4.3 of the report, but suggests that one recommendation for repairing or replacing the monument at UC-3 during the 2020 inspection be added to the list of recommendations. Another recommendation for changing the frequency of the Post Closure inspections after 2020, should also be added to the list of recommendations or modify the Second Bullet on the list to include negotiating with NDEP on post 2020 inspection frequency.	Yes	<p>The additional recommendations were added, as requested. The last bullet of the Conclusions (Section 4.2) was also revised to be consistent with the new recommendations. The revisions are provided below (first sentence has been included in Section 4.2, the two remaining sentences have been added to Section 4.3):</p> <p>No significant concerns were noted for the UC-1, UC-3, or UC-4 sites, and only the concrete monument at UC-3 is recommended for repair. Otherwise, no further maintenance or repairs are recommended at this time</p> <p>Repair the concrete monument at the northeast corner of Mud Pit U3E (Appendix B, photograph 5) during the inspection planned for 2020</p>



Record of Review (continued)

Item Number	Reviewer's Comments and Recommendations	Required	Author's Response (if required)
7	Continuation of comment 7	Yes	Work with NDEP to establish a new postclosure inspection and reporting frequency to be implemented after 2020
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Enter text	Enter text	Select...	Enter text

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