

Nevada  
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DOE/NV--934-ADD



# Addendum to the Closure Report for Corrective Action Unit 355: Area 2 Cellars/Mud Pits Nevada Test Site, Nevada

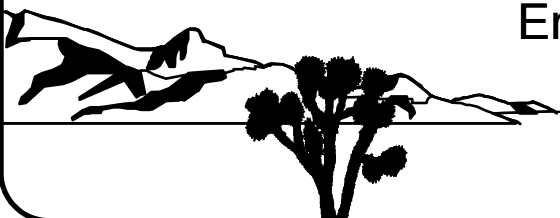
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**ADDENDUM TO THE CLOSURE REPORT  
FOR CORRECTIVE ACTION UNIT 355:  
AREA 2 CELLARS/MUD PITS  
NEVADA TEST SITE, NEVADA**

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

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### **Addendum to the Closure Report for Removal of the Use Restriction**

This document constitutes an addendum to the November 2003, Closure Report for Corrective Action Unit 355: Area 2 Cellars/Mud Pits as described in the document *Recommendations and Justifications for Modifications for Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office Federal Facility Agreement and Consent Order* (UR Modification document) dated February 2008. The UR Modification document was approved by NDEP on February 26, 2008. The approval of the UR Modification document constituted approval of each of the recommended UR modifications. In conformance with the UR Modification document, this addendum consists of:

- This cover page that refers the reader to the UR Modification document for additional information
- The cover and signature pages of the UR Modification document
- The NDEP approval letter
- The corresponding section of the UR Modification document

This addendum provides the documentation justifying the cancellation of the URs for:

- CAS 02-37-01, Cellar & Mud Pit
- CAS 02-37-03, Cellar & Mud Pit
- CAS 02-37-04, Cellar & Mud Pit
- CAS 02-37-05, Cellar & Mud Pit
- CAS 02-37-06, Cellar & Mud Pit
- CAS 02-37-07, Cellar & Mud Pit
- CAS 02-37-10, Cellar & Mud Pit
- CAS 02-37-11, Cellar & Mud Pit
- CAS 02-37-12, Cellar & Mud Pit
- CAS 02-37-13, Cellar & Mud Pit
- CAS 02-37-14, Cellar & Mud Pit
- CAS 02-37-15, Cellar & Mud Pit
- CAS 02-37-16, Cellar & Mud Pit
- CAS 02-37-17, Cellar
- CAS 02-37-18, Cellar & Tanks

These URs were established as part of *Federal Facility Agreement and Consent Order* (FFACO) corrective actions and were based on the presence of contaminants at concentrations greater than the action levels established at the time of the initial investigation (FFACO, 1996; as amended August 2006).

Since these URs were established, practices and procedures relating to the implementation of risk-based corrective actions (RBCA) have changed. Therefore, these URs were re-evaluated against the current RBCA criteria as defined in the *Industrial Sites Project Establishment of Final Action Levels* (NNSA/NSO, 2006c). This re-evaluation consisted of comparing the original data (used to define the need for the URs) to risk-based final action levels (FALs) developed using the current Industrial Sites RBCA process.

The re-evaluation resulted in a recommendation to remove these URs because contamination is not present at these sites above the risk-based FALs. Requirements for inspecting and maintaining these URs will be canceled, and the postings and signage at each site will be removed. Fencing and posting may be present at these sites that are unrelated to the FFACO URs such as for radiological control purposes as required by the *NV/YMP Radiological Control Manual* (NNSA/NSO, 2004f). This modification will not affect or modify any non-FFACO requirements for fencing, posting, or monitoring at these sites.

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Recommendations and Justifications for  
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under the U.S. Department of Energy,  
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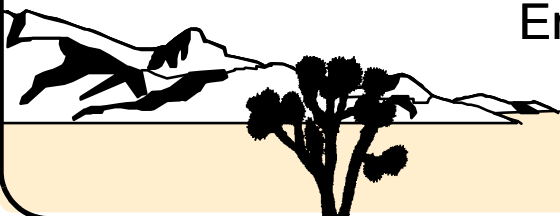
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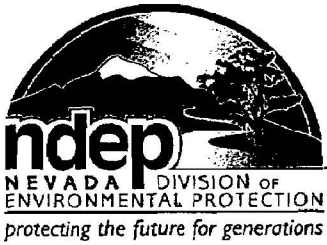
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**Recommendations and Justifications for Modifications for  
Use Restrictions Established under the U.S. Department of Energy,  
National Nuclear Security Administration Nevada Site Office  
*Federal Facility Agreement and Consent Order***

Approved by: /s/ Kevin J. Cabbie Date: 02/05/2008  
Kevin J. Cabbie  
Federal Sub-Project Director  
Industrial Sites Sub-Project

Approved by: /s/ John B. Jones Date: 02/04/2008  
John B. Jones  
Acting Federal Project Director  
Environmental Restoration Project



# STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

February 26, 2008

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

RE: Approval of Recommendations and Justifications for Modifications for Use Restrictions  
Established under the U.S. Department of Energy, National Nuclear Security  
Administration, Nevada Site Office *Federal Facility Agreement and Consent Order*

Dear Mr. Jones:

The Nevada Division of Environmental Protection, Bureau of Federal Facilities (NDEP) staff has received and reviewed the February 2008 final report for Recommendations and Justifications for Modifications for Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration, Nevada Site Office. The NDEP approves the requested changes to the previously agreed upon use restrictions for those Corrective Action Sites (CASs) as described in the report.

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

Sincerely,

/s/ Tim Murphy

T.H. Murphy  
Chief  
Bureau of Federal Facilities

TZ

cc: E.F. DiSanza, WMP, NNSA/NSO  
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John Wong, Jeff MacDougall, Dennis Nicodemus, NDEP Las Vegas, NV





## **14.0 CAU 355, Area 2 Cellars/Mud Pits**

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### **14.1 CAS Descriptions**

Corrective Action Unit 355 is comprised of the following 15 CASs located in Area 2 of the NTS:

- CAS 02-37-01, Cellar & Mud Pit
- CAS 02-37-03, Cellar & Mud Pit
- CAS 02-37-04, Cellar & Mud Pit
- CAS 02-37-05, Cellar & Mud Pit
- CAS 02-37-06, Cellar & Mud Pit
- CAS 02-37-07, Cellar & Mud Pit
- CAS 02-37-10, Cellar & Mud Pit
- CAS 02-37-11, Cellar & Mud Pit
- CAS 02-37-12, Cellar & Mud Pit
- CAS 02-37-13, Cellar & Mud Pit
- CAS 02-37-14, Cellar & Mud Pit
- CAS 02-37-15, Cellar & Mud Pit
- CAS 02-37-16, Cellar & Mud Pit
- CAS 02-37-17, Cellar
- CAS 02-37-18, Cellar & Tanks

Historical documentation and interviews indicate that the cellars and associated mud pits in CAU 355 were constructed to support post-test drillback activities at sites where underground nuclear testing was conducted from 1967 through 1990. Post-test boreholes were drilled to re-enter the test cavities to determine cavity and chimney size, to observe the effects of the test on the surrounding material, determine the distribution of radioactivity in the area, and collect samples for analysis. During the drilling process, drilling mud was used for cooling and lubrication, and to carry the drill cuttings to the surface where they were deposited in a nearby mud pit (NNSA/NSO, 2003g).

Corrective Action Site 02-37-01 consists of a backfilled cellar within fencing that measures 13 by 13 ft and an open mud pit that measures 16 by 59 ft in total area. The mud pit is fenced and posted as an Underground Radioactive Material Area (URMA). The borehole casing has been plugged with cement and the cellar backfilled with soil/gravel (NNSA/NSO, 2003g).

Corrective Action Site 02-37-03 consists of a backfilled cellar and a backfilled mud pit inside a fence. The fence measures 26 by 128 ft and is posted as an URMA. The borehole casing has been plugged with cement and the cellar backfilled with soil/gravel (NNSA/NSO, 2003g).

Corrective Action Site 02-37-04 consists of a backfilled cellar and backfilled mud pit located inside a fence that is posted as an URMA. The total fenced area measures 20 by 128 ft. The borehole casing has been plugged with cement and the cellar backfilled with soil/gravel (NNSA/NSO, 2003g).

Corrective Action Site 02-37-05 consists of a backfilled cellar inside a fence that is posted as an URMA and measures 16 by 59 ft. The open mud pit measures 141 by 151 ft and contains gray drilling mud residue and large amounts of drill cuttings. The borehole casing has been plugged with cement and the cellar backfilled with soil/gravel (NNSA/NSO, 2003g).

Corrective Action Site 02-37-06 consists of a cellar that has been backfilled and is located inside a fence. The open mud pit measures 50 by 75 ft and is inside a fence that is posted as an URMA. The borehole casing was plugged with cement and the cellar backfilled with soil/gravel in 1994 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-07 consists of a backfilled cellar and open mud pit located inside a fence that is posted as an URMA. The mud pit measures 27 by 66 ft. The borehole casing was plugged with cement and the cellar backfilled with soil/gravel in 1981 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-10 consists of a backfilled cellar and backfilled mud pit inside a fence that measures approximately 26 by 151 ft and is posted as an URMA. The borehole casing was plugged with cement and the cellar backfilled with soil/gravel in 1970 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-11 consists of a backfilled cellar and backfilled mud pit inside a fence. The fence measures 36 by 141 ft and is posted as an URMA. The borehole casing was plugged with cement and the cellar backfilled with soil/gravel in 1971 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-12 consists of a backfilled cellar and backfilled mud pit located inside a fence. The fence measures 67 by 118 ft and is posted as an URMA. The borehole casing was plugged with cement and the cellar backfilled soil/gravel in 1973 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-13 consists of a backfilled cellar and backfilled mud pit located inside a fence. The fence measures 67 by 118 ft and is posted as an URMA (NNSA/NSO, 2003g).

Corrective Action Site 02-37-14 consists of a backfilled cellar and an open mud pit located inside a fence measuring approximately 60 by 90 ft and is posted as an URMA. The borehole casing was plugged with cement and the cellar was backfilled with soil/gravel in 1972 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-15 consists of a backfilled cellar and backfilled mud pit located in a fence measuring 50 by 157 ft and is posted as an URMA. The borehole casing was plugged with cement and the cellar backfilled with soil/gravel in 1972 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-16 consists of a backfilled cellar and backfilled mud pit located inside a fence measuring 20 by 85 ft, and is posted as an URMA. The post-test borehole was plugged with cement and the cellar backfilled with soil/gravel in 1976 (NNSA/NSO, 2003g).

Corrective Action Site 02-37-17 consists of an open cellar measuring 8 ft in diameter and is approximately 10 ft deep. The cellar contains dark, moist soil and organic material; suspected drilling mud, and is located inside a fence that is posted as an URMA. It is a post-test cellar that is currently open (i.e., not backfilled). This cellar is associated with a post-test borehole that is identified to be plugged and abandoned by the Borehole Management Program (NNSA/NSO, 2003g).

Corrective Action Site 02-37-18 consists of an open cellar measuring 8 ft in diameter and 14 ft deep and an associated open mud pit not mentioned in the FFACO CAS description. The tanks mentioned in the CAS description have been removed from the site. The cellar is located inside a fence that is posted as an URMA, and contains dark, moist soil and organic material, and suspected drilling mud. The mud pit measures 59 by 125 ft, with one side of the pit partially backfilled, and contains wood and plastic piping debris. The cellar was completed as a gas sampling hole in 1990. It is a post-test cellar that is currently open (i.e., not backfilled). This cellar is associated with a post-test borehole that is identified to be plugged and abandoned by the Borehole Management Program (NNSA/NSO, 2003g).

### **14.2 Current Use Restriction Description**

The future use of any land affected by all URs in this CAU is restricted from any DOE or Air Force activity that may alter or modify the containment control, as approved by the state and identified in the CAU CR or other CAU documentation, unless appropriate concurrence is obtained in advance (NNSA/NSO, 2003c).

The UR boundary points for CASs 02-37-01, 02-37-14, and 02-37-16 are at the corners of the fences posted for demarcation of the URMA. There are no site monitoring requirements (NNSA/NSO, 2003c).

The UR boundary points for CASs 02-37-03, 02-37-04, 02-37-05, 02-37-06, 02-37-07, 02-37-10, 02-37-11, 02-37-12, 02-37-17, and 02-37-18 are the cellar concrete pad corners. There are no site monitoring requirements (NNSA/NSO, 2003c).

The UR boundary points for CASs 02-37-13 and 02-37-15 are the cellar facility demarcation fence corners. There are no site monitoring requirements (NNSA/NSO, 2003c).

### **14.3 Basis for Current Use Restriction**

All of the 15 CASs included a post-test drillback cellar. Thirteen of the post-test cellars were previously backfilled with clean fill material. Two of the post-test cellars at CASs 02-37-17 and 02-37-18 were open (i.e., not backfilled). In addition, 14 of the CASs included an associated drilling mud pit, with eight of these mud pits previously backfilled with clean fill, and the remaining six left open (i.e., not backfilled) (NNSA/NSO, 2003c).

Characterization samples were collected from the base of the two open cellars, the approximate base of the 13 backfilled cellars, and from drilling mud in the 14 mud pits. Samples were analyzed for VOCs, SVOCs, RCRA metals, TPH (full scan), PCBs, and gamma spectroscopy. Petroleum hydrocarbons (diesel, oil, and TPH) were detected above the PAL of 100 mg/kg for samples collected from the two open cellars (CASs 02-37-17 and 02-37-18), three backfilled cellars (CASs 02-37-11, 02-37-15, and 02-37-16), and from three of the mud pits (CASs 02-37-01, 02-37-14, and 02-37-16). Total petroleum hydrocarbons were the only COC detected at concentrations above action levels in any of the characterization samples collected, no VOCs or SVOCs were detected above PALs (NNSA/NSO, 2003c).

Based on the characterization sample results for the open post-test cellars and process knowledge of the historical decontamination of drilling equipment over the post-test cellars, it is reasonable

to assume that TPH is present at the base of the backfilled post-test cellars at concentrations exceeding the action level. For this reason, URs were implemented at all 15 post-test cellars in CAU 355 (NNSA/NSO, 2003c).

Table 14-1 contains analytical results of all COCs at CAU 355 that are the basis for the current URs. The sample matrix for all samples is soil.

**Table 14-1**  
**Sample Results for COCs at CAU 355**  
**Used To Establish Current Use Restriction**

Sample ID	Diesel	Oil	TPH
	PAL 100 mg/kg	PAL 100 mg/kg	PAL 100 mg/kg
01-01-M0 Dup. of 01-01-M1	120	1,200	1,320
01-01-M1	120	920	1,040
11-(0-12)-C1	--	160	160
14-0-M2	--	110	110
15-(0-7)-C1	--	140	140
16-7-M1	--	1,200	1,200
16-6-C1	390	140	530
17-10-C1	260	1,600	1,860
18-14-C1	350	7,500	7,850

ID = Identification  
mg/kg = Milligrams per kilogram  
PAL = Preliminary action level  
TPH = Total petroleum hydrocarbons  
-- = No detects above action levels

#### **14.4 Basis for Use Restriction Modification**

The revised FALs associated with the TPH contamination were established based on the PALs of the hazardous constituents of TPH as described in Section 2.2.2. Because the URs were implemented at all 15 post-test cellars in CAU 355, based on the characterization sample results for the open post-test cellars, and the fact that the samples with the maximum concentrations of TPH have no TPH-related contaminant concentrations above their corresponding PALs, it is reasonable to assume that no contaminants are present at this site in concentrations exceeding PALs, and the revised FALs were established at the PAL concentrations (NNSA/NSO, 2003c).

#### **14.5 Proposed Modification**

Remove the FFACO UR and associated fencing and postings from this site.

## ***References***

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FFACO, see *Federal Facility Agreement and Consent Order*.

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

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.  
2003c. *Closure Report for Corrective Action Unit 355: Area 2 Cellars/Mud Pits, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--934. November. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office.  
2003g. *Streamlined Approach for Environmental Restoration Plan for Corrective Action Unit 355: Area 2 Cellars and Mud Pits, Nevada Test Site, Nevada*, Rev. 1, DOE/NV--868-REV 1. Las Vegas, NV.

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2004f. *NV/YMP Radiological Control Manual*, DOE/NV--11718-079, Rev. 5. Prepared by Bechtel Nevada. Las Vegas, NV.

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2006c. *Industrial Sites Project Establishment of Final Action Levels*, Rev. 0, DOE/NV--1107. Las Vegas, NV.

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