

## RECORD OF TECHNICAL CHANGE

Technical Change No. DOE/NV-1117 ROTC-1

Page 1 of 1

Activity Name Industrial Sites

Date 12/11/2013

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

Cathleen Birney

(Name)

N-I CAU Lead

(Title)

### Description of Change:

Downgrade the FFACO UR at CAU 204, CAS 05-18-02, Chemical Explosives Storage to an Administrative UR.

### Justification:

Since this FFACO UR was established, practices and procedures relating to the implementation of risk-based corrective actions (RBCA) have changed. Therefore, this UR was re-evaluated against the current RBCA criteria as defined in the *Soils Risk-Based Corrective Action Evaluation Process*. This re-evaluation consisted of 1) assuming that the future land use for this CAS is Industrial Area (IA), 2) calculating the present-day activities of the original data used to define the need for the UR, and 3) using the current risk-based IA residual radioactive material guidelines (RRMGs) to calculate the total effective dose (TED). The risk-based RRMGs were developed using the current Soils RBCA process and the most current RRMGs for the IA exposure scenario. Although the average TED within this CAS is below the 25-millirem per IA-year constraint, which implies that the UR may be removed, depleted uranium is present at this CAS. The Administrative UR will protect against an inadvertent exposure to the depleted uranium. Therefore, the FFACO UR is being downgraded to an Administrative UR. See attached "Recommendation to Downgrade Use Restriction" for detailed information.

The task time will be unchanged by approximately 0 days.

### Applicable Activity-Specific Document(s):

Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada

Approved By:

/s/ Tiffany A. Lantow

Activity Lead

Date

12/11/2013

/s/ Robert F. Boehlecke

EM Operations Manager

Date

12/12/13

/s/ Jeff MacDougall

NDEP

Date

12/17/13

Nevada  
Environmental  
Management  
Operations Activity

DOE/NV--1509-Rev.1



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

Controlled Copy No.: \_  
Revision No.: 1

October 2013

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/s/ Joseph P. Johnston, N-I CO 10/08/2013

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**RECOMMENDATIONS AND JUSTIFICATIONS  
FOR MODIFICATIONS TO DOWNGRADE  
USE RESTRICTIONS ESTABLISHED  
UNDER THE U.S. DEPARTMENT OF ENERGY,  
NATIONAL NUCLEAR SECURITY ADMINISTRATION  
NEVADA FIELD OFFICE  
*FEDERAL FACILITY AGREEMENT  
AND CONSENT ORDER***

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

Controlled Copy No.: \_

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**RECOMMENDATIONS AND JUSTIFICATIONS  
FOR MODIFICATIONS TO DOWNGRADE USE RESTRICTIONS ESTABLISHED  
UNDER THE U.S. DEPARTMENT OF ENERGY,  
NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA FIELD OFFICE  
*FEDERAL FACILITY AGREEMENT AND CONSENT ORDER***

Approved by: /s/ Tiffany A. Lantow

Tiffany A. Lantow  
Industrial Sites Activity Lead

Date: 10/9/2013

Approved by: /s/ Robert F. Boehlecke

Robert F. Boehlecke  
Environmental Management Operations Manager

Date: 10/9/2013

## **5.0 CAU 204, CAS 05-18-02 – Chemical Explosives Storage**

### **5.1 CAS Description**

CAS 05-18-02, Chemical Explosives Storage, consists of the Sugar Bunker, a smaller adjacent bunker, and two cellar units that are adjacent to the south end of the Sugar Bunker. This bunker was used for various nonnuclear experiments conducted during the voluntary nuclear testing moratorium from 1958 to 1961. The area of the bunker is approximately 2,160 square feet. The Sugar Bunker is constructed of concrete and steel. There is a large ventilation system on the north end outside the entrance to the bunker. Inside the bunker, the floor is concrete. Steel beams are visible in the ceiling. Two cellar units, located to the south of the bunker, are constructed of steel coverings that are accessible from the southern exterior. The area surrounding the bunker is included in this CAS and comprises approximately 2 acres (NNSA/NSO, 2004b).

During closure activities, both bunker doors were closed and secured. The existing fence was repaired, and where needed, new fencing was installed to define the CAS boundary. In addition, the area was radiologically surveyed, and the existing radioactive material area (RMA) was extended to the CAS boundary and appropriately posted by the Radiological Control Demarcation and Maintenance program (NNSA/NSO, 2006a).

### **5.2 Current UR Description**

The future use of any land related to this CAU is restricted from any DOE or USAF activity that may alter or modify the containment control as approved by the State of Nevada and identified in the CAU CR or other CAU documentation unless appropriate concurrence is obtained in advance. Twelve UR warning signs were posted along the existing fence; fencing is not required for the UR. Site monitoring requirements for the FFACO UR include annual visual inspections of UR signs (NNSA/NSO, 2006a).

### **5.3 Basis for Current UR**

Environmental samples were analyzed for VOCs, SVOCs, RCRA metals, beryllium, TPH-DRO, TPH-GRO, PCBs, gamma spectroscopy, isotopic U, isotopic Pu, Sr-90, and explosives. Not all

samples were analyzed for the full suite of analytes. No VOCs, SVOCs, TPH-DRO, TPH-GRO, PCBs, RCRA metals, beryllium, isotopic Pu, Sr-90, or explosive were detected above PALs. The analytical results for soil samples indicate the presence of thorium (Th)-234, U-234, U-235, and U-238 contamination exceeding the PALs. Because Th-234 is a short-lived (24-day half-life) product of U-238, the two radionuclides should be in equilibrium through having the same activity; therefore, U-238 is considered the COC at this CAS (NNSA/NSO, 2004b). Table 5-1 contains analytical results of all COCs at CAS 05-18-02 that are the basis for the current UR. The sample matrix for all samples is soil.

**Table 5-1**  
**Sample Results for COCs at CAS 05-18-02 Used To Establish Current UR**

Sample ID	Depth (ft bgs)	Th-234	U-234	U-235	U-238
		PAL 63.2 pCi/g	PAL 85.9 pCi/g	PAL 10.5 pCi/g	PAL 63.2 pCi/g
204D003	0.0 - 0.5	1,150 ± 190	284 ± 46 (J)	27.1 ± 6.6 (J)	1,400 ± 220 (J)
204D004	0.0 - 0.5	184 ± 31	--	--	212 ± 29
204D006	0.0 - 0.5	326 ± 55 (J)	202 ± 35 (J)	19 ± 4.5 (J)	780 ± 130 (J)
204D008	0.0 - 0.5	--	--	--	152 ± 24 (J)
204D010	0.0 - 0.5	266 ± 44	--	--	312 ± 45
204D012	0.0 - 0.5	91 ± 15	--	--	180 ± 26
204D018	0.0 - 0.5	71 ± 12	--	--	--
204D019	0.0 - 0.5	74 ± 13	--	--	70 ± 9.3
204D040A	7.0 - 8.0	84 ± 10	--	--	90 ± 16 (Y2, M3)
204D051	0.0 - 0.5	195 ± 24	107 ± 19 (Y2, M3)	10.9 ± 2.8 (Y2, M3)	552 ± 92 (Y2, M3)
204D072	0.0 - 0.5	--	--	--	80 ± 14 (Y2, M3)
204D080	0.0 - 0.5	102 ± 12	--	--	117 ± 19 (M3)
204D083	0.0 - 0.5	116 ± 14	--	--	178 ± 29 (M3)
204D086	0.0 - 0.5	249 ± 30	86 ± 15 (M3)	--	303 ± 51 (M3)
204D093	1.0 - 2.0	--	--	--	193 ± 31 (M3)

J = Estimated value.

M3 = The requested minimum detectable concentration was not met, but the reported activity is greater than the reported minimum detectable concentration.

Y2 = Chemical yield outside default limits.

-- = No detects above original action levels.

The PALs for radiological contaminants were established in the ROTC to the CAIP (NNSA/NSO, 2004f) and were based on the NCRP Report No. 129 recommended screening limits for construction, commercial, and industrial land use scenarios (NCRP, 1999) scaled from 25- to 15-mrem/yr dose and the generic guidelines for residual concentration of radionuclides in DOE Order 5400.5 (DOE, 1993).

#### **5.4 Basis for UR Modification**

The assumption for this CAS is that the future land use is IA. The present-day radiological activities of U-234, U-235, and U-238 were calculated using the standard decay equation; the decay calculations take into account the half-life of the radionuclide and the time since the samples were originally collected. Radionuclide-specific FALs are referred to as RRMGs. These revised RRMGs are based on the 25-mrem/yr TED constraint, which represents the concentrations in soil for a specific radionuclide that would result in a 25-mrem/yr TED to a receptor for a specific exposure time.

Table 5-2 presents the present-day radiological activities, the revised IA RRMGs, and the TED of the radionuclides, which demonstrate that the TED is below the 25-mrem/yr TED constraint for the IA exposure scenario. Although the TED for sample 204D003 is close to the 25-mrem/yr TED constraint, the average dose of the four sample locations within the 1,000-square-meter ( $m^2$ )-diameter area surrounding sample 204D003 (per instructions in NNSA/NSO, 2012b) is 9.3 mrem/IA-yr (Figure 5-1). The average dose of the sample locations highlighted in Figure 5-1 is 5.6 mrem/IA-yr, which is below the 25-mrem/yr TED constraint.

#### **5.5 Proposed Modification**

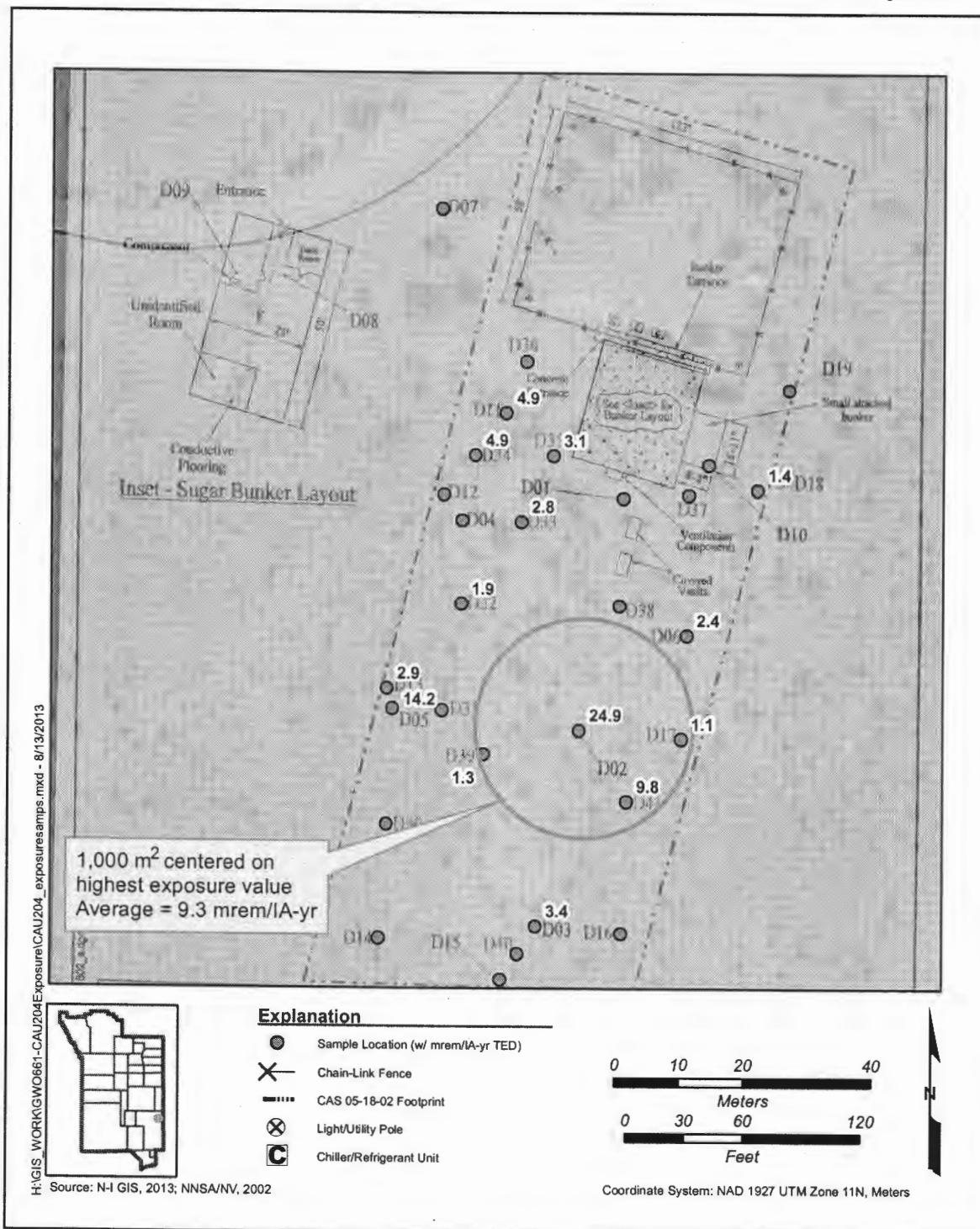
Although the average TED of the area is below the 25-mrem/yr TED constraint, it was decided that rather than eliminating the FFACO UR at this CAS, the FFACO UR will be downgraded to an Administrative UR. This is because depleted U is present at the site. The Administrative UR will protect against an inadvertent exposure to the depleted U. Therefore, remove the FFACO UR and postings from this site; discontinue annual inspections; and change to an Administrative UR. These modifications will not affect or modify any non-FFACO requirements at this site.



**Table 5-2**  
**Present-Day Radiological Activities, IA RRMGs, and TED for COCs at CAS 05-18-02**

Sample ID	Depth (ft bgs)	U-234	U-235	U-238	TED (mrem/IA-yr)
		IA RRMG 22,080 pCi/g	IA RRMG 284.0 pCi/g	IA RRMG 1,581 pCi/g	
204D003	0.0 - 0.5	284	27.1	1,400	24.85
204D004	0.0 - 0.5	--	--	212	3.35
204D006	0.0 - 0.5	202	19	780	14.24
204D008	0.0 - 0.5	--	--	152	2.4
204D010	0.0 - 0.5	--	--	312	4.93
204D012	0.0 - 0.5	--	--	180	2.85
204D019	0.0 - 0.5	--	--	70	1.11
204D040A	7.0 - 8.0	--	--	90	1.42
204D051	0.0 - 0.5	107	10.9	552	9.81
204D072	0.0 - 0.5	--	--	80	1.27
204D080	0.0 - 0.5	--	--	117	1.85
204D083	0.0 - 0.5	--	--	178	2.81
204D086	0.0 - 0.5	85	--	303	4.89
204D093	1.0 - 2.0	--	--	193	3.05

-- = No detects above original action levels.



**Figure 5-1**  
**CAS 05-18-02 Sample Locations with IA-yr TED**

## References

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DOE, see U.S. Department of Energy.

NCRP, see National Council on Radiation Protection and Measurements.

N-I GIS, see Navarro-Intera Geographic Information Systems.

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

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

National Council on Radiation Protection and Measurements. 1999. *Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies*, NCRP Report No. 129. Bethesda, MD.

Navarro-Intera Geographic Information Systems. 2013. ESRI ArcGIS Software.

U.S. Department of Energy. 1993. *Radiation Protection of the Public and the Environment*, DOE Order 5400.5, Change 2. Washington, DC.

U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. *Nevada Test Site Orthophoto Site Atlas*, DOE/NV/11718--604. Aerial photos acquired Summer 1998. Prepared by Bechtel Nevada. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004b. *Corrective Action Decision Document for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--959. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2004f. *Record of Technical Change to Corrective Action Investigation Plan for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--866-RTC1. Technical Change No. 1, 10 March. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2006a. *Closure Report for Corrective Action Unit 204: Storage Bunkers, Nevada Test Site, Nevada*, Rev. 0, DOE/NV--1117. Las Vegas, NV.

U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office. 2012b. *Soils Risk-Based Corrective Action Evaluation Process*, Rev. 0, DOE/NV--1475. Las Vegas, NV.

## Use Restriction Information

CAU Number/Description: CAU 204/Storage Bunkers

Applicable CAS Number/Description: CAS 05-18-02/Chemical Explosives Storage

Contact (DOE AL/Activity): Tiffany Lantow/Industrial Sites - EM

### FFACO Use Restriction Physical Description:

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Points	Northing	Easting
N/A		

Depth:

Survey Source (GPS, GIS, etc):

Basis for FFACO UR(s):

Summary Statement: \_\_\_\_\_

Contaminants Table:

Maximum Concentration of Contaminants for CAU XXX CAS xx-xx-xx, Title			
Constituent	Maximum Concentration	Action Level	Units

Site Controls:

## Use Restriction Information

### Administrative Use Restriction Physical Description\*:

#### Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Points	Northing	Easting
Southeast Corner	4,077,488	592,692
Southwest Corner	4,077,502	592,649
Northwest Corner	4,077,624	592,684
Northeast Corner	4,077,613	592,721
East 1 Corner	4,077,584	592,713
East 2 Corner	4,077,582	592,721

Depth: 5 ft bgs

Survey Source (GPS, GIS, etc): GPS

\*Coordinates for the Administrative Use Restriction exclude the area defined by the FFACO Use Restriction coordinates.

#### Basis for Administrative UR(s):

**Summary Statement:** Although the average TED within this CAS is below the 25-millirem per IA-year constraint, which implies that the UR may be removed, depleted uranium is present at this CAS. This administrative UR is to protect site workers from inadvertent exposure to depleted uranium on the soil surface. It is unknown if there is depleted uranium at depth. As a best management practice, this administrative use restriction will prevent future (more intensive) use of the area. Additional information is presented in *Recommendations and Justifications for Modifications to Downgrade Use Restrictions Established under the U.S. Department of Energy, National Nuclear Security Administration Nevada Field Office Federal Facility Agreement and Consent Order* document.

#### Contaminants Table:

Maximum Concentration of Contaminants for CAU 204 CAS 05-18-02, Chemical Explosives Storage			
Constituent	Maximum Concentration	Action Level	Units
Depleted Uranium	N/A	N/A	N/A

**Site Controls:** This administrative UR area is established at the boundary identified by the coordinates listed above and depicted in the attached figure. No physical site controls are required for this administrative use restriction.

UR Maintenance Requirements (applies to both FFACO and Administrative UR(s) if Administrative UR exists):

**Description:** This administrative UR is recorded in the FFACO database, NNSA/NFO M&O GIS, and the NNSA/NFO CAU/CAS files. No site controls are required for this administrative UR other than the administrative controls for land use at the NNSS.

**Inspection/Maintenance Frequency:** N/A

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, 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.



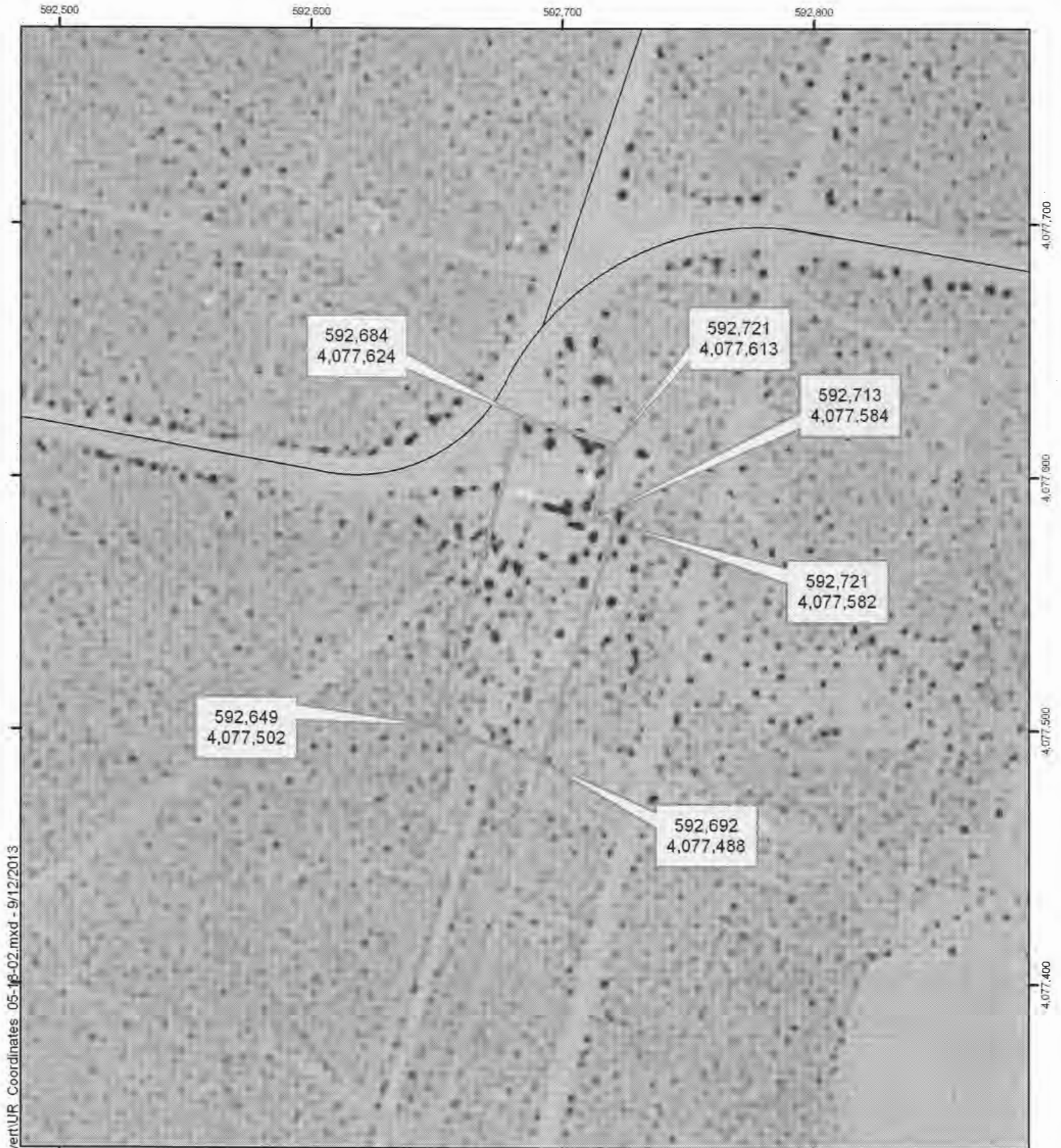
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## Use Restriction Information

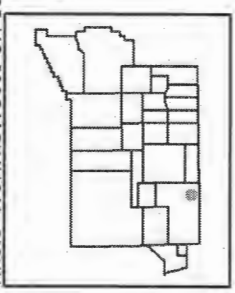
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**Comments:** Personnel are restricted from performing work in this location that would require any use of the area within the UR for activities that would result in a more intensive use of the site than the current land use (i.e., activities consistent with the occasional use exposure scenario). Activities included in the current land use would include short duration activities such as site visits, maintenance of the fence, radiological surveys, short duration radiological training, and retrieval of objects within the use-restricted area. Any activities to be conducted within this area that are not consistent with this defined current land use require the prior notification and approval of the NDEP.

Submitted By: /s/ Tiffany A. Lantow Date: 12/11/2013



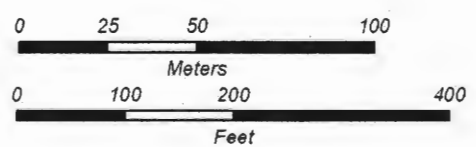
H:\GIS WORK\GW0660 UR Convert\UR Coordinates 05-18-02.mxd - 9/12/2013



Administrative Use Restriction  
CAU 204 CAS 05-18-02  
Chemical Explosives Storage

**Explanation**

 Administrative Use Restriction Boundary



Coordinate System: NAD 1983 UTM Zone 11N, Meter

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